Southern California Fires Incident Analysis Report

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Abstract

The January 2025 fires in Southern California, including the Palisades and Eaton Fires, occurred under extreme wildfire conditions characterized by powerful Santa Ana winds, critically dry vegetation, and rapid fire spread originating in vegetation and extending into the built environment. These fires became among the most deadly, destructive, and costly wildfire disasters in California history, testing communities, emergency responders, infrastructure systems, and government agencies at every level.

This report represents the second phase of an independent analysis conducted by UL Research Institutes (ULRI) at the request of the Office of the Governor of California and builds upon the Southern California Fires Timeline Report released in Phase One. This analysis examines the conditions, decisions, actions, and systems that influenced wildfire and community conflagration outcomes before and during the fires.

The report applies a systems-analysis methodology using the National Cohesive Wildland Fire Management Strategy as a framework for examining wildfire resilience, preparedness, prevention, evacuation, emergency response, infrastructure, and the built environment.

ULRI's analysis of the August 8, 2023, Lahaina Fire also informed the analytical framework and data collection approach used to evaluate each component of wildfire resilience in the January 2025 fires.

Information was collected through technical discussions (TD) with emergency responders and subject matter experts (SME), resident discussions and surveys, geospatial analysis, site inspections, policy reviews, dispatch records, radio communications, and other available operational data. The analysis evaluates wildfire and community conflagration outcomes through the interconnected lenses of Resilient Landscapes; Fire-Adapted Communities; and Safe, Effective, and Risk-Based Wildfire Response.

The findings demonstrate that outcomes were shaped by the interaction of multiple interlinked systems rather than any single factor or failure. California and local jurisdictions had established numerous prevention, preparedness, and response programs prior to the fires, including defensible space inspection programs, fuels reduction efforts, community preparedness initiatives, evacuation systems, mutual aid agreements, and extensive fire suppression resources.

However, the speed, scale, and complexity of the Palisades and Eaton Fires exceeded many assumptions underlying these systems, with ULRI's analysis identifying key implementation challenges, such as community-scale wildfire mitigation, incident management, evacuation coordination, situational awareness, infrastructure resilience, resource accountability, and built environment vulnerabilities. The report also highlights how wildfire risk and structure loss increasingly depend on conditions that can extend beyond individual parcels and traditional wildfire mitigation approaches.

The analysis concludes that future wildfire resilience requires coordinated improvements across landscapes, communities, infrastructure systems, emergency management organizations, and response operations.

Priority recommendations include strengthening community-scale risk reduction, enhancing preparedness for large, wind-driven community conflagrations; improving situational awareness and operational intelligence; expanding wildfire-resistant construction and community preparedness programs; strengthening evacuation and interoperability systems; improving infrastructure resilience; and establishing standardized, post-suppression procedures.

The lessons identified throughout this report are intended to support continuous improvement and help California, as well as other wildfire-prone jurisdictions with community conflagration risk, reduce future losses, improve resilience, and better protect communities facing increasingly complex wildfire threats.

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EXECUTIVE SUMMARY

The January 2025 fires in Southern California occurred during a period of extreme fire weather characterized by powerful Santa Ana winds, critically dry vegetation, and conditions conducive to rapid fire spread.

The Palisades and Eaton Fires ignited on January 7, 2025, less than eight (8) hours apart and approximately 30 miles from one another. These two (2) fires would ultimately be counted among the most deadly, destructive, and costly disasters in California history.

These fires evolved into large-scale community conflagrations that challenged residents, emergency responders, infrastructure systems, and government agencies at every level. The destruction that followed was the result of multiple interconnected factors rather than any single decision, event, or system failure.

At the request of the Office of the Governor of California, UL Research Institutes (ULRI) conducted an independent analysis of the January 2025 fires to examine how prevention, preparedness, evacuation, emergency management, fire suppression, infrastructure systems, the built environment, and related policies influenced fire outcomes.

This report builds upon the *Southern California Fires Timeline Report* (Phase One) and evaluates conditions that existed before the fires, operational actions taken during the incident, and opportunities to improve future wildfire resilience.

The following analysis utilizes the National Cohesive Wildland Fire Management Strategy as its organizing framework and examines wildfire outcomes through the interconnected lenses of Resilient Landscapes; Fire-Adapted Communities; and Safe, Effective, and Risk-Based Wildfire Response.

The report incorporates information collected through technical discussions with responders and subject matter experts, resident conversations and surveys, site inspections, radio communications, dispatch records, geospatial analysis, policy reviews, and other available operational data. The analysis also recognizes limitations resulting from incomplete records, unavailable data, and varying levels of participation by organizations involved in the incidents.

The January 2025 fires demonstrated that California's wildfire challenge can no longer be viewed solely as a vegetation, firefighting, or emergency response problem.

Wildfire outcomes increasingly depend on the interaction of landscapes, communities, infrastructure systems, preparedness programs, emergency operations, and the built environment. Improvements in any singular area can strengthen overall resilience, while weaknesses in one component can affect the performance of many others.

The analysis acknowledges California's significant past and recent investments in prevention, preparedness, and response programs. The City of Los Angeles and Los Angeles County had established defensible space programs, evacuation systems, community preparedness initiatives, mutual aid agreements, emergency management capabilities, and extensive fire suppression resources prior to the January 2025 fires.

Nevertheless, the speed, scale, and complexity of the January 2025 fires exceeded many assumptions underlying those systems. The fires revealed implementation challenges, operational limitations, and areas where policies and practices have not evolved at the same pace as the wildfire risk facing California communities.

The report further reinforces that incremental improvements to individual programs alone will not be sufficient to address future wildfire risk. Long-term risk reduction requires coordinated action that improves wildfire resilience at the community, regional, and state, and federal levels.

California has developed, implemented, and supported extensive wildfire mitigation programs, including defensible space regulations, fuels reduction projects, wildfire preparedness initiatives, Fire Safe Councils, Firewise USA® communities, and Community Wildfire Protection Plans (CWPP).

However, the January 2025 fires illustrated that wildfire risk increasingly extends beyond parcel-level compliance and regulatory boundaries. Community vulnerability was influenced by fuel continuity, the interconnected built environment, public-private land interfaces, and conditions that existed beyond individual properties.

Preparedness efforts prior to the fires varied across organizations. The analysis identified significant differences in planning, staffing, incident management readiness, mutual aid integration, wildfire command qualifications, and engagement in statewide wildfire preparedness programs. These differences influenced organizational readiness during the initial phases of the fires.

The report underscores that wind-driven community conflagrations require preparedness assumptions that differ substantially from those used for typical wildland fire incidents. Wildfire pre-planning, staffing augmentation, incident management capacity, and regional interoperability were all found to influence operational effectiveness during the first operational periods.

Emergency responders operated under exceptionally difficult circumstances. Firefighters, law enforcement officers, emergency managers, dispatch personnel, public works employees, community volunteers, and utility personnel performed life-saving work in rapidly deteriorating conditions. Their efforts contributed significantly to evacuation operations, structure defense, rescue activities, and overall incident response.

At the same time, the fires exposed challenges involving command integration, situational awareness, resource accountability, communications, and Unified Command (UC) implementation. Incident complexity increased rapidly as multiple fires occurred across Southern California during the same operational period.

The analysis found that command systems were sometimes challenged by the pace of fire growth, rapidly escalating resource demands, and the need to integrate multiple agencies and disciplines into a common operating framework.

Large-scale evacuations were conducted under extraordinary conditions, helping prevent additional loss of life. However, the analysis identified opportunities to improve evacuation planning, public alerting, interagency coordination, traffic management, and operational integration among organizations responsible for evacuation decision-making and implementation.

The fires also demonstrated the importance of community preparedness, early evacuation decision-making, and support for individuals with access and functional needs. Analysis of circumstances for those who perished in the fires found many deaths occurred under rapidly changing conditions when evacuation opportunities were limited, delayed, or declined. Older adults and individuals with mobility limitations were disproportionately impacted.

The fires demonstrated the interdependence of emergency response operations and infrastructure systems. Water systems, electrical systems, transportation networks, and communications capabilities all influenced operational effectiveness and community outcomes. Infrastructure disruptions compounded challenges associated with suppression operations, evacuations, and public information sharing.

The built environment itself played a substantial role in fire progression and structure loss. Structure ignition and fire spread occurred through a combination of ember exposure, radiant heat, and direct flame contact, including structure-to-structure fire spread under extreme wind conditions. While wildfire-resistant building features demonstrated benefits in some areas, structure survivability was also strongly influenced by surrounding conditions, neighborhood-scale exposure pathways, and defensive actions.

Independent review of response and post-suppression actions of the January 1, 2025, Lachman Fire identified opportunities to improve inter-agency planning and response actions,

containment verification, mop-up operations, patrol activities, documentation practices, and post-suppression decision-making. The review found that greater standardization of post-suppression procedures may reduce the likelihood of future holdover fire events and improve confidence in containment verification processes.

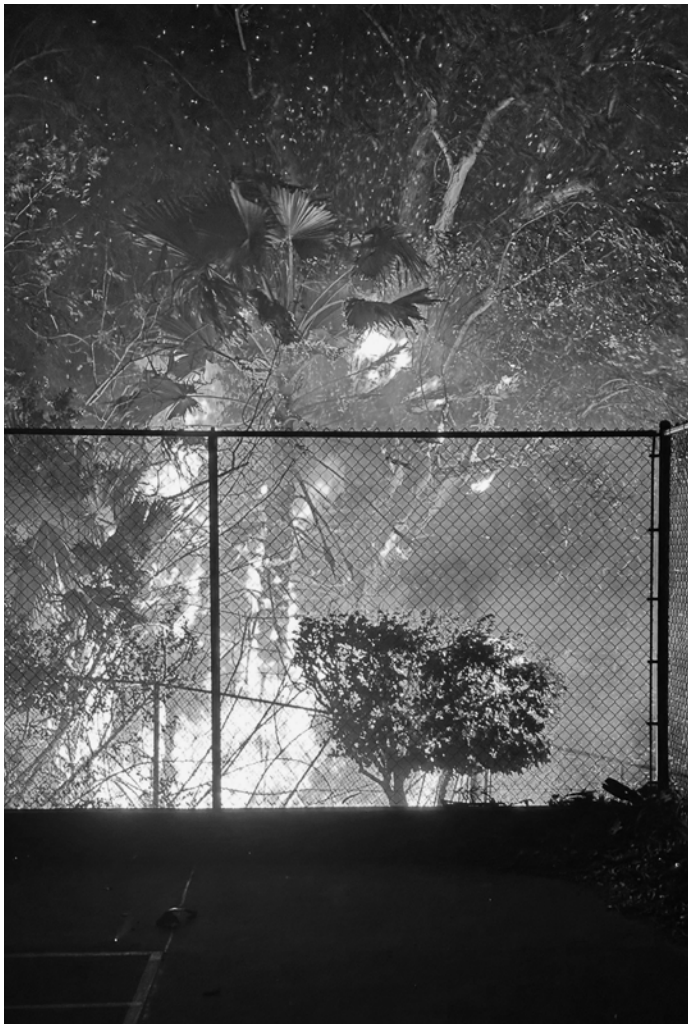
The report contains detailed findings and recommendations throughout each section. Several overarching recommendations emerge consistently across the analysis:

- Strengthen integration among prevention, preparedness, infrastructure, evacuation, and emergency response systems
- Transition wildfire resilience efforts from parcel-level compliance programs toward community-scale risk reduction strategies
- Establish standardized regional planning and preparedness expectations for wind-driven wildfire events
- Improve situational awareness, wildfire intelligence capabilities, and operational decision-support processes
- Expand and integrate community preparedness, home hardening, defensible space, and fire-adapted community programs
- Enhance UC, mutual aid integration, incident management training, and interoperability across disciplines and jurisdictions
- Advance fire suppression capabilities for community conflagrations
- Improve evacuation planning, public warning systems, and support for populations with access and functional needs, while also ensuring incident command organization prioritizes evacuation
- Strengthen infrastructure resilience and develop contingency plans for degraded operating conditions during wind-driven community conflagrations
- Establish standardized post-suppression procedures for containment verification, patrol, mop-up operations, and documentation

The January 2025 fires in Southern California tested California's wildfire systems under some of the most challenging conditions ever experienced in the region. This analysis demonstrates that no single intervention can eliminate wildfire risk.

Future success depends on strengthening the performance of the entire system, including landscapes, communities, infrastructure, preparedness efforts, emergency operations, and the built environment.

The lessons identified throughout this report provide an opportunity for California and other wildfire-prone jurisdictions to improve resilience, reduce future losses, and better protect residents, responders, and communities from increasingly complex wildfire events.



1. INTRODUCTION

Fast-moving wildfires and destructive community conflagrations are not new occurrences for California and its residents. Despite the state's long history with wildfires, many of the state's largest and most destructive fires — and several of its deadliest — have occurred in the past decade.

The January 2025 wildfires that impacted communities in Southern California tested residents, leaders, and first responders significantly, highlighting the growing fragility of communities when faced with the increasing threat that large, wind-driven wildfires pose to states like California and our nation.

In this second phase of the comprehensive independent review of the tragic fires that impacted Southern California, the goal of UL Research Institutes' (ULRI) Fire Safety Research Institute is to lessen the impacts of future fires to lives and property, both throughout the State of California and in other communities around the world.

Phase One of this work, the *Southern California Fires Timeline Report (referred to as Phase One),*[1] was released on November 20, 2025, and provided a detailed timeline of relevant events, based on available information, that occurred from January 7–8, 2025.

This document, the *Southern California Fires Incident Analysis Report,* is the second and final phase in the series and contains an analysis of the facts presented in Phase One against current policies, procedures, and evidence-based best practices for the period from January 7, 2025, at 10:30 a.m. Pacific Standard Time (PST), to the morning of January 8, 2025, along with preparedness efforts that occurred before January 7, 2025.

As the state and its residents continue to learn and rebuild from the January 2025 wildfires, this independent analysis underscores the profound impact these fires had on the communities affected by the Palisades and Eaton Fires. It also recognizes the crucial role that local, state, and national risk intelligence and policy play in either strengthening our resilience to wildfires or perpetuating our vulnerabilities.

Although the findings from this independent analysis are specific to the conflagrations in Southern California, the data makes clear that policy solutions should not be viewed exclusively through the lens of the Southern California region, but also on a statewide level in California. Furthermore, the recommendations and solutions outlined in this report should be considered by every community, jurisdiction, and state at risk of wildfire today and as our country's risk expands into the future.

1.1 UL Research Institutes' Responsibility

ULRI is a leading independent safety science organization guided by the mission of working for a safer world. With a lineage dating back to the formation of Underwriters Laboratories (UL) in 1894, the organization's first institute — the Fire Safety Research Institute — advances fire safety knowledge to address the world's unresolved fire safety risks and emerging dangers.

In February 2025, the Office of the Governor of California engaged ULRI's Fire Safety Research Institute to conduct an independent, broad-based review of the Palisades and Eaton Fires' progression and emergency response timelines (Phase One) and analysis of the fire incidents in Southern California (Phase Two), including the Lachman Fire, which occurred on January 1, 2025.

ULRI's Fire Safety Research Institute focuses on conducting rigorous research in firefighter health and safety, wildland-urban interface (WUI) fires, battery fire safety, data science, fire modeling, materials, and fire dynamics. ULRI draws upon the resources of its global network of scientists and safety professionals to apply science to complex real-world challenges.

This independent analysis of the January 2025 fires in Southern California is informed by multidisciplinary subject matter experts in fire science, engineering, investigation, and emergency operations located in California and beyond. Collectively, this team has 900-plus years of experience researching, responding to, managing, and recovering from major fire incidents around the globe.

ULRI is humbled to assist the State of California with this important research and analysis, which has implications across the United States and within so many other communities worldwide.

1.2 Systems Analysis Methodology

The methodology used to analyze the January 2025 fires in Southern California requires a systems analysis approach. ULRI's analysis examines the overall prevention, preparedness, and effectiveness of the operational system. This approach is necessary due to the complex nature of wildfires, especially those leading to community conflagrations. It considers the interplay of environmental conditions, human activities, policies, and norms.

Wildfires, such as the Palisades and Eaton Fires, are complex events influenced by a multitude of interconnected factors. Addressing any single factor in isolation is insufficient. Considering the complex interactions and cumulative effects of these factors is a more effective way to adequately understand what took place and how the preparedness, prevention, and response systems performed.

A systems approach (a holistic and interdisciplinary method for understanding and solving complex problems) enables a comprehensive understanding of events and system performance, leading to findings and recommendations that address root causes, reduce risk, and improve future fire outcomes.

ULRI's independent analysis of the August 2023 Lahaina Fire also informed the approach to the January 2025 fires in Southern California, providing a proven framework for examining the factors that contribute to large-scale community conflagrations and identifying opportunities to improve wildfire resilience.

1.2.1 Framework for Analysis

The National Cohesive Wildland Fire Management Strategy (referred to as the Cohesive Strategy) provides a reference that can be used to analyze the January 2025 fires in Southern California. The vision of the Cohesive Strategy is: "To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and collectively, learn to live with wildland fire."[2]

Analyzing contributing factors within the context of the Cohesive Strategy facilitates alignment between local, state, and national systems, policies, and best practices. It was used to identify areas of focus for deeper analysis and establish criteria for evaluating wildfire preparedness, prevention, and response efforts.

1.2.2 General Topics within Phase One Requiring Further Study

The Cohesive Strategy categorizes the broad system of components that determine wildfire outcomes into three (3) major areas of focus:

- Resilient Landscapes
- Fire-Adapted Communities
- Safe, Effective, and Risk-Based Wildfire Response

These focus areas make up the overarching goals of the Cohesive Strategy, with numerous management options within each. The Cohesive Strategy encourages the use of the best available science to inform the work within each area, underscoring the need for consistent and timely communication and coordination among all efforts.

The 2023 Cohesive Strategy Addendum[3] added several critical emphasis areas and key challenge priorities, including:

- Climate Change
- Community Resilience
- Workforce Capacity, Health, and Well-Being
- Science, Data, and Technology

The Cohesive Strategy graphic (Figure 1.2.1) represents these three (3) tenets and their overarching goals. Each of the goals, and subsequent actions taken to address them, are inextricably intertwined and result in positive advancement of the other two (2) goals. All actions are informed by the best available science, information, and technology, which is placed at the center.

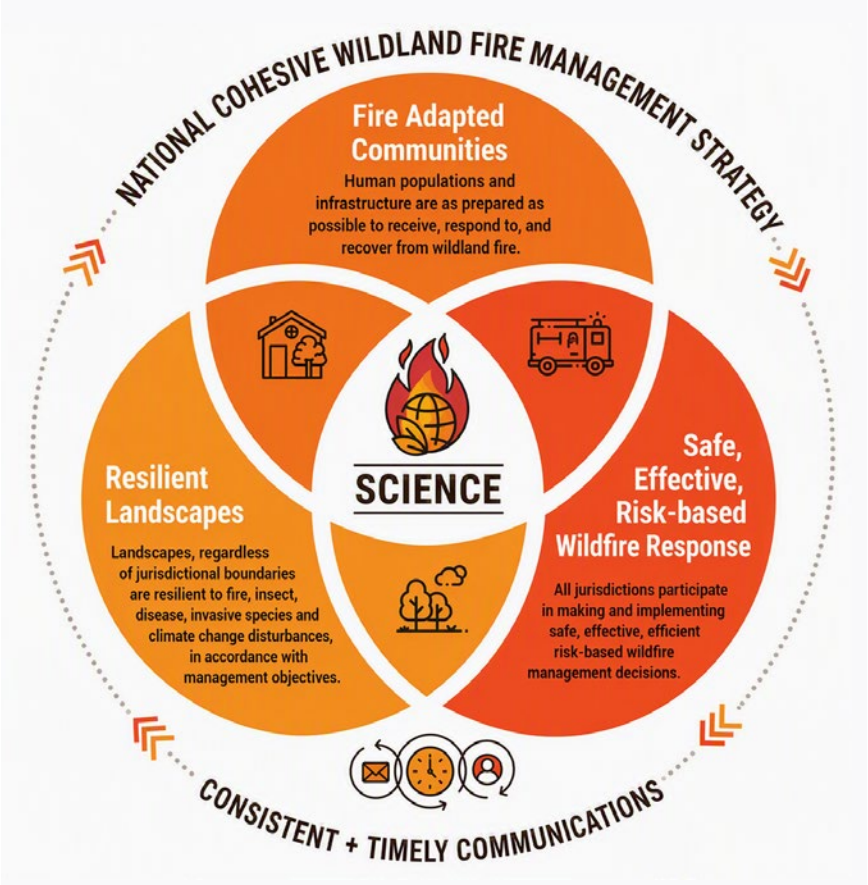


Figure 1.2.1 The Cohesive Strategy.[4]

During Phase One, several system components were identified for further analysis, focusing on organizational leadership, preparedness, prevention, and response.

Wildfire Resilient Landscapes

The Resilient Landscapes goal of the Cohesive Strategy focuses on 1) the threats to natural resources caused by wildfire and other disturbances and 2) the measures necessary to reduce fuels that contribute to ignitions and rapid wildfire spread. It aims for landscapes that are resilient to fire and other pressures in order to prevent, survive, and recover from wildfire.

The goal states, “Landscapes, regardless of jurisdictional boundaries, are resilient to fire, insect, disease, invasive species, and climate change disturbances, in accordance with management objectives.”

The system component analyzed in Phase Two is:

- Vegetative Fuel (both the wildland landscapes and ornamental vegetation)

Fire-Adapted Communities

The Fire-Adapted Communities goal of the Cohesive Strategy focuses on the human system of laws, plans, budgets, and programs, as well as the safety and preparedness of the built environment and its residents.

The goal states, “Human populations and communities are as prepared as possible to receive, respond to, and recover from wildfire (that impacts communities).”

The system components analyzed within Phase Two include:

- Infrastructure (road networks, water, and electrical)
- Evacuation
- Analysis of the Built Environment

Safe, Effective, and Risk-Based Wildfire Response

The Safe, Effective, and Risk-Based Wildfire Response goal of the Cohesive Strategy focuses on informed decision-making, risk management, and effective communication and coordination to enhance safety and efficiency in wildfire response. It aims to prevent injury and loss of life, while quickly and safely minimizing the impacts of fire incidents.

The goal states, "All jurisdictions, responding in all land types, participate in making and implementing safe, effective, and efficient risk-based wildfire management decisions."

The system components analyzed in Phase Two include:

- Weather Forecast
- Communications and Coordination (pre-incident and during)
- Incident Management (including intelligence gathering)
- Fire Suppression Preparations and Operations
- Evacuation Processes

1.2.3 Policy Analysis

Each of the identified system components nested within the Cohesive Strategy framework is examined in this report. A review of each component as it relates to the Palisades and Eaton Fires is provided, discussing its role within the broader system and its specific circumstances and contributions to the incident outcomes.

Each system component is reviewed for comparison to county and state policies and procedures, and, where appropriate, to nationally recognized, evidence-based best practices. Where applicable, an examination is provided of what the policy states and how that compares with the actions taken by the organizations.

Findings are provided both incident-wide and per organization, as appropriate. Where immediate actions to reduce risk are most critical, recommendations are also provided.

1.2.4 Responder and Resident Observations and Experiences

As mentioned in the Phase One report (page 69), ULRI researchers engaged in technical discussions (TDs) with personnel responding to the Palisades and Eaton Fires, as well as those responsible for prevention and preparedness activities. A total of 295 individuals from 22 different agencies participated in TDs for the Phase One and Two reports.

ULRI researchers also had nearly 200 in-person conversations with residents within, and adjacent to, the Palisades and Eaton Fire perimeters. A survey tool, developed by ULRI, was used to collect and organize resident experiences. The survey has had 260 submissions as of the release of this report.

Information gathered from these discussions will be shared throughout the report to provide context to some of the sections. The summary of resident survey responses is provided in Section 6.8 of the Appendix.

1.2.5 Information Sources

Information and data were gathered from a variety of sources. Consistent with the Phase One report, requests for information were made to federal, state, and local governments and private agencies. Details around the requests for information can be found in Appendix Section 6.10.

1.2.6 Findings and Recommendations

"Findings and Recommendations" are provided at the conclusion of applicable sections. Findings are specific areas of interest that impacted the pre-event conditions and activities as well as incident operations. They can be related to policies, procedures, guidelines, codes, standards, best-practices, decisions, organizations, actions, and/or equipment. A finding can also be related to information that is missing or incomplete.

Recommendations are connected to findings. They include information on how to improve the condition mentioned in the finding. In some cases, there may be several recommendations connected

to one (1) finding, and some findings may have no recommendations. A summary of the findings and recommendations appearing throughout the report can also be found in Appendix Section 6.9.

In addition, resource and funding limitations will be noted throughout this report. While government funding is critical to mitigating wildfire risks, the ultimate solution must be rooted in establishing inter-organizational partnerships that span the breadth of entities covered in this report and work collaboratively to establish policies, procedures, and guidelines designed to protect the community.

1.2.7 Report Formatting Details

Throughout the report, time is identified in a 24-hour format that includes two (2) digits for hour, a colon/separator, and two (2) digits for minutes (i.e., 14:00 is 2:00 p.m.). Times listed are PST.

Points of Reference:

- Pre-Fires: Events occurring before 10:30 on January 7, 2025
- Palisades Fire: Fire beginning January 7, 2025, at 10:30 and the analysis of data continues through the morning of January 8, 2025
- Eaton Fire: Fire beginning January 7, 2025, at 18:18, and the analysis of data continues through the morning of January 8, 2025
- Law Enforcement: law enforcement search and rescue operations timelines for both fires extend into the evening of January 8, 2025

Maps are used extensively throughout the report to display the location of landmarks, fire progression, and general and specific geographical locations of incident operations. Many of these maps were created by ULRI investigators, using data collected from ground-level observations, and include the Palisades and Eaton Fire perimeters and interior burned areas.

1.3 Limitations of Analysis

Examining every contributing factor of a wildfire-initiated community conflagration is difficult due to the complexity and interconnectivity of variables. Applying a systems approach is valuable and effective because it allows for a better understanding of the various factors and conditions that contributed to the event.

This analysis approach identifies multiple influences, reveals interconnections, and helps define key leverage points for future intervention. However, this approach has limitations due to complexity and scope, data, and time constraints, and is resource-intensive. The vast range of factors and their interdependencies make it difficult to capture every detail and fully understand all interactions.

Accurate and comprehensive data for every component can sometimes be lacking and can potentially lead to intermittent and/or unintentional gaps in the analysis. The post-incident review process for this incident encountered a range of challenges that limited its completeness and, in some areas, its neutrality.

Several relevant departments and agencies did not provide complete information to the independent review team, constraining the depth and strength of the analysis. In some cases, operational records were sparse, further limiting the evidentiary foundation for analysis. Some agencies also declined to have their personnel participate in TDs, and a few limited participation to only a few key personnel.

See Appendix Section 6.10 for a listing of what was requested from departments and agencies, and what they produced. Known data gaps will be identified throughout the report.

This analysis includes information pertaining to weather, environment, and preparedness activities prior to January 7, 2025. Not included within this report are efforts that have already begun at the national, state, and county levels to address some of these issues. Despite the limitations, a good-faith effort was made to account for and examine major factors that contributed to the catastrophic wildfire events that occurred in Southern California in January 2025.

2.1 Statewide Background

The analysis of the January 2025 wildfires in Southern California found a broad statewide set of norms and practices that provided essential context and background for this report. This statewide context highlights the social and biophysical landscape of wildfire management in California, and the conditions that significantly impacted decision-making and outcomes across Southern California before, during, and after the fires.

This context, which uses the Cohesive Strategy as a tool for analysis and future action, also provides deeper insights into California's wildfire norms, practices, and attitudes. By considering the available funding, current policies, and overarching social attitudes within the state around wildfire preparedness and response, we can create a foundation on which all other system factors can be better understood and evaluated for effective and lasting change.

2.1.1 Escalating Statewide Wildfire Risk

Wildfires in California have grown more deadly and destructive over the last decade, with the Camp Fire in 2018 the deadliest in terms of human lives lost[5] and the Southern California fires in 2025 the costliest in terms of estimated damage and economic losses.[6]

Despite the state's history of living with wildfire, the January 2025 fires highlight the growing threat of wildfire to states like California and the vulnerabilities communities similar to those within the Palisades and Eaton Fire perimeters will continue to face in the coming years.

Leaders and policymakers across the state and the nation should not view this analysis, and its subsequent recommendations, exclusively through the lens of the Southern California region, but also on a statewide and national level.

As our country's risk of wildfire continues to grow, the findings and recommendations outlined in this report must be considered by every community, jurisdiction, and state at risk of wildfire to ensure the implementation of data-backed solutions that can help save lives and mitigate destruction.

2.1.2 Perception of Wildfire Risk within Southern California

The State of California has long recognized its high risk of wildfire, especially in Southern California and similar regions, where mountainous topography, urban sprawl, high concentration of dry vegetation, and increasingly common seasonal weather events support extreme fire behavior.

California has responded to this threat by progressively passing laws, adopting codes and standards, adding staff, purchasing specialized equipment, and funding research to strengthen prevention, preparedness, and response capabilities.

Experts in wildfire and WUI fire suppression recognize the response capacity of Los Angeles and Ventura counties as among the best in the world. As such, both counties provided extensive ground- and air-based fire suppression resources during the Palisades and Eaton Fires, aided by resources provided by local, state, and federal agencies.

2.1.3 State Wildfire Policy

California lawmakers are actively working to reduce the state's risk of destructive wildfires through various state laws and policy initiatives, including updated building and WUI codes.

Recent policy initiatives include:

Bill 3074[7]	Necessitates, among other requirements, the creation of ember-resistant zones around buildings in high fire hazard areas throughout the state. In February 2025, the Governor of California signed an Executive Order (EO) which directed the California Board of Forestry and Fire Protection (BOF) to expedite final regulations for ember-resistant zones by the end of 2025. On August 19, 2026, the BOF approved final Zone 0 regulations, establishing phased requirements for ignition-resistant conditions within the first five feet of structures in State Responsibility Areas (SRAs) and Very High Fire Hazard Severity Zones (VHFHSZs) within Local Responsibility Areas (LRAs).[8,9]
EO N-34-25	Requires state agencies to develop long-term solutions that both stabilize California's insurance market and energy utility sector and manage rising costs associated with wildfire and other climate-related hazards.[10]
2025 California Building Standards Code Updates (effective January 1, 2026)	Incorporate lessons learned from recent wildfire events and growing scientific evidence around building features and materials that aid in increased structural survivability.[11]
California WUI Code Updates	Consolidate prior code requirements into a unified framework and establish construction standards tied to designated Fire Hazard Severity Zones (FHSZs). These standards include requirements for ignition-resistant construction, including components intended to reduce vulnerability to ember intrusion, radiant heat, and direct flame exposure.[12]

Additionally, it was announced in March 2026 that 300 fuels management and mitigation projects had been approved, following the Governor of California's March 2025 emergency proclamation on wildfire.[13,14]

As a result, state agencies are coordinating to fast-track crucial wildfire safety projects across California, while maintaining critical environmental safeguards. Through this streamlined process, projects are being approved in as little as 30 days, saving a year or more of review for more complicated projects.

The updated review and approval process for wildfire mitigation projects has been essential for state and federal agencies, tribes, resource conservation districts, Fire Safe Councils, private landowners, and others to get mission-critical work done faster.

In December 2025, the California Department of Forestry and Fire Protection (CAL FIRE) announced awards of more than $62.7 million in funding for 84 local wildfire prevention projects across the state, including 41 projects in low-income and disadvantaged communities.[15]

Over the last six (6) years, CAL FIRE has awarded more than $566 million in Wildfire Prevention Grants to more than 575 projects across the state.[16]

Also in 2025, the California Insurance Commissioner supported legislation[17] to establish the nation's first public wildfire catastrophe model.[18]

While these policy advancements are important steps forward, they alone are unlikely to fully address the challenges posed by increasingly severe wildfire conditions. Continued investments and improvements in prevention, preparedness, and response will be necessary.

2.1.4 Fire Hazard Maps

Statewide Fire Hazard Maps

California is required to classify wildfire hazard severity through the Fire Hazard Severity Zones (FHSZs) classification system,[19] which includes hazard zone mapping for SRAs and LRAs.

These zones are the foundation for several existing and emerging state laws and building codes, as well as standards adopted at local and state levels. CAL FIRE's public information tool[20] provides the most current map of designated FHSZs in California.

It should be noted that the state's wildfire regulatory framework applies differently across SRAs and LRAs. Within SRAs, state law and regulations generally require application of defensible space and other wildfire mitigation measures across Moderate, High, and VHFHSZs. In contrast, within LRAs, many of the state's mandatory wildfire mitigation measures are required only within designated VHFHSZs, with more limited requirements applying within High FHSZs.

As a result, significant wildfire mitigation measures, including defensible space inspection and enforcement programs, do not consistently apply across all areas that may be exposed to wildfire risk, particularly within LRAs that are outside of VHFHSZs.

In addition, it's important to recognize that wildfires, like the Palisades and Eaton Fires, can impact areas beyond existing regulatory boundaries and mapped hazard classifications, particularly in densely developed environments in or near the WUI, where ember exposure, structure-to-structure ignition, and adjacent fuel conditions can influence fire spread.

Local Fire Hazard Maps

At the time of the January 2025 fires, both the City of Los Angeles and Los Angeles County were operating under the 2007 LRA VHFHSZ maps, as the updated 2025 LRA FHSZ maps were not issued until March 24, 2025.[21]

See Figures 2.1.1 and 2.1.2 for historical and current FHSZ boundaries for the Palisades and Eaton Fire areas, respectively.

At the time of this report, both the city and county are proceeding through the required public review and adoption processes of the new maps.

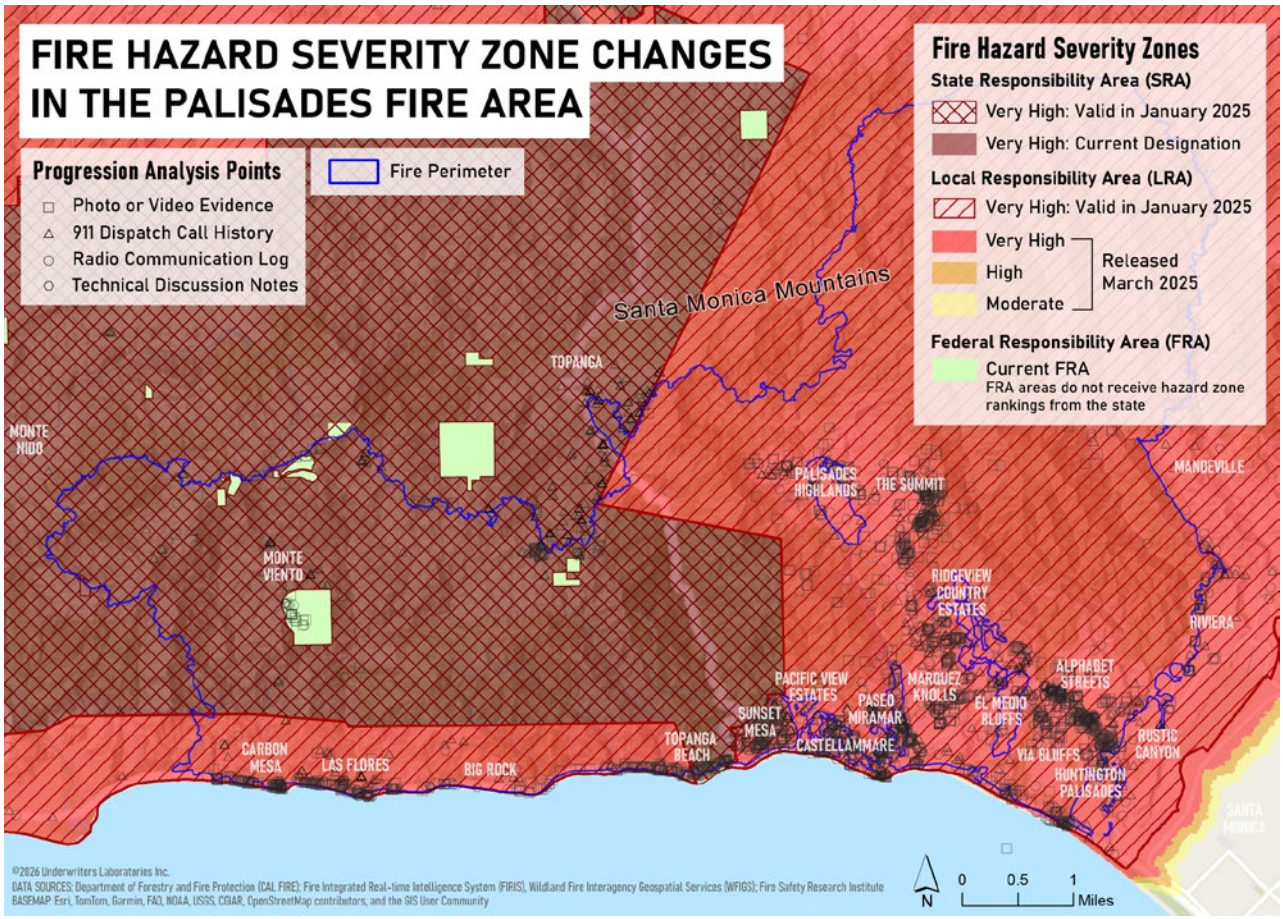


Figure 2.1.1 Palisades Fire area map displaying Fire Hazard Severity Zones at the time of the fire on January 7, 2025, and current zones effective Spring 2025.

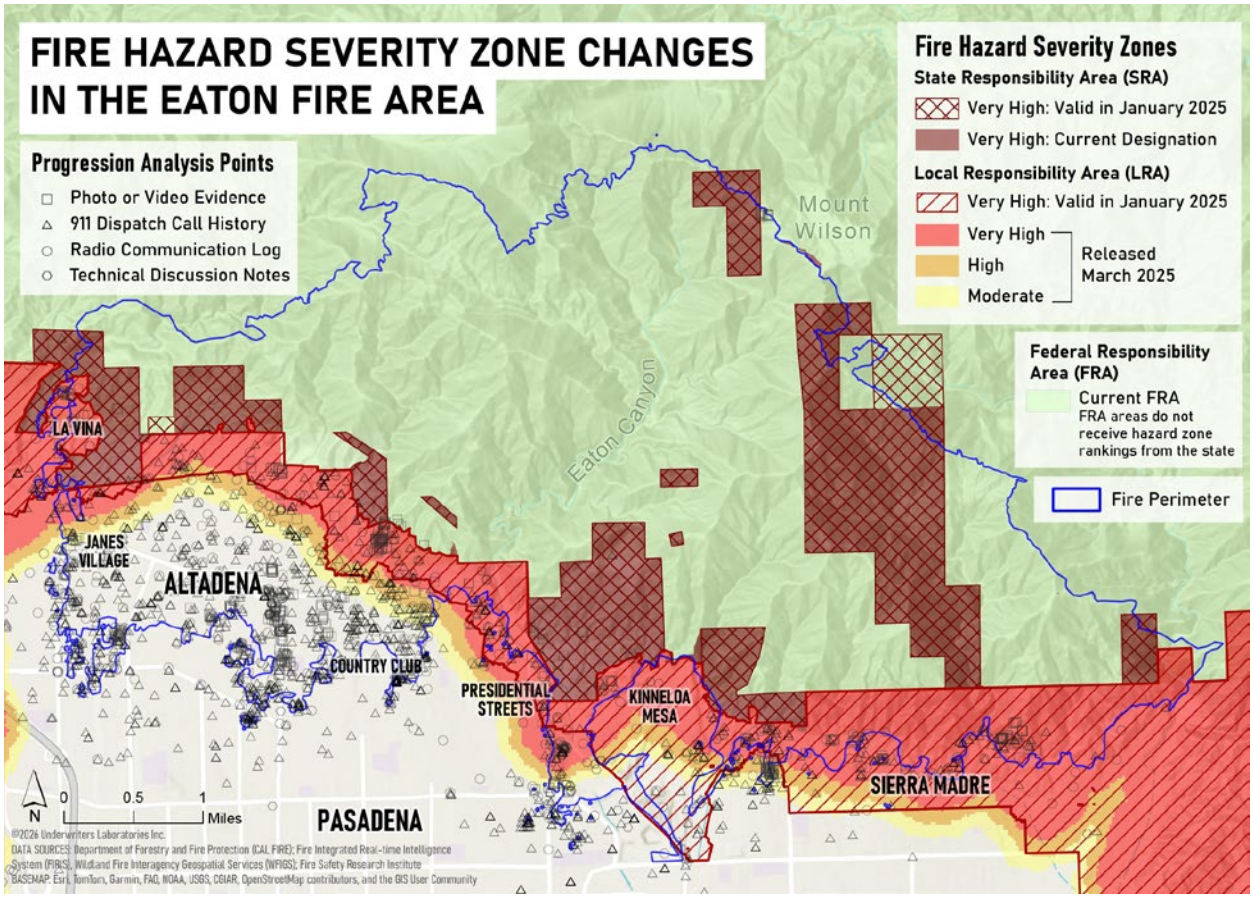


Figure 2.1.2 Eaton Fire area map displaying Fire Hazard Severity Zones at the time of the fire on January 7, 2025, and current zones effective Spring 2025.

Note: *Federal Responsibility Areas (FRA) are excluded from California's FHSZ designation, as those hazard classifications and management are handled by federal agencies.*

The updated 2025 maps expand classifications within the city and county to include "Moderate" and "High" hazard designations. This broadens the wildfire hazard areas within portions of Los Angeles County to include locations like neighborhoods within the Altadena foothills, which experienced catastrophic wildfire impacts during the January 2025 fires.

Replacement of Local Hazard Map Discussion

The use of FHSZ maps as a basis for wildfire mitigation requirements has been the subject of ongoing discussion among policymakers and practitioners.

FHSZ maps are designed to characterize long-term wildfire hazard and are based on factors such as fuels, weather, topography, and expected fire behavior over a 30- to 50-year period. As a result, they do not account for recent changes in conditions, including wildfire activity, fuel reduction projects, defensible space treatments, or home-hardening measures.

Following a wildfire, reductions in available fuels may temporarily alter local hazard conditions, even though FHSZ designations remain unchanged.

Consequently, contemporary wildfire hazard and risk assessment tools can complement FHSZ maps by helping agencies prioritize mitigation investments using current fuels, fire history, and other dynamically changing conditions.

2.2 Federal Wildfire Policy

As the threat of destructive wildfires continues to increase for communities across the United States, wildfire mitigation and preparedness have become major topics within national policy discussions. While the January 2025 fires in Southern California prompted federal policy action,[22] efforts to mitigate the impacts of wildfire have been underway at a national level for years.

In April 2002, the Wildland Fire Leadership Council (WFLC) was established by the federal government to provide a vision for wildland management in the 21st century and serve as the intergovernmental committee supporting the implementation and coordination of the Federal Fire Management Policy.[23]

The cornerstone of WFLC's leadership has been the development and implementation of the National Cohesive Wildland Fire Management Strategy.[24] The USDA Forest Service (USFS) and the Department of the Interior (DOI) are required to submit a report to Congress that contains a Cohesive Strategy. This strategy provides guidance to government and non-governmental organizations seeking national, all-lands solutions to wildland fire management issues.

In 2021, Congress established the Wildland Fire Mitigation and Management Commission[25] to comprehensively review the nation's wildfire system. The commission identified 167 recommendations developed to address the increasing risk of wildfire in the U.S. These recommendations have provided a vital roadmap to improve wildfire outcomes, though further action on these recommendations from Congress is required.

In January 2025, several members of Congress introduced a bipartisan bill, known as the Fix Our Forests Act,[26] which aims to enact several of the recommendations documented in the final report of the Wildland Fire Mitigation and Management Commission.

While this bill has not yet been enacted into law, it represents one of the most sweeping legislative actions aimed at addressing the nation's wildfire crisis, addressing key elements like increasing the speed and scale of forest restorations, establishing a community wildfire risk reduction program, modifying existing forestry authorities, and improving wildfire response operations and post-fire rehabilitation.

A notable national wildfire policy action in response to the 2025 Southern California wildfires is EO 1430,[22] which was issued in June 2025. Titled "Empowering Commonsense Wildfire Prevention and Response," this policy directs the federal government to streamline federal wildfire capabilities to improve their effectiveness and promote commonsense, technology-enabled local strategies for land management and wildfire response and mitigation.

2.3 Regulatory Challenges of a Multi-Agency Wildfire Prevention System

Wildfire prevention in California operates within a multi-level regulatory system involving federal, state, and local entities.

Multiple agencies share responsibilities for wildfire mitigation in the state that include defensible space, roadside, and brush clearance programs; mechanical thinning and fuel reduction; grazing and biological treatments; invasive species control; limited prescribed and cultural burning; and public education and community preparedness (Table 2.3.1).

These activities are carried out by a diverse network of local, state, federal, and community-based organizations in the region, including the Los Angeles Fire Department (LAFD), the Los Angeles County Fire Department (LACoFD), California State Parks, CAL FIRE, USFS Angeles National Forest Fire & Aviation Management (ANF), Mountains Recreation and Conservation Authority (MRCA), local Fire Safe Councils, and nonprofit organizations, such as My Safe:LA, as well as private property owners.

Each entity operates under distinct regulatory frameworks, mandates, priorities, and environmental compliance requirements.

Figure 2.3.1 shows the variety of different fuel reduction projects and responsible agencies and organizations within and near the Palisades and Eaton Fire perimeters from Fiscal Year (FY) 2019/20 to present.[27]

While this system can support specialization and localized implementation, standards, timelines, funding mechanisms, enforcement authorities, and/or risk reduction priorities are not always aligned.

Table 2.3.1 outlines the key responsibilities and impacts of the regulatory entities responsible for wildfire prevention-related activities, both statewide and nationally.

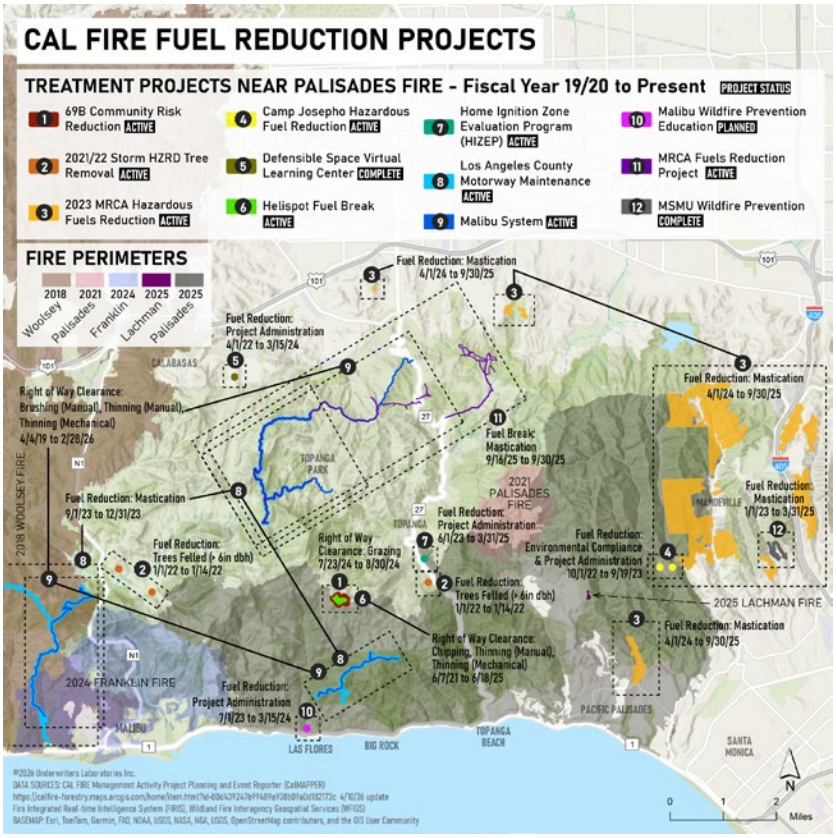
These differing mandates and responsibilities often result in inconsistent expectations around wildfire prevention, including where mitigation should occur, what types of vegetation treatments are appropriate, who is responsible for maintenance, and what level of wildfire risk reduction is considered sufficient. In some cases, agencies and stakeholders may also apply different standards to mandates like vegetation removal, fuel treatment methods, defensible space enforcement, and/or prioritization of high-risk areas.

This misalignment is further compounded by the absence of coordinated implementation across both agency responsibilities and jurisdictional boundaries. These jurisdictional and operational complexities were particularly pronounced in the Palisades and Eaton Fire areas due to the intermixing of federal lands, SRAs and LRAs, utility infrastructure corridors, park lands, open space preserves, and densely developed residential neighborhoods.

Implementation capacity also remains a significant statewide challenge. No single entity is responsible for ensuring that mitigation is completed across the full landscape. Although wildfire prevention programs, including defensible space inspection efforts, have expanded in recent years, many local agencies continue to face staffing, funding, and workload limitations that constrain consistent implementation and long-term enforcement.

Table 2.3.1 Multi-level regulatory framework for wildfire prevention.

Level	Primary Role	Key Responsibilities	Examples of Entities	Implementation Impact
Federal	Policy, funding, and coordination support	Establish national policy frameworks, provide funding, support large-scale fuels management and disaster recovery	USFS, DOI, Federal Emergency Management Agency (FEMA)	Indirect: supports state and local programs through funding and guidance
State	Legal authority and regulatory oversight	Establish defensible space requirements, wildfire policy, building standards, and utility oversight; Provide guidance, funding, and statewide coordination	CAL FIRE, BOF, California Governor's Office of Emergency Services (Cal OES), California Public Utilities Commission (CPUC)	Direct: sets baseline requirements and program expectations statewide
Regional / Coordination Bodies	Multi-agency alignment and resource coordination	Facilitate coordination across jurisdictions and support regional fuels management and planning efforts	California Wildland Fire Coordinating Group (CWCG), regional collaboratives, special districts	Enables consistency and resource sharing across jurisdictions
County/Local Government	Implementation and enforcement	Conduct inspections, enforce defensible space requirements, manage local ordinances, and coordinate mitigation activities	LAFD, LACoFD, local jurisdictions	Primary point of program delivery and enforcement
Land Management Agencies	Vegetation management on public lands	Manage fuels and vegetation on state, federal, and open space lands adjacent to communities	MRCA, State Parks, USFS	Influences fuel conditions beyond parcel boundaries
Property Owner	Compliance and maintenance	Implement and maintain defensible space requirements on private property	Homeowners, homeowners associations (HOAs), property managers	Directly determines effectiveness of mitigation at parcel level



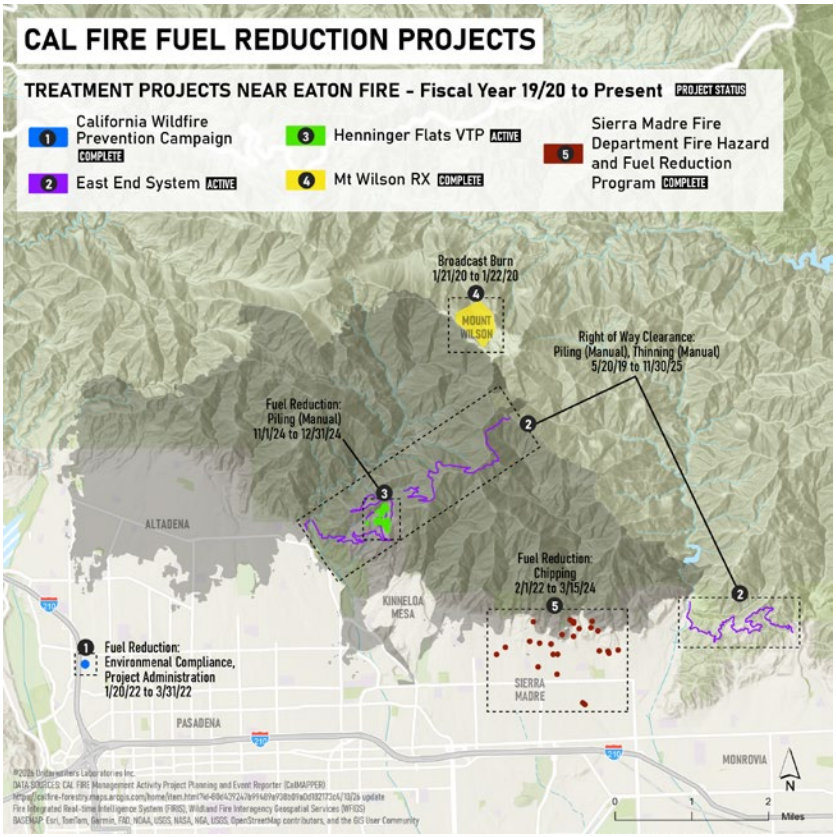


Figure 2.3.1 CAL FIRE fuel reduction and wildfire prevention projects near the areas of the Palisades and Eaton Fires. (FY 2019/20-Present)

Wildfire mitigation is further impacted by planning and development processes. Fuel modification requirements, access standards, and water supply provisions are often established during initial community development, with defensible space inspections serving as an ongoing maintenance mechanism.

Wildfire resilience, therefore, requires both parcel-level action at the community level and sustained cross-jurisdictional coordination across local, state, and federal agencies to improve mitigation efforts and reduce the interconnected pathways that help transmit fire from wildlands into developed areas.

2.4 Community Resilience and Adaptation

Many wildfire preparedness programs focus on reducing risk at the individual property level. However, the January 2025 fires demonstrated that wildfire outcomes are also influenced by factors operating at the neighborhood and community levels, including development patterns, structure spacing, evacuation constraints, infrastructure, vegetation, and the condition of surrounding properties.

As such, it is important to examine how construction standards, community planning, and neighborhood-scale resilience strategies influence wildfire outcomes and discuss considerations for future planning and rebuilding efforts.

2.4.1 Community-Scale Adoption of Wildfire-Resistant Construction

In 2008, California adopted wildfire-resistant construction requirements for new homes through Chapter 7A of the California Building Code[28] (referred to as Chapter 7A). These requirements introduced ignition-resistant building materials and design features intended to reduce structure vulnerability to embers, radiant heat, and direct flame contact. Ember-resistant vents, enclosed eaves, Class A roofing systems, dual-pane or tempered glass windows, and enhanced deck construction are just a few examples of these requirements.

While Chapter 7A represents an important advancement in reducing structural vulnerability through improved building materials and design, its effectiveness must be understood within the broader and more complex context of wildfire events.

Building performance during real-world incidents is not determined by construction features alone, but by the interaction of those features with a wide range of dynamic conditions, including fire behavior, environmental factors, and emergency response actions. As a result, isolating the influence of specific building requirements from other contributing variables remains inherently challenging, particularly in fast-moving, wind-driven fires.

For example, the relationship between home hardening and defensible space requirements is not consistent throughout California's wildfire regulations. State law requires home hardening and defensible space measures within SRAs, regardless of FHSZ classification, and in VHFHSZs within LRAs. However, while home hardening requirements can also apply in High FHSZs of an LRA, defensible space inspection and enforcement programs generally do not.

These requirements are detailed in Table 2.4.1.

Table 2.4.1 California wildfire requirements applicability.

Scenario / Location Condition	Defensible Space Required?	Home Hardening (WUI / Chapter 7A / WUI Code) Required?	Notes / Trigger
SRA	Yes	Yes – for new construction, rebuilds, major remodels	Public Resources Code (PRC) §4291 requires 100 feet (ft) defensible space around all structures in SRA[28]
LRA – VHFHSZ	Yes	Yes – for new construction, rebuilds, major remodels	Gov Code §51182 mirrors PRC 4291 for these zones[29]
LRA – High or Moderate FHSZ	Depends on local ordinance	Depends on local adoption	State law primarily mandates defensible space in Very High zones; Locals may expand requirements[29]
Outside mapped FHSZs	No (state law)	No (state law)	Local governments may still impose requirements
Property with a structure in ANY applicable zone (SRA or VHFHSZ)	Yes	Only if building activity triggers code	Defensible space applies to existing structures, not just new ones[29]
Vacant land (no structure)	No (state baseline)	No	Hazardous vegetation on unimproved parcels is typically addressed through local weed abatement, nuisance abatement, or land management programs rather than the state's defensible space statutes.

These inconsistent regulatory requirements create situations where structures may be required to meet ignition-resistant construction standards without receiving the same level of vegetation management oversight. Similar concerns apply to communities that require defensible space but do not require older homes to be retrofitted with ignition-resistant building materials.

The January 2025 fires demonstrated that wildfire outcomes can be heavily influenced by both building characteristics and the surrounding fuel conditions, suggesting that home hardening and defensible space measures are most effective when implemented together.

Due to limitations in evaluating Chapter 7A's impact on the destruction of properties in the Palisades and Eaton Fires, ULRI's analysis is constrained to a high-level overview.

Figure 2.4.1 and Table 2.4.2 present the damage inspection (DINS) classifications for buildings constructed before and after Chapter 7A's adoption in 2008 within the Palisades Fire area, while Figure 2.4.2 and Table 2.4.3 provide the same data for the Eaton Fire.

Structures within both fire perimeters were mostly built before 2008, so comparisons of structure damage classifications before and after this year should be made cautiously, as this analysis does not include rebuilds or major remodels conducted after 2008.

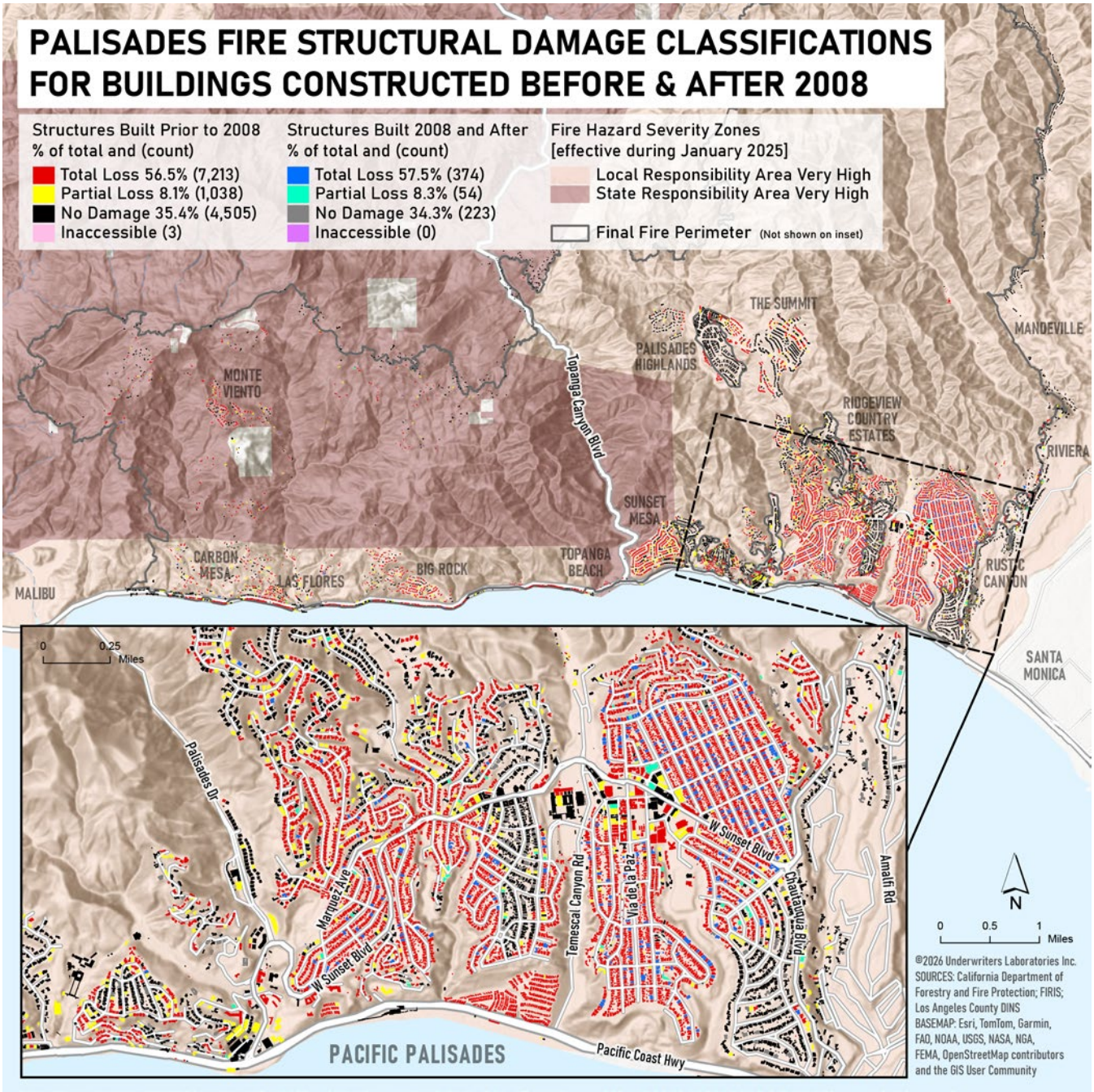


Figure 2.4.1 Palisades Fire structure outcomes based on DINS classifications (before and after 2008).

Table 2.4.2 Palisades Fire structure outcomes based on DINS structure damage classifications.[30]

PALISADES	Total Loss	Partial Loss	No Damage
Palisades Fire – Built Pre-2008 (Total # 12,756)	56.5%	8.1%	35.4%
Palisades Fire – Built Post-2008 (Total # 651)	57.5%	8.3%	34.3%

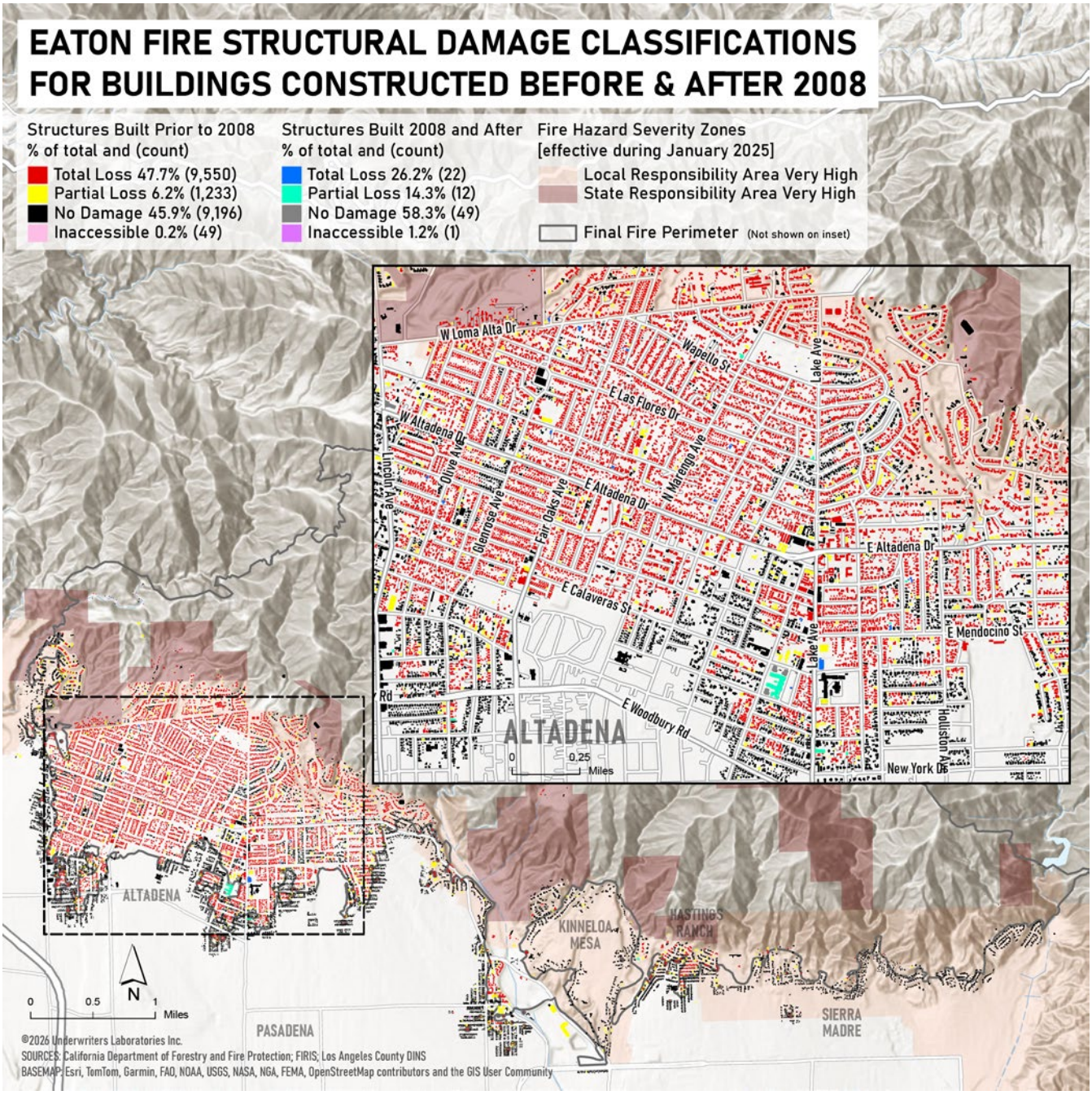


Figure 2.4.2 Eaton Fire structure outcomes based on DINS classifications (before and after 2008).

Table 2.4.3 Eaton Fire structure outcomes based on DINS structure damage classifications.[31]

EATON	Total Loss	Partial Loss	No Damage
Eaton Fire – Built Pre-2008 (Total # 19,979)	47.7%	6.2%	45.9%
Eaton Fire – Built Post-2008 (Total # 84)	26.2%	14.2%	58.3%

Because Chapter 7A applies primarily to new construction, adoption occurs gradually as older structures are replaced. As a result, many communities that are at risk from wildfire impacts can contain relatively few homes built to modern wildfire-resistant standards, as seen in both fire perimeters.

As such, building-code improvements alone are not sufficient to evaluate structure resilience against the type of wind-driven fire behavior that was experienced on January 7, 2025.

The January 2025 fires suggest that broader reductions in community vulnerability may require retrofit programs and neighborhood- or community-scale mitigation efforts, in addition to new construction standards, rather than waiting decades for gradual redevelopment.

This finding is consistent with neighborhood-scale wildfire resilience approaches that emphasize the implementation of mitigation measures across multiple properties. While wildfire-resistant construction may improve the survivability of individual structures, wildfire outcomes are also influenced by surrounding structures, vegetation, infrastructure, and community conditions.

Programs that combine home hardening, defensible space, infrastructure resilience, evacuation planning, and long-term maintenance across entire neighborhoods may provide benefits beyond those achieved through isolated parcel-level actions.

Post-fire rebuilding efforts in Pacific Palisades, Altadena, and other affected communities provide an opportunity to evaluate how wildfire resilience measures can be incorporated into reconstruction and future development.

In addition to rebuilding individual homes, recovery efforts should consider neighborhood-scale approaches, such as improved widespread building practices, defensible space design, public infrastructure, community preparedness programs, and long-term maintenance strategies.

2.5 Public Outreach and Education

While many Southern California residents received wildfire preparedness information through community meetings, websites, social media, local organizations, and preparedness programs, the impacts of the January 2025 fires highlight both the value and limitations of current public outreach and education programs.

In post-fire TDs, stakeholder discussions, and community feedback, many residents stated they were still uncertain about evacuation procedures, home hardening measures, defensible space expectations, and actions that could help improve structure survivability during wildfire events.

These ongoing challenges demonstrate the difficulties associated with communicating wildfire preparedness information across a large and diverse metropolitan and rural region. For example, key materials around preparedness, evacuation planning, assistance programs, and rebuilding information were often distributed to residents via multiple agencies and organizations, making information difficult for residents to locate before and after the fires.

Residents also reported difficulty identifying authoritative information sources, navigating multiple agency websites, understanding evolving recommendations, and determining which preparedness actions should be prioritized. These challenges were particularly pronounced for renters, vulnerable populations (e.g., limited mobility, vision/hearing impaired, etc.), non-English-speaking residents, and individuals who did not actively participate in preparedness programs.

Public outreach and education are most effective when paired with programs that help residents implement risk reduction measures. Future efforts should focus on increasing adoption of defensible space, home hardening, evacuation planning, and community preparedness activities while also improving access to technical assistance, financial assistance, and locally relevant wildfire resilience information.

Expanding partnerships with Fire Safe Councils, community organizations, HOAs, and other trusted local leaders may further improve the reach and effectiveness of outreach efforts.

2.6 Bridging the Gap

California has demonstrated national leadership in wildfire policy, risk assessment, and investment. However, the outcomes of the Palisades and Eaton Fires highlight a critical disconnect between policy intent and on-the-ground implementation.

While the state continues to advance building codes, hazard mapping, fuels treatment programs, and insurance-related reforms, these efforts are not consistently translating into reduced risk at the parcel, neighborhood, or landscape level.

The challenge is not the absence of policy or participation, but the structural limitations within the wildfire prevention system that prevent coordinated, consistent, and scalable implementation of mitigation actions.

Bridging this gap will require:

- Alignment of regulatory frameworks across agencies
- Clarification of authority and accountability
- Coordination across jurisdictional boundaries
- Sustained investment tied to risk-based prioritization
- Expansion of local implementation capacity

Without these changes, overlapping responsibilities will continue to produce gaps rather than redundancy, and wildfire mitigation efforts will remain insufficient relative to the level of risk faced by communities across California and the nation.

2.7 Findings and Recommendations

FINDING 1: Despite significant investments in fuels projects, grant funding, response capabilities, building standards, and legislative support, California's wildfire risk continues to grow due to increasingly severe fire weather and wildfire conditions.	**RECOMMENDATION 1.1:** Continue to expand statewide investments in wildfire prevention, preparedness, mitigation, and response capabilities with a focus on measurable reductions in community wildfire risk.
FINDING 2: The absence of a single entity responsible for coordinating and ensuring landscape-scale wildfire mitigation contributes to fragmented implementation across jurisdictional and ownership boundaries.	**RECOMMENDATION 2.1:** Create a regional or statewide coordination mechanism responsible for prioritizing, tracking, and evaluating cross-jurisdictional wildfire mitigation activities.
FINDING 3: At the time of the January 2025 fires, local jurisdictions were operating under fire hazard maps developed in 2007, while updated hazard classifications identifying additional Moderate and High hazard areas were not issued until after the fires.	**RECOMMENDATION 3.1:** Consider replacing maps by establishing a more frequent and data-driven process for identifying wildfire risk conditions for application statewide.
FINDING 4: Public outreach and education alone are insufficient to drive community-scale wildfire resilience, as awareness does not consistently translate into action.	**RECOMMENDATION 4.1:** Expand wildfire preparedness programs by pairing public education with implementation support, including technical assistance, incentives, and funding to increase adoption of defensible space, home hardening, and evacuation planning. Leverage trusted local partners to improve participation, broaden reach, and sustain long-term community engagement.

3.1 Origin and Cause

ULRI's agreement with the Office of the Governor of California, including the approved scope of work, does not include determining the origin and cause of the Palisades and Eaton Fires.

Section 1.2.1 of the Phase One report includes information on the investigation into the origin and cause of the Palisades Fire that occurred in January 2025. On October 2, 2025, a criminal complaint was filed by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) against an individual potentially involved with the cause of the Lachman Fire (see Appendix Section 6.1) near the area of origin of the Palisades Fire.[32]

The affidavit states that a "multi-agency investigation into the origin and cause of the massive Palisades Fire in Los Angeles, California, on January 7, 2025, has determined that it was a holdover" fire, i.e., a continuation, of the Lachman Fire that began near the Palisades in the early morning of January 1, 2025.

Although LAFD units quickly suppressed the Lachman Fire on January 1, 2025, the fire continued to smolder and burn underground within the root structure of dense vegetation. On January 7, 2025, heavy winds caused the underground fire to surface and spread above ground in what became the Palisades Fire.

The Eaton Fire originated within an SRA, where the LACoFD provides fire protection services under contract with the State of California. In the Phase One report, ULRI noted that the origin and cause investigation was ongoing. On August 4, 2026, LACoFD released the initial and supplemental reports from its joint investigation with CAL FIRE, concluding the investigation.[33]

The investigation determined that the Eaton Fire was caused by electrical arcing events involving an out-of-service Southern California Edison (SCE) transmission tower. Investigators identified the area of origin as a dry receptive fuel bed below the SCE transmission towers on a spur ridge above Eaton Wash, where burning material from the arcing events ignited the vegetation.[34]

3.2 Prevention

3.2.1 Defensible Space and Vegetation Management

Both the City of Los Angeles and Los Angeles County have made significant investments in minimizing wildfire risk within the region. However, while these programs, which include vegetation and defensible space management, are substantial in scale, their effectiveness is constrained by operational limitations, fragmented implementation, environmental changes, and the increasingly interconnected nature of wildfire risk.

Vegetation conditions across Southern California are undergoing significant ecological changes due to prolonged drought, repeated fire activity, invasive species expansion, and land-use changes associated with urban development into the WUI. These changes have altered fuel characteristics within the region and increased the likelihood of large, fast-moving fires that can transition into community conflagrations like those experienced in the Palisades and Eaton areas.

In many areas in and around Los Angeles County, native vegetation has been replaced or intermixed with invasive grasses and other fine fuels that ignite easily and promote rapid fire spread. These fuels create continuous pathways, linking wildlands and developed areas.

As a result, fire behavior is no longer driven solely by factors such as weather and wildland vegetation, but also by large-scale, interconnected fuel systems that can include landscaping, roadside vegetation, fencing, vehicles, and urban structures. These pathways can promote and sustain fire spread across both natural and built environments.

The growth of these interconnected fuel pathways means traditional tactics like parcel-level compliance and high inspection activity have become insufficient and do not always result in sufficient risk reduction.

Improving outcomes, therefore, requires shifting from compliance-based approaches to more integrated strategies that prioritize improved regulatory coordination across jurisdictions, fuel continuity reduction, built-environment resilience, measurable wildfire risk reduction outcomes, and stronger mitigation efforts at the community level.

3.2.1.1 Defensible Space Challenges Along the WUI

Mitigation challenges are most pronounced where public lands interface directly with residential communities. In these areas, fuel conditions on public lands, such as dense, dry vegetation, can directly impact fire spread, structure exposure, and evacuation efforts in residential areas. However, vegetation management can be constrained by environmental regulations, permitting, funding limitations, and operational complexity.

Many parcels near the WUI, such as those near state park boundaries like Topanga State Park, are subject to defensible space regulations imposed by either LAFD or LACoFD. These regulations require trimming, thinning, or removal of hazardous vegetation to up to 200 feet (ft) from a structure, regardless of property lines (per LAFD),[35] and up to 100-200 ft from a structure or to the property line (per LACoFD).[36]

As fuel pathways grow in WUI environments, compliance with these defensible space regulations becomes a vital control method to disrupt fire spread between vegetation, structures, and adjacent land parcels. However, defensible space efforts cannot be limited to just parcel-level treatment by individual property owners, but must also include consistent implementation across adjacent properties and public lands, easy access to public lands to ensure ongoing vegetation maintenance, and sufficient coverage throughout the landscape.

Topanga State Park provides a good example of the challenges both property owners and local government agencies face when it comes to implementation and maintenance of defensible space in WUI areas (Figure 3.2.1), especially when considering the complexity of balancing natural resource protection objectives with wildfire suppression and community protection priorities.

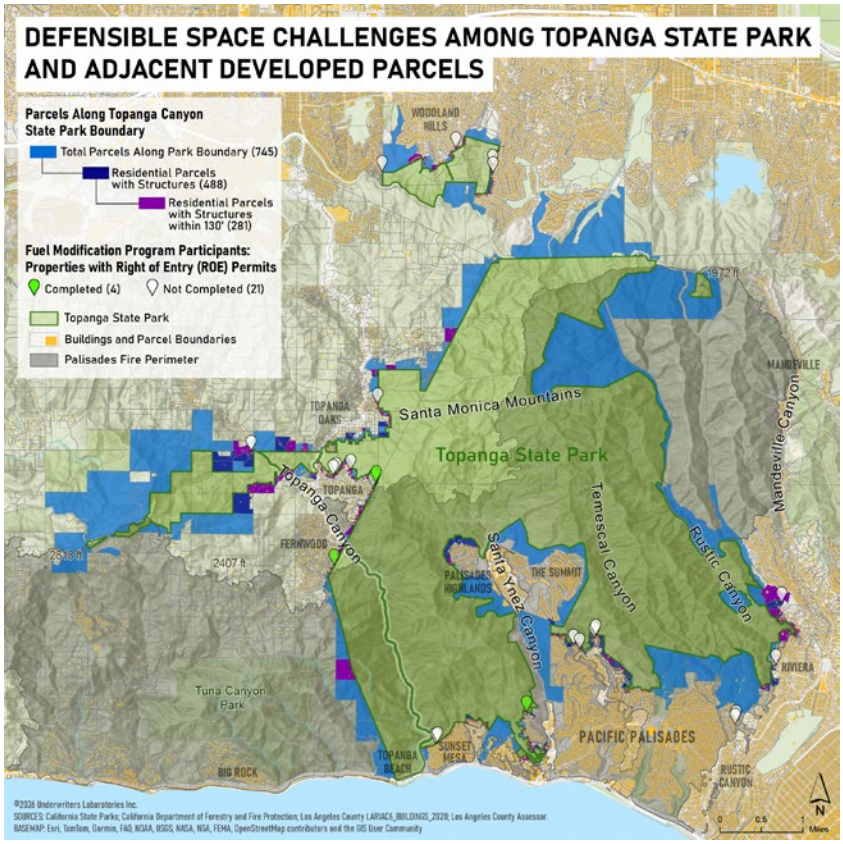


Figure 3.2.1 Map of Topanga State Park with adjacent developed parcels and fuel modification program participants.

According to records provided by State Parks, there are currently a total of 745 parcels along the park's boundary. These adjacent parcels encompass commercial, residential, and governmental use, with residential developments representing the largest share. Furthermore, 281 of these same parcels contain residential structures located within 130 ft of the park boundary.

Topanga State Park policy permits adjacent property owners with structures located within 100 ft of the park boundary to extend vegetation management up to 130 ft into the park. The additional 30 ft accounts for steep terrain, and is intended to provide the equivalent of California's 100-foot horizontal defensible space standard on state-owned land.

In order to satisfy the defensible space maintenance requirements around residential properties, and to maintain ecological protection of the park, State Parks established a Right of Entry (ROE) permitting system, which allows personal property owners access to the park to clear vegetation near their properties, as required by law, following an evaluation performed by a biologist representing the agency.

During the period from January 7, 2024, to January 7, 2025, State Parks records show that 25 ROE permit applications were submitted by adjacent property owners seeking to conduct vegetation management within Topanga State Park. Only four (4) permits were documented as completed, stating that defensible space requirements were met.

The extensive, multiple-step process to acquire an ROE permit may be limiting the likelihood of residents pursuing a permit. Agencies having their own set of compliance standards and processes also creates confusion amongst residents, which may be hindering compliance. Greater defensible space compliance in these critical areas, therefore, may be better achieved by establishing a system of shared responsibility between federal, state, and local government agencies. This new system could ensure shared messaging and processes between agencies, which would help limit confusion amongst residents and promote efficiency in vegetation management near these WUI environments.

During a July 2026 TD with State Parks, officials shared that they are currently in the planning stages of a series of collaborative fuel management projects with local fire agencies, including programs around fuel treatments and prescribed burns. State Parks also noted the following changes in progress to address the bureaucratic challenges impacting defensible space compliance:

- Reduced permit fee from $1,000 to $150 (more cost-effective vs prohibitive)
- Allow multiple homeowners to submit a single ROE permit application with a single fee
- Encourage HOAs to submit a single ROE permit application to increase community-scale impact
- Encouraging staff to look at the interdependency across the wider landscape when evaluating fuels type projects

3.2.1.2 Fire Department Defensible Space Inspection Programs

Fire departments are responsible for inspecting parcels with structures on them for compliance with defensible space regulations. Each local jurisdiction must adhere to the state standard as the minimum, but may implement further requirements if they so choose.

ULRI analyzed the inspection programs of both LAFD and LACoFD. Inspection data was requested from each department (see Appendix Section 6.10) to understand the scale of their programs and to identify components or constraints that may impact effectiveness.

On January 7, 2025, both the City of Los Angeles and Los Angeles County were enforcing WUI requirements under the 2022 California Codes, specifically:

- California Building Code Chapter 7A[28] — materials and construction methods for exterior fire exposure (primary WUI building code)
- California Fire Code Chapter 49[37] — development, access, and fire protection standards
- California Residential Code Section R337[38] — residential WUI construction

These provisions collectively formed California's WUI regulatory framework at the time of the fires. The standalone California Wildland-Urban Interface Code (CWUIC) did not take effect until January 1, 2026, when those requirements were consolidated into a single code.

Note: *Reported defensible space inspection figures should be interpreted with caution, as inconsistencies between LACoFD's inspection database and County Assessor records may undercount the total number of parcels requiring inspection. These discrepancies appear to be associated primarily with vacant lots, newly constructed residences, and other parcels whose development status has changed over time.*

Los Angeles Fire Department

LAFD operates a large-scale brush clearance program requiring vegetation management within up to 200 ft of structures in VHFHSZs — exceeding state minimum standards.

According to LAFD records, the program conducted approximately 172,445 inspections in 2023 — a workload equivalent to 9.6 full-time inspectors, averaging about 86 inspections per inspector per day. At that volume, inspectors would have only a few minutes per inspection when travel time and administrative responsibilities are considered.

These conditions illustrate the scale of operational demand and suggest limits in inspection depth, verification, and long-term follow-up. While compliance rates are relatively high, they do not necessarily reflect treatment quality, maintenance consistency, or effectiveness under extreme fire conditions. See Appendix Section 6.4 for more information.

During TDs, LAFD officials also identified limitations associated with historical record-keeping systems, data organization, and report generation capabilities. These challenges highlight broader issues associated with wildfire prevention program data management, record standardization, long-term tracking, and reporting capabilities within large municipal agencies.

The limitations ULRI encountered during the data request process also illustrate a broader implementation challenge identified throughout this report: wildfire mitigation responsibilities and associated data systems are often decentralized across divisions, programs, agencies, and jurisdictions, limiting the ability to consistently evaluate performance, compliance, treatment effectiveness, staffing capacity, and long-term mitigation outcomes at a regional scale.

In several instances, agency policies, plans, or guidance documents identified wildfire mitigation activities, inspection frequencies, or enforcement expectations that could not be readily validated through operational records or available reporting data. This discrepancy may indicate challenges in translating policy requirements into consistent operational implementation, tracking, or documentation practices. Where applicable, this report identifies areas where written policy guidance and available operational evidence appear misaligned.

Los Angeles County Fire Department

LACoFD operates one of the largest defensible space inspection programs in California, encompassing more than 129,000 parcels across diverse environments.

Inspection activity increased dramatically between 2022 and 2025, largely due to expanded parcel identification and improved Geographic Information System (GIS) mapping. The program relies on a distributed workforce, with fire station personnel conducting initial inspections and forestry staff conducting follow-up and enforcement.

Inspection activity is highly seasonal, aligned with regional fuel curing patterns, and concentrated in late spring and summer. However, this timing may not always align with peak wildfire conditions, which typically occur later in the year.

As with LAFD, workload analysis indicates that inspection activity is highly uneven, with a small percentage of personnel conducting a disproportionate share of inspections. This variability contributes to differences in inspection quality, consistency, and follow-up outcomes.

Although compliance rates exceed 97%, these metrics primarily reflect administrative completion rather than functional wildfire resilience. Field observations and TDs with key personnel indicate that compliance does not necessarily eliminate exposure pathways, especially around ember intrusion, adjacent untreated fuels, structure-to-structure fire spread, and ornamental vegetation and connective fuels (near home combustibles).

As a result, high compliance rates may coexist with significant structure loss. See Appendix Section 6.4 for more information.

3.2.1.3 Fire Department Vegetation Management on State-Owned Lands

LACoFD conducts fuels reduction activities through targeted treatments, such as mechanical thinning, mastication (or mulching), and grazing. Mechanical thinning reduces ladder fuels and vegetation density in heavier brush areas, mastication breaks down woody fuels to reduce fire intensity, and grazing manages fine fuels, such as grasses, that contribute to rapid fire spread.

These efforts are primarily implemented through grant-funded projects rather than a sustained, internally funded program. Over the past 3.5 years, approximately $4.3 million have been invested in these treatments, with project data indicating that work is being carried out across multiple sites using methods tailored to vegetation type and terrain.

Despite the use of these varied treatment methods, implementation remains project-based and geographically limited. These treatments are spatially distributed and often non-contiguous, reflecting funding availability rather than a continuous, risk-prioritized strategy.

Importantly, LACoFD is not a land management agency and does not have authority over large areas of open space. As such, landscape-scale fuels reduction efforts must be coordinated across multiple jurisdictions, including state, federal, and privately owned lands. This limits treatment consistency across boundaries and the ability to maintain treatments over time.

Reliance on grant funding also creates variability in when and where treatments can occur, further constraining program effectiveness. As a result, untreated or regrown fuels remain adjacent to treated areas, allowing wildfire to spread through gaps in the system despite localized mitigation efforts.

Taken together, while fuels reduction activities are occurring, and utilizing appropriate treatment methods, they are not implemented at the scale, continuity, or frequency required to effectively reduce fuel connectivity across the landscape.

3.2.1.4 Constraints of Existing Defensible Space Policies and Regulations

Across both city and county programs in the Los Angeles area, there are gaps in regulatory intent and actual risk reduction outcomes, with several recurring constraints limiting effectiveness, including:

- High inspection volumes relative to staffing capacity
- Short inspection durations, limiting detailed assessment
- Delays between findings of non-compliance and mitigation actions taken
- Incomplete inspections due to access barriers
- Uneven workforce participation
- Jurisdictional gaps, especially at public land interfaces

Additionally, current performance measures focus on inspection activity and compliance rates rather than whether mitigation efforts reduce fire spread, protect structures, or improve community resilience.

As development of the built environment extends further into canyon environments, ridgelines, park-adjacent neighborhoods, and other WUI settings, the challenges associated with coordinating vegetation management, maintaining defensible space continuity, protecting evacuation corridors, and reducing structure-to-structure exposure also increase across interconnected landscapes.

Community Wildfire Protection Plan (CWPP) materials[39] suggest that wildfire risk assessments may require more localized calibration to account for mitigation investments, such as defensible space, home hardening, evacuation access, and infrastructure improvements, rather than relying solely on broad regional hazard classifications.

Although defensible space requirements are established through state law[29] and local enforcement programs, implementation remains uneven relative to the scale and complexity of the risk environment.

Inspection programs must evaluate large numbers of parcels under constrained staffing and operational resources, often resulting in incomplete coverage, delayed reinspection cycles, and variable enforcement outcomes.

In this context, prioritizing accurate and efficient inspection data, including inspection volume, compliance rates, reinspection frequency, incomplete inspections, and time-to-abatement, can provide an important measure of overall system performance and insight into whether mitigation actions are effective in reducing wildfire impacts.

Table 2.3.1 in Section 2.3 summarizes how defensible space policy is established, governed, and implemented across federal, state, regional, and local levels, and where these responsibilities interface directly with property owners.

While defensible space inspections represent the most visible component of wildfire mitigation for many residents, wildfire risk reduction is implemented through a broader system of prevention, planning, and land-use activities.

LACoFD's 2025 Unit Fire Plan[40] identifies wildfire prevention, vegetation management, CWPP development, land development review, building plan review, public education, and community preparedness programs as interconnected components of the department's wildfire risk reduction strategy.

Together, these functions influence wildfire exposure before development occurs, during construction, and throughout the life of a community. As a result, wildfire resilience is shaped not only by annual vegetation management activities, but also by planning decisions, construction standards, public awareness, and long-term community participation.

The implementation flow in Figure 3.2.2 is generally consistent with broader concepts reflected in the Cohesive Strategy, which emphasizes resilient landscapes, fire-adapted communities, and coordinated wildfire response. Within this framework, defensible space should be understood as a local implementation mechanism supporting broader, evidence-based wildfire risk reduction rather than as a standalone regulatory requirement.

Figure 3.2.2 General flow of vegetation management actions from the establishment of laws to parcel mitigation to landscape scale outcomes.

3.2.1.5 Defensible Space Around Electrical Infrastructure

Los Angeles Department of Water and Power (LADWP) and Southern California Edison (SCE) produced extensive records of their vegetation management efforts. The records include locations where vegetation was removed around poles and other electrical infrastructures. It also includes records of removing tree branches near electrical lines. The documents reference compliance with state regulations.

3.2.2 Fire-Adapted Communities

The increasing frequency and scale of wildfires, both in California and nationally, require the implementation of collaborative strategies that integrate land management, community preparedness, and response. Fire-Adapted Communities is a main focus and goal of the Cohesive Strategy (see Section 1.2.2), where residents and agencies work together to reduce risk, respond to, and recover from wildfire.

The Palisades and Eaton Fires — driven by extreme winds and causing widespread damage — demonstrated gaps in preparedness and coordination. Applying Fire-Adapted Communities principles can strengthen mitigation, planning, and resilience, helping reduce losses in future wind-driven fires.

3.2.2.1 Existing Community Risk Reduction Programs

In 2021, the California Wildfire and Forest Resilience Task Force developed the *California's Wildfire and Forest Resilience Action Plan,*[41] which identifies community protection as a primary statewide resilience objective and promotes approaches covering a wide breadth of programs.

In 2023, the Task Force released the *Southern California Regional Profile,*[42] which emphasizes the importance of community preparedness, public education, and community risk reduction (CRR) efforts for wildfires. The profile identified "resilient and fire-adapted communities" as a regional priority for Southern California and emphasized the need for continued investment in emergency preparedness, home hardening, defensible space, ignition reduction, and community engagement programs.

The profile also highlighted the importance of partnerships among residents, local governments, fire agencies, community organizations, and other stakeholders in reducing wildfire risk. These priorities closely align with the programs and initiatives that were underway throughout the city and county prior to the January 2025 fires and provide additional context for evaluating the effectiveness and scale of those efforts.

City of Los Angeles

With approximately 616,465 residents, 112,255 structures, and more than $76.7 billion in property value located within mapped VHFHSZs,[43] the scale of wildfire exposure facing Los Angeles communities is extensive, as is the challenge of implementing risk reduction measures across such a large and densely developed WUI.

Prior to January 2025, the City of Los Angeles' wildfire risk reduction efforts focused on brush clearance inspections, hazardous vegetation enforcement, community preparedness programs, and strategic initiatives intended to strengthen long-term wildfire resilience.

To provide consistent wildfire safety messaging, the city maintains a partnership with MySafe:LA,[44] an organization devoted to helping individuals and families in the greater Los Angeles area become more aware, prepared, and resilient in the face of disasters.

MySafe:LA establishes Fire Safe Councils and National Fire Protection Association (NFPA) Firewise USA® sites. It also maintains WildfireLA.org,[45] where information related to each component of the "Ready, Set, Go" initiative is publicly available.

The city is also developing a citywide CWPP[46] through a collaborative, community-driven process with MySafe:LA, LAFD, and other public stakeholders. City officials provided ULRI with a draft of the CWPP in July 2026. It is intended to provide a framework for wildfire risk assessment, mitigation, and community preparedness.

LAFD's *2023–2026 Strategic Plan*[47] identifies ordinance enforcement, expanded fuel management resources, additional hand crews, and enhanced vegetation management capabilities as priorities for reducing wildfire risk in hillside and WUI communities. The city also maintains Community Emergency Response Team (CERT) programs, preparedness initiatives, and code enforcement activities intended to reduce wildfire risk in surrounding communities.

Also prior to the January 2025 fires, the city expanded Fire Safe Councils and NFPA Firewise USA® communities, with active Fire Safe Councils in the Bel Air, Bel Air Ridge, Brentwood, Hollywood Hills, and Hollywoodland neighborhoods, with additional organizations under development in Pacific Palisades and Mandeville Canyon.

MySafe:LA also reported numerous active Firewise USA® communities throughout the city and identified more than 80 Firewise USA® sites and related efforts countywide. These programs provided a framework for resident engagement, wildfire education, defensible space activities, home hardening outreach, and neighborhood-level preparedness planning.

Note: *Reported counts of Fire Safe Councils and Firewise USA® communities differed substantially across available sources. These discrepancies likely reflect differing methodologies and definitions, including whether counts were limited to formally recognized organizations or also included communities in development, receiving technical assistance, or otherwise engaged in wildfire preparedness activities. Consequently, reported totals may overstate the number of fully established and active community organizations operating at the time of the January 2025 fires and should be interpreted with caution.*

Despite this relative growth in preparedness efforts, participation remained uneven across wildfire-prone communities. As such, several areas heavily impacted by the January 2025 fires were still in the process of organizing or expanding formal CWPPs.

Several TDs with LAFD personnel also noted that wildfire preparedness information and community outreach efforts by the department often depended on individual staff initiative or participation in community events rather than a coordinated, department-wide community engagement strategy.

Los Angeles County

LACoFD's wildfire risk reduction efforts maintain a range of wildfire prevention and risk reduction programs through its Unit Fire Plan (see Section 3.2.1.4).

The county also supports community-based wildfire resilience through Fire Safe Councils, Firewise USA® communities, CERT programs, Community Brigade (Malibu), home ignition zone assessments, and grant-funded mitigation projects. Prior to the January 2025 fires, the county had 13 active Fire Safe Councils and 43 recognized Firewise USA® communities (Figure 3.2.3).

Figure 3.2.3 Fire Safe Councils and NFPA Firewise USA® sites in Los Angeles County before and after January 2025.

Los Angeles County has been developing a CWPP[48] to assess wildfire risk and prioritize mitigation actions across at-risk areas. The effort, led by the Department of Regional Planning, and in coordination with LACoFD, also includes collaboration with Fire Safe Councils, local communities, and emergency organizations.

The plan is intended to support vegetation management, evacuation planning, home hardening, and public education, and — once approved and signed — will improve access to grant funding for wildfire risk reduction projects.

Los Angeles County has also supported a hybrid risk reduction system, coordinated through LACoFD and other county departments, that combines city-led plans with regional CWPPs. These programs recognize that wildfire risk reduction requires coordinated participation by multiple entities, including residents, HOAs, community organizations, local governments, and fire agencies.

They also provided opportunities for communities to participate directly in preparedness, mitigation, and risk reduction activities. While this approach does provide broad community engagement, it can result in inconsistent coverage and varying levels of preparedness across jurisdictions.

Los Angeles County was included on the CAL FIRE Fire Risk Reduction Community List,[49] a statewide designation for jurisdictions that have implemented specified wildfire planning and risk reduction measures. Eligibility criteria include actions such as wildfire planning, public education, defensible space programs, emergency preparedness activities, and CRR initiatives.

3.2.3 Findings and Recommendations

FINDING 5: Current defensible space regulations are primarily structured around parcel-level compliance, while wildfire risk increasingly reflects fuel continuity across parcels and into interconnected built environments. As wildfire spread pathways can also include ornamental vegetation, vehicles, fencing, accessory structures, adjacent buildings, and other connective fuels, isolated parcel-level mitigation may be insufficient to interrupt fire spread at neighborhood or community scales.	**RECOMMENDATION 5.1:** Incorporate fuel continuity and structure-to-structure exposure considerations into defensible space policy and regulatory frameworks. **RECOMMENDATION 5.2:** Support community-scale mitigation planning approaches addressing wildfire exposure beyond individual parcels. **RECOMMENDATION 5.3:** Integrate defensible space implementation to include all of the following: home hardening, Zone 0 mitigation, structure spacing, and landscape-scale fuels reduction efforts. **RECOMMENDATION 5.4:** Develop local planning tools and ordinances supporting neighborhood-scale wildfire resilience strategies.
FINDING 6: Fragmented regulatory frameworks, distributed authority, jurisdictional boundaries, conflicting mandates, and limited local implementation capacity create inconsistent wildfire mitigation actions, accountability gaps, and coordination challenges. These conditions hinder timely and effective mitigation across property, community, and jurisdictional boundaries.	**RECOMMENDATION 6.1:** Establish a coordinated statewide wildfire mitigation governance framework with clear authority, consistent standards, defined accountability mechanisms, streamlined regulatory processes, and sufficient implementation capacity. Support cross-boundary coordination and community-scale mitigation strategies to ensure effective risk reduction across jurisdictions. **RECOMMENDATION 6.2:** All WUI regulations and authorities should be consolidated with the State Fire Marshal's Office, including those currently overseen by the Board of Forestry.
FINDING 7: The current regulatory structure separates defensible space standards development from primary inspection and enforcement functions, limiting alignment between policy, operations, and evolving wildfire risk.	**RECOMMENDATION 7.1:** Evaluate opportunities to improve alignment between defensible space standards development, fire prevention enforcement, and code implementation functions. **RECOMMENDATION 7.2:** Assess potential governance, statutory, operational, and implementation impacts associated with alternative regulatory alignment structures. **RECOMMENDATION 7.3:** Evaluate whether increased integration could improve consistency between standards and enforcement practices, streamline updates, and improve responsiveness to evolving wildfire conditions.
FINDING 8: Defensible space is constrained at the private–public land interface, where landowners may lack authority to treat fuels beyond parcel boundaries, creating gaps that reduce effectiveness. Encroachment permitting processes often add administrative, environmental, and financial barriers, resulting in inconsistent treatment and unmanaged fuels in high- and very high-fire hazard areas.	**RECOMMENDATION 8.1:** Establish a state-led vegetation management approach for publicly owned lands adjacent to residential structures in high-fire hazard interface areas. **RECOMMENDATION 8.2:** Develop shared responsibility frameworks for adjacent public and private lands. **RECOMMENDATION 8.3:** Evaluate alternatives to the current encroachment permit model, including streamlined authorization pathways, pre-approved vegetation management standards, and state-performed treatment programs where appropriate. **RECOMMENDATION 8.4:** Develop risk-based prioritization systems identifying publicly owned parcels where treatment would provide the greatest reduction in structure exposure. **RECOMMENDATION 8.5:** Align defensible space implementation with regional fuels management strategies and landscape-scale mitigation efforts.

3.2.3 Findings and Recommendations (cont.)	
FINDING 9: Defensible space inspection programs in Los Angeles City and County operate at a scale that exceeds available staffing and operational capacity. High inspection volumes, short inspection durations, distributed workforce participation, and uneven inspector experience levels limit the ability to conduct detailed assessments, evaluate complex exposure pathways, and ensure consistent follow-up and enforcement outcomes.	**RECOMMENDATION 9.1:** Establish performance-based staffing benchmarks tied to parcel volume, hazard level, and inspection complexity. **RECOMMENDATION 9.2:** Differentiate between baseline inspections and enhanced inspections for higher-fire hazard areas. **RECOMMENDATION 9.3:** Expand specialized forestry-led inspection and assessment programs emphasizing: home hardening, Zone 0 conditions, connective fuels, and structure-to-structure exposure. **RECOMMENDATION 9.4:** Develop and utilize standardized inspector training and certification frameworks. **RECOMMENDATION 9.5:** Implement quality assurance, audit, and consistency review mechanisms. **RECOMMENDATION 9.6:** Expand technology-assisted inspection and data collection systems.
FINDING 10: Data and reporting limitations hinder accurate assessment of defensible space program performance. Legacy systems, data inconsistencies, and reporting challenges in both Los Angeles County and City reduce the ability to track inspections, measure compliance, and support effective decision-making.	**RECOMMENDATION 10.1:** Modernize defensible space data and reporting systems by standardizing data practices, improving integration with parcel records, and enhancing analytics tools. Prioritize maintaining an accurate inspection universe, reconciling data gaps, and enabling clear tracking of inspection coverage, compliance, enforcement, and program outcomes.
FINDING 11: Current defensible space programs rely heavily on inspection and compliance activities that may not result in timely risk reduction. Delays in resolving non-compliance, performance measures focused on compliance rather than outcomes, and inspection schedules tied to specific months rather than a year-round fire season can reduce program effectiveness, particularly as wildfire risk becomes more dynamic.	**RECOMMENDATION 11.1:** Establish a risk-based, year-round inspection and compliance framework that incorporates dynamic wildfire risk indicators, prioritizes high-risk properties, and ensures mitigation is completed before periods of elevated fire danger. **RECOMMENDATION 11.2:** Implement statewide performance standards and metrics that track time-to-compliance, resolution of identified hazards, and risk-reduction outcomes, including reduced fuel continuity, improved structure survivability, and post-fire performance. **RECOMMENDATION 11.3:** Expand proactive, pre-season mitigation and compliance efforts to accelerate hazard reduction and improve community resilience before peak wildfire conditions occur.
FINDING 12: The Palisades and Eaton Fires show that high defensible space compliance does not necessarily reduce structure loss during large wind-driven fire events, as current metrics emphasize regulatory compliance over actual risk reduction. Consequently, it remains difficult to assess whether mitigation efforts meaningfully reduce wildfire exposure at parcel, neighborhood, or community scales.	**RECOMMENDATION 12.1:** Agencies should supplement compliance-based programs with performance-based measures that assess factors tied to wildfire outcomes — such as fuel continuity, structure-to-structure fire spread risk, home hardening, and post-fire loss patterns — and integrate inspection, hazard, and post-fire data to better evaluate risk reduction and survivability.

3.2.3 Findings and Recommendations (cont.)	
FINDING 13: Prior to the January 2025 fires, LACoFD and LAFD had established comprehensive vegetation management, defensible space, preparedness, and community engagement programs aligned with Fire-Adapted Communities principles and California's Wildfire and Forest Resilience Action Plan.	**RECOMMENDATION:** N/A
FINDING 14: Implementation of wildfire resilience measures remains uneven throughout Los Angeles City and County, and wildfire exposure exceeds the reach of existing programs, leaving many communities vulnerable.	**RECOMMENDATION 14.1:** Develop a regional Wildfire Resilience Implementation Strategy at the county level (all California counties) that establishes measurable targets for home hardening, defensible space compliance, Firewise USA® participation, Fire Safe Council engagement, CWPP implementation, and neighborhood-scale risk reduction activities. Program success should be evaluated using community resilience outcomes rather than solely program outputs, such as inspections completed, acres treated, or outreach events conducted.
FINDING 15: Wildfire preparedness, mitigation, and recovery resources are dispersed across multiple agencies and platforms, while community-based partners such as Fire Safe Councils, Firewise USA® communities, and other local organizations extend mitigation capacity but operate with uneven participation, staffing, funding, and coordination, limiting residents' ability to access authoritative information, prioritize effective risk reduction actions, and receive support in underserved and high-risk communities.	**RECOMMENDATION 15.1:** Leverage state universities, NGOs, and community-based expertise to develop a unified, user-centered wildfire resilience information and support system that integrates preparedness, mitigation, and recovery resources into a single accessible platform organized around resident needs. **RECOMMENDATION 15.2:** Increase sustainable funding, training, technical assistance, and coordination for community-based wildfire organizations to strengthen local capacity and expand risk reduction efforts in underserved and high-risk communities. **RECOMMENDATION 15.3:** Integrate wildfire resilience objectives more directly into future updates of community plans, hazard mitigation plans, circulation plans, infrastructure investment programs, CWPPs, and emergency management strategies. Planning efforts should include measurable actions to improve structure survivability, evacuation performance, infrastructure resilience, and neighborhood-scale wildfire adaptation.
FINDING 16: California's wildfire mitigation framework is fragmented across hazard zone designations, regulatory authorities, and program areas, resulting in inconsistent alignment between defensible space, home hardening, inspections, enforcement, vegetation management, and community-scale mitigation despite evidence that wildfire exposure and structure survivability depend on integrated risk reduction beyond mapped boundaries.	**RECOMMENDATION 16.1:** Align defensible space, home hardening, inspection, enforcement, and hazard severity zone programs within a statewide risk-based wildfire mitigation framework that prioritizes mitigation based on actual wildfire exposure rather than regulatory jurisdiction alone, incorporating factors such as structure density, topography, fuel conditions, ember exposure, historical fire behavior, evacuation complexity, structure-to-structure ignition potential, vegetation conditions, and community-level risk reduction needs. **RECOMMENDATION 16.2:** Establish statewide implementation standards, performance expectations, and reporting requirements for wildfire mitigation programs to improve consistency across jurisdictions, including standardized guidance, regular local reporting, inspection coverage, reinspection completion rates, time to compliance, percentage of parcels mitigated before peak fire conditions, neighborhood-scale fuel continuity reduction, structure survivability, post-fire performance, and other outcome-based measures that evaluate actual wildfire risk reduction rather than administrative compliance alone. **RECOMMENDATION 16.3:** Create a centralized statewide coordination and oversight function with sufficient technical assistance and funding support to align vegetation management, defensible space enforcement, fire prevention, fuels reduction, building/fire code implementation, home hardening, and community-scale mitigation programs; improve cross-jurisdictional coordination; standardize data; identify implementation gaps; and support jurisdictions with limited staffing or operational capacity.

3.2.3 Findings and Recommendations (cont.)	
FINDING 17: LAFD's partnership with MySafe:LA and other nonprofits expanded wildfire preparedness and outreach, but many services relied on external funding and capacity rather than being fully institutionalized. This dependence introduces risks to program continuity, coverage, staffing stability, and long-term sustainability.	**RECOMMENDATION 17.1:** LAFD should assume greater ownership of wildfire preparedness, public education, Fire Adapted Communities initiatives, Firewise USA® support, home assessment programs, and community outreach functions. While partnerships with organizations such as MySafe:LA should continue and be encouraged, core preparedness and prevention responsibilities should be supported through dedicated Department staffing, stable funding, formal program objectives, and performance measures to ensure continuity regardless of grant cycles or external organizational capacity.
FINDING 18: Prior to the January 2025 fires, mitigation efforts focused primarily on vegetation management and preparedness, while post-fire observations show that ember exposure, structure vulnerability, and structure-to-structure spread were major drivers of loss. Community adoption of home hardening measures lagged behind vegetation-focused programs.	**RECOMMENDATION 18.1:** Expand wildfire resilience initiatives to increase emphasis on home hardening, retrofit assistance, structure survivability, and ignition-resistant construction. Future outreach, incentive, and technical assistance programs should integrate home hardening with defensible space and vegetation management efforts.
FINDING 19: The loss of thousands of homes has created a large-scale rebuilding effort that presents a rare opportunity to enhance wildfire resilience beyond what incremental retrofits can achieve. Reconstruction can integrate home hardening, defensible space, infrastructure improvements, evacuation planning, and neighborhood-scale risk reduction into both individual properties and communities.	**RECOMMENDATION 19.1:** State and local agencies should incorporate wildfire resilience objectives into rebuilding programs, permitting processes, technical assistance efforts, financial incentives, and community planning initiatives. Rebuilding efforts should encourage not only the construction of more wildfire-resistant homes, but also the implementation of neighborhood-scale resilience measures that improve the survivability of entire communities during future wildfire events. **RECOMMENDATION 19.2:** Prioritize pilot implementation of Wildfire Prepared Neighborhood, Firewise USA®, and other community-scale resilience approaches within rebuilding areas to demonstrate how coordinated mitigation measures can improve neighborhood survivability.

3.3 Weather

3.3.1 Extreme Fire Condition Build-Up

While powerful Santa Ana winds drove the Palisades and Eaton Fires rapidly through the built environment on January 7, 2025, the conditions that led up to the conflagrations had been years in the making. By late 2024, a combination of climate and weather patterns had converged to create the ideal environment for explosive wildfire activity.

Prolonged dry conditions, record-breaking temperatures, and increasingly parched vegetation transformed the landscape into highly combustible fuel. Over time, these factors combined to create an environment where, once strong winds arrived, fires could easily ignite and spread rapidly through both natural vegetation and developed areas.

Section 2.1.4 (Vegetation and Fuels) in ULRI's Phase One report describes the landscape and fuel types present in Ventura and Los Angeles counties and the pre-existing conditions that influenced their susceptibility to burning on January 7, 2025.

Weather conditions across Southern California from October to December 2024 were characterized by exceptional dryness, delayed onset of seasonal rainfall, and numerous Santa Ana wind and Red Flag events, collectively increasing wildfire risk as winter approached.

Normally, Southern California begins to transition into its wet season during November and December, when Pacific storm systems bring periodic rainfall, which moistens vegetation and reduces fire danger. However, in late 2024, this seasonal transition was significantly delayed.

October began largely dry, and the pattern continued through November and December as high-pressure systems frequently dominated the region, limiting the arrival of Pacific storms. As a result, rainfall totals across much of Southern California were well below average, with only 0.10 inches of rain recorded in Los Angeles between October and late December 2024.

This same period brought multiple rounds of warm, dry (offshore) Santa Ana winds, which are common during the autumn and early winter months. These winds originate from high-pressure systems over the interior western U.S. and blow toward the coast, warming and drying as they descend through mountain passes.

When combined with extremely low humidity and already dry vegetation, these wind events created multiple periods of critical fire weather conditions across Southern California. As a result, the region entered the end of 2024 with critically dry fuels, limited precipitation, and periodic Santa Ana wind conditions, creating an environment highly conducive to large and fast-spreading wildfires.

3.3.1.1 Prior Weather Events Impact on Palisades and Eaton Fires

Increased rainfall between 2022 and early 2024 made them some of the wettest years in California since the 1800s. The 2022–2023 rainy season in the Los Angeles area saw rainfall across much of the state reach 400–600% of average levels, with some parts of Southern California receiving three (3) to seven (7) inches of rain within just a few days (Figure 3.3.1).

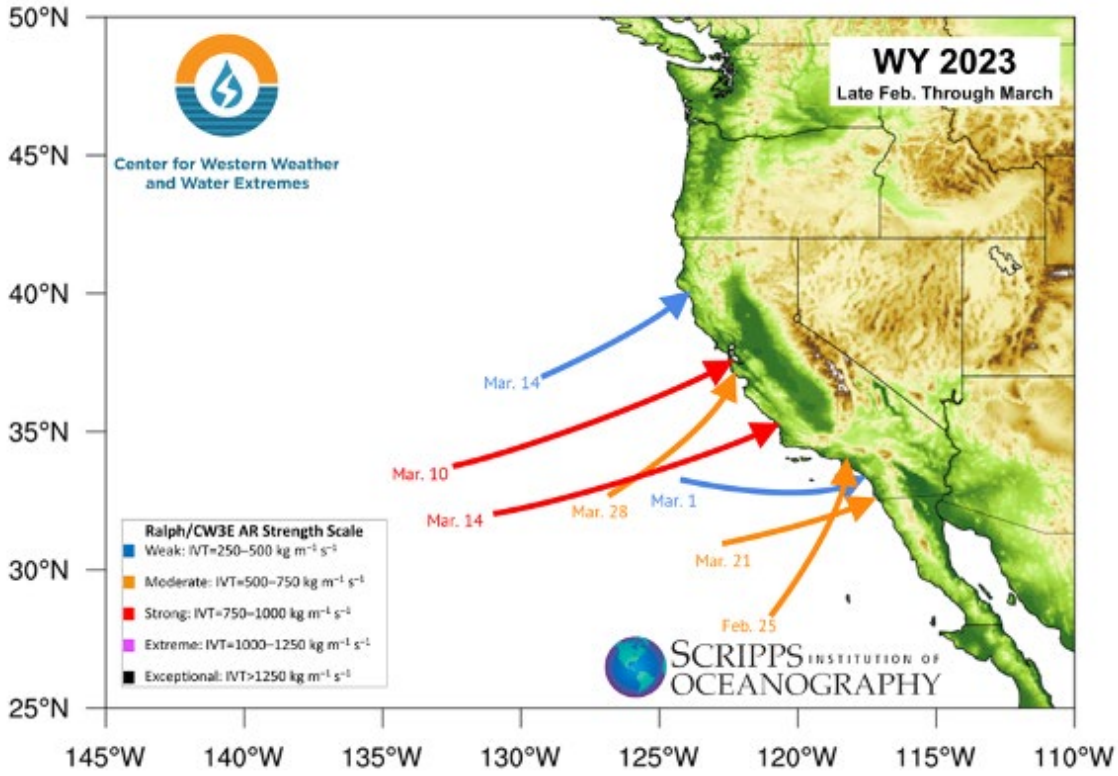


Figure 3.3.1 Winter 2023 Atmospheric Rivers. Source: Scripps Oceanography Institute.

More than 25 inches of rainfall were recorded in downtown Los Angeles in both 2022-2023 and 2023-2024 reporting periods — well above the city's long-term annual average, as seen in Figure 3.3.2.

One of the most significant storms occurred in early February 2024, when a strong atmospheric river delivered extremely heavy rainfall across the region, causing flooding, mudslides, and road closures.[50]

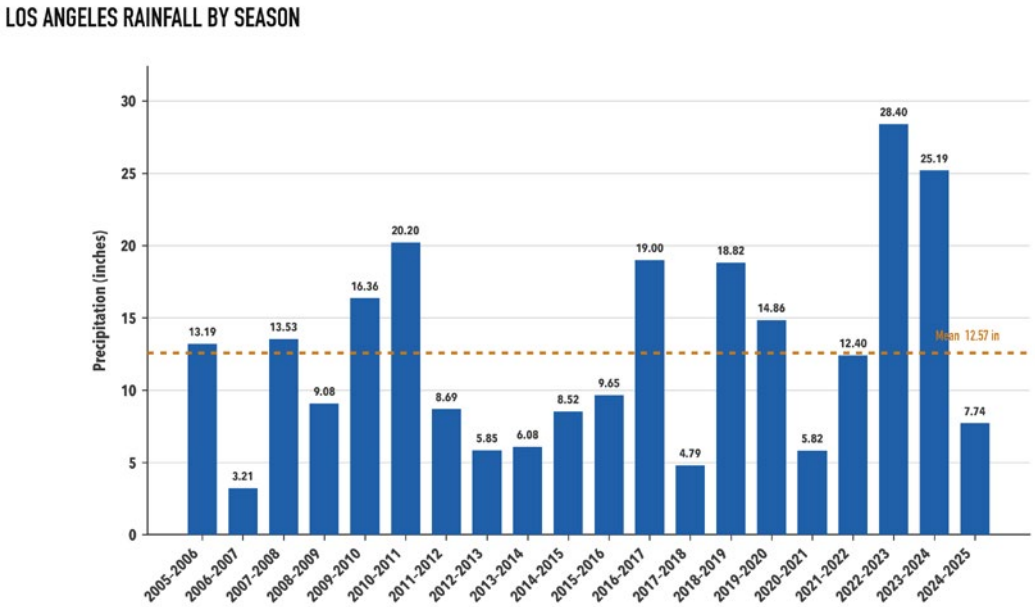


Figure 3.3.2 Downtown Los Angeles Average Rainfall. Source: Los Angeles Almanac.

This record rainfall led to increased vegetation growth in the spring and early summer of 2024. However, after that precipitation, the summer of 2024 was marked by prolonged heat and several record-breaking heat waves in Southern California, as shown in Figure 3.3.3.

The wet winters leading up to the January 2025 fires brought a combined 53 inches of rain to the Los Angeles area, with vegetation in Southern California experiencing widespread plant growth across grasslands, hillsides, and chaparral.

Following these unusually wet winters and resulting increased vegetation growth, the hot conditions left large areas of potential wildfire fuel by late summer.

The first types of vegetation to respond to the wet conditions were annual grasses and small herbaceous plants. These plants germinate quickly when soil moisture increases, so the heavy winter rains produced unusually lush landscapes across Southern California.

By summer 2024, scientists reported that satellite data, such as that shown in Figure 3.3.4,[51] indicated that many parts of Los Angeles County were about 30% greener than average, reflecting the large increase in fuel loading produced by the consecutive wet winters.

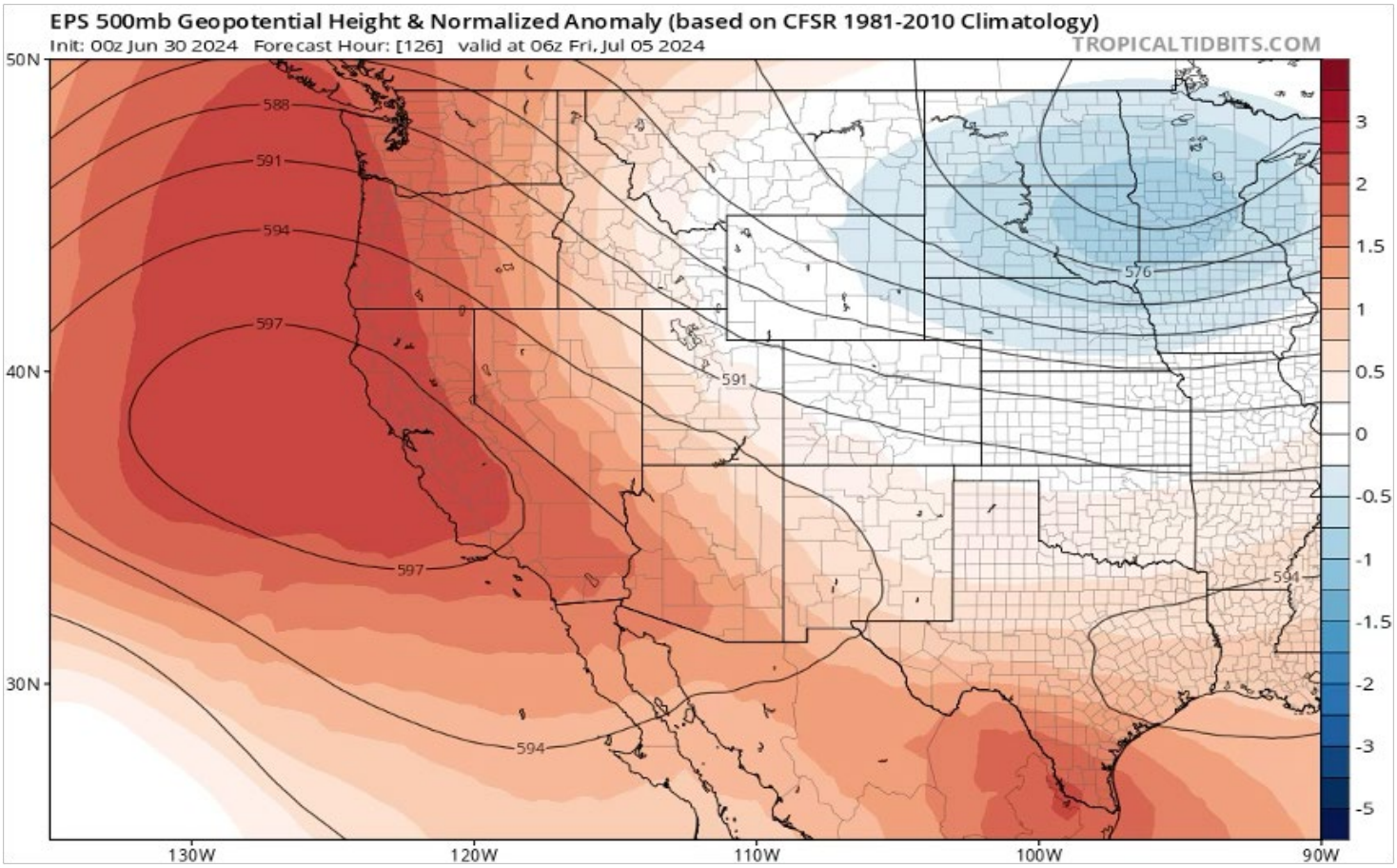


Figure 3.3.3 July 2024 - High pressure over the west brought a record-breaking heatwave. Source: Tropicaltidbits.com.

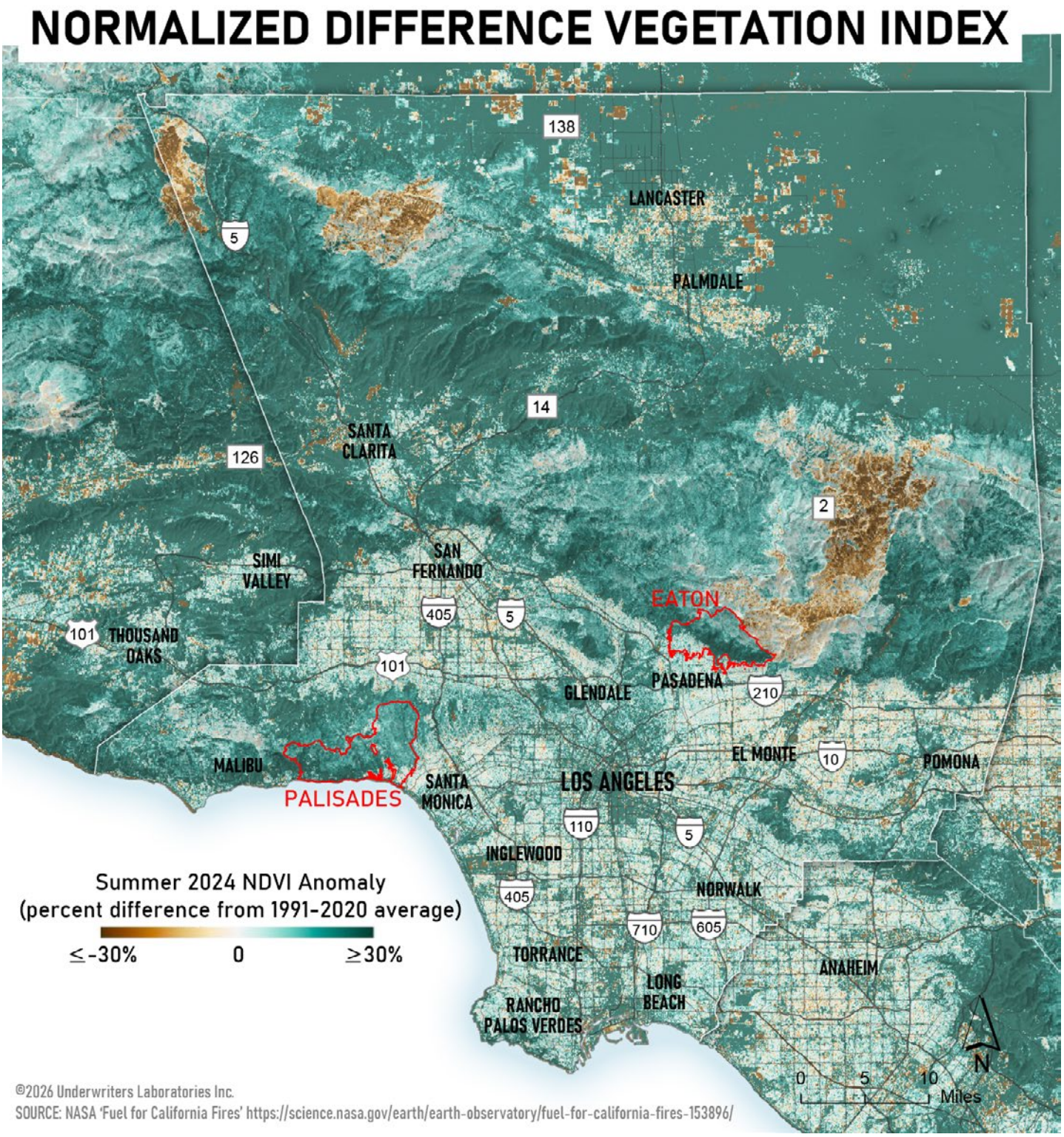


Figure 3.3.4 Satellite Normalized Difference Vegetation Index (NDVI) image in the summer of 2024 shows vegetation greenness after winter/spring rains. Source: NASA Earth Observatory.

The rainfall also supported the growth of shrubs and chaparral, which dominate many Southern California hillsides. Plants, such as chamise, sage scrub, and other woody shrubs, benefited from improved soil moisture and produced new shoots and foliage. This combination of grass, wildflower, and shrub growth created above-average fuel loads.

Vegetation flourished until the summer of 2024, when record heat in the region and a La Niña pattern over the tropical Pacific created a record dry period from October through December 2024.

By late 2024, much of the area around Los Angeles was experiencing its driest start to the wet season on record, with severe levels of drought (Figure 3.3.5) and no measurable precipitation. Vegetation moisture content was at, or below, critical levels by early January 2025, as seen in Figure 3.3.6 and noted in LACoFD's Daily Fire Danger Analysis[52] forecast for January 7, 2025 (Figure 3.3.7).

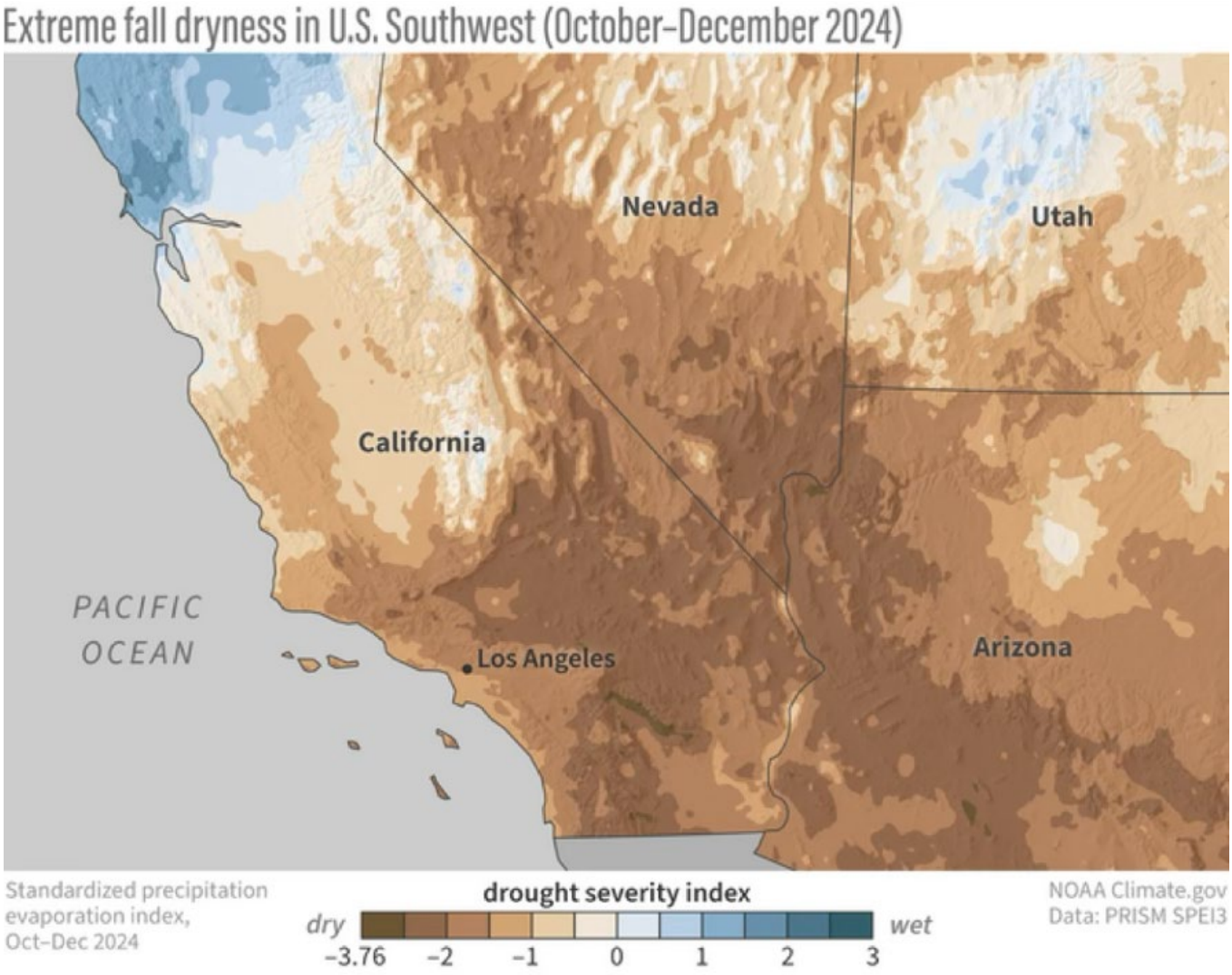


Figure 3.3.5 Vegetation over the southwestern US was very dry in late 2024. Source: NOAA Climate.gov.

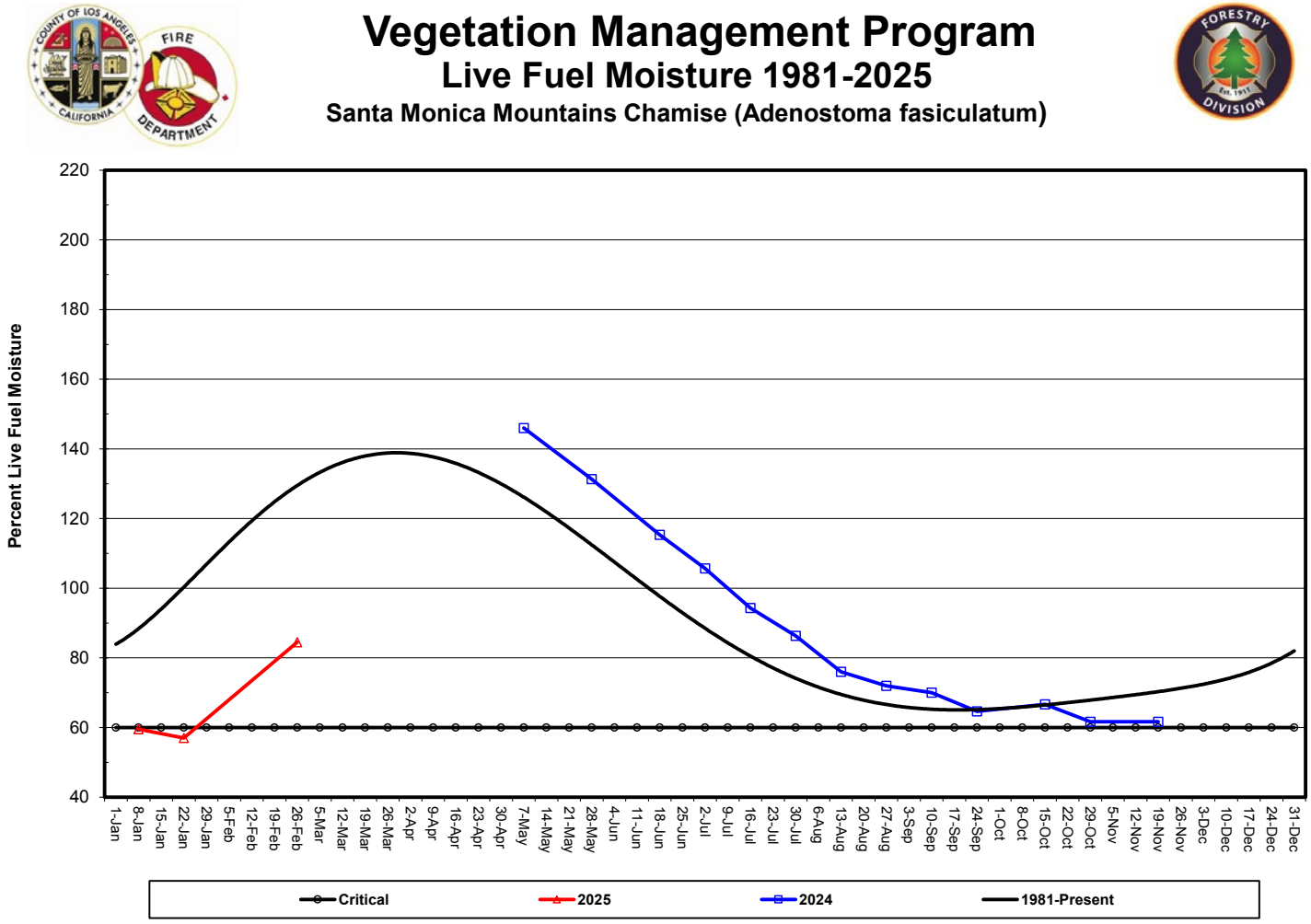


Figure 3.3.6 Live Fuel Moisture (LFM) shows very dry vegetation in early 2025 (red line). Source: Los Angeles County Fire Department.

COUNTY OF LOS ANGELES FIRE DEPARTMENT

DAILY FIRE DANGER ANALYSIS

THRESHOLD=206-LA Basin
THRESHOLD=192-Santa Monica Mountains
THRESHOLD=323-Santa Clarita
THRESHOLD=327-High Country
THRESHOLD=111-Antelope Valley
THRESHOLD=177-Catalina

DATE FORECASTED FOR: January 7, 2025

AREA (ZONE)	RAWS NAME	JURIST. FIRE STATION	STA. NO. MODEL	TEMP. (F)	RH (%)	20' WIND (MPH)	10 HR DFM (%)	BURN. INDEX
LA BASIN	SANTA FE DAM	44	045437X	67	20	25	11	321
	HENNINGER FLATS	66	045439X	61	22	30	8	403
	CLAREMONT	62	045443X	61	22	22	12	290
	WHITTIER	28	045446X	68	24	11	12	196
	SAN RAFAEL	19	045451X	66	18	30	9	386
	TONNER CANYON	119	045453X	64	21	13	10	211
AVERAGES				53	18	18	8	248
						LIVE FUEL MOISTURE		67
SANTA MONICA MOUNTAINS	CHESEBORO	125	045313X	67	15	29	10	376
	MALIBU HILLS	70	045433X	66	22	26	8	367
	BEVERLY HILLS	7	045442X	68	16	18	9	299
	LEO CARRILLO	99	045447X	65	31	24	11	297
	MALIBU CANYON	67	045452X	69	20	27	13	323
	TOPANGA	99	045456X	69	15	27	9	371
AVERAGES				67	20	25	10	339
						LIVE FUEL MOISTURE		62
SANTA CLARITA VALLEY	SAUGUS	111	045412X	64	14	30	9	397
	ACTON	80	045438X	58	20	31	10	382
	DEL VALLE	143	045445X	66	11	29	9	386
	NEWHALL PASS	124	045454X	63	14	34	9	425
AVERAGES				63	15	31	10	398
						LIVE FUEL MOISTURE		64
HIGH COUNTRY	CAMP 9	123	045441X	55	20	32	9	421
	WHITAKER PEAK	149	045448X	57	15	31	9	417
AVERAGES				56	18	32	9	419
						LIVE FUEL MOISTURE		69
ANTELOPE VALLEY	POPPY PARK	112	045440V	60	16	25	11	55
	SADDLEBACK	114	045444V	59	20	23	11	47
	LAKE PALMDALE	131	045450V	57	21	30	10	59
AVERAGES				59	19	26	10	53
CATALINA	CATALINA	55	7B1A2	66	41	11	12	175
AVERAGES				66	41	11	12	175

	LA	SM	SC	HI	AV	CA	Total
ADJECTIVE RATING FOR TODAY:	EXT	EXT	EXT	EXT	MOD	LOW	
NUMBER OF STATIONS REPORTING:	6	6	4	2	3	1	22
PERCENTAGE REPORTING:	100%	100%	100%	100%	100%	100%	100%

FUEL MODELS: *V-Grass, W-Grass/Shrub, X-Brush*

RATING: *LOW, MODERATE, HIGH, VERY HIGH, EXTREME* *NR** *Station is not reporting at this time.*

Figure 3.3.7 LACoFD Fire Danger Analysis on January 7, 2025, indicates extreme fire danger in most areas. Source: Los Angeles County Fire Department.

Months of high temperatures, low relative humidity, and strong solar heating accelerated the evaporation of plant and soil moisture. The lush vegetation that had grown during the wet winters gradually cured into fine, highly combustible fuels by late summer 2024. By the fall of 2024, the region had all the ingredients in place for a major wildfire event.[53]

3.3.2 Santa Ana Winds

Santa Ana winds are a type of katabatic, or downslope, wind that develops due to an intensifying pressure gradient between two (2) locations. While Santa Ana winds are best known to impact Southern California, this type of wind system also occurs in other regions of California and throughout the world. They flow from an area of high pressure, typically over a mountain range, towards an area of lower pressure. The sinking air compresses and warms rapidly, which typically results in hot, dry winds that can exceed 100 miles per hour (mph). A typical Santa Ana wind setup begins with a strong high-pressure system forming over the desert regions of the Great Basin, often centered over northern Nevada, southern Idaho, or western Utah. At the same time, a lower-pressure area develops off the coast of Southern California or northern Baja (Figure 3.3.8).

This difference in pressure — known as a pressure gradient — drives sinking air from the high-pressure region, over the mountains, and toward the lower-pressure area along the coast. The greater the pressure gradient, the stronger the resulting winds.

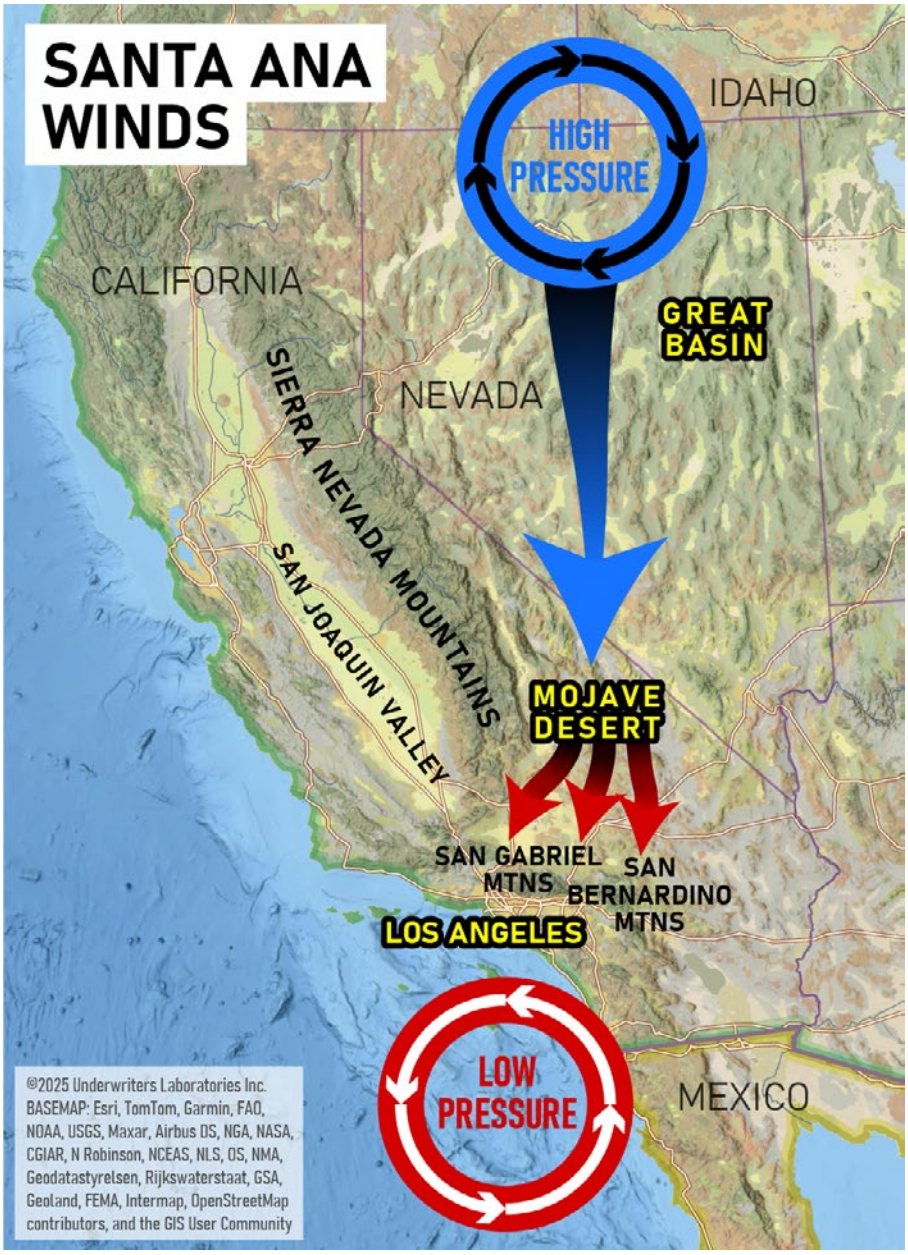


Figure 3.3.8 Typical pressure pattern setup for development of Santa Ana winds.

Atmospheric pressure is typically recorded by weather stations at regular intervals, often every 10 minutes, allowing forecasters to track changes in the pressure gradient between locations. The rate at which this gradient increases — and how steep it becomes — helps determine both the timing and strength of the resulting winds.

A pressure gradient of 4-8 millibars (mb) is enough to create strong and gusty Santa Ana winds, while gradients greater than 10 mb can result in strong and damaging winds. The pressure gradients on January 7, 2025, were in excess of a 14 mb difference between Los Angeles International Airport (LAX) and central Nevada. This LAX–Nevada pairing (roughly 400–450 miles apart) is commonly used to represent the cross-mountain pressure difference between the coastal basin and the Great Basin high-pressure region.[54]

Variable Factors

Most mild to moderate Santa Ana winds are known as “gap” wind events. In these cases, the pressure gradient is only strong enough to produce localized gusty winds through and around terrain gaps. During these events, the strongest and most gusty winds are typically confined to mountain passes and wind-aligned canyons and terrain gaps, often not reaching the coastal plain.

Additional weather variables, however, can turn a mild to moderate “gap” Santa Ana wind into a damaging and life-threatening high-wind event, as happened on January 7, 2025. They include:

- **Cold Air Aloft:** If very cold air is present in the upper levels of the atmosphere, typically above 10,000 ft, this heavier, dense air will accelerate the downward momentum (subsidence) of the sinking air over the mountainous terrain and result in higher wind speeds at the surface[55] (Figure 3.3.9).
- **Upper-Level Winds:** The speed and vertical proximity of winds aloft (roughly 10,000–30,000 ft) can dramatically influence surface conditions when aligned with the offshore pressure gradient. Strong winds in this upper level, particularly a well-defined, low-level jet, can act as a reservoir of momentum.[55] When combined with cold air aloft and a strong surface pressure gradient, this momentum can be transported downward, producing widespread and potentially damaging winds. These ingredients were all in place on January 7, 2025 (Figure 3.3.10).

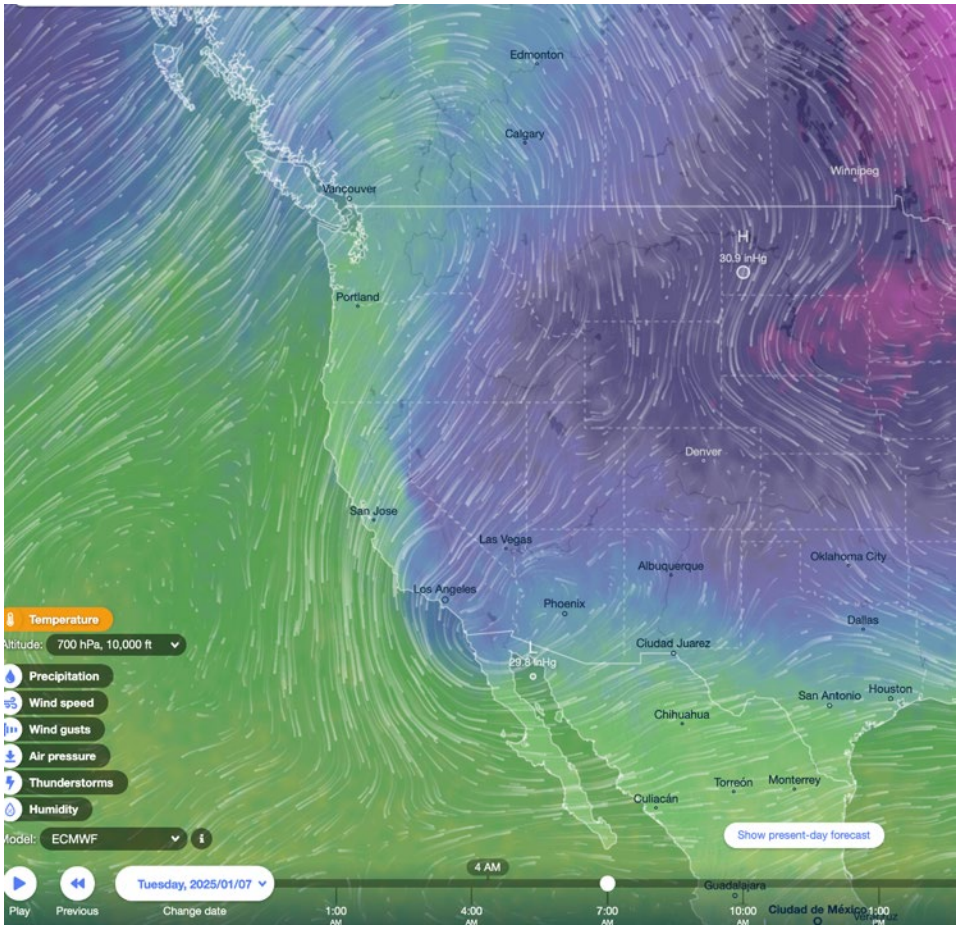


Figure 3.3.9 Cold continental polar air (in purple) at 10,000 ft is drawn southward over Southern California on January 7, 2025, by pressure gradients, increasing downward (subsiding) movement of air. Source: Ventusky.

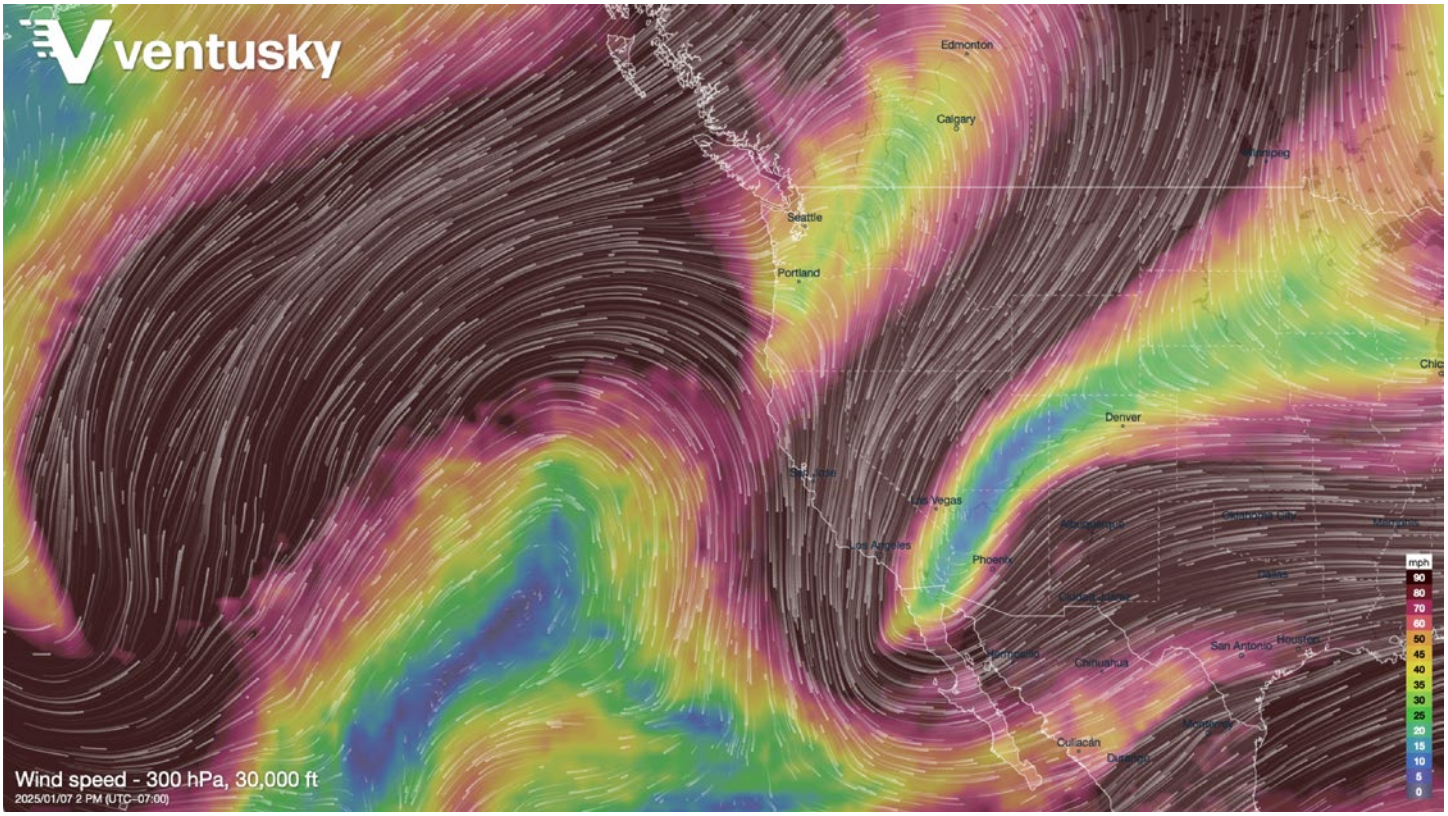


Figure 3.3.10 Strong upper level winds on January 7, 2025, are in alignment with surface wind direction, which adds strength to Santa Ana winds. Source: Ventusky.

3.3.3 Red Flag Warnings

As described in Section 2.1.3 of the Phase One report, a Red Flag Warning is an alert issued by NWS-Los Angeles/Oxnard to indicate that critical fire weather conditions are occurring or imminent. These conditions typically involve a combination of strong winds, low relative humidity, and dry vegetation (fuels) that can lead to rapid wildfire ignition and extreme fire behavior.

From October through December 2024, Southern California experienced multiple Santa Ana wind events of varying intensity, many lasting several days and repeatedly elevating fire weather conditions.

In response, the National Weather Service (NWS-Los Angeles/Oxnard) issued twelve (12) Red Flag Warnings, including five (5) rare Particularly Dangerous Situation (PDS) warnings, indicating severe fire risk. As a result, Red Flag conditions were in effect in Los Angeles County for a total of 18 days during the period leading up to the onset of the wildfires on January 7, 2025 (Figure 3.3.11, Table 3.3.1).

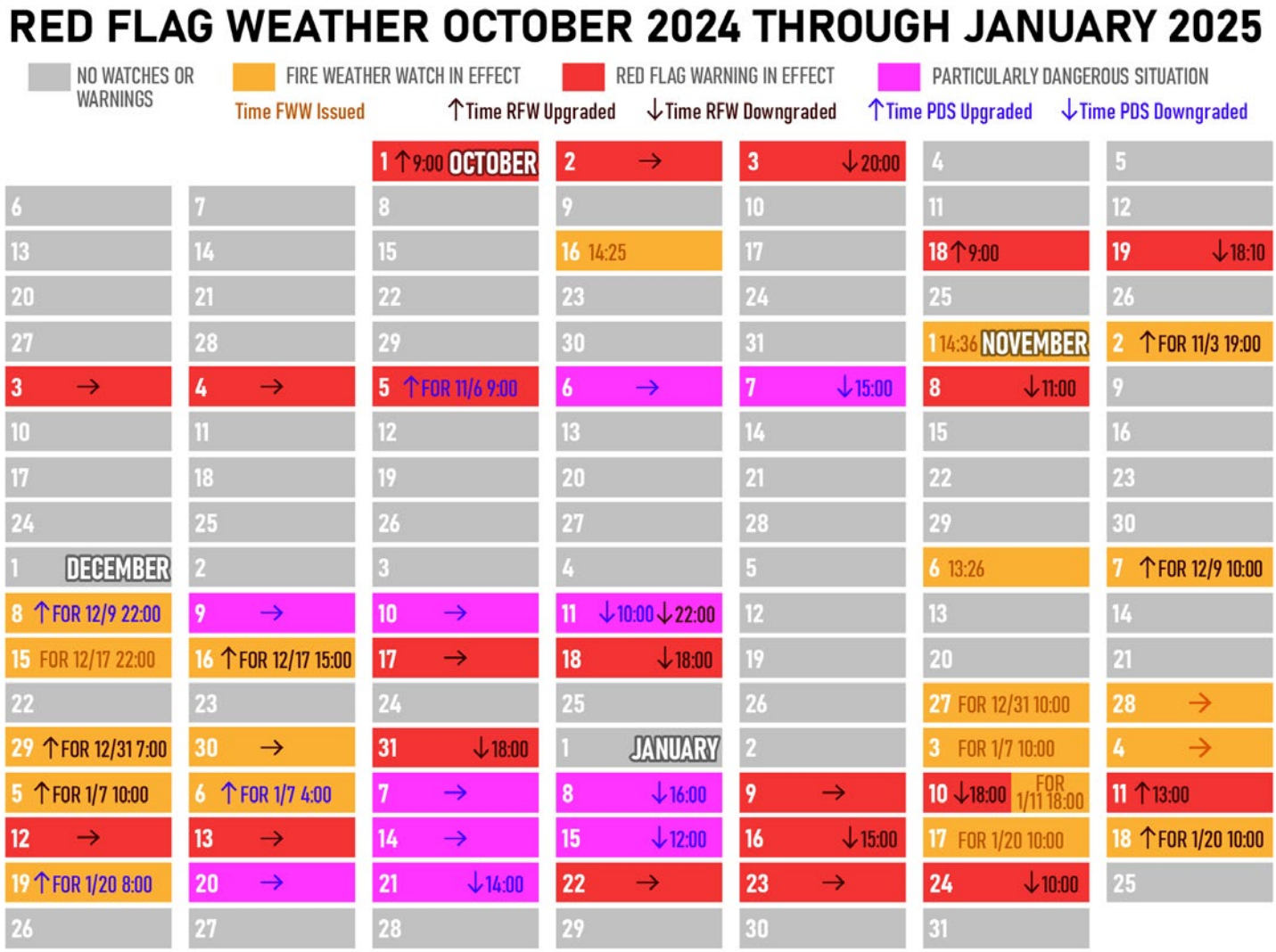


Figure 3.3.11 Calendar view of the Red Flag Weather days before and during the Southern California fires in January 2025.

Table 3.3.1 Tabular view of Red Flag Weather days before and during the Southern California fires in January 2025.

Date	Type	Status	Start Date	Time (PST)	End Date	Time (PST)	Duration [days]
10/1/24	RFW	Upgrade	10/1/24	900	10/3/24	2000	3
10/16/24	FWW	Initial	10/16/24	1425			
11/1/24	FWW	Initial	11/1/24	1436			
11/2/24	RFW	Upgrade	11/3/24	1900	11/4/24	1800	1
11/4/24	RFW	Continued	11/5/24	400	11/8/24	1100	4
11/5/24	PDS	Upgrade	11/6/24	900	11/7/24	1500	2
12/6/24	FWW	New	12/6/24	1326			
12/7/24	RFW	Upgrade	12/9/24	1000	12/11/24	2200	1
12/8/24	PDS	Upgrade	12/9/24	2200	12/11/24	1000	2
12/15/24	FWW	New	12/17/24	2200			
12/16/24	RFW	Upgrade	12/17/24	1500	12/18/24	1800	2
12/27/24	FWW	New	12/31/24	1000			
12/29/24	RFW	Upgrade	12/31/24	700	1/1/25	1800	2
1/3/25	FWW	New	1/7/25	1000			
1/5/25	RFW	Upgrade	1/7/25	1000	1/9/25	1800	
1/6/25	RFW	Continued	1/7/25	400	1/9/25	1800	
1/6/25	PDS	Upgrade	1/7/25	400	1/8/25	1800	2
1/8/25	RFW	Downgrade	1/8/25	1600	1/10/25	1800	2
1/10/25	FWW	New	1/11/25	1800			
1/11/25	RFW	Upgrade	1/11/25	1300	1/15/25	1800	3
1/12/25	PDS	Upgrade	1/14/25	400	1/15/25	1200	1
1/14/25	RFW	Downgrade	1/15/25	1200	1/16/25	1500	1
1/17/25	FWW	New	1/20/25	1000			
1/18/25	RFW	Upgrade	1/20/25	1000	1//2025	800	1
1/19/25	PDS	Upgrade	1/20/25	800	1/21/25	1400	1
1/21/25	RFW	Downgrade	1/21/25	1400	1/24/25	1000	3
							34 Days RFW

Type: FWW = Fire Weather Watch RFW=Red Flag Warning PDS= Particularly Dangerous Situation Red Flag Warning. Status: Initial - First issuance of product. Upgrade: Red Flag Warning upgraded from a Watch. Downgrade: PDS RFW downgraded to a non-PDS Red Flag Warning. Continued: Product extended in time from the initial expiration date/time.

The combined Palisades and Eaton fire areas experienced 18 Red Flag Warning days between October 1, 2024, and January 7, 2025, approximately 1.5 times the historical average of 12 days for the same period based on NWS-Los Angeles/Oxnard Red Flag Warning records from 2008-09 through 2023-24[56] (Figure 3.3.12).

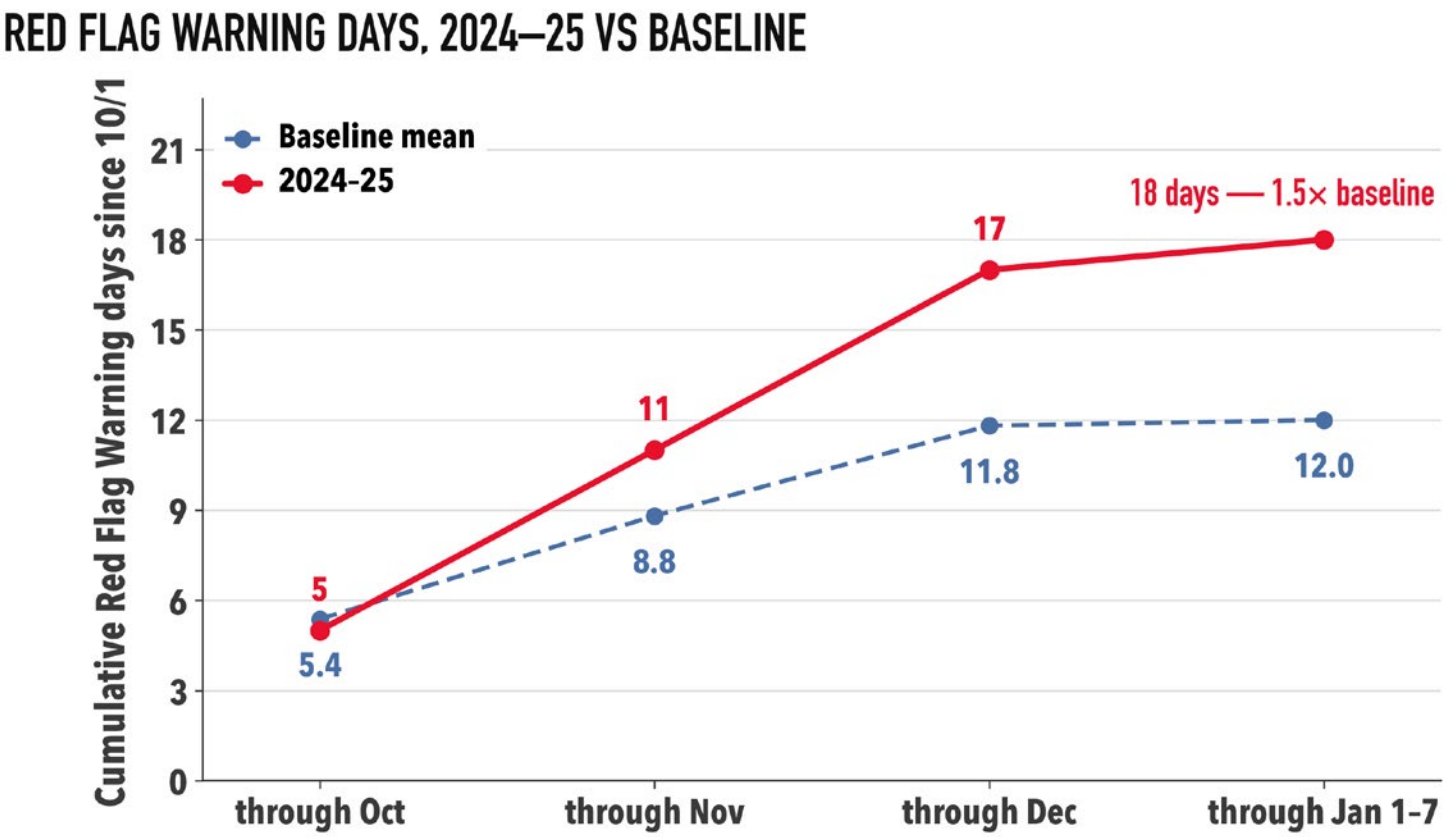


Figure 3.3.12 NWS Los Angeles area Red Flag Weather days October 1, 2024, to January 7, 2025, compared to a typical year in in Los Angeles County. Source: IEM :: NWS Text Archives.

This prolonged period of repeated offshore wind events, critically low relative humidity, and exceptionally dry fuels created an extended interval of elevated wildfire potential.

Consequently, while the January 2025 fires occurred during a notable wind event, the conditions present were the culmination of more than three (3) months of persistently critical fire weather, during which fuels remained increasingly dry and receptive to ignition, contributing to rapid fire growth and extreme fire behavior following ignition.

3.3.4 Pre-Event Weather Coordination

On December 31, 2024, NWS-Los Angeles/Oxnard's Weather Planning Forecast highlighted a growing potential for a Red Flag Santa Ana wind event during the following Tuesday, January 7, 2025, through Thursday, January 9, 2025. As weather models continued to predict the likelihood of the wind event, forecasters at NWS-Los Angeles/Oxnard began outreach and communications efforts to local fire, public safety, and emergency managers to signal the potential for a high-end and extended Red Flag Warning in the coming days.

The headline of the Fire Weather Forecast issued on the morning of December 31, 2024, by NWS-Los Angeles/Oxnard read that there is "a growing potential for a Red Flag event next Tuesday through Friday."

At 10:00 on Friday, January 3, 2025, NWS-Los Angeles/Oxnard issued a Fire Weather Watch that signaled increased confidence that Red Flag conditions were very likely starting on Tuesday, January 7, 2025, for the "potential of strong north to northeast winds and low humidity for much of Los Angeles and Ventura counties."

Later in the day on January 3, 2025, NWS-Los Angeles/Oxnard initiated the first in a series of daily fire weather webinars for public safety and emergency management officials. These webinars were intended to communicate forecast details and updates, share weather probability graphics, and allow for two-way dialogue between forecasters and participants, including the opportunity to address specific questions or concerns regarding the fire weather forecast and the timing of potential Red Flag Watches or Warnings.

In tandem with the webinars, NWS-Los Angeles/Oxnard also held daily fire weather coordination calls with local fire and partner agencies. These calls were used to discuss forecast confidence and uncertainty, while also allowing fire agencies to share information about local vegetation (fuel) dryness and wildfire ignition potential.

Based on records submitted by the National Oceanic and Atmospheric Administration (NOAA) and NWS-Los Angeles/Oxnard, most city and county public safety and emergency management agencies in the Los Angeles area had representatives in attendance on one (1) or more of the fire weather webinars leading up to the wildfires on January 7, 2025.

The Fire Weather Watch was upgraded to a Red Flag Warning on Sunday, January 5, 2025, and further elevated to a PDS Red Flag Warning on Monday, January 6, 2025.

The PDS statement read: “Life-threatening, destructive, and widespread windstorm with critical fire weather conditions… for portions of Los Angeles and Ventura counties.”

The alert outlined different fire weather concerns for the various regions of Los Angeles and Ventura counties — including the coast, valleys, and mountains — and specifically highlighted the potential for strong, erratic, and damaging mountain wave activity over foothill communities adjacent to the San Gabriel Mountains. The graphic in Figure 3.3.13 illustrates one of the ways in which NWS-Los Angeles/Oxnard communicated this information to the public.

For context, NWS-Los Angeles/Oxnard specifically referenced a similar destructive Santa Ana wind event that occurred in late November 2011, which resulted in widespread infrastructure and tree damage in Pasadena and neighboring communities.

Figure 3.3.13 NWS-Los Angeles/Oxnard graphic issued January 6, 2025, highlighting extreme risk for life-threatening damaging winds.

NWS Decision Support Services

The outreach by NWS-Los Angeles/Oxnard before the start of the January 2025 fires showcases the effectiveness of the agency's Decision Support Services (DSS) program, which provides tailored weather information and direct coordination to help emergency managers and public safety agencies maintain situational awareness before and during high-impact events.

Through briefings, webinars, coordination calls, and graphical decision aids, NWS-Los Angeles/Oxnard forecasters communicate expected hazards, timing, confidence, and uncertainty in a clear operational context.

DSS also enables two (2)-way communication, allowing emergency managers, fire agencies, and other partners to share on-the-ground conditions, operational needs, and local vulnerabilities. This collaborative approach supports proactive planning, resource allocation, and real-time decision-making, ensuring agencies have consistent, up-to-date weather intelligence to protect life and property.

3.3.5 Warning Fatigue

"Warning fatigue" is a well-recognized challenge in hazard communication,[57] including within the NWS-Los Angeles/Oxnard warning system. It occurs when people receive frequent watches, warnings, or advisory messages over time and begin to perceive them as routine or less urgent, which can reduce responsiveness to future alerts. This is especially possible during prolonged high-risk periods, including multi-day Red Flag Warnings, wind advisories, and other hazard messages that remain in effect for extended durations.

As a result, members of the public, and even partner agencies, may become desensitized, potentially underestimating the severity of a particularly dangerous period embedded within a longer event.

To address warning fatigue, NWS-Los Angeles/Oxnard uses impact-based wording, escalation messaging (such as PDS statements), DSS briefings, and frequent updates to highlight changes in risk and to emphasize when conditions are expected to become most hazardous.

There is no definitive evidence that weather warning fatigue directly affected the response ahead of, or during, the January 2025 fires, but conditions leading up to the event were consistent with environments where warning fatigue can occur with repeated Red Flag Warnings, including multiple PDS alerts and an extended period of critical fire weather.

3.3.6 Findings and Recommendations

FINDING 20: Consecutive wet winters in 2022-2024 produced substantial vegetation growth across Southern California, while record heat, prolonged drought, and repeated Santa Ana wind events during the second half of 2024 cured this vegetation into highly combustible fuels. Together, these climate and weather factors created an environment that increased the likelihood of rapid fire spread and large-scale urban conflagration once ignitions occurred.	**RECOMMENDATION:** N/A
FINDING 21: Currently, NWS-Los Angeles/Oxnard Fire Weather Decision Support process includes limited Live Fuel Moisture (LFM) sampling/monitoring data from federal and state agencies, and three (3) counties: Los Angeles, Ventura, and Santa Barbara.	**RECOMMENDATION 21.1:** Include other counties in the sampling/monitoring effort to provide higher resolution fuels data throughout the region, especially WUI areas. **RECOMMENDATION 21.2:** Make fuels data easily accessible to encourage more widespread reference and use.

3.3.6 Findings and Recommendations (cont.)	
FINDING 22: NWS-Los Angeles/Oxnard appears to have effectively communicated the January 7, 2025, extreme fire weather threat; however, outdated stakeholder webinar distribution lists may have limited participation by some agency decision-makers.	**RECOMMENDATION 22.1:** Use a system, tool, and/or process that ensures stakeholder webinar invite lists are maintained with active agency decision-makers.
FINDING 23: Due to the large number of Red Flag Days starting in October 2024 and throughout the fire period, there may have been alert fatigue amongst residents and emergency responders by the time the January 2025 fires occurred.	**RECOMMENDATION 23.1:** PDS warnings need to be impactful and motivate a response from both emergency responders and residents. They should also encourage appropriate actions. **RECOMMENDATION 23.2:** Provide more education and training for departmental, regional, or county-level meteorologists.

3.4 Infrastructure

3.4.1 Transportation and Road Networks

Road networks and transportation options in the vicinity of areas impacted by the Palisades and Eaton Fires vary considerably. Limited pedestrian routes, such as sidewalks, and few public transportation options and bicycle lanes within affected zones meant residents needed to rely on a vehicle to evacuate. However, while transportation options were limited across nearly all affected cities, most residents had access to at least one (1) vehicle.

3.4.1.1 Palisades Fire Area Transportation and Road Networks

Within the Pacific Palisades, there are curved and mountainous roads, as well as several arterials (major, high-capacity roads) and many local and collector roads, including cul-de-sacs and neighborhoods with a single point of access/egress (Figure 3.4.1). Many streets lack sidewalks, with limited bicycle and pedestrian networks.

The Palisades area also has limited public transportation, with Metro Bus offering bus service along Sunset Boulevard, but no bus service north of the boulevard. Nearly all households in the Palisades (98%) have a vehicle available, with many households having access to multiple, newer model vehicles.[58]

The Topanga area is similar to Pacific Palisades, hosting some major arterials and dense neighborhoods with limited bicycle and pedestrian networks and few sidewalks.

The City of Malibu and the unincorporated Malibu area have less dense roadway networks with fewer redundancies than Palisades and Topanga, however, Malibu (unincorporated) offers limited public transport with bus service only along the Pacific Coast Highway (PCH) (Figure 3.4.2).

Road networks are dense in the City of Santa Monica, though they are more gridded than curved, with fewer neighborhoods having limited access/egress. Santa Monica also boasts multiple bicycle and sidewalk networks, particularly near downtown, as well as a robust bus network. While Santa Monica as a lower rate of personal vehicle ownership than other affected areas, 90% of households do have at least one (1) vehicle available for use.[58]

Figure 3.4.1 Pacific Palisades major roads and arterials.

Figure 3.4.2 Western Palisades Fire area (Malibu and other Los Angeles County areas) major roads and arterials.

3.4.1.2 Eaton Fire Area Transportation and Road Networks

The City of Pasadena has a dense roadway network that is more gridded than curved with neighborhoods having multiple points of access/egress. The city has a robust sidewalk and bus network with some bicycle lanes. Around 90% of households have at least one (1) vehicle available.[58]

Altadena's roadway network is similar to Pasadena's, with sidewalk networks on main arterials and some bicycle lanes, though many residential streets lack both (Figure 3.4.3). Metro Bus does operate a bus service in the area, though a majority of households (95%) have access to a vehicle.[58]

The City of Sierra Madre also has a dense, gridded roadway network with sidewalks, but very few bicycle lanes. The city does offer public transportation via bus service, though, as with most other cities in the affected areas, a majority of households have vehicle access.

The City of Arcadia has a slightly less gridded network compared to Pasadena, but with many parallel routes and redundancies. There are sidewalk networks on main arterials, as well as bicycle lanes, though, as with Altadena, many residential streets lack both. Arcadia does offer public transportation via bus service, though the majority of households have vehicle access.

It should be noted that several areas impacted by the Eaton Fire were less gridded and had narrow streets with only one (1) point of access/egress. Narrow streets have inherent access/egress challenges due to limited street parking, number of household residents, and number of cars per household that can block or restrict movement during times of emergency. These smaller streets, therefore, can create bottlenecks and impediments to evacuation efforts.

More information on how transportation and road networks affected evacuation efforts can be found in Section 3.10.

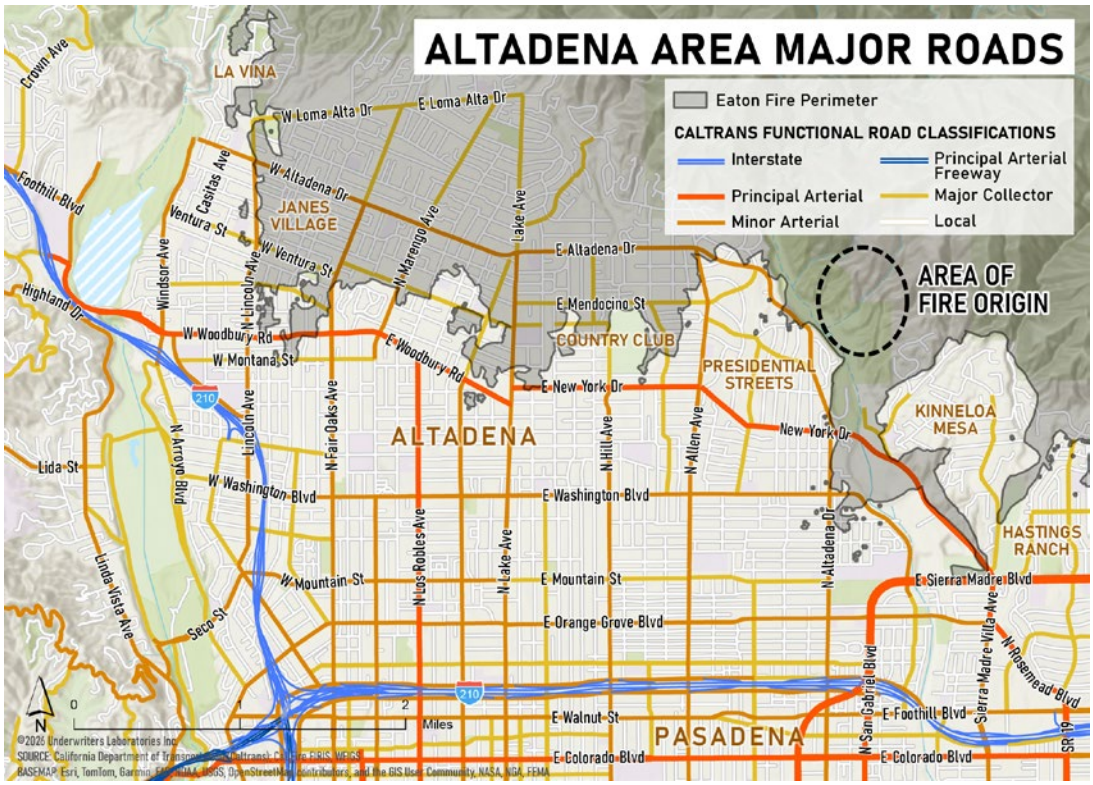


Figure 3.4.3 Altadena major roads and arterials.

3.4.2 Water System

Drinking water in the U.S. may be used for many things, including human consumption, showering/bathing, flushing toilets, washing clothes, watering plants and lawns, and filling swimming pools. Drinking water is also the primary source of water for firefighting in urban Southern California. As such, it is governed by water quality regulations to protect public health.

Water quality regulations for the U.S. are contained in the federal Safe Drinking Water Act (SDWA) and enforced via National Primary Drinking Water Regulations (NPDWR) set forth by the Environmental Protection Agency (EPA). Each state is allowed to establish additional regulations, as long as they are comparable to those set by EPA. In California, EPA has delegated its enforcement authority of the SDWA to the State Water Resources Control Board.

California regulates water distribution storage to minimize water age, preventing the formation of toxic disinfection byproducts in the drinking supply. All drinking water storage tanks are designed with a daily effective storage volume that varies based on the hydraulics and operating parameters of the drinking water treatment, storage, and distribution system.

Community conflagrations like the Palisades and Eaton Fires not only reduce storage volume, but also overwhelm the distribution system as large amounts of unrestricted water flows from damaged plumbing of destroyed homes and multiple firefighting operations happen simultaneously. This outsized demand ultimately reduces system-wide pressure, thus rendering fire hydrants useless.

While municipal water systems use emergency supplies when sudden events, like major fires, cause water demand to spike, the Palisades and Eaton Fires stressed the system beyond its design capacity. The water systems impacted by these fires were analyzed by examining water transfer from wholesaler to retailer, water storage and distribution systems at the community level, and how the systems were impacted by the conflagration.

Note: *In some cases, an analysis of system performance at certain times during the fire could not be completed with the available data. In these cases, the data received will be presented to provide context and a basis for future analysis as more data becomes available.*

3.4.2.1 Southern California Water Supply System

Southern California's water supply is derived from a number of sources and complex facilities, including local groundwater, surface water, recycled water, brackish groundwater, seawater desalination, and imported water.

The Los Angeles Aqueduct (LAA), the Central Valley Project (CVP), the Colorado River Aqueduct (CRA), and the State Water Project (SWP) provide imported water to supplement locally generated supplies. How individual agencies receive and deliver water to their customers varies based on their location and local resources. More detail on the statewide water supply system is contained in Appendix Section 6.5.

Water Sources and Treatment

Local water supplies, such as groundwater and desalinated water, provide about half of the water supply to the region, while imported water provides the rest.

There are numerous water treatment facilities distributed throughout the area that treat raw water supplies to meet the state's drinking water standards.

Water treatment plants (WTP) range in size, with some treating less than 1 million gallons of water per day (MGD) to others treating up to 750 MGD. These treatment facilities use a variety of methods to treat raw water, depending on the source and contaminants present, including membrane filtration, conventional treatments, ion exchange, and biological treatment. Water disinfection is ensured through the maintenance of chlorine or chloramine residual levels in the distribution system.

Southern California is also home to extensive recycled water treatment facilities. Recycled water is used for irrigation, groundwater recharge, and non-potable purposes, but it is not currently used for firefighting. Recent changes in California law (direct potable reuse regulations under Title 22 of California Code of Regulations)[59] will allow recycled water systems to obtain permits to connect to drinking water systems if specific conditions are met. This potential use of recycled water could increase water supply available for fire protection if implemented in the future.

Water Storage and Distribution

Retail water systems are typically divided into water pressure zones, which are designated geographic service areas within a municipal water distribution network where water pressure is maintained within a specific range. These pressure zones serve specific residential and commercial areas at certain elevations with reliable water service for both general and firefighting uses.

They are made up of storage tanks/reservoirs that provide a minimum duration of firefighting water, pumps that move water throughout the system, and pipelines that deliver water to fire hydrants.

Water supplies for emergency use are also pulled from untreated water reservoirs in larger and regional water systems. This untreated water is delivered to WTPs, where it is converted to drinking water and delivered to the retail water system for firefighting use. The largest untreated reservoir, Diamond Valley Lake, provides enough water for six (6) months of emergency supplies for Southern California.

Some water providers, such as LADWP and Las Virgenes Municipal Water District (LVMWD), also have large, open-water reservoirs that store water for later re-treatment and use in the drinking water system.

Water System Design for Firefighting Purposes

In California, treated water storage and distribution systems are designed to meet specific requirements for firefighting capabilities. They are governed by a regulatory framework that includes the California Water Code and the International Standards Organization (ISO), which sets minimum storage, flow, and pressure in a water system to ensure adequate protection during a fire event. See Appendix Section 6.5.2 for system requirements for a standard fire event.

In Southern California's urban centers, water systems typically plan and size their facilities around residential and commercial structure fire protection for an assumed duration. Each pressure zone in a distribution system is designed to meet these requirements.

The California Water Code defines the minimum requirements for a water system, but local agencies may adopt more stringent requirements. Current statutes and guidance, however, do not include criteria for large-scale community conflagrations, like the Palisades and Eaton Fires.

Figure 3.4.4 illustrates challenges encountered by systems designed for current, code-based water storage and fire flow requirements (that address fire events with a limited number of structure fires occurring at one time) when faced with community conflagrations, such as the Palisades and Eaton Fires, where multiple structures are burning at once. Current codes do not account for loss of water pressure during conflagrations due to unrestricted water flow from damaged structures and hundreds of firefighting operations occurring simultaneously.

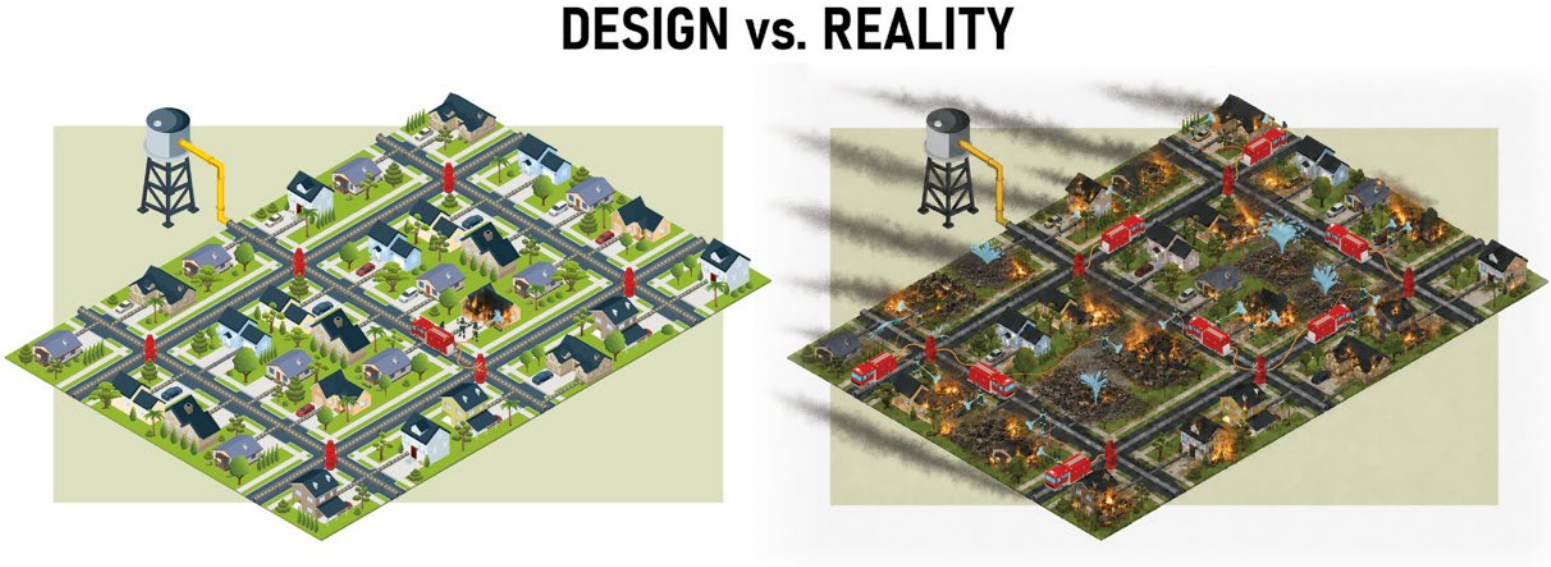


Figure 3.4.4 Illustration of water storage and distribution system design elements vs the reality experienced during the January 7, 2025, Palisades and Eaton Fires.

3.4.2.2 Water Utilities in Southern California

Water utilities provide a sustainable and resilient supply of water for customers within their distribution area. There are multiple water utilities that serve the Palisades and Eaton areas.

3.4.2.2.1 Palisades Water Utilities

The Palisades Fire area is served by two (2) wholesale water providers: Metropolitan Water District of Southern California (Metropolitan) and West Basin Municipal Water District (MWD).

Drinking water is provided to the area by three (3) retail water utilities, which provide drinking water treatment, distribution, and storage, as shown in Figure 3.4.5 and Table 3.4.1:

- Los Angeles City Department of Water and Power (LADWP)
- Los Angeles County Waterworks District 29 (LACWWD-29)
- Las Virgenes Municipal Water District (LVMWD)

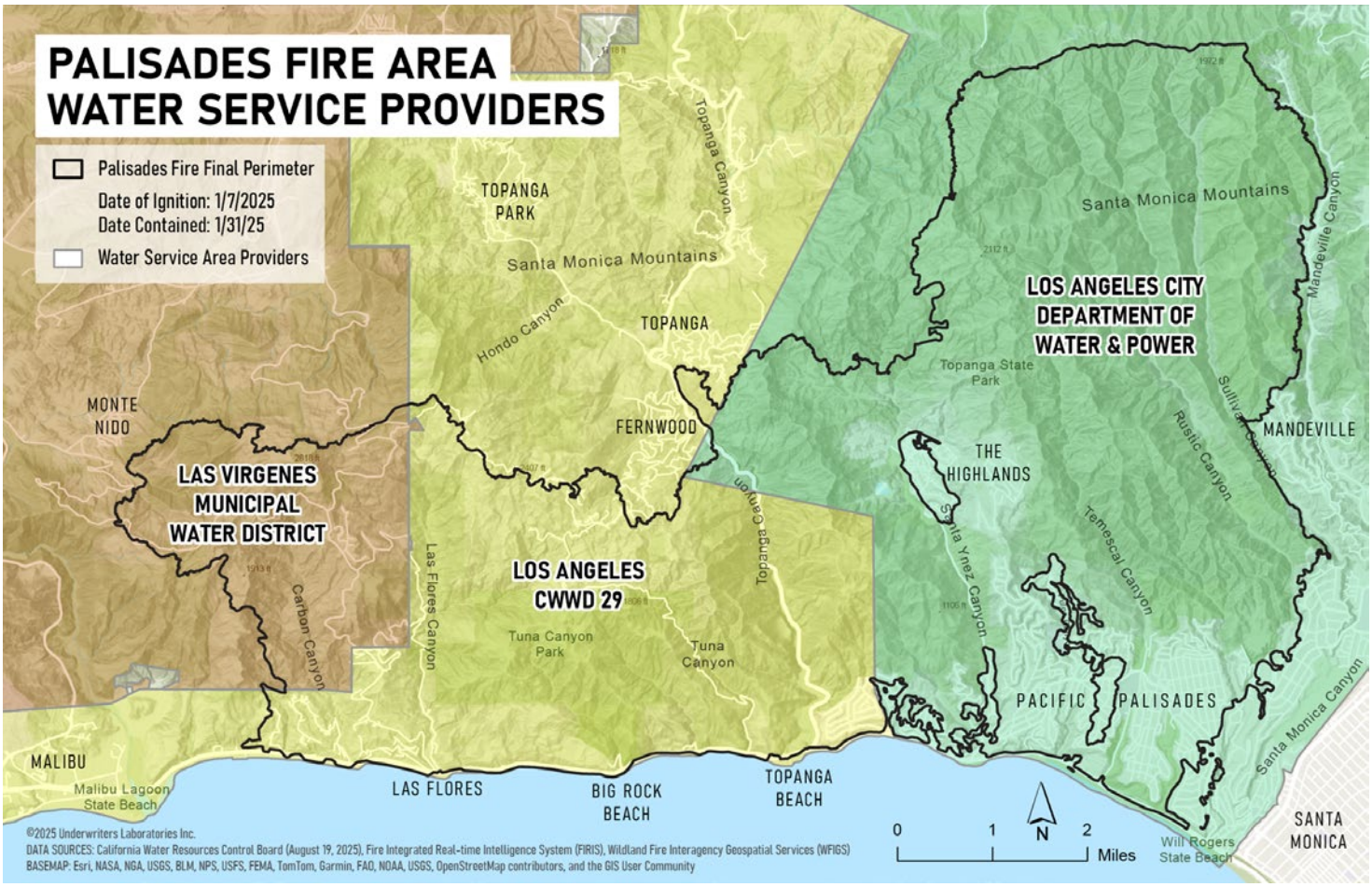


Figure 3.4.5 The water service providers in the Palisades Fire area are shown, with the final fire perimeter for reference.

Table 3.4.1 Water utility agencies in the Palisades Fire area with water sources and storage capacities.

Utility	Water Sources	Storage Facilities	Storage Capacity (MG)[1]	Active Service Connections[2]
LADWP	Groundwater, LAA, Metropolitan, Recycled Water	116 tanks and reservoirs	105,421[3]	740,000
LACWWD-29	West Basin Municipal Water District	50 tanks	21	7,500
LVMWD	Groundwater, surface runoff, Metropolitan	26 tanks and reservoirs	39 (tanks) 3,095 (reservoir)	20,000
West Basin MWD	Metropolitan	N/A[4]	N/A[4]	N/A[4]
Metropolitan[5]	State Water Project, CRA	3 major surface reservoirs	337,624	400

1 Capacity rounded to nearest million gallon (MG)
2 Rounded total, prior to fire incident
3 In-city and LA Aqueduct
4 West Basin system is a recycled water system, not used for firefighting supply.
5 Metropolitan Water District service connections provide treated water used to supplement local purveyor supplies for firefighting.

Metropolitan

Metropolitan is the regional water supply agency for urban Southern California. It supplies water to nearly 19 million people across six (6) counties: Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura.

Metropolitan also provides wholesale water service to 26 water agency customers (wholesale and retail) to supplement their local supplies, as illustrated in Figure 3.4.6.

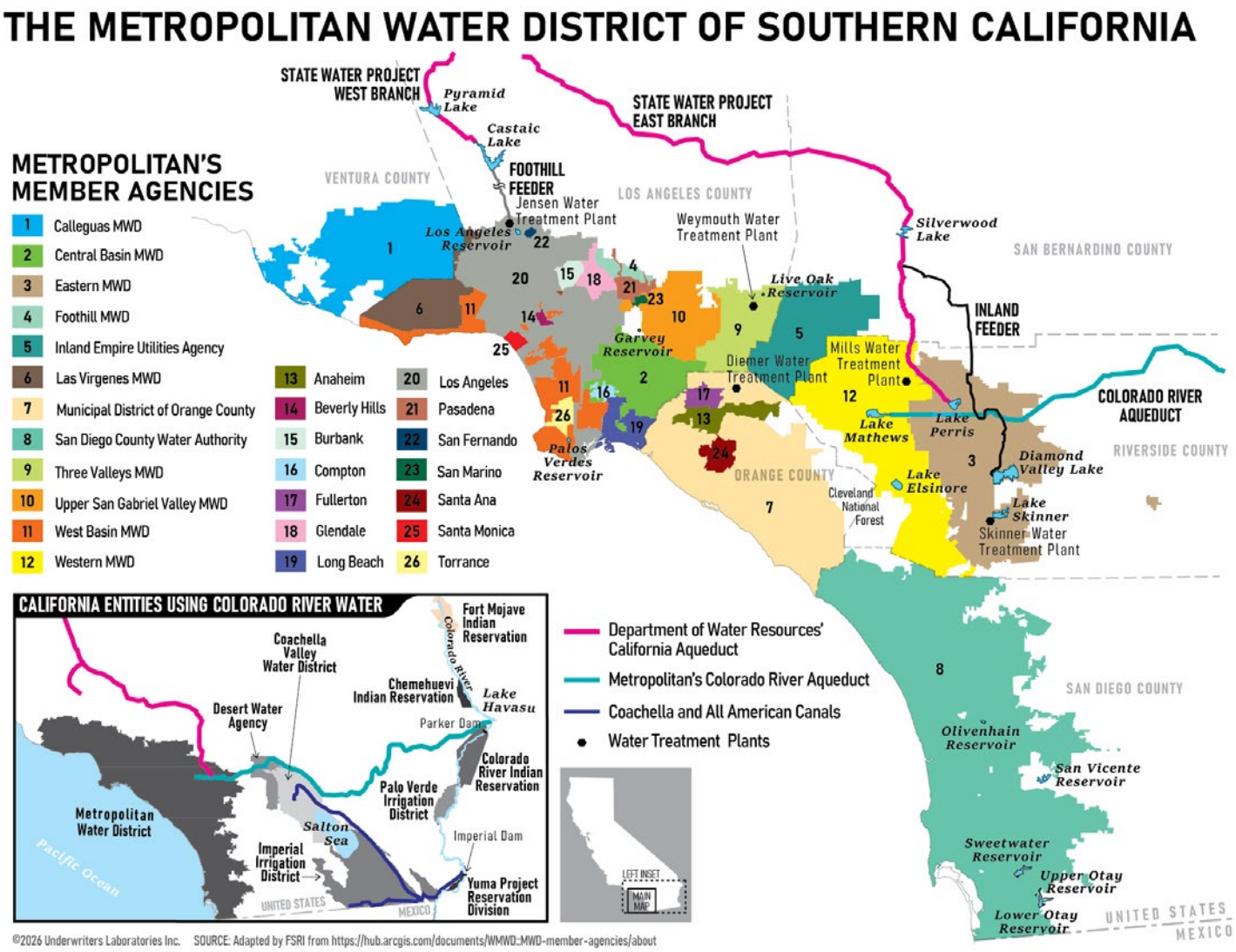


Figure 3.4.6 Map of Metropolitan's 26 water agencies, covering parts of six (6) counties.

Metropolitan operates five (5) large WTPs that range in capacity from 220 MGD to 750 MGD (Table 3.4.2). It delivers both treated and untreated water to its member agencies. Water is treated using ozone as a primary disinfectant, followed by filtration and a post-disinfection residual of chloramines prior to delivery in the distribution system.

Table 3.4.2 Metropolitan's water treatment plant capacity and locations.

Facility	Capacity (MGD)	Location
Jensen	750	Granada Hills
Weymouth	520	La Verne
Diemer	520	Yorba Linda
Mills	220	Riverside
Skinner	350	Winchester

During the January 2025 fires, there were public safety power shut-off (PSPS) events outside of the fire areas that caused the utility to temporarily switch from ozone to chlorine as the primary disinfectant at the Weymouth and Skinner WTPs to ensure reliable operation. This change reduced the electrical loads required to operate the plants.

Metropolitan's water storage and delivery facilities consist of 830 miles of pipelines/canals, three (3) major reservoirs, and 17 hydroelectric generating plants. Distribution system pipelines range in size from 30-inch diameter to 144-inch diameter. Storage from the three (3) major reservoirs totals more than one (1) million acre-ft (over 337,000 MG; Table 3.4.3).

Water is provided to water agencies through approximately 400 wholesale service connections throughout the distribution system. These wholesale service connections deliver water from Metropolitan's regional delivery system to agencies that operate facilities that serve the retail level (or individual customer) and fire hydrants. Metropolitan service connections were utilized for water supply during the Palisades Fire.

Service connection LA-29 provided water to LADWP, while service connection WB-26 provided water to West Basin MWD/LACWWD-29.

Table 3.4.3 Location and capacity information for Metropolitan's major reservoirs.

Facility	Storage Capacity (acre-ft)	Location
Diamond Valley Lake	810,000	Riverside County
Lake Mathews	182,000	Riverside County
Lake Skinner	44,200	Riverside County

Five (5) of Metropolitan's 26 water agencies were impacted by the Palisades and Eaton Fires, including Foothill Municipal Water District (FMWD), LVMWD, Los Angeles, Pasadena, and West Basin MWD.

West Basin Municipal Water District

West Basin MWD is a wholesale agency that serves customers in southwestern Los Angeles County. It provides water to the South Bay area, from the Palos Verdes Peninsula, along the coast to Malibu, and inland to Carson, Culver City, and West Hollywood.

The West Basin service area is shown in Figure 3.4.7. West Basin's customer LACWWD-29 was heavily impacted during the Palisades Fire, while the rest of the service area was unaffected.

West Basin facilities were not actively used during the fire incident, and consequently, are not discussed in detail in this report. During the Palisades Fire, firefighting supplies were delivered to LACWWD-29 through Metropolitan service connection WB-26.

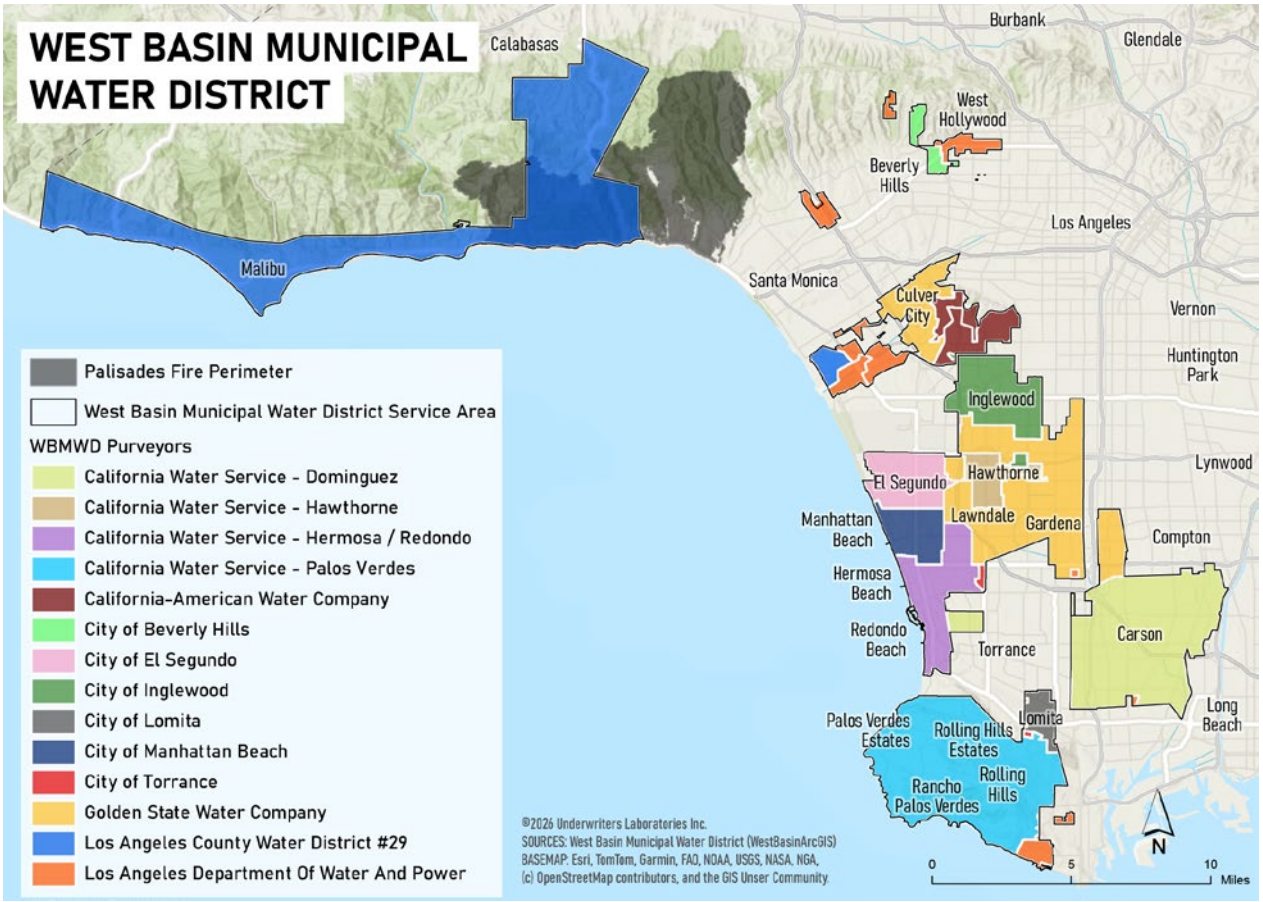


Figure 3.4.7 The service areas of each of West Basin MWD's purveyors, shown in relation to the Palisades Fire perimeter.

Los Angeles Department of Water and Power

LADWP manages and provides water for the City of Los Angeles. As the nation's second-largest water municipality, LADWP serves around four (4) million customers through 740,000 service connections. Water is delivered through 500 miles of trunk lines, over 7,000 miles of distribution pipeline, 78 pump stations (PS), and 114 tanks and reservoirs.

To reliably service and supply water for its customers, LADWP provides water through LAA, groundwater supplies, imported water from Metropolitan, and recycled water for non-potable use. Water from LAA and Metropolitan is delivered to the city's northern boundary, where it is treated at the LAA Filtration Plant, which has a 600 MGD capacity.

After treatment, water is distributed through main trunk lines, up to 72 inches in diameter, to different parts of the system via gravity (for lower elevation zones) and pumping (for higher elevation zones). Groundwater is pumped into the San Fernando Valley, treated, and delivered directly to the distribution system. LADWP also has a number of treated water service connections to Metropolitan throughout its system. These connections can be used as necessary to meet peak or emergency demands.

LADWP distributes treated water via gravity flow through the 36-inch diameter Westgate Trunk Line in the Palisades Fire area (Figure 3.4.8). The Westgate Trunk Line is connected to the Stone Canyon Outlet pipeline, which delivers water from the LAA Filtration Plant and Los Angeles Reservoir located at the northern edge of the city.

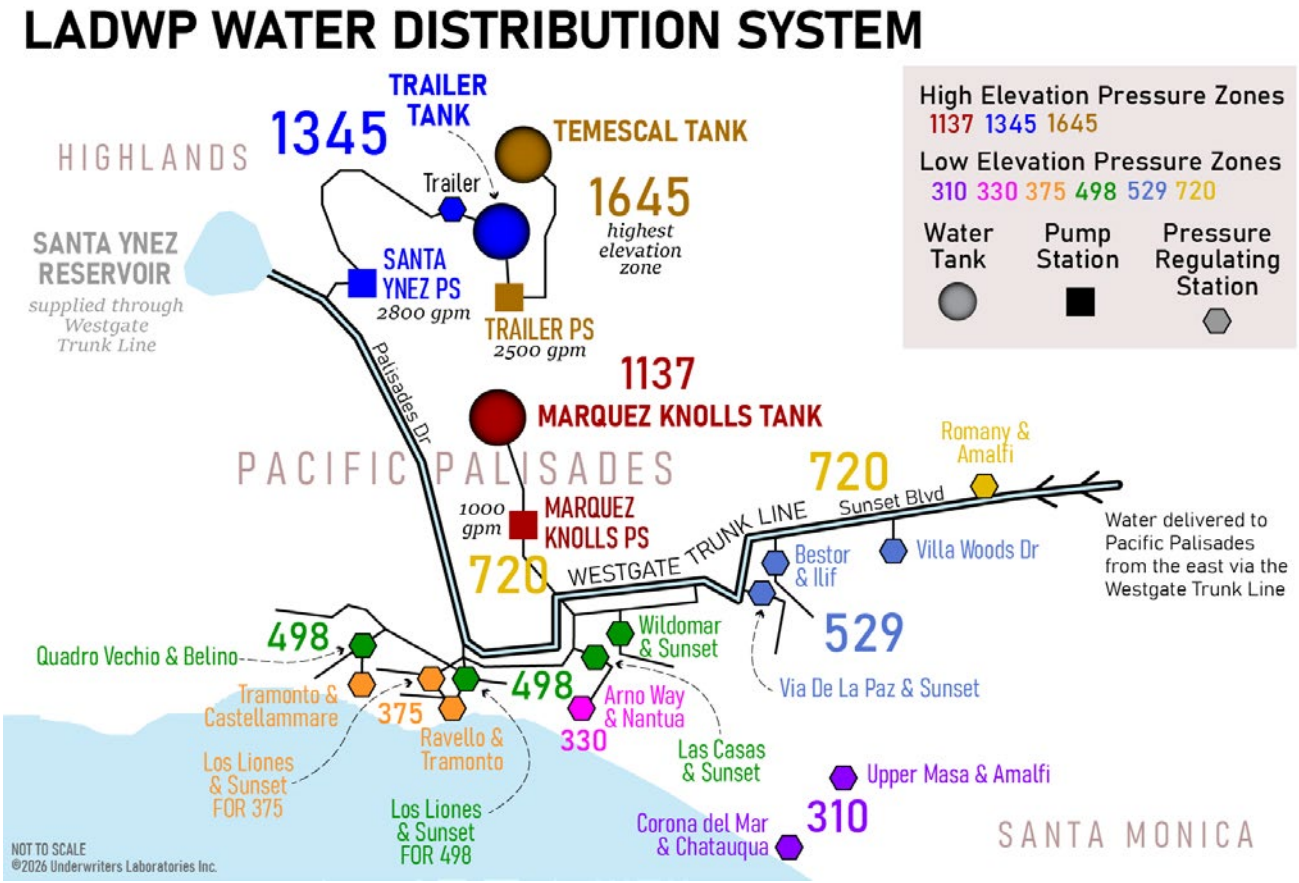


Figure 3.4.8 Diagram of the Los Angeles Department of Water and Power water distribution system in the Palisades Fire area, including pressure zones, water tanks, pump stations, and pressure regulating systems.

Water pressure in the areas directly impacted by the fire is controlled by the Romany & Amalfi pressure regulating station that provides water to the 720 pressure zone. Water from the 720 zone is then either boosted higher to the 1137, 1345, and 1645 pressure zones or reduced further to the 529, 498, 375, 330, and 310 pressure zones.

There are three (3) pump stations that lift water to storage tanks in the higher elevation zones:

The Marquez Knolls PS is a 1,000 gallons per minute (GPM) capacity facility that delivers water through a 16-inch diameter pipeline from the 720 zone to the one (1) million gallon (MG) Marquez Knolls Tank to feed the 1137 zone. The PS is set to shut off when suction pressure drops below 15 pounds per square inch (psi).

The Santa Ynez Pump Station (SYPS) is a 2,800 GPM capacity facility that lifts water through a 23-inch diameter pipeline from the 720 zone to the one (1) MG Trailer Tank to feed the 1345 zone. It is set to shut off when suction pressure drops below 10 psi.

SYPS can pull water from two (2) sources: either the Westgate Trunk Line or the Santa Ynez Reservoir (SYR). However, during the fire incident, SYR was empty and offline for replacement of its floating cover.

SYR is the largest storage facility in the area. It has a total capacity of 117 MG, but its useful operational storage is limited to about 60 MG due to its operating elevation of 695-705 ft. If SYR had been online during the fire, it could have potentially provided additional water supply.

Even if SYR storage was available, the water distribution system may not have maintained adequate pressure due to unrestricted water flow at multiple points throughout the system. A detailed hydraulic model of the distribution system in this area would provide information on the amount of flow and duration available and could be the subject of a future study with additional design details of the system.

The Trailer PS is a 2,500 GPM facility that boosts water through a 12-inch diameter pipeline from the 1345 zone to the 1 MG Temescal Tank, which feeds the 1645 zone. The PS is set to shut off when suction pressure drops below 3 psi.

Once pump stations automatically shut off when suction pressure drops below the indicated settings, they must be manually restarted to resume operation.

Storage in the higher elevation zones is provided by the 1 MG tanks discussed above. Table 3.4.4 summarizes the operational and firefighting storage provided for the 1645, 1345, and 1137 pressure zones.

The regulated pressure zones (310, 330, 375, 498, 529, and 720) in the Palisades area do not have storage tanks within the individual pressure zones, but instead rely upon the Westgate Trunk Line for their supply. When SYR is online, it can provide storage for these zones.

A detailed hydraulic model of the distribution system in this area would provide information on the amount of flow and duration available and could be the subject of a future study.

Table 3.4.4 Summary of Los Angeles Department of Water and Power's operational and firefighting water storage in the area of the Palisades Fire (gallons).

Tank	Actual Capacity	Required Regulatory Storage	Storage Required for Fire Flow	Excess for Emergency	Total Required Storage	Excess Capacity
Marquez Knolls	1,018,502	78,000	480,000	60,000	618,000	400,502
Trailer	972,118	163,000	480,000	60,000	703,000	269,118
Temescal	972,118	63,000	480,000	60,000	603,000	369,118

Los Angeles County Waterworks District 29

LACWWD-29 is a voter-approved, special district formed in 1959, which combines 15 mutual water companies under one (1) umbrella to supply drinking water to the Topanga and Malibu areas along the coast.

LACWWD-29 is operated by the Los Angeles County Department of Public Works (LACDPW) and is governed by the Los Angeles County Board of Supervisors. The system serves approximately 22,000 people through 7,727 metered connections. The district boundary is shown in Figure 3.4.9.

The primary supply source for LACWWD-29 is treated water delivered from a Metropolitan connection, which is purchased through intermediary wholesaler West Basin MWD. The main conveyance facility is an approximately 35-mile-long, 30-inch-diameter pipeline running along the coast from Culver City to Malibu.

The distribution system is generally operated by pumping water from the main coastal supply line up into the canyon and hillside areas, and is divided into the Topanga and Malibu systems. There are 220 miles of distribution mains in the overall distribution system, ranging from one (1) inch to 36 inches in diameter.

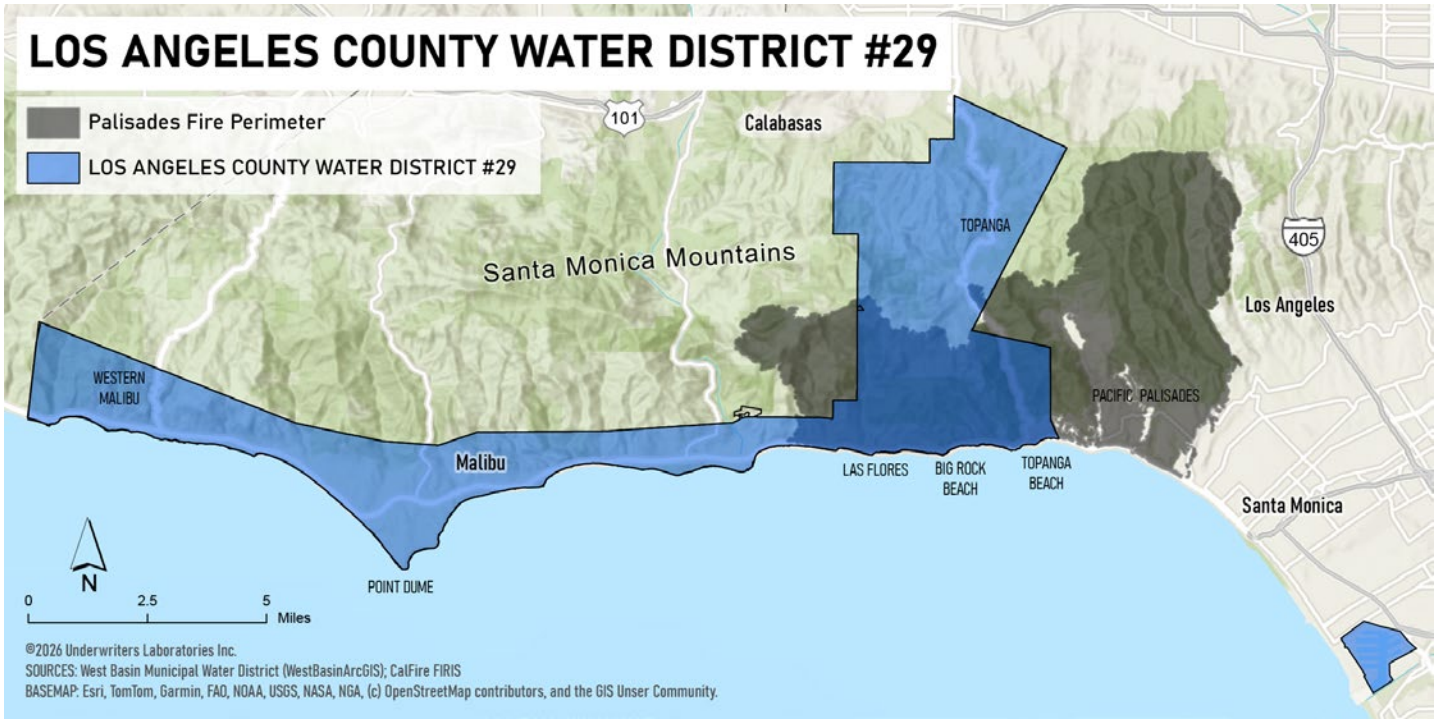


Figure 3.4.9 The service area of Los Angeles County Water District #29 in relation to the Palisades Fire perimeter.

The Topanga system has eight (8) pressure zones with service elevations of 265; 525; 960; 1,330; 1,475; 1,615; 1,649; 1,750; and 2,604 ft. The Malibu system consists of numerous pressure zones where water is pumped from the coastal supply line into canyon service areas, while pressure is reduced to serve zones along PCH. ULRI was not provided schematics of the hydraulic profiles, as LACDPW considered them confidential documents.

The distribution system contains a total of 50 storage tanks with a total storage volume of 21 MG. Tank materials include steel, bolted steel, and concrete construction. Storage volume is sized to provide 7.4 MG of storage for fire flows.

A total of 31 pump stations lift water to the higher elevation pressure zones. Pump capacity ranges from 17 to 4,000 GPM. The system also contains 39 pressure regulating stations, most with two (2) pressure reducing valves (PRVs) to respond to a variety of pressure fluctuations.

Five (5) emergency interconnections are available: two (2) with the LADWP system and three (3) with the LVMWD system. The LADWP connections are six (6)-inch diameter and have capacities of 400 and 700 GPM. The Las Virgenes connections consist of two (2) four (4)-inch and one (1) six (6)-inch meters with capacities of 400 and 1,000 GPM.

Las Virgenes Municipal Water District

Information about LVMWD was obtained from publicly available resources. ULRI staff were unable to schedule meetings with LVMWD to discuss the Palisades Fire response in detail.

The LVMWD service area encompasses 122 square miles and is located on the western edge of Los Angeles County. It borders Ventura County, Malibu, and the City of Los Angeles. LVMWD provides retail water service to over 70,000 people in the cities of Agoura Hills, Calabasas, Hidden Hills, Westlake Village, and unincorporated Los Angeles County.

The LVMWD service area and Palisades Fire perimeter are shown in Figure 3.4.10.

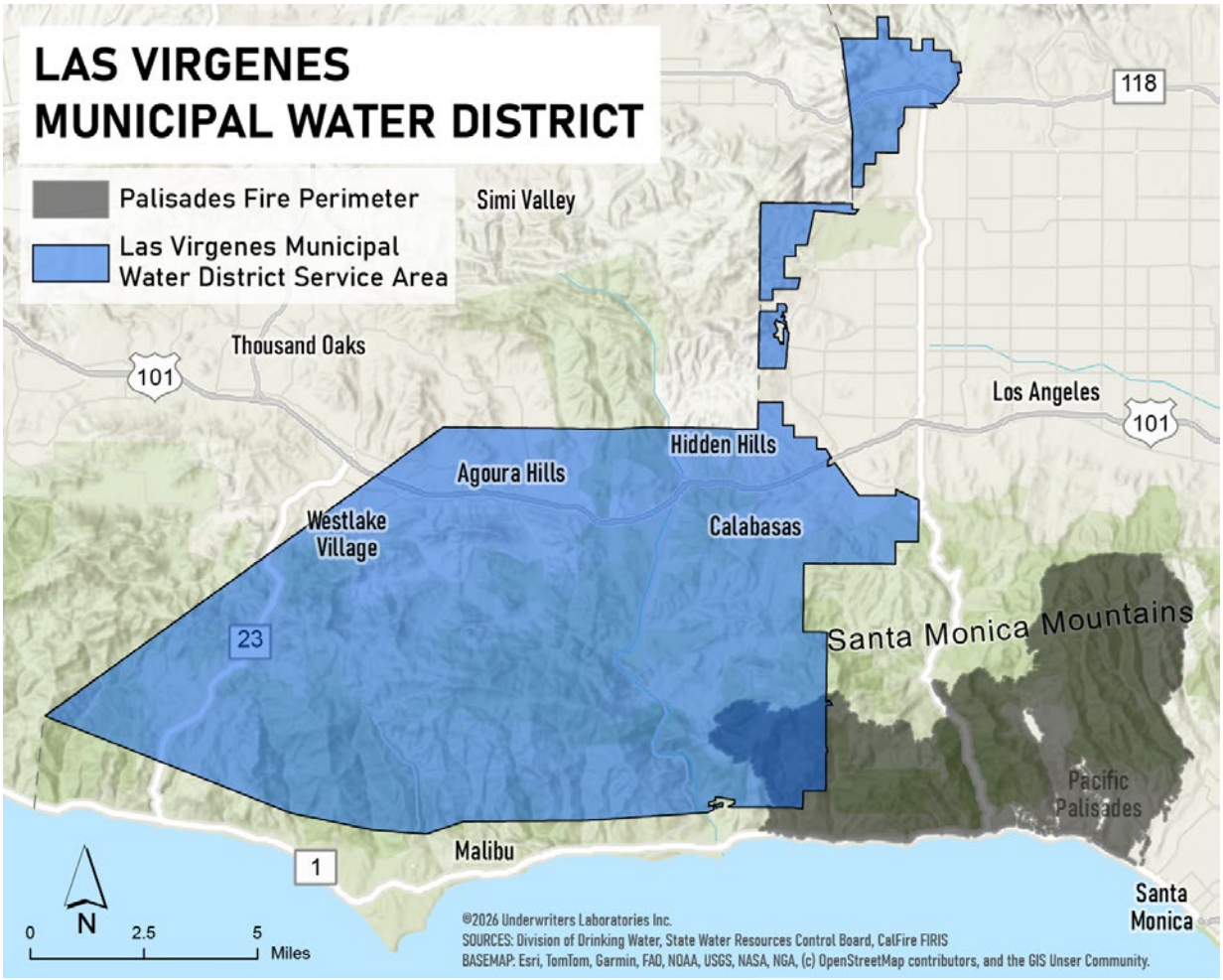


Figure 3.4.10 Las Virgenes service area in relation to the Palisades Fire perimeter.

LVMWD potable water distribution system includes 25 storage tanks, 24 pump stations, and approximately 400 miles of pipelines. There are 22 pressure zones in the system. A schematic representation of the distribution system is shown in Appendix Section 6.5.3.

LVMWD relies on four (4) sources for potable and non-potable water supplies. The predominant water supply is imported water from Metropolitan. It receives SWP water treated at the Jensen WTP, which is delivered through three (3) service connections located on the eastern side of its service area, with a combined capacity of 33,000 GPM.

Treated water is stored in Las Virgenes Reservoir, a 9,500 acre-feet (3,096 MG) capacity open reservoir. It is then treated at the 18 MGD-capacity Westlake Filtration Plant, usually in the summer months. Las Virgenes also imports potable water from two (2) interconnections from the City of Simi Valley/Ventura County Waterworks District 8 and Ventura County Waterworks District 17.

The Westlake Wells No. 1 and 2 produce non-potable water that is blended in the recycled water system and used for irrigation. Recycled water from the Tapia Water Reclamation Facility is the remaining water source and is used for non-potable purposes.

LVMWD can get additional water deliveries through two (2) interconnections with LADWP. The Kittridge interconnection has a 9,000 GPM capacity and the Germain interconnection has a capacity of 1,350 GPM.

3.4.2.2.2 Eaton Water Utilities

Drinking water for the communities impacted by the Eaton Fire is provided by six (6) separate retail water utilities (Figure 3.4.11):

- City of Sierra Madre
- Pasadena Water and Power (PWP)
- Kinneloa Irrigation District (KID)
- Rubio Cañon Land and Water Association (RCLWA)
- Las Flores Water Company (LFWC)
- Lincoln Avenue Water Company (LAWC)

There are also two (2) wholesale water providers for the area: FMWD and Metropolitan.

The retail water providers own and operate the drinking water treatment, distribution, and storage facilities in this area. Additional details about retail and wholesale providers are summarized in Table 3.4.5.

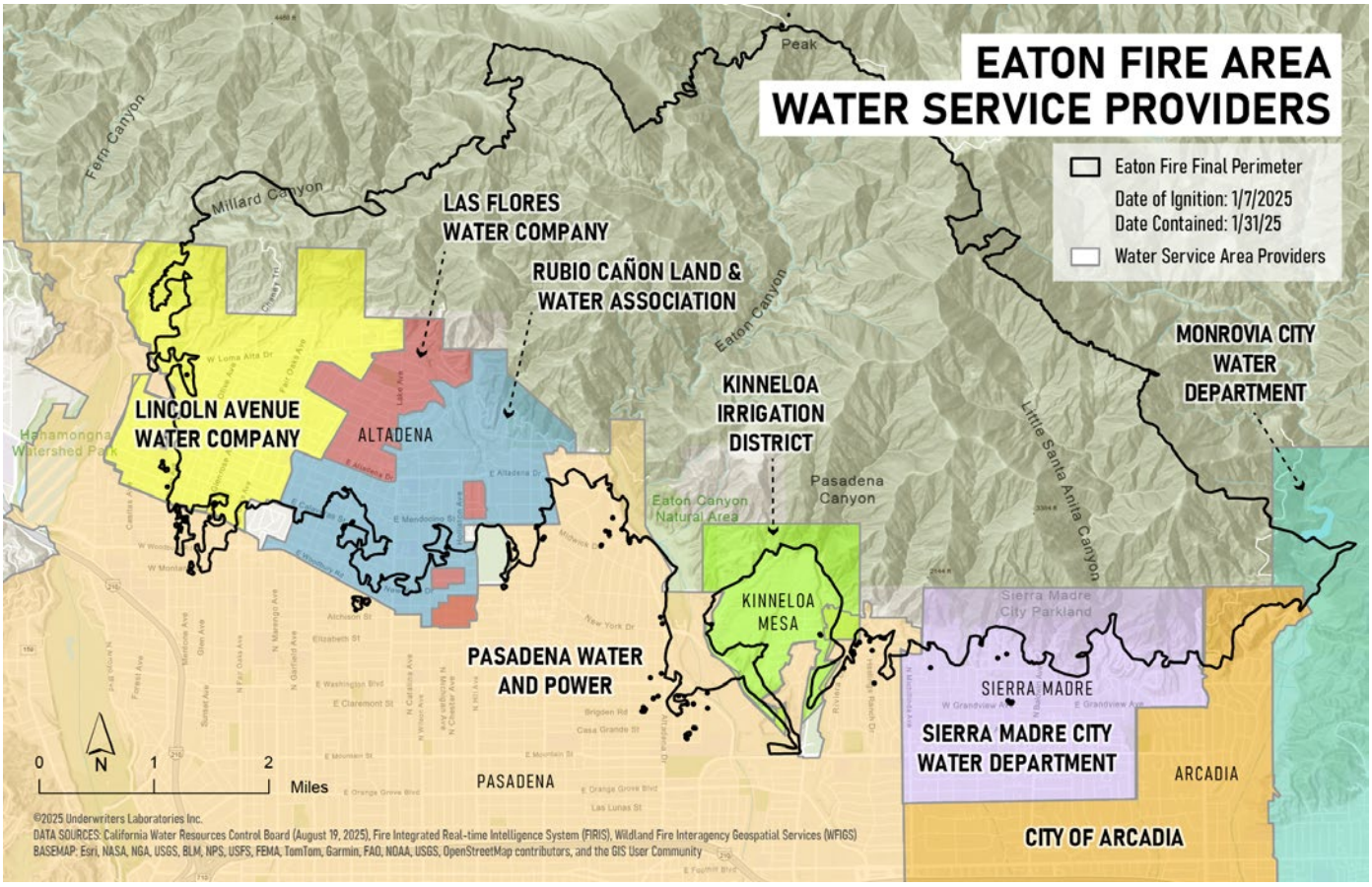


Figure 3.4.11 Retail water providers in the communities impacted by the Eaton Fire shown in relation to the fire's perimeter.

Table 3.4.5 Retail and wholesale water distribution in the communities impacted by the Eaton Fire.

Utility	Water Sources	Storage Facilities	Storage Capacity (MG)[1]	Active Service Connections[2]
City of Sierra Madre	Groundwater, local surface water	8 tanks	8	3,800
PWP	Groundwater	14 tanks and reservoirs	110	Unknown
KID	Groundwater, local surface runoff, FMWD	10 tanks and reservoirs	4	600
RCLWA	Groundwater, FMWD	8 tanks and reservoirs	8	3,100
LFWC	Groundwater, FMWD	5 reservoirs	4	1,500
LAWC	Groundwater, local surface runoff, FMWD	12 reservoirs	11	4,500
FMWD[3]	Metropolitan	2 tanks	3	6
Metropolitan	State Water Project			
CRA	3 major surface reservoirs	337,624	400	

1 Capacity rounded to nearest million gallon (MG)
2 Rounded total, prior to fire incident
3 Facilities serving Eaton Fire area

Metropolitan

Metropolitan's background information and fire experiences in relation to the Palisades Fire (see Section 3.4.2.2.1) largely apply to the Eaton Fire as well.

The principal facilities used to supply water to the agencies impacted by the Eaton Fire include the Weymouth WTP and the Upper Feeder pipeline that delivers water treated at Weymouth. The Upper Feeder has a design capacity of 509 cubic feet per second (cfs) and conveys water to the Pasadena area. There are five (5) service connections on the Upper Feeder to supply Pasadena and one (1) service connection to supply FMWD.

The Weymouth WTP can receive water from both SWP and CRA. SWP supplies come from Lake Silverwood and are sent to the plant via the Rialto Pipeline, which ranges in size from 96 to 120 inches in diameter with a design capacity of approximately 600 cfs.

CRA supplies come from Lake Mathews and are sent to the plant through the untreated portion of the Upper Feeder, which ranges in size from 116 to 152 inches in diameter and has a design capacity of 750 cfs. These two (2) sources may be blended prior to reaching Weymouth if SWP supplies are sent through the Etiwanda Pipeline, a 144-inch diameter pipeline that connects the Rialto Pipeline to the Upper Feeder. The Etiwanda Pipeline has a design capacity of 1,000 cfs.

The Live Oak Reservoir is located in the alignment of the Rialto Pipeline and is used for regulatory storage in the distribution system. It is an open-air reservoir with a capacity of 2,500 acre-ft (815 MG).

Foothill Municipal Water District

FMWD is a wholesale water district that provides water to an approximately 22-square-mile service area in Los Angeles County through eight (8) member agencies.

Four (4) of its member agencies were impacted by the Eaton Fire: KID, LFWC, LAWC, and RCLWA. FMWD's service area and the Eaton Fire perimeter are illustrated in Figure 3.4.12. It should be noted that ULRI analyzed facilities that provided water to fire-impacted areas only.

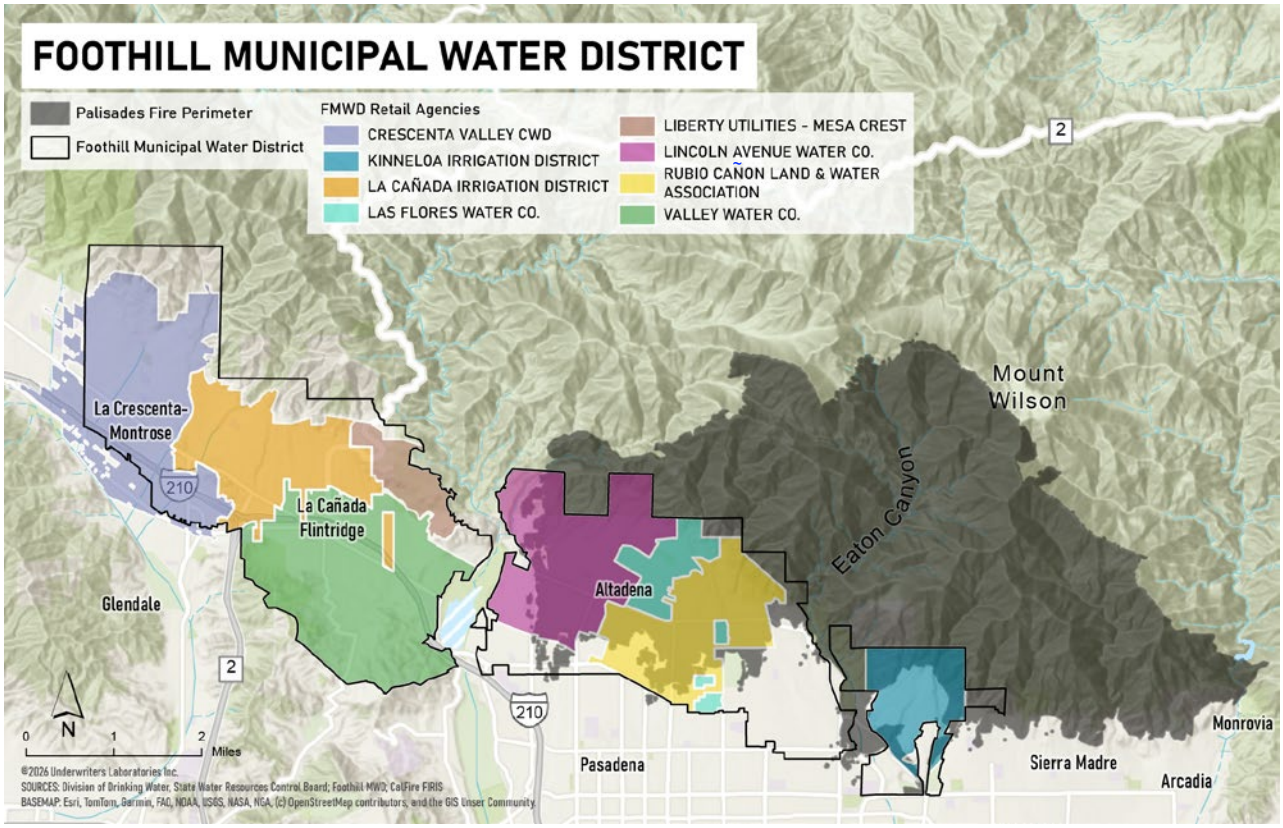


Figure 3.4.12 Foothill Municipal Water District's service area, delivered through eight (8) retail agencies, are shown relative to the Eaton Fire perimeter.

FMWD's distribution and storage facilities on the eastern portion of its service area include two (2) tanks — the Altadena Reservoirs — with 2.6 MG of storage (1.4 MG and 1.2 MG), a PS with five (5) pumps that can provide flow up to 24 cfs, and a 24-inch diameter pipeline from the PS to the storage tanks.

FMWD is a member agency of Metropolitan and takes delivery of treated water from Metropolitan's Upper Feeder pipeline at service connection FM-1, which has a design capacity of 40 cfs.

Water is then delivered through service connections to LAWC, LFWC, and RCLWA. There are no physical connections to KID, but it is set up to have connections installed in the future. These water connections are shown on the FMWD distribution system schematic diagram in Appendix Section 6.5.

Lincoln Avenue Water Company

LAWC is a private, non-profit water company owned entirely by the homeowners it serves. Prior to the January 2025 fires, LAWC served approximately 16,000 people through 4,500 service connections.

LAWC has three (3) sources of water supply: groundwater, imported water purchased from FMWD, and local surface water. Its primary source of water (84%) is groundwater produced from three (3) deep wells in the Monk Hill sub-basin of the Raymond Basin.

LAWC operates in a designated Superfund Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site and treats an extremely impaired groundwater source that has been contaminated with perchlorate and volatile organic chemicals.

Groundwater is treated at an ion exchange (perchlorate treatment) and a granular activated carbon filtration (volatile organic chemical treatment) plant prior to being introduced into the distribution system.

Imported water (4%) provided by FMWD is a blend of CRA and SWP water. Surface water (12%) is drawn from Millard Canyon, diverted to the North Coulter Reservoir, and then treated at the South Coulter Surface WTP.

The WTP uses conventional coagulation and filtration to treat the surface water. Treated water is then stored at South Coulter Reservoir before being introduced into the distribution system. This is a seasonal source of water, and production depends on rainfall. Once water is in the distribution system, LAWC has eight (8) chlorinators that maintain the chlorine residual.

In the distribution system, LAWC has 288,323 linear feet of distribution lines and 18,128 pumping lines. This is a total of 306,451 linear feet (58 miles). The system is serviced through seven (7) pressure zones with four (4) pumping stations. Wells No. 3, 5, and 6 provide capacities up to 900; 1,000; and 2,000 GPM, respectively.

The service area is bordered on the west by The Arroyo Seco, the east by Marengo Avenue, the south by Figueroa Street, and the north by the San Gabriel Mountains. The seven (7) pressure zones are illustrated in Figure 3.4.13 overlaid on the western portion of the Eaton Fire perimeter.

The distribution system contains 12 reservoirs and tanks that provide 10.5 MG of water storage (Table 3.4.6).

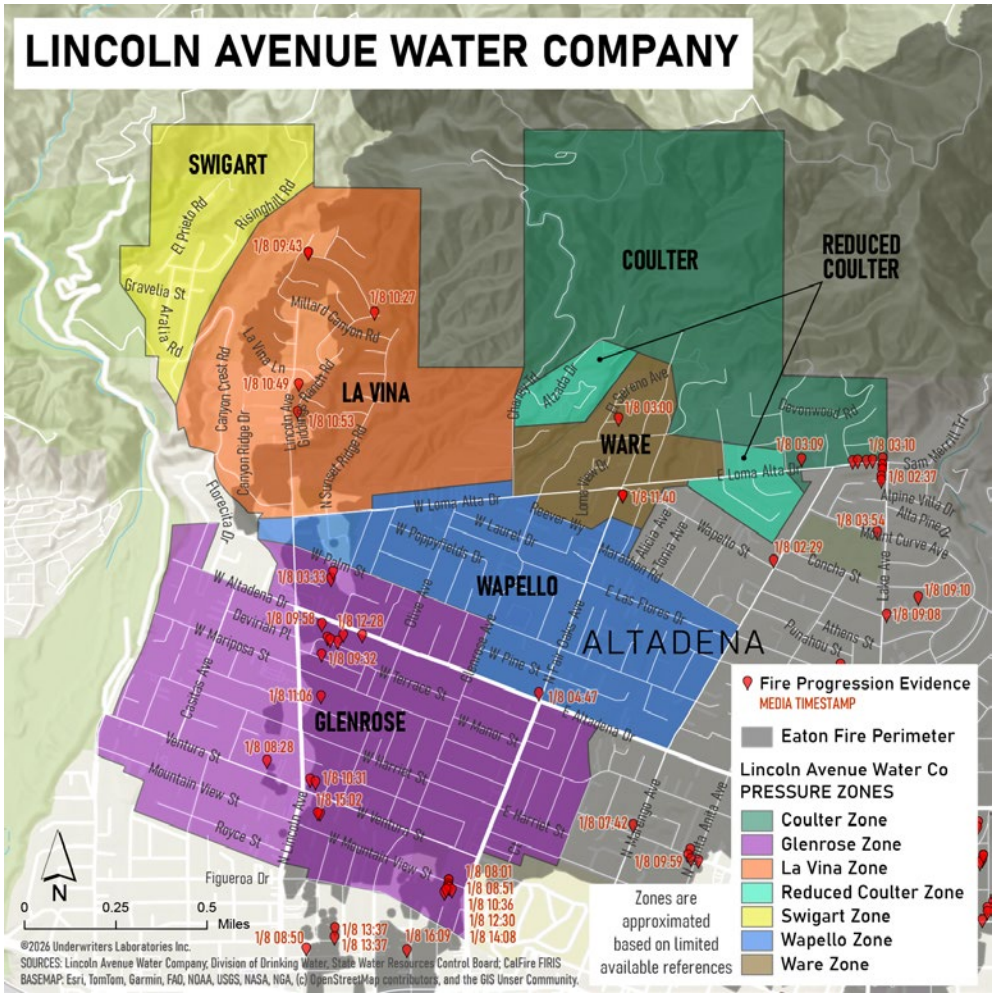


Figure 3.4.13 Lincoln Avenue Water Company pressure zones in relation to the Eaton Fire perimeter.

Table 3.4.6 Summary of Lincoln Avenue Water Company distribution system reservoirs and tanks.

Reservoir	Type	Pressure Zone / Facility Served	Capacity (gal)
North Glenrose	Concrete (below grade)	Glenrose Zone, Wapello Reservoir	1,800,000
South Glenrose	Concrete (below grade)	Glenrose Zone, Wapello Reservoir	2,720,000
Olive Avenue Sump	Concrete	Glenrose Zone	200,000
Wapello North	Concrete	Wapello Zone, Ware Reservoir, La Vina Reservoir, Swigart Reservoir	600,000
Wapello South	Concrete	Wapello Zone, Ware Reservoir, La Vina Reservoir, Swigart Reservoir	790,000
Ware	Concrete	Ware Zone, Coulter Reservoir	910,000
Coulter North	Concrete	South Coulter Reservoir	1,000,000
Coulter South	Concrete	Coulter Zone	1,000,000
Swigart	Concrete	Swigart Zone	482,000
La Vina East	Steel	La Vina Zone, Swigart Reservoir	500,000
La Vina West	Steel	La Vina Zone, Swigart Reservoir	500,000

Las Flores Water Company

LFWC is a mutual water company initially organized in 1885. The company's purpose is to develop, distribute, supply, and deliver water for domestic, municipal, and irrigation uses to its shareholders. There are currently over 1,400 shareholders, according to the LFWC website.

Prior to the January 2025 fires, the system served 1,478 connections. LFWC lost approximately 75% of its connections as a result of the fire. See Figure 3.4.14 for a map of LFWC's service area relative to the Eaton Fire perimeter.

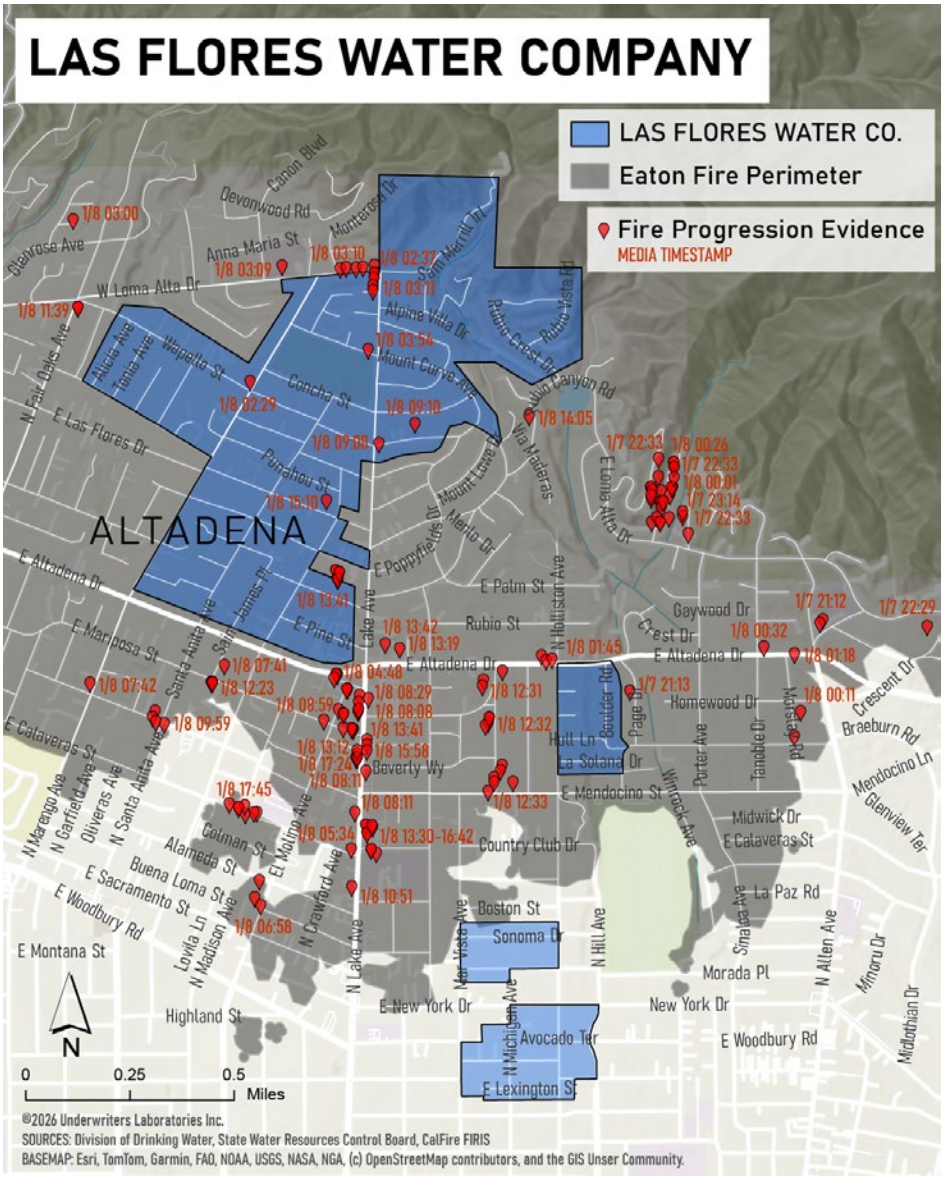


Figure 3.4.14 Las Flores Water Company service area in relation to the Eaton Fire perimeter.

The LFWC system is a manually operated drinking water pumping, storage, and distribution system consisting of three (3) pump stations, five (5) reservoirs, and one (1) inactive well. Under normal operating conditions, the drinking water distribution system is pressurized by gravity due to elevation differences.

The distribution system consists of pipe sizes ranging from four (4) to 12 inches in diameter. Most of the distribution system is comprised of four (4)-inch to eight (8)-inch diameter pipelines that distribute water to individual services. The 10-inch and 12-inch diameter pipelines are used for water transmission from the well or for transmission to reservoir storage.

Interconnections with LAWC and FMWD are also available to provide redundancy and system resilience. LAWC can supply approximately 1,000 GPM through a six (6)-inch connection that has an upstream pressure of 135 psi. The FMWD connection consists of one (1) two (2)-inch, one (1) four (4)-inch, and one (1) six (6)-inch diameter pressure regulating valves that reduce pressure down from 350 psi at the connection point.

The total storage capacity for the five (5) reservoirs in the Las Flores water system is 4.25 MG, and is summarized in Table 3.4.7.

Rubio Cañon Land and Water Association

RCLWA is a gravity-fed groundwater pumping, storage, and distribution system. This gravity-fed system consists of two (2) groundwater wells that serve four (4) pressure zones on the central and east side of Altadena.

Water is pumped from groundwater wells to a 0.5 MGD treatment plant where the water is treated and blended before going to storage at the reservoirs in the four (4) pressure zones — Calaveras, Maiden Lane, Cañon Reservoir, and Zane Grey (Figure 3.4.15).

Table 3.4.7 Types and capacities of Las Flores Water Company storage facilities.

Facility	Type	Capacity (MG)
Poppy Reservoir No. 1	Concrete with timber roof	0.25
Poppy Reservoir No. 2	Concrete with timber roof	0.5
Lake Avenue Reservoir (east)	Concrete with timber roof	1.0
Lake Avenue Reservoir (west)	Concrete with timber roof	1.0
Cobb Estate Tank	Steel	1.5

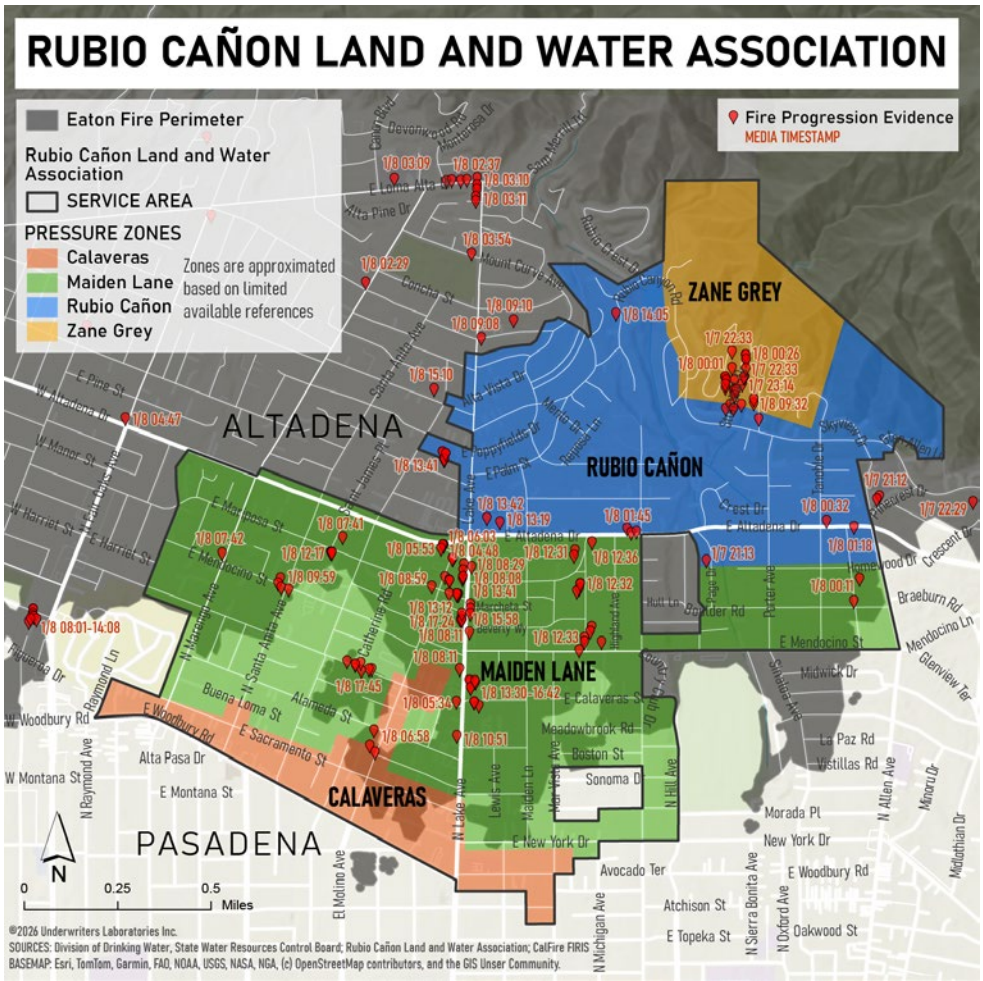


Figure 3.4.15 Rubio Cañon Land and Water Association pressure zones in relation to the Eaton Fire perimeter.

RCLWA is a member of FMWD and has an interconnection and mutual aid agreement with them for water supplies when needed. In the 12 years prior to the fire, RCLWA water deliveries from FMWD were only used for interconnection testing purposes. Additional interconnects exist with both the City of Pasadena and LFWC to send and receive water when needed.

Prior to the Eaton Fire, RCLWA served approximately 9,600 customers through 3,129 connections. Most of the connections are single-family homes, with some commercial connections. Due to the January 2025 fires, RCLWA lost about 37% of their service connections, leaving approximately 1,980 active service connections.

RCLWA obtains all water through a combination of groundwater production from the Monk Hill Subbasin of the Raymond Basin, treated surface water from Rubio Canyon, and imported water purchased from FMWD.

There are two (2) groundwater wells that produce water from the Raymond Basin. Each well's flow rate is dependent on the water table, but generally operates at 600 GPM. These wells operate as the primary source of drinking water for about half the year, typically during higher demand months (May through October), where the approximate water production is about 1,200 acre-feet (390 MG) per month, or until their water rights — a court-determined water allowance — have been exhausted.

For the other half of the year (lower-flow winter months), water is purchased from FMWD. Rubio Canyon surface water is produced through a well, the Rubio stream, and the Carter Tunnel. Groundwater pumped from the wells is sent to a 0.5 MGD treatment plant that operates at a maximum capacity of 240 GPM. Here, the groundwater is treated using conventional treatment, including pretreatment via chemical addition, coagulation/flocculation, sedimentation, filtration, and disinfection via chlorine.

Once water is treated, it feeds into the Maiden Lane pressure zone and fills three (3) reservoirs. From here, the water is fed by gravity to customers in the Maiden Lane pressure zone and the Calaveras pressure zone, which has two (2) reservoirs, and is pumped up to the Rubio Cañon Reservoir pressure zone using three (3) booster pumps that operate at a maximum of 600 GPM.

The Rubio Cañon Reservoir pressure zone gravity feeds customers in this zone and two (2) booster pumps, which pump water up to the Zane Grey pressure zone to fill two (2) steel tanks. Of the four (4) pressure zones, Maiden Lane is considered the heart of the system and has the highest demand, followed by Rubio Cañon Reservoir.

The distribution system is comprised of ductile iron pipes ranging from four (4) to 18 inches in diameter. RCLWA owns and operates eight (8) potable water storage reservoirs and tanks spread across the four (4) pressure zones in their service area (Table 3.4.8). In the Calaveras, Maiden Lane, and Rubio Cañon Reservoir pressure zones, all reservoirs are half in-ground concrete reservoirs, while the Zane Grey pressure zone has steel tanks. In total, the storage capacity of RCLWA is approximately 7.8 MG.

Table 3.4.8 Rubio Cañon Land and Water Association storage details, including capacity and construction type of each reservoir and tank.

Reservoir	Capacity (gal)	Pressure Zone	Area Served	Construction Type
Calaveras 1	506,000	Calaveras	South	Concrete
Calaveras 2	506,000			
Maiden Lane 1	614,000	Maiden Lane	Middle	Concrete
Maiden Lane 2	944,000			
Maiden Lane 3	1,770,000			
Rubio Cañon	3,420,000	Rubio Cañon	North	Concrete
Zane Grey 1	25,000	Zane Grey	North	Steel
Zane Grey 2	25,000			

City of Pasadena Water and Power

Information about PWP was obtained from publicly available resources, including the *2020 Water System and Resources Plan*[60] prepared for PWP. ULRI staff were not able to schedule meetings with PWP to discuss the Eaton Fire response in detail.

The PWP service area is approximately 26 square miles and includes portions of Altadena and unincorporated Los Angeles County. Nearly 170,000 people reside in its service territory. PWP's service area is illustrated in Figure 3.4.16.

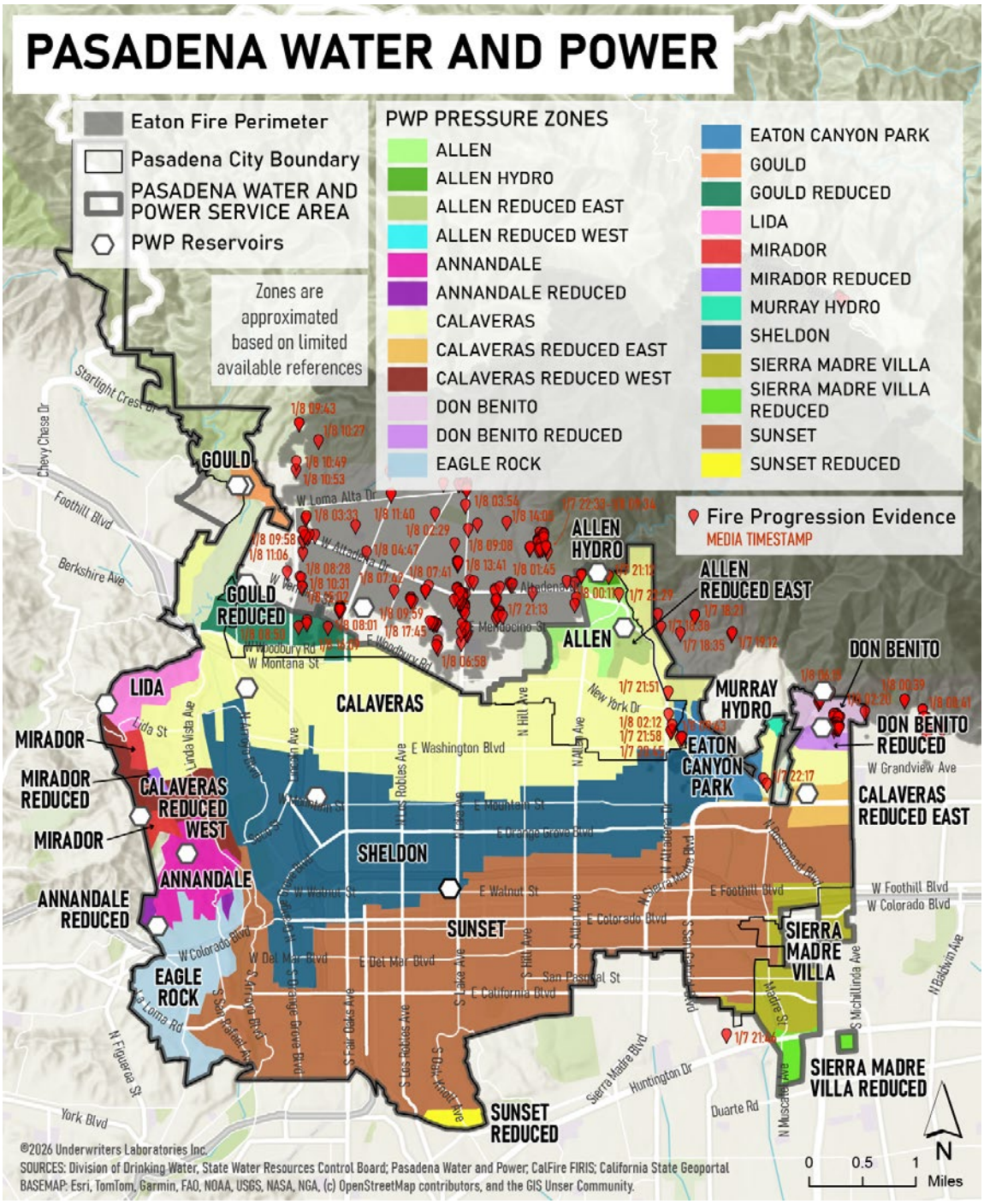


Figure 3.4.16 City of Pasadena Water and Power service area shown relative to the Eaton Fire perimeter.

PWP's distribution system consists of 510 miles of pipelines up to 42 inches in diameter, 14 storage reservoirs with a combined capacity of 110 MG (plus additional emergency storage of two (2) MG through partial ownership of FMWD and Valley water tanks), 19 booster pumping stations, nine (9) active groundwater wells, 27 interconnections with other agencies (plus five (5) imported water connections to Metropolitan's Upper Feeder), 30 pressure regulating stations, WTPs, and two (2) hydro-pneumatic tanks.

A schematic representation of the system is included in Figure 6.5.6 in Appendix Section 6.5.3.

The system pressure zone delineation with the approximate location of the fire footprint in the PWP service area is shown in Figure 3.4.16. The fire impacted seven (7) areas in the northern portion of the service area: Gould Reduced, Calaveras, Allen, Allen Reduced West, Sheldon, Eaton Canyon Park, and Don Benito pressure zones.

Gould and Gould Reduced Zones

The Gould Reduced pressure zone is fed through a PRV station from the Gould pressure zone to operate at a 1,365 ft hydraulic grade, and does not have storage to supplement flow from the PRV station. The PRV station contains two (2) eight (8)-inch and two (2) six (6)-inch diameter valves set to operate at pressures ranging between 40 and 55 psi.

The Gould pressure zone is fed by the Arroyo booster, consisting of two (2) pumps, with 320 GPM and 750 GPM capacity, to lift water to the Gould West Tank and Gould East Tank. These tanks are each 1.5 MG in capacity and have a high water level (HWL) of 1,434 ft. Therefore, three (3) MG of storage and 1,070 GPM design pumping capacity is available to the Gould and Gould Reduced zones.

Calaveras Zone

The Calaveras pressure zone spans nearly the width of the service area. There are three (3) reservoirs that control the hydraulics in the zone: the 10 MG Calaveras Reservoir at a HWL of 1,209 ft; the 4.22 MG Santa Anita Reservoir at HWL 1,207 ft; and the 1.4 MG Thomas Reservoir at HWL 1,200 ft. A fourth reservoir, the 4.75 MG Windsor Reservoir, is used as a forebay for a booster station and sits at HWL 1,154 ft. The Calaveras zone has 15.6 MG of storage that can supply the zone by gravity, with an additional 4.75 MG that can be pumped into the area.

The Glorietta, Jones, Wilson, Atlanta, and Linda Vista booster stations supply the Calaveras zone. The Glorietta booster consists of two (2) pumps with design capacities of 3,600 GPM and 4,250 GPM; the Jones booster has two (2) pumps with design capacities of 1,800 GPM and 1,600 GPM; the Wilson booster has three (3) pumps with design capacities of 2,200 GPM each; and the Atlanta booster has two (2) pumps with design capacities of 2,900 GPM and 4,800 GPM.

The Linda Vista booster has one (1) pump with a design capacity of 2,250 GPM that moves water from the P-03 Metropolitan connection into the Calaveras zone; however, it was noted during TDs that the connection was not supplying water during the fire. At the time of the Eaton Fire, assuming all other booster pumps were available, the Calaveras zone had a design pumping capacity of 25,550 GPM for firefighting efforts.

Allen and Allen Reduced West Zones

Storage for the Allen and Allen Reduced West zones (and the Allen Reduced East zone) is provided by the 4.1 MG Allen Reservoir at a HWL elevation of 1,480 ft. A PRV reduces the hydraulic grade to 1,300 ft for the Allen Reduced West zone. The Santa Anita booster station pumps water from the Calaveras zone to the Allen Reservoir.

The pump station contains two (2) pump units, with a design capacity of 2,200 GPM for each pump. Four (4) PRVs reduce head from the Allen to the Allen Reduced West (or Allen 1) zone. A six (6)-inch diameter valve located at Altadena Drive is set to 47 psi, a four (4)-inch diameter valve at the Santa Anita Reservoir is set to 42 psi, and two (2) valves located at Allen and Meadowbrook one (1) six (6)-inch and one (1) two (2)-inch are set to 56 psi and 46 psi.

Sheldon Zone

The Sheldon pressure zone is located directly south of the Calaveras zone and also covers most of the service area along the east-west axis. It borders the Eaton Canyon area that was impacted by the fire. Two (2) reservoirs — the 6.73 MG Sheldon 1 Reservoir and the 5.1 MG Sheldon 2 Reservoir — provide a total of 11.83 MG of storage for the zone at a HWL of 1,050 ft.

The Glorietta, Jones, Wilson, and Craig booster stations pump water into the Sheldon zone. The Glorietta booster has one (1) 3,600 GPM capacity pump; the Jones booster has two (2) pumps with design capacities of 2,200 GPM and 1,000 GPM; the Wilson booster has two (2) pumps with a design capacity of 4,500 GPM each; and the Craig booster contains two (2) 1,000 GPM design capacity pumps. The total design pumping capacity into the Sheldon zone is 17,800 GPM with all units available.

There are two (2) PRV stations that reduce pressure from the Calaveras zone to the Sheldon zone. The PRV station located at Bradley Street and New York Drive contains three (3) valves: two (2) eight (8)- or six (6)-inch diameter and one (1) four (4)-inch diameter with pressure settings between 65 and 75 psi. The PRV station at Belford Avenue north of Washington Boulevard contains one (1) six (6)-inch valve.

Don Benito Zone

A total storage volume of 1.4 MG is provided by two (2) 0.7 MG tanks used for both the Don Benito and Don Benito Reduced pressure zones and are set at a HWL of 1,432 ft. The Thomas booster station pumps water from the Calaveras zone to the Don Benito tanks. The booster station consists of one (1) 650 GPM pump and one (1) 560 GPM pump for a total capacity of 1,210 GPM.

Kinneloa Irrigation District

KID was formed in 1953 and is a California Special District serving a small area in the central part of Los Angeles County. The service area encompasses approximately 900 acres, with 460 acres of developed land and 440 acres of undeveloped watershed area north of the developed portion. The service area is bordered by the City of Pasadena and the Angeles National Forest.

Prior to the January 2025 fires, the system had approximately 600 connections. Most of the connections are single-family homes, with some commercial customers. KID lost about 8.3% of their service connections in the Eaton Fire, leaving approximately 550 active service connections. The KID service area is shown in relation to the Eaton Fire perimeter in Figure 3.4.17.

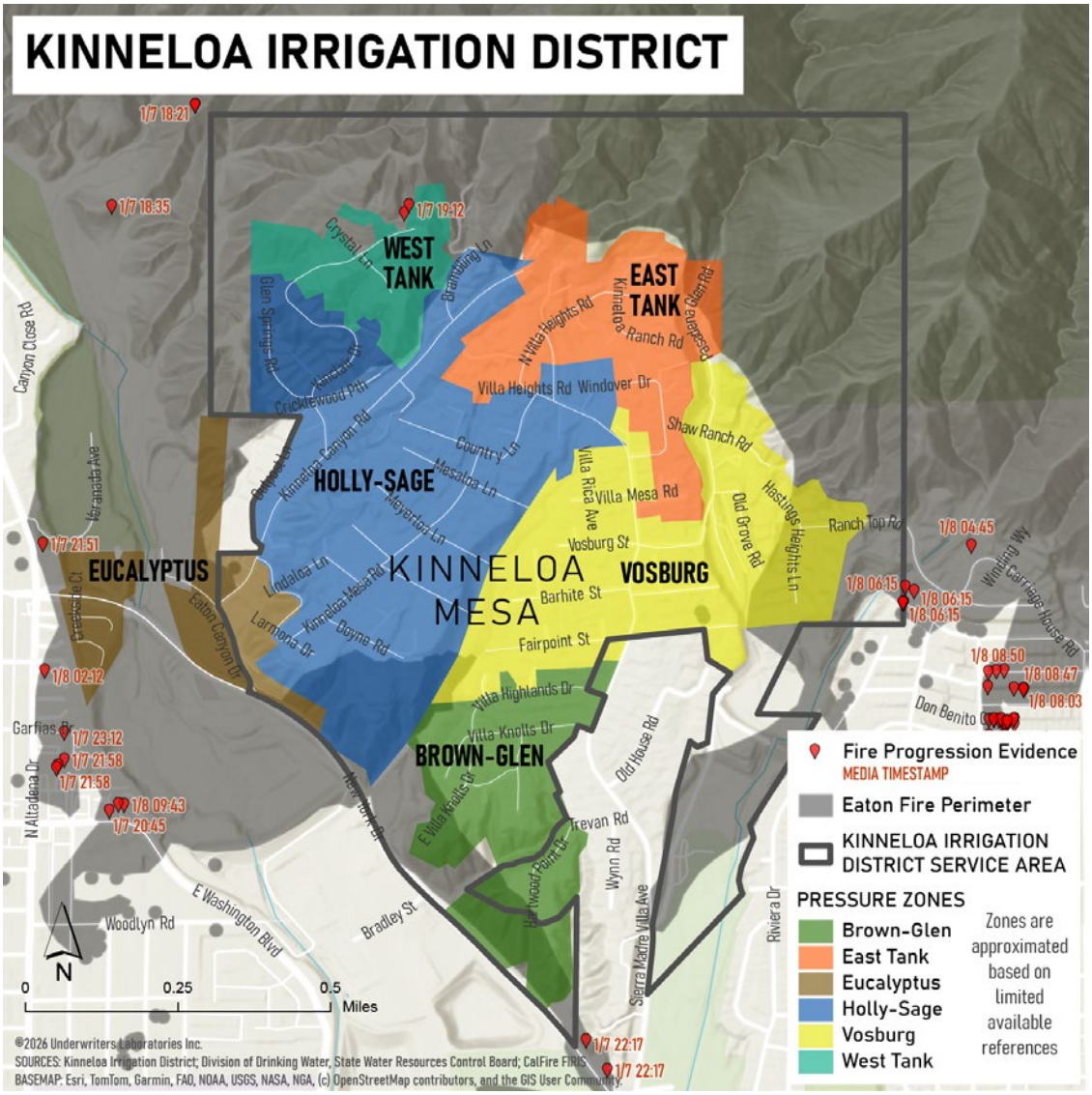


Figure 3.4.17 Kinneloa Irrigation District service area is shown in relation to the Eaton Fire perimeter.

The KID system services six (6) pressure zones (covering approximately 460 acres) in north-central Los Angeles County. This system consists of two (2) groundwater wells, five (5) groundwater tunnels, five (5) booster pump and treatment stations, and 10 potable water storage tanks and reservoirs that provide approximately four (4) million gallons in storage.

There are seven (7) interconnections with PWP for mutual emergency usage. To provide an average daily demand of 0.54 MGD, water is pumped from the groundwater wells to fill the lowest pressure zone reservoirs. Water is then pumped from the lowest pressure zone to higher pressure zones for distribution by gravity.

KID obtains all water through a combination of groundwater production through its adjudication rights in the Raymond Basin and through groundwater tunnels that access groundwater in the mountain formations surrounding the district. Additionally, KID is a member agency of FMWD, however, there are no physical pipelines or interconnections with FMWD, so KID has never received water from them.

KID treats its produced water via blending and disinfection using chlorination. KID blends water from three (3) of its groundwater tunnels to reduce fluoride concentrations below the maximum contaminant level of 2.0 mg/L. For disinfection, there are a total of seven (7) treatment facilities across the system (one (1) at each well or tunnel site).

At these facilities, produced water is disinfected with either low-strength (0.8%) on-site generated sodium hypochlorite or commercially purchased 12.5% sodium hypochlorite solution. In both cases, chlorine is injected into the system via a metering pump to maintain a residual of 0.5 mg/L at all times.

The distribution system contains approximately 17.3 miles of pipelines ranging in diameter from 1.5 to 16 inches. Pipeline materials include unlined steel, asbestos cement, polyvinyl chloride (PVC), and ductile iron. Approximately 25% of the pipelines are under six (6)-inch diameter and limit available fire flows.

There are a total of seven (7) interconnects. Three (3) allow KID to receive water from Pasadena, while the remaining four (4) allow Pasadena to receive water from KID (Table 3.4.9). The interconnections range in size from two (2)-inch to six (6)-inch diameter.

KID operates five (5) booster pumping stations (Table 3.4.10). Individual pumps range in design capacity from 300 - 500 GPM.

Table 3.4.9 Summary of the interconnection facilities between Kinneloa Irrigation District and Pasadena Water and Power. Reproduced from the Kinneloa Irrigation District Water System Evaluation and Capital Improvement Plan (2024).

Connection	Size (inches)	Capacity (GPM)	Delivering Entity	Delivering Pressure Zone	Receiving Entity	Receiving Pressure Zone
Outpost-West	4	800	PWP	Calaveras	KID	Eucalyptus
Outpost-East	4	800	KID	Eucalyptus	PWP	Sheldon
Ranch Top	8	1200	KID	Vosburg	PWP	Don Benito
Ranch Top	8	1200	PWP	Don Benito	KID	Vosburg
Fairpoint	6	800	KID	Vosburg	PWP	Murray
Fairpoint	2	200	KID	Vosburg	PWP	Calaveras
Wilcox	6	Unknown	PWP	Sheldon	KID	Wilcox Reservoir

Table 3.4.10 Summary of Kinneloa Irrigation District pump stations, including capacity, supply zone, and discharge zone. Reproduced from the Kinneloa Irrigation District Water System Evaluation and Capital Improvement Plan (2024).

Facility	Pump Design Capacity (GPM)	Supply Zone	Discharge Zone
Eucalyptus Booster 1	350	Eucalyptus	Holly-Sage
Eucalyptus Booster 2	375	Eucalyptus	Holly-Sage
Eucalyptus Booster 3	375	Eucalyptus	Holly-Sage
Sage Booster 1	400	Holly-Sage	East Tank/West Tank
Sage Booster 2	400	Holly-Sage	East Tank/West Tank
Wilcox Booster 1	500	N/A	Brown-Glen
Wilcox Booster 2	300	N/A	Brown-Glen
Glen Booster	400	Brown-Glen	Vosburg
Vosburg Booster 1	300	Vosburg	East Tank/West Tank
Vosburg Booster 2	300	Vosburg	East Tank/West Tank
Vosburg Booster 3	300	Vosburg	East Tank/West Tank

KID owns and operates 10 potable water storage tanks spread across the six (6) pressure zones in their service area (Table 3.4.11). All reservoirs are covered, screened, and are either entirely above ground (welded steel) or partially below grade (concrete). The levels in the tanks control the system operating pressures in each specific pressure zone served by the storage reservoir. In total, the storage reservoirs provide approximately four (4) million gallons of storage capacity.

3.4.11 Summary of Kinneloa Irrigation District storage reservoirs, capacities, and construction types. Reproduced from the Kinneloa Irrigation District Water System Evaluation and Capital Improvement Plan (2024).

Reservoir	Capacity (gal)	HWL (ft)	Pressure Zone	Area Served	Construction Type
Eucalyptus	185,000	1,125	Eucalyptus	West	Concrete
Sage	225,000	1,457	Holly-Sage	West	Steel
Holly (East)	150,000	1,460	Holly-Sage	West	Steel
Holly (West)	150,000	1,460	Holly-Sage	West	Steel
West	500,000	1,634	East Tank/West Tank	Both	Steel
Wilcox	1,125,000	940	None	East	Concrete
Brown	125,000	1,265	Brown-Glen	East	Concrete
Glen	125,000	1,265	Brown-Glen	East	Concrete
Vosburg	1,250,000	1,437	Vosburg	East	Concrete
East	150,000	1,637	East Tank/West Tank	Both	Steel

City of Sierra Madre Water Department

The City of Sierra Madre is an urban water supplier with approximately 3,800 service connections serving a population of approximately 11,000 people. The City of Sierra Madre obtains source water from both groundwater and surface water. The city's primary source of supply is groundwater from the East Raymond Basin.

The city operates a granulated activated carbon water treatment facility to ensure compliance with all water quality regulations.

The city receives its water supply from the following primary sources: Wells No. 3, 4, and 5, which are in the City Corporation Yard, and Well No. 6, which is located in the adjacent Sierra Madre Park. The city also receives groundwater flows from two (2) horizontal tunnels located at the base of Sierra Madre Dam. The tunnel flow goes into a collection chamber, then directly by gravity into the city's water system.

The Santa Anita Creek Diversion Pipeline diverts streamflow in the creek directly into the city's Spreading Grounds complex below Grandview Avenue.

There are two (2) major booster PSs in the water system: the Main Booster PS, which is located at the City Yard and is comprised of four (4) pumps (three (3) of which are currently in service), and the Mira Monte Booster PS, which is located at the Mira Monte Reservoir complex and is comprised of five (5) pumps.

There are eight (8) reservoirs in the city's water system for a total capacity of 7.8 MG (Table 3.4.12). The city's water distribution system is comprised of 47.6 miles of pipelines, ranging in size from two (2) to 18 inches in diameter.

Pipeline materials include steel, asbestos cement, cast iron, concrete lined and coated, and ductile iron. Installation dates range from 1924 to 2017. A large majority of the pipelines are over 70 years old.

3.4.12 Types and capacities of City of Sierra Madre Water Department reservoirs.

Reservoir	Capacity (MG)	Material
Auburn #1	0.75	Concrete
Auburn #2	1.40	Steel
Carter #1 & 2	0.02	Steel
Grove	2.80	Concrete
Mira Monte #1	0.75	Steel
Mira Monte #2	1.70	Steel
Main Settling Basin	0.40	Concrete
Total	7.80	

The water system has a total of nine (9) Pressure Regulating Stations (Table 3.4.13). There are three (3) located between Pressure Zones 1 and 2, four (4) located between Pressure Zones 2 and 3, and two (2) located between Pressure Zone 3 and smaller subzones.

3.4.13 City of Sierra Madre Water Department pressure regulating stations.

PRV Location	From Zone	To Zone	Number and Size of Valves
N. Michillinda & Mariposa	2	1	1 - 3" 1 - 4"
N. Baldwin & E. Laurel	2	1	1 - 3"
N. Baldwin & E. Highland	2	1	1 - 6"
Woodland Dr.	3	2	1 - 2" 1 - 4"
Santa Anita & Arno	3	2	2 - 6"
Acacia	3	2	2 - 6"
Carter & Mira Monte	3	2	1 - 10"
Brookside	3	3B	1 - 2" 1 - 6"
Holly Trail & Alta Vista	3	3C	1 - 2"

The city has existing system interconnections with the cities of Arcadia and Pasadena at two (2) locations: Sierra Madre Boulevard west of Claridge Street and Sierra Madre Boulevard at Michillinda Avenue. There is also an emergency interconnection to Metropolitan on Grandview Avenue west of Oak View Lane.

3.4.2.3 Palisades and Eaton Fire Events and the Water System

The California State Water Resources Control Board Division of Drinking Water provides emergency response plan guidance[61] for public drinking water systems that serve more than 3,300 people. Public water utilities with 10,000 or more service connections (approximately 33,000 people) are required to review and revise their disaster preparedness plans with related agencies, including fire departments, though a required interval for these reviews is not specified.

Water utilities strive to have the maximum amount of water available to meet potential emergency demands. Each utility implements a specific operating plan tailored to its system and staffing. As such, individual preparation varies according to system design, need, and capability.

In anticipation of unusual weather conditions and during times of high fire risk, such as Red Flag Warnings, water utilities prepare for potential high water demand in accordance with these individual plans. Utilities also prepare for possible power shut-offs by filling all tanks and having backup generators on site to provide emergency power.

In preparation for the January 2025 fires, all in-service water storage systems were filled to capacity, according to onsite interviews with responsive utilities. In addition, water utilities that had backup power supply generators reported to ULRI that they were ready for service at the time of the fire.

All utilities that met with ULRI confirmed that operations staff were either on-call or mobilized for emergency operations during the lead up to the fire, coordinated with adjacent utilities to activate system interconnections, if needed, and maintained contact with first responders to stay informed of developing conditions.

3.4.2.3.1 Water Utility Response to the Palisades Fire

Metropolitan

By the evening of January 7, 2025, Metropolitan had established its Emergency Operations Center (EOC) and mobilized staff at key locations, such as the Los Angeles County EOC, the CAL FIRE Incident Management Team (IMT) at the Rose Bowl, and the Palisades Fire Incident Command Post (ICP). Details of operational changes are included in Appendix Section 6.5.

A major priority of Metropolitan was the protection and continued operation of the Sepulveda Canyon Pressure Control Structure (PCS).

The Palisades Fire came within approximately one (1) mile west of the Sepulveda PCS — a critical water infrastructure facility that regulates water pressure along the Sepulveda Feeder pipeline. Metropolitan staff worked to maintain an on-site presence at the facility to monitor conditions and continue operations. Vegetation was also cleared for defensible space around the PCS, while the facility's perimeter was wetted for additional fire protection. The PCS was powered by emergency generation from January 10-12, 2025.

LADWP

LADWP tankers (tractor-drawn) and water trucks were made available to LAFD during the duration of the Palisades Fire. These vehicles hold between 2,000 and 4,500 gallons of water and were placed under the direction of LAFD for assignment during the fire.

Open-air system reservoirs were made available for aerial equipment access until approximately 19:15 on January 7, 2025, when they were grounded due to high and erratic winds.

The initial request for LADWP water tenders by LAFD came through the EOC at 22:00 on January 7, 2025. LADWP responded by staffing 23 trucks. Drivers came from their homes (from many different areas) to the Sun Valley facility and other locations to retrieve their assigned tender, do a safety check, fuel up, and then respond to the incident. This process took several hours. Arrival times into the Palisades Fire operational area are unknown.

Six (6) 4,500-gallon potable water trucks were positioned along PCH to allow fire apparatus to be filled. At 00:00 January 8, 2025, an LADWP fleet manager called rental companies to secure more water tenders. These additional tenders arrived on scene around 14:00 on January 8, 2025.

Additionally, LADWP crews shut off water services at nearly 4,800 locations where water was freely flowing to help increase system pressure and reduce loss of the remaining water supply.

Crews also attempted to connect high-elevation pressure zones to increase water availability by installing an additional valve, but were ultimately unable to complete the work as they had to evacuate the area due to fire progression into their location.

LACWWD-29

Prior to the Palisades fire, all storage facilities within LACWWD-29 were filled to their HWL. The system relied on backup generators for operations once power was lost.

As with other areas during the Palisades and Eaton Fires, PVC service lines melted as structures were destroyed, causing pressure to drop throughout the system. LACWWD-29 staff worked to shut off water services at these locations to maintain pressure in the system.

Flow in the main coastal transmission line was increased in an attempt to provide additional water supply and increase system pressure to fire hydrants. The increased water deliveries measured at the WB-26 service connection are shown in Appendix Section 6.5.

LACWWD-29 staff reported any access issues at water system facilities and coordinated closely with the fire department to resolve them. Communications remained active via cellular phones, satellite phones, and radios. Crews operated on 12-hour shifts to provide continuous support.

Water system interconnections — physical tie-ins joining independent water supplies or distribution networks to enhance system-wide redundancy, drought resilience, and emergency backup — were used to supplement water supplies in the areas that were impacted by the Palisades Fire.

LVMWD

ULRI staff were unable to schedule meetings with LVMWD to discuss its response to the Palisades Fire. The information related to LVMWD fire response was obtained from a LVMWD Board briefing provided on January 14, 2025.

The briefing stated that prior to the fire incident, staff had prepared the system by topping off tanks and mobilizing backup power generators. The Westlake Filtration Plant was in full operation, ensuring the ability to provide water to the system. Staff noted challenges with the Cornell PS pumps and resolved them early during the emergency.

There were challenges in keeping tank levels up at the Saddle Peak Tank, which was the closest major facility to the fire front. Several emergency generators were deployed prior to, and during the fire, with two (2) generators coming from Bakersfield. Staff electricians and instrumentation personnel worked continuously to hook up and move generators to necessary locations, while working in shifts to refuel the generators.

Mandatory evacuations began on the ocean side of Saddle Peak at 13:02 on January 7, 2025. LVMWD activated its EOC around 06:30 on January 8, 2025. Staff worked with the IC's Branch and Division leadership to coordinate their activities.

The fire reached Saddle Peak on the morning of January 8, 2025 (Figure 3.4.18). Downed power lines and utility poles on the ocean side of Saddle Peak made access to the area difficult (Figure 3.4.19).

Figure 3.4.18 Palisades Fire shown at the top of Saddle Peak at Stunt Road Lookout, January 8, 2025. Source: LVMWD Board Presentation January 14, 2025.

Figure 3.4.19 Downed utility poles near Saddle Peak. Source: LVMWD Board Presentation January 14, 2025.

Approximately 106 homes were confirmed destroyed on the ocean side of Saddle Peak. The destroyed homes posed a challenge to maintain water storage levels as the water services to those homes were destroyed and free flowing (Figure 3.4.20) until crews could shut them off.

Figure 3.4.20 Free flowing water services near Saddle Peak. Source: LVMWD Board Presentation January 14, 2025.

3.4.2.3.2 Water System Response to the Palisades Fire

Water utilities establish pressure zones to safely manage pressure variations caused by changes in ground elevations. These zones help prevent structures at low elevations from experiencing dangerously high water pressure, while ensuring structures at high elevations have strong water flow.

By grouping areas of similar elevation, the utility can design a water system with a uniform set of pressure standards, minimizing the risk of system failure or disruption. Zones use storage tanks, water towers, PRVs, and booster pump stations to isolate areas and balance the pressure dynamically.

There are nine (9) water pressure zones in the Pacific Palisades area. The response of these pressure zones as the fire moved through the Pacific Palisades on January 7, 2025, varied, depending on whether the zone had storage tanks, the distance from main supply pipelines, the loss of power to pump stations, the number of pressure regulating valves used, and how much area in the zone was impacted by the fire perimeter.

1137 Pressure Zone

The 1137 pressure zone extends from Rustic Canyon on the east to Santa Ynez Canyon on the west, generally north of Sunset Boulevard, as shown in Figure 3.4.21. The zone is fed by the Marquez Knolls Pump Station, which pumps water from the Westgate Trunk Line to the Marquez Knolls Tank.

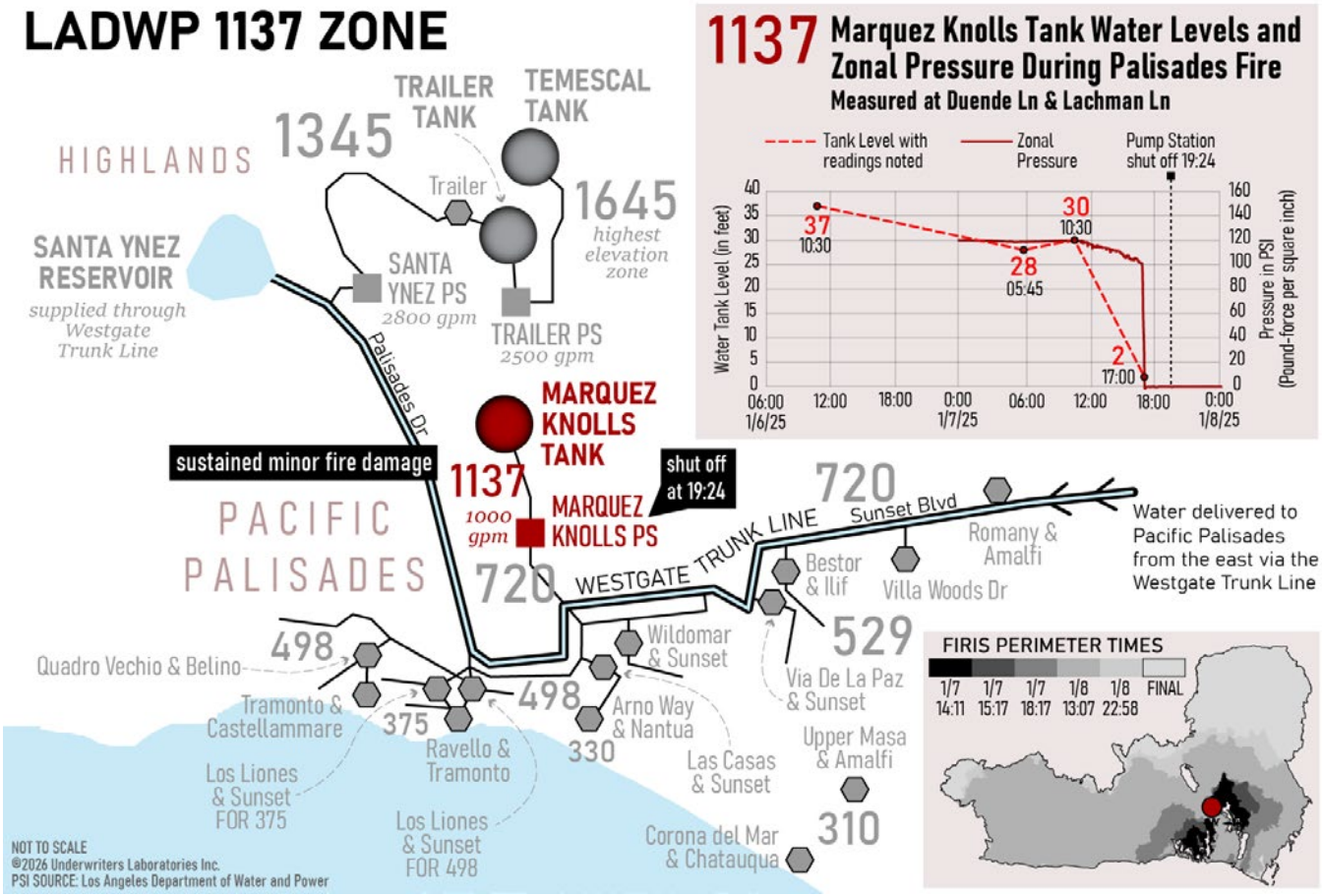


Figure 3.4.21 Los Angeles Department of Water and Power 1137 pressure zone with change in water storage levels in Marquez Knolls Tank and pressure measured near Lachman Lane and Duende Lane. Map insert displays pressure zone location and FIRIS perimeters.

The 1137 zone was the first high-elevation water system impacted during the fire, as shown by Fire Integrated Real-Time Intelligence System (FIRIS) fire perimeters. These perimeters are derived from aircraft-mounted infrared sensors that detect heat signatures, which are then validated by human operators and distributed to Incident Commanders (IC) via web-based maps. For additional details on FIRIS perimeters, please see Section 3.10.

On January 6, 2025, tank levels in the Marquez Knolls Tank were high, up to 37 ft of water at 10:30. Water levels declined over the day to a low of 28 ft at 05:45 on January 7, 2025, following normal usage patterns.

The tank was refilled to 30 ft using pumps by 10:30, when the fire was reported. Water levels declined to two (2) ft at 17:00, as water was used for firefighting efforts and water flowed freely from some destroyed structures, depleting all storage in the zone.

With declining storage levels in the Marquez Knolls Tank, pressure sagged across the zone. Over the course of the day on January 7, 2025, pressure, as measured by recordings at the intersection of Lachman Lane and Duende Lane, declined from 120 psi at the beginning of the day to 0 psi at 16:56. Tank levels and 1137 zone pressure are illustrated in Figure 3.4.22.

The Marquez Knolls PS continued to pump and supply water to the 1137 zone until it shut down at 19:24 due to low suction pressure. The 1,000 GPM capacity pump station was able to continue to supply water because it could access higher gradient supplies from the 720 zone supply line. There was likely some water available for firefighting in the immediate vicinity of the pump station until it shut down.

Staff indicated that three (3) hydrants were being used for firefighting at 13:45 on January 7, 2025.

By 16:00, peak flow due to high demand in the zone reached 4,300 GPM, outstripping the ability of the pump station to meet demands.

At 18:59, a dry hydrant was reported on Glenhaven Drive.

Minor damage to the Marquez Knolls Tank site was observed in the initial damage assessment. Fire scorching occurred near the base of the tank, as well as to approximately 100 ft of block wall and trees on the site. Security fencing was also damaged and a vertical crack was noted in the block wall.

1645 Pressure Zone

The 1645 pressure zone, highlighted in Figure 3.4.22, is the highest elevation zone in the Pacific Palisades and is nearest to the fire's area of origin which is just south of the Temescal Tank near Skull Rock. It is located near Topanga State Park, with Santa Ynez Canyon to the west and Temescal Canyon to the east.

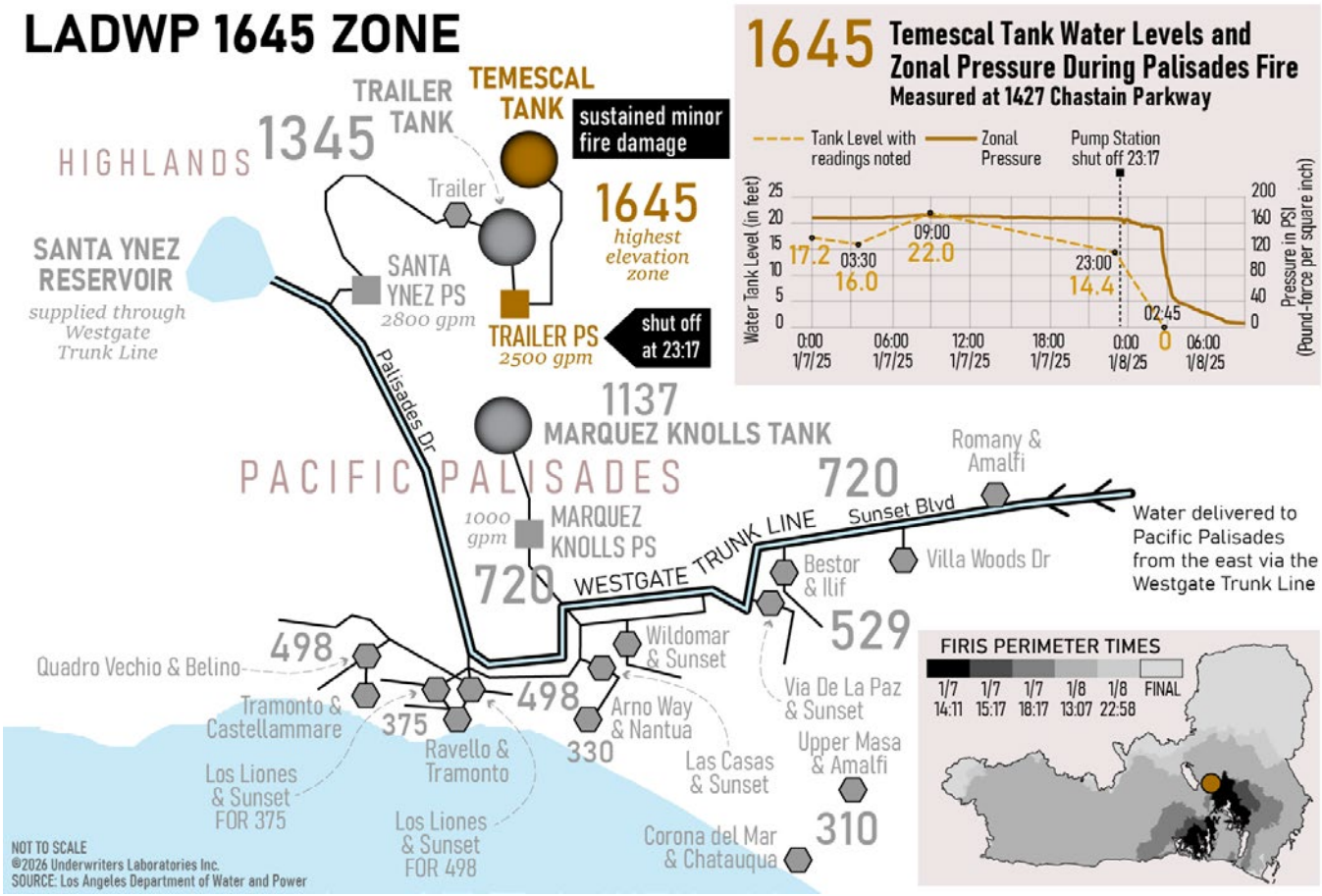


Figure 3.4.22 Los Angeles Department of Water and Power 1645 pressure zone with change in water storage levels in Temescal Tank and pressure measured on Chastain Parkway. Map insert displays pressure zone location and FIRIS perimeters.

The Trailer Pump Station, a 2,500-GPM-capacity facility, delivers water to the Temescal Tank. Water levels in the Temescal Tank began at 17.2 ft at 00:00 on January 7, 2025.

Levels declined in the early hours of January 7, 2025, to 16.0 ft at 03:30, then climbed to the daily high level of 22.0 ft at 09:00.

Storage levels then continued to recede throughout the day, reaching 14.4 ft at 23:00 before a precipitous decline to 0 ft at 02:45 on January 8, 2025.

Distribution system pressure in the 1645 zone is measured by a recorder on Chastain Parkway in a lower elevation area of the zone. Recorded pressure on January 7, 2025, remained in a 160-170 psi range throughout the day, which is normal for this area.

On January 8, 2025, pressures began to lessen, from 164 psi at 00:00 to 99 psi as the Temescal Tank ran dry at 02:45. Pressures reached 0 psi at 14:20, as water drained out of the distribution system while multiple homes burned leaving damaged and destroyed water lines that allowed the free flow of water. Tank water levels and system pressure are shown in Figure 3.4.23.

The Trailer PS remained on for most of the day on January 7, 2025. Staff reported it shutting off due to low suction pressure at 23:17 on January 7, 2025. Following the PS shutdown, tank levels rapidly depleted.

Staff reported that system demand around midnight on January 7, 2025, was approximately 4,000 GPM, meaning that the PS would not have been able to keep up with the required firefighting demand even if it was in-service and would have required supplementation from storage.

The Temescal Tank site had minor damage from the fire. Valve vault vents, chemical injection hoses, and a security camera tripod leg sustained damage and were recommended to be replaced in the initial damage assessment.

1345 Pressure Zone

The 1345 pressure zone is located along the Santa Ynez Canyon and is fed by the SYPS, which boosts water to the Trailer Tank (Figure 3.4.23).

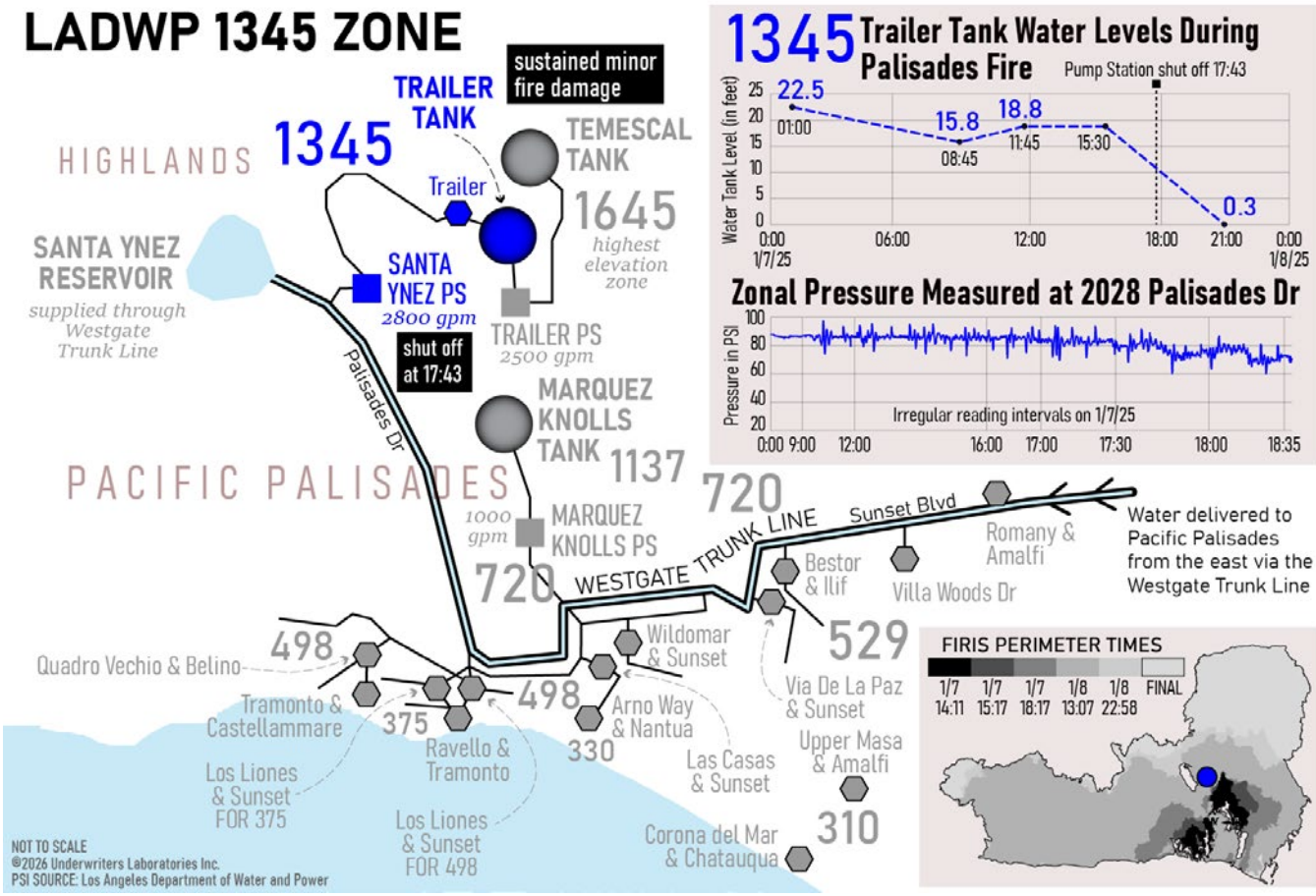


Figure 3.4.23 Los Angeles Department of Water and Power 1345 pressure zone with change in water storage levels in Trailer Tank and pressure measured near the eastern section of Palisades Drive. Map insert displays pressure zone location and FIRIS perimeters.

On January 7, 2025, water levels in the Trailer Tank were at their highest point of 22.5 ft at 01:00. Tank levels decreased to 15.8 ft at 08:45, then refilled to 18.8 ft at 11:45, where they stayed relatively steady until approximately 15:30.

The fluctuations in tank volume correlate to higher demand periods when residents were experiencing normal use, as well as potentially wetting down their properties due to the expected fire weather conditions.

A rapid decline in storage then occurred, with the Trailer Tank emptying at 21:00, when it reached its lowest recorded level and depleted all storage in the pressure zone. Water pressure data was measured near the eastern edge of the zone on Palisades Drive, and was available at irregular intervals until the final reading of 71 psi at 19:24 on January 7, 2025.

When readings were available, pressure remained above 60 psi at all times. Tank levels and pressure readings are shown in Figure 3.4.24.

The SYPS has a capacity of 2,800 GPM and was supplied through the 36-inch diameter Westgate Trunk Line in the 720 zone. Suction pressure at the pump station went below the 10 psi shutoff setting as water demand spiked, and the pump station automatically shut off around 17:40 on January 7, 2025.

Staff estimated demands in the zone at 3,500 GPM, outstripping the ability of the pump station to supply all of the water needed for firefighting. Once the pump station shut off, the rapid use of all storage in the Trailer Tank occurred.

The Trailer Tank site sustained minor damage. The exposed irrigation system, security fencing, fence support columns, and site landscaping were damaged. The pump station site had minor damage from the fire. The initial inspection revealed damage to a pump motor exhaust vent and damage to an exterior security camera.

The SYR site also sustained damage from the fire. The initial inspection reported damage to the following:

- A steel storage container had exterior burns
- Sample analyzer holding tanks were melted
- A sewer line had burned coating
- The electrical communications room structure was burned through and equipment inside was damaged
- A two (2)-inch diameter analyzer drain line was burned through
- A gate valve and fittings had melted gaskets causing leakage
- Hillside vegetation was scarred

720 Pressure Zone

The 720 pressure zone, shown in Figure 3.4.24, is located north of Sunset Boulevard and stretches from Rustic Canyon in the east to the city boundary to the west. Hydraulics in the zone are set by the SYR (when in operation) and the Romany & Amalfi pressure regulating station on the Westgate Trunk Line.

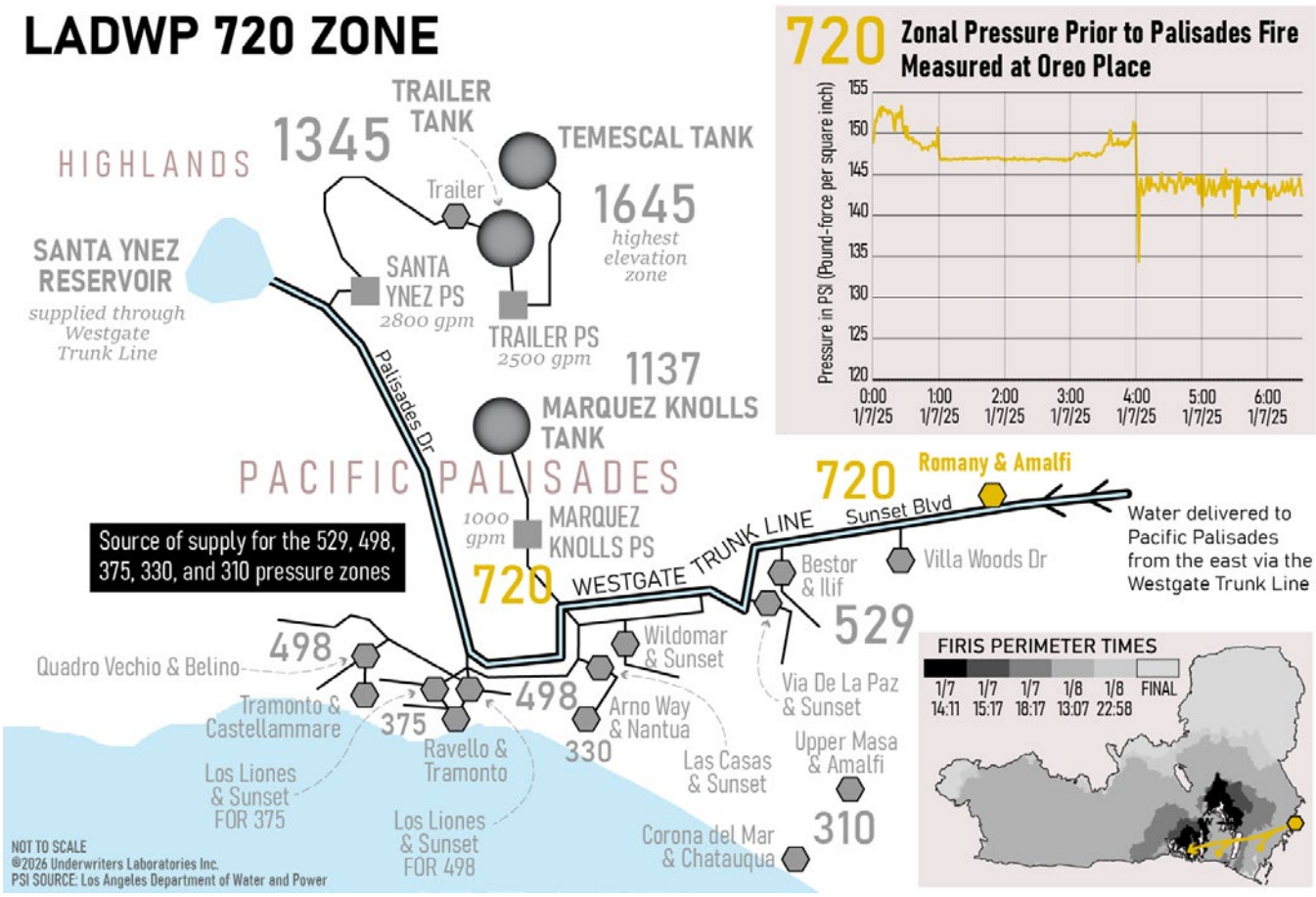


Figure 3.4.24 Los Angeles Department of Water and Power 720 pressure zone with change in pressure measured on Oreo Lane near the middle of the zone. Map insert displays pressure zone location and FIRIS perimeters.

On January 7, 2025, all water deliveries were coming through the pressure regulating station, as the reservoir was out of service for repairs to its floating cover. The Romany & Amalfi station consists of three (3) regulators: one (1) 12-inch diameter and two (2) eight (8)-inch diameter.

All zones south of the Westgate Trunk Line, including the 720 zone, do not have water storage; water is supplied through PRVs. Pressure readings for January 7, 2025, were available from 00:00 to 06:31 and were taken on Oreo Place, located in the middle of the 720 zone.

During this time frame, pressure within the zone remained high and ranged between approximately 135 and 155 psi, as shown in Figure 3.4.25. These early pressure readings confirm water was available to the system prior to ignition of the fire at 10:30.

Staff reported that the Westgate Trunk Line delivered up to 37,000 GPM peak flow during the fire. This flow rate is more than double the 18,000 GPM rate to maintain 20 psi in the system, which is required for firefighting operations.

The available pressure readings did not capture the extreme flow and consequent pressure loss, as this flow occurred after the last reading at 06:31. As pressure drops below 20 psi, there is insufficient pressure to maintain flow to fire hydrants in the area. Because the 720 zone is also the source of supply for the 529, 498, 375, 330, and 310 pressure zones, pressure to these lower zones was also reduced during the fire.

The reported water supply available for firefighting in pressure zone 720 varied by time and location. As hydrant pressure diminished, some crews reportedly shifted to alternative sources and shuttle operations, including the use of pools, static water-tender refill points, and a low-pressure hydrant used to refill engine tanks and support protection of the fire station.

529 Pressure Zone

The 529 pressure zone, shown in Figure 3.4.25, is located in the Huntington Palisades neighborhood. It borders the coast near Will Rogers State Beach in Santa Monica to the east and Temescal Canyon to the west.

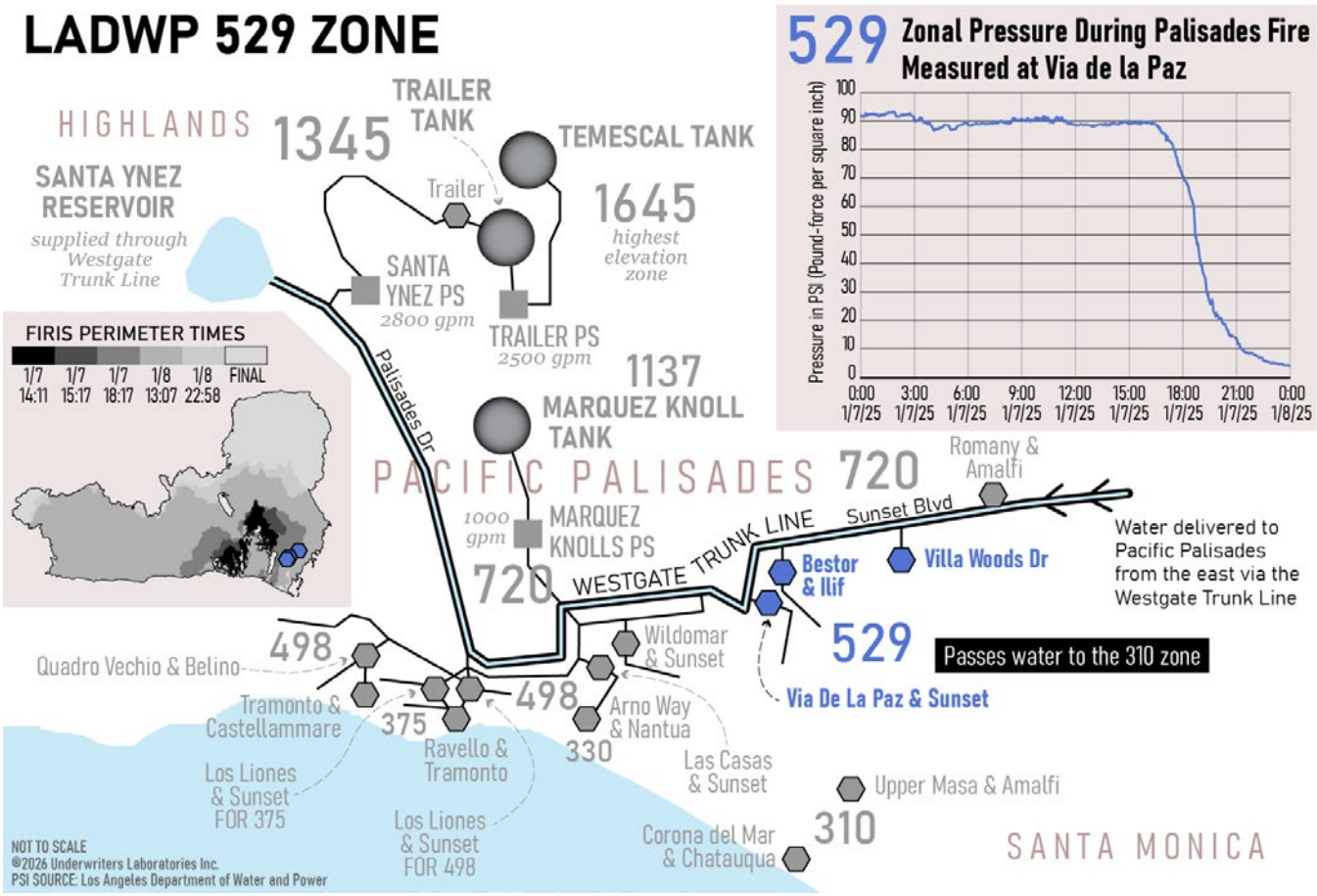


Figure 3.4.25 Los Angeles Department of Water and Power 529 pressure zone with change in pressure measured on Via de la Paz near the western side of the zone. Map insert displays pressure zone location and FIRIS fire perimeters.

The zone is fed by three (3) pressure regulating stations that reduce pressure from the 720 zone. These PRVs are connected to the Westgate Trunk Line as their supply source. The 529 zone does not have any storage available to supplement the flow from the PRVs.

The three (3) regulating stations are the Via de la Paz & Sunset station, the Bestor & Ilif station, and the Villa Woods Drive station. The Via de la Paz & Sunset station consists of three (3) regulators: two (2) six (6)-inch diameter and one (1) two (2)-inch diameter.

The Bestor & Ilif station consists of three (3) regulators: two (2) eight (8)-inch diameter and one (1) four (4)-inch diameter. The Via Woods Drive station consists of two (2) regulators: one (1) six (6)-inch diameter and one (1) two (2)-inch diameter.

Pressure readings for January 7, 2025, were on Via de la Paz, located on the western side of the 529 zone. Over the course of the day, pressure within the zone remained near 90 psi until 16:45, when pressure began a steady decline from 87 psi to 20 psi at 20:11 and approximately four (4) psi at 23:59.

The pressure drop reveals that the heaviest water use occurred late in the day, as many structures in the Alphabet Streets were fully involved with fire. This resulted in damaged water distribution components and free-flowing water, which dropped the pressure significantly in many parts of the larger system. Once pressure dropped below 20 psi, there was insufficient pressure at fire hydrants for firefighting supply.

498 Pressure Zone

The 498 pressure zone, shown in Figure 3.4.26, is bordered by Temescal Canyon on the east, the city boundary on the west, and just north of the coast. It is fed by four (4) pressure regulating stations: two (2) west of Palisades Drive with pressure measured on Bellino Street and two (2) east of Palisades Drive with pressure measured at Bienveneda Avenue.

It also passes water through to the 375 and 330 pressure zones along the coast. The zone does not have any storage available to supplement the flow from the PRVs.

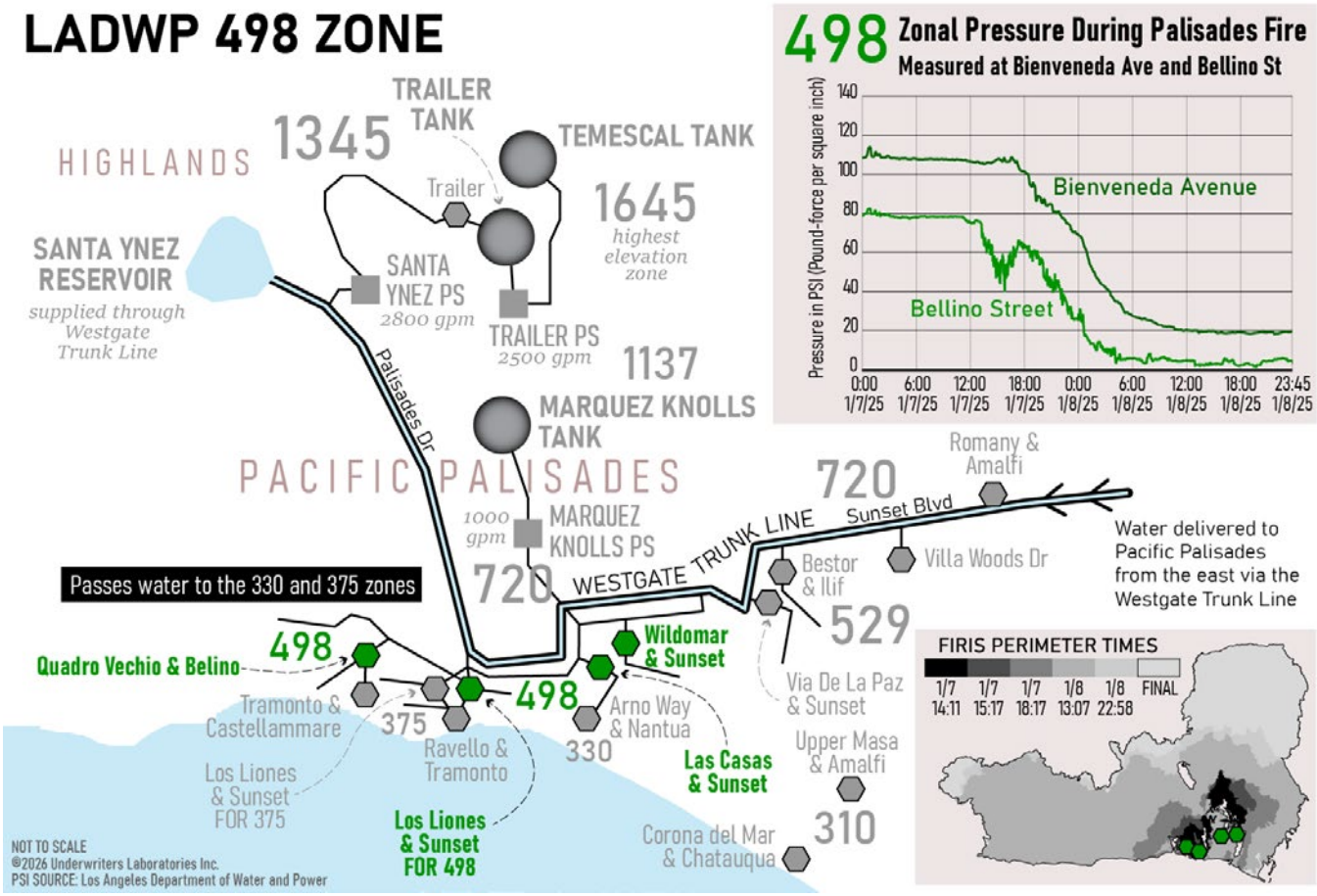


Figure 3.4.26 Los Angeles Department of Water and Power 498 pressure zone with change in pressure measured on Bienveneda Avenue and Bellino Street. Map insert displays pressure zone location and FIRIS fire perimeters.

The PRVs west of Palisades Drive are the Quadro Vechio & Belino station, consisting of one (1) eight (8)-inch diameter and one (1) four (4)-inch diameter valve, and the Los Liones & Sunset station, also consisting of one (1) eight (8)-inch diameter and one (1) four (4)-inch diameter valve.

Pressures at the Bellino Street location hovered around 80 psi at the start of January 7, 2025, and generally remained above 75 psi until 13:11, when they declined to approximately 40 psi at 15:47. Pressure recovered to approximately 66 psi at 17:20, then steadily declined over the rest of the day and into January 8, 2025. Readings indicate pressure fell below 20 psi at 0:33 on January 8, 2025, and stayed below 10 psi starting at 04:00 and for the remainder of the day.

This timeframe corresponds to active fire in the area and catastrophic losses to structures, and the resulting loss of pressure due to damaged and destroyed water lines that allowed free flow of water.

The PRVs east of Palisades Drive are the Las Casas & Sunset station, consisting of one (1) six (6)-inch and one (1) two (2)-inch diameter valves, and the Wildomar & Sunset station, also consisting of one (1)-6 inch and one (1) two (2)-inch diameter valves. Pressures on the east side of Palisades Drive were higher than the western readings.

Pressures at Bienveneda Avenue reached 114 psi by 0:52 on January 7, 2025, and generally stayed above 105 psi until 17:00, when they began a steady decline to 20 psi at 12:00 on January 8, 2025. System pressure then ranged between 18-20 psi over the entire day on January 8, 2025.

This area was also impacted by fire suppression demand and some damaged water distribution lines caused by burning structures, however, this portion of the zone was able to maintain pressure near the minimum required for fire hydrants to flow water.

375 Pressure Zone

The 375 pressure zone, shown in Figure 3.4.27, is located along PCH. It extends from the intersection of Sunset Boulevard and Marquez Avenue to the east to the city boundary on the west.

The zone is supplied by three (3) pressure regulating stations. The PRV stations are:

- Tramonto & Castellammare station, consisting of one (1) four (4)-inch and one (1) two (2)-inch diameter valves
- Los Liones & Sunset station, consisting of one (1) eight (8)-inch, one (1)-6 inch and one (1)-4 inch diameter valves
- Revello & Tramonto station, consisting of one (1)-6 inch and one (1) two (2)-inch valves

The 375 zone does not have any storage available to supplement the flow from the PRVs.

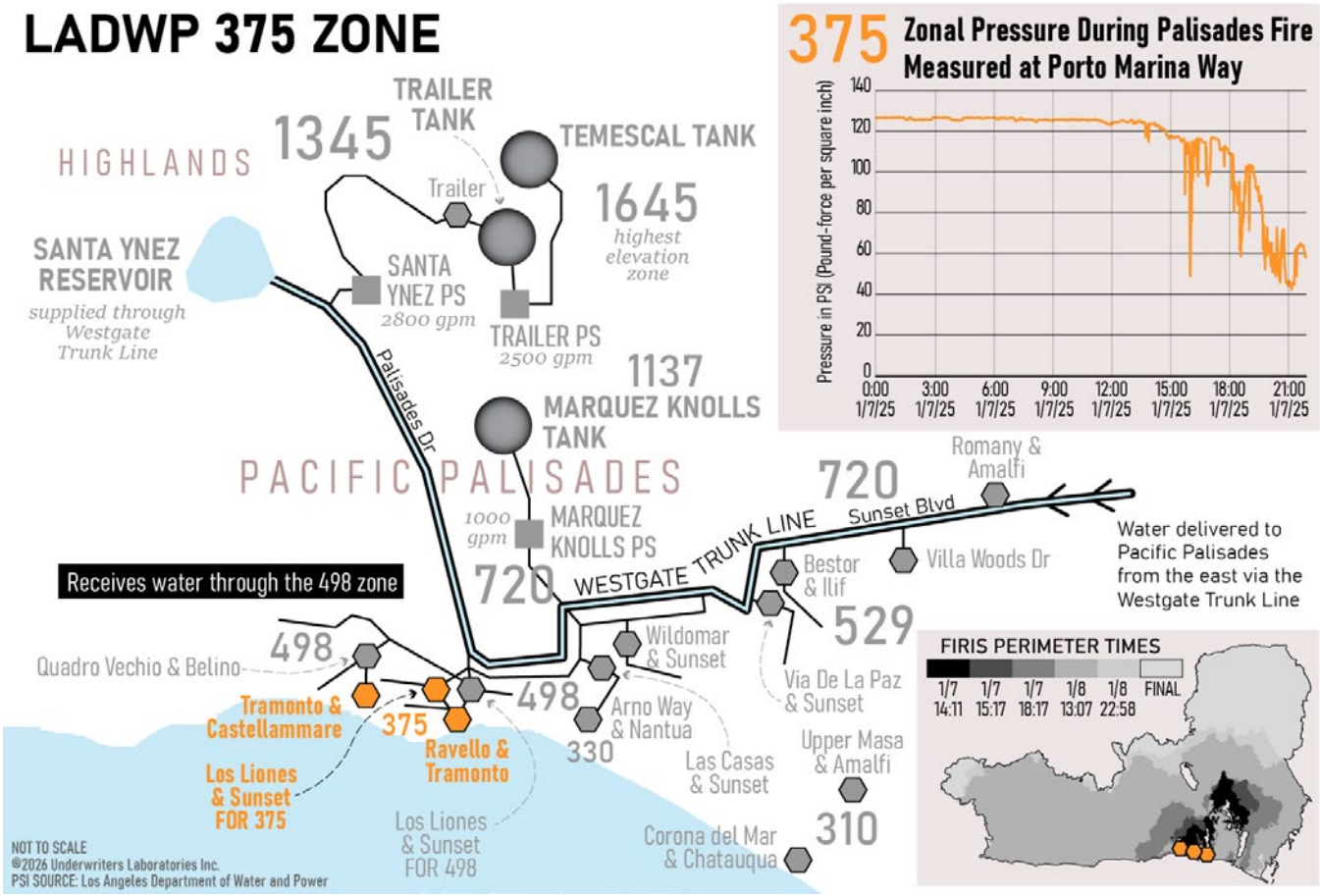


Figure 3.4.27 Los Angeles Department of Water and Power 375 pressure zone with change in pressure measured on Porto Marina Way. Map insert displays pressure zone location and FIRIS fire perimeters.

Pressure for this zone is recorded near the coast at Porto Marina Way in the western half of the zone. System pressure was high at the beginning of the day on January 7, 2025, with an initial reading of approximately 126 psi at 0:00. Pressure began a protracted descent at 14:45 when readings decreased to approximately 119 psi, and continued lower.

There was a downward spike from 114 psi to 48 psi from 15:55 to 15:59. Another large downward spike occurred with pressure decreasing from 107 psi at 18:10 to 61 psi at 18:30. Pressure recovered to 103 psi at 19:09, then lessened to the daily low of 42 psi at 21:08.

The last reading of the day on January 7, 2025, was approximately 58 psi recorded at 21:53. Up to this time, the system was able to maintain adequate pressure for the fire hydrants in the 375 zone likely due to the relatively lower number of destroyed structures within the zone, as well as the location and elevation of the zone in relation to other zones that experienced loss.

330 Pressure Zone

The 330 pressure zone, highlighted in Figure 3.4.28, serves a small area along PCH, from the intersection of Sunset Boulevard and Marquez Avenue on the west to approximately Tahiti Avenue on the east. The zone is fed by the Arno Way & Nantua PRV station, which receives water through the 498 zone.

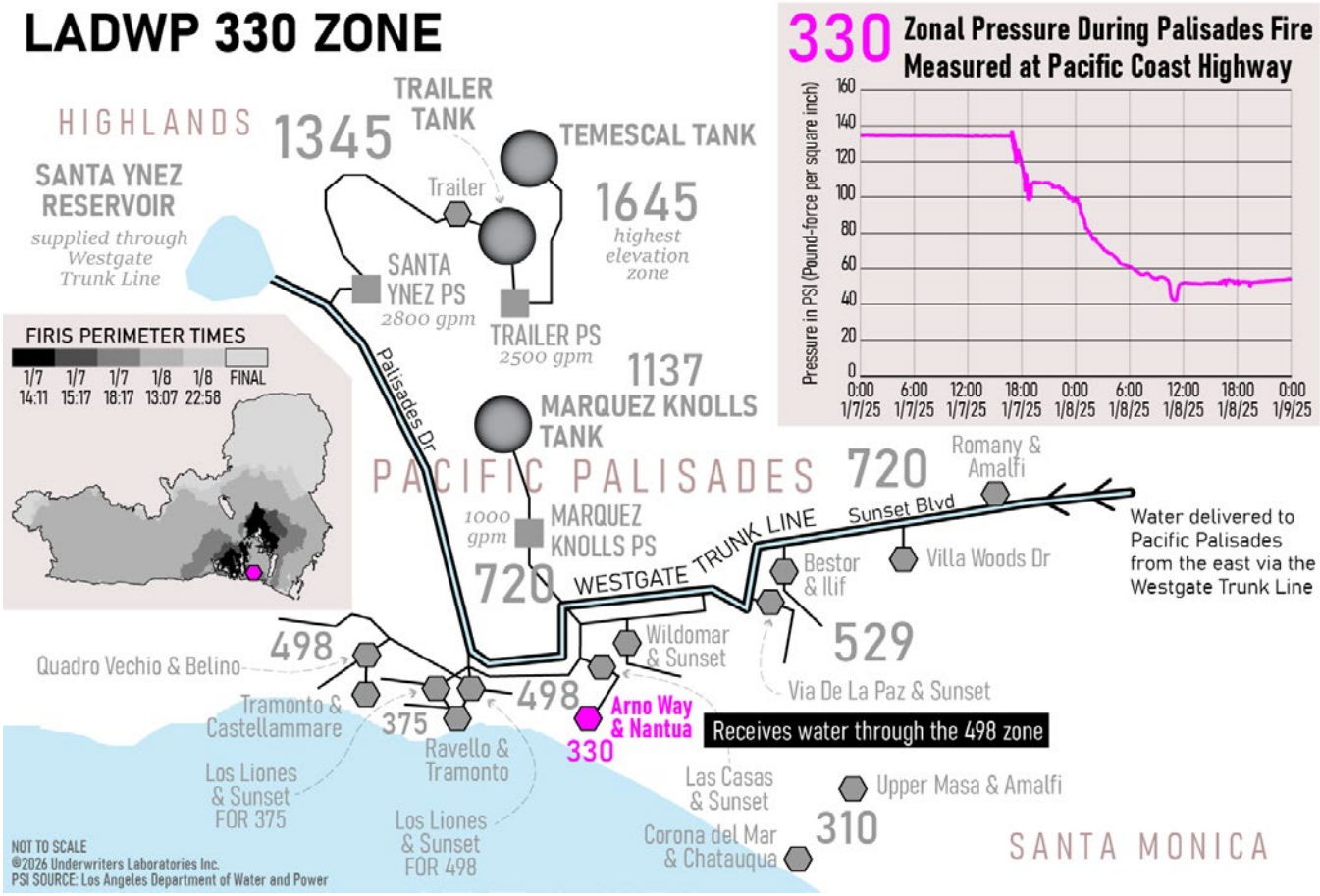


Figure 3.4.28 Los Angeles Department of Water and Power 330 pressure zone with change in pressure measured on Pacific Coast Highway. Map insert displays pressure zone location and FIRIS fire perimeters.

The station contains two (2) valves: one (1) six (6)-inch diameter and one (1) two (2)-inch diameter. The zone does not have any storage available to supplement the flow from the PRVs. System pressure is recorded on PCH at the approximate midpoint of the zone.

Recordings indicate steady readings of about 134 psi from 0:00 to 16:49. Pressure peaked at approximately 138 psi at 16:53 and declined to 98 psi at 18:40. Pressure recovered to about 108 psi from 19:08 to 21:03, then declined overnight to a low of approximately 42 psi at 11:06 on January 8, 2025.

Pressure rose to 52 psi at 11:58 and remained fairly constant for the remainder of January 8, 2025, ending the day at approximately 54 psi at 23:59. Pressure readings indicate the 330 zone pressures exceeded the minimum 20 psi needed at fire hydrants.

310 Pressure Zone

The 310 Zone, shown in Figure 3.4.29, is located along the coast, southeast of Will Rogers State Beach. It borders Santa Monica to the east and Toyopa Drive to the west, along the eastern edge of the fire. The zone is supplied by two (2) PRV stations, located at Corona del Mar & Chautauqua and Upper Masa & Amalfi.

These stations receive water from the 529 zone and reduce pressure to the 310 zone. The 310 zone does not have any storage available to supplement the flow from the PRVs. Pressure recording occurs at North Mesa Road in the middle of the zone but recordings were available only in irregular intervals during the Palisades Fire.

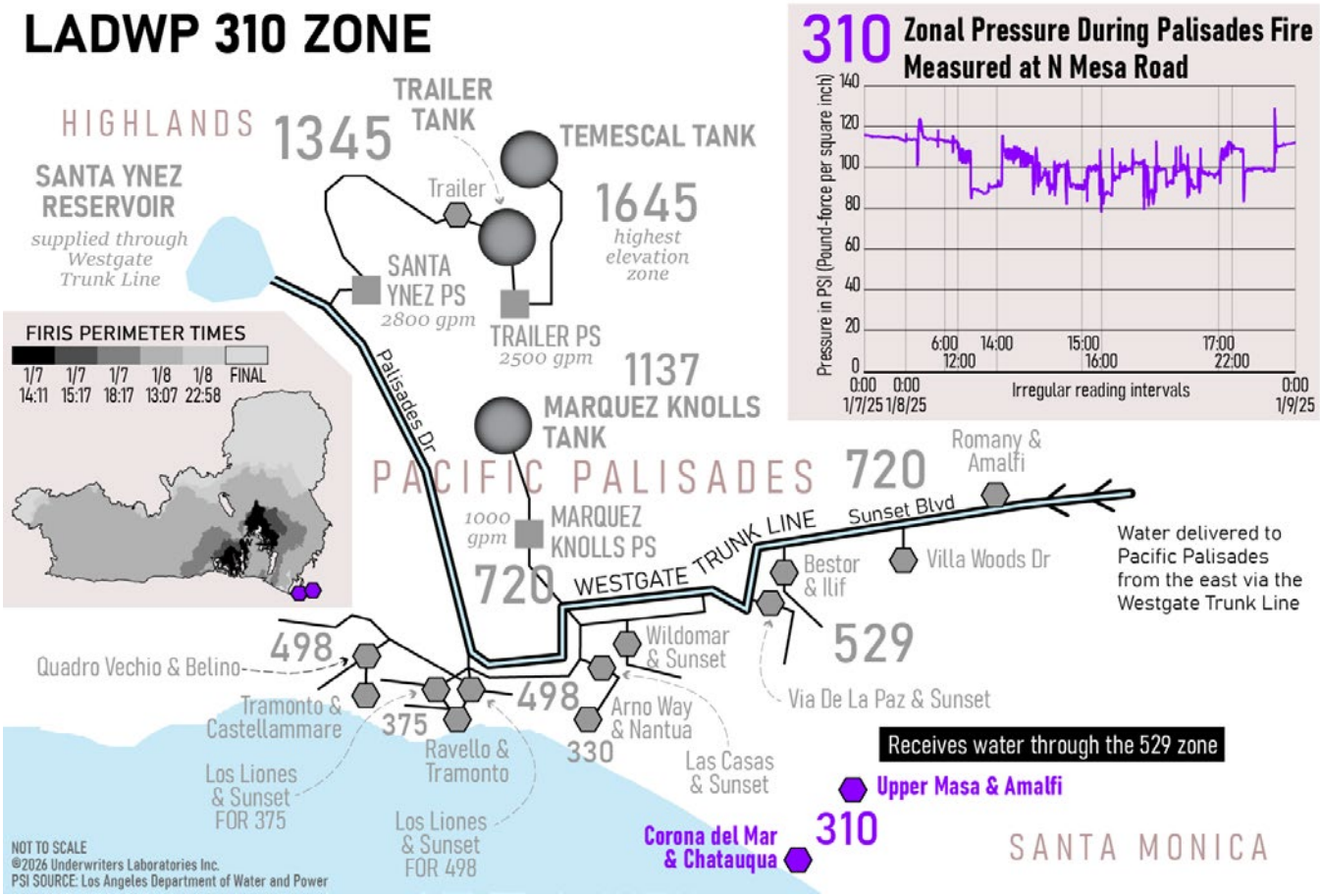


Figure 3.4.29 Los Angeles Department of Water and Power 310 pressure zone.

On January 7, 2025, pressures in the 310 zone held steady between 113-116 psi at available reading intervals. Pressure was highly variable on January 8, 2025, presumably due to firefighting efforts that day.

The fire did not damage as many structures in this zone as in others. The pressure fluctuated between 120 psi to 80 psi, starting midnight on January 7, 2025, to midnight on January 9, 2025. The low of the day was 78 psi at 16:00. Fire hydrants within the zone likely had sufficient pressure and flow on both January 7, 2025, and January 8, 2025, based on these high-pressure readings.

3.4.2.3.3 Water Utility Response to the Eaton Fire

Fire impacted FMWD agencies and PWP at different times and intensities. Figure 3.4.30 shows approximate fire progression ovals where high confidence data indicate the fire's presence throughout a span of time as defined in the Phase One report.[1] The map illustrates the estimated time when Eaton Fire area water retail agencies were likely impacted by fire.

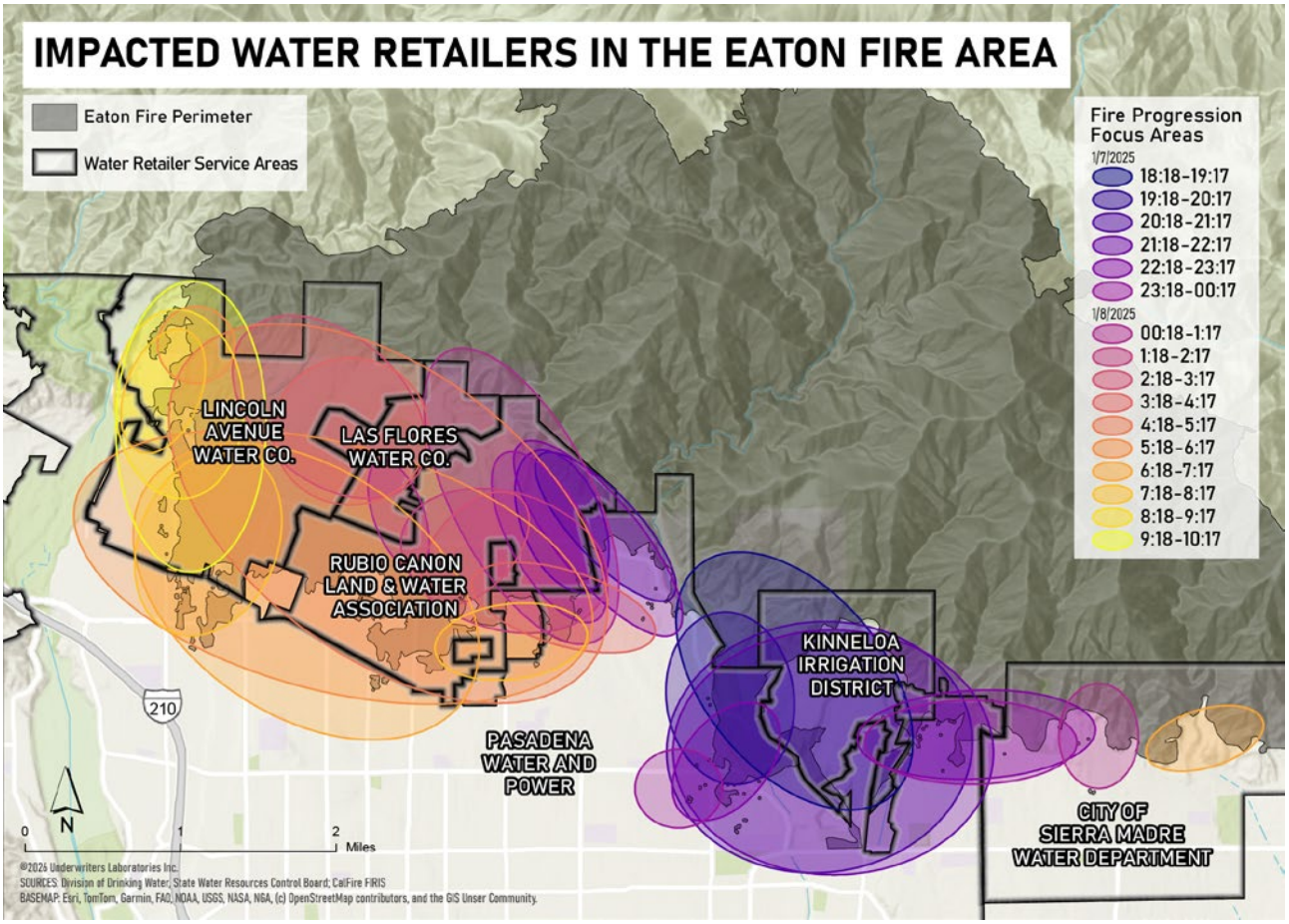


Figure 3.4.30 Map of Foothill Municipal Water District member agencies and Pasadena Water and Power service areas overlaid by fire progression focus areas where high confidence data indicate the fire's presence throughout a span of time as defined in the Phase One report.[1]

Metropolitan

The bulk of Metropolitan's fire experiences are described in Section 3.4.2.3.1, but details specific to the Eaton Fire incident are included here. In response to the fire, and in anticipation of water supply needs of firefighting aircraft, Metropolitan stored an additional 500 acre-feet (163 MG) of water in Live Oak Reservoir.

Deliveries were maintained in the Upper Feeder to provide water to the Pasadena service connections and for delivery further west to the Greg Avenue PS which supplied water to the Los Angeles area.

Deliveries to Pasadena connections P-01 and P-05 were utilized during the fire. Service connection P-01 provided the most water to Pasadena's system. On January 7, 2025, flow in P-01 ranged between 20 and 22 cfs until 19:15, when flow increased to 22.75 cfs, then climbed to 36.36 cfs at 09:00 on January 8, 2025, and remained in the 35-36 cfs range for the remainder of the day.

Flows in P-05 remained more constant over the January 7-8, 2025, time frame, beginning at 1.8 cfs and ranging between 0 and 3.4 cfs over the course of these two (2) days. The 15-minute flow readings are presented in Appendix Section 6.5.

Staff assisted in delivering fuel supplies to backup generator sites for the mutual water companies. Metropolitan also installed a temporary connection for water tenders at the Rose Bowl ICP.

Foothill Municipal Water District

Before and during the fire, the FMWD service area was impacted by electrical power outages due to high winds, SCE PSPS events, and fire.

Just over two (2) hours before the fire was reported, SCE implemented PSPS operations within FMWD's service area at 15:37, 15:38, and 15:56 to the Kinneloa, Lamanda, and Video circuits. This impacted the water districts/companies of Kinneloa, Rubio Cañon, and Las Flores (Figure 3.4.31).

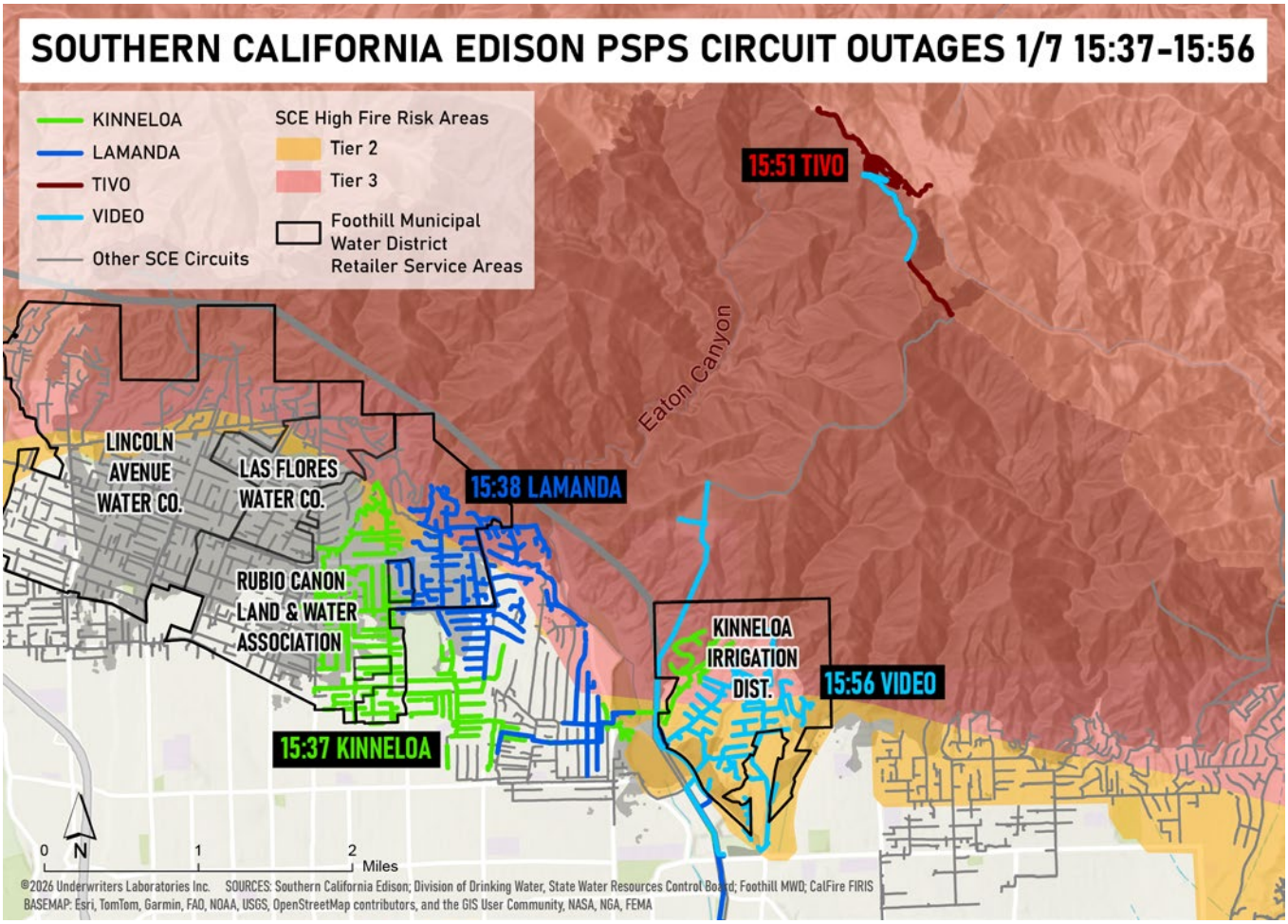


Figure 3.4.31 Foothill Municipal Water District water districts/companies within the area of impact of the Southern California Edison PSPS circuits on January 7, 2025.

In response to the Red Flag conditions, storage tanks were filled to capacity, and backup power generators were placed at facilities.

At 05:00 on January 8, 2025, FMWD staff were notified to evacuate their headquarters building in La Cañada, which is also their main EOC location.

Staff initially relocated to the Rose Bowl but moved to Crescenta Valley due to smoke. By January 9, 2025, they returned to the Rose Bowl and remained there. FMWD served as a central point of contact for its member agencies, though communication with law enforcement and fire was reported to be hindered by differing terminology.

Staff were unable to access reservoir sites on January 8, 2025, and Supervisory Control and Data Acquisition (SCADA) readings were unavailable due to power outages. The water system was operated using manual measurements at the tanks until power could be restored. FMWD was able to assist its members with diesel fuel deliveries to their facilities.

Note: *This section includes maps displaying water districts/companies, SCE circuits serving the area, and fire progression timestamps from ground-based evidence to show how the area may have been impacted by power outages and fire. Fire progression timestamps capture evidence of fire throughout a span of time as described in the Phase One report.*[1]

The media timestamps shown in these maps are limited to what ULRI received from law enforcement, firefighters, and residents. See Figure 3.4.47 in Section 3.4.3.2.2 for more details on the location and timing of SCE power outages and restorations.

Lincoln Avenue Water Company

In preparation for the imminent wind event on the evening of January 7, 2025, LAWC filled all of its reservoirs to their maximum capacities. Staff reported that around 17:30, LAWC lost power in their pressure zones. Once the power went out, generators were deployed to restore power in part of the system, specifically at the office, the Glenrose PS, and the Wapello PS.

These generators ran for 30 days after the onset of the fire to ensure consistent power for the system and water supply. The LAWC pressure zones are shown in relation to SCE circuits and media timestamps recording fire in the area in Figure 3.4.32.

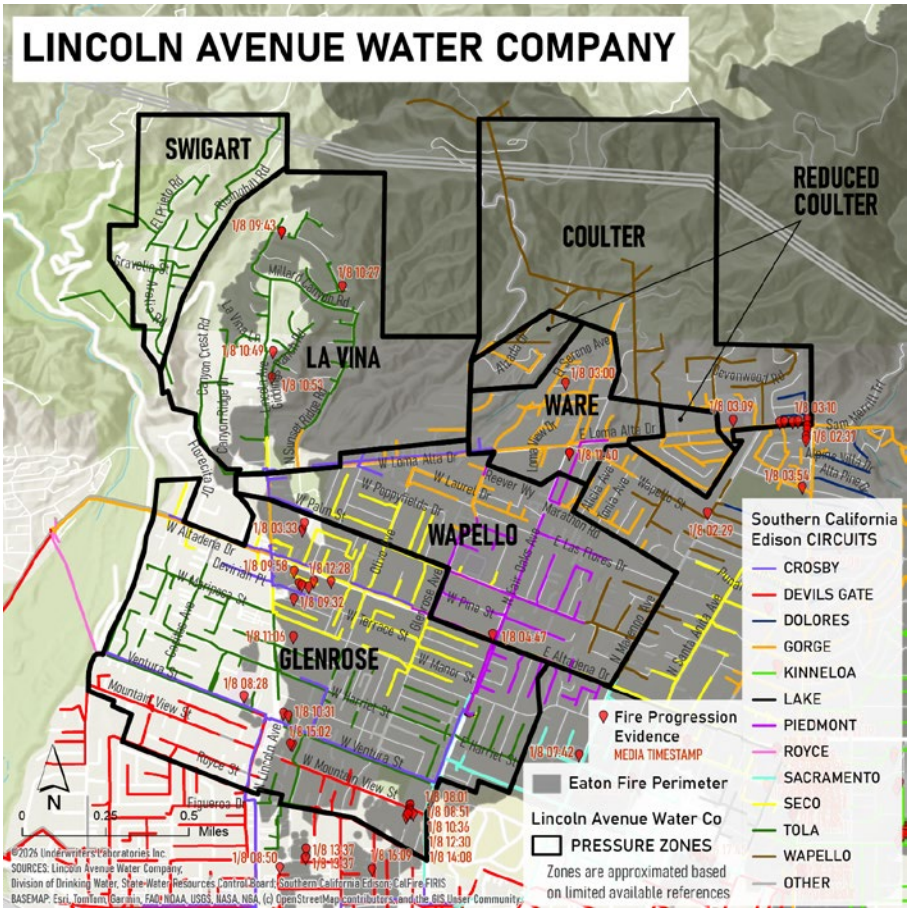


Figure 3.4.32 Lincoln Avenue Water Company pressure zones displayed with Southern California Edison circuits and media timestamps of when fire was observed in the area.

As the wind event continued, LAWC crews frequently went out to check the reservoir levels, but water levels were not recorded beyond what was communicated to SCADA.

Around 05:00 on January 8, 2025, LAWC crews tried to deploy to check on the reservoirs and pump stations throughout the system. However, due to the active fire progression (Figure 3.4.30 above), crews were not able to do so safely. At approximately 10:00, LAWC staff participated in a fire briefing at the EOC, where they asked for police or fire escorts to check on the system and reservoirs.

At this time, LAWC staff was informed that it was unsafe to check on different parts of the system, given the conditions, thus making water availability more challenging. At approximately noon on January 8, 2025, LAWC crews gained access through the fire checkpoints and divided into two (2) separate groups: the Glenrose reservoir group and the Olive treatment plant group.

The Glenrose group went to check on the reservoirs in the Glenrose pressure zone and found houses on fire near the reservoirs. The water levels in both reservoirs at that time were approximately four (4) ft, which is approximately a quarter of the full capacity. Meanwhile, the treatment plant group went to the Olive treatment plant to turn on the backup generators and get that plant running again.

A power pole was on fire in front of the facility and a call was made for the treatment plant group to prioritize safety and leave the plant. At this time, the crew returned to the office and made sure the backup generators were operational. Around 12:30 on January 8, 2025, LAWC reservoirs were considered empty.

Las Flores Water Company

Prior to the fire, and in response to Red Flag conditions, LFWC staff filled system reservoirs and had backup generators in place at the main pumping facility near their headquarters. The Las Flores office at 428 East Sacramento Street reportedly lost power around 16:00 on January 7, 2025, and power in the service area was down by midnight. Winds in the area were observed to be 80+ mph.

Figure 3.4.33 displays the SCE circuits and media timestamps recording fire in the area.

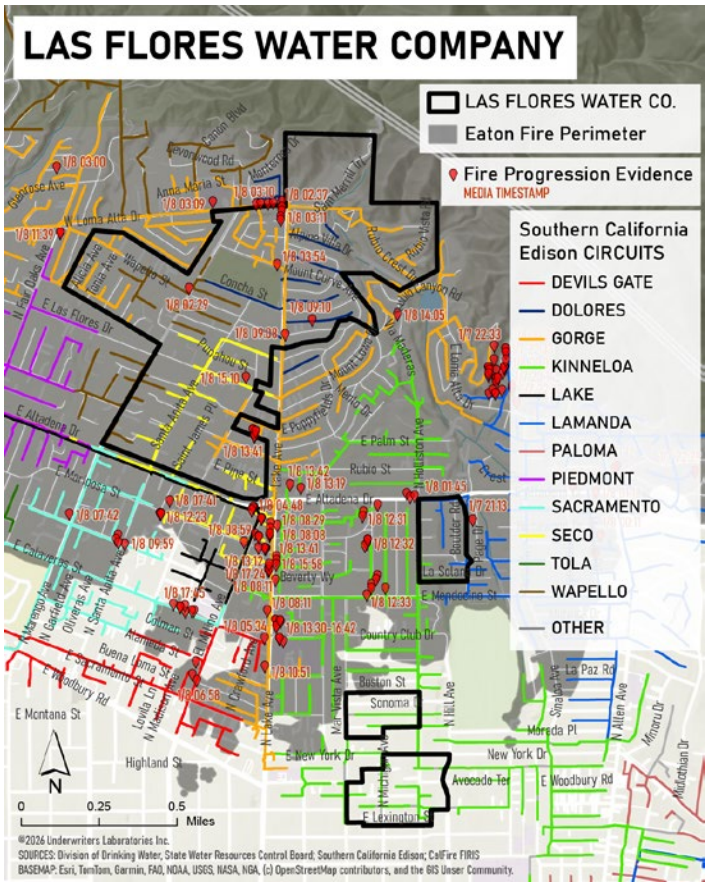


Figure 3.4.33 Las Flores Water Company pressure zones displayed with Southern California Edison circuits and media timestamps of when fire was observed in the area.

Staff arrived at the headquarters around 00:00 on January 8, 2025, and remained on site. After the power shut off, the backup generator enabled the booster pumps to continue pumping water to the Lake Tanks until approximately 01:00 on January 8, 2025, when the pump station shut down due to a high pressure reading of 350 psi on the discharge side of the pumps.

At daylight on January 8, 2025, staff arrived at the Lake Tanks site and observed that timber roof supports had burned and the roofs had collapsed into each tank (Figure 3.4.34). The west tank had 6 ft of water left, but the outlet was clogged with debris. The east tank roof also collapsed, and 4 ft of water was observed in the tank, with the outlet also clogged with debris.

Figure 3.4.34 Lake Avenue Tank Roof Collapse (East Tank).

Staff then traveled to the Poppy Reservoir site and noticed that the LFWC-owned house on the reservoir site was smoldering. Staff used a bucket and water from the pool at an adjacent property to extinguish the burning supports and prevent a roof collapse at the reservoir. Figures 3.4.35 and 3.4.36 show photos from the Poppy Reservoir site and adjacent property.

Figure 3.4.35 Damage to Lincoln Avenue Water Company structure at the Poppy Reservoir site

Figure 3.4.36 Pool used for water supply adjacent to the Poppy Reservoir site.

Rubio Cañon Land and Water Association

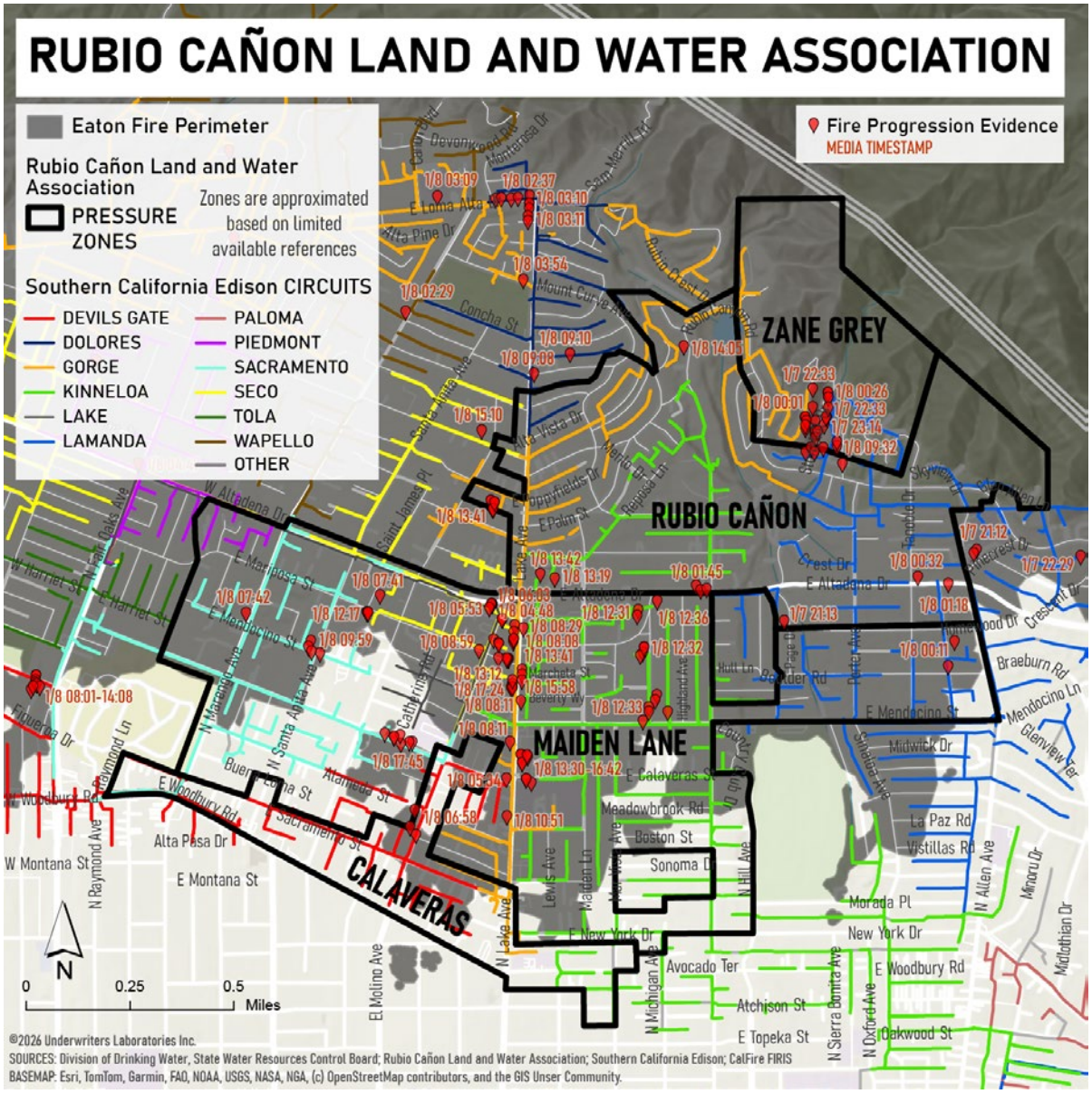
In preparation for a potential wildfire event and due to imminent inclement weather conditions, RCLWA filled all of the reservoirs and tanks in its system.

The RCLWA pressure zones are shown in relation to SCE circuits and media timestamps recording fire in the area in Figure 3.4.37. At 15:37 and 15:38, portions of RCLWA pressure zones lost power during SCE's PSPS on the Kinneloa and Lamanda circuits.

On the evening of January 7, 2025, at approximately 17:30, other RCLWA pressure zones lost power as wind velocity increased. Once the power went out, two (2) backup generators were turned on and remained on for the duration of the fire incident.

These generators were used to power everything at the utility, including, but not limited to, office equipment, SCADA and communication services, and pump stations throughout the RCLWA system.

On January 8, 2025, at 06:00, RCLWA crews were deployed for site inspections in their various pressure zones.



Figures 3.4.37 Rubio Cañon Land and Water Association pressure zones displayed with Southern California Edison circuits and media timestamps of when fire was observed in the area.

Around 09:00, RCLWA crews were evacuated from the area due to increasingly unsafe conditions. At approximately 11:00, RCLWA crews were allowed back on site to wet down their building and prevent further fire spread. At noon, RCLWA issued a Do Not Drink Advisory to customers in their service area.

Throughout the duration of the Eaton Fire event, RCLWA received aid through mutual aid agreements with California Water/Wastewater Agency Response Network (CalWARN) and the Public Water Agencies Group (PWAG). PWAG provided support, fuel, food, and drinking water to RCLWA staff to help ensure they were able to continue to service their system.

Pasadena Water and Power

The City of Pasadena declined ULRI's request to share data on their water system and engage in TDs related to the Eaton Fire. Any information related to Pasadena was obtained through publicly available documents or from discussions with surrounding agencies.

The Eaton Fire impacted only the northernmost portions of the PWP service area, as shown in Figure 3.4.38.

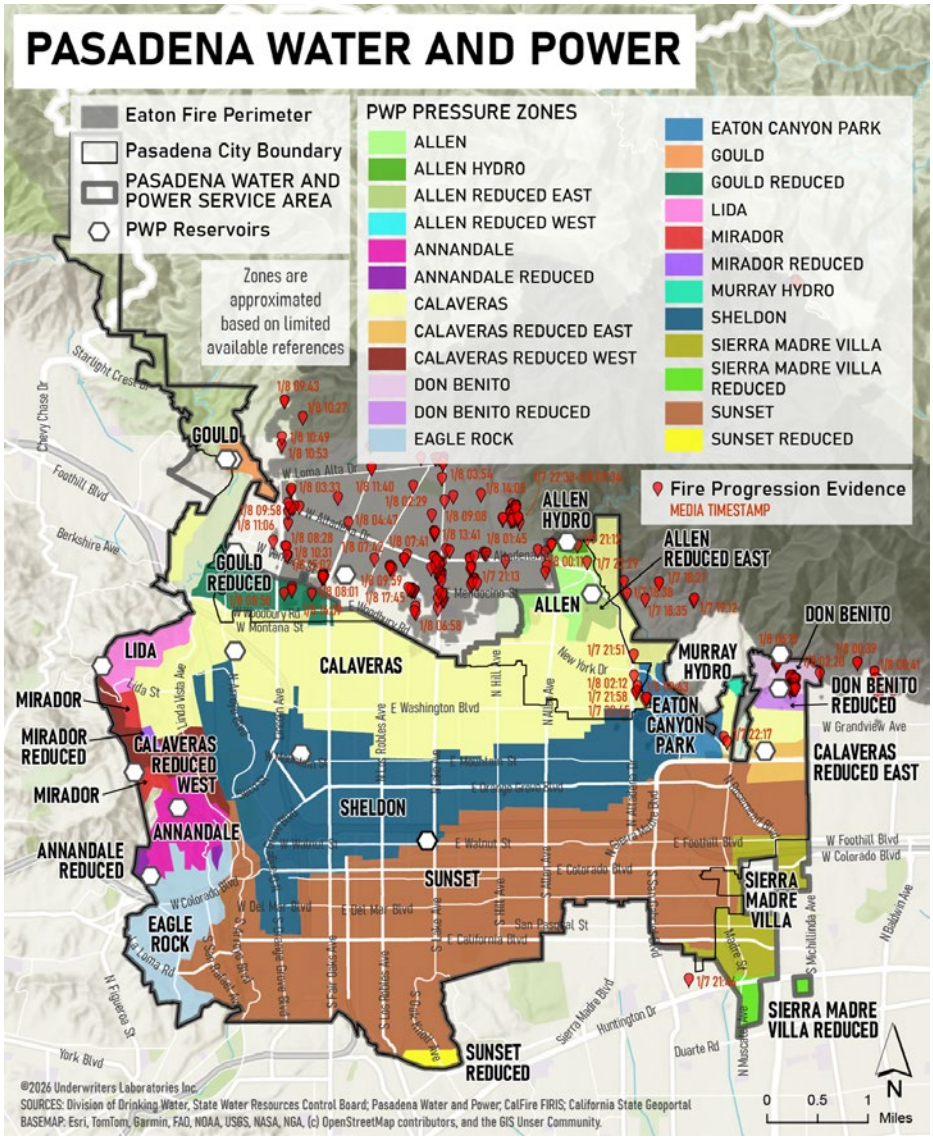


Figure 3.4.38 Pasadena Water and Power pressure zones displayed with media timestamps of when fire was observed in the area.

In 2024, PWP completed a Wildfire Mitigation Plan (WMP), mainly focused on power delivery policies and procedures. The plan addresses coordination between power and water departments, and states that power availability to water pumping stations is a priority. Section 4 of the plan states:

"PWP benefits from internal communication between the Water Division and Power Division of the department. Coordination of staff and resources for wildfire mitigation is handled directly between personnel. It will be the responsibility of PWP Power Delivery staff to ensure that all pumping stations that require power for the purposes of water line pressurization are a priority consideration for energization or back-up generator dispatch."

3.4.2.3.4 Water System Response to the Eaton Fire

Rubio Cañon Land and Water Association

Figures 6.5.11-6.5.14 in Appendix Section 6.5 show the water levels in the Maiden Lane Reservoir 1, Calaveras East Reservoir, Ames Reservoir, and Zane Grey Tanks from January 6-8, 2025.

On the evening of January 7, 2025, at approximately 17:30, RCLWA lost power and deployed backup generators to ensure water availability in the system. After this time, readings in Appendix Section 6.5 may be remnants of the power failure and may not be reliable.

Maiden Lane Pressure Zone Impacts

From January 6, 2025, through approximately noon on January 7, 2025, the Maiden Lane Reservoir system operated as normal.

Due to imminent extreme fire weather conditions, RCLWA began filling the Maiden Lane Reservoirs to ensure water availability for the Maiden Lane pressure zone and other parts of the system. The water level in the reservoir reached its highest level of approximately 12 ft in the early morning and late evening of January 7, 2025.

Heading into the early morning of January 8, 2025, the water level in the reservoir began dropping due to water demand in the system. On January 8, 2025, at approximately 04:00, RCLWA crews went into the service area to assess fire damage to the Maiden Lane Reservoirs; they did not need an escort.

At 06:30, the roof at Maiden Lane Reservoir caught fire. At this time, and throughout the rest of the day, reports of dry hydrants were coming in, likely due to numerous open connections in the system. Likewise, staff reported that there were a lot of hydrants and hose bibs left open that contributed to water loss in the system.

By approximately 11:00 on January 8, 2025, the roofs on Maiden Lane Reservoirs #1 and #3 had collapsed and needed to be isolated from the rest of the system. Maiden Lane Reservoir #2 remained operational and continued to provide water to the system, including to the Maiden Lane (until 15:00 that same day) and the Calaveras pressure zones.

Calaveras Pressure Zone Impacts

From January 6, 2025, to approximately noon on January 7, 2025, the system operated as normal. Due to imminent inclement weather conditions, RCLWA began filling the Maiden Lane Reservoirs, which then backfilled the Calaveras Reservoirs. The water level in the East Reservoir reached its highest at 13.9 ft around 10:15 on January 7, 2025.

From here, the reservoir drained until the system lost power and the booster pumps in the Maiden Lane pressure zone shut off. By approximately 11:00 on January 8, 2025, the Calaveras Reservoirs were isolated due to the collapses in the Maiden Lane pressure zone.

Rubio Cañon Pressure Zone Impacts

From January 6, 2025, to approximately noon on January 7, 2025, the system operated as normal. Due to imminent inclement weather conditions, RCLWA began filling the Maiden Lane Reservoirs, from which water was pumped up to the Rubio Cañon pressure zone using three (3) booster pumps.

The water level in the Ames Reservoir reached its highest at 12.0 ft around 01:00 on January 6, 2025. From here, the reservoir drained until the system lost power and the booster pumps in the Maiden Lane pressure zone shut off around 15:00 on January 8, 2025.

Zane Grey Pressure Zone Impacts

From January 6, 2025, to approximately noon on January 7, 2025, the system operated as normal. Due to imminent inclement weather conditions, RCLWA began filling the Maiden Lane Reservoirs, from which water was pumped up to the Rubio Cañon Pressure Zone using three (3) booster pumps, and then from Rubio Cañon to the Zane Grey tanks using two (2) additional booster pumps.

The water level in the Zane Grey tanks reached its highest at 8.6 ft around 11:45 on January 7, 2025. From here, the reservoir drained until the system lost power and the booster pumps in the Maiden Lane pressure zone shut off around 15:00 on January 8, 2025.

Kinneloa Irrigation District

The KID service area is adjacent to the Eaton Fire area of origin, immediately east of Eaton Canyon, and thus was one of the first areas to be impacted by the fire. On January 6, 2025, staff prepared the distribution system for Red Flag conditions. Backup generators were tested to ensure functionality, and 150 gallons of fuel were stored with each generator. Reservoirs were topped off to provide maximum storage for the system.

On January 7, 2025, high winds resulted in trees being blown down in parts of the KID area. Staff turned the Wilcox Well on due to an SCE power outage at K-3. SCE power was noted coming back on at 09:00. At 15:37, power was out on the west side of the district, and at 15:56, power was out on the east side of the district due to SCE PSPS. See Figure 3.4.31 and 3.4.39 for KID area, SCE circuits, and fire progression timestamps.

At 18:16, staff received a note from Pasadena Fire Department (PFD) that there was a brush fire at Eaton Canyon. Around 18:45, staff called PWP to notify them that they will open a Pasadena interconnection.

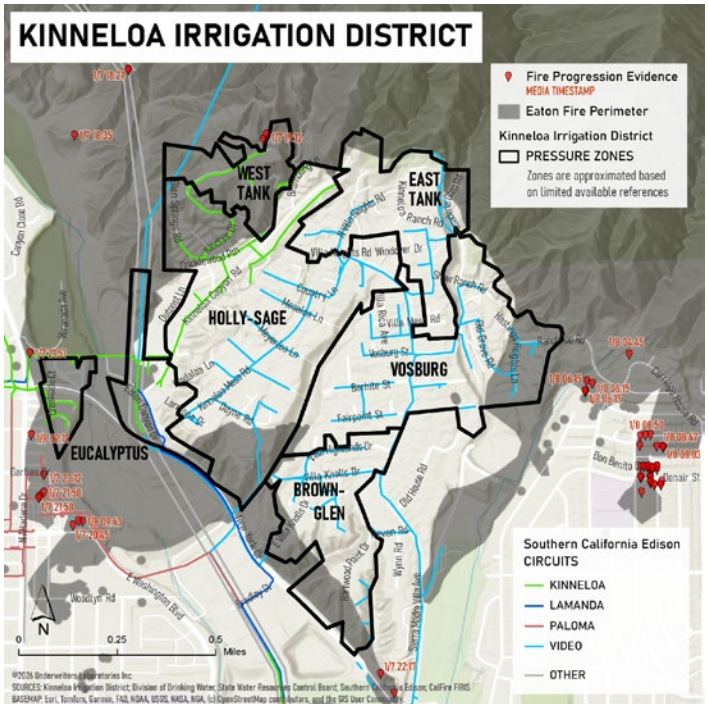


Figure 3.4.39 Kinneloa Irrigation District displayed with Southern California Edison circuits and media timestamps of when fire was observed in the area.

Around this time, staff began to unlock all gates at facilities to enable access. At 19:16, the Outpost-West interconnection with Pasadena was opened. The interconnection is four (4)-inch diameter with a capacity of 800 GPM. All generators were reported running at 19:28 and reservoir levels were noted as starting to drop, as firefighting efforts were ongoing at a townhome complex.

As the townhome complex burned, damaged and open water services further increased the rate at which Eucalyptus tanks were drained. When staff was able to shut off the main townhome complex connection, the tanks were able to refill.

At 21:02, the Wilcox Well and reservoir became inoperative because the fire burned the generator at that site. Delores Tunnel flow was lost at 21:09.

It was noted at 21:15 that incident command was moving to the Rose Bowl, and staff checked in at the sheriff station. Staff communication was lost at 21:34.

Power was lost sometime in the late night on January 7, 2025, or the early morning of January 8, 2025. Staff had two (2) backup generators delivered to provide power to the system. No interconnections were opened during the incident. However, there were no reports of lost pressure in the system during firefighting efforts, and the water supply was adequate for the firefighters.

3.4.2.4 Alternative Water Supply - Swimming Pools

Alternative water supplies can prove critical during community conflagrations when the water system supplying fire hydrants loses pressure. One (1) large but segmented water supply that existed in both the Palisades and Eaton Fire areas was residential and public swimming pools (Figures 3.4.40 and 3.4.41).

The actual available water supply from swimming pools at the time of these fires is based on a number of factors, some of which were estimated for the purpose of this analysis. ULRI used the following methodology to identify the existence of swimming pools and then estimated gallons of water that may have been available on January 7, 2025.

1. Used Los Angeles County Assessor data to identify parcels coded as having pools. Identified additional parcels with pools from ULRI's field work and aerial imagery review for the Built Environment Analysis (see Section 4.0).
2. Applied ESRI's Pool Segmentation model to Los Angeles Region Imagery Acquisition Consortium (LARIAC) aerial imagery to generate initial pool polygons within the fire area.
3. Using a grid system, manually reviewed all pools and created or adjusted polygons where the model missed features, such as pools partially obscured by trees or covers.
4. After finalizing the polygons, total pool-surface area was calculated and water volume estimated using an average depth of 5.5 ft from the Pacific Institute,[62] and converting cubic feet to gallons using a factor of 7.48.

Total pool area and volume (cubic feet (cu. ft.) and gallons) are tabulated in Table 3.4.14 for the Palisades and Eaton Fire areas.

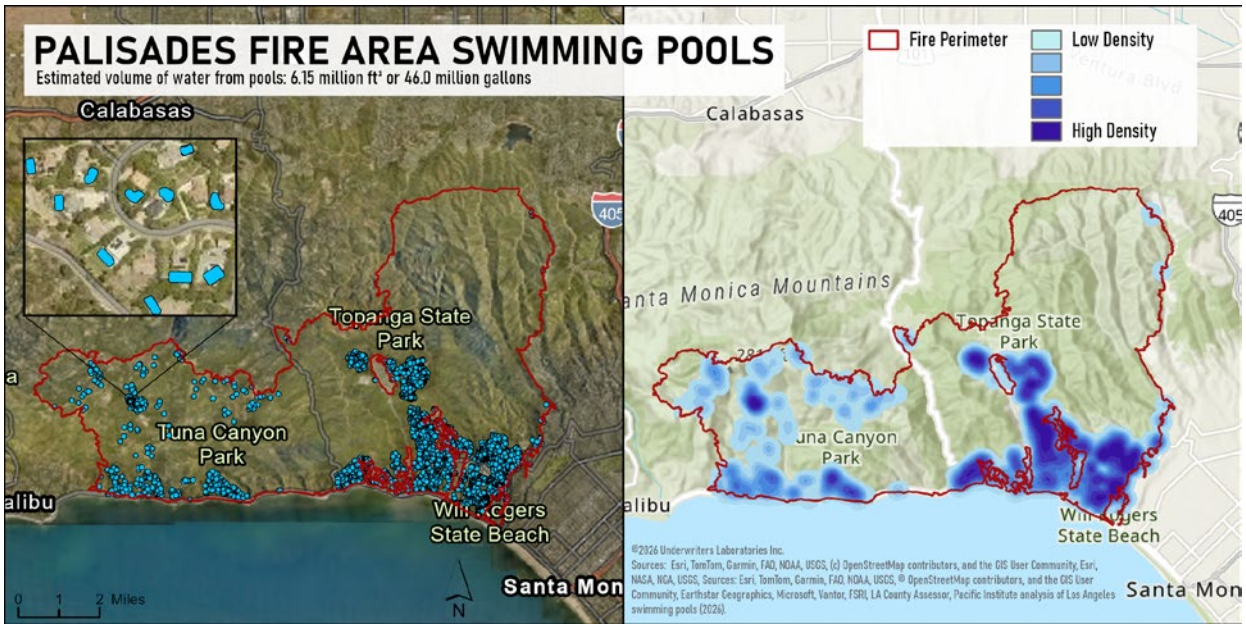


Figure 3.4.40 Palisades Fire Area swimming pools identified through Los Angeles County Assessor records, with size validated through ESRI tools.

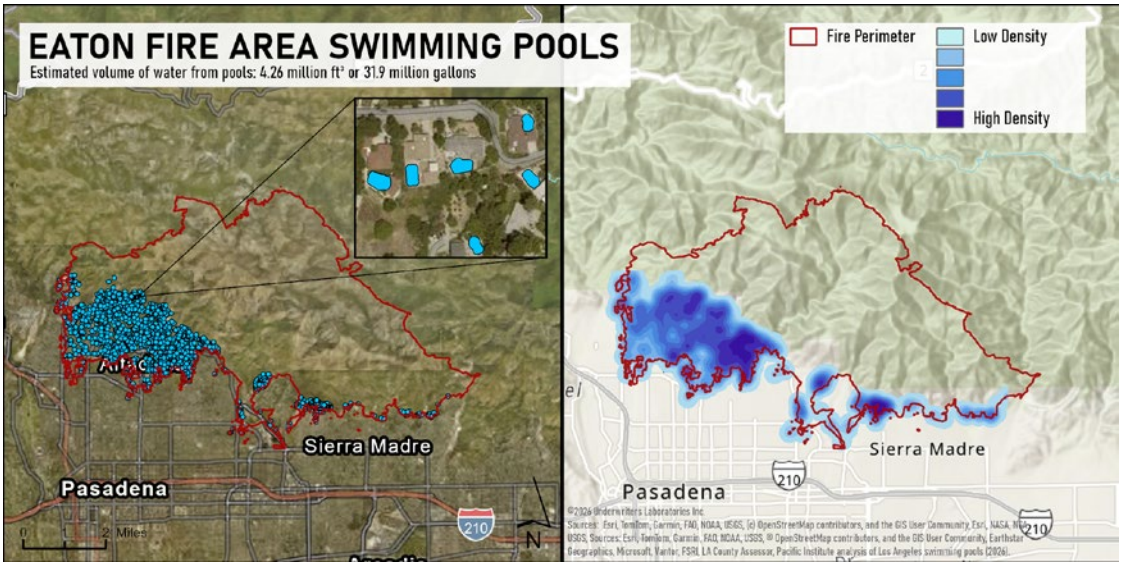


Figure 3.4.41 Eaton Fire Area swimming pools identified through Los Angeles County Assessor records, with size validated through ESRI tools.

Table 3.4.14 Comparison of total volume and gallons of swimming pools in the Palisades and Eaton Fire areas.

Fire Incident	Total Pool Area (sq. ft.)	Estimated Volume (cu. ft.)	Estimated Volume (gal)
Palisades	1,124,797.55	6,186,386.53	46,267,676
Eaton	752,307.36	4,137,690.46	30,945,988

Although total estimated pool capacity exceeds 40 MG in the Palisades Fire perimeter and 30 MG in the Eaton Fire perimeter, the usable volume is likely closer to half of this amount. This is because a significant amount of water may need to remain in each pool to preserve structural integrity, reducing the effective supply to approximately 20 MG in the Palisades area and 15 MG in the Eaton area.

While this represents a massive water supply that was available for fire suppression, accessing and using the water requires forethought, availability of appropriate tools, and training. Most often, the pools are located at the rear of the property and potentially behind secured gates and fencing, making access difficult. After the Old Topanga and Kinneloa community conflagrations of 1993, Los Angeles County adopted “pool hydrant” requirements through Ordinance 95-0029 in 1995.

These requirements apply in high wildfire risk areas, including VHFHSZs and Los Angeles County’s legacy Fire Zone 4. In these locations, swimming pools and spas are treated as auxiliary water sources to support firefighting operations where traditional hydrant systems may be limited or unreliable.[63]

The requirement applies to unincorporated communities and in contract cities served by LACoFD. Pools meeting the threshold (5,000-gallon capacity or greater) must be identifiable, accessible, and maintained so firefighters can quickly locate and use them during an emergency. Cities with independent fire departments — such as Los Angeles (Pacific Palisades), Pasadena, Sierra Madre, Arcadia, and Monrovia — operate under their own fire codes, and do not have a requirement equivalent to Los Angeles County’s “pool hydrant” program.

Drafting the water also requires specialized equipment, which many of the resources that responded to the Palisades and Eaton Fires had. LAFD and LACoFD resources carry water educators (i.e., venturi pumps) that enable drafting from water sources that are difficult to access and when the fire apparatus is a distance away from the source[64] (Figure 3.4.42).

Figure 3.4.42 Firefighter using an eductor to draft from a residential pool.

During TDs with firefighters and conversations with residents, there were several mentions of using swimming pool water for fire suppression. In some cases, ULRI observed physical evidence of this during on-site damage assessments (see Section 4.0 for more information).

At a small minority of properties with pools, water levels were visibly below normal. In some cases, the drop was only a few inches, while in others it was several feet. However, most pools did not show a noticeable reduction in water level, suggesting they were not used for fire suppression.

3.4.3 Electrical Power

3.4.3.1 Electrical Power Preparedness and Response to the Palisades Fire

Electrical power within the Palisades Fire area is provided by the LADWP and SCE. LADWP's service area is the City of Los Angeles, while SCE services all other areas.

Figure 3.4.43 displays the location of the electricity provider circuits along with other related infrastructure components. See Appendix Section 6.10 for data requests and production status for each organization.

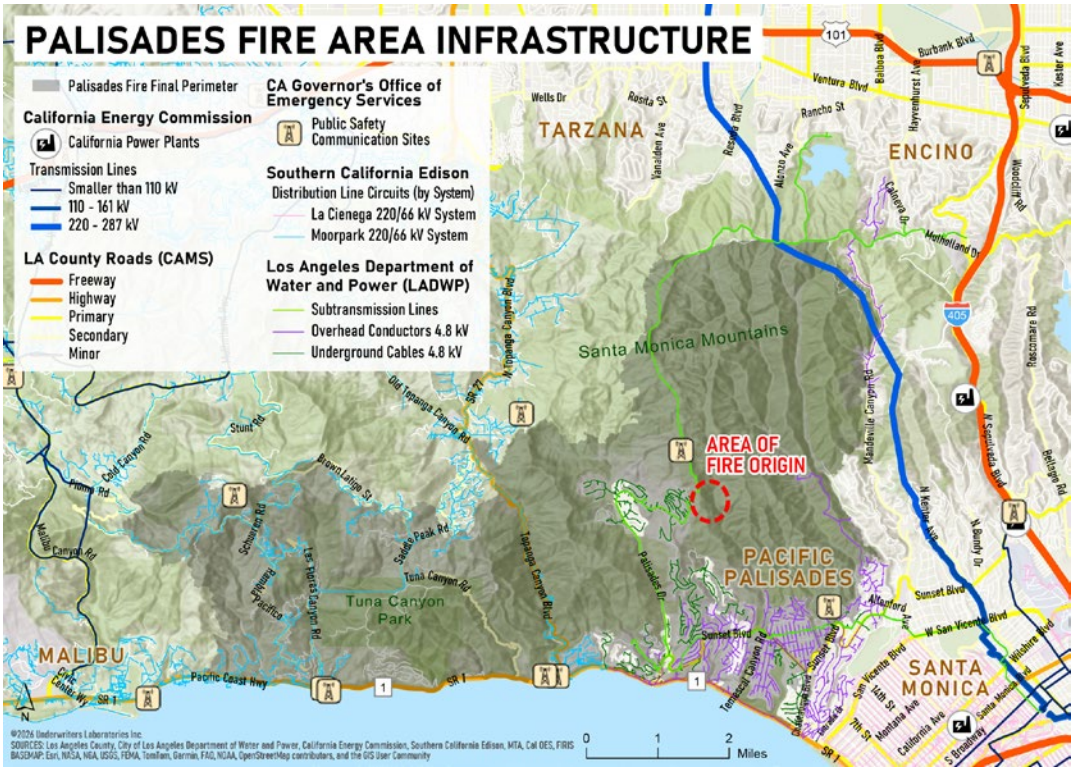


Figure 3.4.43 Palisades Fire area map showing infrastructure elements and agency ownership. Data was captured from publicly available websites and information provided through ULRI's data request process.

ULRI focused its analysis on LADWP's preparedness and response activities within the Pacific Palisades due to the initial fire impact on the area and where populations, and thus evacuations, were high. The following emergency preparedness and response assessment is limited to pre-event activities before January 7, 2025, and the initial operational period, from the start of the Palisades Fire on January 7, 2025, through late morning on January 8, 2025.

Preparation Before January 7, 2025

In response to Red Flag Warnings, on January 6, 2025, LADWP blocked auto-reclosers (AR) on all circuits in Tier 3 High Fire Threat Districts within the Palisades area. These districts are extreme-risk zones that have the highest likelihood of utility-associated wildfire initiation and spread. LADWP also blocked the AR on ROY-MG 1, a Tier 2 circuit supplying the Palisades area, out of an abundance of caution.

Electric companies disable ARs during high winds due to faults being more severe and widespread. By blocking an AR, the circuit remains open (with no power) when a fault is experienced.

There had also been pre-fire hardening efforts in the Palisades area prior to the fires, including a pole replacement on ROY-MG 1, repairs and replacement of poles throughout the area, and ongoing vegetation management, with annual inspections of overhead circuits.

These measures align with nationally recognized pre-event mitigation priorities, including Pacific Northwest National Laboratory (PNNL) guidance around system hardening, vegetation management, and protective-device adaptation.[65]

They also map directly to the requirements of California Public Utilities Code (CPUC) Section 8387[66] for preventive strategies, inspection protocols, vegetation management, and recloser and de-energization practices.

Response to Palisades Fire

LADWP operated under normal staffing levels and standard operational processes in the hours before the Palisades Fire was reported on January 7, 2025.

While PNNL guidance emphasizes enhanced situational awareness during Red Flag events through visual surveillance, grid sensors, and remote sensing, LADWP did not pre-deploy patrollers or spotters. Instead, the agency relied primarily on crews, electrical transmission (ET) field operations, operators, City of Los Angeles EOC coordination, and conventional reporting, rather than dedicated spotter teams or robust remote sensing coverage.

A smoke/fire sensor installation pilot project by LADWP did not cover the Pacific Palisades area, while nearby sensors were not configured to monitor the area.

At 12:00 on January 7, 2025, LADWP activated a Level III (monitoring/minimal activation) Department Emergency Operations Center/Department Operations Center (DEOC/DOC).

At 20:00, the DOC was elevated to Level II (partial activation), as conditions worsened. Additionally, LADWP embedded representatives at the city EOC for coordination.

Throughout the incident, LADWP's operating objectives were to maintain/restore service, protect crews and staff, maintain situational awareness, and inform internal/external partners and the public.

The initial command structure, as of early January 7, 2025, included an Incident Commander (IC), Deputy IC, Public Information Officer (PIO), Health and Safety, and section chiefs for Operations, Logistics, Planning, and Finance. There were also liaison/functional attachments, including those for Customer Service, Environmental Affairs, Information Technology (IT), Documentation, and Power Distribution Operations Support (PDOC).

The Power Command Center organizational chart provided to ULRI shows that LADWP built out a power-specific response organization with branches and support nodes for:

- Power Transmission and Distribution
- Power Supply Operations
- Power Construction and Maintenance
- Integrated Support Services
- Supply Chain
- GIS
- Communications

The command structure also linked to Water, Joint System, Security, Human Resources (HR), and Fleet. This response organization was designed for both strategic oversight and to directly support electric outage management and restoration activities.

The DOC ran 24 hours a day throughout the fire incident, using two (2) 12-hour operational shifts, with a briefing cadence every four (4) hours and a requirement for responders to complete activity logs.[67]

By 12:30 on January 7, 2025, the power system in the Pacific Palisades area had experienced 18,571 outages. In response, staffing was augmented with contract crews ready to deploy, if needed. LADWP had crews monitoring fires near electrical infrastructure before the Palisades power impacts were more widespread.

As fire conditions intensified on January 7, 2025, the agency moved from general preparation to specific field preparation by manually isolating portions of the Palisades-area circuits.

Crews opened switches (i.e., shut the power down) on multiple feeder circuits across the Palisades area between 14:20 and 17:27 on January 7, 2025, de-energizing large portions of overhead circuits in the southwestern Palisades.

This action is consistent with PNNL guidance to shut off power to specific circuits when the operational capability to do so safely exists.

As the fire and wind impacts further escalated on January 7, 2025, LADWP shifted to a high-volume outage and targeted de-energization response.

At 22:00, the agency reported that nearly 117,000 customers were without electricity, while 45 neighborhoods had outages. (**Note:** ULRI was unable to determine the specific number and time frame of outages and restorations in Pacific Palisades from the data provided.)

LADWP had active deployment of 31 district crews, 26 ET field operations crews, and 30 Construction Operations crews across their system.

Throughout the incident, the agency balanced two (2) conflicting priorities: de-energize where necessary for safety, while preserving power for critical water/firefighting functions, where possible.

LADWP documentation provided to ULRI notes that feed-center switches on circuits 29-09, 29-03, and 29-06 were open, while 29-07, which served critical pumps, remained online.

The DOC directed field operations to not take the sub-station offline to ensure power remained available to operate vital fire pumps supplying water to area water hydrants.

By 12:00 on January 8, 2025, the Planning Section had developed a QR code-based electronic check-in/check-out process for PDOC, Western Electricity Coordinating Council (WECC), and the DOC.

During the command center transition to a new shift between January 7, 2025, and January 8, 2025, the command structure kept the same ICS functions. The overnight command structure included dedicated functions for Water, PDOC, Documentation, IT, Customer Service, Environmental Affairs, and Finance, while maintaining a conventional command-and-general-staff backbone.

These actions align with PNNL's emphasis on multi-entity coordination, emergency preparedness, and operational resilience, with the expectation, based on CPUC 8387, that responsibilities and procedures be clearly defined.

By 02:00 on January 8, 2025, system-wide outages had risen to 139,000, with 70 neighborhood outages and 61,784 customers already restored. The Palisades Distribution Station (DS), DS-29, remained inaccessible due to fire, and the “do not drop station” directive remained in effect due to critical pumping and hydrant support needs.

During this same time period, operators and field personnel were distributed across numerous stations citywide, as LADWP managed both the Palisades Fire and the impacts of the larger regional windstorm.

Pacific Palisades remained a continuing concern, including power issues affecting the Marquez Knoll PS. The actions undertaken indicate a restoration approach focused on system stabilization, transmission/sub-transmission recovery, and broader outage restoration, with restoration in the Palisades Fire area limited by access, fire conditions, and interdependencies with water/firefighting operations.

ULRI was unable to produce maps identifying circuit outage/restorations from the information provided by LADWP, however, Figure 3.4.44 shows the locations of impacted circuits along with FIRIS fire perimeters.

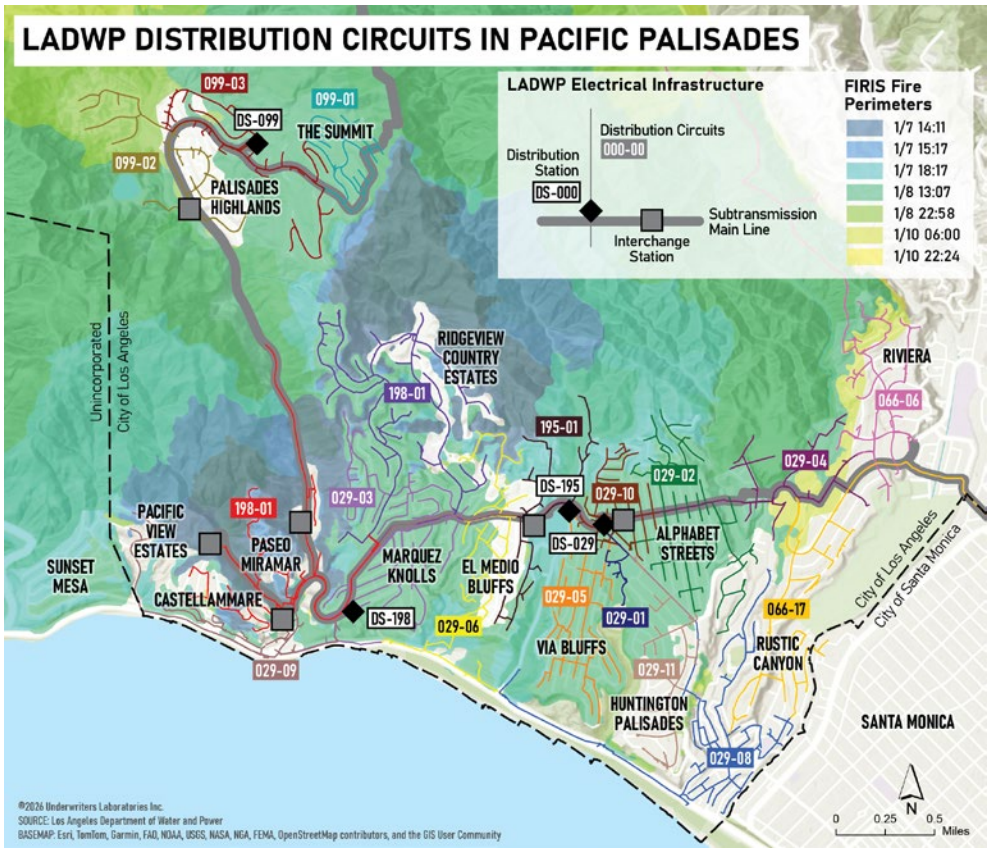


Figure 3.4.44 Los Angeles Department of Water and Power electrical circuits in Pacific Palisades impacted by the fire as indicated by the FIRIS fire perimeters.

Public Safety Power Shutoffs

LADWP did not implement a formal, broad PSPS in the Palisades area before noon on January 8, 2025. Instead, they executed a series of PSPS-like, risk-reduction measures that included: pre-event AR blocking, selective/manual de-energization, and field sectionalizing of circuits in or near the fire footprint. In other words, the agency applied a targeted, operational de-energization approach rather than a formalized, wide-area PSPS construct.

These actions were consistent with PNNL's best practice that favors more precise, adaptive grid operations rather than broad-scale shutoffs. They also adhere to CPUC 8387 guidance, which requires utilities to maintain protocols for disabling reclosers and de-energizing portions of the distribution system while also accounting for public-safety impacts.[68]

Restoration and Infrastructure Repair

During the period from ignition through noon on January 8, 2025, LADWP's restoration efforts were constrained by limited access, damaging winds, and the need to maintain water supply for firefighting activities.

Despite these limitations, restorations increased citywide from nearly 61,784 customers at 02:00 on January 8, 2025, to 118,931 by noon that same day, with a transmission line re-energized and sub-transmission in recovery.

In the Palisades area, restoration remained limited by access constraints, particularly at DS-29, where de-energization risked disrupting critical pumping and hydrant systems. As a result, electric restoration was closely tied to maintaining water and fire suppression capability — an interdependency consistent with PNNL and CPUC 8387 guidance that emphasizes consideration of critical infrastructure and first responder impacts.

Customer Communications

LADWP used several customer and public communication channels to keep residents informed during the Palisades Fire. According to LADWP, its communications toolkit included text/email power outage notifications, targeted email campaigns, news releases, social media posts, and customer service representatives (CSRs) handling customer calls.

Early on January 7, 2025, LADWP communications staff were positioned at the city EOC, while CSRs managed customer calls.

By 22:00, staff reported call spikes, increased web traffic, and outreach from major customers, such as schools.

At 07:00 on January 8, 2025, CSRs were handling calls with an approximate four (4)-minute wait time. Corporate Communications staff were working on a custom outage alert to update subscribers on response times and potential delays in restoration due to the hazardous conditions in the area.

By noon, LADWP reported 48,915 text and email notifications sent to customers, 112,000 web-based views, and 189 active CSRs citywide. The utility also released PIO updates throughout the day and monitored social media channels.

However, the three (3) communications sent specifically to the Palisades community were sent between January 9, 2025, and January 12, 2025.

Prior to noon on January 8, 2025, LADWP's public communications were largely focused on regional weather conditions, power outages, public safety information, media engagement, call-center operations, and broader emergency notifications. Available information indicates less emphasis was placed on Palisades-specific communications regarding de-energization decisions, affected circuits, or anticipated restoration timelines for the area.

This distinction is important because CPUC 8387 emphasizes appropriate and feasible procedures for notifying customers affected by de-energization events.

3.4.3.2 Electrical Power Preparedness and Response to the Eaton Fire

Electrical power within the Eaton Fire area is provided by SCE and PWP (Figure 3.4.45). SCE provides electricity to the largest area (Altadena, Kinneloa Mesa, and Sierra Madre) within the fire footprint, and PWP handles the power needs within the City of Pasadena.

ULRI's analysis focused mainly on SCE's preparedness and response activities during the Eaton Fire, given the limited data provided by PWP and the City of Pasadena. See Appendix Section 6.10 for data requests and production status for each organization.

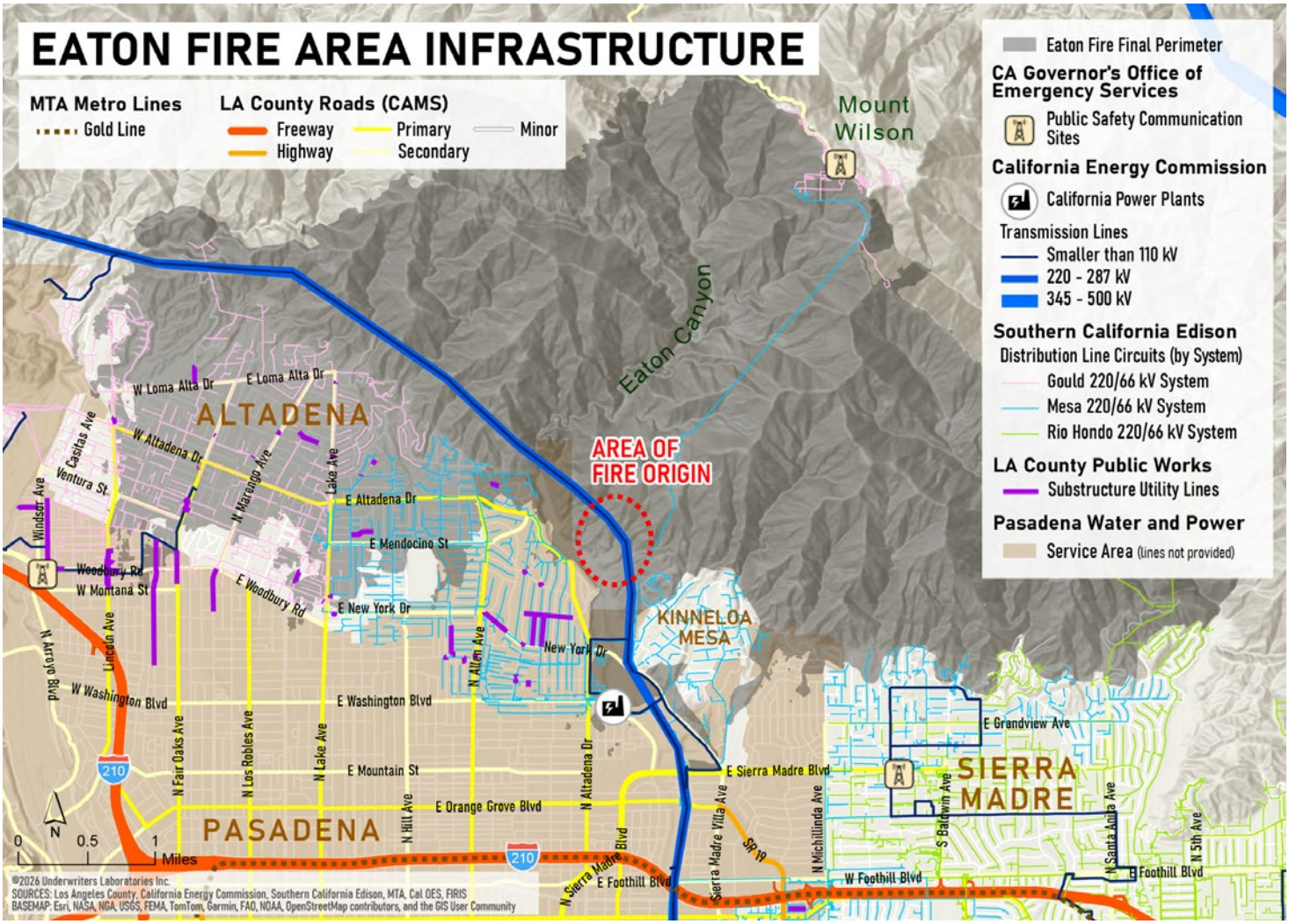


Figure 3.4.45 Eaton Fire area electrical utilities coverage with Los Angeles County roads.

Preparation Before January 7, 2025

Before the Eaton Fire began, SCE's 2023-2025 WMP[69] (the most current version available on January 7, 2025) already included a risk-informed wildfire/PSPS operating model. It emphasized wildfire risk modeling, inspections, vegetation management, system hardening, and weather monitoring, with PSPS as a last-resort operational tool. In 2026, the agency released a 2026-2028 version of the WMP.[70]

The 2022 California Public Utilities Commission (CPUC) Compendium[71] requires regulated utilities to prepare public safety partner contacts, critical-facility coordination, Access and Functional Needs strategies, multilingual communications, and EOC integration in advance of an event.

Incident Action Plans (IAPs) from January 6-7, 2025, provide evidence of these requirements in their county/EOC coordination, public information messaging, and planning for customer support in preparation for high fire danger and PSPS implementation.

PNNL[65] likewise identifies pre-event best practices, including system planning, inspections, staging, weather/risk monitoring, and pre-event coordination across utilities and public agencies.

On the evening of January 6, 2025, SCE approved an Electrical Services Incident Action Plan (ESIAP) for the first phase of the fire (January 6-7, 2025). The agency's objectives in the ESIAP were centered on public and responder safety, coordination with SCE's PSPS IMT, unified communications across stakeholders, and preparations for eventual demobilization/restoration when conditions allowed.

The ESIAP also included staffing plans, pre-positioning and logistics preparation, and safety and public messaging, as well as liaison activity across key counties.

Additionally, SCE staff were coordinating resource sharing, as well as evaluating locations, such as the Santa Anita Racetrack, to use as a possible restoration laydown yard (a large area to pre-stage equipment and materials closer to the area of impact).

This indicates that the agency was preparing not just for de-energization decisions, but also for the sustained operational burden that would continue throughout and after the fire.

SCE's Safety Message/Plan identified the types of field risks that would occur during the first 24 hours of the fire. The plan also identified additional operational tasks and staffing needed, including pre-patrol inspections, Live Field Observations (LFO), and the addition of Customer Care Field Representatives and Spotters/Observers.

Electrical Response

By the afternoon of January 7, 2025, SCE had moved from general preparedness and into a fully operational framework with their various IMTs operating in concert.

In the Wind Event IAP, prepared at 15:45 on January 7, 2025, the agency reemphasized safety, staffing adequacy, One Voice messaging, and restoration planning, as conditions warranted.

The Organizational Assignment List[72] prepared at 16:21 on January 7, 2025, included a built-out incident management structure.

In line with PNNL guidance, SCE had clear command structures and coordinated field operations with missions-specialized work groups[73] in action by January 7, 2025.

This included the Damage Assessment Group, which was created at 17:23 on January 7, 2025, and contained multiple crew packages and team structures distributed across rural, Metro west, Metro east, south coast, desert, and other service areas.

The Debris Clearance Group, created at 17:44 on January 7, 2025, assigned tree crews and utility arborist oversight to support line crews. The group emphasized that line crews and vegetation teams would have to operate in close coordination and under electrical safety controls whenever downed primary conductors were involved.

SCE Circuit Outage and Restorations

Power outages were experienced before and during the Eaton Fire, some prior to PSPS implementation. Figure 3.4.46 identifies the circuit location and times of outages (caused by environmental conditions), PSPS outages, and restorations.

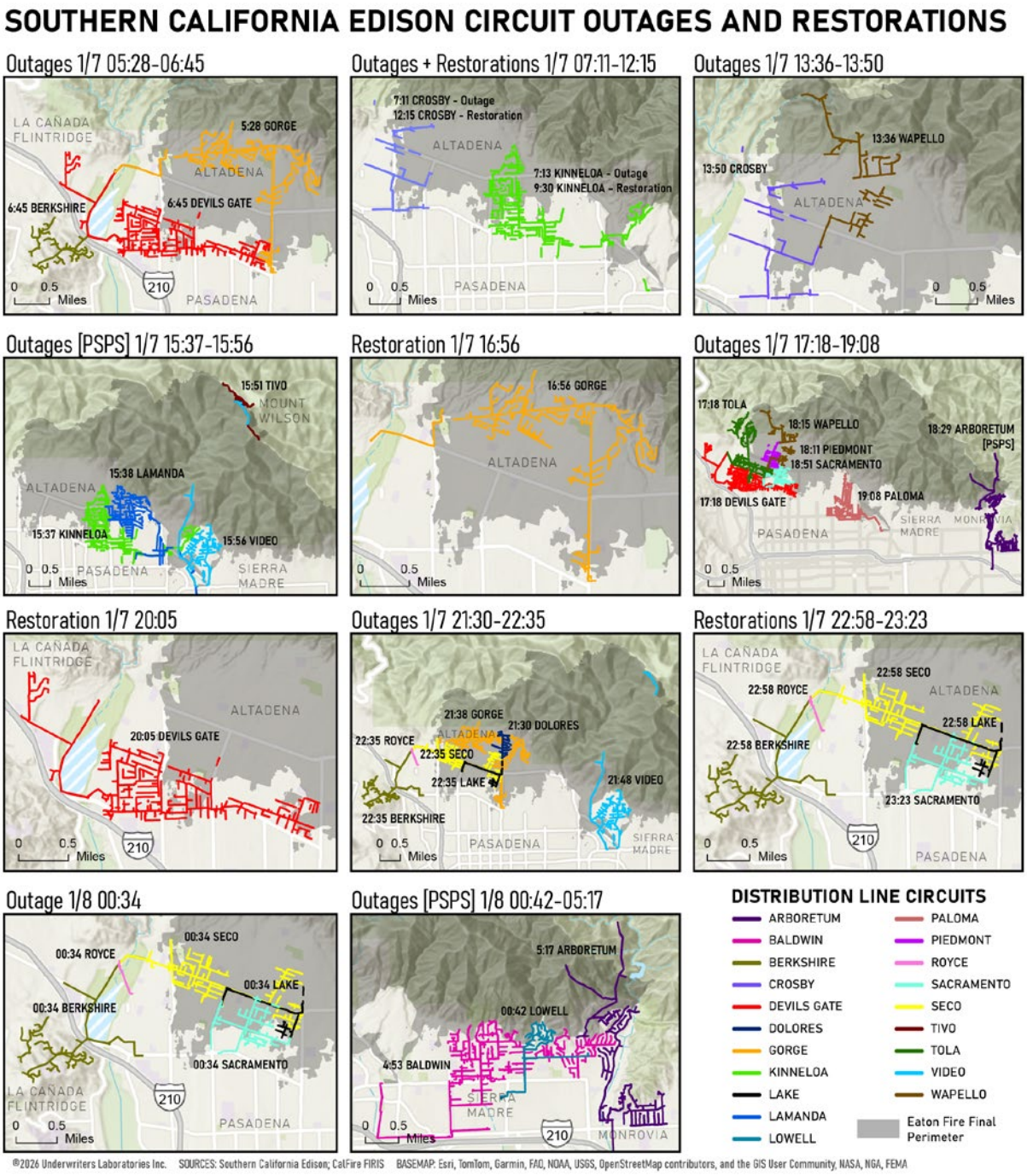


Figure 3.4.46 The timing of Southern California Edison circuits impacted by the Eaton Fire that experienced an outage, restoration, and PSPS.

Note: *The data used to display circuits that experienced multiple outages without a restoration (such as Devils Gate at 06:45 and 17:18 on January 7, 2025) does not include partial restorations, in which only a section of the circuit is restored. In these cases, the record shows only full restorations, even though part of the circuit was restored, leaving another opportunity for the powered portion of the circuit to experience an outage.*

The scale of outages experienced in communities impacted by the wind storm and Eaton Fire was extensive, as was the complexity of restoring power to the area, while also managing PSPS operations.

PSPS Operations

PSPS for the Eaton Fire area consisted of three (3) circuits: Kinneloa, Lamanda, and Video. These circuits were mostly east of Lake Avenue, with Lamanda and Video adjacent to the area of origin. These circuits were shut off about 2.5 hours before the Eaton Fire was reported at 18:18 on January 7, 2025.

Figure 3.4.47 includes a map of SCE PSPS circuit outages layered against SCE-defined High Fire Risk Tier 2 (elevated) and Tier 3 (extreme) areas. The decision to PSPS a circuit involves modeling conditions using sophisticated prediction tools that ingest historical, forecasted, and real-time data to determine which circuits meet the risk profile.

The scope of this analysis will not extend into the decision-making of circuit management before and during high fire danger periods, although ULRI understands SCE experts in this field are evaluating their processes.

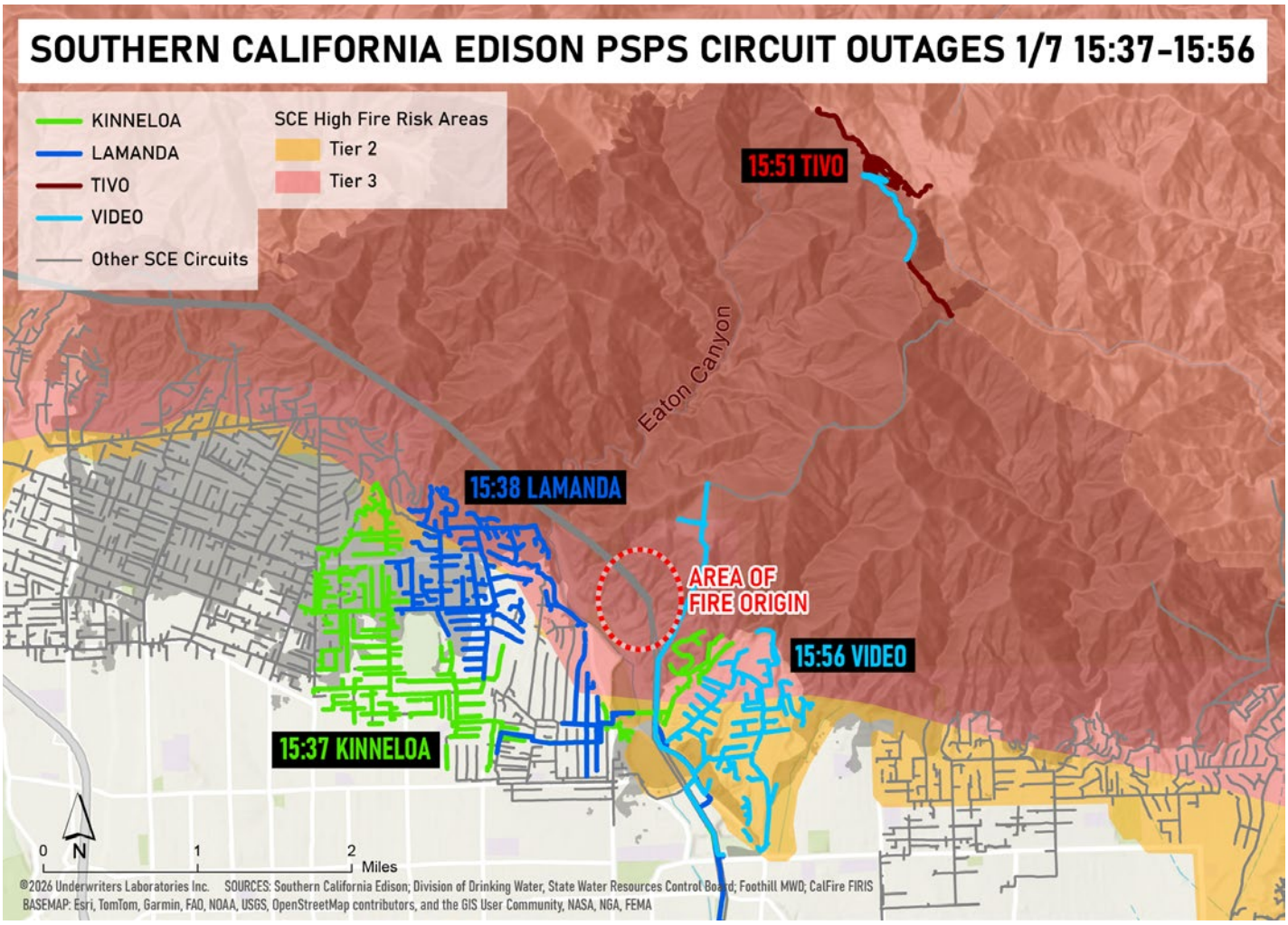


Figure 3.4.47 Map displays Eaton Fire area and the times SCE circuits were shut down as part of the PSPS due to high fire danger.

3.4.4 Findings and Recommendations

FINDING 24: The water systems in both Palisades and Eaton Fire areas consist of treated water servicing hydrants and structures..	**RECOMMENDATION:** N/A
FINDING 25: Water utilities provided the required water storage as defined by water and fire codes in preparation for the forecasted red flag event, but it was insufficient in addressing the water needs for the community conflagration.	**RECOMMENDATION 25.1:** Reevaluate agency policies to identify best practices for managing water supply and maintaining water pressure during high demand and fire impact on the system during conflagrations. **RECOMMENDATION 25.2:** Review and update drinking water system design standards to account for extreme water usage events. **RECOMMENDATION 25.3:** Utilities should perform a hydraulic analysis of their storage and distribution systems for extreme water usage events.
FINDING 26: Santa Ynez Reservoir (SYR) was empty, and although it is not required to meet daily service needs, it could have provided additional water supply for fire suppression.	**RECOMMENDATION 26.1:** Perform hydraulic modeling with details of water distribution system design and estimates of unrestricted water flow to determine the supply benefit of SYR to the system. **RECOMMENDATION 26.2:** Repair cover and return to service as soon as possible to augment firefighting capability in the Pacific Palisades area. **RECOMMENDATION 26.3:** Consider replacement with concrete tank(s) on site to avoid the potential of floating cover tears and removal from service.
FINDING 27: Some water utility structures burned, particularly tanks with wooden roofs.	**RECOMMENDATION 27.1:** Harden tanks, pumps, and SCADA systems. **RECOMMENDATION 27.2:** Add fire-resistant venting materials at the reservoirs and storage facilities and roof covers to protect timber support framing.
FINDING 28: Water utility crews had difficulty accessing their distribution system pipes, hydrants, and service zones during the fires.	**RECOMMENDATION 28.1:** Elevate the status of water utilities in the Incident Command System (ICS) such that, with proper identification, water utilities can aid emergency responders in emergency incidents and ensure water remains available during emergency incidents. **RECOMMENDATION 28.2:** Train and plan with other agencies ahead of time so they know who water personnel are and the critical role they have in maintaining a viable water supply and distribution system during conflagrations.
FINDING 29: Fire hydrants lost pressure in several locations in both the Palisades and Eaton Fires during the course of the community conflagration due to pressure and water loss in the distribution systems.	**RECOMMENDATION 29.1:** Investigate the installation of a separate fire suppression storage and distribution system (similar to San Francisco). Cost and time to develop are primary issues with this approach. **RECOMMENDATION 29.2:** Investigate the feasibility of a separate seawater fire suppression system. **RECOMMENDATION 29.3:** Isolate destroyed and burned-down areas that create water loss more rapidly. **RECOMMENDATION 29.4:** Interconnect systems in as many locations as practical to provide additional flow capability **RECOMMENDATION 29.5:** Install fire hydrants on high-pressure reservoir supply lines, where feasible, to provide direct access to stored water and increase the availability of water for firefighting operations.

3.4.4 Findings and Recommendations (cont.)	
FINDING 30: Shutting off the water meter (services) in areas with destroyed structures helped maintain water pressure in the area.	**RECOMMENDATION 30.1:** Service Shutoffs should be installed as either SCADA-controlled service shutoffs or free-flowing detection shut-off valves. **RECOMMENDATION 30.2:** Service shutoff teams could consist of firefighters paired with utility workers during a fire event as resources become available.
FINDING 31: Water tenders augmented water supply, but were in short supply early in the incident when they were most needed.	**RECOMMENDATION 31.1:** Water utility and fire agencies should coordinate to prepare a water tender staffing plan when extreme fire weather is forecasted to ensure usage during the initial action stage of the incident. **RECOMMENDATION 31.2:** Water utility agencies should ensure tender operators are trained and are provided with the appropriate PPE to operate within the operational area of a WUI fire.
FINDING 32: Alternate water sources, like swimming pools, included millions of gallons of water that were not widely used for fire suppression when hydrant pressure dropped to levels too low to withdraw water.	**RECOMMENDATION 32.1:** State and local fire agencies should collaborate to develop guidance for the strategic and tactical use of swimming pool water during community conflagrations.
FINDING 33: Water utility Mutual Aid Groups supported utilities during the fire event.	**RECOMMENDATION 33.1:** Ensure water utilities are represented in mutual aid groups for extreme water usage events. **RECOMMENDATION 33.2:** Ensure water utilities have mutual aid agreements with other utilities in the event of extreme water usage events.
FINDING 34: Drinking water was contaminated during the fires and persisted post-fire.	**RECOMMENDATION 34.1:** The decontamination procedure for drinking water systems should be reevaluated and updated periodically as needed.
FINDING 35: A lack of training was observed for extreme water-usage events (i.e., catastrophic events beyond the system design parameters) for all participants.	**RECOMMENDATION 35.1:** Develop and practice tabletop exercises for water utilities for extreme water usage events, which include utilities and fire and law enforcement agencies as equal participants.
FINDING 36: LADWP established a scalable incident command structure with core functions and City EOC coordination.	**RECOMMENDATION 36.1:** LADWP should retain this command structure as a core best practice and formalize a standing wildfire electric incident framework with predefined rosters, trigger-based escalation, and standardized shift transitions. **RECOMMENDATION 36.2:** Future records should also clearly link key decisions to ICS roles to strengthen accountability and post-incident review.
FINDING 37: LADWP did not increase pre-event staff in preparation for the extreme fire weather forecast.	**RECOMMENDATION 37.1:** Identify fire weather forecast thresholds to trigger pre-event briefings and operational preparedness staffing before the weather event arrives.
FINDING 38: Situational awareness was constrained by older infrastructure and the absence of dedicated spotter or sensor coverage.	**RECOMMENDATION 38.1:** LADWP should enhance wildfire situational awareness in high-risk areas through layered monitoring (telemetry, SCADA, cameras, and remote sensing) and defined patrol protocols, with criteria for targeted pre-positioning or intensified coverage during extreme fire conditions.

3.4.4 Findings and Recommendations (cont.)	
FINDING 39: LADWP did not implement clearly defined PSPS actions; instead, it relied on targeted de-energization, not characterized in the record as a formal PSPS program.	**RECOMMENDATION 39.1:** LADWP should standardize terminology for wildfire-driven shutoffs, clearly classifying each as PSPS, emergency de-energization, sectionalizing, or restoration hold. For each action, it should document triggers, approval, expected public safety impact, and customer messaging in real time to strengthen situational awareness, consistency, and post-incident accountability.
FINDING 40: LADWP focused customer messaging on broader weather-related notifications rather than proactive fire preparedness and the potential for de-energization.	**RECOMMENDATION 40.1:** LADWP should develop and establish a fire-related messaging program in accordance with CPUC §8387's expectation for appropriate and feasible customer notification procedures related to de-energization.
FINDING 41: LADWP appropriately prioritized electric-water-fire interdependencies, but ongoing fire activity limited access and slowed restoration in the Palisades.	**RECOMMENDATION 41.1:** LADWP should institutionalize electric-water-fire interdependency planning for high-risk service areas by developing station- and feeder-level decision matrices that identify what can be isolated, what must remain energized, what backup measures are available, and what public-safety consequences attach to each option.
FINDING 42: SCE reacted to forecasted extreme fire weather by staffing critical field operations positions and assembling a functional incident management organization.	**RECOMMENDATION 42.1:** SCE should preserve this pre-built incident posture as a standing wildfire/PSPS readiness model. **RECOMMENDATION 42.2:** Future activations should explicitly document the forecast trigger, command transition plan, and branch staffing logic so early setup decisions are easy to defend and repeat during fast-moving wind events.
FINDING 43: Several circuits west of Lake Avenue suffered outages well before pre-planned PSPS circuits were impacted by environmental conditions, suggesting more circuits, especially those west of Lake Avenue, should have been pre-identified as PSPS.	**RECOMMENDATION 43.1:** Utilize data from the Eaton Fire to improve models to better identify PSPS circuits.
FINDING 44: Within the pre-noon January 8, 2025, window, the record provided to ULRI does not clearly show the circuit-level logic used to demonstrate PSPS as a last resort versus utilizing available alternatives.	**RECOMMENDATION 44.1:** SCE should describe the early event decision record for each district or circuit cluster in PSPS scope to capture the threat picture, the operational alternatives considered, such as sectionalization, segmentation, patrol-only posture, or equipment settings, and the reason those alternatives were judged insufficient at that time.

3.5 Communications

This report discusses several fire departments that are commonly identified by more than one (1) acronym. In most sections, the more recognizable versions are used, but to ensure clarity, as well as consistency with Appendix B-1 of the *California Agency Designators by Agency in FIRESCOPE Field Operations Guide 2022* edition, the three (3)-letter identifiers will be used in operational contexts:

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)
- Pasadena Fire Department (PFD = PAS)
- Santa Monica Fire Department (SMFD = SMA)

Timely and consistent communications are integral to wildfire management, connecting all three (3) tenets of the Cohesive Strategy. This includes clear and accurate information from trusted sources, continuous communication within and among response agencies to ensure coordinated efforts, and effective public communications during an event.

Pre-event educational campaigns about critical systems, like Emergency Alert Systems (EAS), provide timely warnings and instructions, enhancing overall preparedness and response efficiency. They also educate residents about fire risks, defensible space, and evacuation procedures, ensuring proactive risk reduction and readiness. Consistent communication with land managers about best practices for vegetation management, fire prevention, and operational changes during high-risk periods also contributes to better preparedness.

During the January 2025 fires, there were several key communication tools available to, and used by, Southern California residents, government officials, and others, including the Wireless Emergency Alert (WEA) system, wireless phones, a public safety radio system, traditional landlines, voice over IP (VoIP), and satellite phones.

Several neighborhoods impacted by the Palisades and Eaton Fires had text chains and group chats among residents. This communal sharing of information preceding and during the fires was invaluable to residents, even when they were unable to get back into their neighborhoods. These groups could be as large as an entire canyon, or as small as a cluster of homes at the end of a cul-de-sac. Older adults and individuals with access and functional needs especially benefitted from these methods of communication.

California has a wildfire response communications framework that includes standardized communications planning with radio channel/frequency assignments for operational periods and statewide FIrefighting RESources of California Organized for Potential Emergencies (FIRESCOPE) guidance for Very High Frequency (VHF) radio.[74]

The performance and effectiveness of this emergency response framework varied during the Palisades and Eaton Fires due to terrain, infrastructure resilience, interoperability limitations, and uneven adoption of modern communication technologies, revealing systemic gaps in policy, infrastructure, and field execution.

3.5.1 Palisades Fire Communications

3.5.1.1 Terrain Effects on Communications

Steep topography, including the Santa Monica Mountains' deep canyons and ridgelines, most likely impacted communications during the Palisades Fire, impairing VHF radio and cellular signal propagation.

During TDs, several emergency responders assigned to the Palisades Fire mentioned challenges using various radio channels throughout the incident, while firefighters and law enforcement officers operating mostly in the flatter terrain of the Eaton Fire, experienced more reliable VHF radio communications and fewer reported failures.

3.5.1.2 Repeater Infrastructure and System Resilience

Emergency responder communications were also affected by issues with local repeaters — automated radio relay stations (typically located on mountaintops or tall buildings) that help boost low-power signals to extend the range of radio communications — like the Los Angeles City's Green Mountain repeater, which was offline during the incident.[75]

This repeater allows dispatchers to reach officers across entire areas of operation. Reports that another repeater was impacted by the fire may have also affected communications during the fire incident. Three (3) offshore repeater sites on Catalina Island did provide some support, but their signals were likely affected by the long distance of these sites from the incident area.

3.5.1.3 Fire Service Communications

LAFD and LACoFD VHF Communications

California wildland fire operations rely on FIRESCOPE's VHF-based interoperability system.[74] Although the Palisades Fire did not operate from a pre-existing mutual threat communications plan like the Eaton Fire did, the incident did transition to a VHF communications plan. Several LAFD personnel, however, reported challenges with the Palisades VHF communications plan.

The initial Palisades Fire communications plan consisted of LAFD's 800 Megahertz (MHz) channels. Anticipating the fire extending into LACoFD's jurisdiction, LAFD requested a VHF plan from LACoFD. This communication plan change required LAFD personnel assigned to the initial alarm to program their radios to the new VHF plan. In some cases, this happened while crews were en route.

LAFD personnel mentioned having limited experience using a VHF plan, which may have impacted its use and effectiveness. For example, personnel with limited training or familiarity with VHF channel organization may have had difficulty programming radios with the correct channels, especially during a fast-moving incident, when time and attention are limited.

During TDs, several firefighters shared that they reverted to using their 800 MHz channels when they were unable to establish reliable communications on assigned VHF channels. This resulted in communications not being heard by personnel assigned to that channel, and potentially missing information that could be useful in maintaining situational awareness. See "Squirrel Channel" use below.

LAFD also had limited integration of VHF into its dispatch consoles, which required dispatchers to use handheld radios with lower transmit power, reducing effective communication range with field units.

Channel Congestion and "Squirrel Channel" Use

Due to the influx of responders operating on a limited number of assigned frequencies, and the unreliability of some repeated frequencies, many fire personnel used unassigned frequencies, or "squirrel channels," to communicate.

Responders used both line-of-sight (simplex, radio-to-radio) and repeated (repeater-based) channels for this purpose. These frequencies were not part of the incident's communication plan.[76]

Squirrel channel usage, especially in large fires like the Palisades Fire, is not uncommon and can be beneficial, helping coordinate work on a channel with minimal users, identifying hazards to other teams, and reducing communication load on the IC.

For example, LACoFD used their access to the relatively new Los Angeles Regional Interoperable Communications System (LA-RICS)[77] to prepare, plan, and execute an entire parallel command structure on the Palisades Fire. LACoFD units could speak to leadership and each other over both assigned frequencies and LACoFD squirrel channels.

Using squirrel channels during emergencies, however, does come with drawbacks. Its biggest hazard is the loss of overall situational awareness with personnel on unassigned frequencies, which can result in responders missing critical alerts related to the incident, such as changes in fire behavior, spread rate, or direction.

3.5.1.4 Law Enforcement Communications

Los Angeles Police Department Communications

The Los Angeles Police Department (LAPD) operates on the standard P25 system — the primary digital two-way radio standard used by public safety and government agencies across North America — with division-specific dispatch channels in the 484-507 MHz range, with area and regional tactical channels within the same band.

The agency also maintains a 700 MHz P25 trunked radio system, which dynamically shares a central pool of frequencies across all users. This trunked system was not widely used in patrol operations at the time of the fire.

At the start of the Palisades Fire on January 7, 2025, radio communication was the main system used by LAPD. When the first LAPD officer arrived on scene, they used their regular patrol radio to report the fire and request help for evacuations. A City-Wide Tactical Alert (TA) was then issued, rapidly bringing in officers from across the city into the incident.

In response to the fast-moving incident, and during the first several hours, LAPD moved communications from routine dispatch channels to a tactical channel to better manage the growing emergency. The system though began to show strain, and LAPD communications were quickly overwhelmed by the scale of the incident.

As responders moved into the Palisades Highlands and Santa Monica Mountains, officers reported “dead spots” where both radio and cell service were unreliable, especially in hillside neighborhoods. One (1) officer explained that these gaps were caused by steep terrain and “the lack of localized cellular towers.”

At the same time, strong winds damaged power and communication infrastructure, grounded aircraft, and contributed to power shutoffs that impacted cellular networks. Cellular service worked in some parts of the Palisades Village, but quickly became overloaded with resident and responder use.

LAPD reported that communications between dispatch and field units were likely reduced due to the Green Mountain repeater being offline. Officers were forced to switch to car-to-car, simplex radio transmissions, meaning they could only talk directly to nearby units.

To keep operations moving, LAPD dispatchers began routing 911 calls through a single captain’s personal cell phone. That captain, who was also serving as the IC in the field, would take calls and then relay instructions over a short-range radio channel.

While this workaround kept communications flowing during critical parts of the incident, it also overloaded one (1) person with both command and communications responsibilities. As a result, the captain’s capacity to coordinate with fire agencies and manage the broader operation was reduced.

Later on January 7, 2025, LAPD focused evacuations in the central and eastern portions of the Palisades, where communications were somewhat more reliable. However, coordination in directing fire suppression and law enforcement resources remained difficult as the ICP was moved three (3) times in the first 12 hours (see Section 3.8.3.2 for more information on the Palisades IC).

Each move created delays, as teams had to rebuild communication setups and reestablish coordination from scratch. Responders relied on a patchwork of tools — simplex radio, cellular phones, and local knowledge — to continue evacuations and rescues.

When LAPD moved its ICP operations to Zuma Beach, new communications challenges were introduced, including limited radio and cellular coverage. It was also far from LAPD’s normal operating area, which meant officers sometimes had to drive up to an hour to travel between the Zuma Beach ICP and the fire area due to terrain and road closures.

Los Angeles County Sheriff's Department Communications

The Los Angeles County Sheriff's Department (LASD) uses the standard Ultra High Frequency (UHF) radio system with frequencies in the 480 MHz band and station-specific dispatch channels. The UHF system is also paired with Local Tactical (L-TAC) channels, which allow field personnel to communicate directly with each other without tying up busy dispatch networks.

Deficiencies in the UHF system's coverage had been identified, however, no improvements to the system had been implemented by January 2025. LASD has begun transitioning to the LA-RICS system, but at the time of the fire incident, the conventional UHF system was still in service for routine operations.

Throughout the fire period, LASD operated under similar conditions as LAPD, using multiple radio channels and cellular services from several providers. They also worked with some different tools and adaptations, such as Mobile Data Computers (MDCs). Also known as Mobile Data Terminals, these systems are vehicle-mounted computers used to communicate in real-time with a central dispatch without relying on continuous voice radio communication.

Some deputies did note these systems could be outdated and have limitations that hinder coordination during mass evacuations. During the fire incident, deputies operating outside their home station had difficulty communicating via MDC, as the system primarily displays and connects units within their assigned station rather than the station they were sent to assist. Additionally, MDCs are not interoperable with other law enforcement agencies, preventing direct visibility and communication between partner agencies.

LASD deputies described using a mix of communication methods to adapt. Some used their home station frequencies to talk within their teams, while also switching to local patrol channels to coordinate with other deputies. Others relied on cell phones or personal knowledge of the terrain. While these workarounds did result in personnel being able to communicate with each other, they also show that the incident's communications plan did not meet operational demands.

LASD personnel also benefited from connections with local community groups, including the Topanga Coalition for Emergency Preparedness (TCEP),[78] which helped share information about the Palisades Fire with residents.

When the ICP moved to Zuma Beach at approximately 19:48 on January 7, 2025, LASD had radio coverage, but "no internet ability." As such, officers had to rely at times on cell phone hotspots. The ICP move was made without fully accounting for these communication limitations, further impairing law enforcement operations.

LASD Lost Hills Station Communications

In the weeks leading up to the Palisades Fire, personnel at the LASD Lost Hills Station (LHS) had begun implementing new tools to improve wildfire detection and situational awareness during Red Flag weather events, including real-time monitoring through the ALERTWildfire camera network and locally developed "Fire Watch" capabilities.

On the morning of January 7, 2025, as dangerous, dry wind conditions increased across the region, the station activated a unique approach to monitoring fire conditions. They established a local Fire Watch command center inside the station. This was a locally developed effort that combined multiple sources of real-time information, using the California ALERT Wildfire Network — a statewide system of more than 1,000 fire cameras designed for the early detection of smoke and fire activity.

Since deputies did not have to wait for traditional dispatch reports, they were able to react within seconds, using both visual confirmation from cameras and radio communication to begin coordinating an initial response.

Information from the Fire Watch command center was quickly relayed via standard radio channels and dispatch systems to patrol units in the field. This allowed deputies to begin moving into position and preparing evacuation routes while the fire was still developing.

As the situation advanced, the coordination between real-time video monitoring and traditional radio communications became a key part of LASD's response, allowing them to create a clearer picture of the fire's movement.

This sequence of events highlights a clear lesson from the early stages of the Palisades Fire: preparedness, local innovation, early detection, and reliable communications can influence how effectively law enforcement agencies respond to emergencies.

3.5.2 Eaton Fire Communications

3.5.2.1 Fire Service Communications

Agencies that responded to the Eaton Fire did not experience the same difficulty with radio communications as those who responded to the Palisades Fire. This could be attributed to the area having more adequate radio repeater coverage, as well as the preparedness of key responding agencies, such as LACoFD, USFS Angeles National Forest Fire & Aviation Management (ANF), and the Verdugo cities.

These agencies are familiar with the Foothill Mutual Threat Zone (MTZ) Communications Plan and regularly meet to discuss wildfire/WUI operations requiring its use. Personnel from these departments are also provided with ample opportunities to use the communications plan during both annual and routine drills and actual incidents.

This preparedness and training likely contributed to the more effective use of radio communications during the Eaton Fire response, with personnel navigating more easily to assigned radio channel frequencies.

Throughout the incident, LACoFD dispatch was also able to maintain full VHF capability and used VHF channels without issue.

3.5.2.2 Law Enforcement Communications

On the evening of January 7, 2025, the Eaton Fire ignited near the LASD Altadena Station (ALD). The station was operating short-staffed, as many deputies had been reassigned earlier in the day to assist with the Palisades Fire. As the first calls came in, the department relied on its standard UHF 480 MHz radio system to coordinate the initial response.

Deputies transmitted updates over this primary dispatch frequency, while emergency calls were handled by the Sheriff's Communications Center (SCC) that quickly became overwhelmed with reports of fire spread, structure fires, and requests for help evacuating residents. One (1) deputy explained that LASD personnel had to constantly sort through incoming radio traffic, balancing routine calls with urgent, life-threatening situations.

Early in the fire incident, communication conditions began to shift as strong, erratic winds grounded aircraft, eliminating aerial surveillance. This required deputies to rely on ground-based radio communications to understand where the fire was moving and where evacuations were needed. As the response expanded, additional deputies from other stations arrived as part of Mobile Field Force (MFF) teams, creating a unique communications challenge.

At around 02:00 on January 8, 2025, deputies began receiving reports of looting in evacuated neighborhoods, forcing them to divide their radio traffic between evacuation efforts and law enforcement calls. This increased the volume of radio communications at a time when coordination was already difficult. Deputies continued to operate in active fire zones, often relying on radio check-ins to maintain situational awareness as they moved between calls.

As in the Palisades Fire, command-level communications were becoming strained as ICPs were relocated multiple times during the incident. There was no reliable internet access, no field-deployed satellite communications, and no real-time computer-aided dispatch (CAD) system available at the command level. Supervisors and command staff often relied on handwritten notes and verbal radio updates to manage operations. Efforts to bring in additional communication equipment and technical support were slow and largely ineffective in the early stages.

Throughout the incident, deputies continued to adapt their use of radio communications. Many relied on constant switching between channels, monitoring tactical channels for evacuation orders while also maintaining contact with their own units on separate frequencies.

This approach allowed them to maintain communication coverage across a wide and rapidly changing incident, even without a unified or fully integrated radio system. Deputies described this as essential to staying coordinated, especially as they worked in unfamiliar areas and shifting conditions.

3.5.3 Communications Centers and Computer-Aided Dispatch (CAD) Systems

To ensure clarity, as well as consistency with Appendix B-1 of the California Agency Designators by Agency in FIRESCOPE Field Operations Guide 2022 edition, three (3) letter identifiers (highlighted below) will be used in operational contexts.

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)

The scale of the Palisades and Eaton Fires required resources from across Los Angeles and beyond. The fires developing into major community conflagrations within the same time period was unprecedented, increasing the strain on LAFD (LFD) and LACoFD (LAC) communications centers, resource availability, and response times.

There are several dispatch centers in Southern California that either cover a specific fire department or multiple departments. LFD is dispatched by Metropolitan Fire Communications (LA Metro), while LAC is dispatched by the Fire Command and Control Facility (LA FCCF).

911 call takers and dispatchers use CAD systems to effectively manage emergency calls to ensure the right types, quantities, and closest resources are dispatched.

These dispatch systems are designed to handle typical yearly call volumes, while also having the ability to increase capabilities during llarge, dynamic incidents.

ULRI used CAD data (provided by LFD and LAC) to evaluate the impact of the Palisades and Eaton Fires on routine incident response throughout the agencies' jurisdictions, including how 911 calls originating from within the impacted areas were processed and managed by both dispatch centers and incident command. The analysis also examined how resource availability and response times to incidents outside the fires were affected.

Note: *ULRI's analysis is not designed to be directly comparative between LFD and LAC. Instead, it is considering the system response of each agency, which were operating under different resource, infrastructure, and geographic conditions during the January 2025 fires. Data availability varied between departments, as did the situational circumstances that each department faced. As such, ULRI's analytical approaches and findings reflect these differences.*

Methodology and Noted Measurements

- January 2020–2024 data is used to establish a baseline for comparison with 2025 data.
- Response times are calculated from the "Time of Dispatch" to "On Scene." On-scene times are not always an accurate reflection of the incident due to the often-chaotic environment of arriving to a scene in an incident of this scale.
- Travel distance is calculated as a straight-line Euclidean distance from the CAD's unit location at the time of dispatch to the CAD's incident coordinates. Incidents without coordinates or a unit location were not included.
- Call processing time is calculated from the "Time of Call Create" to "Dispatch." The call create timestamp in LAC data likely reflects a different point in the call intake process than in LFD. Call processing time comparisons across departments should not be treated as equivalent.
- 911 call volume is not directly measured in this analysis, only CAD data at the incident level. In other words, a single structure fire may generate multiple 911 "calls" from many unique callers. Within CAD, this presents as a single "incident," with an assigned incident number where single or multiple resources may have been assigned.
- "System" is defined as the dispatch center (LA Metro or LA FCCF) and resources available for 911 response.

3.5.3.1 Los Angeles City Fire Department

LFD's response to the Palisades Fire was markedly imbalanced between fire and EMS resources. Fire-side resources — apparatus, call-takers/dispatchers, call-processing throughput — were stretched to the ceiling of the department's capacity.

On a typical day in January, LFD responds to over 1,400 unique incidents, with unit responses averaging nearly 2,400 per day (many LFD units respond to greater than 10 incidents per day), as some incidents require a multi-unit response.

During the Palisades Fire, call volume in other parts of the city continued at a relatively normal pace, adding a layer of complexity as LFD dispatchers attempted to distinguish between calls originating within the fire impact area and those outside of it. The fire conditions depleted fleet availability, which subsequently impacted call processing and unit response times across the system.

Note on Methodology

Incident types were categorized using LFD CAD incident type details, combined with a Fire/Emergency Medical System (EMS) indicators and priority levels (1–3, with 1 being most critical) to create a broader incident category used as a proxy for incident type and severity.

Suppression unit availability was calculated as the percentage of resources available for assignment at any given time using the total number of units active in CAD. Coverage gap analysis identified first-due areas where unit displacement deviated from baseline.

LFD CAD data did not include incidents or unit response outside of the city's jurisdictional area. Mutual aid unit responses into the city were also not present in the data. This is a result of the legacy CAD system built in-house by the City of Los Angeles, in which mutual aid is likely tracked manually and stored independently.

While LFD was unable to provide mutual aid response data from their CAD, new units appeared in the data at a higher frequency in 2025 than in previous years. Based on their unit identifiers, these are likely California Governor's Office of Emergency Services (Cal OES) apparatus, reserve engines, external command staff, or USFS (units from ANF) apparatus. However, LFD stated that mutual aid does not typically exist in their CAD data.

Call Volume and Incident Type Shifts

Despite the increased need for emergency resources, incidents across the rest of the city continued at a relatively typical cadence, particularly EMS calls. While January 2025's fire incidents increased by 42%, overall call volume stayed relatively consistent with the baseline (3% increase from mean incident count) and EMS incident volume remained relatively static (-4%).

Response Patterns and Fleet Availability

In baseline years, suppression unit availability typically fluctuated between 70% and 95%, depending on the time of day. From the onset of the Palisades Fire and well into the following week, total resource availability hovered below 50%, at one point dropping to a low of 35%. This placed measurable strain on the system both during and after the fire.

Figure 3.5.1 illustrates typical resource availability across baseline years compared with availability for the same period of 2025.

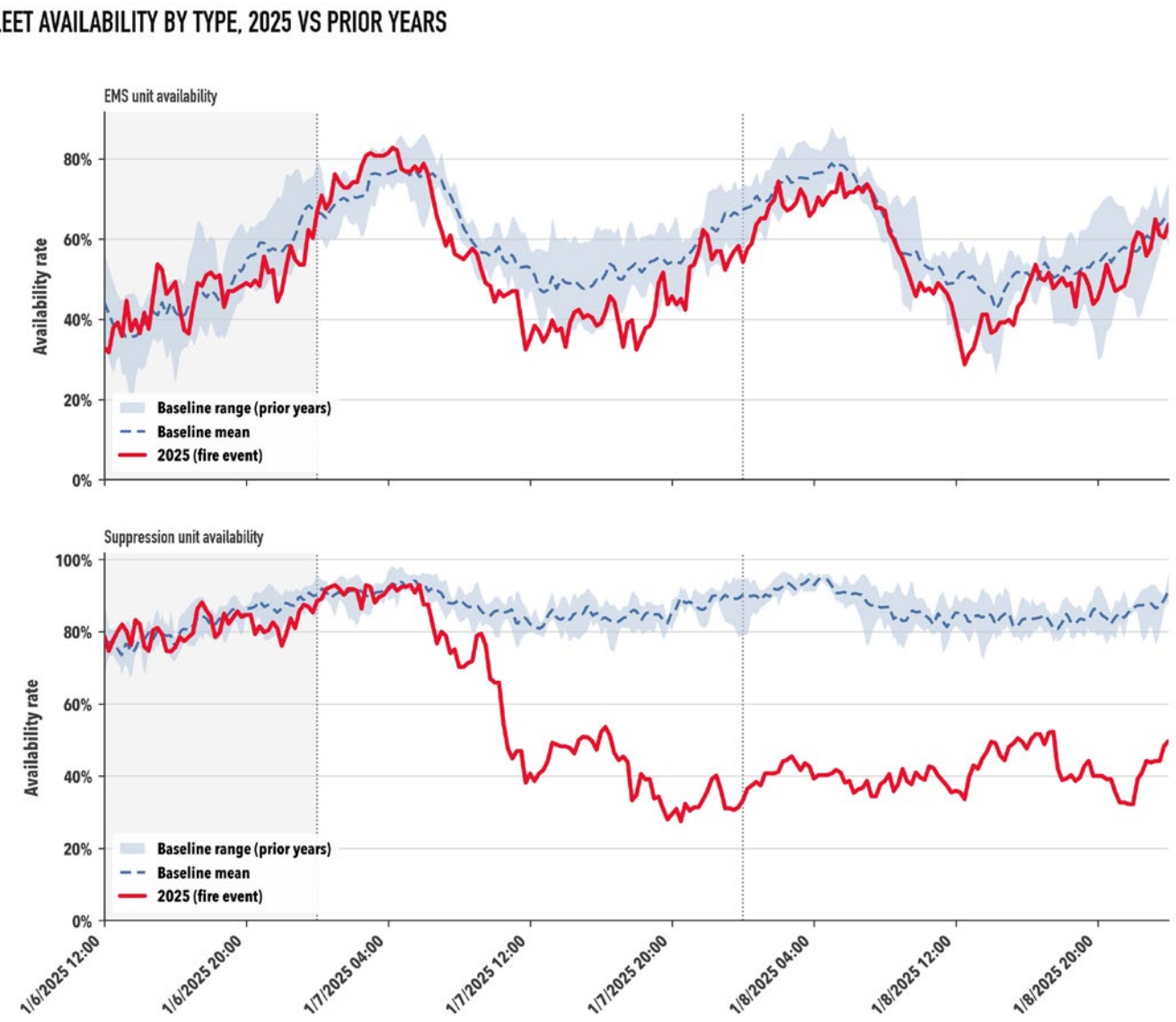


Figure 3.5.1 LFD unit availability of Emergency Medical Services (EMS) and suppression units during the incident window compared with baseline years.

On the morning of January 7, 2025, suppression unit availability began to degrade rapidly, forcing a shift in typical LFD response patterns. On a typical day, EMS response for LFD often includes fire apparatus, with approximately 56% of EMS calls including an engine.

However, for January 7-8, 2025, that number decreased to 33%. This shift can be attributed to the fire pulling suppression units into the Palisades Fire response area, with EMS vehicles and trucks absorbing most of the workload.

As a result, while total EMS call volume did not increase relative to baseline years during the fire period, response patterns were modified and a smaller number of available units were responsible for meeting the demand.

Unit Response Times and Coverage Gaps

In concert with the decline in unit availability, the Palisades Fire response led to suppression units being pulled away from their typical coverage areas, with response times increasing accordingly.

Many stations had their full home-engine roster committed outside their district for 70–100% of the first 24-hour fire period window.

In baseline years, engines typically spent very little time outside their station's response area, or "first-in district" (1̃% across all stations). During the fire period, time spend outside of a typical response area increased to 55%.

Figure 3.5.2 shows a comparison of the median percentage of time that engines spent responding to incidents (of any type) outside their first-in districts during baseline year (left) and from January 7, 2025, at 10:30 to January 8, 2025, at 10:30 (right).

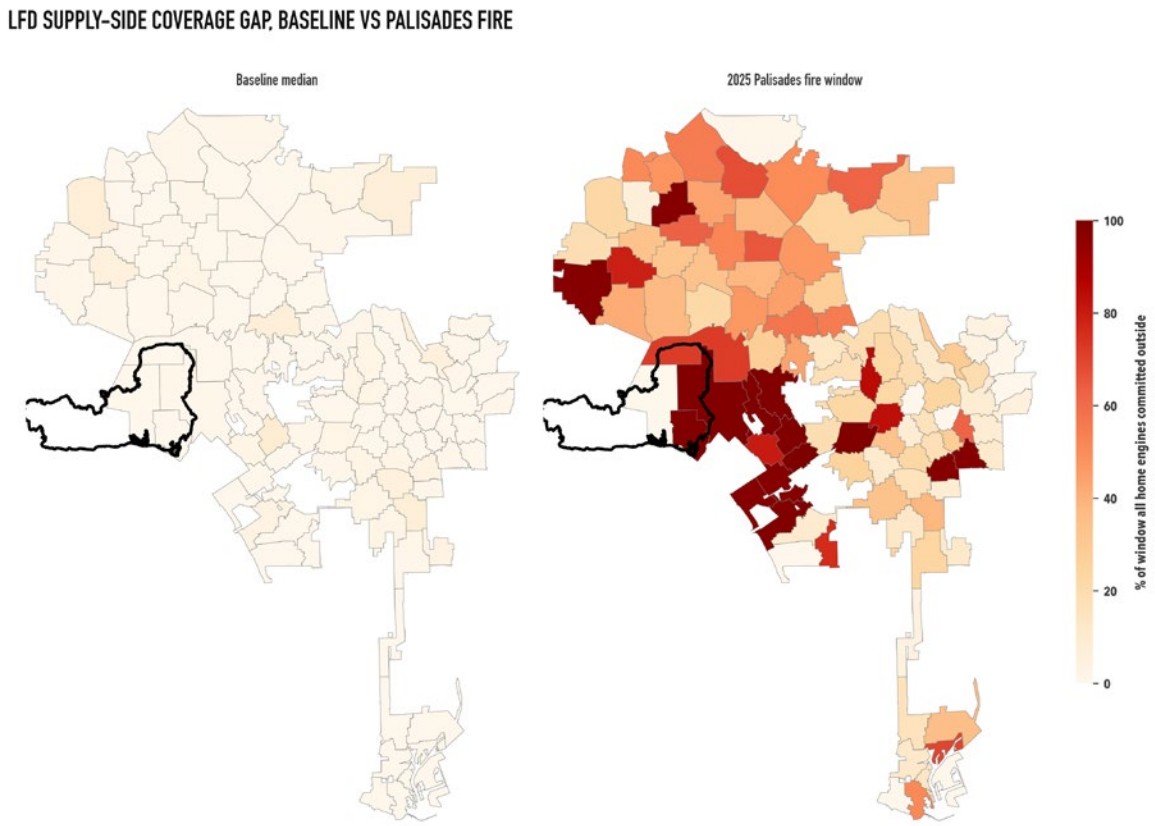


Figure 3.5.2 The percent of time LFD engines spent outside of their first due areas during the first 24-hour incident window compared to baseline. The final Palisades Fire perimeter is overlaid on the map of LFD's first due areas.

The darker red ring around the Palisades Fire incident area illustrates how nearby resources were being pulled into the response area.

As engines shifted further from their first-in districts, response times increased in tandem, though not necessarily in places where coverage gaps were at their most severe. Rather, the increase was distributed across the system, with fire and EMS responses diverging sharply during the fire period.

Fire-call travel distance grew 55–97% above baseline, while response time grew 45–57%. EMS travel distance grew 11–22% with response time increasing 13–26%.

This imbalance was due to ambulances — which are EMS-only apparatus — not being pulled into the fire response. As such, they continued operating at relatively normal travel distances, structurally insulating EMS from the engine pull that was straining the fire side.

Call-Taker/Dispatcher - Call Processing Times

Within a 911 call center, emergency communications are split between two (2) distinct roles: the call-takers who answer 911 calls and the dispatchers who manage the radio communications to field personnel. Both positions require intense multitasking and the ability to make critical decisions in time-sensitive situations.

During the Palisades Fire, call-taking and dispatch capacities were strained on the fire side, but were less affected on the EMS side, reflecting the broader imbalance in demand and available resources.

Median pickup-to-dispatch time for fire calls roughly doubled across all priority levels:

- Priority 1 (most critical): 0.55 → 1.23 mins
- Priority 2: 0.65 → 1.45 mins
- Priority 3: 0.95 → 1.85 mins

Median EMS-call processing was closer to baseline (1.05 mins for P2 and 0.95 min for P3 in both periods).

A main reason for the increase in processing time on the fire side was a large increase in call volume, as urgent fire calls nearly tripled in hourly rate (ex. Priority 1: 5 → 13 calls/hour; Priority 2: 1.3 → 3.5 calls/hour) during this time period, while EMS call volume generally held at baseline (Figure 3.5.3).

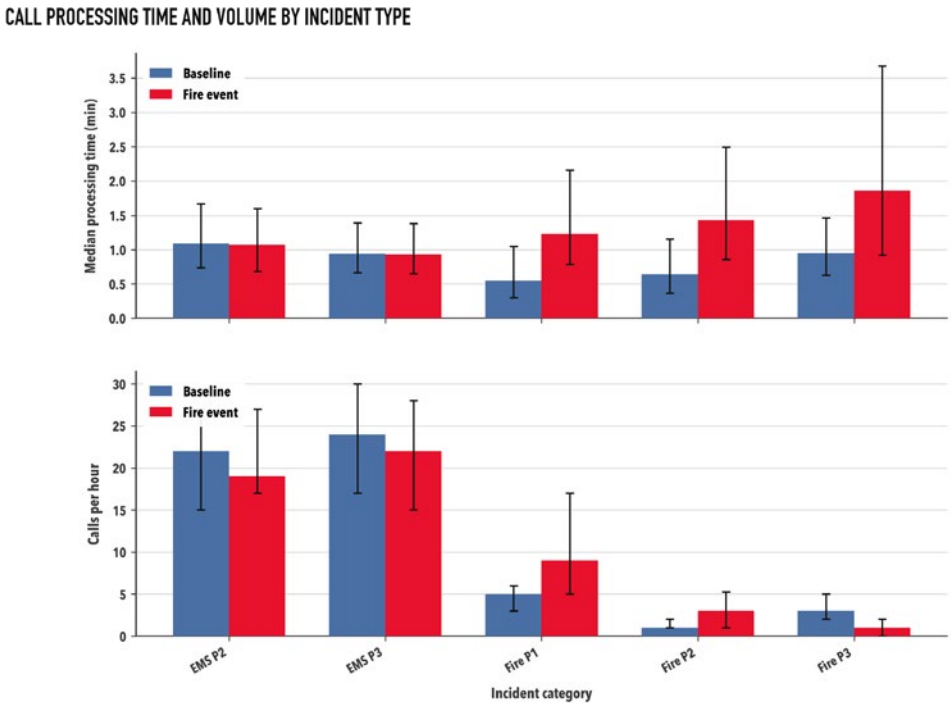


Figure 3.5.3 Median call processing times and call counts per hour during the incident window vs. baseline. P1 = Priority 1, P2 = Priority 2, P3 =Priority 3

Limited dispatcher staffing to handle this increased call volume is also a likely reason. Based on available CAD data, dispatcher staffing did not surge to meet the growing call load — 81 active dispatcher IDs were operating in January 2025 compared to 76–87 in baseline years. Call-taker positions were only modestly elevated during the fire period (36 vs 25–32). Due to fire dispatch operations absorbing roughly 3× the urgent call load with an essentially flat workforce, per-call processing time for fire roughly doubled as a result.

Finally, processing time was most likely affected by dispatchers needing to determine a call's location and then deciding whether to assign it to the Palisades Fire (location and call type sent to field ICs) or create a unique incident.

This process takes time, with dispatchers checking current and expected fire locations against maps and discussing with LA Metro personnel to determine the areas the fire may impact next.

Because response times are measured from dispatch rather than call creation, fire callers in 2025 experienced an additional delay at the dispatch stage that is not captured in the response time figures. EMS callers saw minimal processing delay compared to baseline years, resulting in no additional disruption.

Incidents and Unit Responses Within the Fire Area

At its peak, around 20:00 on January 7, 2025, more than 160 LFD units were assigned to the Palisades Fire, all of which should have been visible to the IC.

Figure 3.5.4 shows the rapid increase in units explicitly assigned to the Palisades Fire and the unit type composition of those assignments.

ULRI's analysis also found that several suppression units (up to 26) operating within the Palisades Fire impact area were not formally integrated into the incident's command structure. As a result, these units were effectively invisible to command, despite operating within the response area.

If a call came from inside the fire area, it would be assigned to the fire response. If the call came outside of the fire area then a unique incident number would be assigned, requiring an individual response by the closest available resources (those not assigned to the Palisades Fire).

Due to the increased call volume and the rapidly expanding nature of the fire incident, dispatchers had difficulty determining if 911 calls were coming from inside or outside the area of impact.

Subsequently, many calls that originated within the fire area were classified as outside of the impact area, and were assigned their own unique incident number, resources, and communications plan. These misclassifications created a vacuum in which units were effectively "dark" to incident command.

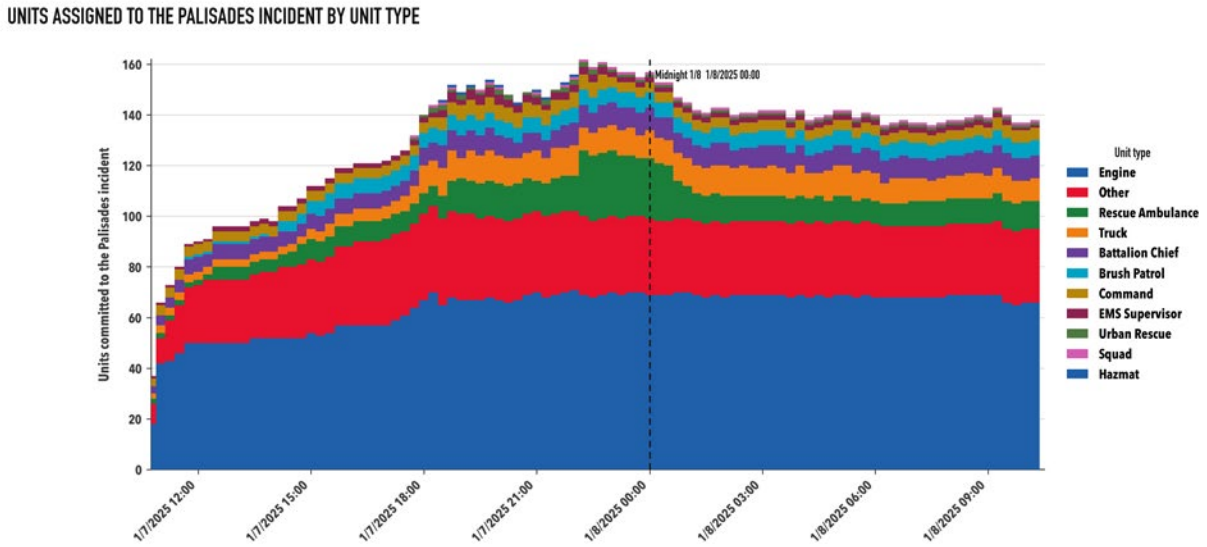


Figure 3.5.4 Count of visible Los Angeles Fire Department units committed to the Palisades Fire incident compared to the number of hours after ignition.

Using coordinates from the provided CAD data, 23 unique incidents (with unit assignments) were identified as falling within the fire impact area (Table 3.5.1). These incidents were created between January 7, 2025, at 10:30 and January 8, 2025, at 10:30. A total of 51 unique units were assigned to these incidents at any given time.

The first dark unit appeared approximately one (1) hour after the fire began at around 11:30 on January 7, 2025. The peak dark period was at 17:45 that same day, with 26 units simultaneously invisible to the IC. Dark units persisted through midnight and into the morning of January 8, 2025.

Figure 3.5.5 shows the incident location where each unit spent the most time.

Table 3.5.1 Incident type breakdown of "dark" incidents within the Palisades Fire perimeter.

Incident Type	Count
Structure Fire	6
Falls	4
Tree Fire	3
Rubbish Fire	3
Sick (No specific complaint)	2
Engine Response	2
Traffic	1
Uncons/Unresp/Near-Syncope	1
Investigation, Accident	1

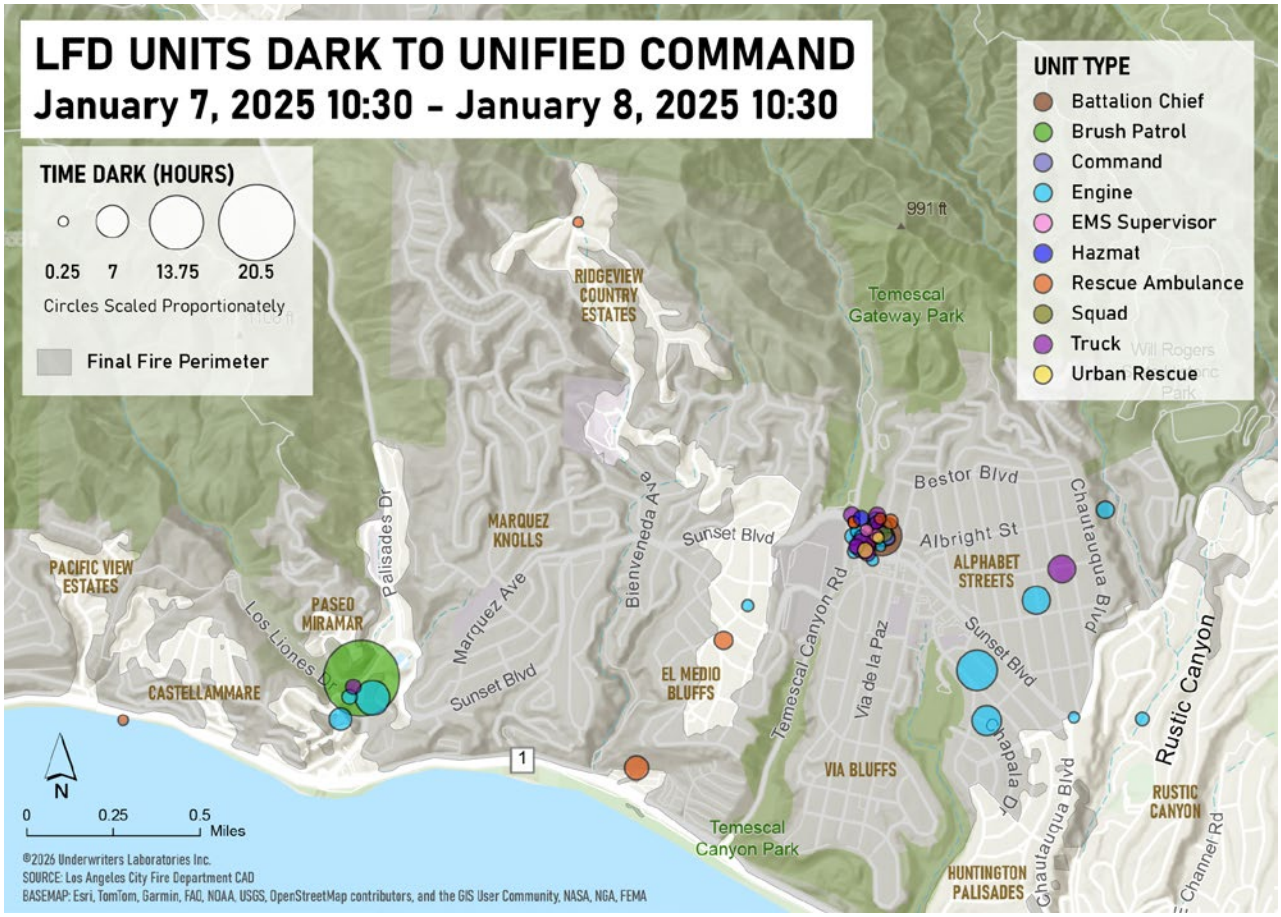


Figure 3.5.5 Map of units assigned to dark incidents, visualized by time spent dark and unit type (includes a half-mile buffer).

The supply-side picture presented here reflects internal redistribution under stress, but the full demand placed on LFD — including outbound commitments — cannot be determined from available data.

As stated previously, the CAD data did not explicitly include mutual aid, so the figure and unit counts only represent LFD units. It is likely that there were additional dark units from other agencies.

It is also worth noting that LFD almost certainly provided mutual aid to neighboring jurisdictions during this event, including potentially to areas affected by the concurrent Eaton Fire. Units dispatched out of jurisdiction did not appear in LFD CAD data as mutual aid exports, meaning this analysis likely understates the total burden placed on LFD's system.

3.5.3.2 Los Angeles County Fire Department

LAC's jurisdiction covers approximately 2,300 square miles and serves more than four (4) million residents.

During the January 2025 fires, LAC faced a complex operational challenge: simultaneously managing resources assigned to the Eaton, Palisades, and Hurst Fires, while also sustaining routine emergency services across a sprawling county-wide footprint.

ULRI's analysis utilizes LAC-provided CAD data to characterize how the Eaton Fire and concurrent regional emergencies, including county-wide wires-down incidents, affected system response outside the Eaton Fire perimeter.

The CAD data included units with mutual aid identifiers, such as PAS and USFS ANF. However, mutual aid units were excluded from most of the analyses below to show organic LAC response, including the wires-down analysis.

The provided CAD data did include LAC's own response outside of their first response jurisdiction (mutual aid provided to neighboring jurisdictions). This data is included to illustrate the overall demand placed on their resources during the incident window.

Call Volume and Incident Type Shifts

Total incident call volume outside of the Eaton Fire perimeter rose from a five (5)-year baseline (2020-2024) mean of 1,260 incidents to 1,923 incidents in 2025 — a 52.6% increase. The composition of that increase is highly imbalanced.

EMS call volume was close to baseline (7.1% increase), confirming that medical demand continued at approximately normal rates throughout the event. Fire incident call volume, by contrast, rose more than sixfold.

This surge in fire calls represents secondary fire response-related demand spread across the rest of LAC's jurisdiction, including downed power lines, brush ignitions outside the main Eaton Fire impact area, alarm activations, and neighboring fire incidents.

Incidents involving wires down increased most notably, while other utility and fire calls increased, but to a lesser extent. A more detailed analysis of wires-down incidents and call processing follows.

Response Times

Since demand outside the Eaton Fire impact area was substantially elevated both field-level response and dispatch-side processing slowed, with the strain mostly concentrated on the fire side, as several major emergencies were being managed simultaneously.

Outside the Eaton Fire area, median first-unit response time rose 24% overall, from 308 to 382 seconds. EMS call wait times slowed 18% (306 to 360 seconds) and fire call wait times slowed 36% (334 to 454 seconds).

The distribution also widened: the slowest quarter of responses expanded 40% overall (395 to 553 seconds) and 67% for fire calls (447 to 746 seconds), meaning residents with the lengthiest responses experienced considerably longer waits than the median suggests.

In plain terms, residents calling LAC for EMS or non-Eaton Fire emergencies typically waited more than a minute longer than normal during the first 24 hours of the Eaton Fire. Those whose calls fell into the slowest 25% waited roughly 2.5 minutes longer than on a comparable baseline day, and for fire calls in that slowest quarter, about five (5) minutes longer.

Figure 3.5.6 shows shifts in median response time for the top 20 call types of the Eaton Fire incident window, by volume.

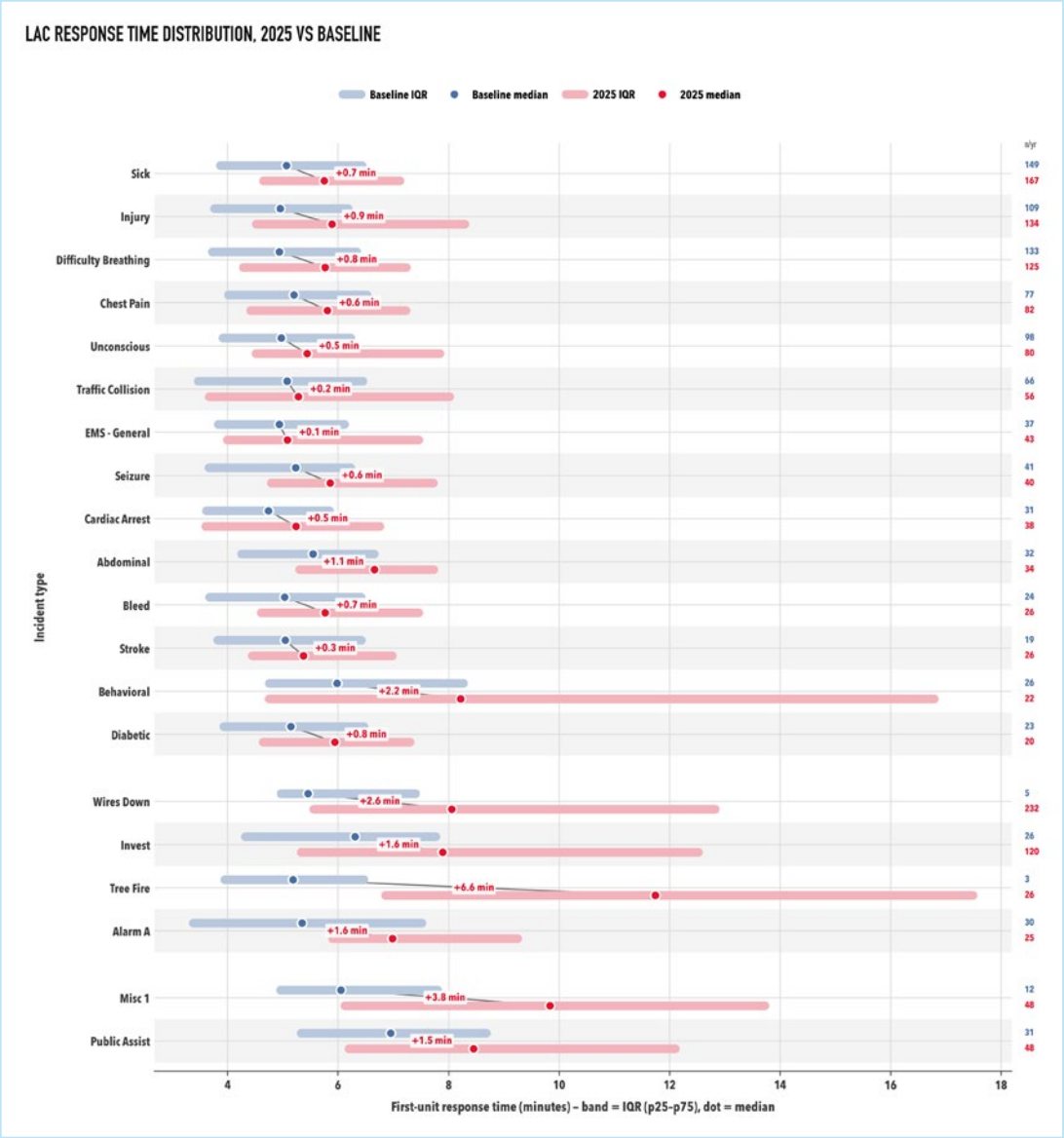


Figure 3.5.6 Shift in median response time of most common call types during the first 24 hours of the Eaton Fire. (IQR = inter-quartile range)

Call-Taker/Dispatcher - Call Processing Times

Additionally, call-processing time on all fire calls both inside and outside the Eaton Fire perimeter rose sharply during the analysis window, with seemingly unchanged dispatcher staffing. This is a clear signal that the dispatch operation was strained on the fire side. (On the EMS side, the data is less conclusive, as EMS call processing times did not rise as notably.)

Call-processing time — the interval between a call entering CAD and the first unit being dispatched — shifted sharply during the Eaton Fire window. During the time window of January 7-8, 2020-2024, median call processing (across all incident types) was about 6 seconds. In the 24 hours after the fire started at 6:30 PM on January 7, 2025, median call processing rose to 20 seconds, more than three (3) times as long as before.

Processing time for EMS calls slowed down slightly, going from about six (6) seconds to 14. Fire calls were hit much harder: a typical fire call's processing time went from about six (6) seconds to 49 seconds, roughly eight (8) times slower.

The most serious delays show up in the slowest fire calls. In baseline years, three (3) out of every four (4) fire calls were sent out within about 11 seconds. During the Eaton Fire, one (1) out of every four (4) fire calls waited more than 12 minutes before any unit was sent.

This is direct evidence that LAC's dispatch operation was strained on the fire side during the event, with the strain materializing inside the dispatch center before any unit-level response delay would have been felt in the field. It should be noted that LAC's dispatch center had also been triaging unit response into the Palisades Fire perimeter since earlier that morning.

Figure 3.5.7 illustrates the number of call takers, consoles, and dispatchers active during the incident window, as derived from the CAD data.

While call-taker counts appear to have increased during busy windows, dispatcher counts did not. This directly mirrors the sharp rise in call processing times - the responsibility to dispatch units to several large, multi-front emergencies fell to a small number of active dispatchers at any given time. Importantly, dispatcher and call-taker counts here are derived solely from CAD activity records and may not capture the full staffing picture.

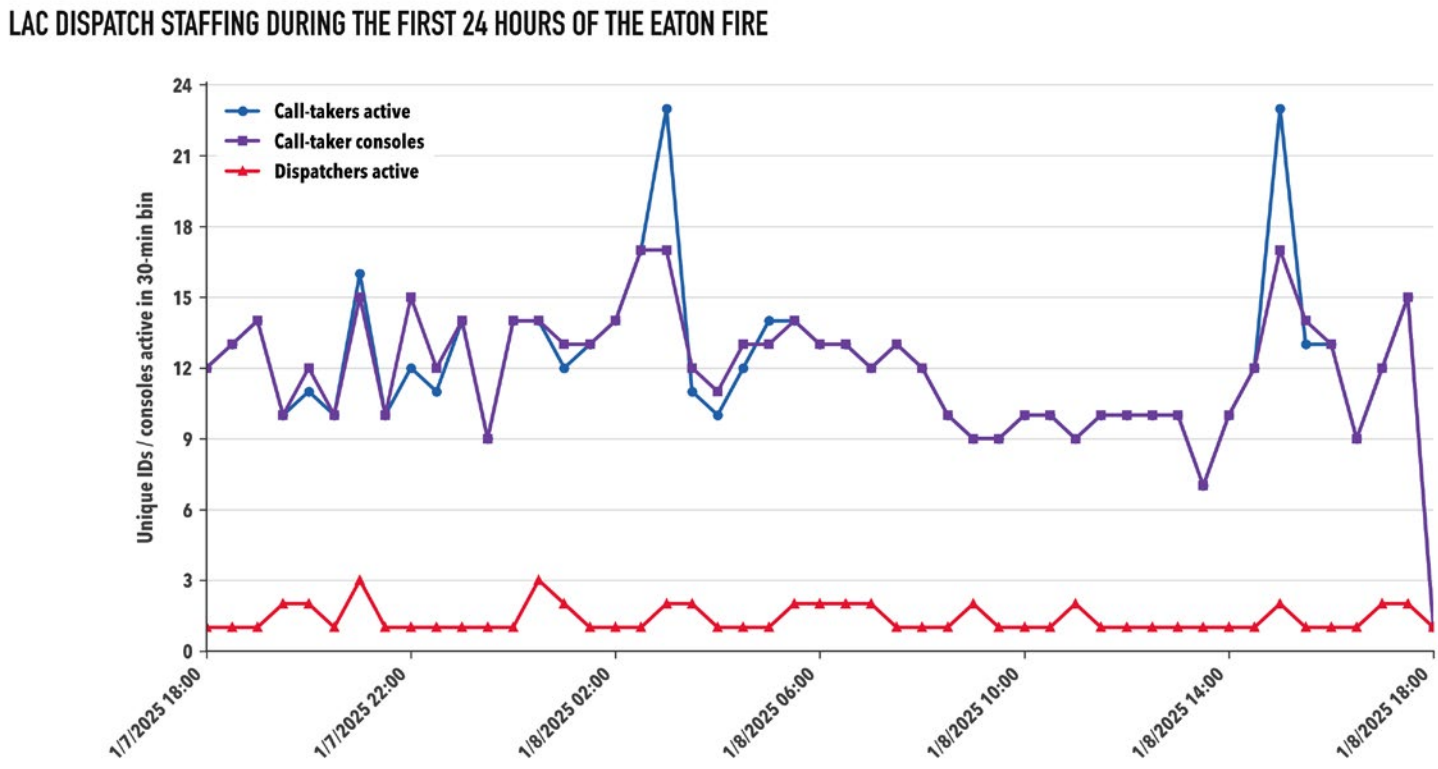


Figure 3.5.7 Count of active Los Angeles County Fire Department call-takers, dispatchers, and terminals during the first 24 hours of the Eaton Fire.

Incidents and Unit Responses Within the Fire Area

Using coordinates from the provided CAD data, 113 unique additional incidents were identified as falling within the Eaton Fire perimeter. A total of 55 unique units were assigned to these incidents at any given time. In many cases, there was overlap in units found between incidents, meaning units likely arrived on scene to one dark incident and were subsequently assigned to additional incidents within the fire's impact area.

Of the 55 dark units, 26 were also assigned to the Eaton Fire incident number at some point during the incident window. This suggests that many of the dark periods were transitional – units were likely assigned to nearby incidents prior to engaging the major incident or directly following release from it.

The breakdown of incident types that fell within the fire perimeter is detailed in Table 3.5.2.

Table 3.5.2 Incident type breakdown of "dark" incidents within the Eaton Fire perimeter.

Incident Type	Count
Wires-Down	25
Alarm R	21
Public Assist	14
Structure Fire	13
Invest	7
Tree Fire	7
Alarm A	4
Injury	4
911	4
Sick	3
EMS	3
Misc 1	2
Difficulty Breathing	2
Back	1
Grass Fire	1
Alarm CO	1
Elevator	1

Wires-Down Incidents

The county-wide wires-down incidents' operational cost was concentrated almost entirely on suppression apparatus — engines, quints, and similar suppression-adjacent units. Because the same apparatus are also primary for fire response, the pattern on wires-down scenes is functionally a suppression-capacity bottleneck during wind events. Coordination with utility providers could help free suppression capacity during concurrent wind-driven fire events, though the impact of this assistance cannot be quantified from CAD data alone.

Among the concurrent emergencies LAC managed during the first 24 hours of the Eaton Fire, the county-wide wires-down incident was the largest single contributor to outside Eaton Fire perimeter demand. Wires-down was the most common incident type, with approximately 315 calls handled during the 24-hour analysis period — substantially more than any other incident category, and a multi-fold increase over the typical baseline rate for the same time window in 2020–2024.

The wires-down incident had a clear two (2)-phase geographic signature: calls built gradually through the first eight (8) hours, surged dramatically during the overnight wind peak (118 calls between 02:00 and 08:00 on January 8, 2025), covering the entirety of eastern and central Los Angeles, lulled during the day on January 8, 2025, then resurged in the afternoon with a narrower geographic footprint (Figure 3.5.8). These surges mirror documented wind shift timing.

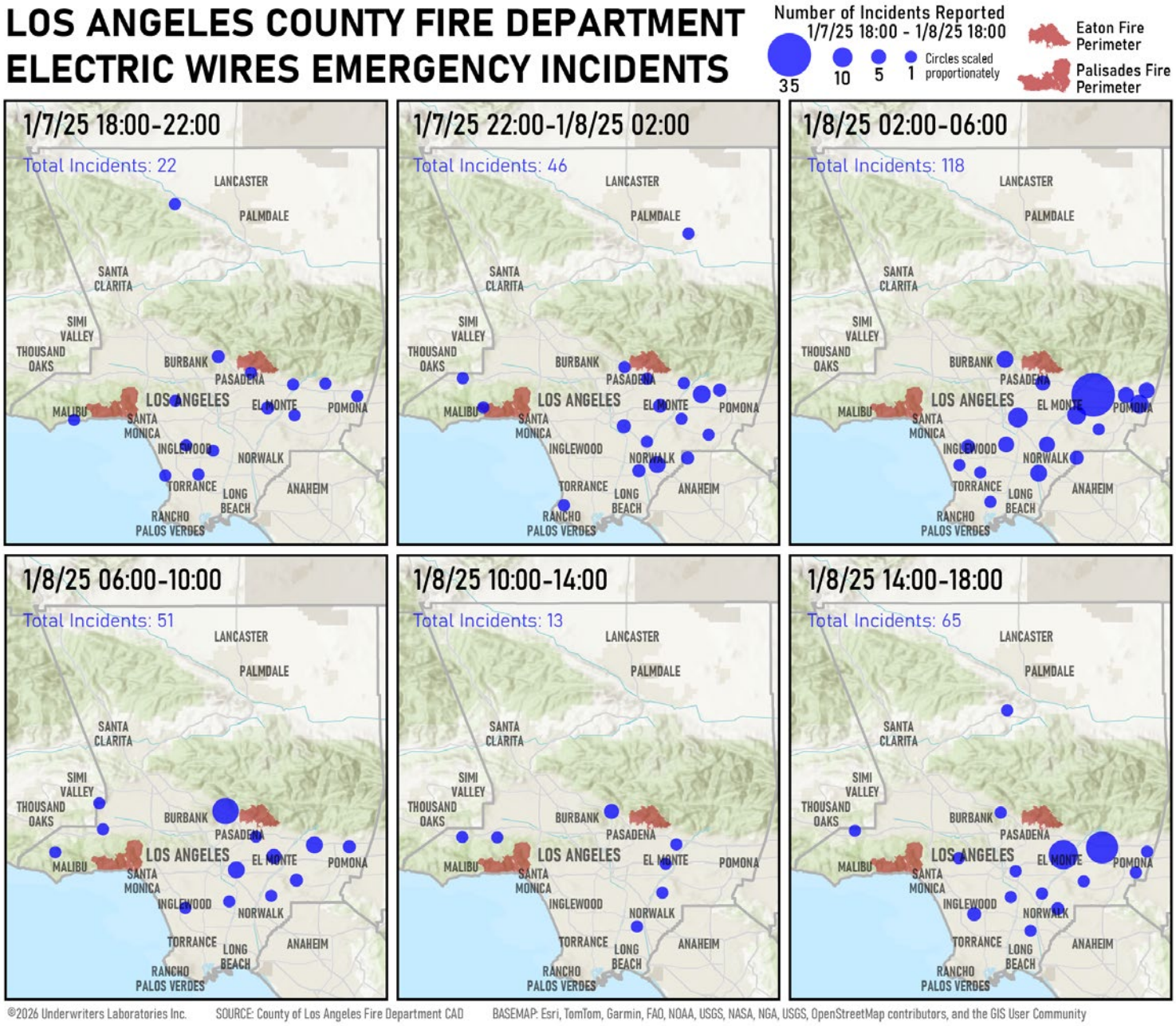


Figure 3.5.8 Map of wires-down incidents by four (4)-hour time window.

The unit-type breakdown below (Figure 3.5.9) reveals that wires-down response fell almost entirely on suppression apparatus. Of the 102 unique LAC units sent to wires-down calls, 92 (90%) were engines or quints. Some LAC CAD records on wires-down incidents lacked an on-scene timestamp (~30%) and are therefore not included in the calculations.

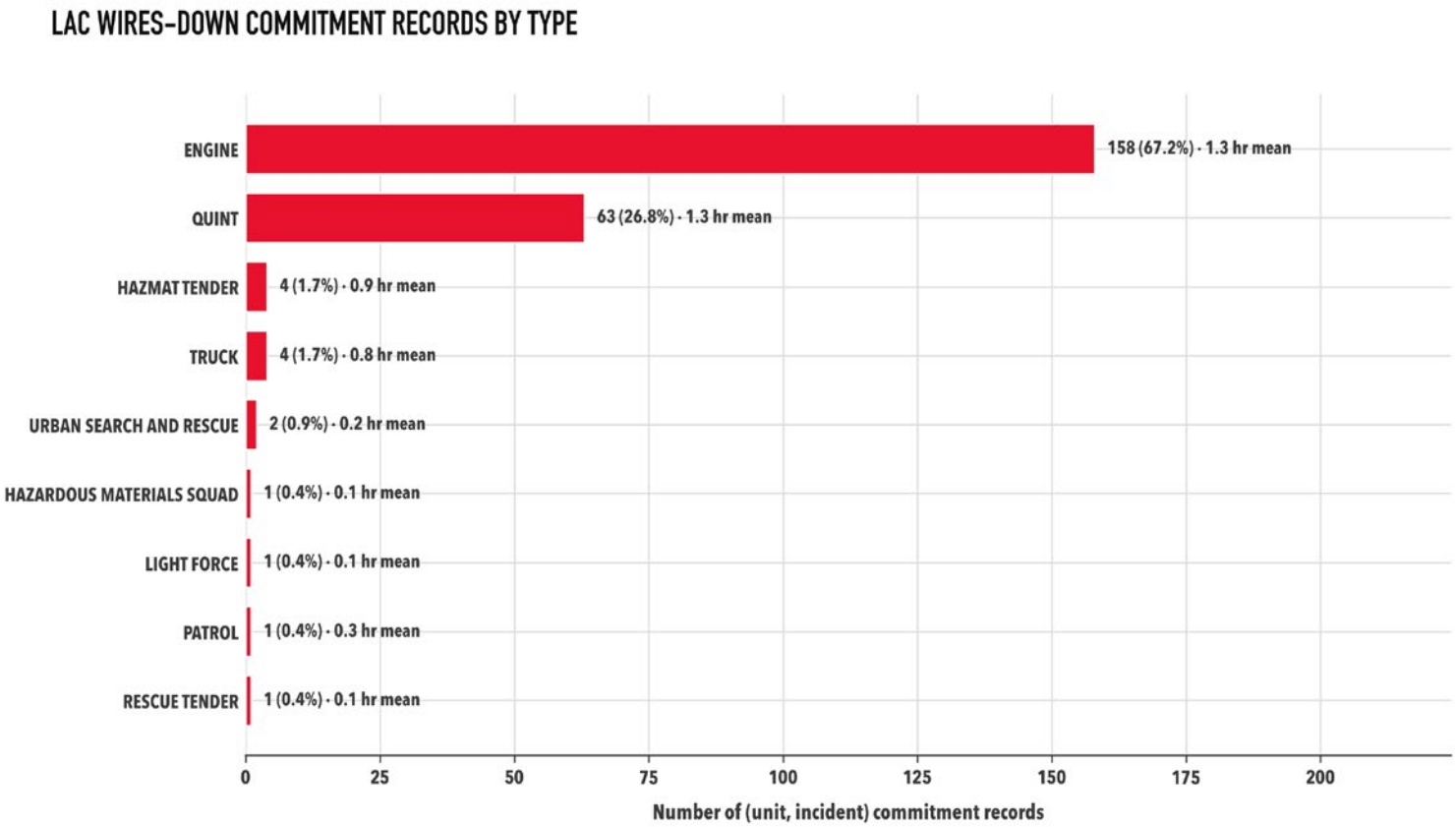


Figure 3.5.9 Resource type breakdown of units committed to wires-down incidents. The count reflects the number of commitment records — one record per unit assigned to one incident. The average number of hours spent on a wires-down incident is included for each resource type.

The wires-down incidents did not require units from a random sample of LAC's apparatus; it pulled the same category of apparatus that the department needed for every other concurrent large-scale fire emergency.

Each hour a suppression unit spent holding a wires-down scene was time that the unit was unavailable for any of the other competing demands. The wires-down incidents' operational cost is therefore best understood as suppression-capacity depletion.

All Incidents and Unit Responses Outside the Fire Area

Within what LAC's own CAD records show, the impact of these concurrent emergencies is concrete and measurable. Though not all mutual aid was captured, a significant amount of external resources arrived during the event and were tracked through LAC's system. A large internal operational footprint spanned every major apparatus category across the entire region during the 24-hour window.

During the first 24 hours of the Eaton Fire, CAD records confirm that LAC was managing a regional, multi-incident mobilization — concurrent brush fires, Palisades-adjacent response, persistent EMS demand across the basin, and routine suppression activity, none of which were committed to the Eaton Fire incident itself.

Routine medical and rescue demand continued at approximately baseline rates throughout. Figure 3.5.10 shows incidents LAC units were committed to during the first 24 hours of the Eaton Fire.

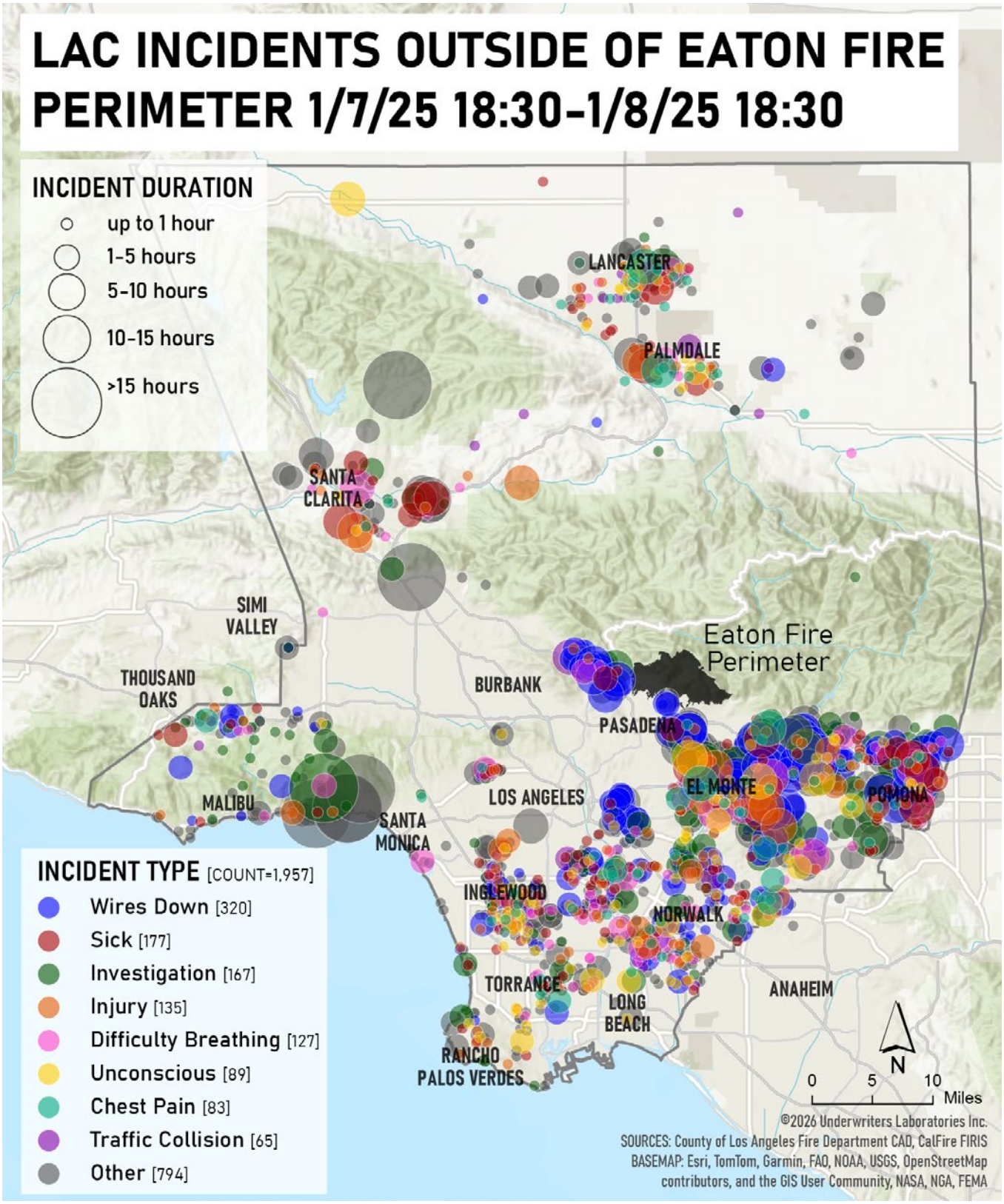


Figure 3.5.10 Incidents to which Los Angeles County Fire Department units were committed during the first 24 hours of the Eaton Fire.

3.5.3.3 CAD Insights and Implications

Loss of Visibility

One of the most notable system failures identified was the loss of command visibility — units operating within fire impact areas without being formally tied to the major incident number. This occurrence represents a breakdown in command-and-control accountability during fast-moving incidents where situational awareness is most critical.

These conditions suggest that protocols should be established to ensure all units operating within a specified buffer of a major incident impact area are formally assigned through the incident command structure, regardless of the dispatch mechanism.

Predictive fire modeling could be utilized to define probable perimeters dynamically. Standardized integration of mutual aid units into jurisdictional CAD tracking would further reduce visibility gaps during complex multi-agency incidents.

Conditional EMS Resilience

Fire-side capacity was pushed to the limits, while EMS dispatch and response remained relatively stable. This is partly because of structural insulation, not because the system was broadly resilient. The EMS stability may not hold in a future event, particularly if the demand for ambulances also increases.

In other words, system response outside the fire impact areas relied on a narrow buffer that may not hold up next time. Additional analysis is needed to understand broader system resiliency during events of this magnitude.

Dispatch Center Strain

While travel distances and response times increased as units were displaced from their first-due area, dispatch center strain may have been as consequential as field resource depletion. This highlights a systemic bottleneck that occurred prior to units ever being sent.

Dispatch center policy should be revisited to identify how to modify staffing, triage, and surge procedures during large-scale incidents. Furthermore, enhanced communication training between incident command and dispatch should be prioritized, and especially focused on how dispatch can efficiently route new 911 calls originating within the fire's impact area to field incident command.

Secondary Incidents

The regional emergency response burden outside of both fire's perimeters was greater than the major fire incident themselves, as secondary incidents were a major driver of system degradation and impact. Wind-driven infrastructure failures and secondary fire incidents consumed the same suppression resources that were needed for the major fire response.

This creates a strategic tension in which departments may plan around the main incident, while additional, significant depletion comes from distributed collateral damage.

Data Gaps and Mutual Aid Integration

These conclusions are limited by important data gaps, which may cause the analysis to understate the true burden on and impacts to these systems. These analyses likely capture the direction of system stress, but some of the most policy-relevant questions, particularly around mutual aid and regional resource load, cannot be answered with the data available.

Data standardization and CAD reconciliation across other regional mutual aid systems would be a substantive analytical step.

3.5.4 Findings and Recommendations

FINDING 45: During the Palisades Fire, rugged terrain, inadequate repeater placement, and loss or degradation of critical infrastructure created wide-ranging radio coverage gaps and unreliable communications during operations.	**RECOMMENDATION 45.1:** Expand and harden repeater infrastructure in high-risk and topographically complex areas. **RECOMMENDATION 45.2:** Pre-stage portable/mobile repeaters and redundancy systems for rapid deployment. **RECOMMENDATION 45.3:** Conduct comprehensive radio propagation and coverage modeling to address known dead zones.
FINDING 46: Palisades and Eaton Fire communications systems (radio, cellular, dispatch) were quickly overwhelmed, and insufficient redundancy forced reliance on improvised workarounds, reducing command effectiveness.	**RECOMMENDATION 46.1:** Develop surge capacity and redundancy plans for dispatch, radio, and cellular systems. **RECOMMENDATION 46.2:** Establish preplanned fallback communication pathways (radio, cellular, satellite).
FINDING 47: Lack of portable satellite-based systems, internet access, and deployable communications technology limited command and field operations.	**RECOMMENDATION 47.1:** Equip command staff with portable satellite, internet, and communications kits. **RECOMMENDATION 47.2:** Decentralize critical technology capabilities to field-level leadership.
FINDING 48: Outdated or incompatible systems (MDCs, evacuation platforms, data tools) limited interagency coordination, situational awareness, and operational efficiency.	**RECOMMENDATION 48.1:** Modernize MDC and data systems to enable cross-agency interoperability. **RECOMMENDATION 48.2:** Integrate evacuation, mapping, and tracking platforms into field systems.
FINDING 49: Communications and resource management were not executed through a single, consistently applied framework. The use of, and capability for, dispatch centers to communicate/monitor through VHF frequencies, such as LA RICS, was not universal.	**RECOMMENDATION 49.1:** LAFD leadership should commit to utilizing communication plans predesignated for multiagency response. **RECOMMENDATION 49.2:** Leadership should make efforts to engrain discipline and competence aligned with ICS-205 and NFPA communication standards.
FINDING 50: Limited interoperability (e.g., lack of universal VHF use) and frequency congestion led to widespread use of unassigned channels, reducing coordinated command communications.	**Recommendation 50.1:** Ensure full multi-band interoperability (VHF/UHF/700/800) at dispatch and field levels. **Recommendation 50.2:** Expand frequency allocations and scalability for large incidents. **Recommendation 50.3:** Enforce adherence to communications plans while providing structured auxiliary channels. **Recommendation 50.4:** Consider creating a pre-assigned MTZ communications plan for the City and County areas of the Santa Monica Mountains and other regions with similar geographic features.
FINDING 51: A Palisades wildland VHF communication plan was requested early in the incident, however, not all LAFD personnel used the channels in the plan to communicate due to a weak signal, lack of familiarity with the VHF plan, and/or lack of familiarity with the handheld radio capabilities.	**RECOMMENDATION 51.1:** Require all Los Angeles Area fire agencies to complete RTG and local agency radio communications training to ensure proficiency using VHF handheld radios to access VHF communication plan channels.

3.5.4 Findings and Recommendations (cont.)	
FINDING 52: Most agencies used alternate frequencies that were outside of the incident communication plan. When information about the fire or tactical directives was shared on these alternate frequencies, it was not heard by personnel using assigned incident radio channels, potentially compromising situational awareness.	**RECOMMENDATION 52.1:** All agencies must train to high radio proficiency standards. Personnel must be adept at radio programming, channel selection, and usage standards. To keep their incident situational awareness, personnel who migrate to squirrel channels must also monitor the appropriate incident frequencies. **RECOMMENDATION 52.2:** Formalize controlled secondary channel use within the communications plan.
FINDING 53: Hybrid communication approaches (radio + cellular + LA-RICS) and community-based information networks enhanced coordination, early detection, and public information sharing.	**RECOMMENDATION 53.1:** Formalize hybrid communications strategies within incident planning. **RECOMMENDATION 53.2:** Expand the use of interoperable systems such as LA-RICS across agencies. **RECOMMENDATION 53.3:** Incorporate vetted community information networks into emergency communication strategies.
FINDING 54: CAD data did not show an increase in 911 call center terminal use or upstaffing of call-takers and dispatchers in preparation for the forecasted fire weather. The lack of additional staff likely contributed to increased call processing times as the number of fire calls increased.	**RECOMMENDATION 54.1:** Anticipate greater call volume and increase terminal availability, upstaffing dispatch centers prior to the arrival of forecasted extreme weather.
FINDING 55: Incidents such as wires-down and secondary fire events were a major driver of system degradation, as these incidents pulled the same resources that were also needed for the major fire response.	**RECOMMENDATION 55.1:** Preparations should be made to account for distributed collateral damage during severe weather incidents. Ancillary utility response should be strategically positioned to free up suppression resources.
FINDING 56: Major data gaps exist within and between jurisdictions that understate the true burden and impact on CAD systems – particularly around mutual aid and regional resource load.	**RECOMMENDATION 56.1:** Data standardization and CAD reconciliation across regional mutual aid systems is needed to not only measure system response, but to ensure visibility and accountability of all mutual aid resources.
FINDING 57: During both the Palisades and Eaton Fires, rapidly expanding fire conditions resulted in resources being dispatched to separate incidents within the incident footprint before being integrated into the established command structure, limiting supervisory oversight, resource accountability, and situational awareness.	**RECOMMENDATION 57.1:** Implement procedures and technology at dispatch and the ICP that improve the rapid identification, tracking, and assignment of responding resources to the appropriate Branches and Divisions during rapidly expanding incidents.
FINDING 58: Fire agencies were driven to modify and reduce normal response patterns outside of major fire areas in order to maintain basic, system-wide response services.	**RECOMMENDATION 58.1:** Modification of response allowed agencies to maintain system-wide services and meet emergency demands. The patterns of modified deployment were successful and should be institutionalized for future needs. This was a best practice.
FINDING 59: EMS operations outside the fire perimeter remained mostly stable, as these fire incidents did not require a large-scale EMS response. This stability may not hold in a future event.	**RECOMMENDATION 59.1:** EMS mutual aid support should be prioritized when planning for large-scale fire events.

3.6 Wildfire Leadership, Culture, and Training

3.6.1 Interagency Relationships and Culture

ULRI's analysis of interagency relationships and culture relies primarily on preparedness and response data, document review, and TDs conducted with agency decision-makers and SMEs. No formal study of organizational culture or surveys of rank-and-file personnel were included in this analysis. Any evaluation of departmental culture should be understood as evidence-based interpretations rather than findings from a purpose-built cultural assessment.

The topics addressed in this section focus mainly on areas related to the Palisades and Eaton Fires, and do not cover other areas unrelated to wildfire and/or WUI response. Areas outside of this focus, whether positive, or conversely, where improvements may be needed, will not be covered.

It should be noted that across all agencies, a common cultural trait was people's desire to help, take initiative, improvise, and engage in life-saving operations during a fast-changing, and at times dangerous, incident.

3.6.1.1 Fire Service Agencies

Los Angeles City Fire Department

LAFD is the third-largest municipal fire department in the U.S., protecting a jurisdiction that includes significant WUI exposure and approximately 136,960 acres of wildland area.

The department's organizational focus is primarily centered on structural firefighting and dense urban emergency response. TDs with department members consistently highlighted that wildfire preparedness, regional wildland integration, and statewide wildfire coordination programs were not prioritized at the same level as surrounding regional agencies.

While LAFD maintains highly capable structural firefighting and all-risk emergency response operations, the department's participation in many elements of California's statewide wildfire response system has fluctuated over time, reflecting periods of increased and decreased engagement.

This included periods of reduced engagement in areas, such as regional wildfire training and cooperative wildfire preparedness initiatives. The department also discontinued portions of the California Incident Command Certification System (CICCS) qualification program and provided inconsistent participation in regional training efforts, such as the Regional Training Group (RTG), which represents a nationally recognized framework for standardized regional wildfire training and interoperability.

This reduced involvement in these key initiatives limited opportunities for personnel to gain operational experience on regional incidents, develop interagency relationships, and remain aligned with changing wildfire tactics, technology, and command procedures used throughout the state. See Appendix Section 6.3 for more information.

Numerous TDs identified a culture that viewed LAFD as largely self-sufficient and operationally independent. While this philosophy may have historically served the department well in urban emergency response, it created challenges during the Palisades and Eaton Fires, which required regional coordination, mutual aid integration, and Unified Command (UC) participation.

Additionally, LAFD operates with a significant gap in qualified personnel and depth of wildfire-specific training, which had a direct impact on incident management during the early operational periods of the Palisades Fire.

The department lacks sufficient numbers of CICCS-qualified personnel across command and general staff positions, and in several cases, individuals were assigned to roles in the fire incident without the necessary training, qualifications, or experience in wildland or wildfire incident management.

LAFD had discontinued CICCS training participation for the decade prior to the Palisades Fire, and existing qualifications were not maintained. While personnel worked within their capabilities and demonstrated commitment to the incident, the absence of depth in qualifications and limited exposure to complex wildfire operations contributed to challenges in establishing an effective incident organization, managing resource ordering, and integrating into standardized ICS processes.

During TDs, personnel discussed why the agency responded to Red Flag and PDS warnings with only a limited increase in staff, citing fiscal pressures, staffing shortages, apparatus maintenance needs, and citywide budget constraints. These were on top of requirements to submit operating budget reductions and closely monitor overtime expenditures tied to staffing, training, and program management.

While these fiscal constraints can limit staffing flexibility, keeping 42 ladder trucks in service as extreme fire weather approached Los Angeles underscores the department's continued cultural emphasis on structural response. Instead, there may have been cost-efficient opportunities to staff additional Type 1 engines with on-duty personnel that were not fully considered.

In preparation for the incident, LAFD primarily utilized state-funded, pre-deployment resources and added only a limited number of additional department-funded engine companies despite the severity of the forecasted weather conditions.

TDs also identified inconsistencies among executive staff regarding recall authorities, staffing policies, and historical department practices related to emergency staffing expansion.

Unlike neighboring regional agencies, LAFD did not maintain a fully integrated IMT culture. The agency was developing a local (Type 3) fire IMT, which was not fully operational at the time of the fire.

That team was deployed to the Palisades Fire, but was not tasked with command because of its trainee status. The LAFD FIMT was successful in generating an IAP and conducting an Operational Briefing by the second operational period.

TDs revealed uncertainty among leadership regarding activation thresholds, IMT utilization, and confidence in the department's IMT readiness. As a result, the agency's IMT was activated later in the incident, and primarily assisted with transition planning for the incoming CAL FIRE team.

In contrast, neighboring agencies that actively participated in California's statewide wildfire system demonstrated stronger interoperability, rapid IMT mobilization, and greater familiarity with regional command practices, technologies, and the deployment system.

LAFD's independent-minded culture affected interagency integration during the Palisades Fire as well. Multiple regional partners described difficulty integrating into the LAFD command staff during the early phases of the incident.

As additional mutual aid resources arrived, experienced regional partners reported they were not readily incorporated into the ICS, reducing situational awareness, slowing command development and communications, and limiting cooperative decision-making. Several agencies reported that LAFD command prioritized jurisdictional control over rapid integration of external command and operational resources.

As the fire crossed from the City of Los Angeles into Los Angeles County, this operational disconnect contributed to a division between city and county response systems. TDs revealed that several county and regional partners began coordinating operational plans outside portions of the established LAFD command structure due to concerns regarding incident organization, command tempo and adaptability, interagency communications, and overall strategic coordination.

Overall, LAFD's response to the Palisades Fire highlighted that current organizational priorities, staffing practices, wildfire preparedness culture, and limited participation in statewide wildfire systems have not equipped the agency to handle large-scale community conflagrations with the necessary level of operational effectiveness required. These conditions were not isolated to a single administration or leadership team, but rather reflect organizational decisions and cultural priorities that evolved over years.

The January 2025 fires reinforced that fire response to fast-moving fires in and near the WUI requires extensive pre-incident preparedness, regional integration, and participation in statewide wildfire coordination systems. No individual department or agency within California can independently manage a large-scale, wind-driven community conflagration without substantial assistance from regional mutual aid partners and an interoperable command structure.

To ensure a more effective response during future fire incidents, the City of Los Angeles should reassess and prioritize its wildfire mission to be more in line with the city's current and projected wildfire risk. This includes reinvestment in wildfire preparedness, regional integration, command training, CICCS qualification, IMT development, mutual aid participation, fleet readiness, staffing appropriate apparatus that match the risk, and regional interoperability programs.

Los Angeles County Fire Department

LACoFD provides all-risk emergency services for more than 4.1 million residents and protects 72 miles of coastline.

TDs consistently described LACoFD as having a deeply established wildfire culture. Wildfire preparedness and regional wildfire integration were widely viewed as core operational priorities throughout the organization. These discussions frequently referenced the 1993 Old Topanga and Kinneloa Fires as transformational events that altered the department's long-term operational philosophy.

These incidents destroyed hundreds of homes and rapidly traversed the Malibu and Altadena areas. Following the fires, department leadership expanded wildfire preparedness efforts, increased investments in specialized equipment and training, strengthened regional integration, and further aligned the organization with California's statewide wildfire response system.

This organizational culture was evident during the January 2025 fires, as LACoFD demonstrated a proactive operational posture that included pre-deployment planning, off-going shift holdovers, early IMT readiness, and advanced coordination among command staff prior to the onset of the wind event.

LACoFD maintained operationally integrated IMTs that routinely trained together and rotated on-call responsibilities for major incidents. Prior to the Eaton Fire, LACoFD IMT personnel met in person to coordinate planning and wildfire readiness operations. When the incident occurred, the team self-deployed to initiate the command transition and ICS activities.

LACoFD leadership demonstrated familiarity and understanding with statewide wildfire mobilization systems, mutual aid coordination, and regional resource ordering practices. Executive leadership acknowledged the significant fiscal impact associated with pre-deployment staffing decisions but stated that operational risk and firefighter and community safety were prioritized over potential overtime costs given the forecasted severe weather conditions.

TDs also highlighted the department's regional relationships and operational integration with surrounding agencies. LACoFD personnel routinely trained and coordinated with neighboring fire departments through regional programs, IMT participation, RTG involvement, and mutual aid systems. This operational familiarity improved interoperability during the simultaneous Palisades Fire, Eaton Fire, and other regional fires.

Despite LACoFD's strong wildfire culture, IMT structure, and proactive pre-incident readiness, the complexity, speed, and scale of the Palisades and Eaton Fires exposed deficiencies in the agency's ability to maintain situational awareness, account for resources, and work effectively with all UC agencies. A fully functional UC structure with clearly defined roles and responsibilities is crucial to support effective evacuation operations in incidents of this scale.

LACoFD has continued to invest in CICCS training, particularly at the company officer and mid-level supervisory ranks. Agency personnel have demonstrated solid foundational ICS capability, and the department has maintained a level of consistency in developing qualifications at the lower and mid-level positions. However, ULRI analysis did find a reduction in depth at the higher levels of incident command.

3.6.1.2 Law Enforcement Agencies

Los Angeles Police Department

LAPD is the third-largest municipal police department in the U.S. and serves approximately 3.8 million residents within the City of Los Angeles. At the time of the fires, LAPD maintained more than 9,800 allocated sworn positions but was experiencing staffing shortages. The department possesses extensive experience managing large-scale protests, civil disturbances, special events, and complex urban policing operations.

TDs and after-action materials shared with ULRI indicated that LAPD historically viewed wildfire incidents as fire department-led events where law enforcement served a supporting evacuation and traffic management role. This operational perspective influenced preparedness, training priorities, and command integration during the Palisades Fire.

LAPD utilizes an internal training model centered on departmental systems and urban law enforcement operations. TDs revealed that participation in regional wildfire preparedness initiatives and interagency coordination practices, as well as adoption and training on wildfire-specific technologies commonly used throughout California, was not prioritized within the agency prior to the January 2025 fires.

This became evident with the department's lack of familiarity with the Genasys evacuation mapping platform, which was used by surrounding regional agencies. Although this technology gap did not prevent field-level operations, it created inefficiencies within command and evacuation coordination functions during the early operational periods at the Palisades Fire.

LAPD did not initially establish an independent command post and relied heavily on informal coordination with LAFD during the fire's early operational period. TDs revealed frustration among field supervisors regarding limited situational awareness from command personnel who were not physically present within impacted fire areas.

Within LAPD, lower-ranking members were initially deployed to the Palisades ICP who lacked an understanding of their command role. Later, senior officers were assigned who did not possess advanced command training, significant wildfire experience, and who were not empowered to represent the city.

LAPD UC representatives were frequently changed, limiting the development of a cohesive UC team. Key decisions regarding evacuation and site access control lagged or were forced to wait while LAPD representatives took UC input to city executives for further review.

TDs also revealed disconnects between leaders' intent and field-level training dissemination. While LAPD leadership stated that wildfire-related guidance and Red Flag preparedness information had been distributed electronically prior to the incident, many field personnel reported they did not recall receiving wildfire-specific operational direction or recent wildfire preparedness training.

Despite these challenges, TDs consistently highlighted the field-level performance of LAPD personnel during the fires. Officers self-deployed into rapidly deteriorating fire areas, initiated evacuations without waiting for formal direction, improvised traffic control strategies, and conducted life-saving rescues under dangerous conditions and rapidly changing fire behavior.

Several officers and supervisors developed or improvised operational solutions to compensate for technological and command limitations. One (1) field supervisor independently escalated the "City-Wide Tactical Alert" process after recognizing the severity of the incident. Another developed a workaround using cell phone photographs of evacuation maps to rapidly distribute evacuation intelligence to field personnel.

LAPD also relies heavily on internal staffing models. These models have been effective during past incidents, which has led to a culture of not utilizing California's formal law enforcement mutual aid system. During the Palisades Fire, LAPD initiated a TA. The TA is a department-wide emergency mobilization that increases staffing and operational readiness by retaining on-duty personnel, reallocating resources, and restricting non-essential activities to support major incidents such as wildfires, large-scale evacuations, and other emergencies. The TA system initially proved effective during the early operational periods of the fire, but created significant staffing strain during the prolonged 29-day incident.

TDs revealed that LAPD leadership did not initially consider statewide mutual aid requests despite sustained operational demands requiring hundreds of officers daily.

The Palisades Fire highlighted opportunities to improve LAPD's limited wildfire preparedness integration, cultural reliance on internal deployment systems, and reduced engagement with regional wildfire coordination programs. By learning from these experiences, the agency can refine its command efficiency and interagency interoperability to better respond to these types of rapidly escalating incidents.

Los Angeles County Sheriff's Department

LASD is the largest sheriff's department in the U.S. and provides law enforcement services across approximately 4,060 square miles. At the time of the fires, LASD maintained more than 9,700 allocated sworn positions, while also experiencing staffing shortages.

LASD has an established wildfire preparedness culture shaped heavily by prior wildfire experiences, particularly the 2018 Woolsey Fire.

TDs revealed that the Woolsey Fire substantially influenced LASD's operational culture regarding wildfire preparedness, evacuation planning, and community integration. Several personnel described a shift toward proactive wildfire planning, community engagement, and closer operational coordination with LACoFD following that incident.

This preparedness posture was particularly evident within the Malibu and Lost Hills areas, where station leadership implemented proactive wildfire mitigation and preparedness measures, including soft road closures, voluntary school closures, Fire Watch programs, temporary command post concepts, and extensive community coordination prior to Red Flag events.

LASD also has strong operational integration with LACoFD. TDs consistently described close working relationships between sheriff personnel, county fire personnel, and local community stakeholders in wildfire-prone areas, especially in Malibu and Lost Hills.

The agency also maintains a strong culture of organizational self-reliance. LASD relied heavily on internal staffing and deployment systems during the fires. The department utilized its MFF model to surge staffing into affected areas, though TDs acknowledged this model was better suited for preplanned events and created travel and mobilization delays during rapidly evolving emergencies.

Although LASD serves as the Regional Mutual Aid Coordinator (RMAC) for Cal OES within the Los Angeles Basin, TDs revealed that the department did not formally request statewide mutual aid resources, despite prolonged operational demands associated with the Palisades and Eaton Fires.

Command personnel noted that many leaders believed existing internal systems would be sufficient, despite escalating operational fatigue and staffing demands. This reflected a longstanding organizational belief that the department could independently manage large-scale incidents without outside assistance.

While LASD generally demonstrated considerable wildfire preparedness and interagency coordination, the fires still exposed gaps involving UC integration, command post co-location, and statewide mutual aid utilization during these prolonged, large-scale wildfire events.

Agencies must continue to strengthen how they work together during evacuations and UC operations, particularly during fast-moving incidents where fire behavior, public warning, traffic movement, rescue needs, and law enforcement priorities are rapidly changing.

Effective evacuation operations require all agencies to operate from both a functional UC structure and clearly outlined and understood objectives. To achieve this, agencies must prioritize early co-location of fire and law enforcement command personnel, as well as direct and consistent communication between operations and evacuation leadership.

3.6.1.3 Regional Interagency Coordination

The Palisades and Eaton Fires exposed significant challenges involving regional interoperability, UC operations, and interagency coordination between fire service and law enforcement agencies.

Although all participating agencies possessed highly capable, expert personnel, TDs revealed that several organizations did not have extensive experience in coordinating an integrated, regional response to large, rapidly evolving fires like those that ignited in January 2025.

UC relationships between fire and law enforcement agencies were inconsistently established during the early operational periods of these fires.

As such, multiple TDs identified delayed command integration, inconsistent sharing of situational awareness, fragmented communication, and limited co-location among command personnel as key issues during the fires. These issues were compounded by organizational cultures that, at times, favored self-reliance, differing operational philosophies, inconsistent participation in statewide wildfire programs, and limited interagency training relationships prior to the fires.

TDs identified RTG as a valuable regional coordination mechanism that could further improve interoperability, common operational practices, and mutual aid effectiveness if broadly adopted and supported across all participating agencies.

As the Palisades and Eaton Fires demonstrated, large-scale wildfire incidents require sustained regional coordination, interoperable command structures, well-developed UC relationships, and extensive pre-incident collaboration among all participating agencies.

These incidents also reinforced that an effective response to a major, wind-driven community conflagration requires extensive reliance on regional partnerships and California's statewide mutual aid system.

3.6.2 Training

Strengthening competencies in UC requires sustained commitment to regional training, interagency relationships, and a mutual operational mindset. Regional exercises and cross-agency engagement build trust and help improve coordination during real incidents.

Additionally, embedding qualification systems, such as CICCS into promotional processes, command staff development, and out-of-county deployment opportunities, supports a culture of competency and readiness.

Incident Command System Training

CICCS-qualified personnel are critical to the successful management of an incident by providing common organizational, safety, assessment, and deployment methodologies. Across both the Palisades and Eaton Fire responses, TDs and analysis confirm that ICS proficiency and CICCS-aligned qualifications for key personnel contributed to functional incident management organizations throughout the incident.

CICCS training programs receive broad participation by the vast majority of fire agencies in the state, and ensure statewide continuity and successful fulfillment of ICS positions and incident management during emergency incidents.

It is important to recognize that the individuals assigned to command roles during both the Palisades and Eaton Fires were seasoned command officers who routinely and successfully manage complex incidents within their jurisdictions. They are experienced leaders who operate in demanding environments on a daily basis.

However, the scale, complexity, and dynamics of a large, wind-driven wildfire present a different operational problem set that requires specific experience, repetition, and familiarity that cannot be replicated through routine daily operations alone.

This gap reflects a broader, departmental reduction in training engagement and qualification sustainment over time for several agencies. LAFD, for example, has not maintained consistent participation in statewide and national wildfire qualification systems, and the number of personnel holding active CICCS qualifications has significantly diminished.

The number of LACoFD personnel holding advanced CICCS command and general staff qualifications has also declined, limiting the available pool of experienced senior leaders capable of filling key roles during large, complex incidents. This was highlighted by the agency's difficulty in maintaining continuous staffing for its three (3) internal IMTs.

LAFD's limited engagement in CICCS training opportunities, reduced participation in qualification pathways, and insufficient opportunities for operational repetition contributed to its reduced level of preparedness for an incident of this complexity. As such, these conditions had a substantial impact on early incident performance at the Palisades Fire, particularly before the integration of external IMT resources.

These observations reflect broader system-level challenges affecting both agencies. The CICCS qualification framework remains a foundational component of California's wildfire response system, but it has not evolved at the same pace as the operational and organizational demands placed on today's fire service.

Personnel in both LAFD and LACoFD operate in environments with substantial daily demands, managing high call volumes, complex urban incidents, administrative responsibilities, and multiple collateral assignments. These demands are ever-present and ongoing, and they directly compete with the time and focus required to complete and maintain CICCS qualifications.

The current model, which relies heavily on time, task books, and extended mentorship, often requires years to achieve higher-level certifications and does not consistently align with modern workload realities or career timelines.

Additionally, opportunities for meaningful incident experience, critical for building and sustaining proficiency, remain limited and inconsistent. At the same time, alternative methods of training and competency development, including simulation, web-based learning, and hybrid delivery models, represent important and necessary enhancements to the system.

These methods should be leveraged to expand access, increase frequency of training, and improve overall preparedness, while complementing, not replacing, operational experience.

Despite these challenges, the Palisades and Eaton Fire incidents reinforce that CICCS qualifications and training are essential to developing a baseline that can lead to higher-level skills.

Addressing these issues requires a strategic approach rather than incremental or agency-specific adjustments. The responsibility for modernization should be addressed at the state FIRESCOPE- and Cal OES-level, with a focus on evaluating and adapting CICCS frameworks to better align with current and future operational demands.

This approach should include examining training pathways that incorporate demonstrated proficiency alongside traditional requirements, expanding the use of modern training technologies, and creating more flexible and scalable qualification models that reflect the realities of large metropolitan fire departments.

The goal should not be to reduce standards, but to ensure the system remains relevant, accessible, and capable of producing and sustaining qualified personnel at all levels of command.

Within the LAFD, improvement and emphasis of wildfire and WUI tactical training is needed. Broad and expanded wildland tactical training, including participation in both field drill and classroom training, should be prioritized and broadly undertaken department-wide.

Examples of areas where LAFD adoption of standardized wildfire tactics would have benefited deployment during the fires include integration of “fire-front-following”/ tactical patrol, “anchor and hold,” and “prepare and go” tactics.

Furthermore, LAFD could benefit from more practical training addressing vegetation fire initial actions, such as perimeter control, incident command organizational structure, and strategy and tactics as fire impacts the built environment.

For LAPD, officers were placed in tactical situations involving search and rescue in hostile work areas that would have benefited from essential wildfire training.

Currently, training opportunities are fairly limited to one (1) offering per year, per position, per region. These limited opportunities have been an obstacle for many in pursuit of training opportunities and limits robust succession of qualified staff among agencies.

For higher IMT positions, including Types 1, 2, and 3, a regional or state committee must review applications. While this is a reasonable step for certification at the Type 1 or 2 level, which are required to perform at high-complexity incidents, it may not as beneficial for at the Type 3 or local level.

The fire service in California could benefit from a new, precursor level of training that would provide statewide short-term courses for fire managers that reviewed best practices and procedures around fire response to fast-moving WUI fires during the first operational period.

Not only is this a time when initial attack and major fire development occurs, it is also a period when resources are limited, full command teams are not present yet, and when the majority of structural loss occurs. This pattern was demonstrated in both the Palisades and Eaton Fires.

Available Role Models

Southern California fire departments that successfully manage ICS/CICCS training for fast-moving and complex fires implement a number of measures, such as matching the size of their internal rosters of qualified personnel to specific goals related to incident response and performance, prioritizing incident management during the first 48-hour period, and developing local IMTs.

These organizations invite regional fire agencies and law enforcement to participate in trainings, and do not limit participation to any single agency.

Examples of typical performance goals for these teams include the ability to:

- Manage a 1,000-acre fire of moderate complexity with up to five (5) Divisions for 48 hours independently
- Successfully implement command and operational deployment in preparation for transition to a Type 1 team
- Develop a roster with sufficient depth to ensure 24/7/365 availability

These agencies also typically target certain ranks with acquiring ICS certification minimums, including:

- Battalion Chiefs (BCs) -> Strike Team Leader Engines (STENs)
- Senior Battalion or Division Chiefs -> Division Supervisors or ICS General Staff
- Higher ranking chief officers -> ICs

Program Exercise and Maintenance

Annual, regional tabletop exercises for major fire response and command development serve to create common expectations and improve coordination, especially related to evacuation and incident response to rapidly developing incidents. This is a long-standing practice by fire agencies across California, and is a known method of improving interagency response.

Tactical Wildfire Training

Currently available tactical training emphasizes wildfire response basics, but lacks emphasis on community conflagration conditions, especially the operations necessary to secure alternative water sources when hydrants lose pressure.

The transition of wildfires into community conflagrations has been an increasing phenomenon in the last decade, however, curriculum upgrades that identify best practices under such fast-moving fire conditions are lacking.

Necessary Agency Support

All fire agencies in California with wildfire responsibilities need to maintain a continuous cycle of training and qualification to ensure readiness and to prevent degradation of qualified rosters through retirements and succession.

Achieving this requires both management prioritization and appropriate budget allocations.

IMTs and incident organizations work best when senior and more experienced staff work with newer staff in joint incident management activities, thus promoting mentorship, experience, and success. This type of staffing arrangement was noted as a benchmark characteristic of more successful ICS/CICCS agency training programs.

ICS training alone does not ensure candidate readiness, and should include off-agency assignments to wildfires as a means of developing experience. Some surrounding counties have developed a regional procedures manual as a means of standardizing preparedness and response and should be considered here.

3.6.3 Findings and Recommendations

FINDING 60: Limited statewide training opportunities and qualification pathways have constrained the development of incident management personnel and reduced preparedness for managing fast-moving wildfires during the critical first operational period.	**RECOMMENDATION 60.1:** Increase the frequency and availability of statewide incident management training courses to expand the pool of qualified personnel and support succession planning. **RECOMMENDATION 60.2:** Establish a foundational wildfire leadership curriculum focused on command, coordination, and decision-making during the first operational period of fast-moving WUI fires. **RECOMMENDATION 60.3:** Streamline qualification processes for Type 3 and local-level positions to accelerate development of future incident management personnel. **RECOMMENDATION 60.4:** Incorporate lessons learned from recent California WUI fires and community conflagrations into statewide training, exercises, and certification programs.
FINDING 61: LAFD's intermittent participation in California's statewide wildfire training, qualification, and preparedness programs limited the development of wildfire-specific expertise, interagency relationships, and operational integration needed for complex wildfire incidents such as the Palisades Fire.	**RECOMMENDATION 61.1:** Reestablish and sustain participation in CICCS qualification programs to increase the number of personnel qualified for wildfire incident management positions.
FINDING 62: Despite established interagency coordination frameworks, LAPD, LAFD, LASD, and LACoFD experienced challenges operating under Unified Command during these large-scale incidents. Gaps in joint training and coordination limited their ability to effectively manage resources and conduct unified operations across agencies.	**RECOMMENDATION 62.1:** Agency leadership should prioritize regional coordination and joint training to build trust, improve interoperability, and enable seamless Unified Command and resource management during major incidents. **RECOMMENDATION 62.2:** The Los Angeles Area Fire Departments should embrace the RTG program design and mission. Los Angeles Area Fire Chiefs Association (LAAFCA) should redefine and prioritize regional training in the wildland and WUI and ensure all regional partners are accountable for the training.
FINDING 63: Critical incident debriefings and/or behavioral health support were not readily available and took several weeks.	**RECOMMENDATION 63.1:** Prioritize behavioral health, incident stress debriefs, and peer counseling as one of the core elements of incident management.

3.7 Pre-Incident Preparedness and Mobilization

3.7.1 Pre-Fire Planning

Pre-fire planning for complex wildfire incidents is a best practice that allows organizations to get a "jump start" on incident command and response. Rather than having to conceptualize attack plans in the midst of ongoing response efforts, preparing a fire pre-attack plan allows for the advanced recognition and mitigation of risks and the calculation of planning and deployment.

A fire pre-attack plan can help agencies recognize risks found within their jurisdiction, and when done correctly, it can reduce decision-making times that may impact public safety efforts and emergency mitigation strategies.

Pre-fire planning is vital in not only preparing for emergencies, but also for training and collaborating with other departments and agencies, stakeholders, community leaders, and mutual aid partners. This allows agencies to create an effective planning culture that is centered on risk management and provides valuable guidance to organizational leadership.

As an example, the structural defense and evacuation of Wrightwood, California (a community with shared boundaries in both Los Angeles and San Bernardino counties, and surrounded by Angeles National Forest) in September 2024, during the Bridge Fire was driven by a cooperatively developed and contemporary pre-fire plan.[79]

The fire's onset in this community was rapid and threatening, and effective deployment of all available resources was critical to both community protection and evacuation. Following the fire, officials cited the pre-fire plan as crucial to an effective response, in which structural loss was kept to a minimum alongside evacuation and related public safety actions, despite sudden, extreme fire conditions in the community.

In Southern California, local pre-attack plans are not standardized across the region, causing some information to be outdated.

Cal OES and FIRESCOPE have been engaged in a study of wildfire pre-fire planning for an extended period (over 16 years), however, they have yet to adopt a statewide standard template or recognition of key planning characteristics. This has led local agencies either developing their own versions of planning tools or waiting for the state template before revising existing plans.

During TDs, research, and analysis of department actions, pre-attack plans were found to be largely static documents that contained dated references and existed primarily as paper documents and PDFs. The development of these documents is largely insular and centered on the institutional knowledge of the author or agency.

Each plan is specific to jurisdictional boundaries, local hazards, and resources, and appears to have little effect on departmental decisions around emergency mitigation and management. Some TDs referred to them as "archaic." Additionally, modern technological advancements, science-based applications, and fire modeling have not influenced the evolution of these documents or their use in the field.

TDs also noted that personnel at several agencies were either unaware that pre-attached plans existed or they failed to use them to complement emergency mitigation efforts.

LACoFD has made their pre-attack plans available via their Fire Sync App, however, they require LACoFD current membership to access, and are agency and discipline-specific.

Law enforcement evacuation planning does not currently correspond to or complement fire department planning. And while pre-attack plans are largely pre-fire planning tools, analysis indicates that actions in the field did not always follow the prescribed planning.

Moreover, in areas where experience and education were lacking, as in the case of the Palisades Fire, the pre-fire plans were followed in part but without the understanding of current fire behavior. This misalignment resulted in multiple ICP relocations and a staging location intersecting with a one-way evacuation route, causing significant challenges and delays for residents and first responders.

California Pre-Fire Planning Programs

While FIRESCOPE and Cal OES recently refocused their goals in 2025, they have yet to designate a standard template or make available their considerable library of statewide plans.

Unfortunately, the state has tied the adoption of a standardized template to a second goal: the adoption and development of a statewide data system that could serve as a fire management tool, a fire modeling tool, and a mapping source.

Delays in the adoption of a statewide standard are generally due to challenges and costs related to creating such a complex system. With the recent adoption of the National Emergency Response Information System (NERIS) across California fire departments and its available fire data, the standardization of pre-fire planning should be prioritized.

This statewide standard will require a significant investment that utilizes an enhanced public-private partnership that integrates emerging technology and establishes a project timeline.

Program objectives of the 2025-26 FIRESCOPE mapping project include:[80]

- FIRESCOPE and Cal OES should, in the short term, establish standards for development and presentation of pre-fire plans using currently available technologies.
- These standards should include recognition of best-practice templates for use by emergency services in developing inter-disciplinary, interagency pre-fire plans.
- Pre-fire plans should also be focused on firefighting and evacuation conditions during the initial operating period of fires, a period generally conducted with limited emergency resources and without the assistance of IMTs, a period of high risk for both responders and the public.
- Maintaining a statewide, accessible library of pre-incident plans would support emergency responders by providing consistent access to critical planning information before and during incidents.

3.7.2 Pre-Positioning

In this report, pre-positioning refers to the proactive movement of additional firefighting resources into an area of risk to augment normal resources and staffing given extreme wind and associated fire danger. It also facilitates rapid response by providing strategic coverage of an area of high risk so fires are suppressed when they are small.

The importance of pre-positioning is rooted in the principle of rapid initial attack. Wildfires are generally easier to contain, require fewer resources, and result in fewer impacts when firefighters can reach them quickly and apply sufficient suppression capability before significant growth occurs. As fire size increases, so do the resources required for containment, the likelihood that evacuations will be necessary, and the potential for damage to communities and infrastructure.

For this reason, fire agencies routinely augment and pre-position resources ahead of forecasted fire weather events to improve response times and increase the likelihood of containing fires during their early stages. The goal is not merely to place more resources in the field, but to place them in locations where they can have the greatest effect on reducing fire growth and protecting life and property.

Recent research suggests that these decisions can be informed and optimized through proactive analysis of local data. By incorporating weather forecasts, fuel conditions, historical fire occurrence data, resource availability, and suppression effectiveness, analytical models can estimate where fires are most likely to occur and where additional resources are most likely to improve outcomes.

Research conducted with LACoFD found a statistically significant relationship between firefighting capability and reduced burned area, indicating that stronger initial-attack resource packages can improve containment success.[81] Studies such as these may help agencies refine pre-positioning strategies, improve the effectiveness of limited resources, and enhance preparedness for increasingly complex wildfire events.

State Pre-Position

As weather forecasts became clearer on the developing severe wind event, the State of California began to preassemble fire service resources for pre-staging in Southern California. This decision involved multiple conference calls with partner fire agencies in the projected jurisdictions of wind impacts, as well as dispatch centers statewide.

The State of California has been engaged in pre-positioning for Santa Ana winds for decades, moving CAL FIRE resources statewide in preparation for wind events. In the last several years, Cal OES resources have been added through staffing of Cal OES apparatus by local government firefighters or movement of mutual aid under a state funding agreement.

This has been facilitated under special State legislature authorization and the program has limited annual funding, which has been dramatically overspent each year due to emergency demands.

The value of having augmented resources immediately available for deployment in regions exposed to elevated wildfire threat cannot be overstated, and is a likely contributor to limiting loss of life and property. However, a more reliable source of funding commensurate with the current and expected demand is needed to continue to support this program.

Overall, between Cal OES and CAL FIRE efforts, 130 additional engines were mobilized on January 7, 2025, along with aircraft, crews, dozers, and command teams, and placed in areas of higher threat and in accordance with wind forecasts.

The resources were spread from San Luis Obispo County in the north to California's southern border. The State's pre-deployed resources were substantial enough to normally staff a major fire on their own.

To determine how many resources are needed for an anticipated incident, Cal OES uses a worksheet that utilizes predicted weather, wildfire risk, values and populations at risk, and past fire history as determining factors.

Working in conjunction with regional fire agencies, Cal OES completes an assessment and fills out a matrix that helps guide determination of pre-position. A new form is a "work-in-progress" according to Cal OES staff, and as such, it is still subject to revision.[82]

In general, the worksheet delivered a second-tier risk assessment for the region prior to January 7, 2025, and did not indicate the peak risk level. LAFD officials were particularly critical of this finding as they believed that the matrix failed to accurately assess fire weather conditions, leading to a conclusion that did not generate adequate pre-position funding by the state.

Despite city officials' concern, the assessment delivered strong regional pre-positioning of resources in Southern California.

In the Los Angeles County area, the number of resources pre-positioned was substantial. CAL FIRE had positioned two (2) Type 3 engine strike teams (STs), staged in Santa Clarita, moved additional State handcrews into Los Angeles County's Camp Fenner near Wrightwood, and the State had mobilized extra LACoFD resources under contract county agreements, including two (2) handcrew STs, staged in Malibu and Pasadena, additional helicopters and dozers from both Los Angeles City and County, and an extra Los Angeles County Type 3 engine ST staged in Pacoima.

LACoFD aggressively augmented its wildfire response capability prior to January 7, 2025. In addition to state-funded pre-positioned resources, LACoFD held over personnel and staffed 19 relief engines, 8 patrols, and a water tender using more than 100 additional personnel.

The department also coordinated with Cal OES, CAL FIRE, and neighboring agencies to maximize regional pre-positioning and resource availability despite the high costs associated with local government upstaffing.

As pre-positioned resources were committed to emerging fires, Cal OES authorized immediate backfill of those resources to maintain readiness. Los Angeles County and Orange County both used this process, allowing pre-positioned coverage to be sustained throughout the event.

This practice ensured resources remained available for immediate dispatch to new incidents or reassignment to additional pre-positioning locations as conditions evolved. This was a best practice.

Federal Pre-Position

Staffing within ANF assured that all available resources were covered and staffed, and that additional task forces (TFs) and single resources, usually engines, were positioned in key positions.

As an example, an engine TF from the State of Arizona had been staged at the Forest Supervisor's office and participated in the early response to the Eaton Fire. The mission for these pre-staged resources was the protection of Federal jurisdiction lands.

ANF had also acted to extend air tanker contracts, which ensured their availability for critical fire response. Normally, such aircraft would be off contract during this time of year; however, the ANF Fire Chief had worked to secure the aircraft, given the critical fire danger in the region.

The amount of fire resources pre-positioned in Southern California by State and Federal funding was large and impactful. The majority of these pre-staged resources in Los Angeles, Orange, and Ventura Counties were committed to the Palisades Fire within the first two hours.

This surge of augmented resources into the Palisades incident was critical to the early staffing and fire demands, and without these resources, the incident could have resulted in even greater loss.

While pre-positioning was not specifically placed in the Palisades community, much of the pre-positioned equipment in Los Angeles County was located within a 30-45 minute response time from the Palisades Fire, but close and adjacent to the Eaton Fire's origin. The pre-positioned resources were placed in the central San Fernando Valley, in Santa Clarita, and near Pasadena.

Locations for staging were determined by the agencies receiving control of the resources. Primary factors driving resource staging selection included facility size and capacity to house the equipment and staffing associated with the assigned resources, centralized location in consideration of expected demand, and area wildfire risk. This risk decision was informed by past fire history and current weather and fire behavior data.

3.7.2.1 City of Los Angeles Pre-Position

While the City of Los Angeles received and deployed some resources based upon state-sponsored pre-position, they deployed limited augmentation to their normal daily staffing on January 7, 2025. They mobilized only three (3) additional engines at local expense, which they upstaffed with reassigned fire inspectors. Their pre-positioning and staffing of resources is further detailed on pages 84 and 86 of the Phase One Southern California Fires Timeline Report.

City fire leadership defined this mobilization as "pre-position," which confused some resource system managers since that term is usually associated with staffing above daily or normal levels.

Los Angeles Fire Department

LAFD has previously followed its SOPs for elevated fire danger by reconfiguring structural fire TF deployments and pre-positioning resources ahead of anticipated wildfire threats. Although these procedures existed and had been implemented during past high-risk periods, they were not widely utilized during the January 7, 2025 fires.

The typical daily deployment model combines two (2) engine companies and a truck company, using a crew of at least 10 personnel, as a normal station coverage and response method, creating a “Task Force”.

During past high-risk periods and for brush fire emergencies, these TFs would be broken up, and while one (1) engine would continue to be paired with a truck company as a Light Force (LF) for coverage, the second engine from the TF would be fully staffed and made available for independent assignment, augmenting 40 additional companies for up to seven (7) engine strike teams (STs) (which each consist of five (5) engines). This allowed LAFD to rapidly reconfigure and mobilize for past brush fire events.

Additional STs may also have been configured in the past using reserve equipment, which was reported to be largely unavailable in January 2025.

Previous LAFD practices demonstrated that additional STs could be quickly assembled through the reconfiguration of existing on-duty personnel and apparatus. Although this capability remained available on January 7, 2025, it was not widely utilized.

Additionally, the staffing and deployment of fire patrols and support equipment staffing was designated in LAFD SOPs, given the fire weather conditions, but were not implemented. Following initial actions on the Palisades Fire, LAFD largely retained its daily TF staffing pattern for the remainder of the incident.

City Assessment of Risk

While the pre-positioning of resources can be difficult due to the many variables that are required to consider in order to anticipate where a fire may start or ultimately grow, city fire leadership did not utilize fire weather and fuels data as effectively as other agencies prior to the start of the January 2025 fires. Placement of pre-positioned resources was primarily in the San Fernando Valley due to the availability of large staging areas.

The San Fernando Valley, however, was not impacted as severely by the fire. LAFD did not follow its own internal SOP with regard to activation of preparedness steps. LAFD should conduct research on the pre-positioning of resources in their response area and use data-driven tools to determine the areas of highest probability of fire.[81]

During TDs with City Chief Officers responsible for predeployment, they stated their belief that they were adequately prepared for the predicted wind event with their on-duty coverage plus state pre-positioned resources. LAFD officials did raise concerns that the state process for calculating risk was inadequate and the worksheet needed to be evaluated for accuracy in addressing appropriate augmentation during high fire danger days.

They cited several perceived obstacles in mustering additional resources, including limitations in labor contract agreements they believed were a barrier to mandating non-voluntary overtime in the absence of an ongoing fire, lack of available housing for placement of additional staff, competition for resources with the simultaneous presidential visit, and awareness of city budget limitations.

Based on the evidence gathered, the ULRI team concluded that the intensity of fire risk may have been underestimated by LAFD, and they could have benefited from greater use of the available SME opinion and warning data.

Impacts of Lack of Pre-Positioning

The lack of LAFD resource augmentation compromised the city’s initial and extended response, and further compromised the region through a lack of deployment for the city’s share of wildland within its jurisdiction. However, the state, LAFD, and other adjacent city fire departments’ predeployment placed significant resources within a short drive time from the Palisades Fire area. These outside agencies contributed meaningfully to the early and rapid deployment.

This robust augmentation by other agencies had been strategically located to serve the entire region, and while not pre-positioned specifically within the Palisades community, it was nearby. Augmentation resources were similarly staged within and adjacent to the Eaton Fire area, enabling early response.

Best wildland fire practice would have prompted firefighters to prioritize checking recent burn areas, such as the Lachman Fire, on the morning of January 7, 2025. From there, they would have deployed additional resources to the Palisades area for pre-staging, while initiating city-wide patrols of brush areas and discontinuing any non-emergency activity that would have caused resources to be out of position or distant from their core response areas.

Los Angeles Police Department

During TDs, it was noted that LAPD did not conduct any pre-planned staffing augmentation or resource deployment prior to the start of the Palisades Fire; they did not direct stations within wildfire-prone areas to increase staffing in anticipation of NWS-Los Angeles/ Oxnard PDS warning. TDs with personnel all stated that on the day of the fire, it was business as usual.

One (1) interviewed officer stated that they were made aware of the Lachman Fire by their sergeant, and due to the extreme high-wind event on January 7, 2025, they were vigilant in checking for smoke and other hazard indicators at the start of their shift.

This officer visited the site of the Lachman Fire early that morning. They stated that they checked the area from the roadway near the origin of the fire and did not see any visible smoke or hazards.

Additionally, TDs indicate that field units were inadequately supported, and there was a delay in the provision of personal protective equipment (PPE) and the establishment of command structures due to a lack of pre-deployment resource allocation.

3.7.2.2 Los Angeles County Pre-Position

Los Angeles County Fire Department

For detailed information on LACoFD pre-positioning, see the Staffing and Preparedness Section 4.2.2 in the Phase One report.[1]

Los Angeles County Sheriff's Department

TD's revealed that LASD conducted initial planning meetings in response to NWS-Los Angeles/Oxnard PDS warnings. The actions taken were not agency-wide or at the level of preparation needed for the catastrophic event that was unfolding. TDs revealed that the rank-and-file staff felt January 7, 2025, was a routine start to their day and were unaware of any particular preparation other than what they had heard from the news and social media outlets.

The Emergency Operations Bureau (EOB) was aware of the weather concerns and conducted phone and in-person meetings with EOB members prior to the January 7, 2025, workday. The preparation included informal meetings and an initial update of the MFF rosters and members of the IMT.

EOB staff continued to monitor NWS-Los Angeles/ Oxnard weather products. At the start of the Palisades Fire, two (2) EOB members were returning from LAX and saw smoke in the distance, so they responded to the Fire Command Post to liaise with LAFD and LAPD and offer assistance if needed. The fire was not in the county's area of responsibility at that point.

LASD ALD was working short-staffed and required overtime to staff patrol; no additional personnel were scheduled for the Red Flag PDS event.

LHS scheduled additional Red Flag staffing for early morning shifts on January 7, 2025. The additional personnel conducted road closures at Topanga Canyon, reducing traffic to residents only.

The augmented staffing also provided personnel to staff an operations center focused on the Red Flag event, which was set up in the station on the morning of January 7, 2025. The operations center monitored the University of California San Diego ALERTCalifornia Camera system and other camera feeds to assess the weather and fire potential.

3.7.2.3 Holdover and Recall of Fire Personnel by Key Fire Agencies

Both LAFD and LACoFD had similar access to key data; however, they made drastically different staffing decisions regarding holdover and recall of personnel. Senior executive officers of both agencies were responsible for making this risk-based decision the morning of January 7, 2025.

Los Angeles Fire Department

LAFD did not hold over the off-going personnel, despite the already-present heavy wind and fire danger conditions. Regular, daily staffing of apparatus occurred, with minimal utilization of locally funded augmentation. Some state pre-positioned resources were assigned to the LAFD jurisdiction at state expense, and three (3) additional engines were added at city expense.

A recall was initiated of all off-duty LAFD fire personnel within the first hour of the Palisades Fire on the morning of January 7, 2025. This process was complicated by the city's issuance of an emergency message using local television and radio media to announce the recall.[83]

While the recall was intended to involve only LAFD personnel, the media message was miscommunicated broadly to include "anyone with firefighting experience."

The internal department staffing phone number was distributed by the media as the call-in location. Thousands of calls originating from individuals and groups throughout the world flooded these numbers and made them inaccessible to city staff for over 48 hours, rendering this specific recall attempt ineffective.

The predeployment and recall processes used by the city did not follow their own written procedures and appeared to be largely budget constraint-driven.

Off-duty personnel did start to return to their normally assigned work stations on an ad hoc basis, but no means or plan for rapid utilization had been pre-arranged. No relief fire apparatus were available for coverage as well. LAFD internal media staff had recommended against the media use for this purpose, but were overruled by supervisors.

The city's holdover decision process was made based on web-published forecasts, but without consulting outside experts with additional weather and/or wildfire experience.

The failure to conduct a holdover of the off-going shift, and the complications experienced during early attempts to initiate a recall, generated substantial obstacles that negatively impacted LAFD's mobilization.

Los Angeles County Fire Department

On the morning of January 7, 2025, a decision was made to hold over the off-going shift, in addition to the oncoming shift. LACoFD's daily staffing is close to 1,500 firefighters on duty at one time, and this action doubled that number to nearly 3,000.

This additional staffing enabled the agency to immediately staff more than 20 additional relief fire engines and other apparatus, as well as assemble a pool of personnel to establish apparatus coverage for both routine and incident-assigned apparatus department-wide.

It also authorized robust augmented staffing of camp crews, dozers, water tenders, engines, aircraft, and an IMT using both local and state funds. LACoFD's action to holdover the off-going shift enabled a surge of augmented resources and staffing that assisted not only the county's response, but also the entire region's ability to respond to this wind event and subsequent major fires.

When questioned regarding the holdover decision, senior officers cited using long wildfire experience, expert opinion, and educated judgment aided by numerous conference calls with partner agencies, fire behavior experts, and NWS-Los Angeles/Oxnard to guide the decision for holdover. They also engaged the use of a number of technologies, including weather monitoring and web camera equipment, to inform their decision.

3.7.2.4 Resource Ordering and Mobilization Processes

California maintains two (2) systems for major fire service resource ordering. One (1) pipeline is managed by Cal OES, and focuses on mutual aid, while a second system is managed by CAL FIRE and focuses on wildfire-specific resources.

These two (2) systems, while independent, are closely coordinated by staff from both agencies and are collocated in regional operations centers. Both CAL FIRE and Cal OES systems mobilized to pre-position resources in advance of fire development.

In past years, there was a distinct difference in resource types available from each ordering pipeline, but many of those distinctions have blurred in more recent times, with similar types of engine resources available from both systems.

By January 8, 2025, California had deployed more than 7,500 firefighting and emergency personnel across agencies to support wildfire suppression and emergency operations associated with the Southern California wildfires.[84]

Ordering Data Management System

Both ordering pipelines for wildfires and other major incidents and events are managed through a common automated system, which is also the standardized national wildfire emergency ordering and business management system, the Interagency Resource Ordering Capability (IROC).[85]

It was launched by the federal government in 2020, and can be complex to use and interpret. In California, IROC is used by local, state, and federal agencies. Local agencies rarely use IROC except for major resource ordering during wildfires.

This limited use by local agencies is generally driven by their primary reliance on faster, more automated systems to meet daily dispatch needs, resulting in a lack of familiarity with IROC.

Some fire executive officers in California have indicated that the IROC system and ordering pipelines fail to deliver the closest available resources quickly, especially during complex, high-risk fires where lives and structures are threatened. As mentioned in TDs, IROC workarounds during previous fires were used to limit response costs and overcome ordering system restrictions.

During the January 2025 fires, chief officers responsible for regional coordination and dispatch from CAL FIRE, Cal OES, and Los Angeles County/Cal OES Region 1 all indicated IROC performed as needed, but that processes were assisted by augmentation and integration of CAL FIRE dispatchers who were familiar with IROC into local dispatch centers and workforces. With their involvement, some ordering processes were managed or changed “on the fly” to improve or expedite resource flow.

The current ordering system has its foundation in 1970, with the advent of the FIRESCOPE program in California. While that initiative facilitated the development of the current systems, they have advanced over time with “bolt-on” or “plug-in” improvements.

However, today’s ordering systems remain essentially based on the original technology and methods. A key constraint in mutual aid delivery is that it is a voluntary system in which fire chiefs statewide are asked to react to an emergency need or request for resources and determine what they can send based on their own perception of local fire coverage needs.

The search for available resources and follow-on requests is known in the system as “canvassing” and frequently requires considerable time.

In preparation for the January 2025 wind event, senior managers for Cal OES started canvassing of central and northern California fire departments as early as January 6, 2025, in advance anticipation of the development of major wildfires in Southern California, which greatly aided their ability to mobilize Statewide resources on January 7, 2025.

These experienced system managers likely maximized the potential for Statewide firefighting assets to respond as fires developed.

Ordering System Upgrades

In a modern technology comparison, Amazon can immediately respond to a customer request, search its available inventory, and dispatch the closest available resource to meet the customer’s needs within seconds to minutes.

The item requested has individual bar coding, inventory data, and system real-time tracking, enabling rapid location identification, ordering, and assignment. This kind of capability and use would suggest that considerable and similar upgrades are likely available for both fire apparatus and crews to speed response, but such a change would require significant funding and statewide development.

The Governor of California assembled a TF in early 2025 to study resource ordering in the aftermath of these fires, but they are early in the process, and it is unclear how extensive the changes, the level of automation, or funding that the study may recommend.

Current Workarounds and Alternative Methods

In the absence of such system-wide change, fire chiefs statewide have implemented workarounds to IROC to speed up the delivery of resources. According to workaround proponents, the intent of this process is to expedite resource delivery, especially when lives and structures are threatened by wildfire exposure. This process is known as "chief-to-chief ordering."

While not identified in formal guidance as "chief-to-chief ordering," California's Closest Resource Concept allows operational areas and regions to directly order immediate-need resources from adjacent operational areas or regions to expedite response when life and property are threatened.[86]

For an example of how this system worked in the January 2025 fires: just 11 minutes into the Palisades Fire, the LAFD Fire Chief sent a text to the fire chiefs of Los Angeles, Orange, and Ventura counties requesting immediate dispatch of available resources. Each chief responded with at least three (3) STs of engines (45 engines total), crews, dozers, and chief officers, and had the resources en route within minutes.

This resource base arrived quickly at the rapidly developing Palisades Fire. Anecdotally, past fire ordering through IROC resulted in delivery of Orange County resources to the Malibu area (a short distance from the Palisades Fire) within 2.5-3 hours of request. Under chief-to-chief ordering, this response time was cut to 1.5-2 hours — a remarkable improvement in response.

While the response time issue was improved, the tracking of regional resource commitment is more problematic. Catch-up in IROC on the data about who is responding typically occurred hours later, as dispatchers had time to process. There is concern about how to track the safety of assigned resources that are not acquired through IROC.

However, fire chiefs have communicated to Cal OES the need to maintain a mechanism for such alternative resource ordering for urgent conditions among neighboring organizations.

At the same time, objections were raised by some local fire chiefs that both IROC and its alternative processes might have ignored closer resources for more distant ones.

It was observed that both IROC and chief-to-chief processes tended to target larger agencies that are more able to send bulk agency resources quickly, considering that smaller, but perhaps closer, agencies typically required more time to coordinate and organize for response.

Fire agencies still needed to maintain coverage for routine response, and units left behind were frequently counted upon to service not only their own jurisdiction, but also to provide call coverage for vacated stations in neighboring areas.

Fire chiefs in Ventura and Orange counties largely mitigated this "opportunity sharing" complaint issue through intentional integration of smaller agencies into their cooperative response. In related circumstances, some senior fire officers questioned why the "Verdugo Cities" — cities served by the Verdugo Fire Communications Center — had not been tasked to deliver their usual two (2)-engine STs for mutual aid.

It was determined that Verdugo Cities staffed the first ST for pre-deployment, where it was quickly assigned to the Palisades Fire, then committed additional resources to the initial attack of the Eaton Fire, exceeding their usual mutual aid drawdown levels.

Governor's System Review

The California Governor's Office has directed CAL FIRE and Cal OES to work with the federal government and other state partners to address the IROC system's lack of capacity to process real-time requests for additional resources during the January 2025 fires.[8]

However, the resolution will likely require statewide adoption of tracking and communications technologies (i.e., satellite) currently unavailable to the fire service. State and federal funding mechanisms need to be identified to help finance the redevelopment of this system.

The State of California should consider consolidating its two (2) primary ordering systems into a single system and agency to improve coordination. Over the years, the types of resources and responsibilities managed by Cal OES and CAL FIRE have become more similar and blended.

Cal OES performs its mutual aid function with a limited staff, while CAL FIRE operates major coordination centers with larger teams. While both agencies collaborate today, they utilize a dated system for incident ordering and tracking.

Local Agency Commitment

How LACoFD and LAFD staffed in preparation for the Palisades and Eaton fires, and throughout the response, was different. LACoFD maintains pre-identified lists of wildland-configured engine STs and other resources for immediate organization and dispatch as requested.

LAFD had developed a list of available resources, but did not include a staffing or deployment component, and never activated some resources on this list. As a result, some equipment remained underutilized.

Into the early morning hours of January 8, 2025, LAFD and LACoFD had deployed similar proportions of their available engine resources to the Palisades and Eaton Fires, while also retaining a portion of their fleets to sustain routine emergency response.

Based on dispatch records, IROC resource orders, TDs with dispatch center supervisors, radio communications, and Cal OES reimbursement documentation, LACoFD had committed approximately 68% of its available engine capacity, compared to approximately 64% for LAFD.

Under this broader operational accounting, LACoFD deployed approximately 119 engine companies through a combination of multi-alarm assignments and 11 STs, while LAFD deployed approximately 90 engine companies and supplemented those resources with truck companies, heavy rescue units, and other specialty apparatus.

Total resources deployed by LAFD and LACoFD into the second operational period on January 8, 2025, of the Palisades and Eaton Fires are summarized in Table 3.7.1.

Table 3.7.1 Total resources deployed by LACoFD and LAFD into the second operational period on January 8, 2025, for the Palisades and Eaton Fires.

	LACoFD	LAFD
Number of stations	171	106
Regularly staffed engines	173	140
Engines committed to fires by 08:00 January 8	119 (68% of total)	90 (64% of total)
Stations uncovered 08:00 January 8	26	Unknown
Stations partially covered 08:00 January 8	21	Unknown

Use of non-standard resource nomenclature

Confusingly, during the Palisades Fire, multiple different operational entities operated under the description of a "Task Force." Under ICS, TFs are mixed resources assigned for incident use. They may arrive preassembled or be assembled from single resources at the incident. A number of incident-formed TFs were utilized in the Palisades Fire. In contrast, the LAFD uses a different, daily "Task Force" organization for deployment.

Finally, the term "tactical Task Force" was used by LAFD commanders early in the Palisades Fire to designate ICS structural defense groups. These three (3) different uses of TF configurations were confusing to some responders and complicated incident command.

LAFD utilized deployment methods inconsistent with well-accepted ICS practices for wildland fires, which would be common or understood by most fire agencies in California.

While highly challenged by fire behavior conditions, STs and TFs were a more successful deployment model because they concentrated firefighting capability and obtained a force multiplier effect in addressing conflagration conditions.

3.7.3 Findings and Recommendations

FINDING 64: LACoFD's upstaffing decisions on January 6, 2025, and the decision to hold the off-going shift on January 7, increased their readiness before fire occurrence.	
FINDING 65: LAFD largely maintained its normal task force staffing configuration of 42 trucks, each paired with two (2) engines, despite forecasted extreme fire weather, limiting staffing flexibility and the number of deployable Type 1 engines available for wildfire/WUI response.	**RECOMMENDATION 65.1:** Prioritize staffing of Type 1, Type 3, and Type 6 engines in preparation for fast-moving wind-driven vegetation fires extending into the built environment.
FINDING 66: Los Angeles County and the City of Los Angeles used widely different methods to determine regional upstaffing and augmentation. LAFD initiated recall efforts after the origin of the Palisades Fire. The recall was poorly executed, resulting in unorganized and unproductive staff recall and utilization. LAFD failed to modify its daily TF staffing pattern to make additional resources available following the activation of recall. They maintained normal patterns instead of splitting for deployment flexibility, as had been the past practice.	**RECOMMENDATION 66.1:** LAFD should follow its own internal procedure and upstaff and deploy to meet elevated wildfire risk conditions. **RECOMMENDATION 66.2:** LAFD should revisit labor agreement constraints that may prohibit it from meeting emergency staffing needs.
FINDING 67: LASD and LAPD lacked standardized, agency-wide processes for pre-positioning resources and increasing staffing (including dispatch) in response to extreme fire weather forecasts, resulting in inconsistent preparedness actions, limited law enforcement capacity in high-risk areas, and delayed response during the early stages of the fires.	**RECOMMENDATION 67.1:** LASD and LAPD should establish standardized wildfire preparedness protocols that define activation thresholds, staffing increases, and resource pre-positioning actions for extreme fire weather events to ensure consistent readiness and adequate law enforcement capacity in high-risk areas.
FINDING 68: Despite resource ordering challenges with the current state Wildland and Wind Mobilization Score Sheet, state pre-positioning of firefighting resources improved local response capability and agility.	**RECOMMENDATION 68.1:** Increased collaboration with local fire agencies could lead to better utilization and placement of pre-positioned resources to meet regional needs. **RECOMMENDATION 68.2:** CAL OES should continue to optimize their updates to the Wildland and Wind Mobilization Score Sheet to ensure appropriate risk-level determination for local departments. **RECOMMENDATION 68.3:** Pre-position should be expanded to include law enforcement resources.

3.7.3 Findings and Recommendations (cont.)	
FINDING 69: IROC struggled to meet resource ordering demands as multiple incidents escalated concurrently.	**Recommendation 69.1:** State-of-the-art systems and automation are needed to support mutual aid and wildland resource ordering systems. **Recommendation 69.2:** Priorities for ordering system delivery improvement should include increasing speed of canvassing for mobilization, increasing speed of dispatch, predetermination of unit availability, and enhanced automation for resource tracking and deployment. **Recommendation 69.3:** The state should consider consolidation of dual (mutual aid and wildland) resource ordering systems and responsibilities into a single entity/agency.
FINDING 70: LASD and LAPD filled law enforcement resource requests from within their own agency rather than using the Cal OES Mutual Aid system to request outside agency assistance. For LASD, this decision resulted in staffing shortages requiring the reassignment of personnel from jails and courts, straining operations due to using personnel with limited patrol experience.	**RECOMMENDATION 70.1:** LASD and LAPD should consider utilizing the well-established Cal OES Mutual Aid System to request assistance from surrounding agencies, rather than handling such large-scale events using their agency resources. **RECOMMENDATION 70.2:** Establish clear mutual aid activation criteria linked to incident complexity indicators, such as Red Flag or PDS forecasts, and support with predefined staffing thresholds and scenario-based exercises to enable timely requests during escalating incidents, or when situational awareness is compromised.

3.8 Incident Management

Incident management is crucial for a coordinated and effective wildfire response, aligning with the Cohesive Strategy goals of protecting lives, property, and natural resources through timely communication and risk management. Safe and effective response involves pre-incident planning, risk assessments, resource inventories, agency engagement, and tactical response strategies.

3.8.1 Incident Management Teams

During a wildfire, IMTs coordinate communication and tactical decision-making through UC structures, monitor real-time fire behavior and weather conditions, and ensure rapid deployment and synchronization of available resources.

Additionally, IMTs oversee evacuation efforts, providing accurate and timely information to the public about fire status, evacuation orders, and shelter locations.

3.8.1.1 Local IMTs

Fire IMTs

City and county fire agencies established IMTs for both the Palisades and Eaton Fires early in the response. The LAFD IMT was deployed to the Palisades Fire but was in a “trainee”/newly organized status, and as such, did not assume command.

Nevertheless, the LAFD IMT worked overnight on January 7, 2025, to produce an IAP. They also conducted an operational briefing the morning of January 8, 2025. The team was aided in this effort by a limited number of outside agency staff who had full ICS planning credentials.

LACoFD deployed a local/internal IMT during the first hours of the Eaton Fire, assuming command of the incident shortly before midnight at the Rose Bowl ICP. As State Type 1 teams arrived, county IMT staff coordinated with these teams, functioning as one (1) incident command organization — a best practice.

Law Enforcement IMTs

The LASD IMT consists of trained law enforcement officers assigned to designated roles within the ICS. These teams are intended to handle complex incidents and facilitate coordination among responding agencies through a standardized command structure recognized across various disciplines.

IMT members serve in a collateral role, responding from their usual duties when activated, and work under the guidance of the EOB, which manages training, preparedness, and staffing for three (3) established teams.

Section Chiefs and operational staff from both outgoing and incoming shifts took part in structured pass-on briefings to ensure smooth continuity of operations before transferring command responsibilities. Personnel noted this approach was somewhat different from fire IMT operations, where personnel generally stayed assigned throughout the period and followed more formal shift transition procedures.

During the first operational period, interagency coordination within the LASD IMT pass-on briefing was mostly limited to Sheriff's Department personnel. An LASD commander recognized a future need for enhanced technology to improve resource tracking, real-time fire and evacuation mapping, and operational visibility between law enforcement and fire personnel, thereby strengthening interagency coordination during rapidly evolving incidents.

Additionally, reliance on manual documentation led to delays and uncertainty in monitoring evacuation status, despite the available technology. Issues with staging location choices and situational awareness further affected resource stability as fire conditions quickly evolved.

These observations highlight the importance of strengthening preparedness, improving early resource configuration, and enhancing coordination and documentation within the IMT and the broader incident management framework.

3.8.1.2 State IMTs

CAL FIRE maintains six (6) IMTs for statewide deployment to high-complexity incidents. The teams are composed of 50 incident management specialists each, providing a complete range of ICS services.

Two (2) of these state teams were deployed during the January 2025 fires, one (1) to the Palisades Fire and a second to the Eaton Fire. Each team included personnel from throughout the state. A federal team, CAL FIRE IMT 5, was also deployed.

Team members recognized that these fires could be among the worst the state had encountered with regard to structural loss and the potential impact this would have on overall incident management. As such, command teams on both fires sought to ensure a single, unified approach to command and direction of all incident activities.

CAL FIRE IMT 2 was deployed to the Palisades Fire, with the first team members arriving while the ICP was at the Gladstones Restaurant parking lot.

A team transition meeting was held shortly before midnight on January 7, 2025. The team became operational at 06:00 on January 8, 2025 and assumed command at 08:00.

Early efforts by the team resulted in the mobilization of the National Guard, as well as the activation of additional statewide fire and law enforcement resources.

At the Eaton Fire, the first arriving IMT members participated in a UC meeting at the Rose Bowl around midnight on January 7, 2025.

The team became operational at 06:00 on January 8, 2025, integrating with CAL FIRE IMT 5 and an LACoFD Type 3 IMT.

CAL FIRE IMT 3 officially became a part of the UC at 11:30, with the unified teams agreeing to divide responsibilities:

- CAL FIRE IMT 3 would lead search and rescue, morgue, hazardous materials (HAZMAT), damage assessment, flood preparedness, and other issues
- LACoFD IMT would lead structural defense and suppression
- Federal IMT would lead perimeter control

Overnight from January 7, 2025, into the early morning of January 8, 2025, 80 water tenders, 200 California Highway Patrol (CHP) officers, 400 Urban Search and Rescue (USAR) personnel, HAZMAT teams, and Damage Assessment Teams (DATs) were ordered via state funding to assist the incident.

While fire management was the primary concern for these teams, the IMTs worked to reduce duplication and ordering challenges associated with the two (2) California State systems operated by Cal OES and CAL FIRE and the federal ordering system.

They also implemented important initial steps in disaster response and recovery, including damage assessment and hazard reduction work. It was critical to begin this work early, as it would need to be completed before public re-occupancy could be allowed.

The scale and cost of these initial recovery activities would have been difficult for local governments to achieve independently. As such, Governor Newsom agreed to underwrite the cost of many of these initial recovery actions in order to ensure a unified response and timely implementation.

3.8.1.3 Federal IMT

In a rare action, local, state, and federal IMTs were mobilized for the Eaton Fire. Although this could cause increased incident complexity in its own right, dedicated efforts were directed towards working together, allocating workload, and collaborating, which contributed to the success of all involved.

This allowed complex and simultaneous operations for active firefighting, search and rescue and body recovery, and initiation of disaster response, including structural inspection, HAZMAT management, and flood control.

The President of the United States (POTUS) agreed to cover 100% of the engine response costs for emergency response, exceeding the normal 75% allocated through federal disaster grants.

3.8.1.4 Incident Management Qualifications

There was a lack of coordination between key teams and agencies throughout the Palisades Fire response, including at ICPs, dispatch centers, and IMTs. This misalignment was likely due to the assignment of some personnel who either did not understand or accept their activated role, or who lacked authority to make real-time decisions.

CICCS qualifies individuals, through field experience and classroom work, to fill all of the positions in a command structure (see Section 3.8.3).[87]

Qualified Division/Group Supervisor (DIVS) bring the experience needed to develop tactical plans, coordinate assigned resources, and align field operations with the incident objectives.

At the time of the Palisades Fire, the highest CICCS operations qualification within LAFD was DIVS. On the morning of January 7, 2025, this individual was a STEN for a State OES Type III engine ST that was pre-positioned for the forecasted wind event.

When the Palisades Fire was reported at 10:30, and the ST was assigned to the incident, the IC established two (2) divisions and assigned the Cal OES STEN to serve as a DIVS. In order to assume the DIVS position, the STEN had to delegate the ST responsibilities to a STEN Trainee (STEN-T), although they both had to remain in the same vehicle. This complicated and confused divisional resources, and created challenges for the STEN-T and the DIVS to properly fulfill their assignments.

During the initial attack phase of the Palisades Fire, only one LAFD officer assigned to a Branch Director or DIVS role was CICCS-qualified, and that qualification was at the DIVS level. This may have contributed to challenges in coordinating and tracking suppression resources.

In contrast, in Branch VII (Getty Villa to western edge of fire area), LACoFD Operations Branch Directors and Division Supervisors were all CICCS-qualified at the division level or higher.

For law enforcement, the California Commission on Peace Officer Standards and Training (POST) has integrated ICS training into statewide law enforcement standards. Additionally, personnel involved in formal IMTs within LASD and LAPD are generally expected to complete advanced incident management training and Texas A&M Engineering Extension Service-related courses. These are designed to enhance skills for managing large-scale incidents and coordinating UC operations.

3.8.2 Emergency Operations

When an EOC is activated for incident coordination and support, it provides a secure, central location where government officials, emergency management personnel, and representatives from various partner agencies can collaborate to support the on-scene ICs.

The primary purpose of the EOC is not to command tactical operations in the field, but rather to collect and analyze intelligence, formulate a common operating picture, manage complex resource requests as needed, and provide public awareness by issuing alerts and warnings as directed by operational personnel from the field.

By handling the logistical, financial, and strategic burdens of the crisis, the EOC allows the IC at the scene to focus on life-safety and incident stabilization efforts without being overwhelmed by administrative tasks.

The core function of the EOC is to coordinate the four (4) phases of the disaster life cycle, ensuring that local, state, and federal entities work cohesively to protect life, property, and the environment, as illustrated in Figure 3.8.1.

Figure 3.8.1 Four (4) phases of emergency management

The staffing and activation level of an EOC scales based on the severity and complexity of an incident. During large-scale catastrophic events, such as the January 2025 fires, the EOC can scale to include representatives from:

- State emergency management agencies
- Federal partners, like FEMA
- National Guard
- Public health officials
- Transportation authorities
- Utility companies
- Non-governmental organizations, like the American Red Cross

The presence of these representatives in the EOC provides opportunities for rapid decision-making and a coordinated, comprehensive response to the unfolding disaster.

Section 4.3.3 Emergency Management in the Phase One report[1] established that both the City of Los Angeles Emergency Management Department (EMD) and the Los Angeles County Office of Emergency Management (OEM) undertook preparedness and response actions before and during the January 2025 fires.

The Phase One report[1] documented EOC activations, staffing preparations, interagency coordination activities, alert and warning operations, and emergency management support functions as conditions escalated across Southern California.

While the Phase One report[1] focused on establishing a factual chronology of these actions, this Phase Two report evaluates how emergency management organizations, staffing models, operational structures, coordination processes, and evacuation notification decision-making frameworks influenced the overall response to the Palisades and Eaton Fires and the broader regional emergency.

3.8.2.1 City of Los Angeles Emergency Management Department

The City of Los Angeles EMD serves as the strategic coordinating body for the City's Emergency Operations Organization (EOO). The department's primary mission is to prepare the city for disasters, manage interagency coordination during crises, and guide long-term recovery efforts.

The EMD maintains a highly collaborative and unified relationship with LAFD and LAPD. Representatives from these agencies rotate as EOC Directors, depending on the incident type. Chief fire officers serve as EOC Director for fire incidents and uniformed chief police supervisors oversee police-related matters.

While LAFD and LAPD handle their own direct mutual aid, the EMD is responsible for managing non-traditional resource requests, such as arranging evacuation shuttle buses or Animal Services officers.

The EMD is responsible for citywide emergency planning, preparedness, response, and recovery for a population of roughly four (4) million nighttime residents and a daytime population of six (6) million. Their operations adapt drastically, depending on the threat level.

Blue Sky Days (Normal Operations)

Under normal conditions, the EMD focuses on planning, hazard mitigation, and community outreach. It also offers emergency preparedness events for the public, provides daily monitoring of the weather, and acts as a supporting entity in urban planning.

Gray Sky Days (Incident Operations)

When a significant incident occurs, or is forecasted, the EMD shifts to a response mode. The duty officer assesses unmet needs, deploys an EMD liaison to the field command post, and makes the determination to activate the EOC.

Once activated, the EMD supports field operations with situational awareness, logistics, and recovery planning. A primary responsibility during a "gray sky" event is amplifying public safety messaging and taking over the Alert & Warning (A&W) capabilities for subsequent emergency notifications.

Personnel and Staffing Levels as of January 2025

During the January 2025 fires, the EMD was tasked with operating the city's EOC at a "Level 1" activation — its highest tier. This required coordinating a massive, multi-jurisdictional response that included local police and fire, county partners, state agencies (CAL FIRE, Cal OES), and federal entities (FEMA).

During the fire event, city EMD personnel managed complex logistical requests, coordinated public emergency alerts, including evacuation warnings and orders, and liaised with nongovernmental organizations to support mass sheltering operations.

The EMD has a strong working relationship with the OEM. EMD leadership was in direct contact with OEM staff at the beginning of both the Palisades and Eaton Fires.

3.8.2.2 Los Angeles County Office of Emergency Management

The Los Angeles County OEM serves as the lead emergency management agency for the county and is responsible for coordinating preparedness, response, recovery, and mitigation activities across county departments and Operational Area municipal, county, state, federal, and private-sector partners.

The OEM manages the County Emergency Operations Center (CEOC) and serves as the primary coordination link between local jurisdictions, county departments, state agencies, federal agencies, and nongovernmental organizations during major emergencies.

The OEM operates within one of the most complex emergency management environments in the U.S., encompassing 88 incorporated cities, extensive unincorporated communities, critical transportation and utility infrastructure, and a population of approximately 10 million residents. Structural challenges exist within the OEM, as coordinating with 88 different cities makes highly localized organization difficult.

The OEM also has a Watch Center, which operates 24/7/365 to maintain situational awareness and provide technical support for alert issuance.

While fire departments, law enforcement agencies, and municipal emergency management organizations maintain operational control of their respective field resources, the OEM provides countywide coordination, situational awareness, emergency management support, public information functions, and emergency alert and warning coordination.

It also facilitates information sharing among agencies, supports resource requests, and maintains communication with state and federal partners during incidents affecting multiple jurisdictions.[88]

Blue Sky Days (Normal Operations)

Under routine conditions, the OEM focuses on emergency planning, training, exercises, preparedness coordination, grant management, continuity planning, and hazard mitigation activities. It works closely with county departments, incorporated cities, special districts, and community organizations to maintain readiness and strengthen emergency management capabilities throughout its Operational Area.

Gray Sky Days (Incident Operations)

As incidents emerge, or are forecasted, the OEM transitions into an operational coordination role. Responsibilities include staffing and operating the CEOC, maintaining countywide situational awareness, supporting emergency alert and warning activities, coordinating resource requests, facilitating information sharing, and maintaining communication with local, state, and federal partners.

During major incidents, the OEM also supports public information operations and coordinates with emergency response agencies regarding evacuation warnings and orders.

Pre-January 7, 2025 Incident Preparedness and Activation

A detailed assessment of the OEM's pre-incident preparedness activities, interagency coordination, operational readiness measures, and preparedness messaging is provided in the McChrystal Group's After-Action Review of Alert Notification Systems and Evacuation Policies for the Palisades and Eaton Fires.[89]

Approximately 96 hours prior to January 7, 2025, NWS-Los Angeles/Oxnard began broadcasting the potential for a major Santa Ana wind event and extreme fire weather conditions (see Section 3.3.4). OEM personnel evaluated this forecast and elected to proactively activate the CEOC.

Upon activation, Operational Area coordination calls were conducted to brief stakeholders (i.e. other county agencies and incorporated cities) on the forecasted weather and other possible hazardous conditions that could develop in the coming days, EOC activation statuses, and proactive measures.

These proactive safety measures included road closures in vulnerable areas like Topanga Canyon and the transition of some local schools to online learning.

The OEM also implemented a preemptive staffing plan based on these forecasted conditions, which included recalling personnel from approved time off to ensure sufficient operational coverage.

Initial Response and the Palisades Fire on January 7, 2025

High winds in the early morning hours of January 7, 2025, prompted OEM personnel to prepare for deployment. This heightened state of readiness resulted in an early response to the Palisades Fire where OEM Agency Representatives (A-Reps) would embed with the Palisades IMT.

These embedded A-Reps began utilizing Genasys mapping systems (see Section 3.11.1) to help dictate the first wave of evacuations. As the fire rapidly outpaced evacuation efforts, the initial Palisades ICPs became compromised by heavy smoke, forcing multiple emergency relocations.

To maintain continuity, members of OEM leadership also embedded directly into the Palisades ICPs to help facilitate formal disaster proclamations. They also ensured A-Reps maintained an uninterrupted “hot hand-off” during shift changes, guaranteeing direct, immediate transitions between shifts.

Escalating Conditions and the Eaton Fire

Shortly after 18:00 on January 7, 2025, the Eaton Fire ignited and rapidly expanded from 10 to over 100 acres. Additional A-Reps were dispatched to support the emerging fire incident, though travel to the Farnsworth Park ICP took roughly an hour due to severe operational hazards, including power outages and downed trees blocking the roadways.

By midnight on January 7, 2025, multiple A-Reps were centralized at the Rose Bowl ICP to manage overlapping incident zones, establish hot spots, and relay critical zone updates back to the EOC.

Due to the encroaching fire, smoke, and wind, the Palisades ICP was forced to relocate a third time to Zuma Beach at 06:25 on January 8, 2025.

Rapid Escalation on January 8, 2025

Between 02:00 and 03:00 on the morning of January 8, 2025, temperatures dropped and winds at the Rose Bowl ICP shifted west, blanketing the command area in ash. Sustained, heavy winds also caused a rapid change in fire behavior.

To relay these rapid, continuous changes, A-Reps sought shelter inside vehicles near the Rose Bowl ICP to escape the extreme winds, transmitting updates to the EOC every two (2) to five (5) minutes.

By 06:00 on January 8, 2025, the fire’s southwest flank was in alignment with the Rose Bowl ICP, prompting urgent discussions regarding the potential evacuation of the Eaton ICP itself.

By 07:00, dense smoke completely obscured the sun, causing confusion among personnel on the ground. Orderly shift changes were executed throughout the morning of January 8, 2025, and relieved field personnel transitioned back to the EOC to assist in auxiliary roles, including supporting the Joint Information Center.

Operational and Technical Challenges

Throughout the Palisades and Eaton Fire incidents, OEM field personnel communicated with the EOC mostly using cell phones, which were intermittent and unreliable in some areas. See Section 3.5 for more information regarding challenges with communications.

The OEM lacked dedicated vehicles and independent satellite infrastructure, leaving them entirely dependent on fire department Starlink satellite internet systems to maintain connectivity with the EOC.

The EOC also experienced an electrical power interruption that was quickly addressed by backup generators. As conditions worsened throughout January 7, 2025, and into January 8, 2025, grounded aviation assets, darkness, rugged terrain, and limited access restricted situational awareness of the fire perimeter. Consequently, the EOC could not independently develop a common operating picture and relied on A-Reps for field intelligence.

Additionally, interagency friction complicated the response. While some contract cities immediately utilized OEM's A&W systems, other municipalities experienced delays because they required multi-step protocols, including secondary approvals from city managers and mayors in some areas, before publishing Genasys evacuation zones.

3.8.3 Incident Command

To ensure clarity and consistency with Appendix B-1 of the California Agency Designators by Agency in FIRESCOPE's 2022 Field Operations Guide,[90] the below three (3) letter identifiers will be used in operational contexts.

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)
- California Department of Forestry and Fire Protection (CAL FIRE = CDF)
- Pasadena Fire Department (PFD = PAS)

Large-scale fire incidents in California, like the Palisades and Eaton Fires, are managed under the ICS. The ICS, initially developed through California's FIRESCOPE program, was created after a series of wildfires ignited in WUI areas around Southern California in the 1970s.

The ICS provides guidelines and best practices for interagency response to major incidents and disasters across fire, law enforcement, EMS, infrastructure (water, electrical, public works/ transportation, communications, etc.), and emergency management.[91]

The foundation of the ICS system rests on several concepts, including:

- **Leaders' Intent** - Identify the task, the purpose of the task, and the end state of the task (or how it looks when complete).
- **Span of Control** - Effectively supervise with each supervisor overseeing between three (3) and seven (7) resources, including TFs and STs.
- **Chain of Command** - Ensure all personnel should have an identified supervisor.

After the 2005 adoption of the National Incident Management System (NIMS), ICS training and compliance became more deeply integrated into California's emergency response operations.

NIMS requires that organizations maintain a clear line of succession at both the executive and operational levels. This includes pre-identifying alternates for all command and general staff roles, credentialing those personnel in advance, and conducting cross-training before incidents occur.

As a fire incident expands in size and complexity, command of the event is often split between an IC, who oversees the overall management of an incident (with full command and general staff positions) and develops incident objectives, and an Operations Section Chief (OSC), who manages operations in the field directly applicable to the primary mission and provides field-level supervision.

A written delegation of authority, clarifying the distinction between the policy role of the Senior Official (a fire chief or their designee) and the IC's command role, must be established at the time of activation.

UC partners should be working from the same location, and a single organizational chart with an effective start time stamp should be published and updated whenever leadership or section changes occur.

All agencies that have a jurisdictional responsibility for an incident, either geographical or functional, should become part of a UC, where each jurisdiction's concerns are addressed in the development of an IAP, under a single unified ICS.

Large fires in the WUI require a full build-out of the ICS system, using branch management, early in the incident, in order to manage all aspects (evacuation, medical, perimeter control, structure defense, traffic management, logistics, etc.) of the expanding threat.

This requires a large number of incident management overhead personnel to staff multiple Divisions (geographical areas that limit span of control) and Groups (resources assigned to a functional task) early on.

3.8.3.1 ICS Challenges During the Palisades and Eaton Fires

The fast growth rate of both the Palisades and Eaton Fires meant that a large number of trained and qualified personnel were needed to staff a rapidly expanding incident.

This proved difficult with operational qualifications for some overhead assignments being inconsistent and, in certain cases, inadequate given the complexity of the incident.

Other issues included a lack of coordination during the early response to the fires, as law-side IMTs, for example, made unilateral decisions without coordinating with other ICs. Multiple relocations of the ICP also disrupted continuity (Figure 3.8.2).

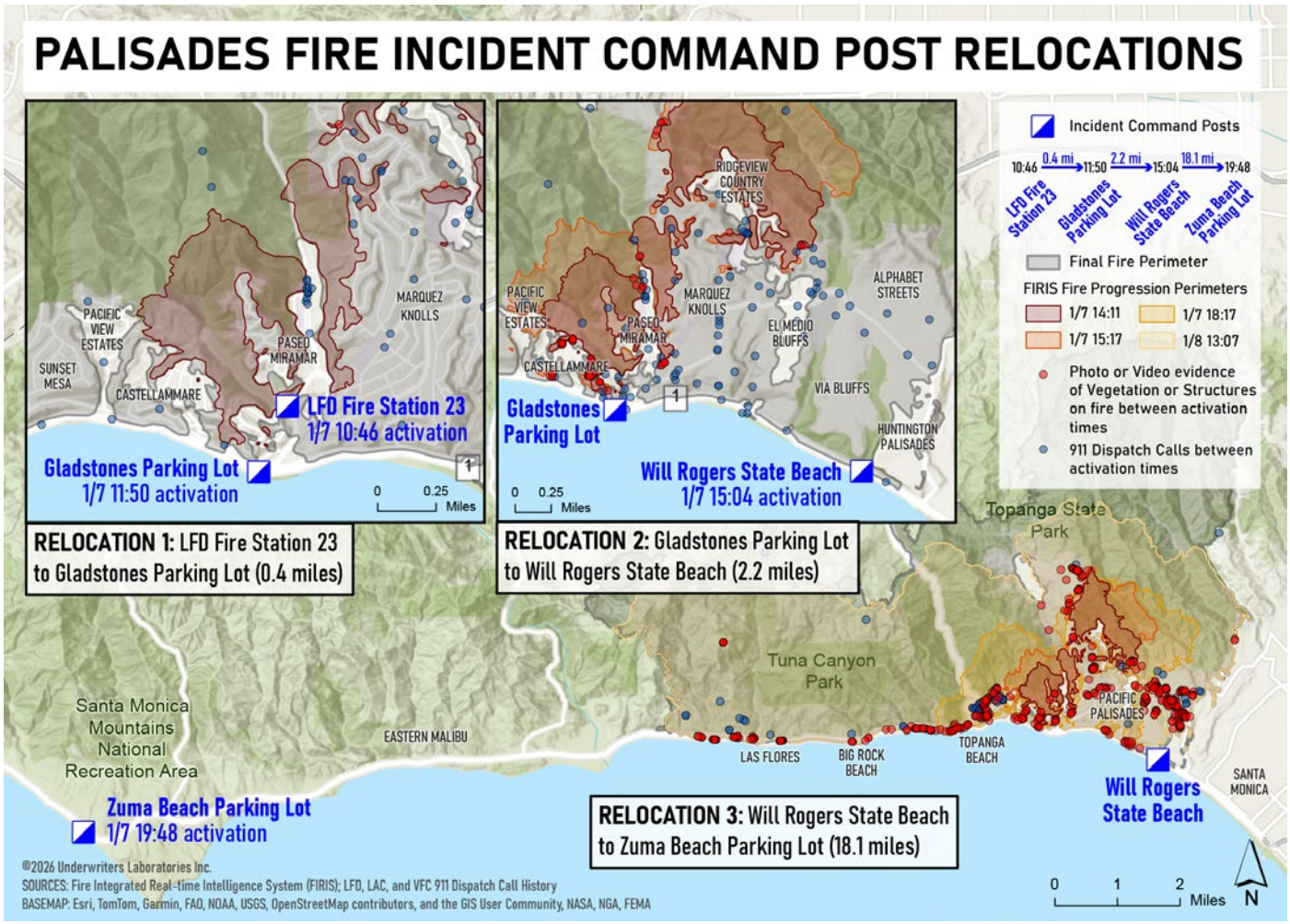


Figure 3.8.2 The four (4) command post locations for the Palisades Fire are shown in relation to each other and the fire's progression.

The integration of multiple IMTs was broadly positive, but uneven onboarding and hand-off practices created pockets of confusion. Managing overhead and Command Staff across two (2) concurrent incidents also placed additional stress on continuity and span of control. As such, there was UC fragmentation at times between agencies, undermining the integrated approach the situation required.

Off-scene entities occasionally attempted to direct on-scene operations, blurring the critical distinction between policy authority and command authority.

3.8.3.2 Palisades Fire Incident Command

Palisades Incident Command was established at 10:44. Prior to establishing a formal command structure, an LAC Assistant Chief (AC) ordered a further 20 Engines and three (3) Type 3 fixed-wing aircraft, on top of the standard initial resource allocation and the 10 additional Engine companies and LFD helicopters that LF69 had initially requested. During the early phase of the incident, the AC and a Logistics Captain organized the delivery of command trailers and other logistical needs to Will Rogers State Beach.

Note: *More information on the timing around the establishment of the Palisades Incident Command is included in the Phase One report.*[1]

First Incident Command Post: Fire Station 23

The first ICP for the Palisades Fire was established at LFD Fire Station (FS) 23 by the IC by 10:46 on January 7, 2025. The initial ICP location presented several operational challenges and was established before the rapidly increasing scale and complexity of the incident became apparent.

Not only was it in the path of the fire and located along a primary evacuation route near The Summit and Palisades Highlands neighborhoods, it also offered limited situational awareness of the rapidly expanding incident due to its location in a narrow canyon, which restricted the ICP's view of the fire's progression.

Communications from the FS23 ICP were also difficult due to its secluded location (see Section 3.5.1).

The LFD command team running the incident was unfamiliar with the resource ordering process and expressed concern about who would be responsible for the cost of the resources ordered. This concern caused a delay in ordering the appropriate resources for the incident.

The additional resources that were requested did not match the resources needed based on expected escalating PDS weather, and were ultimately insufficient to address the scale of the incident.

ICS/CICCS-qualified cooperating agency staff began assisting LFD early on at the Palisades Fire to create an effective incident ordering and planning system, which would have likely been further delayed without their assistance.

Staff from these agencies recognized that resource ordering was not matching the demands of the growing emergency and recommended accelerating the process. They also urged conversion of the incident from an initial attack-oriented organization to a major fire organization.

Finally, they recommended transfer of the Unified Ordering Point (UOP) — a single location through which all incident resource orders are processed — from the city's Metro Dispatch to the more wildfire-experienced LAC dispatch center to speed resource delivery.

Despite indications from the Helicopter Command (HLCO) that the fire was rapidly developing and could reach structures in Pacific Palisades within just a few minutes, the ICP did not order the necessary supervisory overhead positions needed to support this potentially complex incident.

Additionally, the initial Palisades Fire staging location, designated at Palisades Drive and West Sunset Boulevard, presented challenges. Its location was on a major transportation corridor used by evacuating residents, while communications between the ICP and the Staging Area Manager (STAM) were lost for a portion of the response time.

The STAM was also reportedly working alone and did not have the additional support personnel required. It is unclear whether this staffing issue resulted from the communications failure or a lack of response from the OSC.

Communication challenges also caused fire units to remain in staging for an extended period of time without assignment (Figure 3.8.3).

As the fire began impacting structures near the staging area, these units recognized the need to take immediate action. As such, they self-deployed using TIER (Take Initiative, Engage, and Report, see Section 3.9.2). While this was an appropriate action, it contributed to the OSC's lack of accountability for resources for the entire first operational period.

Figure 3.8.3. Fire resources staged at Sunset Boulevard and Palisades Drive.

With the arrival of chief officers from the Sunset Fire, a formal command structure was established. An LFD BC assumed the role of OSC, an AC became the IC, and a Deputy Chief (DC) served as the Agency Administrator (AA).

The officers filling these roles had limited experience managing wildland and large WUI fires, which may have affected their ability to anticipate the fire's progression and behavior.

Additional chief officers from surrounding agencies, who had extensive experience in managing WUI fires, began to arrive on scene. However, they were not integrated into the incident command structure.

Further delays were caused by the internal LFD IMT waiting for a written delegation of authority to respond to the incident within their jurisdiction. When the LFD IMT did arrive on scene, some members were not clear on their roles in the incident organization.

During this time, the LFD command team was still operating at FS23, even though they were encouraged multiple times to relocate the ICP to the parking lot at Gladstones restaurant due to its size and location. This location was off PCH, and although a better location than FS23 at the time, it would ultimately also be overrun by fire.

As the fire progressed toward FS23, children who had evacuated a nearby school sought shelter near the station and were congregating at the ICP. This complicated the LFD command team's ability to manage the incident with the chaos surrounding them.

The scene at the FS23 ICP quickly worsened with thick smoke, heavy traffic, and large crowds of evacuated civilians trying to locate family members, creating a dangerous situation. Vehicles and pedestrians overwhelmed the area around the ICP, forcing responders to park farther away and walk in.

At approximately 11:30 on January 7, 2025, an LAPD captain arrived at FS23 and advised LAPD dispatch that they assumed the role as LAPD's IC. During this same time period, LFD and LAC initiated a UC.

Around this same time, initial efforts were made by LAPD personnel to coordinate directly with LFD to obtain situational updates and better understand the rapidly changing conditions affecting evacuation efforts.

LFD personnel, however, were primarily focused on fire suppression and containment and protecting lives and property, which limited early communication about evacuation coordination between the agencies. Coordination improved once additional LAPD leaders arrived on-scene and worked directly with LFD staff to better share information.

LAPD's initial focus was on gaining situational awareness, identifying resources, and assessing the needs of personnel already in the field. After consulting with fire personnel, the decision was made to prioritize deploying more police officers to assist with evacuation and life-saving efforts at locations where field supervisors requested urgent help. This limited the number of personnel who were assigned to traffic control.

Second Incident Command Post: Gladstones Restaurant

Around 11:50, LFD officers managing the incident at FS23 relocated to Gladstones Restaurant (Figure 3.8.2). With LFD and LAC at Gladstones, and the fire still not in the LAC LRA, new incident control objectives were developed. An LAC AC, assisted by a Santa Monica Fire Department (SMA) DC, created the organizational structure for the incident.

The SMA DC was also acting as an intermediary between LFD and LAC. The LFD LRA consisted of Branch V with three (3) structure defense groups (SDGs) and two (2) divisions. The LAC LRA consisted of Branch VII with three (3) divisions.

See Figure 3.8.4 for the Palisades Fire's initial and expanded organizational assignments through January 8, 2025, 09:00.

Figure 3.8.4 Palisades Fire initial and expanded organizational assignments and locations, including ICPs, staging areas, SDGs, Branch and DIVS, and helispot, from initial attack through January 8, 2025, 06:00.

Although LAC and SMA were able to provide assistance, LFD did not fully leverage their knowledge and experience with commanding fast-moving, multi-jurisdictional WUI fires. This absence of experienced and qualified LFD command officers in key decision-making roles likely contributed to the Palisades Fire outpacing resource ordering, as well as efficient evacuation and fire suppression activities.

The LAC AC created TFs to manage resources and maintain an appropriate span of control. TF locations were fluid early in the incident, however, they would ultimately work at a defined location under a division supervisor assigned by the Branch VII director. The LAC AC continued to build out the TFs by creating multiple staging areas and a medical group.

When the LAC AC arrived at Gladstones around 11:00, they had a good view of the fire progression and behavior. At this time, the fire was not in the LAC LRA, but LAC anticipated, based on the extreme winds, that it would be shortly.

LAC command officers, recognizing the scope of the expanding incident and the inadequacy of the current command organization to fully manage the situation, made the decision to build a parallel incident organization in LAC's area of responsibility which would soon be impacted by the fire.

The LAC AC instructed the LAC OEM director and the LAC Division 7 OEM community service liaison to respond to the LAC AC's location. Anticipating the progression of the fire, the LAC AC used Tablet Command (TC) to identify evacuation zones early, well in advance of the fire impacting these areas.

While LFD and LAC had declared a UC early in the incident, in practice, there were two (2) separate parallel command structures in each of their respective jurisdictions. This led to each agency developing its own strategic and tactical plans, and acquiring and assigning resources to address its individual needs instead of those of the greater incident.

LAPD also did not initially fully integrate into the UC, which created challenges in maintaining coordinated response across agencies during the incident's early critical phase.

This lack of a true UC can inhibit effective coordination and communication among UC members, which are essential to identifying and addressing emerging needs. A rapidly escalating incident, such as the Palisades Fire, requires a united command structure that can quickly expand to meet growing operational demands. When organizations operate in silos, efforts may be duplicated, information may not be shared, and overall effectiveness can be reduced.

At the time the Eaton Fire started, multiple LAC chief officers were meeting at LAC helispot 69B in the Santa Monica Mountains. They were discussing the current Palisades Fire and reinforcing plans in case another fire were to start in the county.

The two (2) LAC ACs acting as a Task Force Leaders (TFLs) and Branch VII director left the Palisades Fire to respond to the Eaton Fire, as outlined in an LAC plan developed earlier that day in case of concurrent fires. The LAC AC who had arrived first to Gladstones at the start of the fire subsequently became the Branch VII director, while management positions in Branch VII were shifted to account for the loss of personnel to the Eaton Fire.

The LAC AC to first arrive on scene notified LA FCCF of the incident footprint, as well as the incident organization chart, branch names, and boundaries. A system to handle 911 calls in the LAC LRA was developed early in the Palisades Fire, with LA FCCF contacting the Branch VII director directly on command, instead of the LFD IC/OSC.

To facilitate better response coverage, LA FCCF moved county fire companies up to LAC fire stations that were closer to the incident in the Malibu area. While at these Malibu-area stations, move-up companies were frequently dispatched into the fire footprint by LA FCCF, bypassing the system developed above to handle 911 calls.

For example, LAC Engine (E) 236 from Carson was moved up to cover LAC FS69 in Topanga Canyon on the afternoon of January 7, 2025. They indicated they were dispatched to an incident in the Sunset Mesa neighborhood and arrived just as the fire was beginning to impact that neighborhood where structures were catching fire.

They ended up being attached to a TF working in the neighborhood, and asked the LAC BC who assigned them to the TF to notify LA FCCF that they were being attached to the fire incident. This is an example of how “dark” resources, as mentioned in Section 3.5.3, can use line supervisors to inform incident command of new resource assignments.

Third Incident Command Post: Will Rogers State Beach

The ICP was moved again to a third location at Will Rogers State Beach at 15:04 on January 7, 2025, due to fire conditions (ICP #2 was directly in the path of the fire’s progression) and heavy traffic impacting the ICP’s parking lot (Figure 3.8.5).

Throughout the day and night, the command team received several radio reports about the fire’s progression, but they did not utilize the reports to revise operational plans.

Fourth Incident Command Post: Zuma Beach

The ICP was moved a final time to Zuma Beach at 19:48 on January 7, 2025 (Figure 3.8.2), once again due to fire conditions and traffic concerns. As the fire’s flanks widened, the eastern flank extended to ICP #3 at Will Rogers State Beach along PCH. While Zuma Beach was not in the path of the fire, its location presented a number of challenges, including communications issues (see Section 3.5.1).

By the time the ICP was at Zuma Beach, officials realized that LAPD personnel were using evacuation maps that did not match the fire department’s maps, causing confusion about evacuation zones.

Some LAPD personnel noted that coordination and consistency greatly improved once CDF took over incident command at the ICP, leading to more unified and synchronized evacuation mapping, communication, and interagency efforts.

Figure 3.8.5 Fire impacting the ICP at Will Rogers State Beach from the north (top) and south (bottom) around 22:00 on January 7, 2025.

Throughout the initial attack, the LFD command team did not know the location of the fire. The OSC was stationary at all ICPs until the CDF OSC took over at Zuma Beach. This limited the LFD OSC's ability to gain the required situational awareness needed during the incident and prevented sufficient understanding of the fire's scope required to build out an appropriate incident organization and effective IAP.

Resource Accountability

Complete and accurate resource accountability is required for an OSC to effectively manage an incident and ensure the safety of personnel. Accountability, through the development of a proper assignment list (ICS Form 204[73] or equivalent), is necessary to properly plan for upcoming operational periods before they begin.

During the initial attack of the Palisades Fire, the OSC was unable to maintain full accountability of resources, compromising the command of the incident.

For example, when a firefighter mayday occurred over the radio at 12:42 on January 7, 2025, it took an extended amount of time for the OSC to account for all the personnel involved in the fire incident, which drew their focus away from their overall management of the incident.

As discussed in Section 3.5.3, there were several LFD resources that were operationally engaged for days without the knowledge of the OSC or LA Metro.

Throughout the incident, there was also a lack of collaboration between the OSC/IC and LA Metro.

During the afternoon/evening of January 7, 2025, as the fire spread into neighborhoods in the Palisades, LA Metro dispatched resources into the footprint of the fire on separate incidents.

The LFD BCs running these separate incidents should have recognized that the use of that many resources was not appropriate, and should have contacted the IC/OSC and LA Metro for clarification and direction.

In the IAP prepared by LFD for the operational period starting at 07:00 on January 8, 2025, there were few LFD resources listed, even though there were many resources working on the incident. LFD resource accountability was not reconciled until days later.

As such, when the CDF IMT assumed management of the incident on January 8, 2025, accountability continued to be an issue, as the newly assigned supervisors did not have a complete accounting of assigned resources working in their areas.

Additionally, LA Metro moved resources to LFD FS23 and FS69, which were within the fire perimeter for station coverage. Later, these resources were then dispatched by LA Metro to structure fires in Pacific Palisades without the knowledge of the OSC or the IC.

Incident command and control were further compromised by the high volume of calls for service coming in. These 911 calls overwhelmed the OSC, making it nearly impossible to both manage the incident and assign resources to the calls. See 3.5.4 for more details on the handling of 911 calls.

Administrative performance during the early phase of the incident was insufficient, as initial IMTs did not maintain full ICS logs, nor did they organize officers under formal branches and groups. This lack of streamlined information between IMTs significantly reduced the situational awareness available to these follow-on teams.

Similarly, the DOC did not immediately provide department-wide situational awareness or resource accountability. Moreover, some DOC staff were unfamiliar with available incident management systems, which slowed processing and generated duplicate requests.

As a result, some supply requests were submitted independently from base camp without IC approval, creating confusion in Finance and Logistics and delaying procurement. The initial ICS-205 Communications Plan did not reflect the incident's size or scope and was unevenly followed across sections.

At the same time, conflicting and duplicative requests arrived through personal phones, text messages, and multiple informal channels, reducing the bandwidth of Finance and Logistics units and creating accountability gaps.

The DOC encountered additional challenges as DOC and EOC positions could not be staffed continuously at the outset, while work-rest cycles and cross-coverage arrangements were inconsistent. Publicized recall numbers and published contact lines flooded PSO and DOC phone lines, consuming administrative bandwidth that should have been reserved for more critical support functions.

There were also early gaps in check-in and demobilization documentation, including ICS-211, which produced mismatched personnel counts between the ICP, staging, and the DOC. Not all incident products, including situation and status snapshots and IAP attachments, were captured and archived consistently, creating potential gaps in the financial and legal record.

Command Capacity

A fully built out command and general staffing plan is a critical step in managing an effective ICP. However, the LFD command team's limited experience in handling large-scale, WUI fires meant they did not staff for key Deputy, Liaison, Safety, and PIO positions during the initial incident. Had these positions been filled, the OSC would have had more time to focus on incident management rather than taking on additional tasks like handling the large volume of 911 calls.

This lack of specific core functions of the ICP also caused significant gaps in resource tracking, strategic forecasting, and accountability.

The ICP also suffered from command credibility issues, where a lack of trust and an overall institutional disconnect between command staff and line personnel resulted in parallel pathways of operations. LFD Captain II personnel, for example, were often viewed as more trusted operational leaders than formal command staff.

This often undermined the leadership of command staff, further complicating unified operational objectives.

Coordination at the command level between LFD and LAPD was also inadequate. While both agencies acknowledged each other's presence, they were not operating "side-by-side" at the ICP. As a result, the two (2) agencies did not work together as they should to ensure the objectives of both departments were integrated into an IAP.

This disconnect caused response delays, as command actions became unnecessarily complicated. For example, the IC called LA Metro at 11:52 to have LAPD shut down traffic on Palisades Drive in the Highlands. Had a functioning UC been established, the IC would have only needed to turn to their LAPD counterpart for faster response coordination.

When the Eaton Fire started at 18:18, resource availability for the Palisades Fire was impacted. Many of the effected neighborhoods in the Eaton Fire area were devoid of fire resources, and the OSC, already challenged by the lack of situational awareness, now faced the additional challenge of a lack of resources to manage the Palisades Fire.

Branch VII's organizational structure stayed in place overnight as some qualified members from CDF arrived at the Will Rogers ICP on the evening of January 7, 2025.

Red Flag/PDS weather warnings and EOB notifications were disseminated to LASD patrol stations, including LHS, prior to the ignition of the Palisades Fire.

In response to the forecasted high-risk weather conditions, an LHS captain authorized overtime staffing at approximately 03:40, to support soft road closures in the Topanga Canyon area prior to fire ignition. Additionally, Area Residents Serving and Observing Neighborhoods (ARSON) Watch volunteers were deployed throughout the Palisades Fire area to monitor potential fire activity.

Despite these precautionary measures, command staff kept patrol staffing at normal deployment levels rather than implementing pre-incident staffing increases or callback procedures. TDs indicate an operational mindset largely centered on a response-based model, rather than proactively staging resources during high-confidence Red Flag and PDS conditions.

Prior to the establishment of the UC at Will Rogers, an LHS captain-initiated ICS-based command operations from the Lost Hills station and assumed IC responsibilities during the early stages of the incident.

However, although ICS was operationally initiated, several key command and general staff functions, including Operations, Planning, and Logistics, were neither formally assigned nor consistently staffed during the fire's rapid expansion.

As a result, decision-making and coordination responsibilities remained highly centralized with the IC, while many field personnel continued to operate primarily in direct-response roles rather than within fully established ICS functional assignments.

3.8.3.3 Eaton Fire Incident Command

When the Eaton Fire started in the Foothill MTZ, LAC had been actively responding to the Palisades Fire in their jurisdiction since shortly after 10:30 on the morning of January 7, 2025.

Note: *The timing of when the Eaton Fire IC was first established is included in Section 4.3.2.2.3 of the Phase One report.*[1]

Fires in this part of the MTZ receive an automatic response consisting of first-alarm assignments from LAC, ANF, and PAS (consisting of resources from any of the 13 cities that are part of the Verdugo Fire Communications Center), as well as a pre-designated VHF communications plan.

First Incident Command Post: Eaton Canyon Equestrian Center

A PAS BC, the first chief officer on scene, established the initial Eaton Fire ICP at 18:26 on January 7, 2025, at the Eaton Canyon Equestrian Center on New York Drive, just east of N. Altadena Drive (Figure 3.8.5).

ANF, LAC, and PAS established UC while at the Equestrian Center ICP. The ANF chief took the lead in organizing the roles and responsibilities for the initial attack and established a single ordering point with LA FCCF. The agencies in the Foothill MTZ met regularly prior to the incident, and the UC was cooperative and trustworthy.

The PAS BC also began implementing the assigned communications plan and started forming SDGs around the mouth of Eaton Canyon, identifying them sometimes by number and sometimes by the name of a street or neighborhood.

Individual apparatus were assigned to the SDGs under the direction of a group supervisor. Later in the initial attack stage, some SDGs that were initially identified by numbers were changed to specific place names, making it difficult to account for all of the resources.

A report from HLCO indicated that the fire was moving to the east toward Kinneloa Canyon and that it would impact homes in that neighborhood shortly. The PAS BC assigned an LAC BC as leader of SDG5 (later named Kinneloa SDG) and assigned a large number of resources to report to the LAC BC.

The SDGs boundaries, resources, and objectives were not well defined, and numerous SDGs were formed in a small geographic area.

At around 18:40, LASD deputies at ALD and Crescenta Valley Station (CVS) identified the risk of the fire spreading rapidly into nearby residential areas, especially west of Eaton Canyon, due to strong winds and ember cast ahead of the fire. Response efforts were challenged by staffing shortages for both stations, as MFF activations to the Palisades Fire reduced staffing to about 50% of normal patrol levels.

As spot fires ignited homes and vegetation in neighborhoods adjacent to Eaton Wash near Eaton Canyon, deputies focused on life safety and began evacuation efforts using public address (PA) systems and door-to-door notifications. Despite worsening fire conditions, deputies persisted with evacuations, striving to stay ahead of the advancing fire front.

Second Incident Command Post: Farnsworth Park

At approximately 18:51, the Equestrian Center was directly in the path of the fire and was being heavily impacted by smoke and ember cast. Around 19:00, an LASD deputy initially set up a mobile command post at Farnsworth Park with LAC and took on informal incident command duties early on.

The ICP was officially relocated to Farnsworth Park at 19:06 (a preplanned ICP location by LAC) at Lake Avenue and Concha Street in Altadena (Figure 3.8.5).

The UC structure was established with LAC taking the lead role. The UC was expanded to include the Pasadena Police Department (PPD), SMFD, and LASD. The UC established the priorities of life and structure defense.

An LAC BC assumed the position of IC at Farnsworth Park, and the PAS BC assumed the position of the OSC, commanding resources in the field. Numerous LAC chief officers and LASD deputies and commanders, including the LAC Fire Chief and the Los Angeles County Sheriff, arrived at the Farnsworth Park ICP.

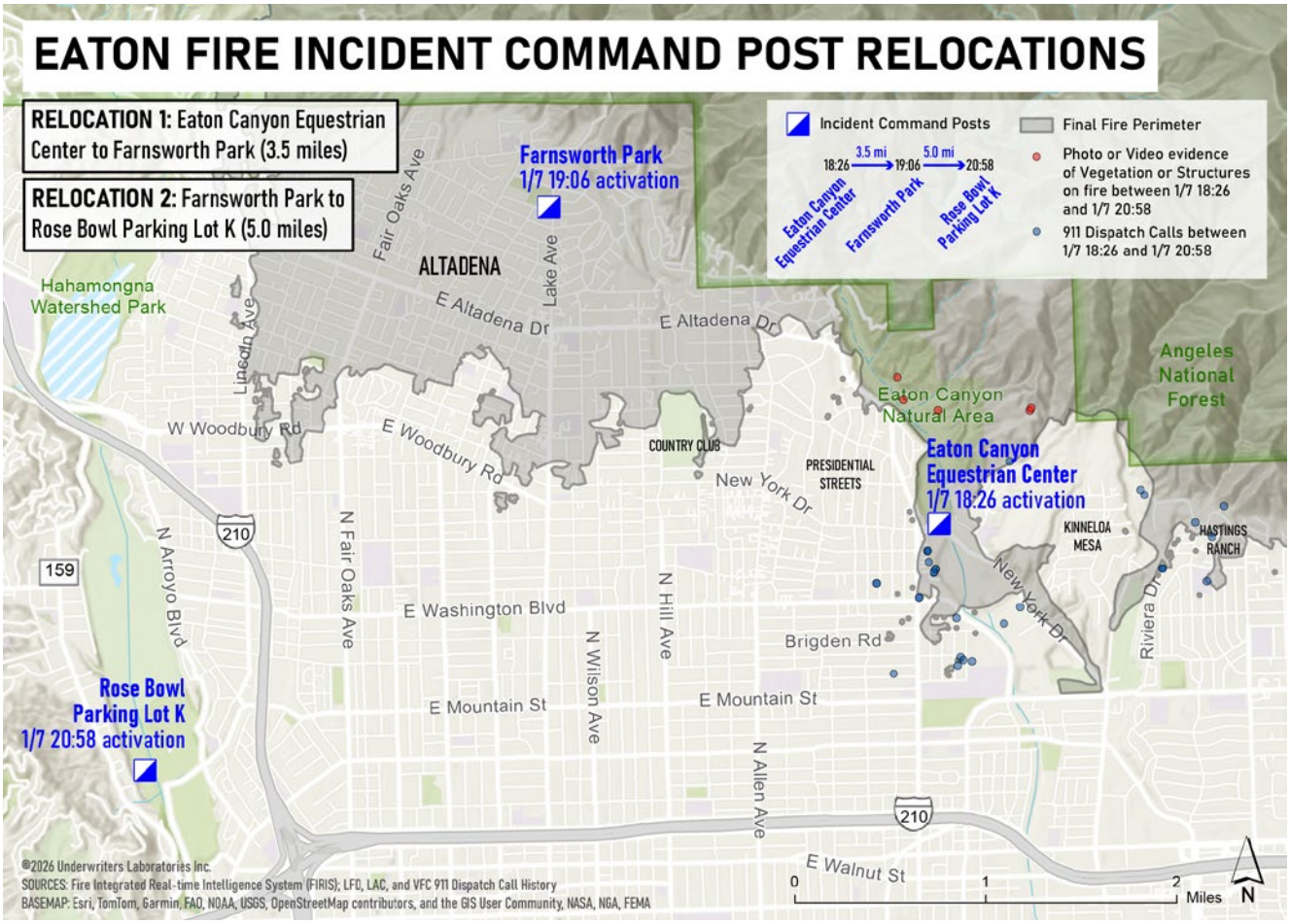


Figure 3.8.5 The three (3) command post locations for the Eaton Fire are shown in relation to each other and the fire perimeter.

At 19:18, all aircraft were grounded due to very high and erratic winds. The loss of aerial reconnaissance constrained situational awareness that considerably impacted informed decision-making for the remainder of the night on January 7, 2025. The last report from HLCO was that the fire was pushing from the point of origin to the east.

As the incident grew, a lieutenant from CVS was designated IC and took over. The senior LASD deputy attempted to coordinate evacuation efforts by monitoring LASD personnel via their portable radios and communicating those efforts to LAC.

Two (2) ACs from LAC left the Palisades Fire and responded to the Eaton Fire. Upon their arrival at Farnsworth Park, these two (2) officers assumed Branch Director positions on the Eaton Fire.

LAC assumed the OSC role from PAS at approximately 19:45. At this time, LAC recognized that the current incident organization, consisting of SDGs, was quickly being outpaced by the progression of the fire from brush into the neighborhoods, and there was inadequate resource accountability.

The LAC OSC began to reorganize the incident utilizing branch management, while the PAS OSC worked with them to reconcile resources.

The LAC AC formed Divisions Z and M, west of Altadena Drive, and Divisions A and D, east of Altadena Drive. When the division boundaries were established, each DIVS drove through their geographical area to account for resources and make them aware of the new organizational and reporting structure.

Complicating this reconciliation of resources was the presence of a number of LAC resources in the area that were operating outside of the Eaton Fire incident (see Section 3.5.3.2). Once these additional resources were in the fire area, they were absorbed into the incident and the DIVS began to capture, account for, and provide leaders intent to those resources.

As fire conditions worsened and threatened Farnsworth Park, LASD and LAC moved the ICP to the Rose Bowl, a safer location outside of the immediate fire threat area.

See Figure 3.8.6 for the Eaton Fire's initial and expanded organizational assignments through January 8, 2025, 06:00.

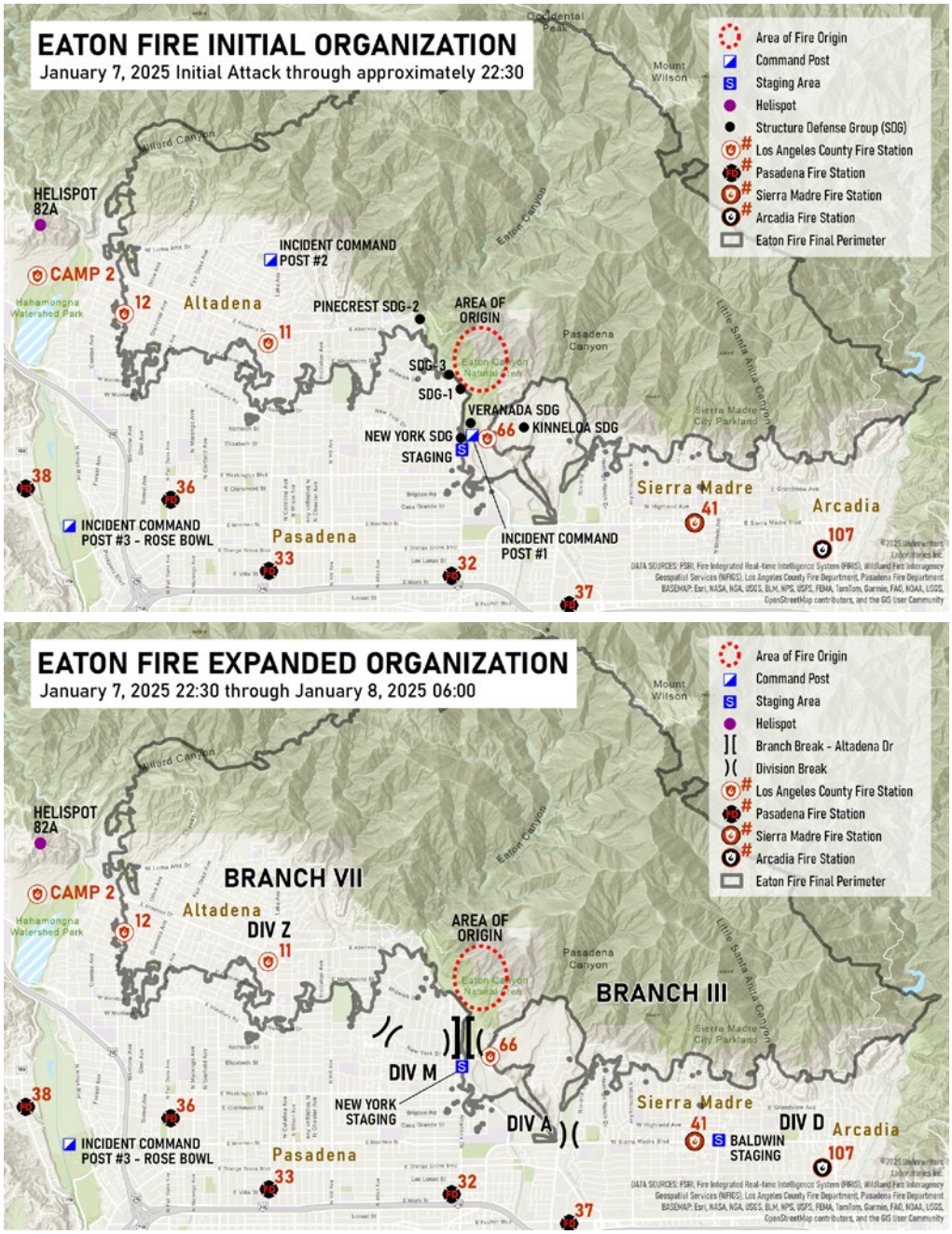


Figure 3.8.6 Eaton Fire initial and expanded organizational assignments and locations, including ICPs, staging areas, SDGs, Branch and DIVS, and helispot, from initial attack through January 8, 2025, 06:00.

Third Incident Command Post: Rose Bowl

The final ICP for the Eaton Fire was established at the Rose Bowl at 20:58 on January 7, 2025. When the transition to the Rose Bowl ICP occurred, the UC structure became fractured. LASD and LAC went into their separate command trailers.

Outside of UC, individual roles and responsibilities at the Rose Bowl ICP were not clearly and formally defined. This contributed to a strategic gap between leadership at the ICP, and between the ICP and personnel in the field who were task saturated.

For example, the LAC BC who arrived initially was unclear about the role assigned as the incident expanded, and the LAC ICs differed in their recollections of their specific responsibilities. Although the LAC BC had limited interaction with the designated LAC IC, the BC responded to radio transmissions addressed to the IC.

Multiple individuals within the command organization believed a Law Branch or Evacuation Group was established and managing the evacuation effort. Despite the presence of experienced chief fire officers at the ICP, the organization of the evacuation component into a Law Branch or Evacuation Group was not established by LAC.

ULRI learned through a publicly available podcast that an Evacuation Group was established early into the incident by PAS.[92]

ULRI was unable to validate this information or how this Group transitioned to the LAC command structure due to the City of Pasadena electing not to participate in ULRI's TDs.

A commander from the LASD IMT arrived at the command trailer, where personnel faced heavy smoke, strong winds, and rapidly changing conditions. Their initial focus was on quickly assessing the environment, identifying key personnel, and building situational awareness at the ICP.

Inside the trailer, LASD deputies and supervisors coordinated evacuation efforts, managed multiple radio channels, and assigned evacuation tasks amid a fast-moving and dynamic situation. It was clear that significant operational activity was happening, especially among those managing evacuation coordination and field deployment.

The LASD commander observed that upon arrival, some aspects of the ICS structure were not fully operational. However, they believed that pausing the evacuation to transfer command to the LASD Commander's IMT might have delayed life-saving actions. Instead, the decision was initially to have LASD IMT personnel shadow and monitor the evacuation efforts.

The IMT team provided recommendations to improve coordination of life-saving efforts. The commander mentioned that all activities were previously tracked manually on paper, but the LASD team later uploaded the missions to a digital platform to enhance tracking efficiency.

The commander then located and contacted the lead fire representative. During this initial coordination, the commander introduced themselves as the LASD IC for the first operational period, exchanged contact details, and stated that LASD command staff was available to assist with operational decisions and resource needs during the shift.

Personnel acknowledged that the early operational period faced challenges typical of rapidly escalating incidents, such as limited time to set up formal meetings, planning cycles, and coordinated briefings usually seen in sustained UC operations. After initial coordination with fire personnel, focus shifted to defining LASD's role and priorities for the next phase of the incident, especially regarding evacuation support, field deployment, and incident stabilization.

There is an expectation that LAC AC and DC Officers will respond to major incidents within the county, so there were several experienced officers at the ICP at the Rose Bowl. Additionally, there were many chief officers from LAC and other agencies providing input at the ICP.

This is normal and usually helpful. However, some of them were performing critical functions, such as identifying evacuation zones and ordering evacuations, which were outside of the formal command structure and without direct responsibility for those functions.

ICs from LAC and LASD were not “side-by-side” in Unified Command, and the physical separation caused a separation in building common knowledge. They did not manage the incident effectively together to ensure the objectives of both departments were integrated into an IAP. This caused a major gap in communication and a lag in response between the two (2) agencies. See Section 3.11.3 for more information.

During the first operational period, the ICs, LASD, and other fire personnel at the Rose Bowl ICP did not know the location of the fire and lost situational awareness. This was partly due to a lack of intelligence-gathering capabilities.

The LAC IC was unaware that the fire had progressed through west Altadena until the daylight hours on January 8, 2025. By that time, most of the structures in west Altadena had already been impacted by the fire. See Section 3.10.2.1 for more information.

When the Hurst Fire started at 22:29 on January 7, 2025, CICCS-qualified and field-experienced LAC personnel, who were assisting with important tasks, left the Rose Bowl ICP to respond to the Hurst incident. The ANF Chief also left to check on the status of ANF’s jurisdiction.

With three (3) major fires burning, LAC command capabilities were stretched to the maximum. As the night wore on, the Eaton Fire commanders at the ICP struggled to keep pace with the incident and continued to have difficulty determining the fire’s progression.

As Divisions began to ask for more resources, there were radio reports of homes burning with no fire engines in several areas, including at the top of Villa Heights Road at 21:01, at the top of Sierra Meadow Drive at 23:13, and at the top of Oak Crest Drive at 23:16, all located within Branch III, east of Eaton Canyon.

By 22:30, the LAC OSC established the new incident organization consisting of Branch VII (led by an LAC AC) with Divisions Z (LAC AC) and M (LAC AC) west of Altadena Drive, and Branch III (LAC AC) with Divisions A (LAC AC) and D (LAC BC) east of Altadena Drive.

Also around 22:30, an LAC DC replaced the LAC BC as the IC at the Rose Bowl. The branch director and division supervisor positions were staffed with personnel with extensive incident management experience in the WUI.

Fire activity in Altadena increases from midnight through just after 06:00 on January 8, 2025, as indicated in Figure 3.8.7.

At 00:45, on January 8, 2025, LAC E32 asked for more resources to assist with three (3) fully involved structures on Brigdon Road between Martelo Avenue and North Altadena Drive, in Division M. The OSC had just been notified by an LAC DC that there would be no new resources arriving until the next morning.

The OSC reported that they were shocked at this notification, as they had never been told that in any incident they had ever been assigned to. The OSC transmitted over the radio the information that there would be no additional resources and reiterated the priorities of life and structure defense.

At 00:54, the fire was reported by personnel in the field to be continuing to make a push to the east and they advised the OSC to continue to push resources to the east. The OSC continued to make Branch III the priority for resource assignments.

A radio report at 01:18 to the OSC from the field stated that the fire progression had slowed down in its eastern movement. This location was noted at the top of Baldwin Court in Sierra Madre. Around this same time period, 911 calls in the area of Lake Avenue increased, indicating a directional change of the fire’s progression toward West Altadena.

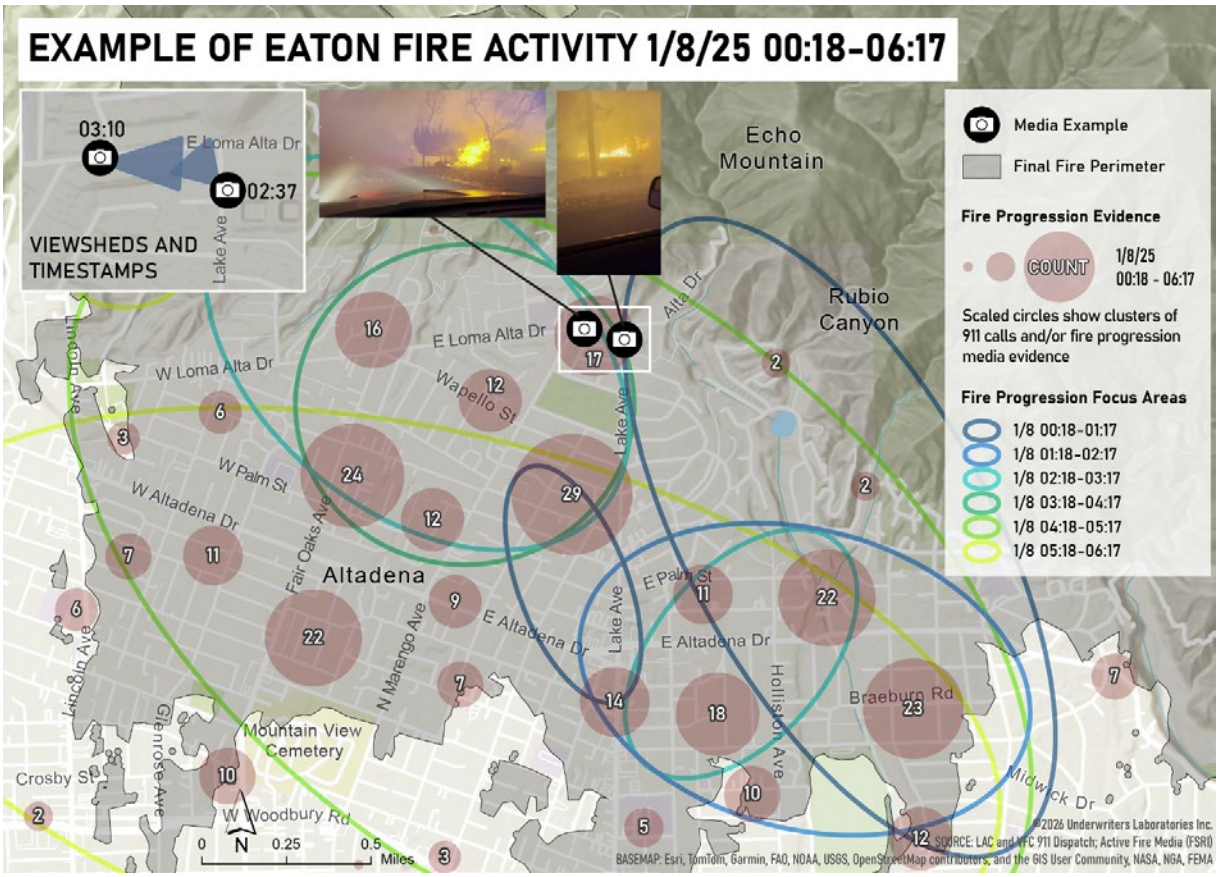


Figure 3.8.7 Map of Eaton Fire activity in the area of East Loma Alta Drive and Lake Ave between 00:18 and 06:17 on January 8, 2025.

From approximately 01:00 to 02:30, the majority of notifications by LA FCCF to the OSC of reports of structures on fire changed from east of Eaton Canyon to west of Eaton Canyon but east of Lake Avenue. Resources were insufficient to fight even a fraction of the fires that were igniting. One of the DIVS commented that if they had another 150 engines in their Division, they would have put every single one of them to work.

Clusters of fires were reported in the area east of Altadena Town and Country Club and the 1100 block of East Mendocino Street. There was no continuous progression of the fire front; structures were igniting in a discontinuous, scattered pattern, and firefighters attempted to defend structures over a six (6)-mile area from east to west. The OSC and Branch Directors were managing the resources assigned, but were having limited success in suppressing the fires.

At around 02:30, the calls for service to LA FCCF, and reports of homes on fire, started to rapidly increase west of Lake Avenue. Reports of additional homes on fire continued to be reported in the east, but fewer than in west Altadena. The OSC reached out to DIVS to see if any resources could be shifted to the west.

Although several STs and single resources were moved from Division A to Division Z, many units were engaged and could not keep up with the rapidly expanding fire in their own areas and were not available to be moved to the west.

There were not enough resources to address the volume of fire, and no additional resources would arrive until the next morning. The Division Z supervisor attempted to get to Loma Alta Drive between Lake Avenue and Fair Oaks Avenue, but was unable to and nearly got trapped by the fire, which had engulfed the entire area (Figure 3.8.8).

At this time, Division Z prioritized responding to calls for people trapped over calls for structure fires for the 22 STs under their command.

Figure 3.8.8 Images from videos taken at 02:37 (left) and 03:10 (right) on January 8, 2025, showing the conditions near East Loma Alta Drive and Lake Avenue.

As all areas and resources became overwhelmed, and the command structure was stretched to the maximum, the OSC received a phone call of a major threat to the community at around 02:00.

If the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) burned, it was the understanding of commanders that there would be catastrophic implications to civilian life over a wide area. The OSC was forced to shift some resources to report to JPL to pre-plan the facility at 02:18.

As the fire expanded in the west, the Branch VII director created two (2) more divisions to try to keep pace with the fire, but there were only pockets of success as the fire continued to march south.

There was a lack of continuity of command at the Rose Bowl ICP. Essential functions of command were not fulfilled. A full command and general staff structure, including a Law Branch, Evacuation Group, PIO, Liaison Officers (LOFRs), Safety Officers (SOFRs) (and assistants as needed), was necessary early in the first operational period.

If available, Field Observers (FOBSs) could have been assigned to collect situational information from personal observations in the field. In the absence of situational awareness, it was difficult for commanders to assemble the incident management organizational structure to address the rapidly escalating incident.

3.8.4 Findings and Recommendations

FINDING 71: The EOC and field personnel experienced communication challenges due to overloaded and damaged infrastructure.	**RECOMMENDATION 71.1:** Invest in back-up satellite-based communication infrastructure for all emergency response organizations in California.
FINDING 72: The emergency management A-Reps in the field provided an important connection between incident command personnel and the EOC by providing situational awareness, evacuation warnings, and orders issued by field command.	**RECOMMENDATION 72.1:** Expand the emergency management A-Rep program to ensure there are sufficient personnel capable of responding to multiple incidents requiring multiple incident command posts.
FINDING 73: As per policy, emergency management A-Reps are required to travel to a designated location and pick up a city/county vehicle that is outfitted with supplies and equipment for the A-Reps. In order to provide rapid response, several A-reps responded to the ICP in their personal vehicles.	**RECOMMENDATION 73.1:** Ensure on-call emergency management A-Reps have immediate access, such as a take-home vehicle, for rapid response over the large geographic area without having to respond to the EOC first, particularly during forecast high-risk wind events.
FINDING 74: Both Los Angeles City EMD and Los Angeles County OEM are under-resourced and under-staffed relative to peer jurisdictions, population served, risk profiles, workload, and community expectations.	**RECOMMENDATION 74.1:** Recommend comprehensive staffing and management studies, performed by independent firms, to determine appropriate staffing for both agencies. **RECOMMENDATION 74.2:** Increase staffing levels based on the comprehensive study.
FINDING 75: LASD's EOB assists IMTs by coordinating resources and providing the facilities and equipment to support the incident management organization. However, IMT roles are secondary, placing strain on home divisions and, without formal incentives, leading to recruitment and retention issues despite dedicated personnel.	R**ECOMMENDATION 75.1:** Implement incentive programs and career development pathways to acknowledge EOB assignments and enhance recruitment and retention. **RECOMMENDATION 75.2:** Provide organizational support functions, such as backfill staffing or workload adjustments, to reduce strain on personnel and their home divisions during deployments.
FINDING 76: Although some proactive actions were taken, LASD patrol staffing levels remained the same on January 7, 2025, as on a normal day, with no broader pre-positioning or increased operational staffing in preparation for the extreme fire risk.	**RECOMMENDATION 76.1:** Consider increased staffing models during high-risk wind events in WUI patrol divisions. **RECOMMENDATION 76.2:** Integrate pre-event unified situational awareness briefings with allied agencies to identify and mitigate traffic challenges and choke-points.
FINDING 77: LASD has a centralized EOB, which houses the DOC and CEOC. It monitors incidents and offers liaison support to ICs, improving situational awareness, ICS deployment, and coordination during complex events.	**RECOMMENDATION 77.1:** Maintain and expand the EOB model by including leadership support roles, utilizing SMEs for wildland fire response, and exploring regional IMT capabilities to improve readiness for WUI fire incidents.
FINDING 78: Despite the complex wildfire threats facing Los Angeles County, fire and law enforcement agencies maintain varying levels of commitment to IMT staffing, qualification, and long-term program sustainment.	**RECOMMENDATION 78.1:** Los Angeles-area agencies should maintain qualified IMTs capable of responding to the region's wildfire and community conflagration risk, and other planned and emergent events. **RECOMMENDATION 78.2:** Engage in the development of regional IMTs to enhance response capability to critical incidents.

3.8.4 Findings and Recommendations (cont.)	
FINDING 79: All LACoFD Division Supervisors and Operations Branch Directors were CICCS-qualified at the division level or higher and had extensive WUI fire experience. These individuals quickly mobilized to the Palisades and Eaton Fires to assume roles within the incident management organization.	**RECOMMENDATION 79.1:** LACoFD should continue to build out additional qualified personnel to assist with managing multiple incidents simultaneously, as well as to replace personnel who are retiring.
FINDING 80: LAFD's Palisades Fire initial command structure, lacking CICCS-qualified individuals, did not incorporate experienced and qualified fire officers from other agencies who were at the ICP.	**RECOMMENDATION 80.1:** LAFD should provide a pathway for CICCS qualification attainment to be able to maintain a roster of qualified personnel capable of performing incident command roles. **RECOMMENDATION 80.2:** Whenever possible, command positions on major incidents should be assigned to CICCS-qualified (or trainees for the positions) individuals. **RECOMMENDATION 80.3:** Experienced and qualified chief officers from other agencies should be assigned to Command and General Staff roles early in the incident.
FINDING 81: Based on TDs, LAFD Captain IIs, instead of command staff, were perceived as leaders with trusted operational capabilities. As a result, LAFD line personnel reportedly deferred to Captain IIs often instead of ranking chief officers.	**RECOMMENDATION 81.1:** LAFD should evaluate organizational structure to ensure appropriate chain of command to support effective leader/subordinate relationships.
FINDING 82: The rapid growth and complexity of the Palisades and Eaton Fires outpaced the development and expansion of the incident management organization, reducing situational awareness, coordination, and operational effectiveness.	**RECOMMENDATION 82.1:** Work cooperatively with fire and law enforcement agencies to identify complexity-based triggers that rapidly expand incident management organizations, staffing, and support functions as fire conditions escalate.
FINDING 83: During the Palisades Fire initial attack resource ordering period, LAFD command staff expressed concern over their agency being responsible for paying for additional resource engagement. LAFD's posture may have contributed to LACoFD organizing a separate command structure to address LACoFD jurisdictional areas.	**RECOMMENDATION 83.1:** All emergency response agencies should be knowledgeable of the California Mutual Aid System and reimbursement process during large multi-jurisdictional incidents.
FINDING 84: The Palisades Fire staging was not sized for the scale of the incident; it was not staffed with experienced and qualified staging area managers (STAMs); and the location at Palisades Drive and Sunset Boulevard was in the path of a major evacuation route and was also overrun by fire just hours into the incident.	**RECOMMENDATION 84.1:** Fire agencies should pre-identify multiple possible staging locations for large-scale incidents that do not interfere with evacuation routes. **RECOMMENDATION 84.2:** Staff staging with multiple individuals when large numbers of resources are expected in staging.
FINDING 85: Each time the ICP location moved, interagency interaction was reduced, situational awareness was impaired, and Unified Command lost operational pace in their management of the incident.	**RECOMMENDATION 85.1:** ICP locations should be selected based on current and anticipated fire conditions and their ability to sustain incident management functions across multiple operational periods.

3.8.4 Findings and Recommendations (cont.)	
FINDING 86: Unified Command was not consistently operationalized, resulting in unclear roles, ineffective communication of objectives and priorities, parallel agency operations, and poor coordination of resources and incident activities.	**RECOMMENDATION 86.1:** Strengthen multiagency Unified Command through standardized training, clearly defined roles and responsibilities, interoperable communications, and shared processes for establishing and communicating incident objectives, priorities, and resource assignments. **RECOMMENDATION 86.2:** Utilize the RTG to develop a multi-agency Unified Command training curriculum addressing wildfire-initiated community conflagrations.
FINDING 87: When LACoFD took over command of the Eaton Fire incident from PFD at approximately 19:30 on January 7, 2025, it took LACoFD several hours to reorganize the incident and account for and reconcile resource assignments, due to different incident organizational structures/approaches between departments.	**RECOMMENDATION 87.1:** Agencies that respond to an MTZ incident should be in alignment with how an incident with a large growth potential should be organized. **RECOMMENDATION 87.2:** LACoFD should establish and communicate a standardized incident management framework through regional training so that incoming and outgoing command staff can transition seamlessly during large incidents.
FINDING 88: As the Eaton Fire burned into hours of darkness and backed into narrow canyons, personnel were not in a position to be able to visualize active areas of the fire, causing command and operational personnel to lose situational awareness.	**RECOMMENDATION 88.1:** DIVS and/or Branch Directors should ensure there is a lookout to monitor the location of the fire for both community and firefighter safety. Adhere to Standard Firefighting order #2: Know what your fire is doing at all times and #5; Post lookouts when there is possible danger. **RECOMMENDATION 88.2:** When air resources are not available, the IC/OSC should assign scouts or FOBSs to monitor the location and behavior of the fire and provide regular status updates.
FINDING 89: Limited command and supervisory staffing reduced strategic oversight, exceeded span-of-control capabilities, and hindered the effective coordination and execution of operations.	**RECOMMENDATION 89.1:** Develop staffing models and mobilization triggers that rapidly expand command and supervisory capacity to maintain span of control, situational awareness, and strategic oversight during complex incidents.
FINDING 90: The absence of a shared resource-tracking platform created operational challenges for LAFD, while LACoFD used Tablet Command (TC) to track resources.	**RECOMMENDATION 90.1:** Ensure all cooperating agencies can access a common resource-tracking tool/application to maintain consistent resource accountability and situational awareness during large incidents.
FINDING 91: The Palisades and Eaton Fires revealed longstanding gaps in law enforcement preparedness for rapidly evolving wildland-urban interface fires.	**RECOMMENDATION 91.1:** Establish a baseline law enforcement WUI readiness program that includes training, PPE, and coordination with fire department partners.

3.9 Fire Suppression

3.9.1 Weather on January 7, 2025

Palisades Fire

Santa Ana winds developed during the early morning hours of January 7, 2025, as north-northeast (NNE) winds began strengthening along the coastal slopes of the Santa Monica Mountains. As the dry, gusty offshore flow surfaced, weather stations along the coastal terrain began recording the onset of strong winds.

The Malibu Canyon Remote Automatic Weather Station (RAWS), located at 1,575 ft, measured NNE winds of 32 mph with gusts to 47 mph just before 03:00 on January 7, 2025. Within the next few hours, stations at Topanga and Leo Carrillo State Park reported NNE wind gusts approaching 50 mph (Figure 3.9.1).

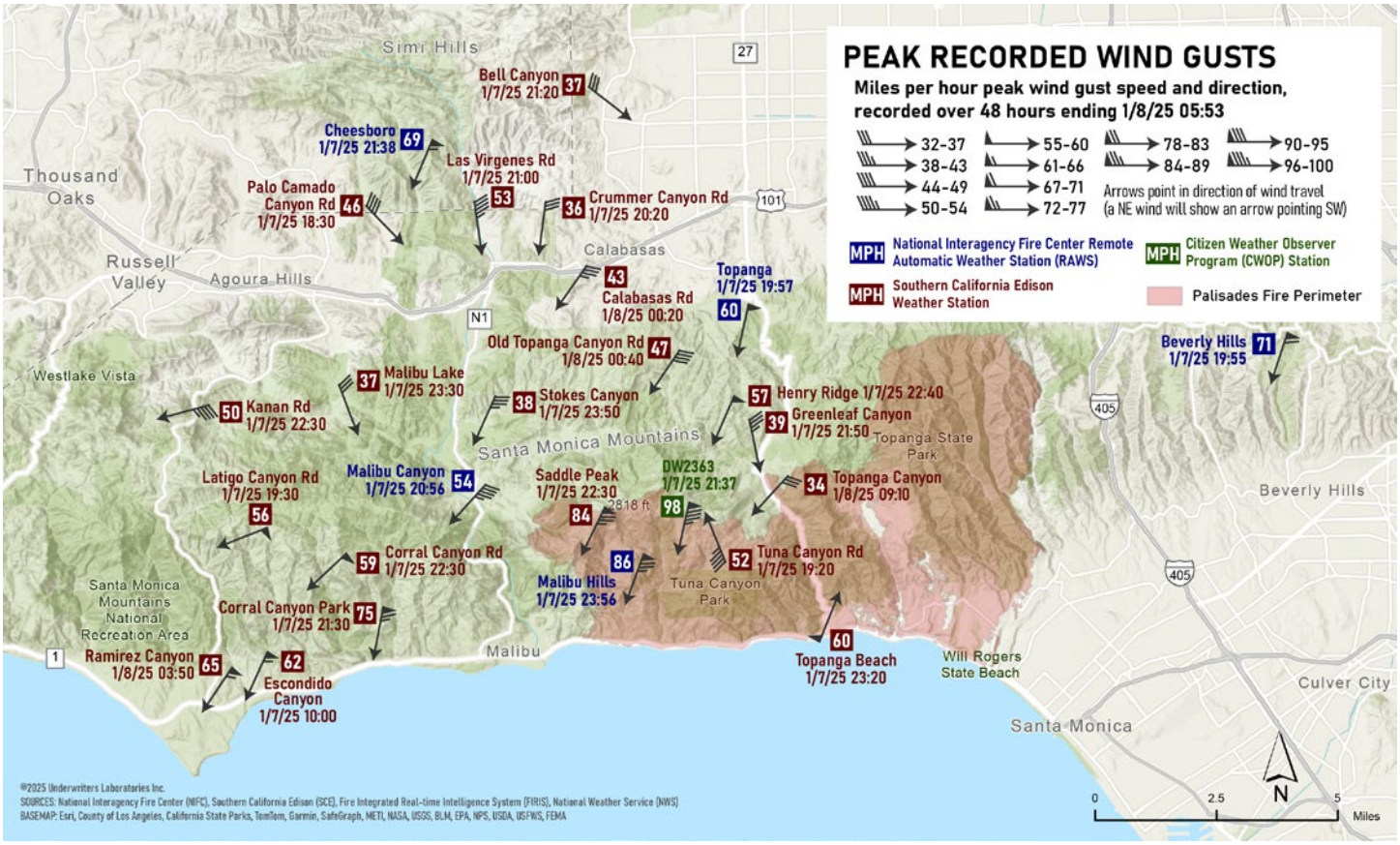


Figure 3.9.1 Peak wind speeds over Palisades Fire January 6-8, 2025.

NWS-Los Angeles/Oxnard launched a weather balloon at Vandenberg Air Force Base (located in Santa Barbara County approximately 140 miles northwest of Los Angeles) at 04:00 on January 7, 2025 (Figure 3.9.2), which indicated strong north winds at all elevations above 3,000 ft.

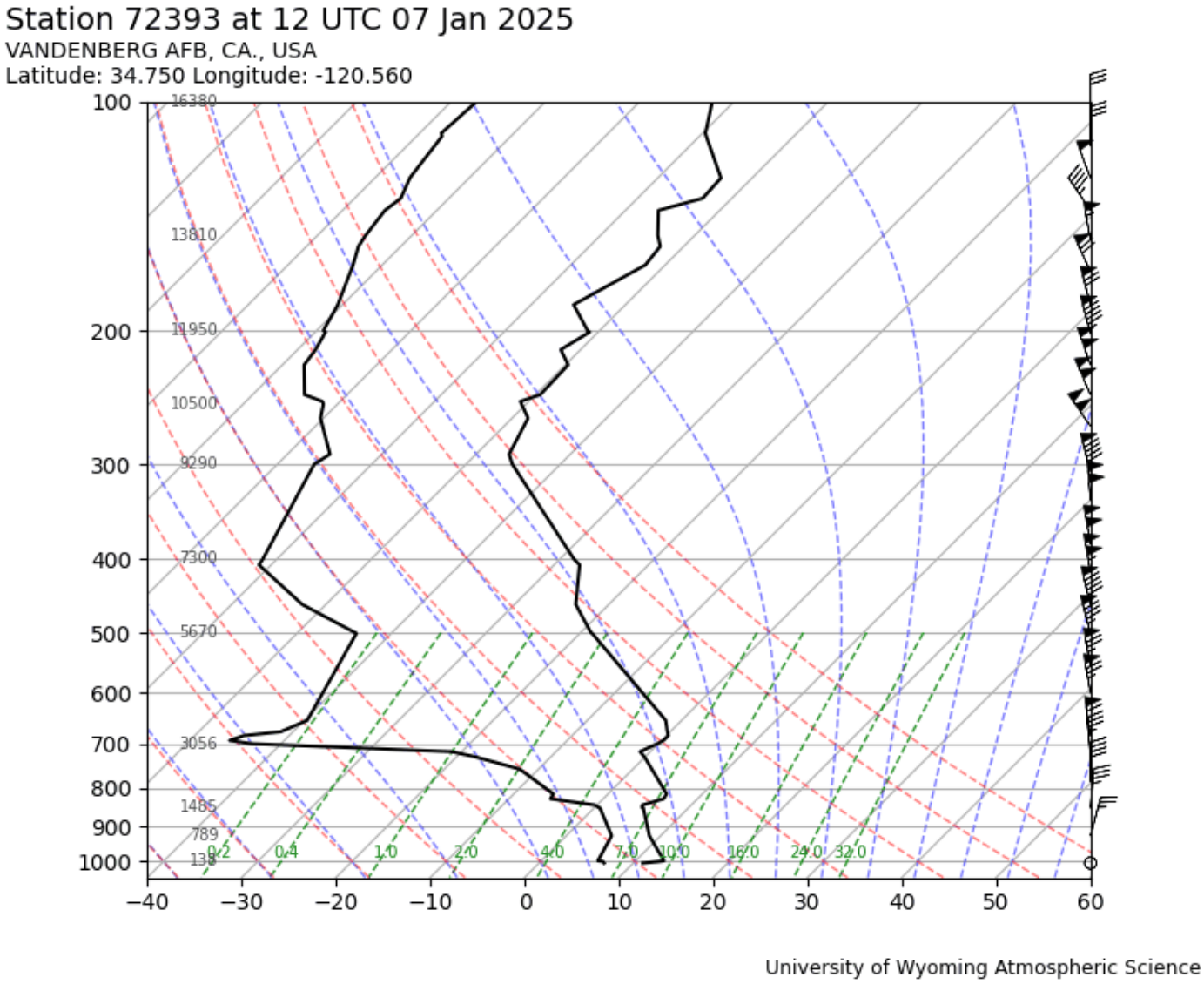


Figure 3.9.2 Weather balloon sounding from Vandenberg AFB at 04:00 January 7, 2025, shows strong northerly winds at all levels of the atmosphere and very dry air mass. (x-axis is temperature in degrees centigrade, y-axis is altitude in millibars). Source: University of Wyoming Atmospheric Sciences.

Eaton Fire

Santa Ana winds pulsed throughout the day on January 7, 2025, and strengthened further after sunset and into the overnight hours (Figure 3.9.3). As northeasterly flow pushed over the San Gabriel Mountains, winds accelerated downslope into the foothill communities of Sierra Madre, Altadena, and La Cañada Flintridge. After crossing the crest, the air rapidly descended on the lee side, producing mountain-wave amplification that enhanced wind speeds (Figure 3.9.4).

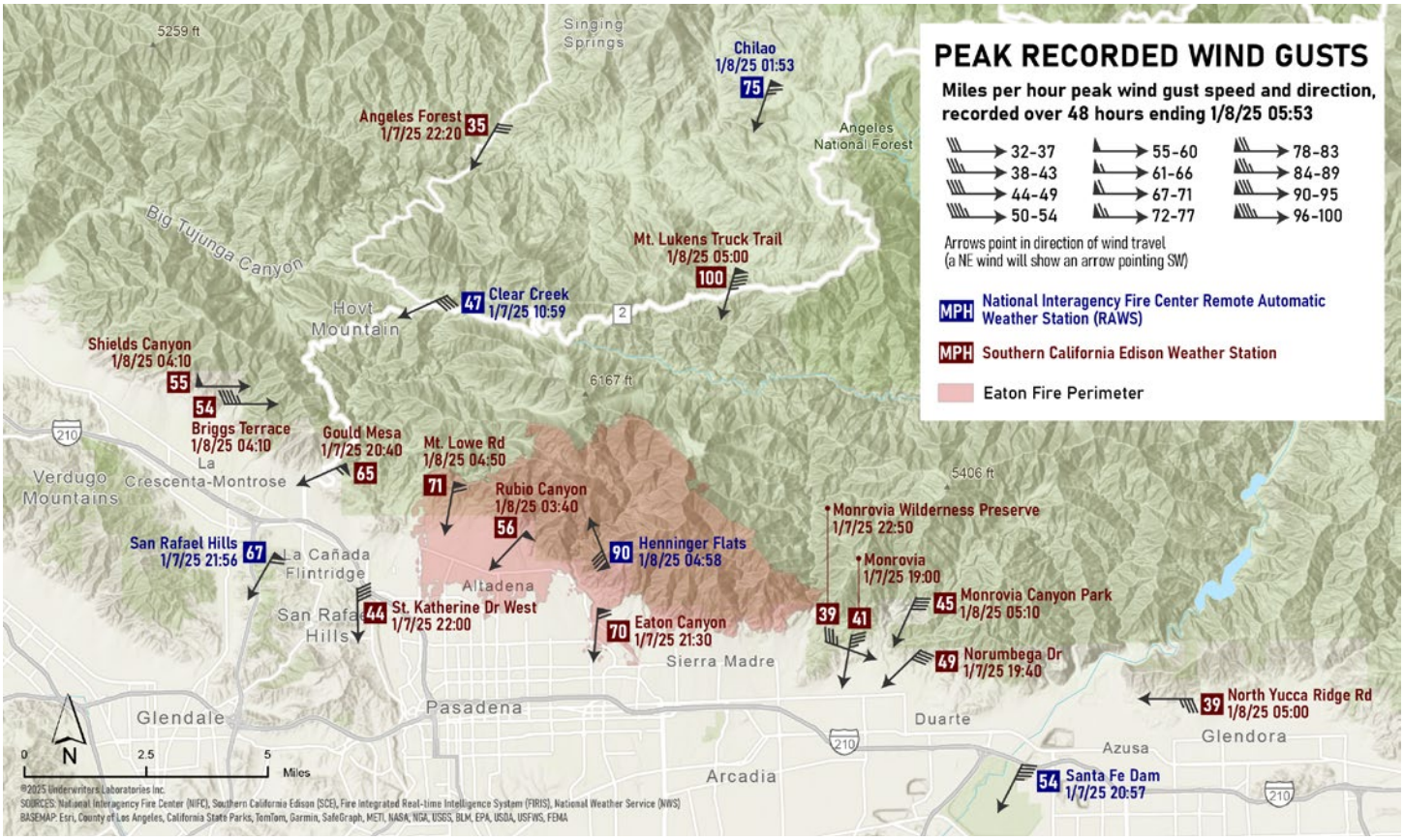


Figure 3.9.3 Peak wind speeds over Eaton Fire from January 6-8, 2025.

These mountain waves generated erratic, surging wind gusts across the foothill communities, consistent with reports from residents and first responders on the Eaton Fire. Firefighters described sudden, violent wind bursts occurring roughly every 30 to 45 minutes.

Wind gusts near 100 mph were recorded at the SCE weather station along the Mt. Lukens Truck Trail in the eastern San Gabriel range, while gusts in the 80 mph range were measured at another station near Magic Mountain in Santa Clarita.

The varied terrain of the west-facing San Gabriel Mountains resulted in damaging winds descending through narrow canyons, causing an abrupt change in wind direction. Mountain waves can also generate rotor circulations beneath the wave crest, producing turbulent and shifting winds near the base of foothill communities.

Firefighting aircraft assigned to the Eaton Fire described similar turbulent conditions, which resulted in the grounding of all rotary and fixed-wing assets assigned to the fire.

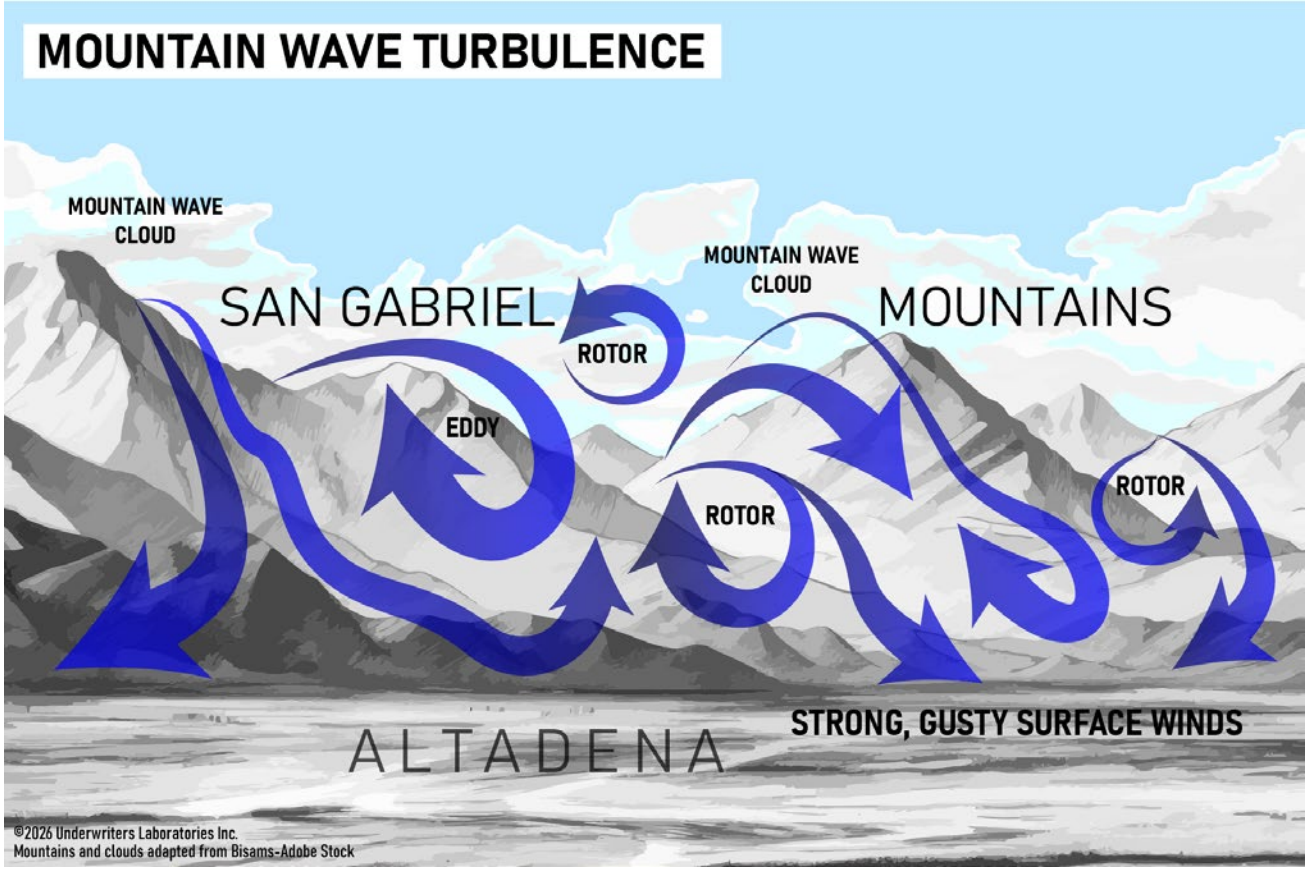


Figure 3.9.4 Mountain wave turbulence were experienced during the Eaton Fire as strong winds blew across the San Gabriel mountain range impacting the south facing slopes and community of Altadena.

Fire Spread in Complex Terrain

Fire spread across wildland landscapes is governed by three (3) primary factors: available (burnable) fuels, weather, and topography. Fires typically move more rapidly uphill due to convection and radiant heat, as advancing flames are positioned closer to unburned fuels, promoting preheating and drying ahead of the fire front.

As a result, rates of spread can increase substantially, often doubling with each 10-degree increase in slope. In contrast, a fire moving downhill is considered a “backing” fire, spreading more slowly because flames are farther from unburned fuels, reducing heat transfer efficiency.

The Palisades and Eaton Fires were driven primarily by very strong NNE Santa Ana winds, which pushed fire spread down canyons and drainages, causing rapid acceleration where terrain and wind were aligned.

The Eaton Fire’s progression was initially southward, but expanded both east and west in the foothills. The initial spread east into Kinneloa Mesa and Sierra Madre, which resulted in initial focused resource deployment to the eastern front, may have been influenced by winds from the northwest (NW) to north-northwest (NNW) that began shifting to NE-NNE around midnight.

The most damaging impacts to communities were west of the fire’s origin, but the original spread to the east was significant. Wind flow interacted with the landscape in a dynamic way, at times producing erratic fire movement that deviated from the prevailing wind direction as air followed paths of least resistance.

Alignment between wind and topography was a critical factor in the rapid growth of both fires. Major terrain features, including canyons and drainages in the Malibu and Topanga areas, as well as along the San Gabriel Mountain foothills above Altadena, were oriented with the strong NNE winds, enabling the fires to accelerate and spread quickly across the landscape.

Mature, critically dry vegetative fuel (62% - 67% LFM) in the Santa Monica (Palisades Fire) and San Gabriel (Eaton Fire) Mountains in steep topography resulted in high fuel consumption rates. These conditions made early perimeter control nearly impossible.

The burning dense dry fuel bed produced an embercast pushed by these hurricane-force winds, creating spot fires potentially more than a mile downwind, while fast-moving up-slope fire runs eliminated opportunities to control the fire at the ridge tops.

Westward fire progression for both Palisades and Eaton Fires would ultimately slow as the weather conditions changed, creating opportunities for perimeter control.

3.9.2 Strategy and Tactics

3.9.2.1 Fire Operations and Tactics

To ensure clarity, as well as consistency with Appendix B-1 of the California Agency Designators by Agency in FIRESCOPE Field Operations Guide 2022 edition, three (3) letter identifiers (highlighted below) will be used in operational contexts.

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)
- CAL FIRE (CDF)
- Ventura County Fire Department (VNC)
- Orange County Fire Authority (ORC)
- Pasadena Fire Department (PFD = PAS)

3.9.2.1.1 Palisades Fire Operations

Establishment of Staging and Creation of Task Forces

Staging locations are critical to effective resource management during fast-moving fires. Staging can be established at multiple locations to allow for resources to arrive from a variety of routes. This was especially important in the Pacific Palisades, where resources were arriving from the west (Ventura), north (Los Angeles Valley), and east (Santa Monica).

During the initial periods of the Palisades Fire, only one (1) staging location was announced. At approximately 10:44 on January 7, 2025, the OSC stated on the radio that the staging location was at North Palisades Drive and West Sunset Boulevard. At approximately 11:10, an LFD EMS captain was assigned as the STAM.

During the Palisades Fire, the STAM was responsible for checking resources in, creating TFs, and keeping the OSC informed of the number of available resources. Keeping the OSC current with the resources available in staging was difficult due to intermittent radio and cellular communications.

Arriving resources were grouped as TFs and assigned a leader, which reduced the number of unit leaders assigned to Divisions (geographical areas) and Groups (functional tasks).

This configuration reduced supervisors' span of control — the number of personnel reporting to a single division or group supervisor — throughout the operational areas. As such, TFs were an effective way to manage the fire incidents due to the lack of available supervisory overhead.

The location of the staging area was complicated for many reasons. Sunset Boulevard is considered a "Principal Arterial" by Caltrans Functional Road Classifications, and is intersected with "Major Collector" streets, which serve as the only evacuation route for neighborhoods along this two (2)-mile stretch (Figure 3.9.5).

Figure 3.9.5 The Palisades Fire initial staging locations experienced access challenges created by the road system, evacuations, and emergency responder activity.

When approaching the staging location from PCH, the location also intersects with North Palisades Drive, which Caltrans identifies as a “Minor Arterial.” Importantly, it serves as the only improved evacuation route for homes in The Summit and Palisades Highlands neighborhoods.

As residents were evacuating down these streets, fire and law enforcement resources were using them to travel in the opposite direction to access fire areas. This high volume of traffic in both directions resulted in gridlock (Figure 3.9.6).

Critically, this area was also in alignment with the progression of the fire.

At 11:25, spot fires were reported near the staging area (Figure 3.9.7). Fire companies that had been waiting for an assignment were unable to move up the hill, so they began to self-deploy, taking action to perform structure defense and assist with evacuations. Their actions were critical in protecting the civilian escape route.

Figure 3.9.6 Gridlock at the intersection of West Sunset Boulevard and Palisades Drive.

Figure 3.9.7 Firefighters addressing spot fires along Palisades Drive near West Sunset Boulevard.

Another complicating factor impacting staging functionality was the number of civilians abandoning their vehicles nearby the staging area due to the traffic jam caused by the advancing fire and deteriorating visibility.

The STAM characterized the initial staging effort as "chaotic" as fire resources continued to move in and out of the area and civilian vehicles and personnel in the area required instruction on how to safely navigate the dynamic environment.

Overall, the Palisades Fire staging was inadequate for the scale of the incident. The initial, singular staging location on a major evacuation and incident access route hampered operations, while the staffing of the STAM with one (1) individual was not in alignment with the LFD policy stating the position be staffed by a Light Force (LF).[93]

These decisions may have been due to the IC not recognizing how extreme the Red Flag PDS fire weather conditions were and the impact they would have on fire behavior.

LFD Tactical Operations

As incident operations progressed, tactical operations in many areas were largely independent and uncoordinated. This resulted in the OSC lacking awareness of assigned resources and their locations, as well as instances of resources self-deploying and resources being assigned to separate incidents within the incident by LA Metro. See Section 3.5.3 for more information on resources assigned throughout the City of Los Angeles.

Around 14:00 on January 7, 2025, an LAC dozer was assigned to clear vehicles blocking streets near the initial staging location (Figure 3.9.8).

While en route, the dozer assisted with structure defense operations at LFD FS23 by constructing a dozer line around the back of the station, which some have attributed to saving the fire station. The dozer continued to its assignments and assisted in opening access to Palisades Drive from West Sunset Boulevard.

Figure 3.9.8 Heavy equipment (bulldozer) moving cars on Palisades Drive to make way for access and egress.

Fire units were triaging structures in the field, assessing and classifying a structure's defensibility based on current fire behavior and its location, construction, and adjacent fuels.

This practice is consistent with the Structure Triage Guidelines found in the FIRESCOPE Field Operations Guide ICS 420-1.[90]

Once structures were triaged, these units employed a variety of firefighting tactics with varying degrees of success, including, but not limited to, "Check and Go," "Prep and Go," and "Prep and Defend." They also utilized "Fire Front Following," "Bump and Run," "Anchor and Hold," and "Tactical Patrol."[94]

During TDs, several LFD personnel mentioned how the effectiveness of any tactic was mostly related to coordination with other resources to apply water where it could suppress the most fire and prevent extension to adjacent vegetation and structures.

They also mentioned the importance of remaining in a location long enough to ensure the fire was adequately extinguished. This tactic would prove important as evening approached and winds intensified.

Some personnel mentioned that, at times, the deployed tactics were incapable of knocking down the flames or keeping the seemingly countless re-ignitions from occurring.

Weather conditions, coupled with ember accumulation on fuels (vegetation, structures, and other near home combustible items), created a fire environment that exceeded the capacity of ICs to effectively deploy available resources and employ strategies. It also hampered the effectiveness of tactics used to limit fire growth in some areas. Fire suppression resources did experience success in some areas.

At approximately 16:15, some resources moved from the Palisades Highlands into the upper El Medio Bluffs neighborhood at the intersection of Anoka Drive and El Medio Avenue

Multiple fire crews used a coordinated attack with hose lines to prevent the spread of fire from homes burning on the north side of the street to homes on the south side of the street (Figure 3.9.9). This tactical action may have helped slow fire spread to numerous homes downwind to the south.

Figure 3.9.9 Firefighters using hose lines to suppress burning structures.

At 17:17, buildings at Palisades High School were beginning to catch fire. At approximately 19:30, three (3) LFD resources relocated to the school and coordinated fire suppression tactics for several hours, ultimately preventing the fire from extending to most of the buildings on the school's campus (Figure 3.9.10).

Figure 3.9.10 Fire burning at Palisades High School.

While supervisors have a responsibility to ensure fire companies have a clear understanding of their intent for an assignment, resource capacity and commander ability became overwhelmed by the rate of fire spread throughout the built environment, limiting their ability to assess what was needed and to engage resources strategically.

For example, the direction often given to several fire companies by supervisors was: "go find some work," "go do good work," and "do what you can." This lack of leaders' intent and direction did not adequately provide the strategy and guidance the incident required, where minimum briefings that include situation status, task, purpose, end state, incident objectives, incident communications, hazards, and predicted fire behavior should have been best practice.

At 17:38, there was a reported shift in the fire's progression, and structures at Piedra Morada Drive and Monte Hermosa Drive came under threat (Figure 3.9.11). The OSC indicated there were no resources in staging, as resources had been working all day in The Summit and Palisades Highlands neighborhoods, just north of this area.

Two (2) LFD engines moved down to Monte Hermosa Drive and Cumbre Alta Court, but there were no additional resources to assist. Over the next several hours, many homes burned in this area.

Figure 3.9.11 Firefighters applying water to vegetation as fire spread and threatened structures on Piedra Morada Drive and Monte Hermosa Drive.

At 18:12, Division Z reported to the OSC that they were having issues with hydrants in the Palisades Highlands and Marquez Knolls neighborhoods, as higher elevation areas began to experience water loss. A few water tenders were assigned to The Summit and Palisades Highlands neighborhoods, but there were not enough to cover the full operational area. As such, Division Z suggested to the OSC that they order more water tenders from LADWP.

LADWP received the order via the EOC at around 22:00 and began staffing 23 water tenders shortly thereafter. LADWP provided limited records around when the water tenders arrived and how they engaged in these operational areas.

Records do show that water tender drivers did not have adequate wildland fire PPE, and their apparatus-mounted radios were only capable of communicating amongst LADWP apparatus and personnel. See Section 3.4.2.3.1 for more information.

From approximately 18:00 until about 22:00, despite command officers' concern that certain areas in the Via Bluffs, Huntington Palisades, and Alphabet Streets neighborhoods were unsafe, many LAPD officers continued to conduct emergency evacuations in these areas.

The LFD OSC was unaware of the LAPD's activities in these neighborhoods, as the two agencies were not together at the ICP.

Once the Eaton Fire started at 18:18, the Palisades Fire IC was notified that they would not be receiving any additional resources until the next day. As such, there were no new fire resources to assign as the fires expanded.

At approximately 19:30, fire resources working in other areas moved to the Via Bluffs, where many homes were already on fire. Virtually every home in this neighborhood was eventually destroyed (Figure 3.9.12).

Figure 3.9.12 Home burning in Via Bluffs neighborhood.

Around this same time, the upper Alphabet Streets were already being impacted by fire. When resources attempted to redeploy into the neighborhood, they were unable to engage due to the volume and intensity of fire.

At 20:38, the OSC, as well as Division and Group supervisors, were asked over the radio if they could release any resources to staging for redeployment. Division A returned a TF consisting of three (3) engine companies to staging, but Division Z did not have any resources that could be redeployed.

At 21:11, the fire was actively burning in the Huntington Palisades (Figure 3.9.13). Fire resources moved to the area at 21:30, and the number of resources increased steadily over the next several hours. However, many structures continued to burn throughout the night without the presence of fire apparatus.

Eventually, using a coordinated attack and recognizing the separation provided by Pampas Ricas Boulevard, a group of engines helped stop the fire's progression between Pampas Ricas Boulevard and Almoloya Drive.

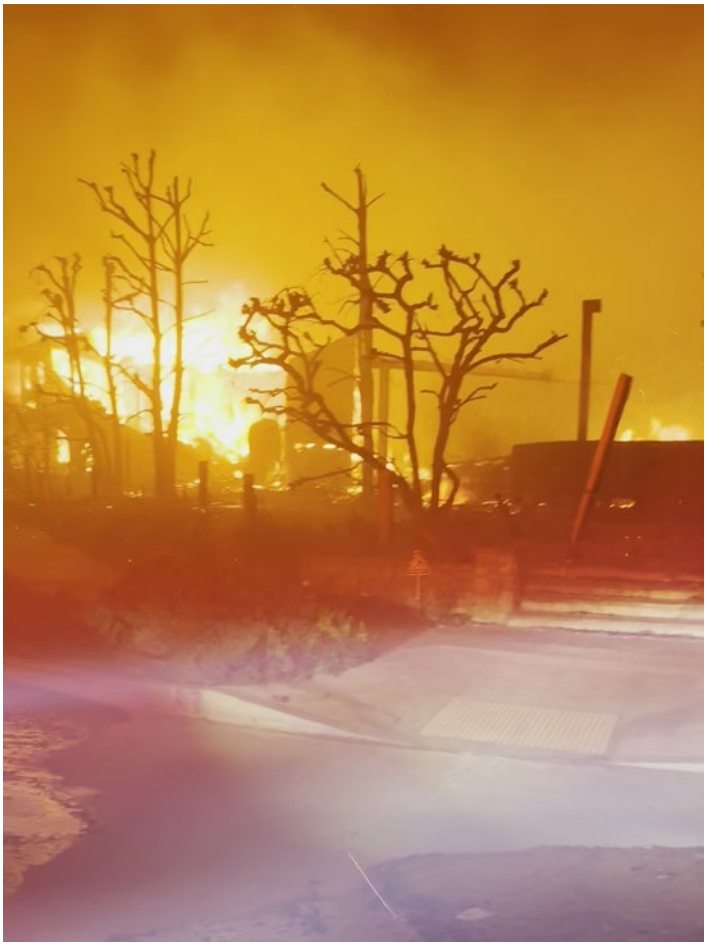


Figure 3.9.13 Structures burning in Huntington Palisades.

Figure 3.9.14 Structure burning at 00:36 on January 8, 2025, in the Riveria neighborhood on Umeo Road.

At 00:36 on January 8, 2025, structures were burning in the Riviera neighborhood (Figure 3.9.14). LFD resources were moved to Amalfi Drive, Umeo Road, Alta Mura Road, and the surrounding streets in the area. Among the resources moved to this area were those originally dispatched separately to the apartment fires on West Sunset Boulevard (see Figure 3.5.5) and organized into TF1054.

Resources remained in the Riviera neighborhood well into the daylight hours of January 8, 2025, with many homes in the area ultimately saved.

At 01:25, a perimeter dozer control contingency (indirect) line was established along the eastern flank of the Westridge Trail — a ridgeline east of the fire's area of origin. Fire activity was too intense to attempt to establish the perimeter control line on the eastern flank with hand crews.

By the early hours of January 8, 2025, the scale of the fire was coming into view. Resources continued to engage throughout the incident area, including responding to calls for service.

By this time, many neighborhoods were already heavily damaged and/or destroyed, with LFD resources concentrated around FS69 in The Summit and Palisades Highlands neighborhoods and in the El Medio Bluffs neighborhood.

El Medio Bluffs had almost completely burned around the perimeter of the neighborhood, where homes were adjacent to either Temescal Canyon Road on the east or Las Pulgas Road on the west. However, the center of the neighborhood had an area of unburned homes. Several apparatus were in this area throughout January 8, 2025.

LAC Tactical Operations

LAC first alarm units assigned to LFD's area of responsibility early in the Palisades Fire largely worked independently during the initial attack. LAC personnel reported being sent to the staging location at Palisades Drive and West Sunset Boulevard and not receiving an assignment.

After sitting in staging for an extended period without an assignment, several LAC resources self-deployed after seeing nearby structures burning or starting to ignite.

It was unclear to some resources who they reported to and some tried to find supervisors working in the area, but were unable to as overhead assignments were not prevalent early in the incident.

Most LAC captains used TIER to make tactical decisions, but didn't always know to whom they should report their actions.

As the fire began to impact the LFD LRA in the Castellamare, Getty Villa, and Pacific View Estates neighborhoods, an LAC AC moved county resources staged at Topanga Canyon Boulevard and PCH into those neighborhoods for structure defense.

LAC worked proactively with pre-positioned resources when the Palisades Fire started. For example, STs 1870C, 1151C, and 1103A were moved from their pre-positioned areas to be closer to the Pacific Palisades and Malibu in anticipation of needing to be dispatched to the incident or needing to be in position to protect the LAC LRA, if the fire moved westward.

These STs were staged at Topanga Canyon Boulevard and PCH, beginning at approximately 12:02 on January 7, 2025. Eventually, apparatus from ST1151C were moved to South Surfview Drive (12:08) and the Getty Villa (12:35), while apparatus from ST1103A were moved into Pacific View Estates (12:40) and Castellamare (13:06).

Apparatus from LAC ST1870C were moved into Castellamare at around the same time as ST1103A. Within a short period of time, most of these LAC resources ended up in Castellamare.

An LAC AC also assigned STs that arrived from VNC and ORC to work in these neighborhoods. As the fire progressed to the west, resources also moved westward, from Castellamare, to the Getty Villa, to Surfview, and eventually into the LAC LRA in the Sunset Mesa neighborhood.

Most LAC ST resources that were staged at Topanga Canyon and PCH were in the LAC LRA by 16:40. Operations in these areas were organized with appropriate supervision, but the fire overwhelmed most everything in its path.

The fire intensified and progressed westward across the inland upper elevations of the Santa Monica Mountain Range throughout the day.

An LAC BC traveling south on Topanga Canyon Boulevard around 19:00, during the height of the fire activity, shared that they were unable to reach PCH due to extreme fire behavior, large boulders on the road, heavy smoke conditions, limited visibility, and downed power lines blocking the road.

These conditions prohibited fire and law enforcement from gaining access to many of the inland areas of Malibu.

As the fire progressed west, ember impacts from vegetation to the north and structure-to-structure fire spread from the east were prevalent on both sides of PCH and into the Big Rock Community at around 18:50.

Big Rock residents were instructed to evacuate by LASD and the Community Brigade, however, some residents chose to remain. Some of these residents suffered severe burns while defending their homes, and were treated by personnel in the Dukes Restaurant parking lot. See Section 3.11 for evacuation information.

As the fire moved west, DIVS identified an area of Las Flores Canyon Road (where it intersected with PCH), where resources could take advantage of favorable topography, structure separation, and a misalignment of the fire with the wind. The strategic placement of resources and tactical usage of water contributed to the successful defense of a cluster of commercial and residential structures.

As the fire expanded, Branch VII established additional staging areas for resources arriving from the north and west. Branch VII also began to expand with additional divisions along the coast and into the interior areas of Malibu.

As winds drove the fire toward the coast, its western flank made topographical runs near LAC Camp 8 at the intersection of Las Flores Canyon and Rambla Pacifica. Camp 8 ultimately became a safe refuge area for firefighters and residents.

The fire made two (2) runs at the camp. The first run impacted the most southwestern part of the camp at approximately 01:30 on January 8, 2025, where it burned an outbuilding and caught part of the dorms on fire (Figure 3.9.15).

Residents and firefighters were forced to shelter in the camp kitchen. A few engines that arrived at the same time as the first fire front were instructed to stay in their apparatus. Once the fire passed, they were able to mitigate the fire damage to the buildings, but were unable to leave the camp as the fire encircled their location.

The fire made a second strong push through the camp from the northeast at around 05:05 (Figure 3.9.16). Many of the homes in the neighborhoods around Camp 8, especially Monte Viento, were destroyed. Power lines were down and many of the roads were impassable. Both residents and firefighters were unable to leave Camp 8 for several days.

Figure 3.9.15 Camp 8 outbuildings and dormitories at approximately 01:30 on January 8, 2025.

Figure 3.9.16 Fire progression at Camp 8 at approximately 05:05 on January 8. 2025.

On the morning of January 8, 2025, indirect perimeter control lines started to be constructed in Topanga Canyon and along Saddle Peak down to the Monte Nido neighborhood. There was no air support available due to other air priorities on the east-end of the fire towards Mandeville Canyon. There were Type III engines in the area, but they were assigned to structure defense and did not support the building of the control line.

Palisades Fire Water Challenges

Firefighters assigned to the Palisades and Eaton Fires consistently reported limited or unreliable water supply. These conditions included hydrants with low pressure, intermittent flow, or no water at all particularly at higher elevations.

Some firefighters adapted their tactics using both formal training and improvised methods to locate, conserve, and distribute available water.

As conditions worsened, companies frequently encountered hydrants with low pressure, or that had no water, and responded by searching for functional ones, then communicating their locations to other crews. This sharing of information became a critical adaptation method as the fire incident evolved.

Firefighters also used water shuttling operations, with engines traveling between working hydrants and fire areas to supply multiple companies. In some cases, companies attempted to draft from hydrants using hard suction, though this approach had limited success.

Alternative water sources were occasionally used. Crews drafted water from swimming pools using eductors (siphon ejectors), though this technique appears underutilized relative to the available source (see Section 3.4.2.4 for more details). Garden hoses were also used both to fill apparatus tanks and for direct firefighting in some instances.

Firefighters also adapted their tactics to the available water supply. Some chose “anchor and hold” strategies (i.e., remaining in place to defend structures), while others remained mobile to address rapidly igniting spot fires. Company officers adjusted water usage, selecting nozzle flow rates to conserve the limited supply while still attempting fire control.

As the event progressed into the early morning of January 8, 2025, water pressure loss was widespread, with many firefighters experiencing hydrants with little to no pressure. Some firefighters and LADWP crews shut off domestic water lines at structures in an attempt to restore hydrant pressure, but with little effect.

3.9.2.1.2 Eaton Fire Operations

When the Eaton Fire started at 18:18, the Palisades Fire had already been burning for nearly eight (8) hours (Figure 3.9.17). Hundreds of fire engines from throughout Los Angeles, Ventura, and Orange counties, as well as local government resources, were already assigned to that incident.

Figure 3.9.17 Photograph showing the initial stages of the Eaton Fire looking northwest from Canyon Close Road, collected at 18:21.

Figure 3.9.18 Photograph taken approximately 20 minutes after Figure 3.9.17 from the same location, showing rapid fire growth.

The initial response to the Eaton Fire consisted of a first alarm brush assignment from three (3) agencies: LAC, PAS, and ANF. The dispatch address came in at two (2) addresses: 22** Pinecrest Drive in Altadena and 21** Canyon Close Road in Pasadena.

The first arriving LAC resources responded to Pinecrest Drive, while the first arriving PAS resources responded to Canyon Close Road. As additional resources arrived on scene, they were assigned to an area by a PAS BC (who was the first arriving chief officer from any agency) or self-deployed to an area and reported their location to the PAS BC.

These initial resource assignments were made based on the reported address and direct observations by individual fire companies. Assignments were also based on fire progression reports from HLCO that stated the priority was Kinneloa Canyon, as the fire was making a strong push to the east (Figure 3.9.18).

At 18:36, the PAS BC began sending resources into various areas around Eaton Canyon for fire progression updates, and then assigning resources as information was received. Multiple SDGs were formed around the mouth of Eaton Canyon.

Around this time, the fire was moving down Eaton Canyon to the south, in close proximity to the homes on the west side of the canyon. It began to impact the Nature Center, Kinneloa Canyon neighborhood, and the neighborhoods near New York Drive and North Altadena Drive (Figure 3.9.19).

Figure 3.9.19 Firefighters defending structures on North Altadena Drive near New York Drive.

At 18:56, HLCO advised the PAS BC to issue evacuation orders in map area PAS-109, and at 19:18, in map area LAC E-183.

Around 19:00 and later, many additional single-resource apparatus and incident management overhead resources began arriving on scene, or were operating in the area and not assigned to the incident.

The PAS BC assigned some of them to various locations at New York Drive and North Altadena Drive, though there was no immediate organizational structure. At 19:10, an LAC BC was assigned to the New York SDG near New York Drive and North Altadena Drive, and formed the SDG from resources in that area.

Additional SDG supervisors were also gathering unassigned resources and adding them to the incident.

At 19:20, the LAC BC, who assumed the IC role, transmitted the first direction over the radio of the incident's priorities, including that teams were in "life priority mode." They also instructed to "keep units mobile" and that units should "not anchor in."

As the fire rapidly progressed, resources in the field were immediately challenged by the extreme fire behavior. Law enforcement and fire resources knocked on doors to alert citizens of the need to evacuate (Figure 3.9.20). As the winds picked up, the ember cast became heavy, making it difficult to conduct face-to-face communications without shelter.

Around 19:45, the PAS BC and an LAC AC met in person near the intersection of Allen Avenue and East Washington Boulevard to initiate a transfer of the OSC position from PAS to LAC.

Subsequently, the LAC OSC significantly reorganized the incident, utilizing branch management and divisions.

Figure 3.9.20 Los Angeles Sheriff's Department deputy approaches a home, alerting residents to evacuate.

Staging areas were established at various times in the initial attack. However, new resources that arrived in staging were immediately deployed into the incident, often directly by the OSC with no delay.

Several STs were able to bypass staging altogether by contacting the OSC while they were en route to the staging location. The OSC was then able to assign them to a division, deploying them immediately into the incident.

Around 20:00, the fire spread rapidly in east Altadena, as well as impacting northeast Pasadena. It also began spreading east of Eaton Cayon towards Hastings Ranch. As a result, resources were being moved by supervisors in the field between different SDGs based on need (Figure 3.9.21).

The OSC announced over the radio the new organizational structure and the incident priorities of life and structure defense. DIVS were instructed to reconcile and account for resources in their geographical area and to form TFs with their units to reduce the span of control.

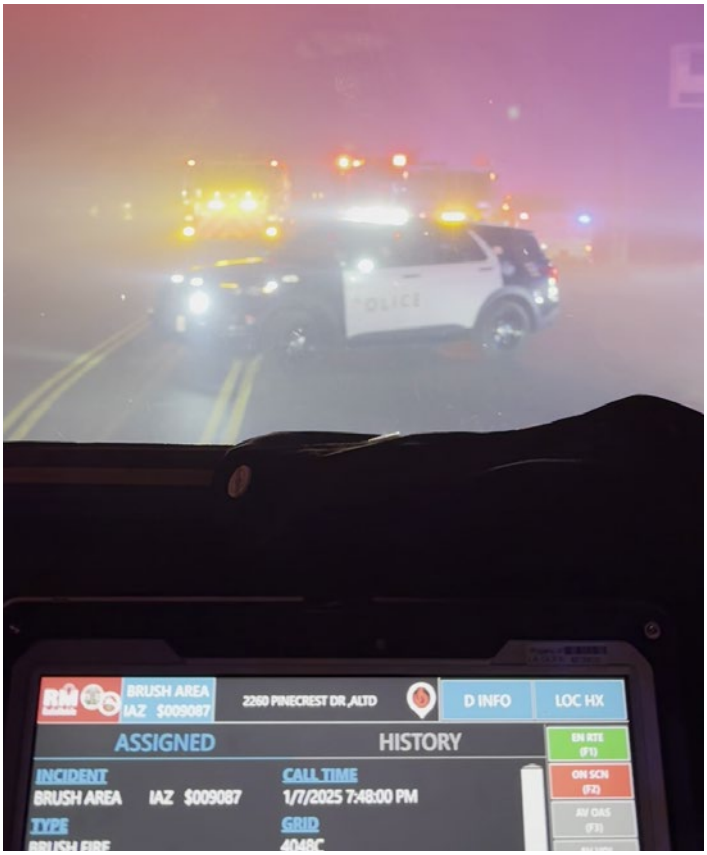


Figure 3.9.21 Image from a video taken at 20:12 in the area of East Altadena.

Throughout the night, DIVS were continually asking for more resources. The OSC rotated sending new resources that arrived on scene to divisions in Branch III (east) and Branch VII (west).

Overnight from January 7-8, 2025, there were insufficient resources to fill the requests coming from DIVS, and the OSC was eventually notified that there would likely be no additional resources until sometime on January 8, 2025.

The fire did not burn through the neighborhoods in an organized fashion. It was described as a “checkerboard,” where homes many blocks away from the main firefight would catch fire, and then within a short amount of time, most of that block would be on fire.

The ember cast in the Eaton Fire was described as “like a hurricane, but with embers instead of rain.” The thick, black, acrid smoke caused firefighters to vomit and caused severe headaches. Breathing also became difficult.

As in the Palisades Fire, the number of structures requiring suppression far exceeded firefighting capabilities.

Early into the Eaton Fire, independent action was taken by many LAC fire companies. LA FCCF, unaware that the fire was rapidly moving into neighborhoods far removed from the WUI, dispatched full structure assignments with a supervisor (BC) into the Eaton Fire area.

These LAC resources were eventually absorbed into the Eaton Fire incident (including transitioning to the Eaton communication plan), and continued to work for the BC they were assigned to on the structure assignment.

As the incident unfolded and the scope of the incident became clearer to personnel in the dispatch center, LA FCCF discontinued separate dispatches into the Eaton Fire area.

As 911 calls were received, dispatchers would inform the OSC of pending 911 emergency calls within the fire perimeter on the command channel. Due to a lack of available resources, the OSC would sometimes respond to the radio transmission request for service both over the radio and by visiting the site of the 911 call.

There were several instances where law enforcement, fire personnel, and civilians worked together in the field to rescue large numbers of people.

The first instance occurred around 20:00 on January 7, 2025, with the evacuation of assisted living and nursing home facilities on Washington Drive that resources identified as needing immediate evacuation (Figure 3.9.22).

The assisted living facility, a fully sprinklered building, housed a number of elderly civilians and was beginning to catch fire. Working together with civilian bus drivers and the Fire Operational Area Coordinator (FOAC), who organized and responded with a large number of ambulances for transport, they evacuated both facilities. The assisted living facility eventually burned to the ground, and the nursing home suffered major damage.

In another example, at 06:05 on January 8, 2025, another assisted living facility, at 22** El Molino Avenue in Altadena, was under serious threat of fire. Dozens of structures were burning around this area. Again, law enforcement, fire personnel, and civilians worked together to rescue workers and residents from the facility. Bus drivers worked through tremendous fire and smoke conditions to assist public safety personnel in the rescue and evacuation.

As the night wore on, firefighters and law enforcement were faced with conditions that many said they had never experienced. Fires were igniting throughout the landscape.

The fire's progression, initially most active in the east, now shifted to the west. A law enforcement officer reported driving up a street that had no fire on it. However, on the way down the same street, five (5) or 10 minutes later, multiple houses were on fire and cars were igniting.

When resources were shifted to the western flank at about 02:30 on January 8, 2025, personnel reported that the winds were blowing through neighborhoods west of Lake Avenue. Many areas in northwest Altadena were untenable, even to firefighters wearing PPE.

Entire homes and cars were burning. Power lines were down, making many streets impassable, while utility poles were on fire. The heat and embercast were intense.

Around daybreak on January 8, 2025, conditions had calmed slightly east of Eaton Canyon. However, west of Lake Avenue, conditions remained dire. Although it was daylight, some areas were still relatively dark with minimal sunlight coming through the smoke.

Figure 3.9.22 Evacuation of residents from an assisted living facility.

At approximately 07:00, hydrants suffered a lack of pressure throughout the area. There were not enough available water tenders to make a difference in firefighting efforts. And while there were many swimming pools available, they were not utilized effectively.

To make up for the lack of water pressure, engines would travel to the 210 Freeway to find a working hydrant, and then travel back up to the area to re-engage with the fire.

Given the large volume of fire, the options for effective suppression operations were limited. Structure fires and spot vegetation fires continued to ignite across the incident area.

New resources were starting to trickle into the incident by the morning of January 8, 2025, but there were still not enough resources to keep up with the number of structures on fire and threatened by fire.

Early in the day on January 8, 2025, resources coordinated efforts on Lake Avenue, where there were large commercial buildings on fire (Figure 3.9.23).

Figure 3.9.23 Commercial structure along Lake Avenue burning through the afternoon on January 8, 2025.

By the afternoon, most fire resources were patrolling the area independently. When fire crews came upon a structure where they thought they could engage, given the limited resources and water available, they would do so.

Eaton Fire Water Challenges

Firefighters assigned to the Eaton Fire encountered similar limitations as those who responded to the Palisades Fire. However, some units were able to rely on pre-planned and shared alternative water strategies.

Eaton Fire crews identified water supply issues through hydrant pressure loss. In response, they sought out working hydrants, sometimes traveling long distances, and communicated locations of working hydrants to other units.

A few alternative supply methods were mentioned in TDs. Some crews used their eductors to draft water from swimming pools, securing the equipment in place and communicating the locations for others to use. Other crews left hose lines connected to functioning hydrants so that arriving apparatus could quickly refill without setting up new supply lines.

Several firefighters demonstrated adaptability in their use of equipment. Reel lines and smaller-diameter hoses were used for rapid movement and exposure protection, particularly during early fire suppression efforts. However, crews reported that smaller streams and lower flow rates became ineffective as wind conditions intensified.

Additional challenges included contamination of pool water sources (i.e., leaves and debris that clogged eductors), which limited the effectiveness of drafting operations in some areas. Water tenders were used for shuttling operations (Figure 3.9.24), though shortages and access limitations were noted.

Figure 3.9.24 A water tender position to provide water supply for a fire engine.

Firefighters also adjusted tactics to manage the limited supply. Crews emphasized mobility, water conservation, and rapid knockdown using higher-flow applications for short durations, when possible. In some cases, firefighters mentioned that no amount of available water could overcome the intensity of the ember-driven fire spread.

These experiences highlight the importance of pre-incident planning for alternative water supply strategies during community conflagrations when there is widespread destruction of structures, leading to the continuous flow of water from damaged and destroyed water distribution systems.

Effective response, therefore, depends on both anticipating loss of system pressure and ensuring crews are prepared to secure and distribute water from multiple sources under rapidly changing conditions.

3.9.2.1.3 Resident Experiences

As the fire progressed through the night on January 7, 2025, numerous residents, with limited to no prior training, defended, or attempted to defend, structures. Residents used their own garden hoses (when water was available) to fight the fire, or, when water pressure was low, would fill up small trash cans using water from nearby pools as their supply (Figure 3.9.25).

Figure 3.9.25 Residents used garden hoses, when water was available, to defend homes and their community.

When there was no more available water, they would use shovels of dirt to extinguish what they could.

It should also be noted that while some of these tactics were successful, some residents performing these actions were injured and, in at least one case, perished in the fire. See Section 4.4.4.3 for more information.

3.9.2.1.4 Perimeter Control

Throughout the initial attack period of the Eaton Fire incident, perimeter control opportunities were evaluated on both the western and eastern flanks by LAC. Areas of possible engagement were in Arcadia along the Santa Anita Canyon on the eastern flank and at the top of Lake Avenue to the west. However, the fire moved into these areas too quickly to be able to safely engage.

Due to the extreme fire activity and the lack of air support on the night of January 7, 2025, the construction of perimeter control lines had not been possible on either flank.

On the morning of January 8, 2025, a perimeter control line using hand crews started to be constructed from Chantry Flats towards the homes near Santa Anita Canyon. Air support was intermittent as air operations had just resumed.

Hand crews also started to build a perimeter control line at the edge of Division Z near JPL. Over the next several days, perimeter control lines continued to be built to contain the lateral spread of the fire.

Aircraft

Initial perimeter control for the Palisades Fire was attempted at the heel of the fire using LAC, LFD, ORC, and VNC hand crews, along with an LFD dozer and rotor-wing aircraft.

Fixed-wing aircraft had painted a retardant line in this area earlier in the day. However, due to increased wind and extreme fire behavior, and the lack of engine companies available to support the operation, the attempt was discontinued at 19:52 on January 7, 2025.

Numerous fixed- and rotor-wing aircraft were assigned to the incident from initial dispatch until approximately 19:30, when aircraft were grounded due to high and erratic winds (Figure 3.9.26).

Figure 3.9.26 Rotor-wing aircraft (helicopter) making a water drop south of the Palisades Highlands neighborhood.

Figure 3.9.27 displays aircraft flight tracks in 90-minute blocks by agency, type, and water dropping capability (gallons). Flight tracks generally identify aircraft areas of focus or water drop locations on the fire's vegetative flanks.

The fire's resistance to control, even with the large number of aerial resources, speaks to the fire's intensity resulting from critically dry fuel oftentimes in steep topography with escalating fire weather conditions.

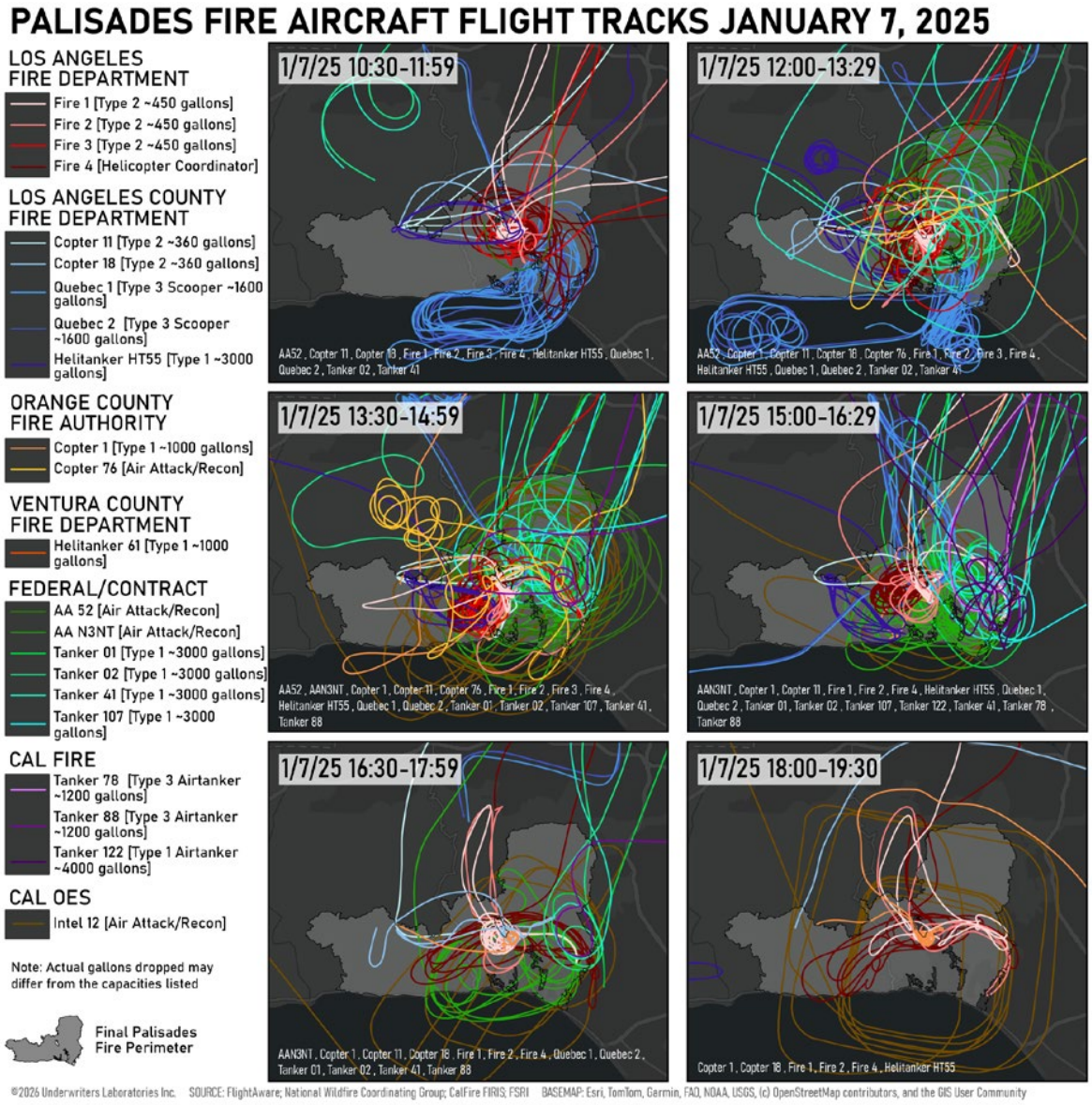


Figure 3.9.27 Palisades Fire flight tracks of aircraft from the fire's start to 19:30 on January 7, 2025.

3.9.2.1.5 Successful Fire Suppression Tactics

There were very clear tactics and actions that were successful at both the Palisades and Eaton Fire incidents. The supervision at the company level provided for tactical decision-making and ensured the safety of firefighters. While there were injuries, no firefighters lost their lives during these fires.

Firefighters and law enforcement personnel coordinated together in the field to carry out the incident objectives of life safety and fire suppression, often in the absence of sufficient supervision.

Resources that coordinated their attack with multiple other resources, rather than working independently, delivered more successful outcomes.

For example, when the fire was spreading structure-to-struture along PCH oceanfront homes, DIVS scouted ahead and located an area with sufficient separation (the Moonshadows parking lot). Firefighters were able to use a coordinated attack to save a series of homes adjacent to that open area (Figure 3.9.28).

Figure 3.9.28 Aerial imagery of defended homes along the Pacific Coast Highway.

The use of hand crews in neighborhoods ahead of the fire, as well as utilizing "Prep and Go" tactics and extinguishing small ornamental vegetation fires, was also successful in slowing fire progression during these incidents.

Additionally, tactical patrol, where an apparatus stays mobile and continuously monitors an assigned area, was critical in identifying and extinguishing small fires after resources relocated from the area while the threat to structures still remained.

Supervisors who recognized that there were areas where a given tactic could create opportunity had more success. Those who evaluated a structure or neighborhood based on the fire's alignment, and considering factors like topography, wind, fire behavior, and the resources available, were able to pick more locations where crews could engage successfully.

Having sufficient overhead during such large-scale incidents is critical so supervisors have enough time to evaluate the fire area for this level of strategy. Unfortunately, due to many factors, sufficient overhead was often unavailable during both the Palisades and Eaton Fires.

The tactic that proved to be the most successful in combatting structure-to-structure fires spread during both incidents was a modified version of "Anchor and Hold."[94] This modified tactic uses large water streams to attempt to stop the spread of fire from a burning structure, and often requires being connected to a water supply due to the large volume of water needed to execute the operation.

The goal is to extinguish structure fires, protect exposures, and reduce ember impact. In a community conflagration environment, such as in the Palisades and Eaton Fires, the modification of this WUI tactic commonly involved the coordination of multiple companies.

One (1) or two (2) companies attack the structure, which, can produce a large embercast. Another one (1) or two (2) companies protect the immediate exposures, and then several companies extinguish small fires downwind of the main fire.

This modified tactic lends itself to the efficient use of a full ST, or possibly multiple STs, to save a large cluster of structures.

A supervisor who has the time to assess the proper location to implement this tactic must be aware of the amount of water needed and have the authority to commit the necessary personnel.

During the January 2025 fires, this modified "Anchor and Hold" tactic still required a tactical patrol to be assigned when the resources were redeployed to another area. One of the areas where this tactic proved successful was on the Palisades Fire in the Huntington Palisades neighborhood, where Chapala Drive and Ocampo Drive intersect with Almoloya Drive, as seen in Figure 3.9.29.

Figure 3.9.29 Evidence of tactics possibly contributing to saving some homes in the Huntington Palisades neighborhood.

TIER: Operational Engagement Principle

The use of TIER (Take Initiative, Engage, and Report) was extensive in both the Palisades and Eaton Fires. This operating principle was used consistently early in the fire as resources faced extreme weather and fire conditions, resulting in the need for quick decision-making before a defined command structure could be established.

It should be noted that the "Report" element of TIER was frequently not completed during the Palisades Fire due to the significant amount of radio congestion, inconsistencies in the use of the communication plan, and the viability of the communications plan itself.

Note: *The practice of TIER should be used as a whole. The method is not fully implemented if a report is not completed through the chain of command. Without reporting, action taken outside of the chain of command can become what some refer to as independent action or "freelancing."*

3.9.2.1.6 Law Enforcement Operations and Tactics

For a full breakdown of the operation and tactics used by law enforcement during both the Palisades and Eaton Fires, see Section 3.11.

During the Palisades and Eaton Fires, the swift transition from a wildland fire to wind-driven community conflagration exposed longstanding deficiencies in baseline wildfire readiness among law enforcement and other partner agencies operating in fire-prone regions.

In preparation for the fire season, supplies, equipment, and specialty vehicles should be pre-positioned for rapid response to high-risk areas. Agencies must also have clear and open lines of communication within and among partners for rapid and coordinated deployment of resources.

The evidence provided suggests that neither law enforcement agency gave adequate consideration to resource allocation after receiving the PDS warning. It also appears there was little planning or strategy development around possible scenarios to aid in resource-deployment.

For example, neither LASD nor LAPD pre-deployed resources, such as command trailers or spare patrol vehicles, to a pre-planned location for potential use during the PDS event — a fundamental practice that is critical to mitigating threats and providing an expedited response to emergencies.

Additionally, neither agency added any additional staffing for the day in response to the PDS event. This lack of planning led to responding officers traveling long distances to unfamiliar areas to assist with the emergency situation.

A major issue during the fire was the lack of adequate PPE for law enforcement officers during the first operational period of the Palisades Fire.

LAPD and LASD should follow the example of government entities that consistently operate in the WUI, including issuing wildland PPE with patches and law enforcement identifiers, to their responders. This type of PPE should be designated as the "uniform of the day" during Red Flag conditions to ensure readiness, safety, and professional identification for officers operating in fire environments.

As extreme conditions and weather patterns become more common, law enforcement agencies in high-risk areas must address the persistent lack of foundational wildfire and WUI training; the issuing and proper use of PPE; and the establishment of comprehensive PDS protocols.

LASD Mobile Field Force Drawdown Policy

LASD's activation of the MFF required each station to redirect 50% of its on-duty personnel to the MFF emergency. MFF works well for LASD when staffing for specific location events like civil disturbances, however it is less effective during widespread events like what was experienced on January 7, 2025. In this case, MFF created an ALD staffing shortage as officers were activated for the Palisades Fire.

The station was operating with eight (8) officers on the street prior to the MFF Palisades activation. Once the Palisades activation was initiated, ALD reduced its officer level to four (4) deputies. This action led to a lack of staffing during the initial onset of the Eaton Fire on the evening of January 7, 2025. To ensure adequate staffing during potential emergencies, LASD should consider maintaining minimum staffing in all stations in or near WUI areas, including during MFF activations.

3.9.2.1.7 Automatic Vehicle Location Data

In rapidly developing community conflagrations, resources often respond, reposition, or self-deploy across a wide geographic area. Automatic vehicle location (AVL) data can be useful in determining resource location and movement during large-scale community conflagrations like the Palisades and Eaton Fires.

This section presents AVL-based maps using the data received by ULRI.

Note: *ULRI requested AVL data from fire and law enforcement agencies assigned to both incidents, however, not all agencies provided data. There may also be gaps in the data due to non-functioning systems, some apparatus not being equipped with AVL, or movements not being fully captured by dispatch records. As such, the AVL maps included in this report should be interpreted as a partial representation of resource location and movement during the fires, rather than a complete accounting of all resources operating during these incidents.*

The AVL heatmaps that follow display the relative location of combined fire agency resources for each hour of the first 24 hours of each fire, ending 10:29 on January 8, 2025, for the Palisades Fire, and 18:17 on January 8, 2025, for the Eaton Fire.

Each one (1) hour time period displaying a heat signature represents a collection of units with their associated time points within a geographic area.

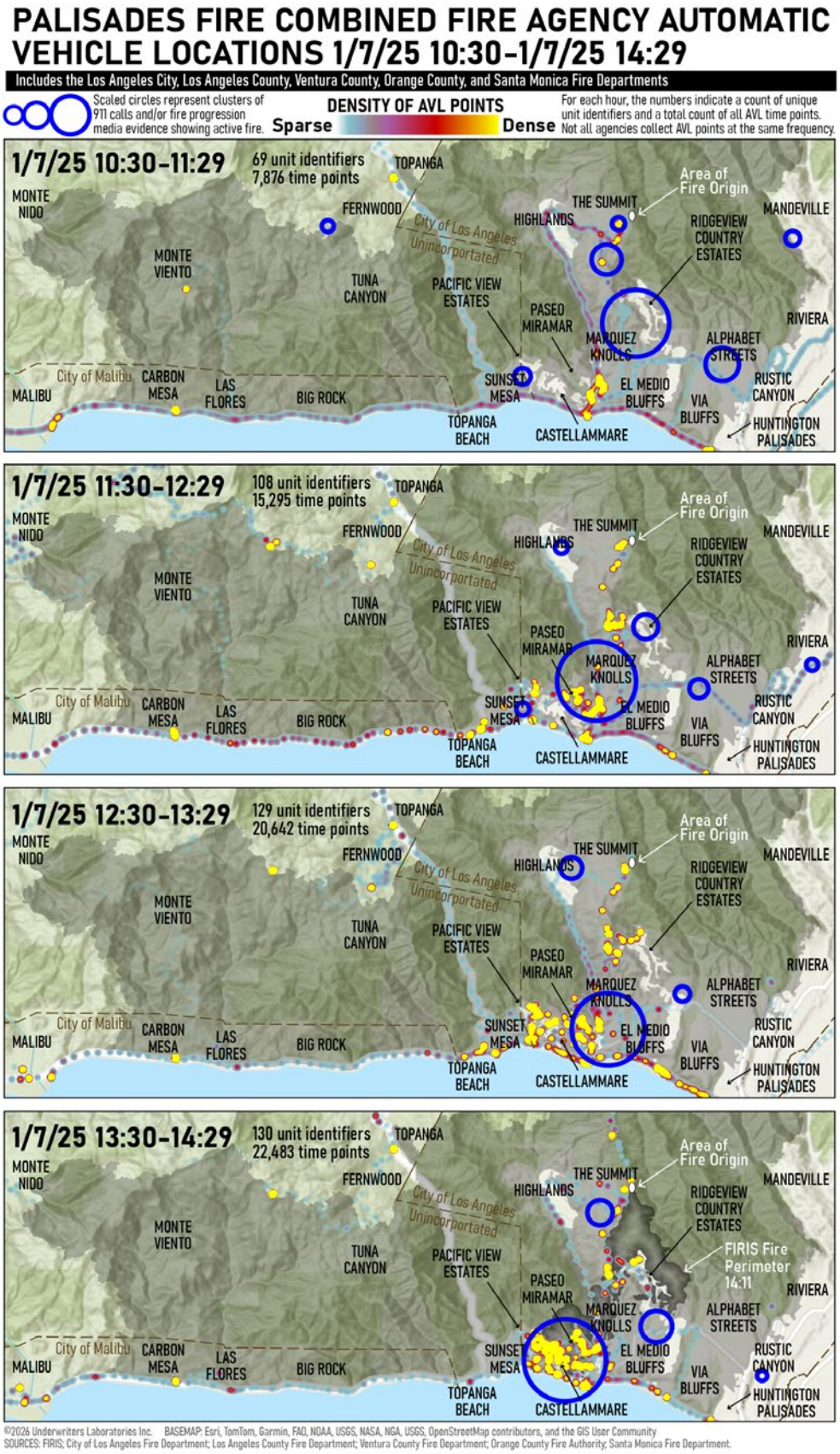
The warmer the color, the more unit time points were recorded in that location. All points were weighted equally, and heatmap settings and map scale were maintained to support comparison across time periods.[95]

The maps also include fire perimeter, city/county boundary line, and circles sized to represent the quantity of 911 fire calls, as well as visual evidence of fire from time-stamped pictures and video.

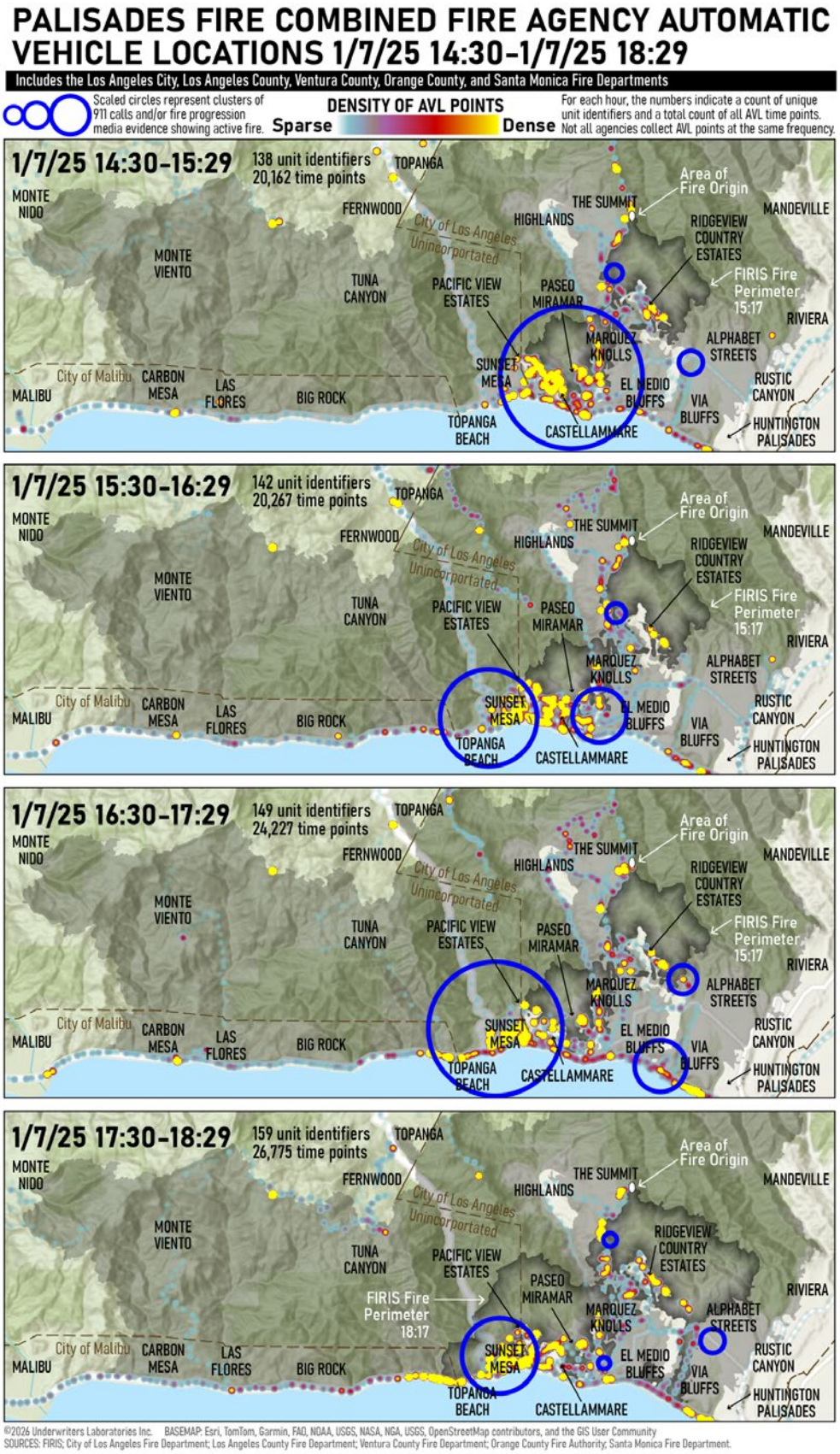
Palisades Fire

LFD, LAC, VNC, ORC, and SMA all shared AVL data with ULRI (Figure 3.9.30-3.9.35). Additionally, the positioning of many LFD and LAC apparatus on the initial response was indicated by chief and company officers during TDs.

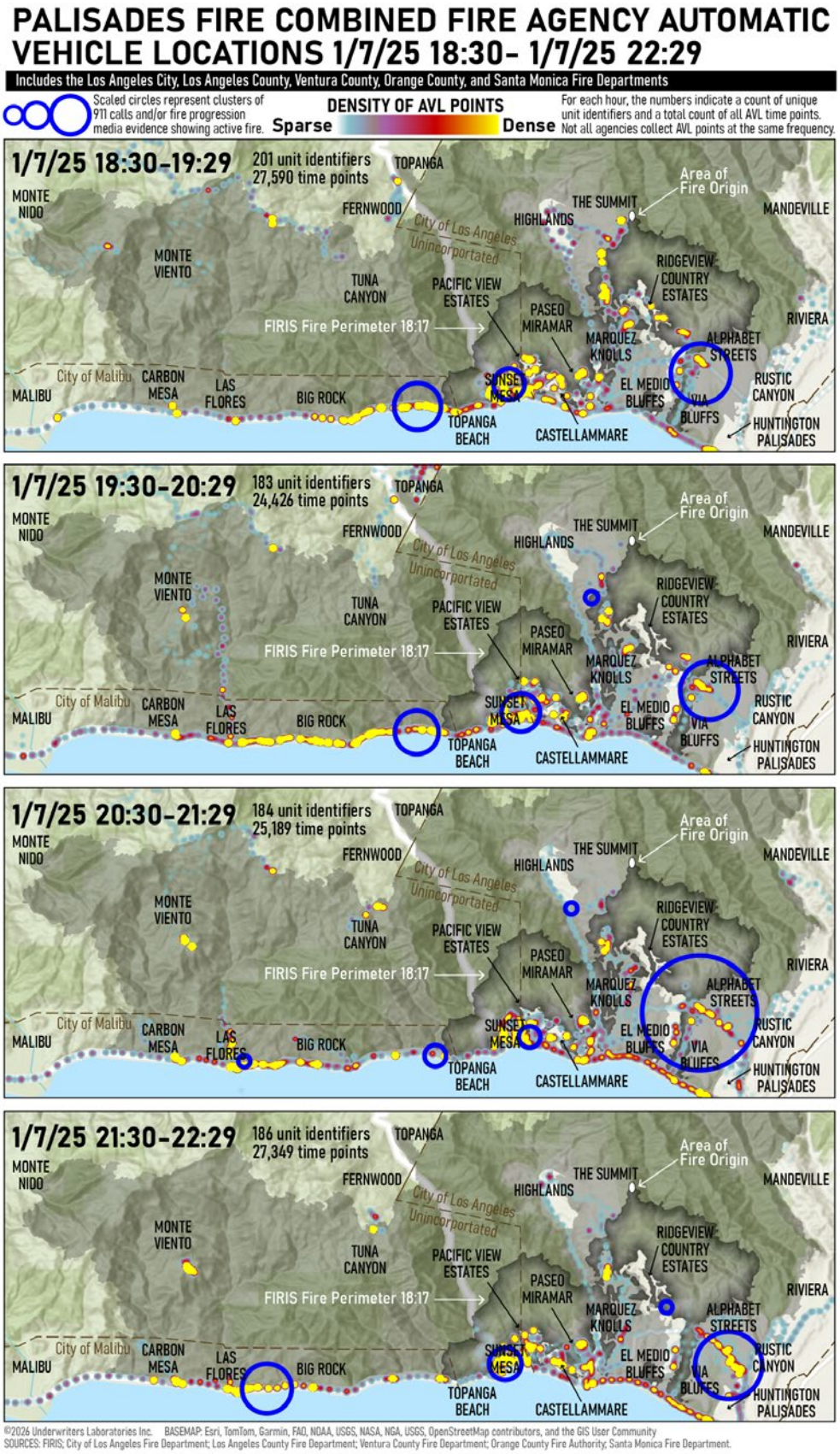
Personnel assigned to many of these resources identified their location on a map, and ULRI was able to use dispatch/communications records to verify locations in most cases.



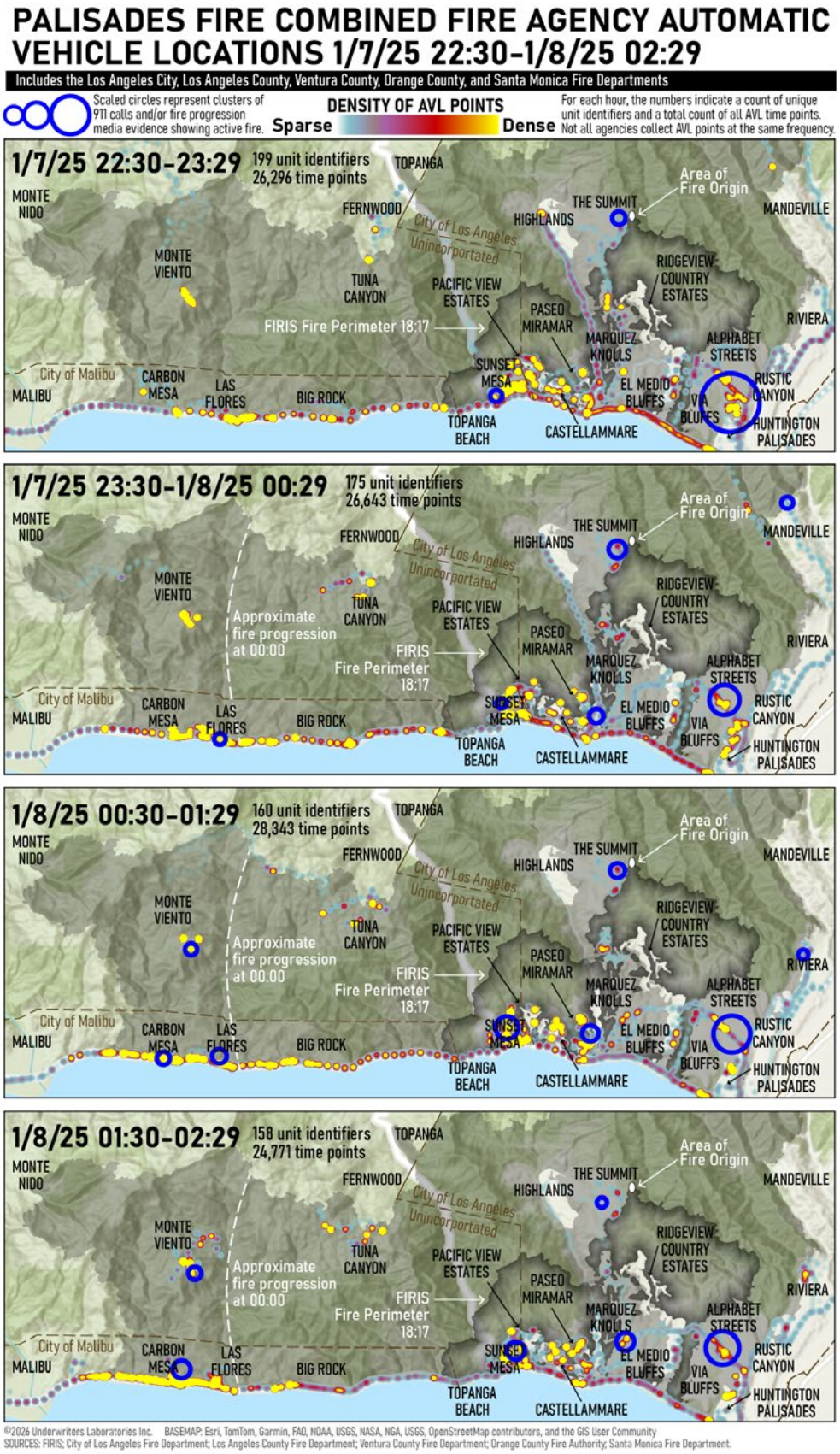
Time period: 10:30–14:29
Figure 3.9.30 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident.



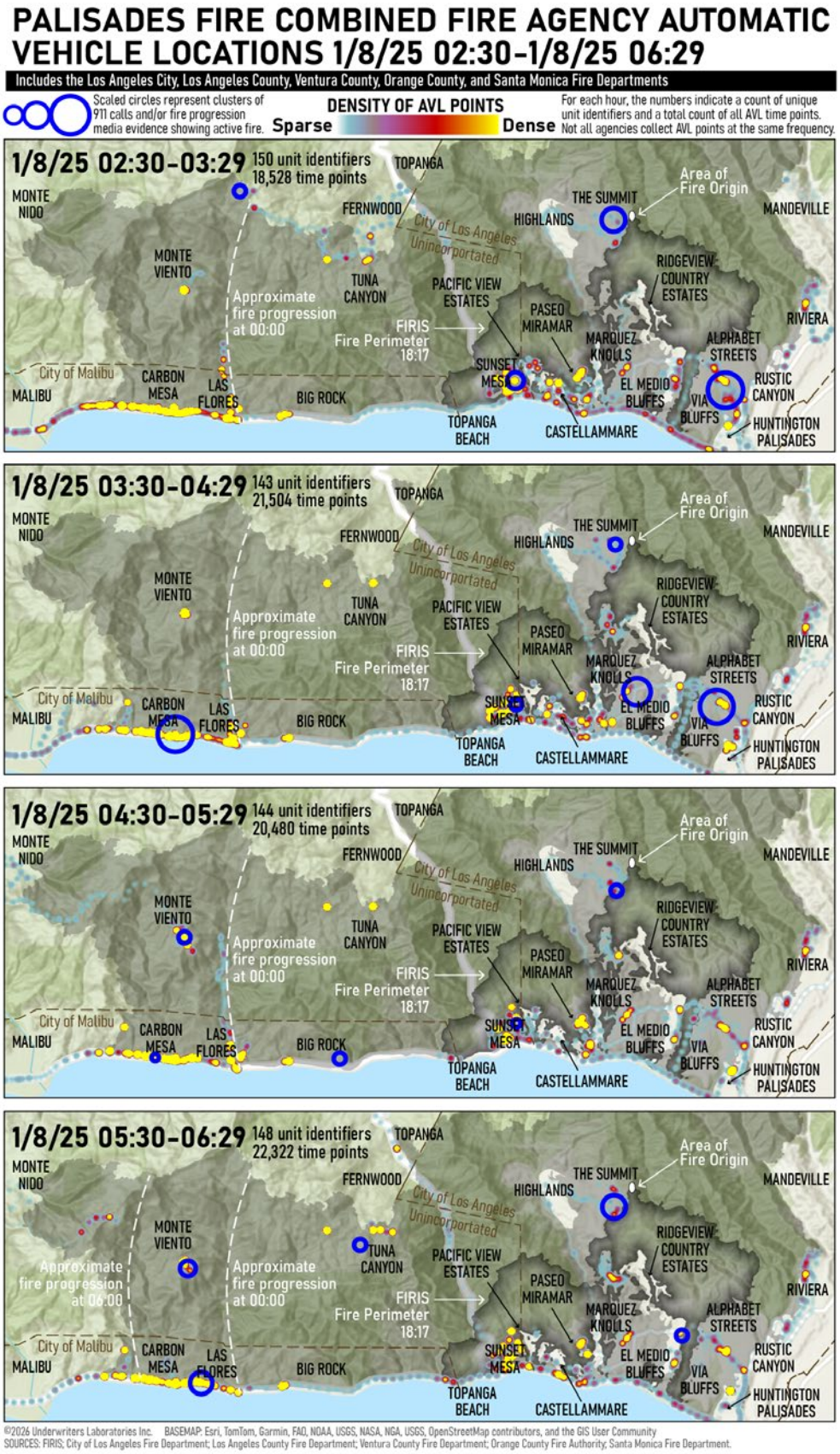
Time period: 14:30–18:29
Figure 3.9.31 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



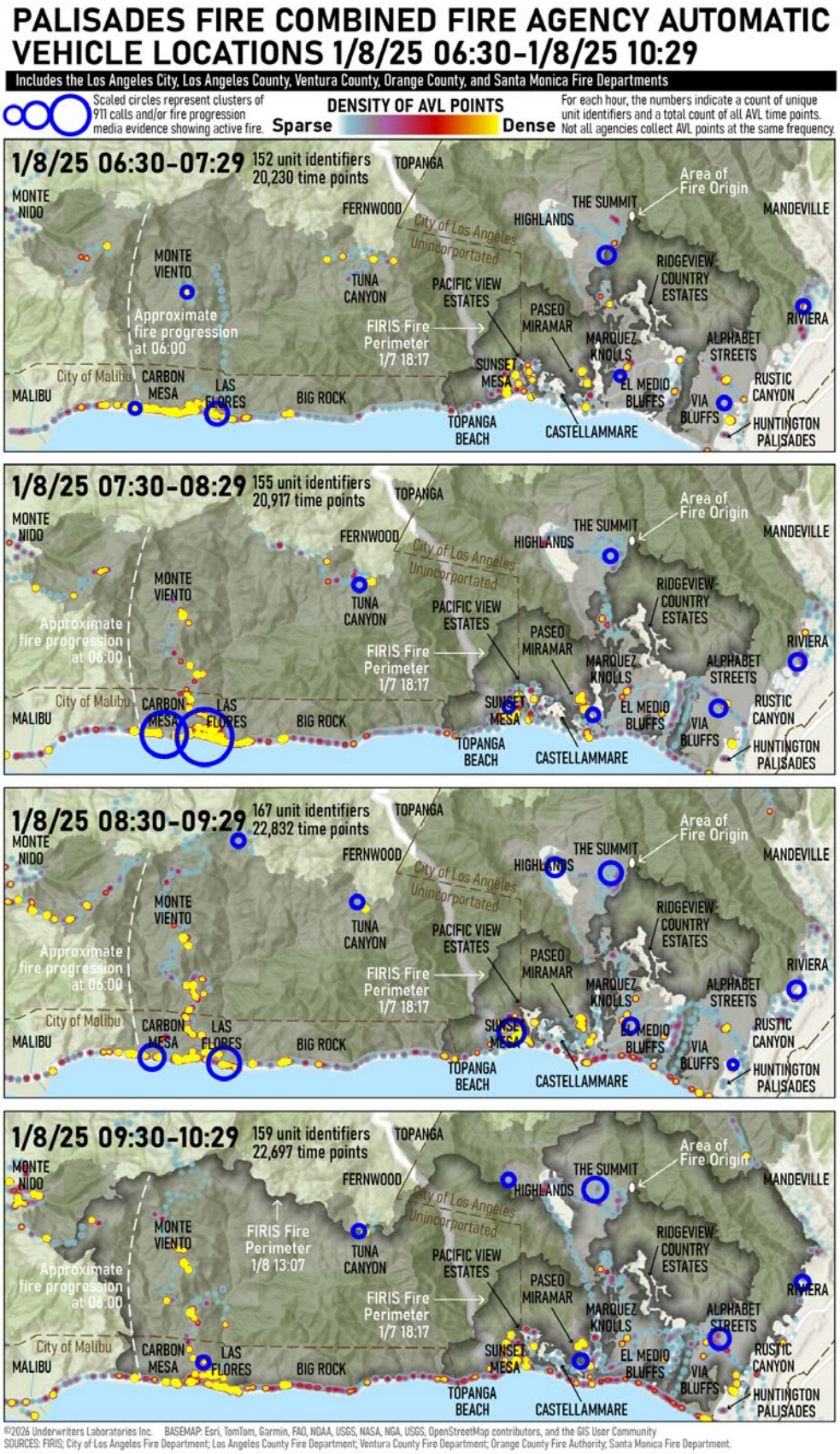
Time period: 18:30–22:29
Figure 3.9.32 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



Time period: 22:30–02:29
Figure 3.9.33 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



Time period: 02:30–06:29
Figure 3.9.34 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



Time period: 06:30–10:29
Figure 3.9.35 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)

AVL data shows fire resources were positioned mostly in areas impacted by fire. Initially, most resources were positioned in the Pacific Palisades, then several units moved west as the fire spread into Castellammare (near Getty Villa) and eventually into Sunset Mesa — the first LAC jurisdictional area impacted.

As the fire reached the coastline, its flanks widened, with the western flank in more alignment with the wind. From 19:30 to 22:29 on January 7, 2025, fire resources are positioned in Las Flores (Figure 3.9.36) and eventually into Monte Viento near LAC Camp 8.

The number of resources assigned increased until a high of more than 200 units were in the operational area between the hours of 18:30 and 19:29 on January 7, 2025.

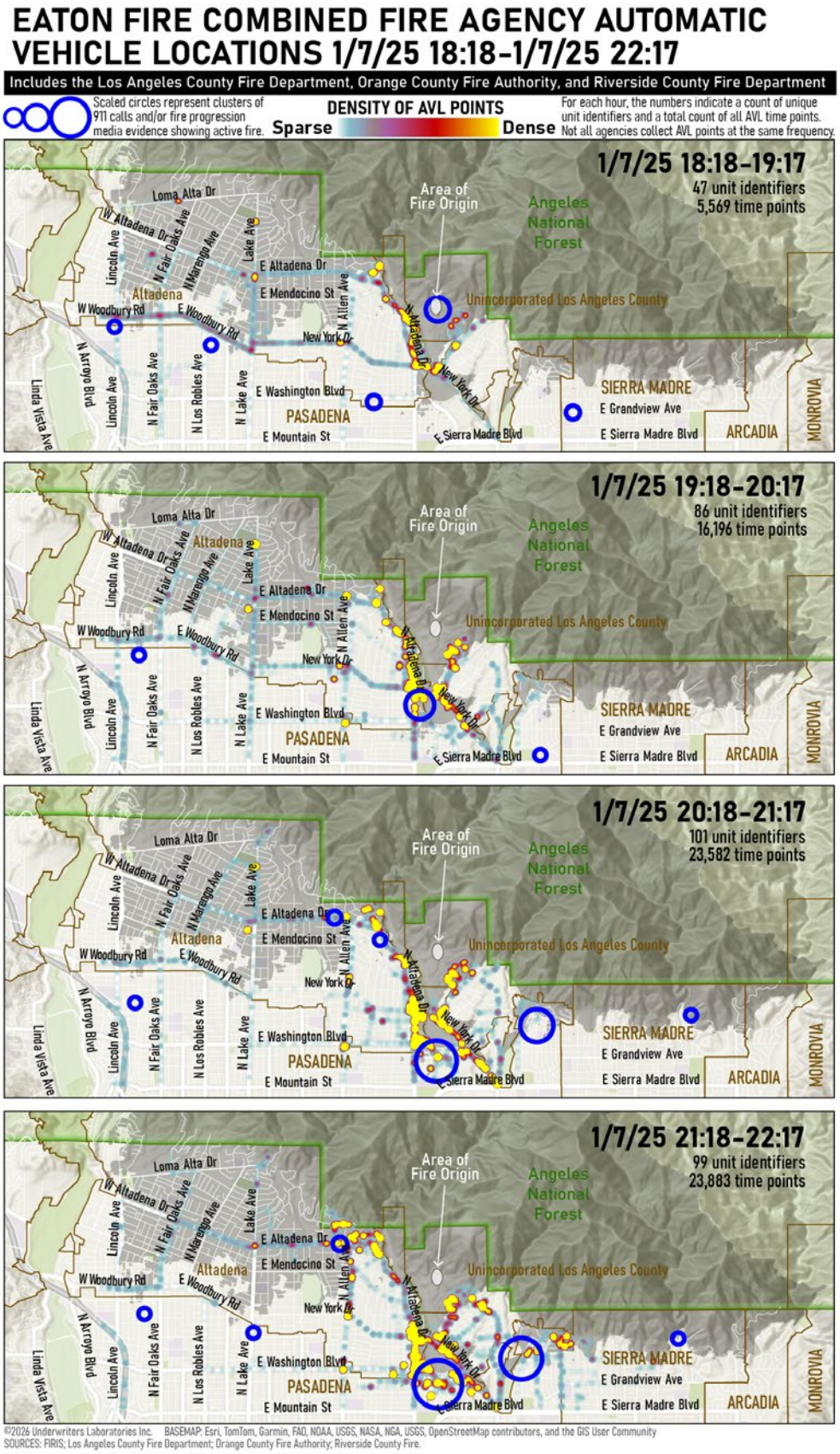
Figure 3.9.36 Palisades Fire spreading west, viewed from PCH.

Eaton Fire

LAC, ORC, and Riverside County Fire Department (RVC) all shared AVL data with ULRI (Figure 3.9.37-3.9.42). As with the Palisades Fire, the positioning of many LAC apparatus on the initial response was indicated by chief and company officers during TDs.

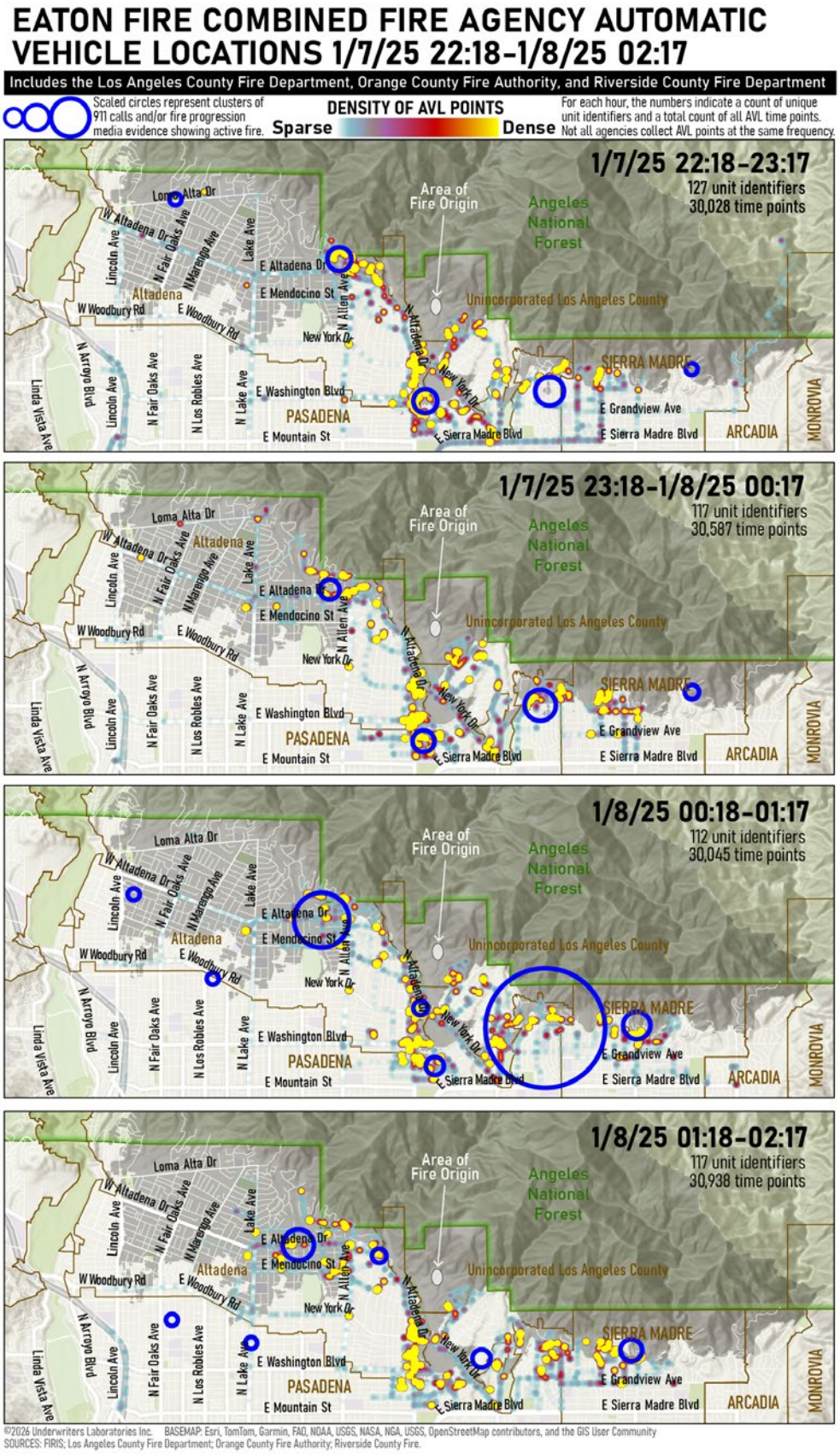
The Eaton Fire was reported at 18:18 on January 7, 2025, near the Eaton Canyon area, impacting the City of Pasadena near North Altadena Drive and Canyon Close Road. PPD and PFD responded and were actively engaged in evacuations and structure defense in the city.

The City of Pasadena did not provide AVL data. As such, the maps below show limited to no fire agency activity in the area.



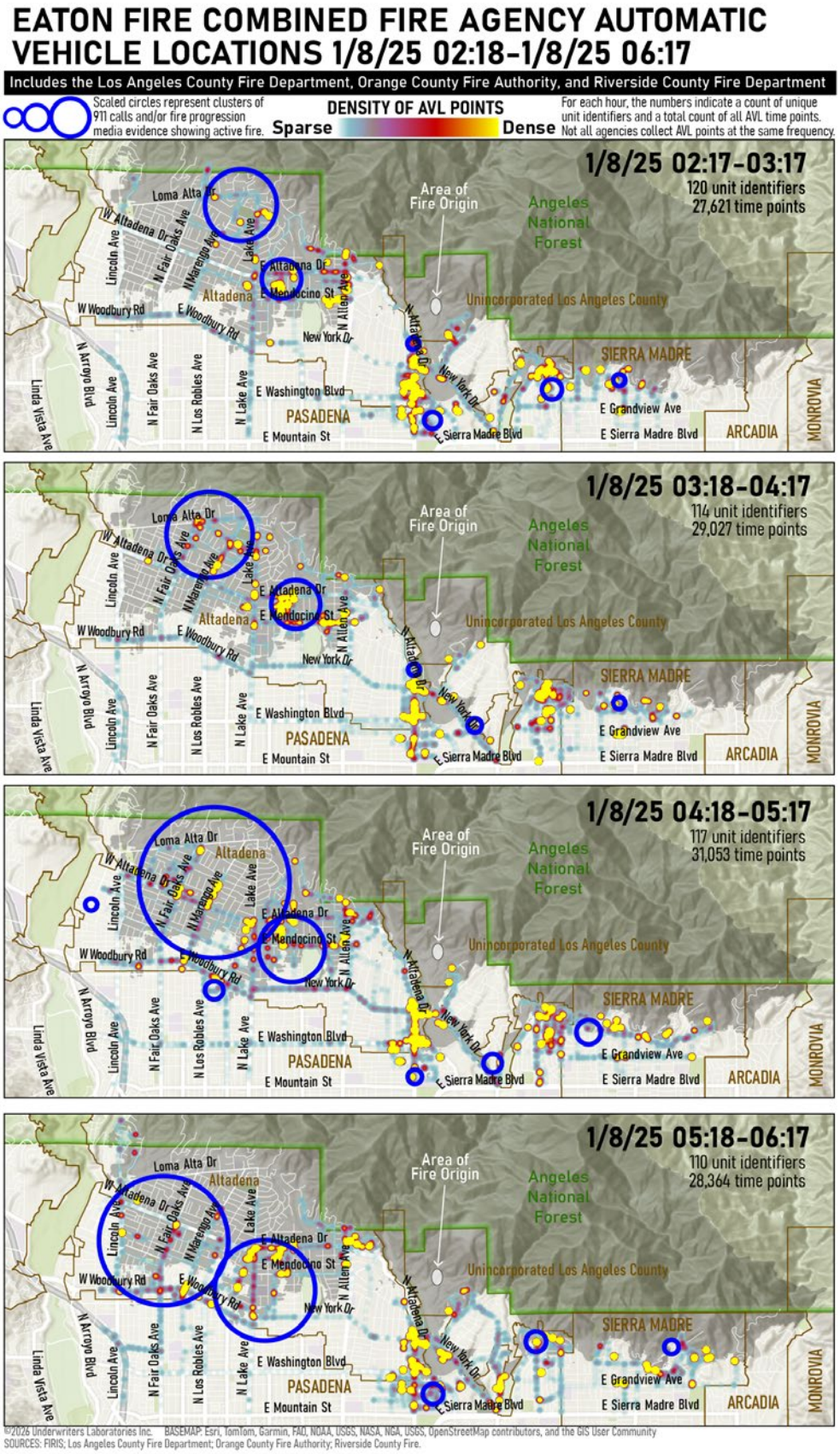
Time period: 18:18–22:17

Figure 3.9.37 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident.



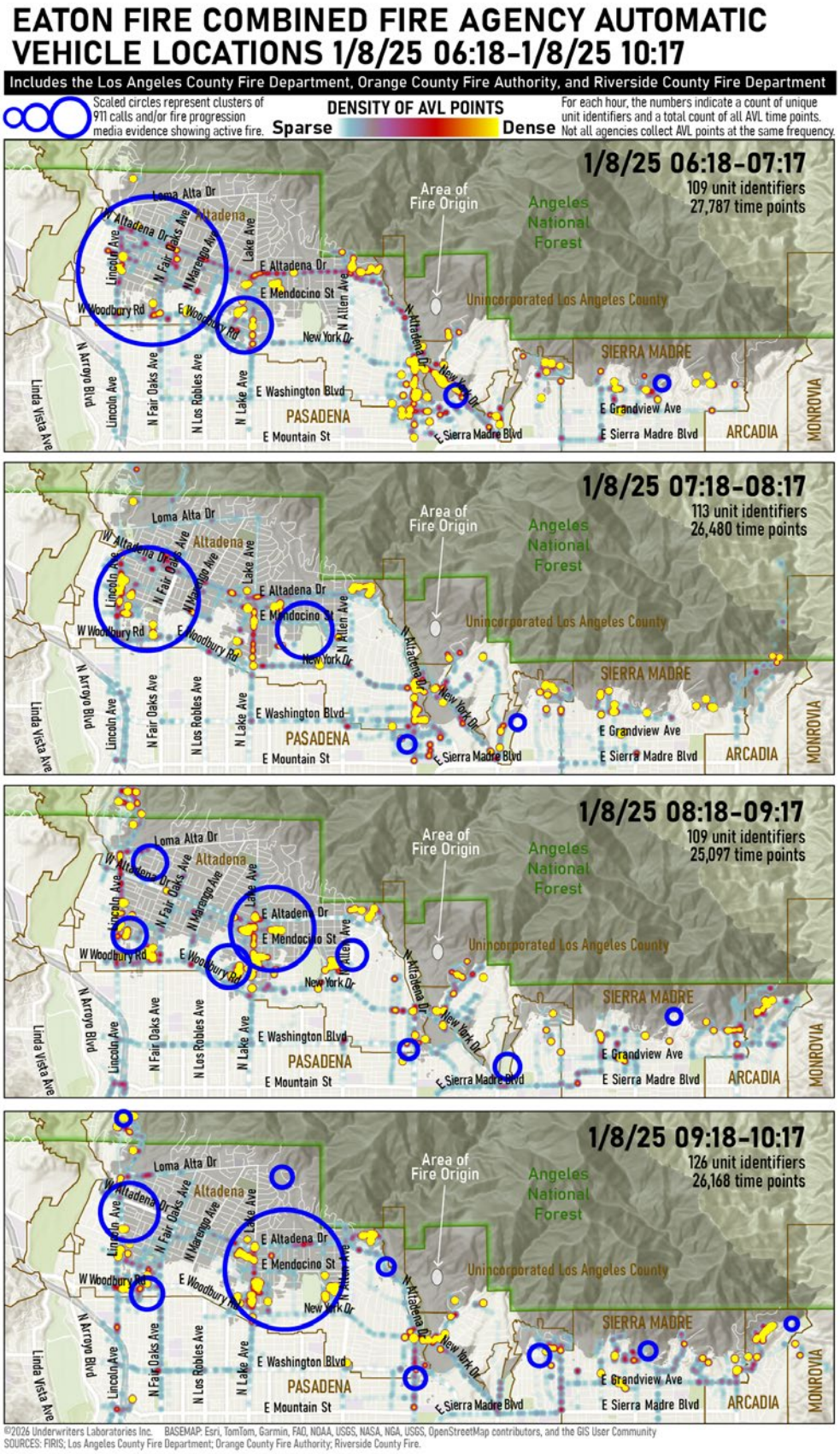
Time period: 22:18–02:17

Figure 3.9.38 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



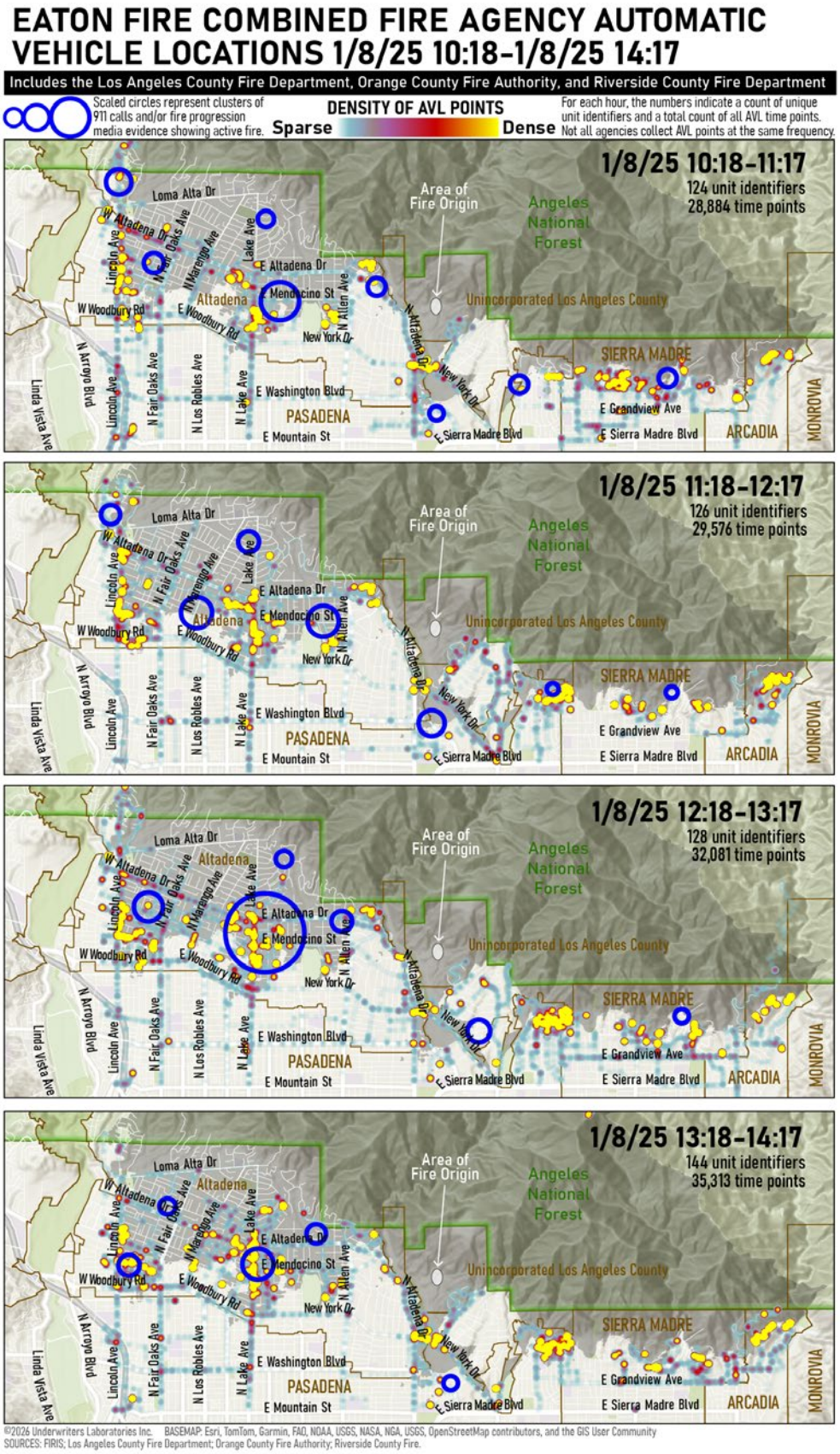
Time period: 02:18–06:17

Figure 3.9.39 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



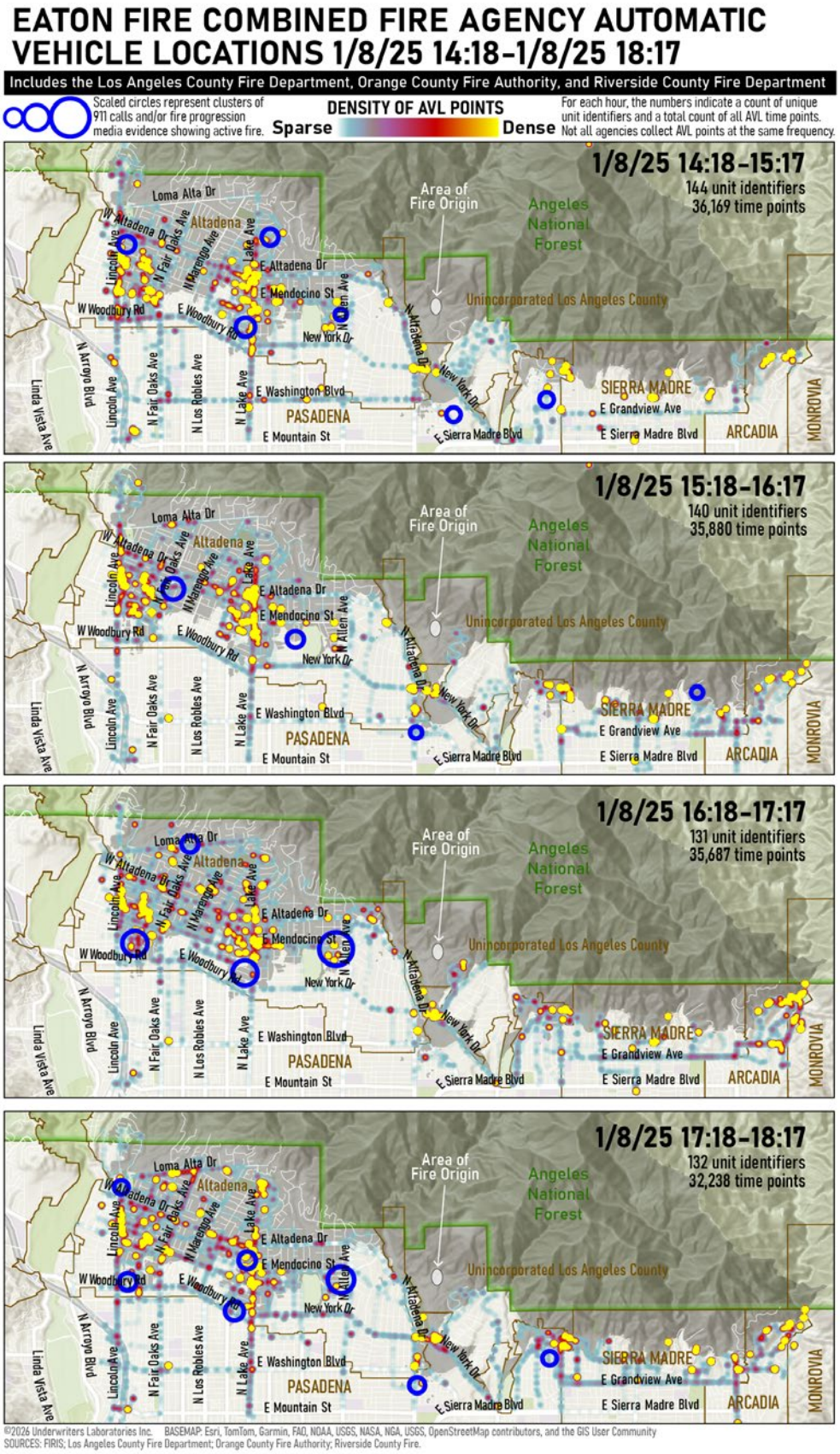
Time period: 06:18–10:17

Figure 3.9.40 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



Time period: 10:18–14:17

Figure 3.9.41 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)



Time period: 14:18–18:17

Figure 3.9.42 Combined fire agency AVL data aggregated to location by hour, for the first 24 hours of the Eaton Fire. Although these maps include AVL data from several agencies, they do not include data from all assigned to the incident. (continued)

AVL data again shows fire resources mostly in areas where structures were impacted by active fire. For the first eight (8) hours (approximately 18:18 on January 7, 2025, to 02:18 on January 8, 2025) most fire resources were positioned near the Eaton Canyon area and then moved east toward Kinneloa Mesa and Sierra Madre.

Around 02:18 on January 8, 2025, fire resources began to move west into Altadena. A pronounced increase in the number of units west of Lake Avenue was seen beginning around 03:18 (Figure 3.9.42).

By 05:18 on January 8, 2025, data shows resources moving south towards Woodbury Avenue / New York Avenue.

Figure 3.9.42 Structure burning west of Lake Avenue, near Mount Curve Avenue.

3.9.2.2 Resource Deployment and Mutual Aid

Local Government Fire Resources Offers to Assist

In the overnight hours of January 7-8, 2025, several local fire jurisdictions offered to send additional equipment to Cal OES Region 1. These offers were generally small and usually consisted of only one (1) or two (2) additional engines that had been staffed due to local agency personnel recall efforts.

Due to the desire to keep resources available to respond to new emergencies, as well as the belief that mutual aid engines en route to the fires would likely meet demand, these offerings were not utilized for assignment to the major fires.

It is also likely that managers understood that the safety and tactical capability of larger groups of assembled resources was preferred over single resource deployments under current high-hazard fire conditions. Instead, these resources were generally used to increase local coverage.

Despite the statewide drawdown, limitations of ordering systems, long travel times, and resource-deficient fire conditions, the anticipatory and rapid mobilization conducted by Cal OES Region 1 in cooperation with CAL FIRE, Cal OES, USFS, and other response partners ensured that a near-maximum response was deployed as quickly as possible during the fires.

These actions were key to executing one of the largest responses to a community conflagration emergency in California history.

Cal OES Region 1

Coordination of resources occurred through local, state, and federal dispatch and coordination centers. Regional coordination was managed by Cal OES Region 1, which was operated and staffed by the LAC Command and Control Division.

This center coordinated mutual aid resources for Los Angeles, Ventura, Orange, Santa Barbara, and San Luis Obispo counties and oversaw the regional processing and assignment of resources from California's statewide fire resource ordering systems.

The center also served as LAC's EOC and provided master coordination for internal department resources to the Palisades and Eaton Fires. It was active from the initial pre-deployment phase of the emergency through several weeks of response.

Staffed initially by five (5) LAC chief officers and several dispatch staff, the center grew as multiple agencies, including the City of Los Angeles, sent ordering teams and additional communications specialists. Center managers integrated all agency responders with local staff to operate Cal OES Region 1 as a single entity — a best practice.

As requests for emergency resources began to come from the City of Los Angeles early on January 7, 2025, Cal OES Region 1 initiated mass resource assembly and positioning for potential response. As pre-positioned resources were committed to assist the city, Cal OES Region 1 would simultaneously assemble and stage additional STs for replacement pre-positioning purposes.

As the center worked to commit additional resources, they simultaneously considered critical coverage throughout the region. This was a particularly important concern, as local fire agencies were simultaneously experiencing extremely high call volumes for non-wildfire emergencies.

The potential for new and additional wildfires was also necessary to consider. Cal OES Region 1 continued with a pattern of commitment, then immediate replacement of standby fire resources through several cycles in anticipation of continuing need.

Typically, the mutual aid system works on the basis of mobilization following specific requests. However, chief officers at Cal OES Region 1 knew that additional resources would most likely be required and did not wait for specific requests before acting.

This included streamlining ordering procedures to eliminate process time. These actions proved critical to the center's ability to provide a rapid and robust response.

Shortly after the Eaton Fire ignited, LAC and Cal OES chief officers discussed the resources needed and the rapid mobilization of large orders of engine STs. These conversations also included discussions on resource drawdown concerns.

For example, due to the exhaustion of mutual aid from Southern California, protracted travel times now applied to additional mutual aid arrivals, which were generally responding from Northern California or out of state. The tempo of new resource arrivals waned at both the Palisades and Eaton Fires after midnight on January 8, 2025. The Hurst Fire had started late in the evening on January 7, 2025, and was also requiring resources.

What few resources arrived overnight at fire staging areas were immediately assigned. Otherwise, the availability of newly arriving resources paused for a period of 4-6 hours overnight. Evolving needs at major incidents were constrained to the resources currently assigned, even as the fires continued to grow.

Emergency Management Assistance Compact

A multi-state agreement, termed the Emergency Management Assistance Compact (EMAC), facilitated a large-scale response once authorized by the California Governor's Office. This action resulted in a response from 12 western states, generating more than 40% of the overall engine resources mobilized for the January 2025 fires.

While the response requires significant mobilization and travel time, and despite the state's mutual aid system, California would have been critically deficient in firefighting resources to confront the January 2025 fires without EMAC assistance.

EMAC assistance requests were initiated by the Governor's Office late on January 7, 2025, when it became clear the state's mobilization capability would be taxed to meet response demands.

Local fire chiefs from Southern California, Cal OES, and CAL FIRE were all aware by the early evening of January 7, 2025, that they were near maximum drawdown in Southern California, and new requests for resources for the Eaton Fire would further require the acquisition of available resources from the farthest corners of the state.

Cal OES initiated the requests on behalf of the Governor's office with a goal to deliver resources to CAL FIRE for deployment. While some states provided immediate and large numbers of resources for response, others required up to 48 hours to deploy their state's resources. The first out-of-state resource to be committed arrived at the Eaton Fire around 06:00 on January 8, 2025.

Under EMAC, 312 engines from 10 states were mobilized to California. Of these, 212 engines were assigned to the Palisades and Eaton Fires, while the remaining 100 engines were used for fire staffing in San Diego County and provided initial attack coverage for vacated fire stations. The Phase One report[1] notes that all EMAC resources were utilized during the mandatory 14-day deployment period.

EMAC requires responding states to provide personnel and equipment capable of performing the missions expected by the receiving state. However, TDs with LAC chief officers noted that differences in training, qualifications, equipment, and operational practices occasionally required ICs to modify assignments to better match the capabilities of arriving resources.

These examples highlighted the importance of maintaining flexibility when integrating out-of-state resources into California's wildfire response system.

Housing for this large resource was a challenge, requiring substantial accommodations. In one case, a hangar at the Santa Monica Airport was procured to stage and house multiple STs from the Pacific Northwest. On day three (3) of the response, the state implemented a mobilization center in a regional park near Beaumont, California, that would intercept incoming out-of-state resources for briefing and deployment.

The center was key to relieving incidents of the added duties of briefing and mobilizing EMAC resources, becoming a mobilization site for both state- and federal-deployed resources.

The center was staffed by a local IMT from San Diego County, and provided briefing, staging, and fire assignment of resources. It also provided housing, meals, medical, and vehicle support, as well as vehicle safety checks to ensure apparatus were in working condition prior to deployment.

A vehicle smog check for California emissions standards was not required, contrary to reports by some media. Average time in the center for early-arriving resources was less than an hour during the initial phase of the incidents, increasing to 24-48 hours during the first week of response.

EMAC served as an important supplemental source of firefighting resources during the January 2025 fires. While national wildfire coordination systems routinely move federal and state resources throughout the country, California's activation of EMAC expanded the pool of available resources beyond those normally obtained through the wildfire ordering system.

To make the most of the system, fire leaders need to remain cognizant of the limits of system resources in California, as well as the inherent delays with waiting for out-of-state response. As such, they should act early to declare a continuing need, as was done in this crisis.

Hand Crew Staffing

Augmentation of local hand crew resources was particularly difficult to secure during the fire incidents. This was due mainly to the annual downsizing of federal crews in January due to seasonal conditions. Most hand crews were pulled from fire assignments at the Palisades and Eaton Fires and sent to rest on the mid-evening of January 7, 2025. They were directed to report back at 06:00 on January 8, 2025, for perimeter control work.

This was necessary due to the limited availability of additional hand crews for the coming day shift, but more importantly, because the overnight fire conditions on January 7, 2025, simply did not allow for safe or effective perimeter control work by hand crews.

The morning of January 8, 2025, brought better perimeter control opportunities, and handline construction was initiated on both the Palisades and Eaton Fires. This is a common practice from past wind-driven fires and achieved the safest and greatest utilization of hand crew resources given the circumstances.

Designation of State Responsibility Area

Despite Topanga State Park's state ownership and significant WUI exposure, most of the park is classified as an LRA because it lies within the incorporated boundaries of the City of Los Angeles. Under California's responsibility-area framework, primary wildfire protection responsibility in these areas rests with the local agency rather than the state. [96,97]

At 11,525 acres, it is the largest state park in the Santa Monica Mountains. The park is located largely within the City of Los Angeles' jurisdiction, with portions in unincorporated areas of Los Angeles County. Approximately 40% of Topanga State Park's boundary directly abuts WUI communities, placing homes and other developments directly adjacent to park vegetation.

The park's extensive chaparral and coastal sage scrub fuels, combined with steep slopes and rugged terrain, create conditions conducive to rapid fire spread and increase the potential for wildfire to impact surrounding communities. The area of origin of both the Lachman and Palisades Fires was located within the City of Los Angeles LRA.

Under California's responsibility-area framework, lands within incorporated cities are generally excluded from SRA designation, and fire protection responsibility remains primarily with the local agency. How state-owned lands located within LRAs should be managed for wildfire prevention, preparedness, and emergency response remains an ongoing policy consideration.

Review of the current statutory framework may be warranted to ensure that state-owned wildlands with significant wildfire exposure receive adequate prevention, preparedness, and suppression resources while supporting their long-term environmental stewardship.

3.9.2.3 Community and Private Fire Assistance Organizations

3.9.2.3.1 The Community Brigade

The Palisades Fire reinforced a recurring lesson from Southern California wildfires: when extreme winds, dry vegetation, and dense WUI development align, life-safety demands can quickly exceed available response resources. During these events, response agencies and organizations are forced to prioritize limited personnel across rapidly expanding incident footprints.

At the same time, public agencies continue to face staffing, funding, and preparedness constraints. While California maintains one of the most extensive mutual aid systems in the world, the increasing frequency and scale of destructive WUI fires suggest that professional resources alone may not be sufficient during these extreme events.

Additional local capacity is needed to support preparedness, evacuation, situational awareness, and post-fire operations. One approach emerging in Los Angeles County is the use of Community Brigades.[169]

The Community Brigade Pilot Program was established following the 2018 Woolsey Fire. The program was created through a partnership between the Los Angeles Emergency Preparedness Foundation and LAC, becoming operational in late 2024 after a year of recruiting and training volunteers.

The pilot program was initially implemented in seven (7) high-risk communities within the Santa Monica Mountains:

- Malibu West
- Point Dume
- Big Rock
- Hidden Hills
- Corral Canyon
- Topanga Canyon
- Communities along the county line

These communities were selected because they are located within historic fire corridors that have repeatedly experienced destructive wildfire activity.

Unlike spontaneous volunteers, Brigade members are organized under formal program policies and procedures. Members are subject to background checks, training requirements, deployment standards, accountability processes, and PPE requirements.

The program prohibits self-deployment and establishes a structure intended to support coordination with fire department operations.

Brigade Staffing and Training

The Brigade is staffed by local residents who undergo progressively advanced training. Depending on qualification level, members receive training in:

- ICS
- NIMS
- Wildland firefighting
- Fire behavior
- WUI operations
- Structure triage
- Portable pumps and water supply operations
- Crew leadership
- First aid and CPR

The program's training framework resembles a scaled version of professional wildland firefighter qualification systems and is intended to align members with wildfire and WUI operational concepts and terminology.

Brigade Equipment and Capabilities

The Brigade operates using LAC-approved wildland PPE and maintains equipment that includes:

- Four (4) Type VI engines
- Mobile water pumps and tanks
- Wildland hand tools
- EMS supplies
- Starlink communication systems
- Communication compatibility within the Santa Monica Mountains MTZ

Brigade members are trained in pre-fire operations related to prepping homes before the fire's arrival, evacuations, and operational tactics associated with "fire-front following," "tactical patrol," and "structure triage."[94]

Brigade Operations During the Palisades Fire

Following confirmation of PDS fire weather conditions, Brigade leadership activated pre-deployment procedures before the fire started. Members prepared equipment and personnel in anticipation of potential operations.

When the Palisades Fire ignited on January 7, 2025, the Brigade deployed within approximately one (1) hour. Over the course of the incident, approximately 50 trained members participated in operations supporting community protection and fire department objectives.

Their activities generally fell into four (4) categories:

Brigade Evacuation Support

Brigade members conducted door-to-door notifications and evacuation assistance throughout threatened neighborhoods. Their effectiveness was enhanced by their status as local residents.

The Community Brigade After Action Review (AAR) notes that some residents who had initially ignored official evacuation warnings ultimately evacuated after speaking directly with Brigade members. In many cases, members knew residents personally or shared existing community relationships. This local credibility allowed the Brigade to influence evacuation compliance in ways that traditional emergency responders could not.

See Section 3.11 for more discussion on the Brigade's evacuation support in the Palisades Fire.

Brigade-Supported Situational Awareness

Brigade personnel provided local knowledge regarding:

- Community access conditions
- Neighborhood vulnerabilities
- Remote structures
- Road network limitations
- Areas appropriate for operational engagement

This information helped improve situational awareness during a rapidly evolving incident where conditions changed faster than public agencies could fully track.

Brigade Structure Defense and Fire Suppression Support

Although Brigade doctrine emphasizes operating behind the fire front, conditions during the Palisades Fire often blurred the distinction between structure defense and suppression activities.

Examples discussed in the AAR include neighborhoods, such as Sunset Mesa, Big Rock, Las Flores Canyon, and other Santa Monica Mountain communities.

In several locations Brigade personnel participated in structure triage, property protection, and suppression-related activities alongside responding agencies.

These actions demonstrated the Brigade's value as a force multiplier, but also highlighted a recurring challenge: volunteer personnel naturally gravitate toward active operations when their own communities are threatened.

Brigade-Supported Community Resilience and Recovery

The Brigade's role extended beyond immediate suppression support during the Palisades Fire, with members continuing to support community information sharing, damage assessment, community recovery activities, and mitigation efforts.

These functions helped extend public agency reach during an event that lasted well beyond the initial fire attack period.

The Brigade's Value During Major Fire Incidents

The Palisades Fire provided the first major test of the Brigade concept under extreme operational conditions.

Several strengths emerged, including:

- Providing additional workforce at a time when professional resources were overwhelmed by a rapidly expanding fire footprint and effectively increasing available personnel without requiring permanent public staffing increases.
- Possessing members with detailed knowledge of neighborhoods, access routes, residents, and community vulnerabilities that were unavailable to incoming mutual aid resources, which improved situational awareness and operational efficiency.
- Serving as trusted messengers with existing community relations that helped influence residents' evacuation decisions, which may have contributed to improved evacuation compliance and reduced life-safety risk.
- Demonstrating that trained community members can perform meaningful support functions, while also working within a coordinated framework.

Limitations and Risks of the Brigade

While the Brigade's deployment proved successful in a number of ways and concluded without reported Brigade-member injuries, the Palisades Fire revealed several challenges.

One of the biggest challenges is defining the boundary between support operations and active firefighting. Although Brigade doctrine emphasizes relatively safer fire-following operations, multiple examples suggest members became involved in activities closer to active fire operations than originally envisioned.

This is understandable given personal investment in protecting homes and neighbors, but it increases risk and exposure, and complicates accountability.

Integration within the ICS remains another challenge. Many incident personnel reportedly had little familiarity with the Brigade's capabilities, qualifications, or operational role. This limited visibility sometimes complicated assignments and coordination efforts.

Sustainable funding remains a significant concern. Sustaining PPE, radios, vehicle maintenance, communications systems, training, insurance, and administrative oversight requires dependable long-term funding. Programs dependent primarily on donations may struggle to maintain readiness at scale.

Finally, volunteer participation introduces liability concerns. Expanding Brigade operations inevitably places more people into hazardous environments and raises questions regarding worker protection, credentialing, risk management, and legal responsibility during emergency operations.

3.9.2.3.2 Private Firefighting Resources

The use of private firefighting resources to protect structures and assets from wildfire continues to be a controversial practice in California. While shown to be successful in targeted areas during the January 2025 fires, the practice presents unique and ongoing challenges for incident management across safety, communications, deployment, accountability, and command and control concerns. Only limited regulation and policy guide this practice in the state.

During the Palisades Fire, private fire companies responded primarily as representatives of insurance providers to protect insured properties and as private contractors working for clients to protect selected properties. According to the multiple companies providing response, the facilities and structures of over 1,000 clients received private firefighting resources at the Palisades Fire by over 25 independently acting private fire apparatuses.

This deployment was largely successful but was conducted separately from the ongoing city and county fire agency response. For example, four (4) insurance fire apparatus protected a shopping mall in downtown Pacific Palisades, where loss around the facility was extensive. This was accomplished during a time of widespread fire through the built environment and limited fire agency resource availability.

Tactics used by these private fire companies also resulted in the protection of non-contracted structures. For example, in Topanga Canyon, a private contracted structure was located mid-block, where it was determined that it would be best protected by the prevention of ignition of any structure on the same block. This action was praised by local homeowners who stated that public fire apparatus were not present when fire was in the area.

While the use of private resources was successful, they do remain controversial as some observers perceive them as providing an additional layer of protection primarily to affluent property owners and high-value insured assets.

Media coverage of the Palisades Fire highlighted public concern that private firefighting services could create disparities in protection during large-scale disasters. At the same time, the California Professional Firefighters union criticized private firefighting operations, arguing that private crews do not train to the same standards as public firefighters and may complicate incident operations.

Concerns raised by union representatives and policymakers included the adequacy of oversight, coordination with incident command, and the regulation of private firefighting companies operating on private property. [98,99]

Current state law and FIRESCOPE policy require that private resources be trained and equipped with communication devices that allow emergency communications. These policies, however, leave much to interpretation around how private resources must be licensed or equipped, what practices they are allowed or not allowed to follow, and how they might be controlled or communicated with by IMTs for safety and efficiency. [100,101]

While a number of private companies aim to offer similar levels of performance as public fire agencies and even go so far as to hire retired firefighters to serve in leadership roles, these organizations may deploy personnel with less qualification or experience.

Radio communications on the fireground between public and private firefighters is rare, and private responders are not subject to the same accountability standards as their public counterparts.

Private firefighters are reluctant to share client lists or deployment locations, likely due to the sensitive nature of their clients and their desire for lack of disclosure.

It is clear that the practice of deployment of private firefighters has been successful and assists in mitigating a greater emergency, but command and control issues and lack of coordination with ICs and organizations create safety and operational concerns that need to be addressed.

Licensing and bonding requirements, along with minimum standards for personnel, equipment, and operational capability, can help ensure that qualified private firefighting resources are deployed.

3.9.3 Findings and Recommendations

FINDING 92: Both LACoFD and LAFD had pre-fire plans for the Palisades and Eaton Fire areas, however, they were outdated and reportedly not used, even though some were accessable via the Fire Sync Ops app.	**RECOMMENDATION 92.1:** Emergency response agencies should update, regularly maintain, and train on comprehensive pre-fire plans for areas at risk for wildfire impact, particularly in the WUI. **RECOMMENDATION 85.2:** Establish a statewide pre-fire planning tool and standardized template to improve consistency, usability, and interoperability.
FINDING 93: A written joint agency evacuation plan was not created for either fire.	**RECOMMENDATION 93.1:** Fire, law enforcement, and emergency management agencies should regularly conduct joint training on all-hazard evacuation scenarios.
FINDING 94: Other local jurisdictions in Southern California, within and adjacent to Los Angeles County, organize and resource their local emergency management agencies in different ways, with different authorities, reporting relationships, and capabilities; all of these agencies are key partners during a fast-moving multi-jurisdictional/disciplinary emergency or disaster event.	**RECOMMENDATION 94.1:** Conduct a region-wide study of local emergency management agencies in Southern California, with the goal of describing current capabilities, identifying any resource/capability gaps, and assessing resource needs.
FINDING 95: On the Palisades and Eaton Fires, the initial resource order after dispatch was for 20 additional engine companies, which was inadequate for the current and predicted fire weather and the resource needs of the incident.	**RECOMMENDATION 95.1:** Resource orders should be based on current and expected fire behavior, which allows command officers to make strategic decisions, implement effective tactics, and effectively order resources. **RECOMMENDATION 95.2:** Develop a standard ordering guideline for ordering resources (1st alarm, 2nd alarm, 3rd alarm, closest number of engines, STs, etc.), along with sufficient overhead to manage the resource order.

3.9.3 Findings and Recommendations (cont.)	
FINDING 96: The early activation of EMAC resources demonstrated the importance of initiating interstate resource requests well before critical shortages develop.	**RECOMMENDATION:** N/A
FINDING 97: Cal OES Region 1/LACoFD Command and Control executed the mutual aid requests effectively throughout the fire incident.	**RECOMMENDATION 97.1:** Cal OES Region 1/LACoFD should document its best practices for use in future training for similar events.
FINDING 98: LAFD largely depended on their internal, day-to-day deployment models, which are designed for single-structure fire response, resulting in instances of inefficient and resource-deficient tactical deployment during the Palisades Incident.	**RECOMMENDATION 98.1:** Use the standardized wildland fire resource configurations for more efficient deployment and utilization.
FINDING 99: Extreme wind-driven fire behavior, receptive fuels, limited available resources, and equipment configurations not optimized for the conditions overwhelmed conventional WUI suppression tactics, contributing to the extensive structure losses in both fires.	**RECOMMENDATION 99.1:** Invest in research to identify evidence-based WUI tactical considerations, vehicle types, and suppression equipment to prevent wildfires from becoming community conflagrations.
FINDING 100: Tactical patrol was essential for identifying and extinguishing spot fires caused by ember cast, and in many cases, structures that were initially saved later burned when follow-up patrol and suppression were not maintained.	**RECOMMENDATION 100.1:** Allocate resources for sustained tactical patrol in impacted neighborhoods to detect and extinguish ember-caused ignitions following initial structure defense efforts.
FINDING 101: Due to fire behavior, fuel type and condition, topography and weather, perimeter control utilizing direct line construction was limited for the Palisades Fire and non-existent for the Eaton Fire until late morning on January 8, 2025.	**RECOMMENDATION 101.1:** Maintain a network of access roads in wildland areas to facilitate firefighter access and effective perimeter control. **RECOMMENDATION 101.2:** Consider using hand crews normally assigned to perimeter control/line construction for structure defense missions if firefighter safety, public safety, and security can be maintained.
FINDING 102: Take Initiative Engage & Report (TIER) was effectively applied by individuals trained in its use when leadership was unable to provide direction due to the demands of the highly dynamic incident.	**RECOMMENDATION 102.1:** Incorporate TIER into WUI tactical operations training addressing early stages of wind-driven community conflagrations when supervision and the Division and Group level are in short supply.
FINDING 103: The use of ladder trucks without water on the Palisades Fire reduced operational effectiveness due to limited maneuverability, roadway congestion, and tactics that were not always aligned with incident conditions.	**RECOMMENDATION 103.1:** Prioritize the deployment of apparatus and resource configurations that are best suited for fast-moving WUI fires and community conflagrations, and limit the use of ladder trucks without water in situations where they may impede mobility, increase congestion, or provide limited operational value.
FINDING 104: A small number of resources used their eductors (siphon ejectors) to draft water from the numerous pools within both fire areas.	**RECOMMENDATION 104.1:** Fire service should develop a curriculum supporting a water supply technical specialist in the pre-planning phase of forecasted fire weather and for operational performance during community conflagration. **RECOMMENDATION 104.2:** Fire service should practice with water siphon ejectors on a more regular basis to ensure their use is prioritized during periods of reduced hydrant pressure.

3.9.3 Findings and Recommendations (cont.)	
FINDING 105: Water-enhancing agents, including foam and fire-suppression gels, demonstrated some value as structure defense tools but were not widely employed.	**RECOMMENDATION 105.1:** Incorporate foam and gel-based structure protection into WUI pre-planning, training, and tactical decision-making where appropriate.
FINDING 106: While there were some successful salvage operations, the salvage of resident private property did not occur consistently throughout the incidents and was not prioritized by ICs.	**RECOMMENDATION 106.1:** Salvage operations prioritization should be clearly stated within the strategic objectives of the IAP. **RECOMMENDATION 106.2:** Training should be developed to educate firefighters on the proper way to plan for and execute salvage during a community conflagration.
FINDING 107: Secondary searches were not conducted as the fire progressed, limiting rescue opportunities, while significant post-fire hazards and a lack of appropriate PPE prevented responders from safely conducting these operations.	**RECOMMENDATION 107.1:** Establish protocols that prioritize secondary search operations using appropriately equipped fire/USAR resources, with law enforcement providing support for coordination and access control rather than directly entering hazardous areas.
FINDING 108: AVL data can provide valuable insights for operational analysis; however, not all agencies were able to share this data because some vehicles lacked AVL capabilities and some agencies restricted data sharing through policy.	**RECOMMENDATION 108.1:** Agencies should standardize AVL capabilities and data-sharing policies to ensure vehicle location data is available for incident management, coordination, and after-action analysis.
FINDING 109: LAFD is responsible for fire suppression on portions of Topanga State Park located within the City of Los Angeles. Although these lands are state-owned, they are classified as Local Responsibility Area (LRA).	**RECOMMENDATION 109.1:** Given the size, fuel conditions, and WUI exposure of certain state-owned lands located within LRAs, the Legislature may wish to evaluate whether the current responsibility-area framework appropriately aligns ownership, risk, operational responsibility, and funding.
FINDING 110: Private fire companies provided value on the Palisades Fire by defending structures they were hired to protect, which also protected neighboring structures they were not paid to defend.	**RECOMMENDATION:** N/A
FINDING 111: Private firefighting resources were deployed in the operational area and functioned outside of Palisades Incident Command.	**RECOMMENDATION 111.1:** Statewide standards and regulations for management, fireground accountability, certification, and bonding of private fire services are needed and should be established by State regulation. **RECOMMENDATION 111.2:** Appropriate fireground access by private fire services should be determined by regulation and be consistent across the State.
FINDING 112: FIRESCOPE policy addressing private fire resources is not in alignment with how these resources operated during the Palisades Fire.	**RECOMMENDATION 112.1:** The State of California needs expanded regulation and procedure to define and standardize the roles and resources of private fire brigades/companies and their staff. These standards must establish minimums for training, deployment, operation, coordination, and communications, and include stronger coordination with field commanders deployed by public agencies. **RECOMMENDATION 112.2:** The proposed new standards should certify firefighters employed by such organizations as competent. The improved regulation should include stronger integration with public firefighting efforts, including enhanced command and control and improved fireground accountability. These standards should be codified into State law, and, with compliance with said regulations, private fire services should be granted access to lawfully restricted fireground areas.

3.10 Operational and Intelligence Tools for Situational Awareness

3.10.1 Gaps in Situational Awareness

Situational awareness during large, outdoor fires, such as the Palisades and Eaton Fires, is critical to operational success and safety. Tools for obtaining and maintaining situational awareness range from ground-based firefighters to sensors at varying altitudes above the Earth's surface.

In recent years, fire department operations (including surveillance) have grown increasingly reliant on aerial methods using fixed-wing and rotor-wing aircraft, as well as unmanned aircraft systems (UAS). However, grounding aircraft due to high, erratic winds is a recurring challenge in California during wind-driven fire events.

The lack of persistent aerial surveillance, especially during the Eaton Fire, where the first surveillance perimeter was not produced until 18:30 on January 8, 2025, limited firefighters' ability to track fire location.

This placed them at a disadvantage, particularly when ground observations were hindered by weather, terrain, access, and fire intensity.

This gap conflicts with the second of the Ten Standard Firefighting Orders, which emphasizes knowing what the fire is doing at all times.[102]

Since 2019, California has expanded investment in real-time wildfire intelligence systems, including the FireGuard program[103] and FIRIS,[104,105,106] which provide satellite- and aerial-based fire detection, mapping, and near-real-time perimeter data to support decision-making.

With the exception of one (1) ANF chief officer, firefighters and law enforcement personnel did not reference these products when asked about intelligence tools they used in TDs. Although some individuals later shared timestamped images, including FireGuard perimeters and predictive models (Figures 3.10.1 and 3.10.2), the limited discussion suggests these tools were either overlooked, forgotten, and/or not trusted.

One chief officer indicated they were not useful since early on during the Palisades Fire they could see the flanks of the fire at ground level and they also had aerial surveillance aircraft producing perimeters.

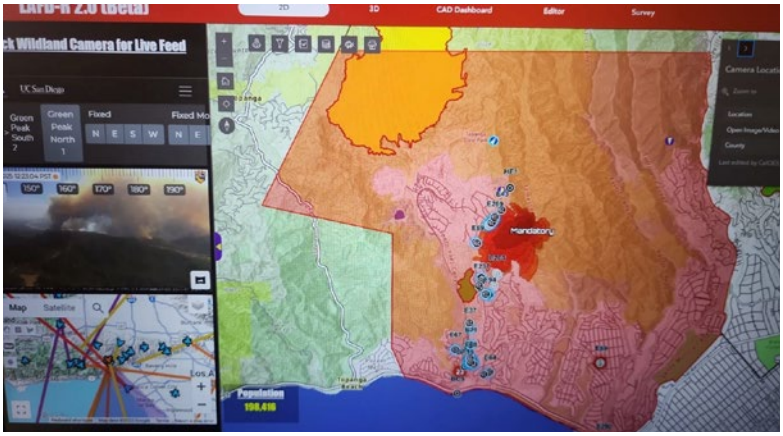


Figure 3.10.1 Screenshot of Los Angeles Fire Department unit positions assigned to the Palisades Fire and UCSD WIFIRE predictive models on January 7, 2025, at 12:23 (provided by individual assigned to the Palisades Fire during a TD with ULRI).

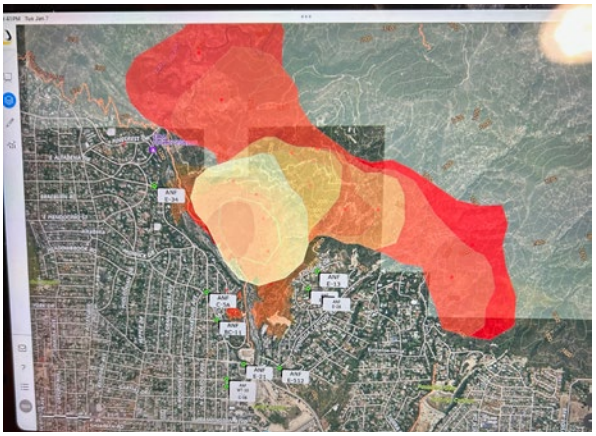


Figure 3.10.2 Screenshot of Eaton Fire with Angeles National Forest unit positions and FireGuard satellite perimeters on January 7, 2025, at 21:41 (provided by individual assigned to the Eaton Fire during a TD with ULRI).

This lack of awareness and utilization may indicate that fire and law enforcement decision-makers in the Los Angeles area do not fully understand the value of these tools. This may be attributed to how these products are shared within the incident management organization during the initial action period of highly dynamic incidents.

Currently, there is no defined process for receiving, validating, and determining how products should be used to inform decisions.

During the Palisades and Eaton Fires, intelligence products were shared with individuals via texts and emails. Some products were also shared via TC, Intterra, or other department-specific platforms. From there, how the products were used was at the discretion of the ICs and other decision-makers.

The limited use of these tools by fire and law enforcement agencies suggests broader challenges in how CAL FIRE and Cal OES promote and integrate real-time intelligence capabilities across agencies.

This section describes how perimeters (e.g. FireGuard, FIRIS) and fire prediction models (e.g., WIFIRE and Technosylva's Wildfire Analyst) are generated. It also provides a comparison to perimeters produced by ground-based methods available during the Palisades and Eaton Fires and their limitations for assisting with real-time decision-making.

Operationally speaking, tools used to develop fire perimeters are applied to help understand where the fire has already progressed, while fire prediction models can help understand where the fire is likely to be moving.

3.10.2 Determining Fire Perimeters

Much of the work in establishing real-time fire perimeters with aerial and remote sensing technologies builds on early wildfire detection systems. The objective of early wildfire detection systems is to identify a new ignition shortly after it begins so that suppression actions and evacuation decisions can be initiated while the fire is still comparatively small.

This objective becomes especially important during extreme fire weather, when rapid rates of spread can sharply reduce the time available for effective response.

General classification of detection approaches includes ground-based human observation and automated sensing, airborne sensing, and satellite remote sensing.[107,108] Similar methods are used by the fire service to establish fire perimeters.

Ground Methods

Human observation remains the most established detection pathway. Dedicated lookout towers and reports from the firefighters on the ground and the public provide baseline information for fire perimeters. There are, however, inherent complexities in using manual observation data.

While reports from the public can collect perimeter observations from across a much larger landscape than from emergency responders alone, these observations must be confirmed for trustworthiness and analyzed in a systematic way.

In many operating environments, trained observers still provide more accurate and faster detections than automated systems, but the method is inherently non-systematic and depends on an observer being present and having adequate visibility. Consequently, its effectiveness deteriorates in remote or sparsely populated regions.[109]

Ground-based automated systems can include video cameras, thermal imagers, air-quality sensors, and wireless sensor networks. Most optical systems require line-of-sight, which can require dense networks in rugged or heavily vegetated terrain.

Performance can also vary depending on illumination, smoke, fog, weather, and terrain shielding. Successful detections may be poorly localized if the fire base is obscured.[109,110]

Camera systems, such as those used in AlertCalifornia,[1,111] can be used to establish fire perimeters. However, while proof-of-concept studies have shown that point sensors can provide valuable data for early detection, these systems have not been widely used in characterizing a fire perimeter. [112,113,114]

As such, ground-based systems must either be monitored by individuals or leverage sophisticated, artificial intelligence (AI)-enhanced models to detect whether fire and smoke are in the field of view. A key advantage of these systems is that the location and view of the systems are known, which makes it easier to locate observations within the landscape.

Aerial Methods

Detection and monitoring can also be performed using aerial assets equipped with optical and thermal sensors. Relative to fixed camera systems, aerial systems can revisit suspected ignitions, patrol a broader area with fewer sensors, and in some cases, operate beneath cloud layers that could obstruct satellite observations.

The tradeoffs are that these systems require patrol logic, communications, trained operators, sustained logistical support, and battery-powered platforms often have limited endurance.[115,116] Importantly, these systems may be limited by severe weather and high wind conditions.

The statewide availability of aircraft in California has increased over the years, and these observations are used regularly by Cal OES's FIRIS.[105,106,1] However, FIRIS relies on aircraft that were grounded during large portions of the Palisades and Eaton Fires.

Satellite Methods and FireGuard

Satellite (remote sensing) products for wildfire applications are based on multispectral observations spanning the visible (VIS), near-infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), and long-wave infrared (LWIR) portions of the electromagnetic spectrum.

Because vegetation, soils, water, smoke, and clouds exhibit different reflectance and emission behavior across these wavelengths, multi-band observations can be used to infer land cover, vegetation condition, aerosol loading (particulate matter present in the air column between the sensor and the target), and surface temperature. Fundamentally, these algorithms are based on detecting heat from a fire which is higher than the background baseline.

A recurring challenge is that algorithms calibrated in one (1) region do not always transfer cleanly to another, because background reflectance depends on fuels, canopy structure, topography, viewing geometry, and atmospheric state. If not addressed appropriately, these variations can cause the algorithms to inaccurately interpret the image (e.g., failing to detect an active fire).

Recent benchmark work likewise notes that threshold-based, active-fire products can remain unreliable and that deep learning-based spatiotemporal models may improve detection by exploiting spectral, spatial, and temporal context simultaneously.[117,118]

AI-based fire and smoke detection emphasize multimodal fusion, lightweight deployment, and improved benchmark design as central research directions.[117,118]

FireGuard is a U.S. wildfire detection and monitoring capability intended to provide persistent, near-real-time awareness of active heat when traditional aircraft coverage is unavailable, delayed, weather-limited, or not readily scalable across many simultaneous incidents.

FireGuard bases its detections on military satellites using the National Geospatial-Intelligence Agency's classified Firefly program, and these detections may be supplemented by additional aerial observations from Unmanned Aerial Vehicle (UAVs).

Unclassified products are produced through collaboration with the National Interagency Fire Center (NIFC) and National Guard personnel in California and Colorado.[103]

The program is designed primarily for early detection and monitoring in the early stages of a wildfire (first 24-48 hours), during which information is scarce.[119]

The mission statement of FireGuard is the following:

> *FireGuard analysts exhaust all means to aggregate, analyze and assess multi-source, near real-time remote sensing information, and disseminate timely and tailored products to wildfire fighting interagency partners nationwide in order to inform operational decisions on the ground when lives and property are on the line and every second counts.*[120]

In contrast, the Unclassified//For Official Use Only document states:

> *For existing fires, FireGuard offers 10-minute updates on areas of fire growth and activity without the cost or exposure of aircraft, but does not offer fire mapping level accuracy (i.e., should not be used for perimeter generation). Frequently, teams managing large fires have requested NIROPS [National Infrared Operations] and other platforms to map or verify that the fire has not moved beyond known firelines. FireGuard offers a similar product and monitoring capability to the fire managers, but should not be used for tactical decisions.*[121]

While the specific algorithm used by Firefly is classified, it is based on heat detection similar to other remote sensing models.[122] Representative open-source algorithms include:

- Visible Infrared Imaging Radiometer Suite (VIIRS) active fire product[123]
- Moderate Resolution Imaging Spectroradiometer (MODIS) active fire product[124]
- Landsat fire and thermal anomaly products[125]
- Geostationary Operational Environmental Satellites (GOES) fire-temperature products[126]

Each of these systems reflects a different compromise among spectral sensitivity, spatial resolution, and temporal refresh, which drives the usefulness of the product to inform operations.

Publicly available tools have either a limited temporal resolution (e.g., Landsat 30 meter (m) resolution every 16 days), daily measurements at moderate spatial resolutions (e.g., VIIRS 375 m, MODIS 1,000 m), or near real-time measurements at coarse resolutions (e.g., GOES 2,000 m every 10-15 minutes).

FireGuard provides near real-time heat detections every 10-30 minutes at a better spatial resolution using classified data. The spatial accuracy is listed as 1,000 m.[122] However, several of the provided polygons show discriminating features at < 100 m.

While the specific wavelengths and algorithm used by Firefly are classified, it is expected to be similar to these public examples.

Researchers are developing new tools for detection which are not yet available operationally. Recent developments suggest that the field is moving from stand-alone hotspot products toward integrated multi-source workflows.

In 2024, DOI and USDA reached an agreement with NOAA to expand use of GOES—R Series (GOES-R) data for early wildfire detection, real-time tracking, and smoke-related public-safety applications.[127]

NOAA has since advanced the Next Generation Fire System (NGFS), which automatically analyzes satellite observations to identify heat anomalies, track spread and intensity, and distribute these products through the Wildland Fire Data Portal for use by forecasters, dispatchers, and first responders.[128,129]

At the same time, emerging data resources such as TS-SatFire[117] are framing active-fire detection, burned-area mapping, and next-day progression prediction as linked tasks within shared spatiotemporal datasets.

Dedicated fire-observing constellations are also being developed: Earth Fire Alliance's FireSat protoflight launched in 2025, the first operational satellites are scheduled for 2026, and the planned full constellation is intended to deliver global high-resolution updates every 20 minutes.[130,131]

While these multi-source fusions were not available in operations to date, these developments are significant for the future because they point toward a future architecture in which classified detections, public satellite products, and AI-assisted analytics are fused more tightly than the current generation of systems allows.

Remote Sensing Limitations

All remote sensing products suffer from several recurring limitations. Conditions contributing to these limitations existed at a large scale during the Palisades and Eaton Fires. The topography, fuel density, tree canopy, and fuel consumption rates resulting in large, dense smoke plumes all challenged remote sensing capabilities:

- **Atmospheric interference:** Clouds, dense smoke, and variable aerosol loading can distort the measured signal and reduce detection reliability. Methods such as analyzing multiple wavelengths ("multi-band correction") and comparing each measurement to its surroundings ("contextual screening") can help reduce these effects, but they cannot fully eliminate them.[123,126,117]
- **Surface occlusion:** Sensors record the integrated signal from whatever is visible within the pixel footprint. In forests and urban areas, canopy tops (vegetation) and rooftops (structures) can mask lower-level burning, so understory fires or interior structure fires may remain weakly expressed until the upper layer becomes involved.[115,124]
- **Algorithm calibration and scale mismatch:** Active-fire products are designed around departures from a local background and therefore depend on threshold selection, training data, and pixel size. Mixed pixels (i.e., pixel footprints that covers multiple sources), uncommon surface materials, and unfamiliar environmental conditions can increase both misses and false alarms, especially for small ignitions.[132,133,117]

3.10.2.1 FireGuard Perimeters in the Palisades and Eaton Fires

Figure 3.10.3 and Figure 3.10.4 compare the time-resolved FireGuard perimeters with the FIRIS perimeters and available ground-based evidence of fire spread from cameras, video, radio communications, and 911 dispatch calls on the Palisades and Eaton Fires, respectively.

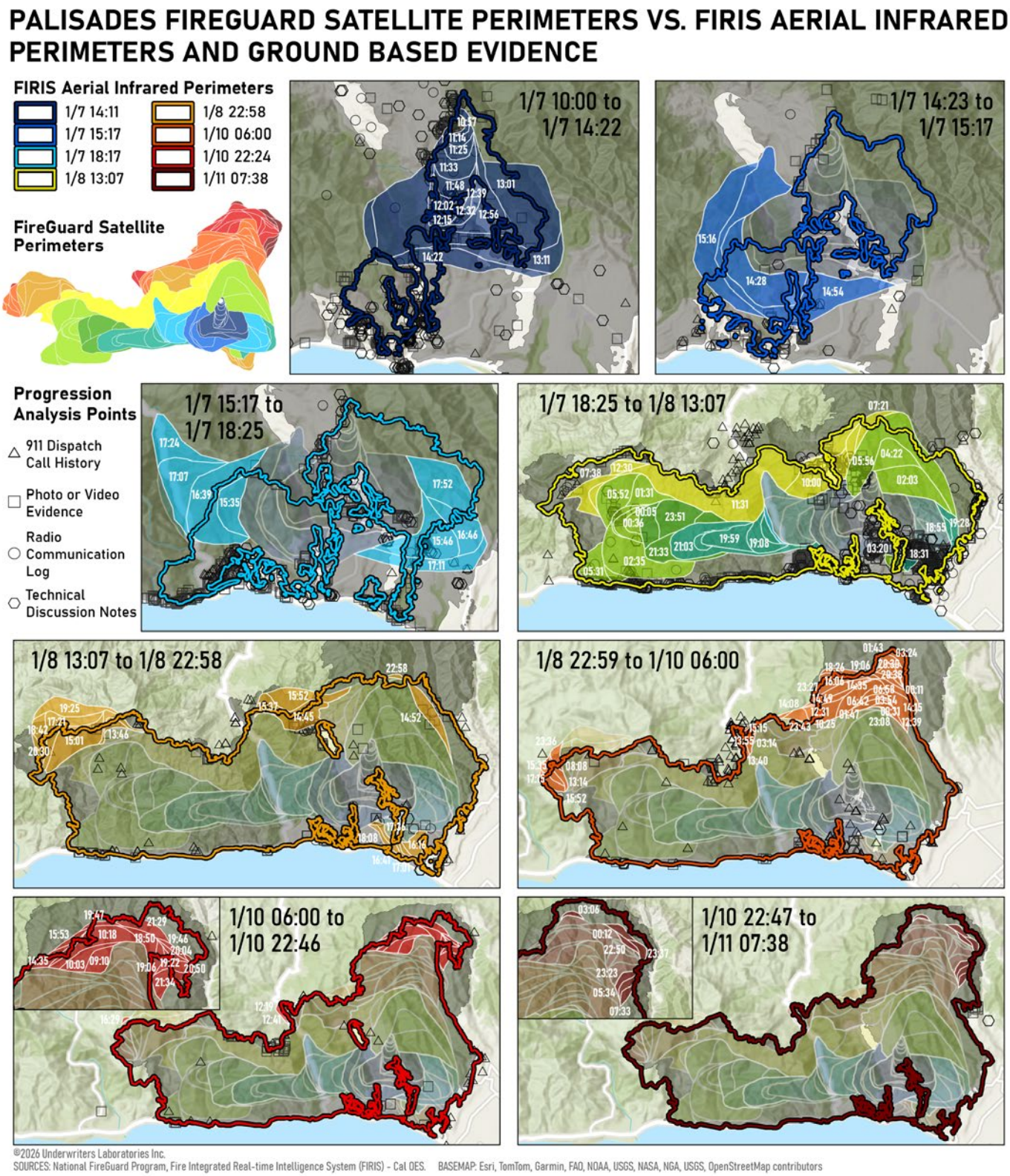


Figure 3.10.3 FireGuard perimeters of Palisades Fire compared with FIRIS and ground-based evidence.

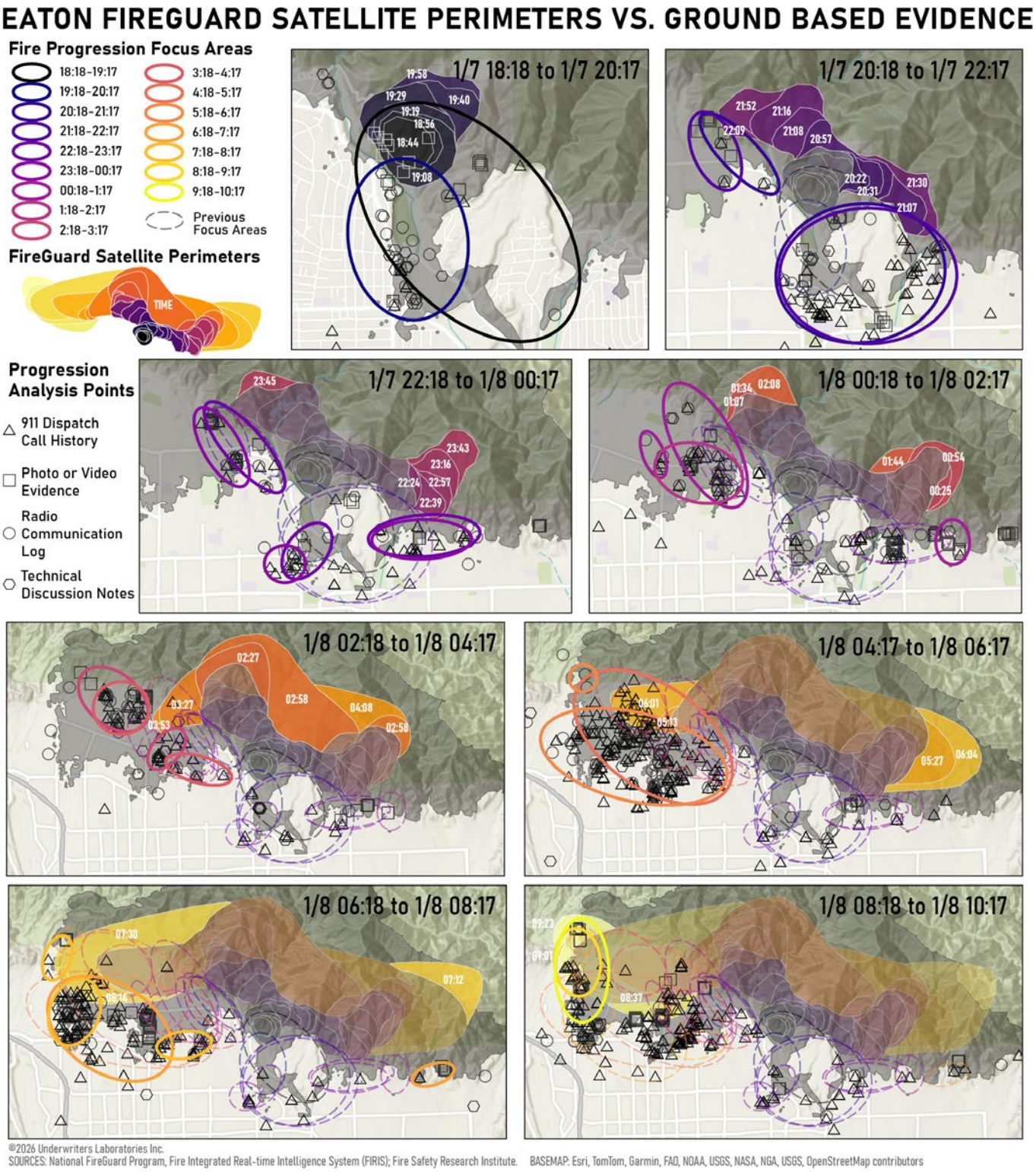


Figure 3.10.4 FireGuard perimeters of Eaton Fire overlaid on the first FIRIS perimeter (created at approximately 18:30 on January 8, 2025) and compared to fire progression focus areas where high confidence ground-based evidence indicates the fire's presence throughout a span of time as defined in the Phase One report.[1]

The comparison between FireGuard perimeters and available ground-based evidence was stronger in the Palisades Fire, although there were still critical areas of omission, particularly during the early stages of the fire.

Figure 3.10.3 shows that ground-based evidence indicated the fire had spread to the southwest in Castellammare during the first four (4) hours based on photo and video evidence. This fire progression was accurately reflected in the FIRIS perimeters, but not in the FireGuard perimeters.

The next update to FireGuard, nearly five (5) hours after ignition, showed spread into the far north section of Castellammare; however, the FireGuard perimeter did not reach the coast, as was observed in evidence and the FIRIS perimeters.

This same trend was observed to an even greater extent in the comparisons starting eight (8) hours after ignition in Figure 3.10.3. At this stage, the extent of the fire had spread east and west, which both agreed well between FireGuard and FIRIS. However, FireGuard did not indicate any burning along the coast.

The remaining FireGuard perimeters, 24-81 hours after ignition, agreed fairly well with FIRIS at each observation time, with the exception of the omission of burning along the coast from El Medio Bluffs to Malibu.

The remote-sensing-detected fires in the early parts of the Palisades Fire appear to indicate that their algorithms had some ability to detect the fire in the urban areas, but failed to do so consistently and did not indicate that the fire had reached near the ocean. The omission of detections along the coast indicates a gap in the system, which was unique to the Palisades Fire.

Referring back to the common difficulties with remote sensing-based active fire detections discussed in Section 3.10.3, it is possible that the algorithm was not designed with coastal fires in mind. The additional moisture content coming from the ocean could have an impact on the background reflectance measurements, which impacted the detection algorithm.

It is unclear how much of the improved agreement between FireGuard and FIRIS after the first eight (8) hours of the Palisades Fire was due to the detection algorithms in Firefly performing better in the spread through vegetative fuels to the west versus the incorporation of additional ground observations.

It is difficult to provide additional insights into the FireGuard performance without more information on the raw reflectances, model algorithms, and data synthesis process used at the time the perimeters were developed.

On the Eaton Fire, all aircraft were grounded within two (2) hours of the initial fire report and the first FIRIS fire perimeter was not produced until 18:30 on Wednesday, January 8, 2025. Aerial assets provide size-up information and monitoring of the initial spread, but ground-based methods were relied upon to track fire progression over the rest of the first 24 hours of the Eaton Fire.

The available ground-based evidence (pictures, video, radio communications and 911 dispatch) and fire progression focus areas identified in the Phase One report[1] are concentrated on the built environment and nearby wildland areas where most emergency responders were operating and residents were present.

As such, there is limited ground-based evidence of fire spread in the Angeles National Forest north of Altadena, Pasadena, Kinneloa Mesa, Hastings Ranch and Sierra Madre.

The comparisons of the Eaton Fire perimeter sensing and ground-based evidence early in the fire's progression highlight a limitation of the FireGuard perimeters.

Figure 3.10.4 shows evidence of the fire progressing initially south of Eaton Cayon, along Eaton Wash and towards Pasadena as well as into east Altadena during the first hours of the fire, where FireGuard does not show the fire progressing.

This trend continues as the fire progresses east into Hastings Ranch and Sierra Madre and west through the eastern and northern sections of Altadena, shown 2-6 hours after ignition.

These results from early in the Eaton Fire demonstrate a consistent omission of fire detections in the urban areas where fire was present. The FireGuard perimeters do not indicate spread into the built environment until after 03:00 on January 8, 2025.

Ground-based evidence, however, indicated that the fire reached the far south end of the burn perimeter in Altadena and the westernmost area of the burn perimeter near Lincoln Avenue by 05:00.

Fire was reported in the farthest northwest extent of residential areas within the final burn perimeter by 08:00 on January 8, 2025.

FireGuard perimeters include some spread into Altadena, but by 10:00 on January 8, 2025, they miss approximately 800 m of fire spread into the urban area along the full border of the perimeter.

The raw reflectance measurements and algorithms for the detections used to create these FireGuard perimeters are not available as they are classified and were not shared with ULRI. As a result, it is not possible to determine the specific mechanism leading to the delays and omissions in the urban areas.

Some possible contributing factors to the systemic errors in remote sensing include:

- Algorithm calibration basis focusing on rural areas, leading to inaccuracies in urban areas
- Interference from the smoke above the urban areas
- Occlusion of heat from fire within buildings

Since the FireGuard perimeters are able to include information from aerial systems, it is unclear why observations from the FIRIS flights, when available, were not incorporated in the development of these perimeters.

FireGuard fills a specific operational role within the broader fire detection landscape. FireGuard products describe areas of heat rather than authoritative fire perimeters, and the capability is intended to provide operational insights during the first 24-48 hours of an incident, when operational information is commonly sparse.[119]

In operational terms, the mission is to aggregate, interpret, and disseminate multi-source, near-real-time remote sensing information quickly enough to inform ground decisions when the incident is changing faster than conventional collection methods can keep pace.[120]

However, caution must be applied when using these perimeters for operational decision-making, particularly in urban areas and along coastlines, where the two (2) performance gaps were observed in the January 2025 fires.

3.10.3 Wildfire Modeling

Wildfire models are tools for estimating how a fire may grow across a landscape. They are used for planning, training, fuel-treatment evaluation, evacuation analysis, and, in some cases, real-time incident support. Their purpose is not to reproduce every physical process inside a wildfire. Instead, they attempt to simplify a very complex problem into a form that can be calculated quickly enough to inform decisions.

The spread of a wildfire is influenced by many interacting factors. These include fuel type, fuel moisture, wind speed and direction, slope, terrain shape, vegetation structure, atmospheric stability, spotting, suppression activity, and the heat released by the fire itself.

No operational model represents all of these processes in full detail. Model developers make choices about what to include directly, what to estimate through simplified relationships, and what to ignore.

As a result, wildfire model predictions depend not only on the equations in the model, but also on the quality of the weather, fuels, terrain, moisture, and perimeter information used to initialize it.[134,135]

ULRI analyzed the main sources of uncertainty in wildfire modeling, as well as why model results should generally be interpreted as decision-support information rather than exact forecasts.

3.10.3.1 Model Form and Physical Scope

Many operational wildfire models are based on the Rothermel surface-fire spread formulation, originally developed in 1972 for wildland fuels.[136] This approach estimates the rate of spread of a surface fire using simplified descriptions of fuels, wind, slope, and moisture.

It is widely used because it is computationally efficient, relatively interpretable, and practical for decision-support tools, such as BehavePlus, Fire Area Simulator (FARSITE), FlamMap, and Prometheus.[137,138,139,140]

The main advantage of these models over more complex formulations is speed. They can be run over large landscapes and can be used to compare scenarios, such as changes in wind direction, fuel moisture, or ignition location. The main limitation is that they represent fire behavior using a small number of effective variables.

This is often appropriate for broad planning within the limitations of fuel models available, but it can be less reliable when the fire is moving through highly variable fuels, discontinuous canopies and steep terrain or impacted by rapidly changing winds.

The same issues arise when a fire becomes plume-dominated, meaning that the heat from the fire begins to influence the local atmosphere and the winds that control its own spread.

This does not mean these models are unusable. It means that their results should be interpreted in light of their assumptions. A model may produce an estimate of perimeter, arrival time, and/or flame-length with high numerical precision, but the true uncertainty may be much larger than the number of decimal places suggests.

The reliability of the output depends on whether the fire, fuels, weather, and terrain are similar to the conditions for which the model was developed and tested.[135]

Fuels, Moisture, and Landscape Resolution

The usefulness of a wildfire model is strongly controlled by the landscape data it receives. In most operational systems, vegetation is represented through fuel models.

These fuel models compress real vegetation into categories that describe how easily fuels ignite and how quickly fire can spread through them. This simplification is necessary, but it also creates uncertainty.

A single fuel category may not capture recent vegetation growth, previous fire history, fuel treatments, landscaping, roads, structures, or other local features that affect fire behavior.

Standard fuel models list roads and buildings as non-burnable surfaces, which limits their usefulness in modeling WUI scenarios. While there have been efforts in developing fuel models for urban areas, these models are not standardized and need validation.[141]

Widely used landscape fuel datasets are provided at a 30 m resolution by LANDFIRE.[142] This resolution is useful for regional modeling, but it can miss local features that could matter if a model is intended to provide an accurate forecast in a real fire.

Narrow roads, fuel breaks, defensible space, small canopy gaps, and patchy understory fuels may be averaged into one (1) grid cell. In the WUI and urban/suburban environments, this limitation can be especially important because the model may not fully represent the mixture of vegetation, buildings, ornamental plants, pavement, and other non-burnable surfaces.

Fuel moisture is another critical input. Dry fuels ignite more easily and usually support faster spread than wet fuels. Operational models commonly use fuel moisture classes such as 1-hour, 10-hour, and 100-hour fuels, which describe how quickly different sizes of dead vegetation respond to changes in humidity and rainfall (with 1-hour fuels representing the smallest, which are most receptive to moisture changes in the surrounding environment).

Recent work does suggest that longer-term moisture indicators, such as soil moisture and seasonal vegetation greenness, can also strongly affect fire behavior.[143,144,145]

These variables are difficult to measure accurately across a large landscape. Satellite data, weather stations, and field observations each provide useful information, but none gives a complete picture of fuel moisture everywhere a fire may spread.

Higher-resolution fuel mapping, including lidar, satellite imagery, and three (3)-dimensional vegetation datasets, may improve some model applications.[146,147,148]

However, higher resolution does not necessarily mean higher accuracy. A detailed map can still be wrong if the vegetation has changed, if the fuels are misclassified, or if local moisture conditions are poorly represented.

Weather and Fire-Atmosphere Interaction

Weather is one of the largest sources of uncertainty in wildfire modeling. Wind speed and direction strongly affect how fast a fire spreads and where it moves. Temperature and humidity influence how dry the fuels become. Atmospheric stability affects plume rise and smoke transport.

In complex terrain, local winds can vary sharply between valleys, slopes, ridges, and canyons. A weather forecast that is reasonable at the regional scale may still miss the local winds that control fire spread at the incident scale.

Some models treat weather as an external input: the fire responds to the wind, temperature, and humidity supplied by the weather forecast, but the weather does not respond to the fire.

This approach is efficient and is common in operational modeling. However, large or intense fires can create strong updrafts, alter nearby winds, and produce plume-driven behavior.[149] In these situations, the fire and atmosphere are coupled.

Coupled fire-atmosphere models are designed to represent this interaction. They allow heat and moisture from the fire to affect the nearby atmosphere, while the resulting winds are then used to predict fire spread.[150,151,152]

This provides a better physical framework for large, intense, or plume-dominated fires. It can also be useful in complex terrain, where local wind patterns are especially important.

The tradeoff is computational cost and input sensitivity. Coupled models require detailed weather initialization, fine grid spacing, and substantial computing resources. They can also be sensitive to small errors in the starting wind field or in the way information is exchanged between the weather and fire components.

For that reason, coupled models can improve realism, but they do not eliminate uncertainty. They are most useful when interpreted as scenario tools and checked against current observations.

Validation and Observability

A major challenge in wildfire modeling is determining whether a model prediction is actually correct. This is harder than it may appear. Fire perimeters, satellite detections, aircraft observations, weather stations, cameras, and field reports often describe different aspects of the fire at different times and resolutions.

A model may predict the fire edge at one time, while the available observation may show heat detections, smoke, burned area, or a perimeter collected hours later.

These differences create scale and timing problems. A reasonable model can appear wrong if the observation is delayed, poorly geolocated, or affected by smoke and cloud cover. Conversely, a poor model can appear reasonable if only limited observations are available.

Recent work on remote sensing for model evaluation has highlighted recurring issues such as sensor calibration, geolocation uncertainty, atmospheric correction, incomplete automation, and uncertainty about what each sensor can observe during active fire events.[153]

Field campaigns are important because they collect the kinds of measurements needed to test models more directly. For example, campaigns, such as the California Fire Dynamics Experiment (CalFiDE), measure inflow winds, updrafts, plume structure, fire intensity, and rate of spread, which are especially useful for evaluating coupled fire-atmosphere models.[154]

However, these campaigns are difficult to conduct, expensive, and rare compared with the number of fires that models are asked to simulate. The most dangerous and fast-moving fires are also often the hardest to observe safely.

As a result, validation remains a central limitation. Better wildfire forecasts require not only better models, but also better observations, shared benchmark datasets, and clearer standards for comparing model results with real fires.[155,153]

Computational Cost and Operational Use

There is no single best wildfire model for all purposes. Simpler models are faster and easier to run, which makes them useful for planning and incident support. More detailed models can represent additional physical processes, but they require more data, more computing power, and more time.

Emergency operations often need results quickly, so model complexity must be balanced against operational feasibility.

Physics-based models such as the Wildland-urban interface Fire Dynamics Simulator (WFDS)[156] and FIRETEC[157] can represent combustion, heat transfer, turbulence, and vegetation structure in greater detail.

These models are valuable for research, reconstruction, fuel-treatment analysis, and WUI studies. However, they generally require fine grids and detailed input data, which limits their use for broad-area real-time forecasting.

Recent work has focused on practical ways to manage uncertainty without making models too slow for operations. Ensemble modeling runs many simulations using different assumptions about weather, fuels, moisture, ignition location, or model parameters. Instead of producing one (1) forecast, it shows a range of plausible outcomes. Data assimilation methods update a model using observations such as satellite detections, aircraft-derived perimeters, or infrared mapping.

These methods can improve the starting point of a simulation, but they are limited by the timing, accuracy, and completeness of the observations used.[153]

Machine-learning surrogates are also being developed to approximate the outputs of more expensive fire models. These tools may allow many simulations to be produced quickly and may support ensemble forecasting or uncertainty analysis.[158]

However, they are only as reliable as the data and simulations used to train them. A surrogate trained on simplified or synthetic cases may not perform well for rare, extreme, or poorly observed fire behavior.

Known Limitations

Several limitations of existing operational tools were noted in the background on wildfire models in this section. The limitations are especially important when interpreting model outputs during emergency response:

- **Model simplification:** Operational wildfire models simplify a highly complex physical process into a form that can be calculated quickly. They may not fully represent mixed fuels, discontinuous canopies, plume-dominated behavior, spotting, suppression activity, or structure-to-structure fire spread.
- **Input data quality:** Model predictions depend on the quality of the weather, fuels, terrain, moisture, ignition location, and perimeter information used to initialize the simulation. Errors or gaps in these inputs can produce large differences in predicted spread, arrival time, flame length, and exposure.
- **Weather uncertainty:** Wind speed, wind direction, temperature, humidity, and atmospheric stability strongly influence fire spread. Regional weather forecasts may miss local wind shifts, canyon flows, ridge-top acceleration, and other terrain-driven effects that can control incident-scale fire behavior.

- **Observation timing and scale:** Fire perimeters, satellite detections, aircraft observations, cameras, weather stations, and field reports often describe different aspects of a fire at different times and resolutions. A mismatch between model output and observations may reflect timing, scale, or geolocation differences rather than a true modeling error.
- **Scenario dependence:** A single simulation represents one (1) set of assumptions about weather, fuels, moisture, ignition location, and model parameters. Multiple reasonable scenarios may produce different outcomes, so modeled perimeters and arrival times should not be interpreted as a single deterministic prediction.

3.10.3.2 Operational Tools in California

Operational wildfire modeling in California commonly relies on software systems that translate information about fuels, topography, weather, fuel moisture, and fire location into spatially explicit estimates of potential fire behavior.

Although the specific interfaces, data sources, and model implementations differ, the major operational tools share a common purpose: to support planning and decision-making by rapidly producing conditional scenarios of how a wildfire could spread across a landscape. These systems are used to estimate quantities such as potential fire growth, fire intensity, spread rate, flame length, arrival time, and areas of exposure.

The two (2) tools discussed here, Wildfire Analyst and WIFIRE, both function as operational decision-support environments rather than as simple stand-alone equations.

In each case, either a user or an automated workflow defines an ignition point or starting perimeter, combines that fire location with fuels, terrain, weather, and fuel-moisture information, and runs a simulation to generate spatial fire-behavior outputs.

Both tools also allow analysts to compare scenarios by changing assumptions about winds, fuel moisture, ignition location, or forecast duration. This scenario-based structure is central to their operational value because the result is not a single, certain prediction, but a modeled outcome that is dependent on the selected inputs.

These tools also share common sources of uncertainty. Neither system has perfect information about the actual condition of fuels, structures, roads, ornamental vegetation, suppression actions, or local winds at the time of a fire. Their results depend on the quality, resolution, and timeliness of the input datasets, as well as the assumptions made by users or automated workflows.

Errors in the starting location/perimeter, fuel map, weather forecast, or fuel-moisture estimate can substantially affect the simulated fire growth.

For this reason, operational fire-spread outputs from both Wildfire Analyst and WIFIRE are best utilized as decision-support products and scenario forecasts rather than deterministic predictions of what a fire will do.

Wildfire Analyst

Wildfire Analyst is a fire behavior and spread modeling software platform created by Technosylva, Inc., a CAL FIRE contractor. The platform is used to estimate potential wildfire growth, fire intensity, arrival time, and related operational metrics.

The tool uses a suite of fire-behavior and risk-analysis models built around a surface-fire propagation core, primarily based on the Rothermel/Albini fire spread formulation (similar to other operational models such as FARSITE, Eulerian Level set Model of FIRE spread (ELMFIRE), etc.).[159]

The model primarily uses standard fuel models.[160,161] However, it includes custom fuels for specific landscapes. It also incorporates:

- Time-evolution and minimum-travel-time methods for fire growth and fire paths
- High-resolution wind modeling through WindNinja
- Wind adjustment factors
- Fuel-moisture modeling
- Crown-fire behavior

- Spotting
- Firebreak effects
- Probabilistic simulation modes.

In short, it combines established USFS fire-behavior models with Technosylva enhancements intended for operational, real-time wildfire prediction and risk analysis.

Wildfire Analyst is widely used in California for operations support and planning. CAL FIRE uses it and has contributed to its validation in operational use.[162]

Fundamentally, the Wildfire Analyst software is a wildfire modeling sandbox. In a typical workflow, the user defines the area of interest, selects or imports fuel and topographic data, provides weather and fuel-moisture assumptions, and identifies one (1) or more ignition locations or starting perimeters. As a result, the model predictions have an additional component of uncertainty due to user effects, because different users may adjust the data in different ways.

The software has tools available to collect this data from various sources to aid the user. Weather forecasts are updated daily in the morning, and these forecasts are used to update fuel moistures and surface winds. Fuels are updated throughout the fire season by the software developers as new data is collected.

Wildfire Analyst can produce spatially explicit fire behavior information faster than would be possible through manual analysis alone. This makes it useful for scenario testing. For example, an analyst can evaluate how a fire might grow under different wind directions, fuel-moisture assumptions, or ignition locations.

The software can also help identify locations where terrain, fuels, and wind align to support faster spread. In pre-incident planning, this type of analysis can support evacuation planning, fuel-treatment evaluation, structure exposure assessment, and prioritization of areas for further review.

In addition to the user-generated simulations, automated workflows can be used to trigger simulations based on Application Programming Interface (API) calls from different sources. The two (2) primary automated simulation sets are the “FireGuard Harvester” and the “HotspotsHarvester.”

These programs initialize a simulation based on a perimeter provided by the API, with all other inputs set to defaults based on the data available in the model tools. The “FireGuard Harvester” initializes a simulation based on a perimeter provided by the FireGuard program. The “HotspotsHarvester” is initialized based on remote-sensing detections.

The “IrwinHarvester” user-initiated simulations are automated simulations based on incident data from Integrated Reporting of Wildland-Fire Information (IRWIN). IRWIN is a U.S. interagency data-exchange system for wildland fire incident information.

Its purpose is to let many wildfire applications share the same core incident data, reducing duplicate entry and improving consistency, accuracy, and availability.

Beyond the user-effects uncertainties, Wildfire Analyst is subject to the same general limitations as other operational wildfire modeling tools mentioned above. The software does not know the true condition of every fuel, structure, road, ornamental plant, or suppression action on the landscape.

Its results depend on the accuracy and resolution of the input datasets. If the fuel map is outdated, if local winds are poorly represented, or if the ignition time or starting perimeter is uncertain, the simulated fire growth may differ substantially from the actual fire.

WIFIRE

WIFIRE is a wildfire cyberinfrastructure and decision-support platform developed at the University of California San Diego for real-time data fusion, wildfire spread simulation, prediction, and visualization.

The WIFIRE project, partly supported by a Cal OES contract, was designed as an end-to-end system that connects environmental data streams, geospatial datasets, fire behavior models, computational workflows, and web-based visualization tools for wildfire research and emergency response.[163,164]

Its Firemap interface provides a web-based environment for viewing active fires, running predictive fire-spread simulations, visualizing modeled outputs such as perimeter growth, spread rate, flame length, and estimated time of arrival, and sharing results with other users.[163]

Fundamentally, WIFIRE is not a single fire-spread model, but a modeling and data-integration environment. In a typical workflow, the user selects an area of interest or active fire, defines an ignition location or starting perimeter, chooses a simulation duration, and configures model inputs such as fuels, terrain, wind, weather, and fuel moisture.

Firemap then connects these user-specified inputs with available geospatial and real-time data sources and executes a fire modeling workflow on remote computing infrastructure[163,165] using FARSITE for the fire perimeter calculation.

The system was explicitly developed to support dynamic, data-driven fire modeling, including the ingestion and visualization of sensor networks, satellite information, camera data, archived geospatial data, and other wildfire-relevant information.[163]

WIFIRE Commons extends this capability by providing a shared catalog of wildfire datasets, models, services, and workflows that can be used by research and operational applications.[165]

A key feature of WIFIRE is that it links wildfire simulation with near-real-time data and scalable computing. This makes it useful for rapid scenario generation, situational awareness, and comparison of possible fire growth under different assumptions.

For example, an analyst can examine how a fire might evolve under alternative wind fields, fuel-moisture conditions, ignition geometries, or forecast periods. Firemap outputs can be animated through time, shared, and downloaded as geospatial products, allowing results to be incorporated into operational maps and other decision-support workflows.[163]

These capabilities are especially useful when the main operational need is not only to run a fire model, but to rapidly connect that model to changing information about weather, fuels, topography, perimeters, from ground, aerial, and satellite detections.

WIFIRE has also evolved toward a modular architecture in which multiple fire behavior models and data services can be integrated.

Recent Firemap work describes containerized microservices and representational state transfer (REST) APIs that allow models, such as ELMFIRE and GridFire, to be run through the Firemap environment for longer-duration and extended-attack fire modeling.[165]

In this architecture, Firemap acts as the user-facing analysis and visualization layer, while backend services prepare inputs, execute the selected fire model, store raster outputs, and return the results for visualization. This design allows WIFIRE to incorporate new models, data sources, and workflows without treating the web interface itself as the underlying fire-spread model.

In addition to user-initiated simulations, WIFIRE is designed around automated data ingestion and dynamic updating. The Firemap literature emphasizes the integration of high-density sensor networks, satellite observations, cameras, archived datasets, modeling tools, workflows, and social information for wildfire research and response.[163]

The public Firemap interface includes layers and tools for weather, satellite products, official fire perimeters, cameras, estimated time of arrival, flame length, and spread rate. Its documentation notes that official active-fire perimeters are generally updated daily, and satellite updates occur approximately every six (6) hours, although the timing and quality of these updates depend on the external data source.

As a result, WIFIRE simulations can be initiated from user-defined perimeters or from newly available observational data, but the resulting forecasts remain conditional on the accuracy, latency, and resolution of those inputs.

WIFIRE is subject to the same general limitations as other operational wildfire modeling systems noted above, with additional uncertainty introduced by its dependence on heterogeneous real-time data streams and automated workflows. Again, the platform does not know the true state of every fuel bed, structure, ornamental vegetation patch, road, suppression action, ember exposure, or local wind field.

Its predictions depend on the fire model selected, the spatial and temporal resolution of fuels and weather data, the accuracy of the starting perimeter or ignition location, and the assumptions used to translate data products into model inputs.

Errors or delays in satellite detections, perimeter updates, weather forecasts, fuel-moisture estimates, or fuel maps can propagate through the simulation.

Consequently, WIFIRE outputs should be interpreted as conditional fire-growth scenarios and decision-support products rather than deterministic predictions of what a fire will do.

3.10.3.3 Wildfire Models in the Palisades and Eaton Fires

Wildfire Analyst

Many iterations of Wildfire Analyst simulations were run over the course of the Palisades and Eaton Fires. The numbers of simulations from Wildfire Analyst provided by the vendor are shown in Table 3.10.1. It is unclear which of these simulations were viewed by users, as this information was not tracked by the vendor, CAL FIRE, Cal OES, or LACoFD.

Most of the simulation initiations were from the "HotspotsHarvester." These simulations include an ignition point for each hot spot identified by the remote sensing program. Simulations are started on the order of every five (5) minutes, although this varies throughout the event.

The first hot spot initialization from hot spots in the Palisades and Eaton Fire simulations is shown in Figures 3.10.5 and 3.10.6, respectively. The example simulation for the Palisades Fire has nine (9) different hot spots, which were used to initialize the simulation.

The hot spot detection algorithm shows ignition locations to the west of Topanga Canyon at 11:31 PDT on January 7, 2025, which does not agree with any of the ground-based or aerial evidence available. The other hot spot initialized simulations demonstrate similar behavior with the remote-sensing detections indicating the hot spots in different locations.

These observations call into question the usefulness of the unvalidated workflow of the hot-spot initialized perimeters, which were inconsistent throughout the incident.

Table 3.10.1 Quantity and initiating users of Wildfire Analyst simulations during the Palisades and Eaton Fires.

Fire Incident	User	Quantity	Earliest Timestamp
Palisades	FireGuard Harvester	2	1/7/2025 10:58:19
	HotspotsHarvester	155	1/7/2025 11:31:28
	Human Analyst	18	1/7/2025 10:44:15
	IrwinHarvester	4	1/7/2025 11:10:09
Eaton	FireGuard Harvester	1	1/7/2025 18:46:10
	HotspotsHarvester	111	1/7/2025 18:47:26
	Human Analyst	11	1/7/2025 19:06:53
	IrwinHarvester	1	1/8/2025 7:25:17

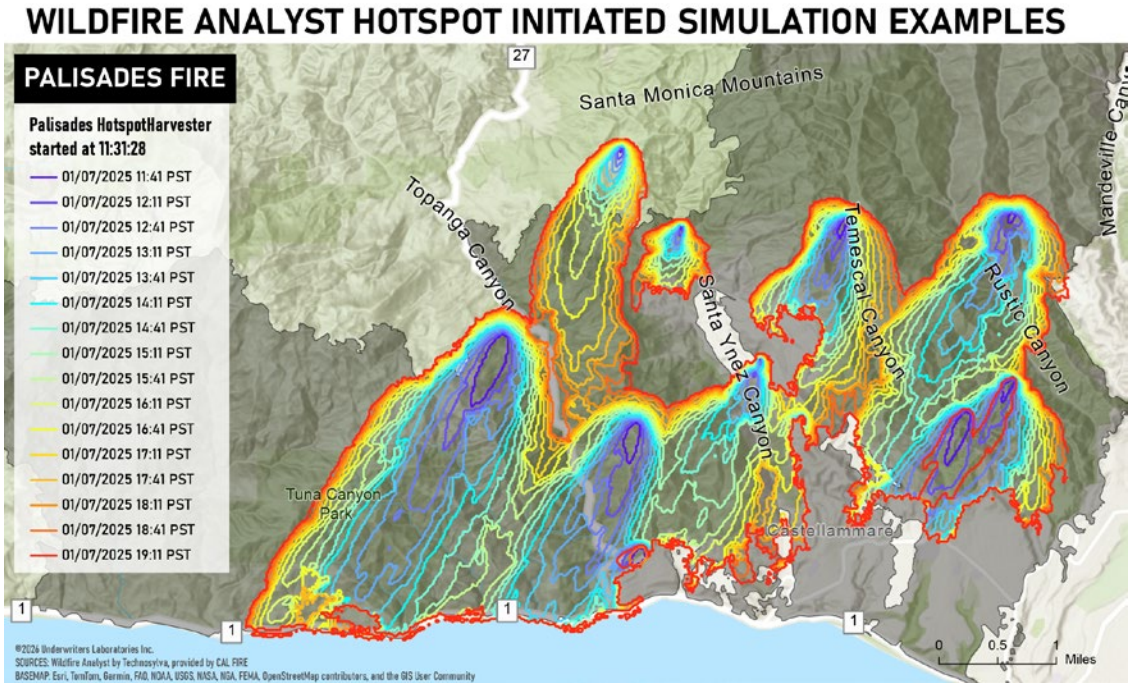


Figure 3.10.5 Fire arrival times for the Palisades Fire predicted by Wildfire Analyst initialized by the first hot spot detection, overlaid on a portion of the FIRIS perimeter in this area.

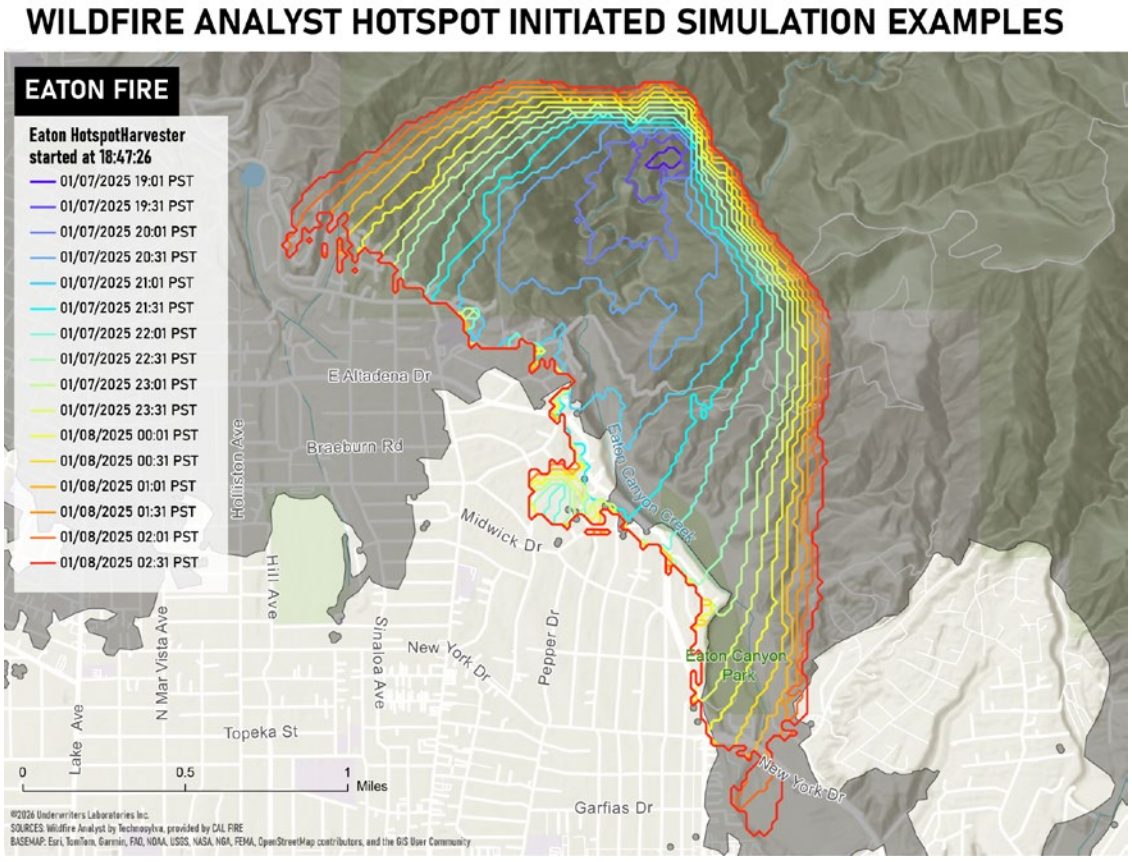


Figure 3.10.6 Fire arrival times for the Eaton Fire predicted by Wildfire Analyst initialized by the first hot spot detection, overlaid on a portion of the FIRIS perimeter in this area.

While these simulations can provide insight into the general behavior, they are not a specific forecast, as they do not provide an accurate initialization of the current fire location or perimeter.

The overall east-to-west area coverage in the initial Palisades Fire simulation shown in Figure 3.10.5 agrees fairly well with the FireGuard perimeters over the predicted time range, but this is due to the individual hot spots detected rather than the fire spread from the ignition location or initial perimeter.

The initial “HotspotsHarvester” initiated simulation for the Eaton Fire (Figure 3.10.6) predicted the fire would spread predominantly to the south towards Pasadena and Altadena and showed almost no spread into the built environment.

In reality during this timeframe (approximately 19:00 on January 7, 2025, to 02:30 on January 8, 2025), the initial fire spread predominantly south along Eaton Wash (though more rapidly than shown in the simulation), but then began to spread to the east and west, impacting a much wider area of structures and vegetation from Altadena to Sierra Madre over the selected time period.

The “FireGuard Harvester” user simulations were initialized through automated workflows by perimeters provided by FireGuard. These workflows were not automatically refreshed throughout the event, with only two (2) simulations during the Palisades Fire, and only one (1) simulation during the Eaton Fire.

In both cases, the first simulation occurred early in the incident (within approximately 30 minutes of first reports) and shortly after the first FireGuard perimeters (10:57 for the Palisades Fire and 18:44 for the Eaton Fire, see Figures 3.10.3 and 3.10.4).

The two (2) Wildfire Analyst simulations during the Palisades Fire that were initialized from FireGuard perimeters are compared in Figures 3.10.7 and 3.10.8.

The first FireGuard perimeter-initiated simulation in the Palisades Fire was started at 10:58:19 on January 7, 2025, and the second followed approximately six (6) hours later, at 16:40:24 (from the 16:39 FireGuard perimeter). Comparing these two (2) simulations highlights several key limitations in the modeling approach.

The first Palisades Fire FireGuard initialization aligns well with the orientation of fire spread and the subsequent FireGuard perimeters and the FIRIS perimeter shown at the similar time stamps.

However, the FireGuard perimeter used for initialization in the second perimeter only includes the new perimeter on the west side at timestamp 16:39 (i.e., neglects the previous perimeters as well as the new spread to the east side). As a result, the model shows predicted fire spread into the areas which were already burned.

In addition, the model predicted spread at the conclusion of the first simulation did not agree well with the FireGuard perimeter used to initialize the second. In reality, the fire grew more to the west, south-west, and the east than predicted by the model.

The westward fire spread shown in the second simulation agreed better with the FireGuard observed perimeters up to 00:05 on January 8, 2025.

The Wildfire Analyst simulation prediction of the Eaton fire initialized from FireGuard is shown in Figure 3.10.9. The model predicted spread predominantly to the south and south-east, which agrees with the initial fire spread described by ground-based observations (see Figure 3.10.4).

However, the initial spread south along Eaton Wash was notably more rapid than estimated in this simulation. Additionally, the fire spread observed to the east in foothills and northern Kinneloa Mesa/Hastings Ranch/Sierra Madre and west along the foothills and northeastern Altadena was not captured in these simulations. FireGuard perimeters also show extension to the north (ground-based observations were lacking in this location for verification), which is also not predicted by this initial model.

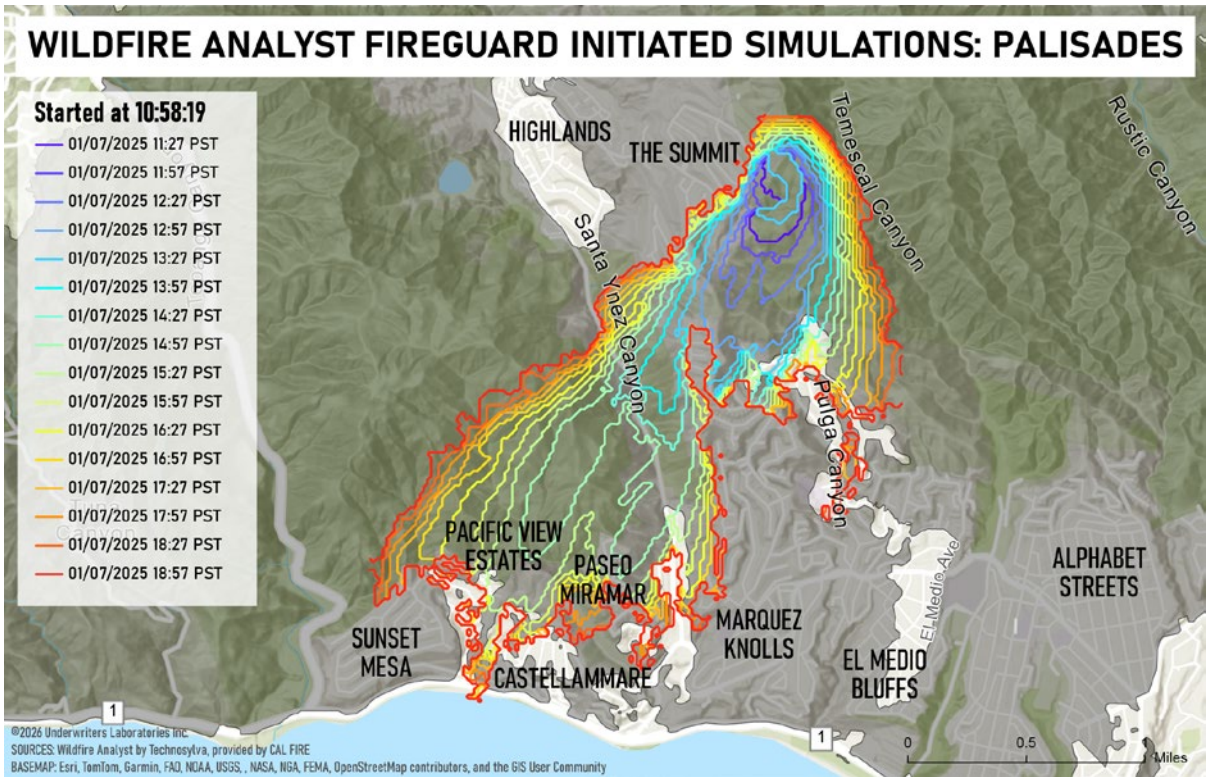


Figure 3.10.7 First Wildfire Analyst simulation of Palisades Fire initialized at 10:58:19 on January 7, 2025 through an automated workflow by perimeters provided by FireGuard.

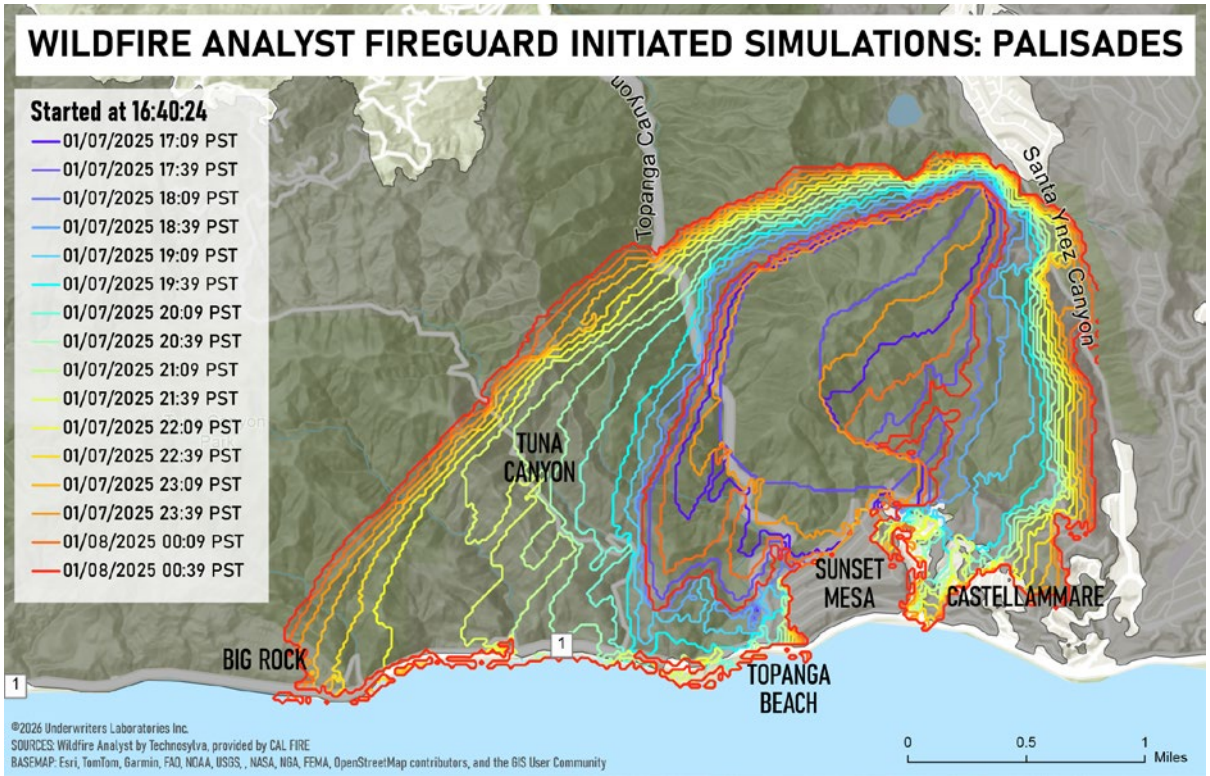


Figure 3.10.8 Second Wildfire Analyst simulation of Palisades Fire initialized at 16:40:24 on January 7, 2025 through an automated workflow by perimeters provided by FireGuard.

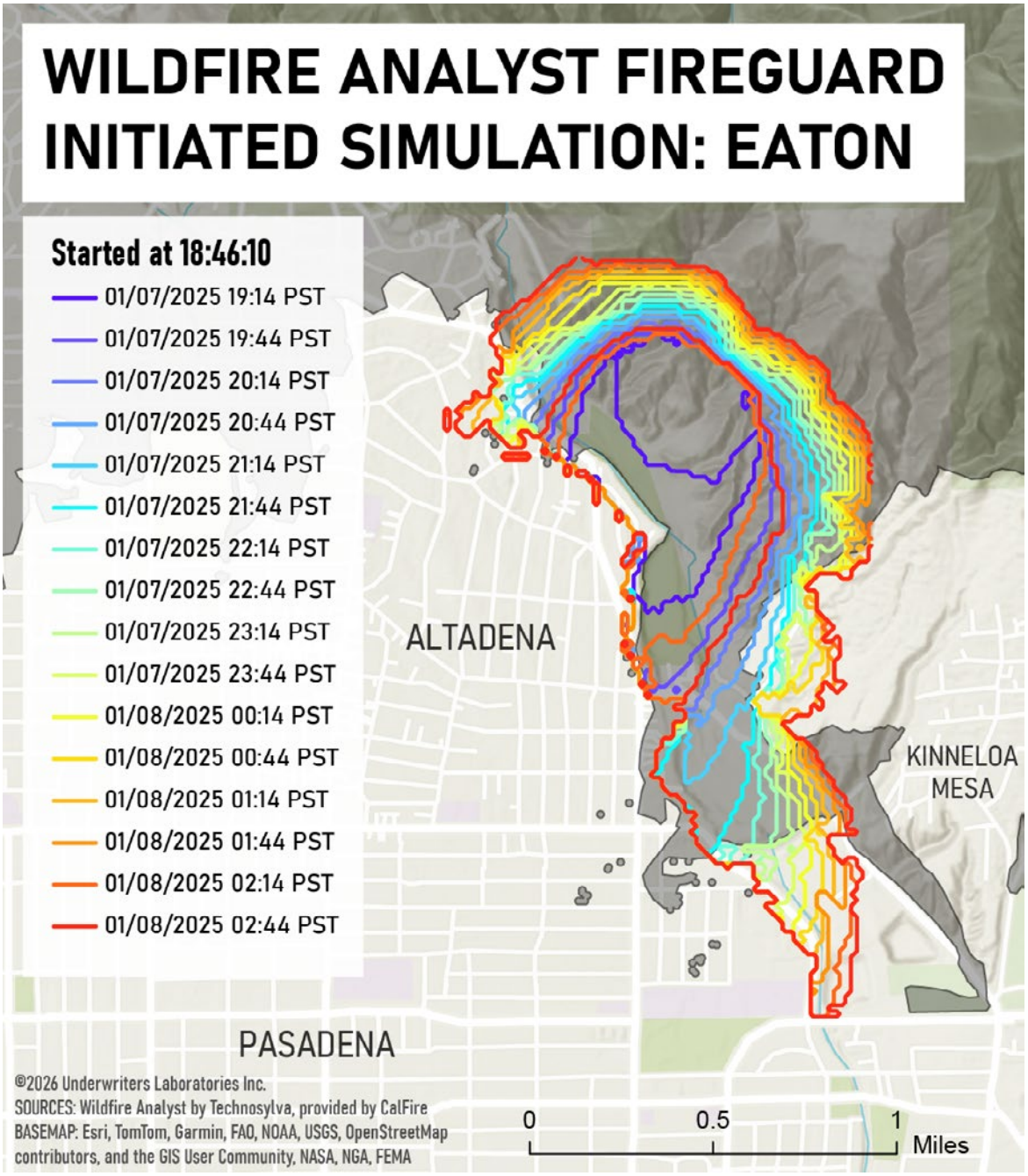


Figure 3.10.9 Wildfire Analyst simulation of the Eaton Fire initialized at 18:46:10 on January 7, 2025 through an automated workflow by perimeters provided by FireGuard.

There was one (1) Wildfire Analyst simulation from the “IrwinHarvester”available in each of the Palisades and Eaton Fires which had perimeter information. In both cases, the extent of the computational domain was much smaller than in the FireGuard initialized simulations.

The timestamps stored in the resulting data files do not agree with the simulation initialization time listed in the metadata provided to ULRI. In addition, the fire progression and area of origin disagreed dramatically with the observations from FireGuard and evidence on the ground.

The simulations initiated by the human analysts depend on the objective of the analyst. Upon review, these tended to either be similar to the FireGuard initialized simulations or be a simulation from a single point evaluating the extent of the fire if it were to spot in a specific location.

The majority of the human analyst simulations were of the first type. It is unclear to what extent the simulations generated by individual analysts of the second type were communicated to firefighters in coordinating their planning operations.

WIFIRE

The WIFIRE model predictions, shown in Figures 3.10.10 and 3.10.11 focused on the early stages of the fire as an initial attack model. Across both the Palisades and Eaton Fires, the models predicted slower fire spread rates than observed on the ground and, while there was overlap with the FireGuard perimeters, fire spread directions did not always agree.

In the Palisades Fire, the WIFIRE model initialized the fire further to the east than observed in the FireGuard perimeters.

The initial fire spread to the west predicted in the WIFIRE model was similar to the Wildfire Analyst simulations initiated by FireGuard over the period simulated.

However, this was limited to first 2.5 hours of the simulation, which was prior to significant lateral spread to the east and west. In the Eaton Fire, the WIFIRE model predicted spread primarily to the south but at a much slower rate than ground-based observations, similar to the Wildfire Analyst simulations.

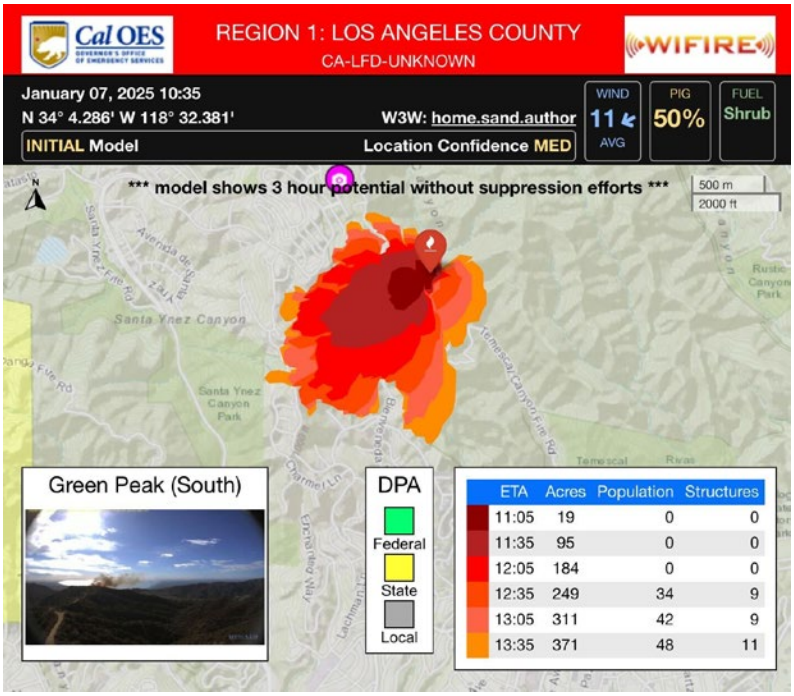


Figure 3.10.10 WIFIRE simulations for initial attack planning in Palisades Fires.

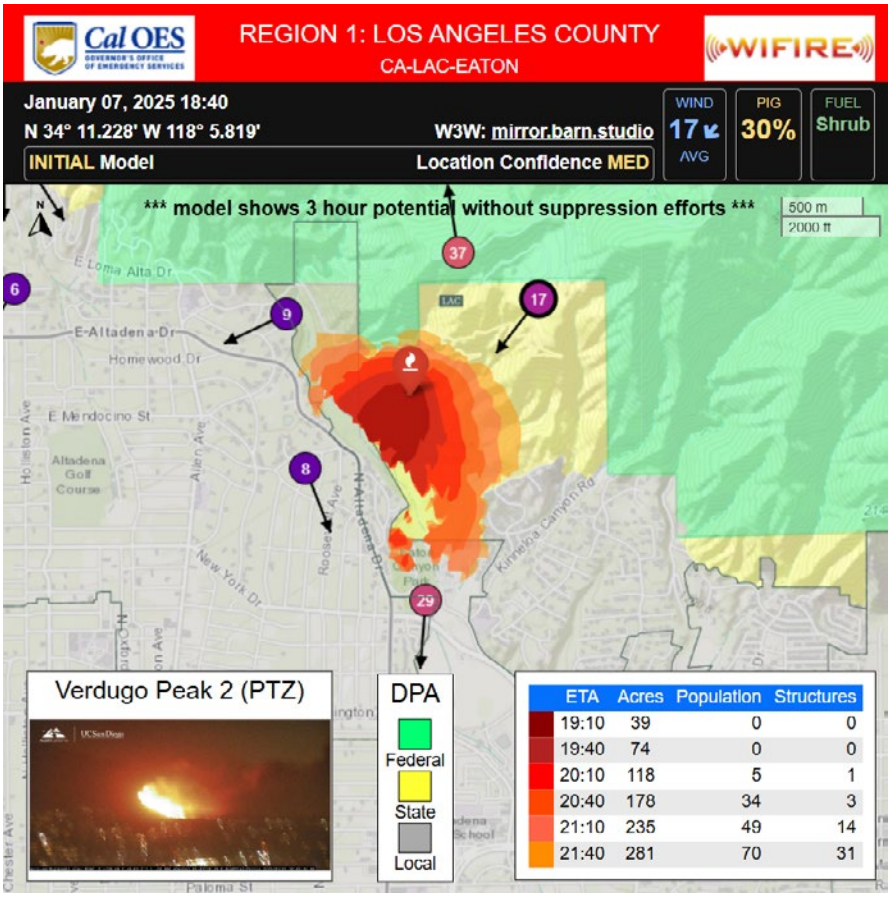


Figure 3.10.11 WIFIRE simulations for initial attack planning in Eaton Fires.

Simulations from both WIFIRE and Wildfire Analyst (initialized from FireGuard perimeters) are compared with the FireGuard and FIRIS perimeters for the Palisades Fire in Figures 3.10.12 and 3.10.13. Comparing these datasets highlights some of the key limitations in available technologies.

During the early growth, shown in Figure 3.10.12, the rate of spread in the primary direction to the southwest agreed well between the simulations, FIRIS and FireGuard. However, the lateral spread to the east and west was under-predicted in this case.

The second Wildfire Analyst (initialized from FireGuard perimeter) simulation that was reinitialized from the 16:39 perimeter on the west side of the fire predicted spread to the coast, which matched the ground-based observations and FIRIS perimeters, but were not captured in the FireGuard perimeters (Figure 3.10.13).

However, the westward extent of the fire perimeter predicted by the models significantly under-predicted the ultimate fire spread of the Palisades Fire in the timeframe of these simulations.

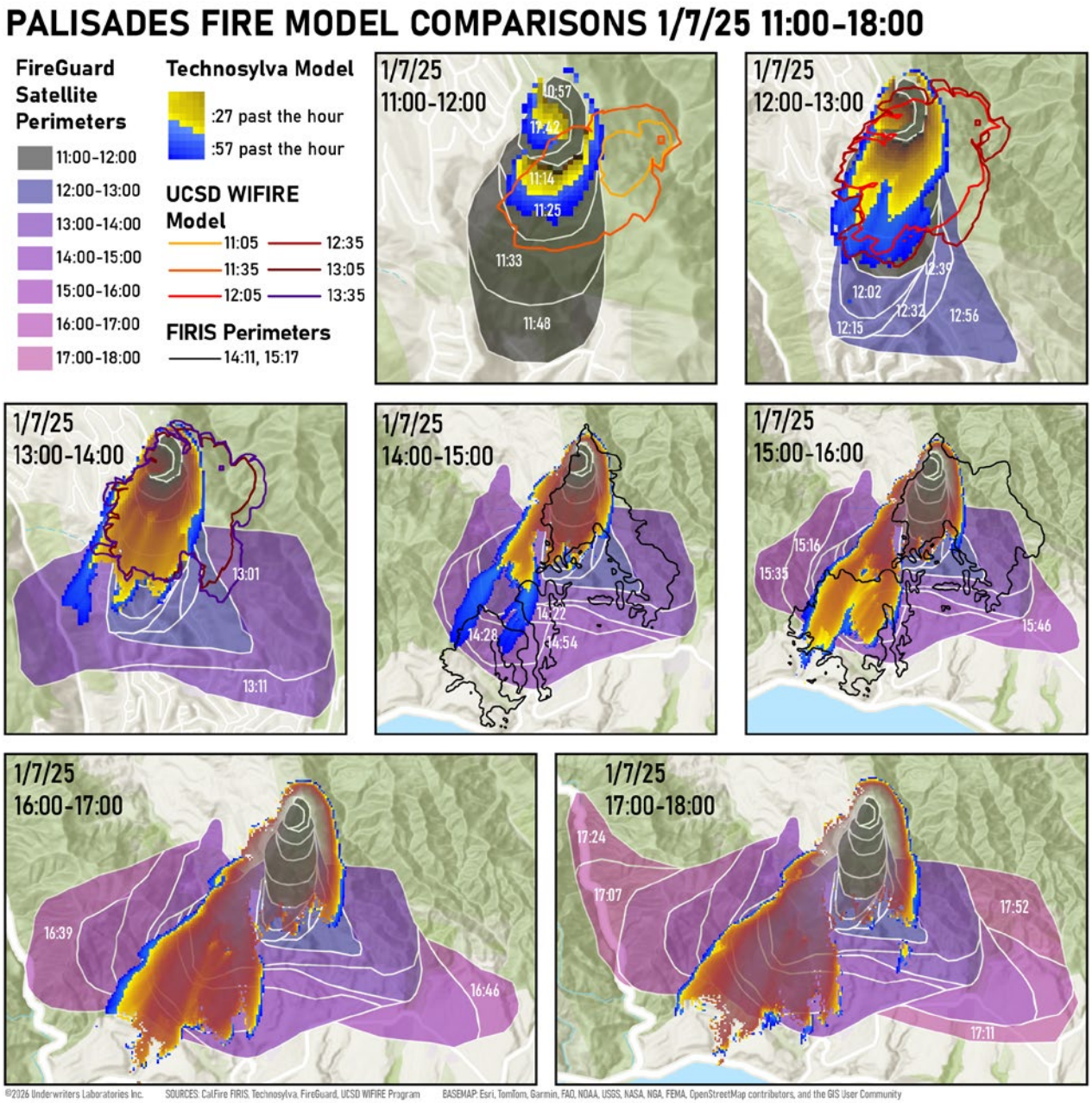


Figure 3.10.12 Palisades Fire simulations from WIFIRE and Wildfire Analyst (initiated from 10:57 FireGuard perimeter) compared with subsequent FIRIS and FireGuard perimeters.

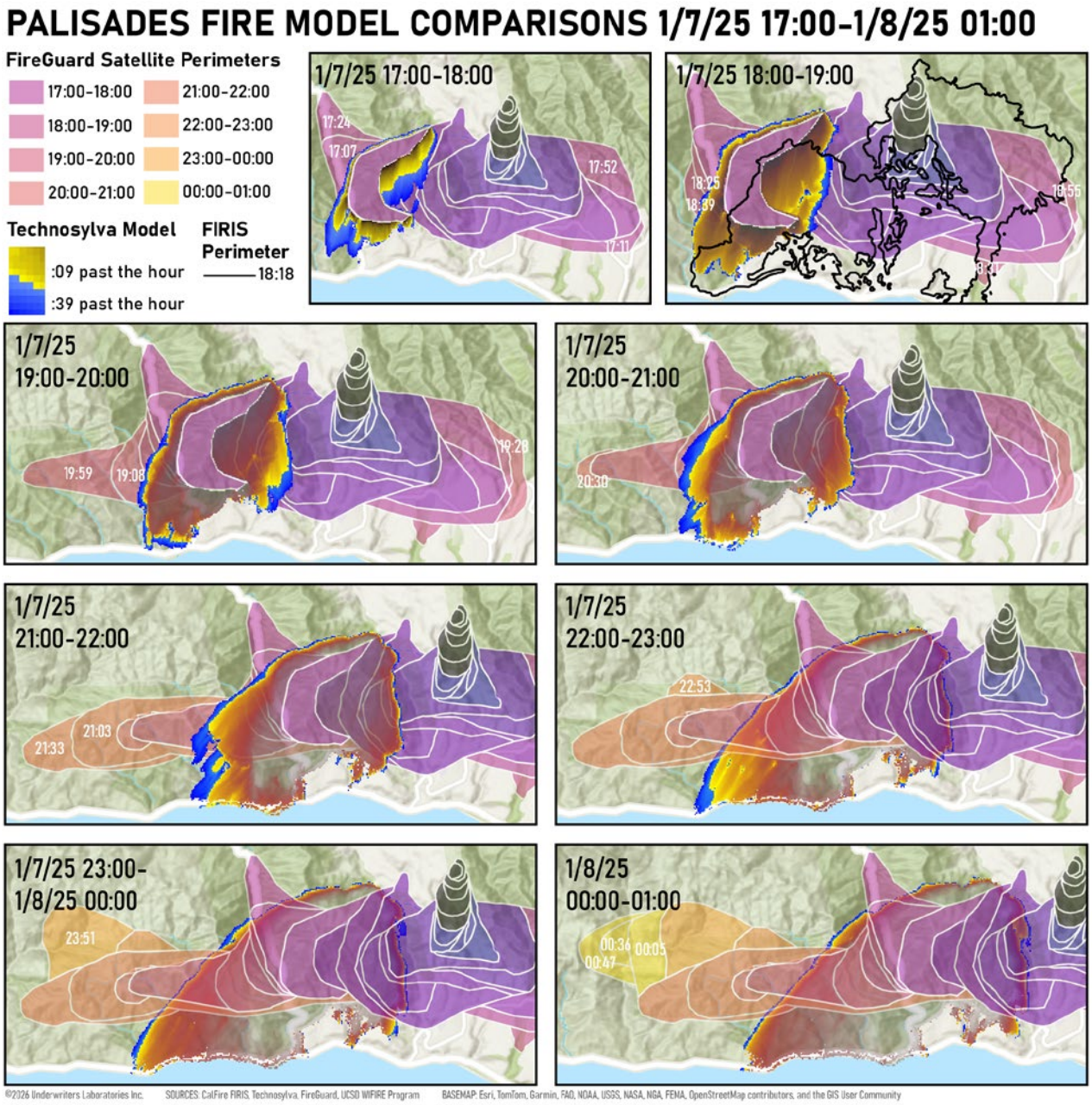


Figure 3.10.13 Palisades Fire simulations from Wildfire Analyst (initiated from the 16:39 FireGuard perimeter) compared with subsequent FIRIS and FireGuard perimeters.

Figure 3.10.14 provides a similar comparison for the Eaton Fire (though there were no FIRIS perimeters in this timeframe). The initial southward fire progression predicted by the models agreed with the ground-based observations (and early observations from HLCO) mentioned in this report, which are not captured in the FireGuard perimeters.

However, as discussed in Section 3.10.3.1, the FireGuard perimeters failed to capture the initial spread of the fire to the south during this event. Similar to the Palisades Fire, the models did not predict the lateral spread east and west, which could have been important for creating situational awareness for the possibility and risk for the spread of the fire into Altadena.

These observations confirm the known limitations of remote sensing and modeling in providing situational awareness during an active fire. While FireGuard satellite sensors may be capable of detecting heat along portions of a backing flank or heel burning in more open vegetation, their effectiveness can be reduced when the sensor's view of the fire is obstructed by tree canopies or in developed areas with structures.

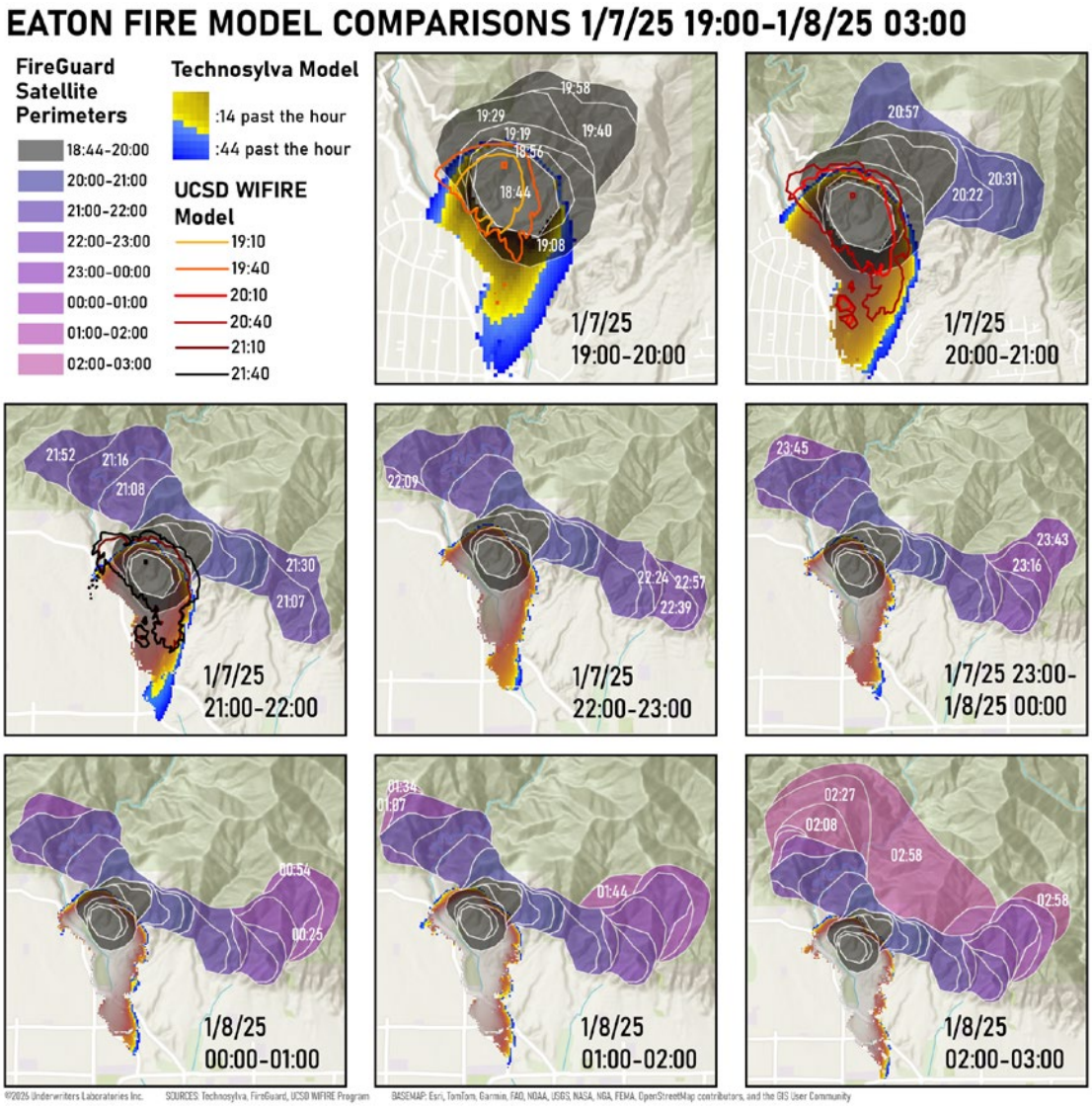


Figure 3.10.14 Eaton Fire simulations from WIFIRE and Wildfire Analyst (initiated from 18:44 FireGuard perimeter) compared with subsequent FireGuard perimeters.

The combination of FireGuard (or other situational awareness tools) and wildfire model perimeters should produce better operational intelligence than either on its own. For the Palisades and Eaton Fires, it is unclear why more simulations were not initialized from later FireGuard observations or more accurate aerial and ground-based evidence.

Without these data it cannot be confirmed whether the predictions of the spread to the east and west by the models would have improved throughout the incidents. It is also unclear why the re-initialized simulations in the Palisades Fire limited the scope to the west side of the fire rather than using the full extent of FireGuard observations.

3.10.4 Findings and Recommendations

FINDING 113: There are inconsistencies in the stated goals, objectives, and limitations of FireGuard regarding its use in operations.	**RECOMMENDATION 113.1:** Clarify the goals, objectives, and limitations of FireGuard to address the inconsistency between what is stated and what is in practice.
FINDING 114: The FireGuard perimeters missed key spread along the coast in the Palisades Fire and into some urban areas in the Palisades and Eaton Fires. The source of these errors is unclear, as the raw reflectance measurements and detection algorithms are classified.	**RECOMMENDATION 114.1:** These systematic errors need to be reduced to improve trust in these perimeters when applied to fires in the WUI and community conflagrations.
FINDING 115: The wildfire models are not configured to create a continuous update of the fire perimeters based on the latest evidence.	**RECOMMENDATION 115.1:** More frequent assimilation of the FireGuard perimeters and initializing using the entire history of the FireGuard perimeters (as opposed to just the most recently released polygon) would improve the overall accuracy of the predicted state of the fire.
FINDING 116: While the various simulation perimeters are available to users of the software, there is no clear indication of the quality of the individual simulations or the purpose of the smaller-domain individual simulations.	**RECOMMENDATION 116.1:** Improved data management of the set of simulations would improve the ability of analysts, incident managers, and emergency responders to rapidly find the latest accurate predictions.
FINDING 117: While the wildfire models were available to fire officers and analysts, these predictions were not mentioned by the ground-based firefighters as important for decision-making. During the Palisades and Eaton Fires, intelligence products were shared with individuals via texts, emails, and other department tools. From here, how the products were used was at the discretion of the ICs and other decision makers.	**RECOMMENDATION 117.1:** Additional training on the use and application of these models would improve consistency in fireground decision-making and operations.
FINDING 118: The current models were unable to capture the rate and distance of fire spread observed in the Palisades and Eaton Fires.	**RECOMMENDATION 118.1:** The underlying data, fire spread models, and/or weather models need to be improved, such that the forecasts can provide better predictions of lateral flame spread, particularly when encountering structures and the built environment.
FINDING 119: The strategic investments made into wildfire intelligence and modeling by the State of California have enabled analysts to make rapid predictions of fire behavior. While additional work is needed to improve the modeling predictions, the capability of collecting and distributing this information is well beyond what has been available historically.	**RECOMMENDATION 119.1:** The State of California should be commended for making (and should continue to make) strategic investments into improving wildfire perimeter tracking and modeling approaches. **RECOMMENDATION 119.2:** Additional progress could be made by increasing collaboration across the various agencies, groups, and stakeholders.

3.11 Evacuation

The rapid evacuation of communities impacted by a natural or man-made disaster can be challenging even under the best of circumstances. It becomes especially difficult during fast-moving community conflagrations that produce extreme fire and smoke conditions.

Coordinated and efficient evacuations are crucial to saving lives, minimizing the overall impacts of fire incidents, and achieving the goals of the Cohesive Strategy for safely living with fire, particularly as part of safe and effective wildfire response.

Effective evacuation procedures require multifaceted pre-incident planning built on several best practices derived from FEMA[166] and Cal OES[167] evacuation guidance:

- Timely communication to the general public, including consistent and clear dissemination of evacuation orders through multiple channels
- Smooth traffic management, including designated and maintained evacuation routes that are well-publicized to the public
- Clear interagency communications, including establishing communications plans between rescue teams and IMTs, especially during times of communication network failures (see Section 3.5)
- Adequate personnel and resources, including ensuring each team has the necessary resources to effectively handle emergencies at scale
- Coordination among agencies, including a unified and efficient response, with well-defined roles established on key teams

During the Palisades and Eaton Fires, limited resources, barriers to effective communication and organization between key agencies, and challenging access and egress points all complicated evacuation efforts.

Despite numerous obstacles, city and county law enforcement officers and firefighters worked to accomplish missions with limited supervision and direction. Although conditions were difficult and the evacuation operation lacked a unified structure, thousands of residents were safely evacuated.

Evacuation Communication Tools

Evacuation operations during both the Palisades and Eaton Fires occurred in a challenging communications environment. Responders relied on a mix of radio systems, cellular networks, MDCs, and informal workarounds as terrain, infrastructure impacts, network congestion, and interoperability limitations reduced the effectiveness of normal communication methods.

See Sections 3.5, 3.8, and 3.11 for more information related to communications, the evacuation notification process, and timing.

Despite these challenges, law enforcement, fire, and emergency management personnel adapted in real time to support evacuations and life-safety operations.

In the Palisades Fire, communication issues were compounded by the absence of a shared evacuation information plan across agencies. Differing approaches to mapping, evacuation zone management, and information sharing contributed to coordination difficulties during critical early operational periods.

For example, responders frequently relied on text messages, manually shared maps, verbal relays, and local knowledge to communicate evacuation information amongst themselves and develop situational awareness.

In the Eaton Fire, radio communications generally remained operational and served as the primary means of coordination. However, responders still faced challenges with multiple radio channels, ICP relocations, limited technical support, and the need to coordinate across a rapidly expanding incident area.

Personnel adapted by using a combination of radio, mobile data terminals, cellular communications, and agency-specific workarounds to support evacuation efforts and resource coordination.

3.11.1 Alerts and Warnings

Wireless Emergency Alerts

WEAs provide a direct-to-device broadcast channel that bypasses the limitations of a standard short message service (SMS) system. They are geographically targeted, text-like emergency messages sent by authorized government agencies through FEMA's Integrated Public Alert & Warning System (IPAWS).

IPAWS validates message origin and compliance standards and then transmits the message for public distribution over the Public Broadcasting Service Warning, Alert, and Response Network (PBS WARN) broadcast system.

Unlike SMS, which is point-to-point and can fail during network congestion, WEAs use Cell Broadcast technology. This allows a message to reach every compatible device within range of a specific cell tower simultaneously.

Individuals within the target area do not opt in to receive this messaging. Messages are delivered automatically to all devices within the geographically determined zone via multiple channels (selected by the emergency message originator), which can include SMS, emergency TV broadcast alerts, and social media messaging options.

PBS WARN provides emergency alerting by bypassing the internet entirely. It receives alerts from FEMA via satellite and broadcasts via the PBS digital television signal. Cell towers are equipped with specialized receivers that monitor the local PBS station's signal.

In case of a widespread internet outage or disruption of mobile cellular networks, as experienced during the Palisades and Eaton Fires, the tower automatically grabs the alert data from the PBS broadcast and sends it to phones.

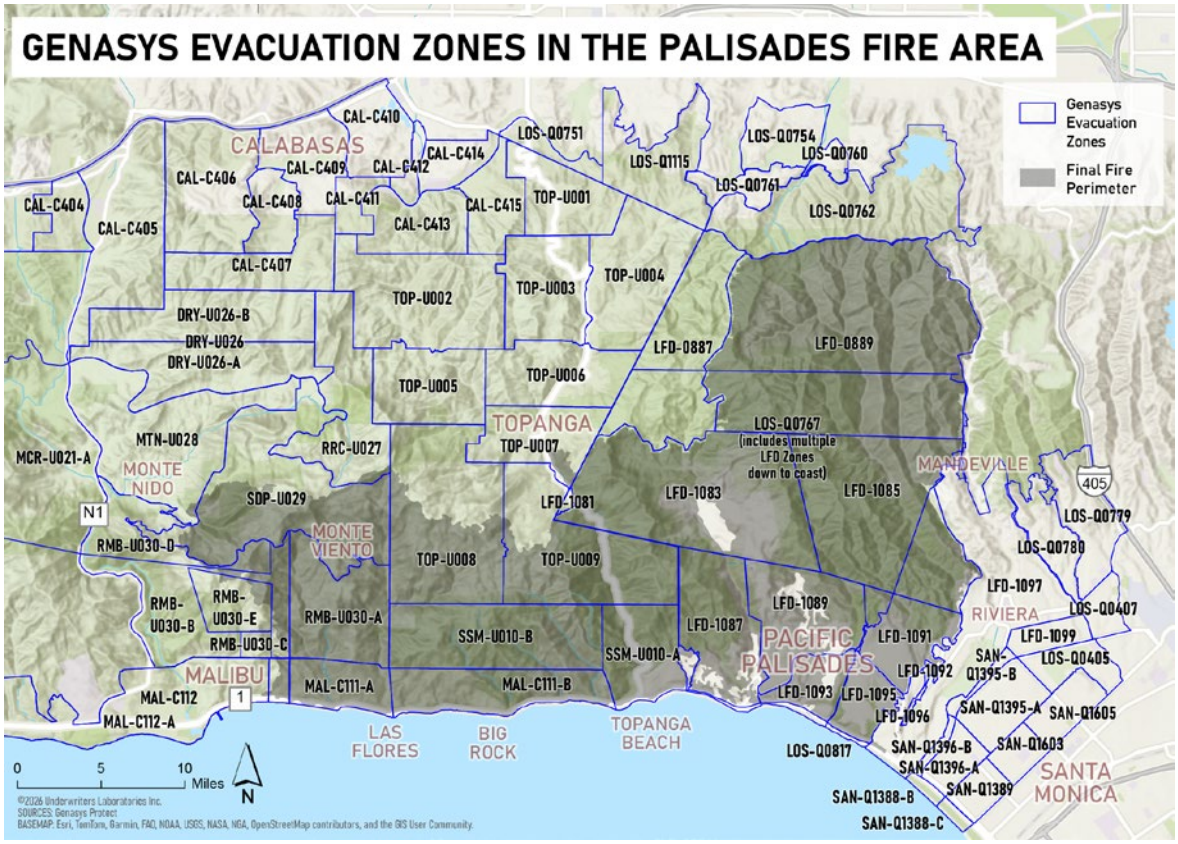
Users with phones that are off, or shielded from cell signals, may not receive the message. There are also times that technical and /or physical issues within the disparate systems can cause a message to be delayed or fail to send.

Alert Generation using Genasys

Los Angeles County Office of Emergency Management (OEM) personnel also used the Genasys Protect Emergency Alert System (EAS) during the Palisades and Eaton Fires, which delivers real-time alerts and critical public safety information directly from authorized officials. Personnel used the ALERT mapping interface to select either pre-defined or customized/split evacuation zones.

The geographical zones shown on the maps in Figure 3.11.1 are designed to enable the evacuation of a population of residents without overwhelming routes of travel under anticipated emergent conditions. The zones' naming convention includes the agency responsibility, using its three (3)-letter location designation, and zone number.

More detailed Genasys zone maps with evacuation notification timing, vehicle trips, and fire progression time stamps are shown in Figures 3.11.22 - 3.11.25 and Figures 3.11.28 - 3.11.31.



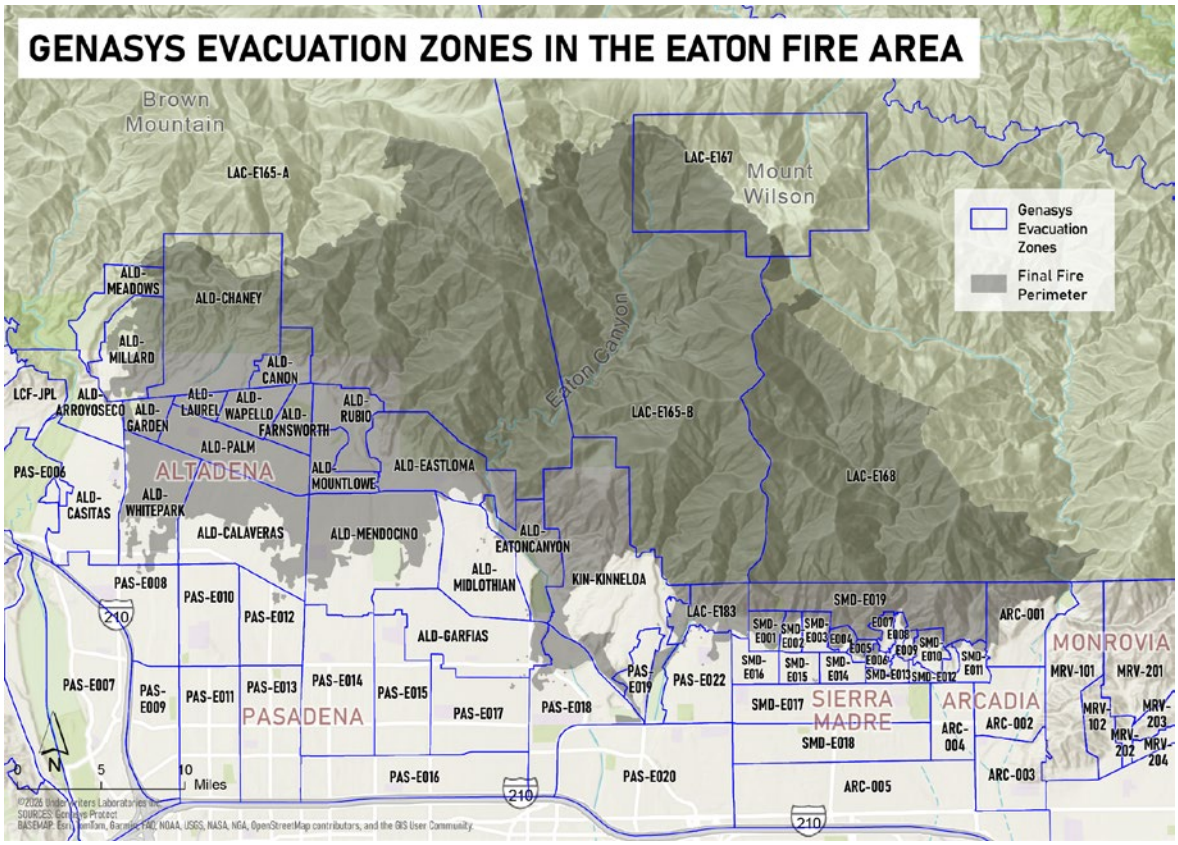


Figure 3.11.1 Palisades (top) and Eaton (bottom) Fire Genasys Zone maps at the time of the fire overlayed with final fire perimeter.

The system generates both 90-character (for older devices) and 360-character (for LTE/5G devices) alerts based on these zones. Genasys formats the alert into a Common Alerting Protocol (CAP) file, which is the industry-standard XML format required for communication with federal systems.

The process is as follows: Genasys securely transmits a CAP message to the FEMA IPAWS aggregator. FEMA then authenticates the credentials of the originating agency and validates that the alert area is within its jurisdiction. Once authenticated, FEMA pushes the alert to participating wireless carriers (Verizon, AT&T, T-Mobile, etc.).

Carriers identify the cell towers that overlap with the geographic targeted area and instruct them to broadcast the message. Carriers include the polygon coordinates in the broadcast using Enhanced Geo-Targeting (WEA 3.0).

The mobile device itself then checks its internal Global Positioning System (GPS), and if the device is outside the polygon, but still within range of the tower, it will suppress the alert. This limits “bleed-over” to within 0.1 miles of the target area.

However, if a carrier’s internet connection is severed due to a natural disaster, local infrastructure failure, or cyberattack, they lose the ability to broadcast those alerts to cellular phones.

Figure 3.11.2 illustrates the processes of evacuation alerts for Genasys/IPAWS and PBS WARN WEAs.

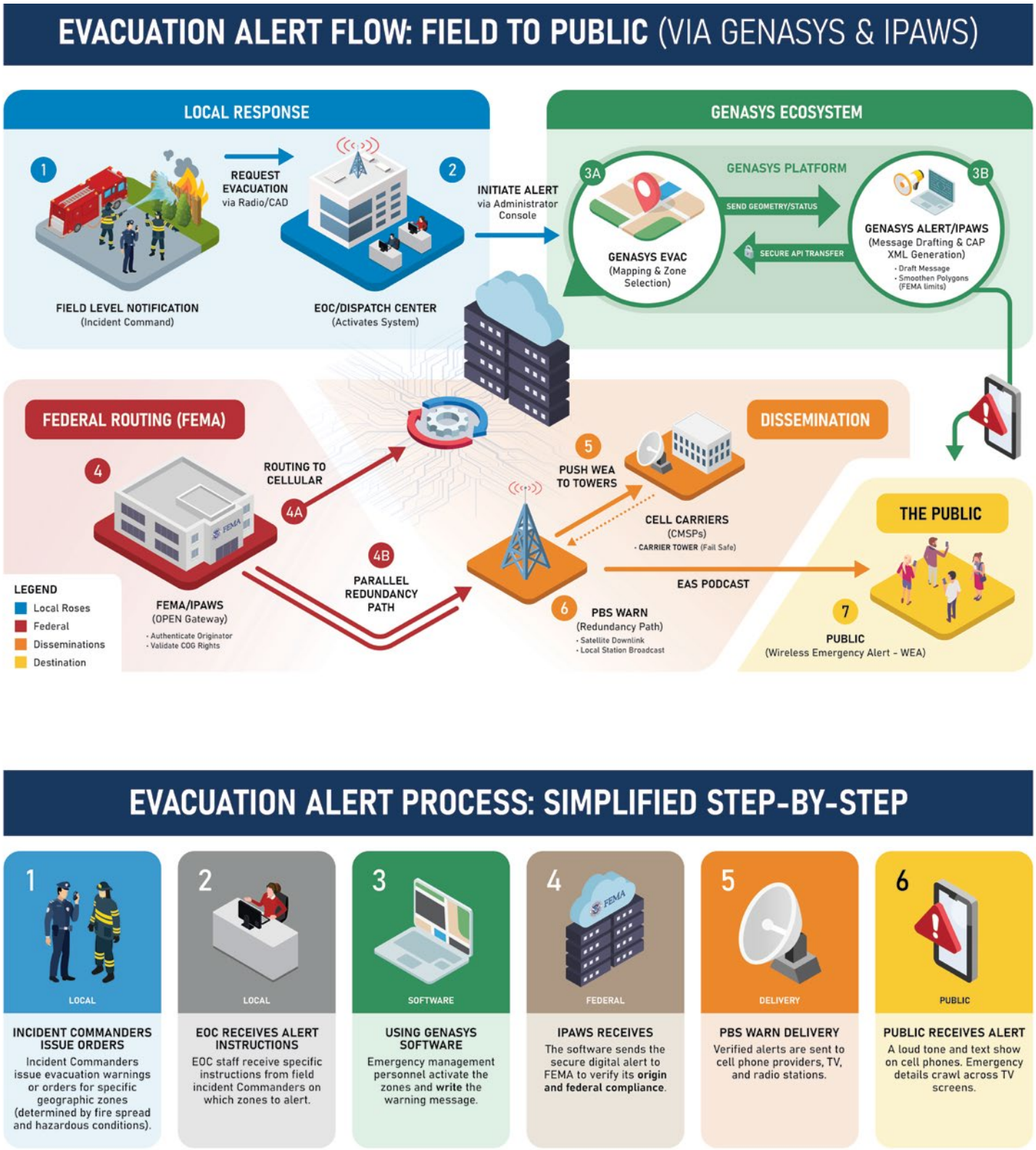


Figure 3.11.2 Evacuation alert communications flow showing a message generated in the field to arriving in the public's devices via Genasys and IPAWS.

3.11.1.1 Los Angeles City and County Standard Alert & Warning Processes (as of January 2025)

Los Angeles City EMD

1. Tactical evacuation decisions, including boundaries and routes, are made by the IC at the field command post.
2. The IC's field order is communicated to LA Metro, which is co-located at the city EOC.
3. An EMD A&W specialist at the EOC works with PIOs to draft the warning.
4. The draft requires LA Metro and IC approval before a city EOC representative issues the alert to the public via NotifyLA.
5. After message approval, the city EOC sends the warning to the county EOC for distribution through the Genasys system.

Note: *As of the date of this report, the city has fully implemented Genasys.*

Los Angeles County OEM

1. A fire's rate of spread, direction, and its potential impact on residential areas are evaluated by both ICs and UC staff.
2. Once the decision to evacuate is made, the request is relayed via radio to dispatch personnel.
3. These dispatchers then coordinate with the OEM Watch Center, which acts as the primary focal point for coordination with all 88 cities, 137 special districts, and non-governmental organizations within the Operational Area.
   a. **Note:** *Different cities and areas within the county have their own approval process prior to issuing an alert or warning, during which a system operator accesses the Genasys ALERT platform.*
4. The operator selects the appropriate geographic polygons or pre-defined evacuation zones based on the IC's direction.
5. The operator then selects the communication channels (IPAWS, SMS, voice, etc.) and populates a message template (including translation into Spanish).
   a. The system is designed to auto-populate certain geocodes (such as Los Angeles County), while also allowing for precise polygon targeting within those boundaries.
6. Once the message is ready, it is sent through the selected channels.
7. For IPAWS specifically, the message is authenticated and validated by FEMA's central servers before being distributed through various communication pathways, including wireless carrier networks and the PBS WARN EAS for broadcast.

3.11.1.2 Processes and Challenges

Challenges were encountered, including infrastructure failures, failures within Genasys itself (as reported by OEM personnel), and "echoed" messages that were sent after cell tower service came back online.

Some residents closest to the Palisades Fire ignition point did not receive an evacuation alert until roughly 40 to 90 minutes after homes had already begun burning. This delay in notification appears to have been caused by a combination of outdated manual processes and software transitions coupled with a rapidly moving, wind-driven fire that created a challenging environment for command to identify the specific areas of fire impact.

The Los Angeles City EMD sent pre-incident warnings using NotifyLA. If cellular devices are set on silent or "Do Not Disturb" mode, no audible alert will sound. WEAs can sometimes override device settings for notifications.

During the January 2025 fires, the city was still in the process of implementing Genasys, and, as such, did not have full access to, or active utilization of, the mapping and evacuation zone software.

As a result, LA Metro and EMD personnel were constructing evacuation zones manually based on spoken street names transmitted over radio traffic.

When the first evacuation was ordered, more information was required between the field and LA Metro to determine the exact spelling of street names and define the geographic boundaries.

Once the evacuation zone was determined, EMD personnel relayed this information to the OEM for public dissemination using Genasys — a time-consuming process during a rapidly evolving fire incident.

During the Eaton Fire, fire spread also outpaced digital notifications in some areas, leading to situations where residents received alerts only after their neighborhoods were already compromised. This latency is attributed to a multiple-step process between agencies and the OEM that required information to be verified, mapped, drafted, and approved before message dissemination.

Emergency evacuation notifications are not issued instantaneously once a decision is made to evacuate an area. System timestamps often capture only a portion of this process.

For example, alerting platforms such as Genasys record when an alert workspace is opened, but that timestamp does not necessarily represent when the evacuation decision was made, when approval was granted, when the alert was transmitted, or when residents ultimately received the notification.

The January 8, 2025, evacuation order for the area west of Lake Avenue during the Eaton Fire illustrates the distinction between these stages of the alerting process. The Genasys system recorded a timestamp of 03:06 when the alert drafting process began.

However, personnel were simultaneously gathering and verifying incident information, confirming evacuation boundaries, coordinating with UC, and preparing the notification for distribution. As a result, there was a period of time between the initiation of the alerting process, transmission of the official notification, and eventual receipt by the public.

It is also important to recognize that third-party emergency notification platforms, such as Watch Duty, may disseminate evacuation information before or independently of an official evacuation notification. During the Palisades and Eaton Fires, third-party platforms monitored incident radio traffic, public safety communications, field reports, and other real-time information sources that provided insight into developing evacuation activities.

As a result, residents following these platforms may have received evacuation-related information before receiving an official notification disseminated through Genasys, IPAWS, WEA, or other government alerting methods.

The release times reported by various systems may therefore reflect different points in the notification process.

For example, PBS Warn data indicates that the initial Genasys evacuation zones west of Lake Avenue were disseminated at approximately 03:25 on January 8, 2025, while Watch Duty published a corresponding evacuation notification at approximately 03:27.

These timestamps differ from the 03:06 Genasys workspace timestamp because they represent later stages of the alerting and information-sharing process. Similar timing differences were observed throughout both the Palisades and Eaton Fires as information moved from incident personnel to official alerting systems, third-party notification platforms, and ultimately to residents.

3.11.2 Palisades Evacuation

To ensure clarity, as well as consistency with Appendix B-1 of the California Agency Designators by Agency in FIRESCOPE Field Operations Guide 2022 edition, three (3) letter identifiers (highlighted below) will be used in operational contexts.

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)
- Pasadena Fire Department (PFD = PAS)

3.11.2.1 Los Angeles City Evacuation Coordination

On the morning of January 7, 2025, before the start of the Palisades Fire, the LFD BC responsible for the Pacific Palisades area contacted his counterpart at LAPD to discuss the impending weather and how law enforcement would be used for evacuations.

Prior to the fire, there had been no joint evacuation training or drills between LFD and LAPD for the Pacific Palisades area, other than documented prior training in Mandeville Canyon that occurred in 2014 and 2019.[168] As such, the LAPD captain, who was new in this role, was unclear on evacuation policies and LAPD's role.

At 10:46, radio communications from HLCO stated that structure impact would most likely occur within minutes. LFD officials requested street names of potential fire impact, believing the fire would eventually move into LAC's area of responsibility.

However, the Operations Section Chief (OSC) did not seek additional information or use the reported and anticipated fire behavior communicated by HLCO to develop informed evacuation recommendations for threatened areas.

LFD command's limited experience in managing rapidly expanding wildfires, as well as their poor visibility of the fire from the FS23 ICP, likely contributed to them not fully comprehending the fire's rapid expansion or spread direction. As a result, the urgency of HLCO's report may have not been understood.

The OSC was also aware that evacuation of The Summit and Palisades Highlands neighborhoods would be problematic due to the areas' limited routes for egress, which further complicated decision-making.

Additionally, LFD officials were cautious in issuing evacuation notices, as such decisions are often subject to public and governmental scrutiny. Officials sought to ensure that evacuation notifications were necessary and accurately targeted to the affected areas.

At about 11:13, the city EOC issued a WEA to residents in the Pacific Palisades, and the surrounding areas, to inform them of a possible evacuation. An LFD AC was assigned to scout the fire.

At 11:28, the LFD AC traveled from FS23 to the Gladstones parking lot to meet with the LAC AC, who was set up at that location. From Gladstones, the LFD AC was able to immediately observe the scope of the incident (Figure 3.11.3).

At 11:29, the LFD AC bypassed the IC and directly radioed LA Metro, ordering an "evacuation all the way down to PCH."

Figure 3.11.3 Incident Command Post at the Gladstones parking lot.

By this time, spot fires were on both sides of Palisades Drive. The intersection of Palisades Drive and West Sunset Boulevard (the staging location for responding fire apparatus) was already gridlocked.

At 12:09, the City of Los Angeles issued the first evacuation notice, through NotifyLA, for the entire Palisades area.

The WEA order was posted on the LFD website at 12:23 and stated the specific area as: Northeast to Merrimac Road west to Topanga Canyon Boulevard and south to PCH.

Thus, almost two (2) hours after the fire was reported, evacuation notifications had been issued for all Pacific Palisades neighborhoods.

Between 11:13 and 12:23, Los Angeles County also sent WEAs for county areas. Even though both LFD and LAPD were working at the FS23 ICP and at Gladstones, LFD officials had yet to identify an LAPD representative with operational expertise for evacuation coordination between the two (2) agencies. As a result, coordination between the agencies was minimal.

An Evacuation Branch was, however, established within the incident command structure, and an Evacuation Branch Director from LFD was identified.

Although the entire Palisades area had been issued an evacuation order, the Evacuation Branch Director began hand-drawing evacuation zones on a map, noting areas where 911 calls were being received.

The Evacuation Branch Director did not receive fire progression updates from the OSC. As such, they had to develop them independently, interpreting the fire location by listening to radio traffic.

Evacuation coordination between LFD and LAPD improved once the ICP moved to Will Rogers State Beach at 14:45 (Figure 3.11.4). There, the Evacuation Branch Director was able to identify an LAPD officer who was part of the LAPD IMT, as they had previously worked together.

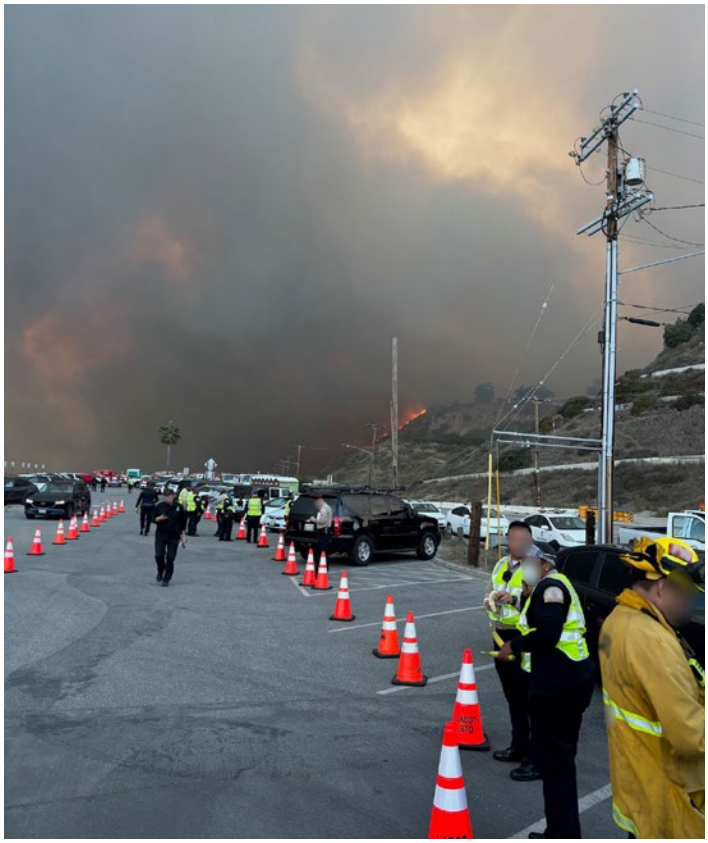


Figure 3.11.4 Incident Command Post at Will Rogers State Beach.

Evacuation leadership worked throughout the night of January 7, 2025, to launch evacuation missions in the zones they had created. Throughout the night, the Evacuation Branch Director continued to struggle to obtain reliable fire location updates from the OSC and began contacting personnel known to be operating in the field to gather information.

The Evacuation Branch Director was concerned about sending LAPD officers into zones without understanding the fire situation in those areas.

At 19:25, LFD expanded the evacuation order east to Kenter Avenue and north to Mulholland Road, encompassing Mandeville Canyon.

At approximately 21:00, Division Z identified an assisted living facility in the Palisades Highlands requiring the evacuation of 40 patients and 24 staff. Most patients were non-ambulatory. The Evacuation Branch facilitated the evacuation using facility staff and LFD ambulances.

3.11.2.2 Los Angeles County Evacuation Coordination

Los Angeles County's evacuation process consisted of an LAC AC identifying areas requiring evacuation notices; OEM representatives issuing, or notifying their offices to issue, the evacuation notifications; and LASD officials deploying deputies into those areas with Brigade[169] assistance.

An LAC Division 7 Community Service Liaison communicated with incorporated and unincorporated cities and areas, while also notifying leadership of the evacuation's status and conditions.

Upon arrival at the Palisades Fire from FS89 at 11:03, the LAC AC called the LASD LHS captain and the OEM Director, asking them to respond to the incident and meet in the Gladstones parking lot.

While at Gladstones, the LAC AC initiated evacuation notices for Topanga Zones 7 and 9, Mesa Zone 10, and later for Malibu Zones 111 and 112. These areas were several hours from being impacted by the fire. Once they arrived at Gladstones, an LASD captain and the OEM Director were briefed by the LAC AC on the evacuations that had already been initiated.

Initially, there was a large number of residents in the Sunset Mesa neighborhood who did not want to evacuate. LASD officers, individual LAC resources, and the Brigade were in the neighborhood facilitating evacuations and helping residents into cars or engines for transport through noon on January 7, 2025.

As the fire began to impact Sunset Mesa, Brigade members continued assisting with evacuations because many residents continued to refuse to evacuate.

As the fire moved west of the Palisades, evacuation notices were just ahead of its arrival. LASD deputies and the Brigade were present in the Big Rock neighborhood at 17:30 and all night on January 7, 2025, along PCH.

LASD deputies were also in Fernwood and the Topanga area from 17:45 to 19:00, in Monte Viento from 21:00 to 21:40, and in Monte Nido from 02:00 to 05:15 on January 8, 2025.

At approximately 21:00 on January 7, 2025, the Brigade assisted with evacuation of Rambla Pacifico and upper Las Flores, near LAC Fire Camp 8.

3.11.2.3 Traffic Management in the Palisades Fire

Traffic control during the Palisades Fire involved both LAPD and LASD, depending on jurisdiction. LAPD was responsible for managing traffic and evacuation movement within the City of Los Angeles, while LASD was responsible for managing evacuation and traffic control in county areas.

The Palisades Fire evacuation environment was shaped by steep terrain, limited access and egress, and a small number of primary evacuation corridors. Sunset Boulevard serves as the main east-west corridor connecting Pacific Palisades to Brentwood, Westwood, and the broader Los Angeles area.

Key north-south routes include Chautauqua Boulevard, Temescal Canyon Road, Lachman Lane, Palisades Drive, and Los Liones Drive, which connect hillside neighborhoods to Sunset Boulevard or PCH.

Due to the coastal terrain and limited street grid, these few roads carry most traffic entering and leaving the Palisades (Figure 3.11.5).

Figure 3.11.5 Photograph taken at 12:43 from a vehicle stuck in traffic while traveling along Temescal Canyon Road.

The City of Malibu and the unincorporated areas of the Santa Monica Mountains also contain remote neighborhoods, steep terrain, and limited access and egress.

Due to the frequency of wildland fires in the unincorporated areas of the Santa Monica Mountains, several agencies and organizations, including LAC, LASD, OEM, TCEP, and the Brigade volunteers, are well known to each other, aware of the evacuation challenges of the area, and familiar with defined evacuation roles and responsibilities.

Residents are generally familiar with the dangers of living in these areas and the evacuation process. Some residents, having experienced and survived previous brush fires and evacuation events, did refuse to evacuate when the fire impacted their neighborhoods.

3.11.2.4 LAPD Evacuation Response

ULRI's analysis of LAPD's traffic control activities during the Palisades Fire was based on a limited number of TDs with LAPD officers, supplemented by one (1) officer's BWC footage, as well as CAD records, radio communications, and the agency's Palisades Fire AAR.[75]

These sources provided insight into field-level actions, traffic congestion, evacuation challenges, hazardous conditions, and officer decision-making.

However, the limited access to LAPD personnel did not allow for a comprehensive assessment of the overall traffic management strategy, including how traffic control locations were selected, how officers were briefed, what communications occurred between supervisors and field personnel, and how evacuation movement was coordinated across the Palisades road network.

Few policies and procedures were either shared or available to guide traffic management during evacuation operations. The available information did not identify a consistent standard, procedure, or best-practice framework to manage evacuation traffic during rapidly evolving fire conditions.

As a result, traffic control actions appeared to rely heavily on field-level judgment, local knowledge, and immediate problem-solving rather than a standardized emergency evacuation traffic management process.

The evacuation routes and LAPD traffic control locations are shown in Figure 3.11.6.

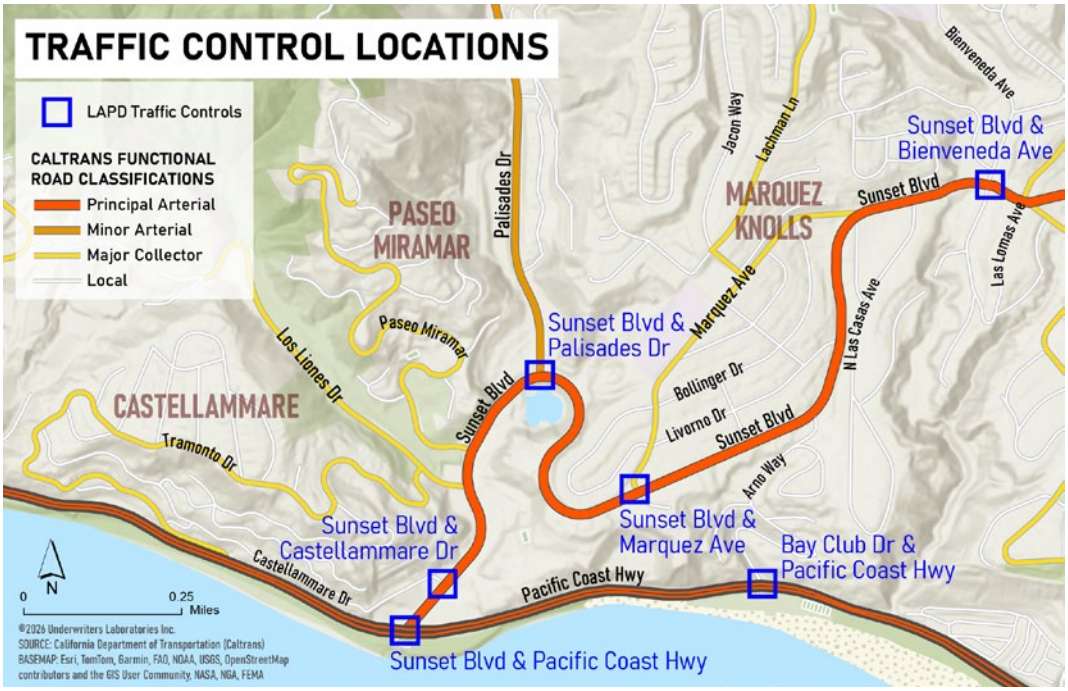


Figure 3.11.6 Los Angeles Police Department Traffic Control locations within the Pacific Palisades area during the first several hours of the fire.

When the Palisades Fire started, an LAPD officer, whose daily assignment consisted of patrolling Will Rogers State Beach, self-responded and called the fire into dispatch.

The officer followed the first LFD fire apparatus and arrived on scene at The Summit neighborhood at approximately 10:40. Additional officers and one (1) sergeant also responded to The Summit neighborhood and began conducting door-to-door evacuation notifications.

Without a unified traffic management or evacuation plan, officers and supervisors in the impacted areas reacted to conditions identified through 911 calls (relayed to field units by dispatch), field situational awareness, resident reports, and expanding traffic gridlock.

Despite deteriorating conditions and a large volume of vehicles overwhelming the limited roadway network, there is no evidence that any Palisade Fire-related fatalities or significant injuries occurred as a result of vehicle evacuation movement.

At 11:03, an LAPD captain responded to the FS23 ICP to coordinate with fire personnel regarding evacuation and traffic needs.

At 11:05, a field supervisor requested additional units to respond to the “upper neighborhoods” (The Summit and Marquez Knolls neighborhoods of Pacific Palisades) that were in immediate danger from the fire to assist with door-to-door evacuations.

At 11:14, after realizing that citywide mobilization efforts would take time, the field supervisor requested a City-Wide Tactical Alert (TA) to bring additional personnel into the area for evacuation and traffic control support.

This step taken by a field supervisor was unusual, with LAPD leaders indicating they could not recall a prior instance where a sergeant initiated a City-Wide TA without command-level authorization.

These actions reflected early recognition that the incident was exceeding the capacity of the initial police response and would require a large number of additional resources.

During this time, traffic conditions continued to deteriorate as the fire expanded and more residents attempted to leave the area.

At 11:21, a resident called 911 to report that traffic had stopped and was not moving at the intersection of Bienveneda Avenue and Sunset Boulevard.

At 11:25, LAPD requested assistance from the Los Angeles Department of Transportation (LADOT). LADOT employs professional traffic control officers; however, these resources did not arrive until after 13:00.

Shortly after, LAPD requested that westbound traffic on Sunset Boulevard be stopped at Palisades Drive.

Between 11:30 and 11:38, LAPD assigned units to key traffic control locations, including Sunset Boulevard at Palisades Drive, Sunset Boulevard at PCH, Sunset Boulevard at Castellammare Drive, and Sunset Boulevard at Bienveneda Avenue.

At 11:42, officers reported to Marquez Avenue and Sunset Boulevard to manage gridlocked traffic control (Figure 3.11.7).

Figure 3.11.7 Photograph taken at 11:43 from West Sunset Boulevard near the intersection with Palisades Drive. Pedestrian and emergency vehicles are stuck in gridlock traffic.

At 11:55, additional units were assigned to support both evacuations and traffic control. These actions occurred while officers were simultaneously supporting door-to-door evacuation notifications, responding to trapped residents, attempting to keep evacuation corridors moving, and managing intersections affected by heavy smoke, fire behavior, abandoned vehicles, and disabled traffic signals.

The LAPD Communications Division received over 160 calls for assistance in the early hours of the fire on January 7, 2025.

Many people reported to be stuck in their homes were elderly or disabled, and officers were sent to rescue them. Cell phone networks in the area were either down or overburdened, and people called 911 when they could not verify that their loved ones had made it to safety.

LAPD BWC footage shows officers working through thick black smoke without sufficient PPE while assisting residents in evacuating their homes.

In one instance, an LAPD sergeant discovered that an elderly woman remained inside her home and had no means of evacuation. The sergeant flagged down a passing neighbor and assisted the woman into the vehicle so she could escape safely.

At about 11:55, an LAPD Captain I, acting as the LAPD IC, began assigning missions for responding officers to assist with evacuations and emergency traffic control.

Eventually, a Captain II arrived and assumed the LAPD IC role. The Captain I took a subordinate role and began receiving cell phone calls directly from the dispatch center to handle rescues and evacuations.

After approximately one (1) hour of door-to-door evacuations in Palisades Highlands, a sergeant realized that evacuating traffic had come to a complete standstill (Figure 3.11.8).

The sergeant attempted to drive down Bienveneda Avenue in the opposite lane. He quickly found that both lanes were stopped and clogged with vehicles, including residents attempting to drive back into the neighborhood to rescue family members and pets.

The fire was spreading rapidly house-to-house, putting hundreds of residents in immediate danger.

Recognizing the severity of the situation, the sergeant exited his patrol vehicle and began running down the hill toward Sunset Boulevard. As the sergeant ran, he shouted commands to residents, directing them to turn around to clear the bottleneck.

While moving downhill, the sergeant encountered a school, which was conducting its own evacuation of young students.

A school employee was seated in a golf cart, directing vehicles exiting the school parking lot.

Figure 3.11.8 Image from a video taken at 11:17 showing standstill traffic headed south on Bienveneda Avenue.

The school employee transported the sergeant in the golf cart farther downhill to the source of the bottleneck at the intersection of Bienveneda Avenue and Sunset Boulevard. Traffic along Sunset Boulevard was moving east and west, but vehicles attempting to exit the upper neighborhoods were stopped by a red light at the intersection and were unable to proceed.

The sergeant immediately took control of the intersection and directed two (2) LAPD officers to hold eastbound and westbound traffic on Sunset Boulevard to allow uninterrupted movement for vehicles exiting Bienveneda Avenue.

Once traffic began moving again, the sergeant proceeded up Bienveneda Avenue to the location of the patrol vehicle. While traveling uphill, the sergeant observed a driver attempting to reenter the neighborhood. When questioned, the driver explained that his wife and children were trapped inside the evacuation zone and had no vehicle to escape.

The sergeant placed the man in the patrol vehicle and transported him back to the top of the hill, where he was able to reunite with and rescue his family.

According to the sergeant, that home was ultimately the only residence destroyed by the fire. The fire eventually burned over the ridge, but spared the surrounding homes.

After clearing the traffic congestion on Bienveneda Avenue, the sergeant worked to address additional traffic control points (TCPs) throughout the area, including Sunset Boulevard and Marquez Avenue, where traffic had again come to a halt.

There, the sergeant spoke with a local resident to identify possible alternate evacuation routes that could bypass the heavy congestion on Sunset Boulevard.

The resident identified a lesser-known neighborhood street that connected to a parking lot along PCH. The sergeant drove the route and determined that it could serve as a viable alternate evacuation corridor.

The sergeant briefed three (3) LAPD officers on the plan and implemented a traffic relief strategy that rerouted vehicles from Sunset Boulevard and Marquez Avenue through smaller feeder streets leading down to PCH.

These actions successfully restored the southbound traffic flow toward Santa Monica. The sergeant continued coordinating traffic control efforts throughout the day and into the evening.

Given the limited arterial routes out of the Pacific Palisades neighborhoods, this improvised plan was an effective field-level solution to relieve congestion and allow residents to evacuate the danger zone safely.

Around 18:10, the fire began spreading toward Palisades Village, the Via Bluffs, the Huntington Palisades, and the Alphabet Streets. A sergeant in the area observed that several of these neighborhoods still had residents who had not evacuated. The sergeant immediately requested 10 units to respond to Sunset Boulevard and Swarthmore Avenue.

From Sunset Boulevard and Swarthmore Avenue, LAPD units were divided into squads and assigned to begin proactively evacuating all neighborhoods south of Temescal Canyon.

The size of the neighborhoods, intense smoke, and low visibility made door-to-door evacuations dangerous and ineffective. Instead, officers drove through the neighborhoods using their PA systems to advise residents to leave immediately.

As the fire continued to spread east along the Sunset corridor, evacuees from Palisades Village, the Via Bluffs, and the Huntington Palisades were directed down Chautauqua Boulevard to southbound PCH. The West LA supervisor’s decision to call for evacuations in the Alphabet Streets, Via Bluffs, and Huntington Palisades likely saved numerous lives.

By 19:15, homes in central Palisades neighborhoods were on fire (Figure 3.11.9). A sergeant took a squad into these “hot zones” and evacuated hundreds of residents in the fire’s path. Ultimately, the Via Bluffs and the Alphabet Streets were almost entirely destroyed.

By 00:30 on January 8, 2025, LAPD officers were being deployed and stationed at fixed traffic posts throughout the Palisades and Mandeville Canyon areas. They were dealing with hazards, such as downed trees blocking the entire westbound lanes of Sunset Boulevard.

This early operational period demonstrated that LAPD traffic control during the Palisades Fire was largely reactive and driven by immediate life-safety needs rather than by a pre-established evacuation traffic management plan. Field-level personnel addressed rescue situations with little command-level input or direction.

Delays in establishing a viable ICP and implementing a fully integrated UC structure may have contributed to coordination challenges during the early stages of the incident, although many factors influenced operational effectiveness during this rapidly evolving incident.

Figure 3.11.9 Image from a video taken at 19:39 on Albright Street showing structures burning and spot fires.

3.11.2.5 LASD Evacuation Response

LASD operations at the Palisades Fire were influenced by pre-existing relationships and evacuation familiarity in the Santa Monica Mountains, Malibu, and Topanga areas. LASD personnel worked with LAC, OEM, the Brigade, and TCEP to support evacuations in county responsibility areas.

Deputies conducted door-to-door notifications, used patrol vehicle PA systems, staffed closures, restricted ingress into threatened communities, and supported rescue operations in areas impacted by fire, smoke, downed utilities, and blocked roads.

In response to the NWS Red Flag Warning, LHS assigned overtime personnel to conduct soft road closures leading into the Topanga Canyon area on the morning of January 7, 2025. This soft closure restricted vehicular traffic to residents only.

Additionally, LASD had a preplanned agreement with local schools (see sidebar) in Topanga Canyon to implement virtual learning school days on Red Flag/ high fire danger days. These two (2) actions likely reduced the number of vehicles and people within the danger area that had to be evacuated.

The Los Angeles Unified Schools, in cooperation with LASD, developed a program in which schools located within the WUI area of Topanga Canyon would attend classes online during Red Flag Days.

Because of this program, on January 7, 2025, students attending public schools in the Palisades Fire area were not on campus the day of the fire. This effort relieved evacuation routes of normal traffic congestion experienced when school is in session. This same policy was not in effect for other areas of the Palisades Fire, such as the schools located in Pacific Palisades.

Topanga Canyon residents prepared for evacuation utilizing TCEP evacuation plans, and communicating with one another on the status of the incident.

On the morning of January 7, 2025, normal LASD patrol operations continued until reports of the start of the Palisades Fire. LASD deputies from LHS were deployed to obtain visual confirmation of the fire's location and progress, relaying situational updates back to county dispatchers.

LASD already had resources in the area of Topanga and PCH, which created timely situational awareness for the LHS EOC.

LASD worked with LAC in evacuation decision-making. The LHS captain became the law enforcement IC for all county sheriff personnel and coordinated efforts from the ICP and the LHS EOC.

Initially, LASD did not anticipate that the fire would extend into county jurisdiction. Shortly after ignition, LHS began receiving a surge of emergency calls originating from Malibu. As the fire expanded and the threat rapidly shifted toward Los Angeles County, deputies were assigned to support evacuation and rescue operations.

The speed and intensity of the fire's growth quickly outpaced initial law enforcement deployment, highlighting early challenges in resource availability and surge capacity.

At this stage, LASD staffing was limited to a regular patrol deployment with a supplemental team of extra deputies and volunteers, for a total of approximately 8–10 patrol units and 10–12 deputies available.

While LHS had reserve deputies and volunteers on duty, overall resources were insufficient to simultaneously manage both calls for service and rapidly escalating evacuation needs. As a result, LHS increased emergency operations staffing.

At approximately 11:35, an LHS sergeant acting as the Emergency Disaster Supervisor requested additional personnel from the LASD MFF system. Twenty-five deputies were dispatched to assist.

The MFF system operates well for planned, large-scale events. However, due to the county's large geographical size, it can be challenged by delays and logistical processes during rapidly unfolding emergencies, resulting in the slow arrival of supplemental deputy resources.

LASD deputies who were immediately available arrived on scene of the Palisades Fire when it was still confined to the city's jurisdiction.

Later, at approximately 12:15, two (2) LHS deputies responded to Sunset Mesa, a small unincorporated community within the Palisades. Upon arrival, they observed severe wind conditions and heavy smoke blowing sideways.

Embers were landing on vegetation and igniting ornamental landscaping next to homes. As trees and homes ignited, deputies used garden hoses from affected homes in an attempt to extinguish fires, while also conducting door-to-door evacuation notifications.

The initial lack of communication between LASD and LAPD created challenges for overall evacuation coordination. For example, LASD deputies working traffic control on PCH discovered that LAPD was directing evacuees down into the PCH area, directly into hazardous conditions.

LAPD, LASD, and California Highway Patrol (CHP) had to clarify evacuation traffic routes through radio traffic and their dispatch centers.

In Sunset Mesa, LASD deputies were flagged down by a woman who reported that she and her 90-year-old mother needed assistance to evacuate. The deputies helped load both women into their personal vehicle and directed them out of the area.

Soon after, the deputies were overcome by heavy smoke and could no longer see. Deciding it was too dangerous to continue, they made their way back down to PCH.

An LASD Deputy described the sky as being as dark as night as they drove slowly down PCH, navigating downed power lines, light poles, and debris in the roadway. As they drove away from the smoke, visibility improved almost instantly.

As deputies stopped to regroup, they heard several loud bangs, and suddenly a car came through the smoke, missing a wheel with electrical lines wrapped around the axle. They quickly realized it was the same vehicle that they had previously assisted the elderly women into.

They rescued both women, placed them in their patrol vehicle, and drove them to a nearby fire station for medical aid.

Deputies reported frustration with having to return to areas they had already evacuated to rescue residents who stayed behind, finding themselves in severe fire danger areas.

Deputies reported that most residents were responsive and left the area, but some refused to leave, saying they were staying until the fire got closer. Deputies advised them of the danger and moved on to the next area for evacuations.

At approximately 12:00, an LASD Sergeant requested an additional squad of officers from the EOB. Twelve deputies were sent from Lakewood and Marina Del Rey stations.

At approximately 13:30, LASD deputies assigned to closure points were directed to escalate conditions to a “hard closure,” prohibiting all traffic into the canyon communities.

As the fire moved west, resources shifted to an all-hands evacuation effort. Deputies continued to support operations by assisting with garden hose lines from houses to suppress spot fires, conducting evacuations, and using patrol vehicle loudspeakers to broadcast evacuation orders while moving through threatened neighborhoods.

As conditions deteriorated and radio traffic became increasingly unreliable, deputies adapted by forming squads of six (6) to coordinate evacuations and rescues more effectively.

Deputies also responded to vulnerable populations during this incident. Without being dispatched, they self-deployed to an encampment in one of the impacted canyons, alerting and evacuating unhoused individuals.

An LASD sergeant reported that over 200 “humanitarian missions” were performed as deputies assisted residents, including by delivering medication or supplies to residents who sheltered in place.

Evacuations continued throughout the afternoon on January 7, 2025, in Big Rock and other coastal neighborhoods. Deputies described conditions along the coast as extremely hazardous, with black smoke obscuring daylight and multiple fire whirls — rapidly rotating columns of fire, smoke, ash, and debris — crossing the roadway, preventing the safe exit of vehicles.

A detective reported working approximately 19 hours during this operational period and characterized the scene as resembling a war zone.

At approximately 16:20, deputies were ordered to retreat from some county neighborhoods along PCH due to extreme fire conditions and the high risk to personnel safety.

At 17:41, an LHS sergeant requested one (1) additional platoon from MFF. Four (4) squads from the night shift, totaling 53 personnel, were activated to respond Code 3 (lights and sirens) to LHS.

At approximately 19:48, the ICP moved north of the fire to Zuma Beach due to heavy smoke and fire approaching from the bluffs above the highway at Will Rogers State Beach.

At about 20:00, the LHS captain met with the LASD IMT IC. They agreed to assign a skeleton crew of LASD IMT personnel along with the LHS captain to the Palisades Fire, while redirecting the remainder of IMT staff to the new Eaton Fire.

This LASD leadership decision was a positive strategic move as the Eaton Fire was developing rapidly, and critical time was saved by having the IMT already en route.

At about 22:09, an LASD EOB lieutenant reported that both the DOC and IMT Team 1 had been activated in support of both fires.

Throughout the night of January 7, 2025, LASD MFF deputies worked in two (2)-person patrol cars and evacuated most of their jurisdiction in the Santa Monica Mountains. Residents were also evacuated from remote canyons and mountains.

Because LHS had previously trained and planned for a large fire, LASD units assigned to the Palisades Fire were able to leverage additional staffing from reserve deputies, Search and Rescue, Arson Watch, TCEP, and the Brigade.

LASD radio traffic documented rescues through the early morning of January 8, 2025.

At about 06:00 on January 8, 2025, LASD IMT Team 1 and the LAPD IMT responded to the Zuma Beach ICP and participated in the CAL FIRE UC. This was the first time that a coordinated UC involving all partners was officially operating within the Palisades ICS process.

Throughout the rest of day, LASD deputies responded to evacuation calls, looter prevention, and traffic control coordination with CHP and LAPD.

3.11.2.6 Contraflow Traffic Plan

As the Palisades Fire expanded toward PCH, traffic control became increasingly a multi-agency operation. Although initial communications indicated existing resources were managing conditions, CHP personnel later observed rapidly increasing traffic congestion and evacuation-related roadway impacts.

Based on those observations and the expected traffic increase, a CHP lieutenant executed a contraflow traffic plan to enhance evacuation flow and decrease congestion, even though no official activation request had been received from another agency.

Under CHP's contraflow traffic plan, responding agencies deploy personnel to key traffic corridors and intersections to restrict inbound traffic and maximize outbound evacuation flow.

Specific agencies are assigned responsibility for designated roadways and cross streets, including closures associated with PCH, the 10 Freeway, and coastal access routes.

CHP's contraflow traffic plan in the West Valley area has been in place for several years and has been used during prior wildfire incidents, including the Woolsey Fire, to facilitate large-scale evacuations along the PCH corridor between Topanga Canyon and the McClure Tunnel.

The plan mirrors evacuation strategies previously utilized in West Los Angeles and by LASD. It relies on coordinated communication protocols among multiple agencies, including LAPD, LASD LHS, Santa Monica Police Department (SMPD), West Traffic Division, Caltrans, the City of Malibu, and other regional partners.

The plan establishes designated points of contact, operational notification procedures, and predefined traffic control responsibilities for participating agencies.

At 12:28, CHP requested that LAPD shut down PCH southbound traffic at Coastline Drive. LAPD and CHP worked together to control traffic entering and exiting PCH, and began efforts to initiate the contraflow traffic plan (Figure 3.11.10).

Figure 3.11.10 Photograph taken at 14:33 from PCH near the intersection with Coastline Drive showing the southbound lane closed as the fire was impacting travel.

Figure 3.11.11 Image from a video taken at 12:42 on Palisades Drive showing abandoned cars in both southbound and northbound directions.

At 12:32, LAPD worked with CHP to keep lanes open for emergency exit routes, and by 12:39, CHP began the process of shutting down PCH at Temescal Canyon Road.

At 12:45, a citizen reported to 911 that at 7** Palisades Drive, vehicles were stuck in traffic congestion and were burning, emphasizing the severity of the evacuation environment and the direct relationship between traffic gridlock and life safety (Figure 3.11.11).

At 13:03, SMPD sent multiple units to assist with traffic control, and at 13:15, Caltrans established a hard closure at PCH and Los Flores Canyon Road.

The lieutenant stated that once the contraflow traffic plan was activated, participating agencies were contacted to confirm implementation of their assigned traffic control responsibilities and roadway closures. The lieutenant spoke with each agency and reported that they coordinated effectively during activation, with no known system failures or major communication breakdowns identified during implementation.

The lieutenant estimated that full activation of the contraflow traffic plan required approximately one (1) to one-and-a-half (1.5) hours. A similar amount of time was required to safely demobilize and return roadways to normal traffic flow once evacuation operations concluded.

3.11.2.7 Operational Challenges

At about 13:05, traffic was so congested on Sunset Boulevard near Palisades Drive that an LAPD officer directed citizens to abandon their vehicles and leave on foot westbound toward PCH to avoid being burned by the approaching fire.

These vehicles were later pushed out of the roadway by an LAC department bulldozer to clear a path for emergency vehicles. The drivers ran downhill to PCH, where they were assisted by LAPD officers.

The LAPD AAR stated that approximately 350 vehicles in total were abandoned on streets within the Palisades during the fire.

As the fire progressed, infrastructure failures further complicated evacuation efforts. Power outages disabled traffic signals, requiring officers to manually direct traffic in smoky, hazardous conditions.

Downed power lines and fallen tree limbs blocked several neighborhood access points, further increasing congestion along evacuation routes.

Many hillside streets are narrow and, in some cases, effectively single lane, creating additional risk as residents attempted to evacuate while emergency responders were simultaneously trying to enter the area.

At about 17:56 hours, the LAPD IC notified personnel that LAPD officers would not provide rescues or evacuations in areas determined to be “hot zones” by LFD. This directive created confusion among officers, as nearly all areas requiring evacuation were within or near active fire, smoke, embercast, and immediate life-safety threat areas.

The message reflected the disconnect between the IC and evacuation actions occurring in the field, where officers were encountering residents who remained in threatened neighborhoods and had limited time to evacuate.

This lack of clear communication, as well as the absence of a coordinated evacuation plan and current situational awareness at the ICP contributed to the gap between command-level direction and field-level life-safety needs.

Officers disregarded the directive and continued to conduct evacuations and rescues where residents remained at risk.

In the absence of consistent command-level guidance and communication, field personnel and street-level supervisors were often required to identify congestion points, establish traffic control locations, coordinate with CHP and other transportation agencies, and support evacuation movement while neighborhoods and roadways remained under threat from the fire.

Based on the available information, field-level decision-making, early requests for additional law enforcement resources, and adaptive traffic control measures appear to have played an important role in maintaining evacuation movement as traffic volumes increased and the Pacific Palisades road network became increasingly congested.

3.11.2.8 Automatic Vehicle Location Data

LASD was the only law enforcement agency that provided AVL data. The data received from LASD provides a partial view of department resource locations and movement during the Palisades and Eaton Fires.

The AVL data should not be interpreted as a complete accounting of all law enforcement resources operating at either incident. Not all vehicles assigned to the incident were equipped with AVL, and some AVL systems may not have been functioning or consistently transmitting during the operational period.

In addition, multiple law enforcement agencies operated in and around the incident areas, including agencies that did not provide AVL data for this analysis. As a result, the AVL maps in this section represent only the LASD vehicle location data available to ULRI.

The location of law enforcement resources is mostly consistent with information communicated during TDs, with the understanding that deputies (and law enforcement officers from other agencies) may have been required to work a distance from their assigned vehicle during the time they were evacuating residents during “knock and notify” operations.

The AVL heatmaps in Figures 3.11.12 and 3.11.19 display law enforcement relative location for each hour from the start of the incident through 10:29 on January 8, 2025, for the Palisades Fire, and through 18:29 on January 8, 2025, for the Eaton Fire, respectively.

Each one (1) hour time period displaying a heat signature represents a collection of units with their associated time points within a geographic area. The warmer the color, the more time points were recorded in that location.

All points were weighted equally, and heat map settings and map scale were maintained to support comparison across time periods.[95]

The maps also include fire perimeter, city/county boundary line, and circles sized to represent the quantity of 911 fire calls, as well as visual evidence of fire from time-stamped pictures and video.

In addition, the positioning of many LASD resources on the initial response was communicated by officers during their TDs. Personnel assigned to each unit identified their location on a map, and ULRI used dispatch/communications records and BWC video to verify their location in most cases.

AVL Data - Palisades Fire

After the Palisades Fire began in the Palisades Highlands/The Summit area of the Pacific Palisades on January 7, 2025, AVL data shows LASD

resources arriving at the fire from the north, where LHS is located, as well as from the west along PCH. These resources begin to move south starting at around 11:30.

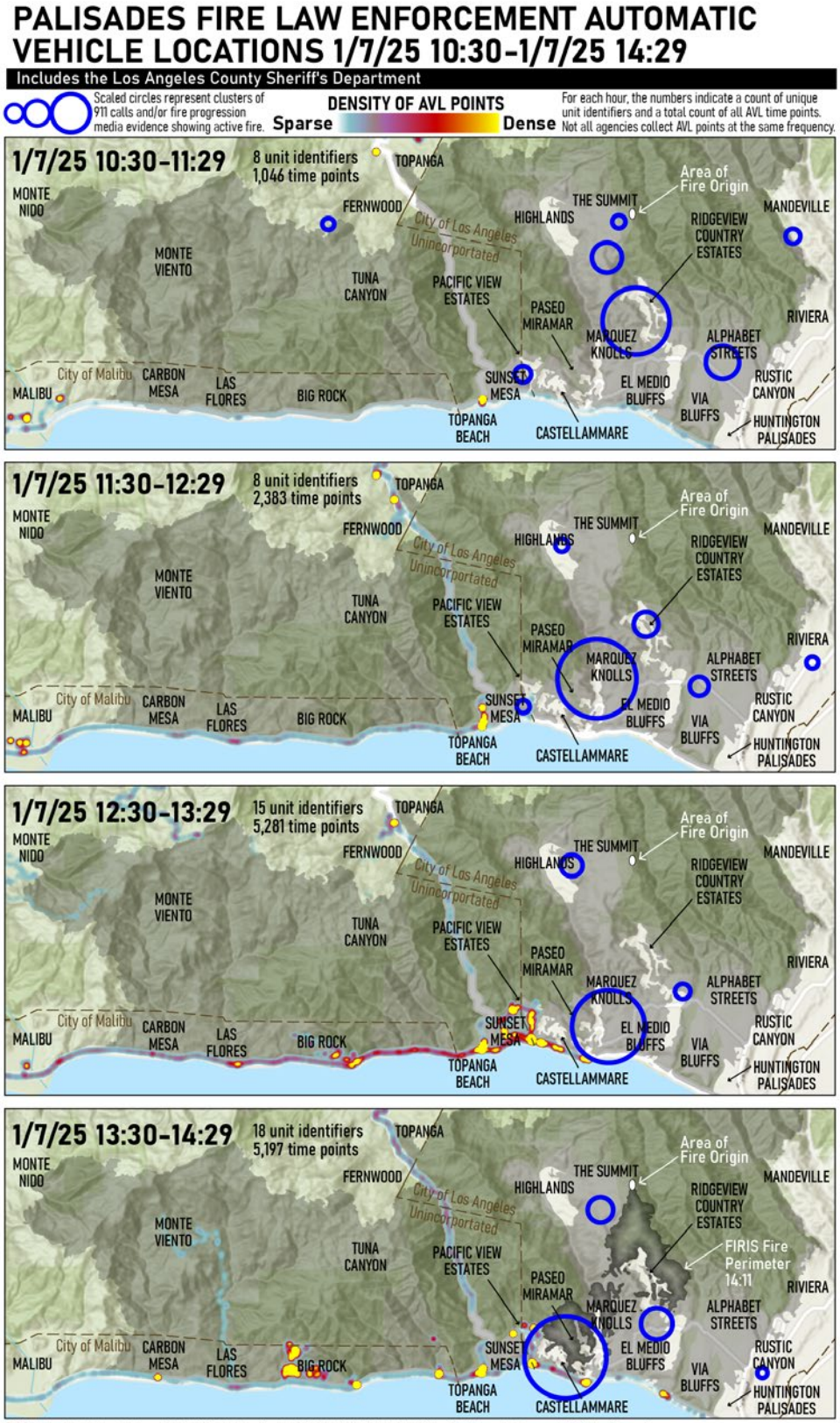
Note: *Figure 3.11.12 shows no law enforcement activity east of Sunset Mesa, as no AVL data was provided by LAPD.*

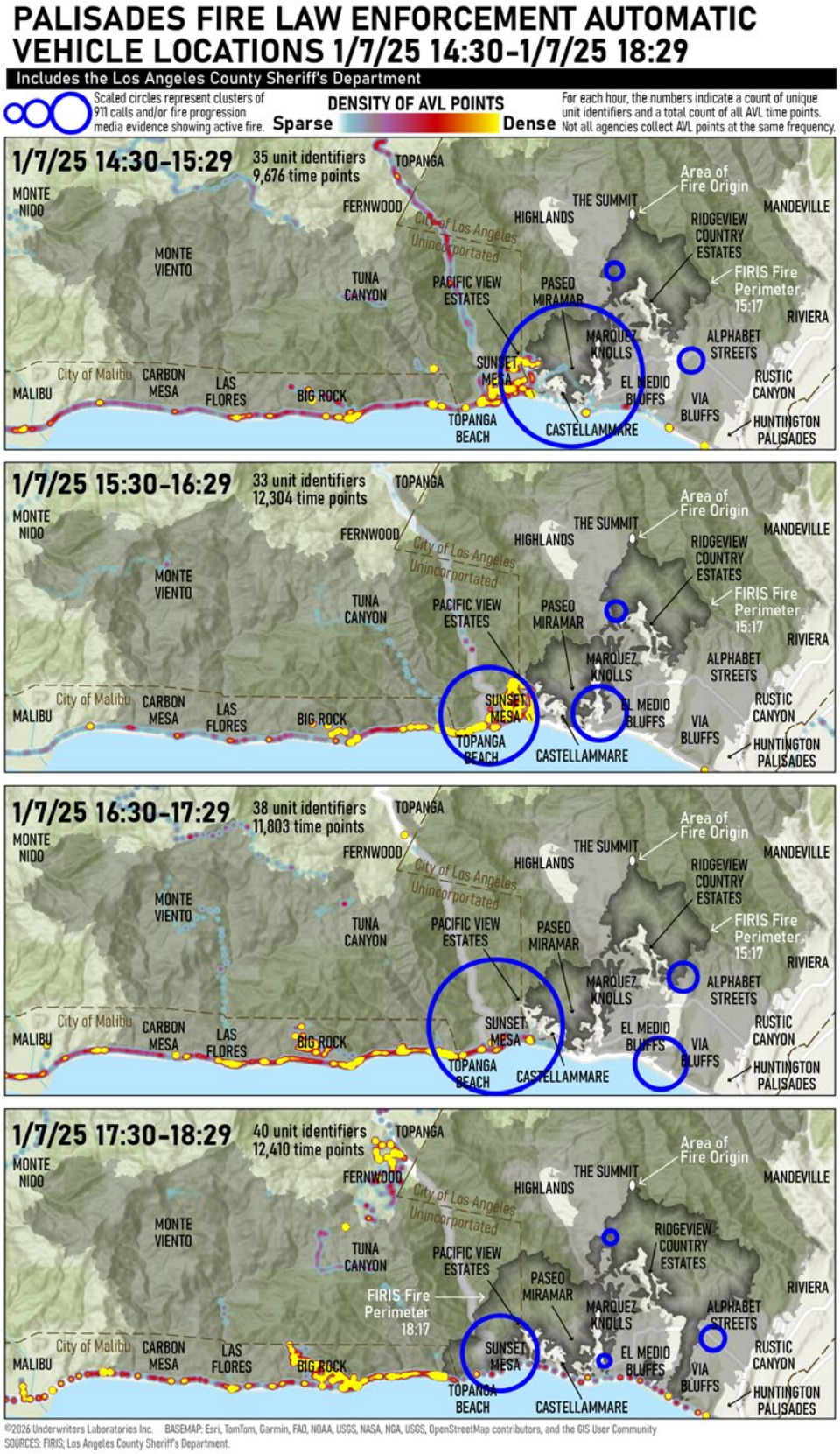
By 12:30, most LASD resources were positioned in the Sunset Mesa area, which was the first Los Angeles County community impacted by the fire.

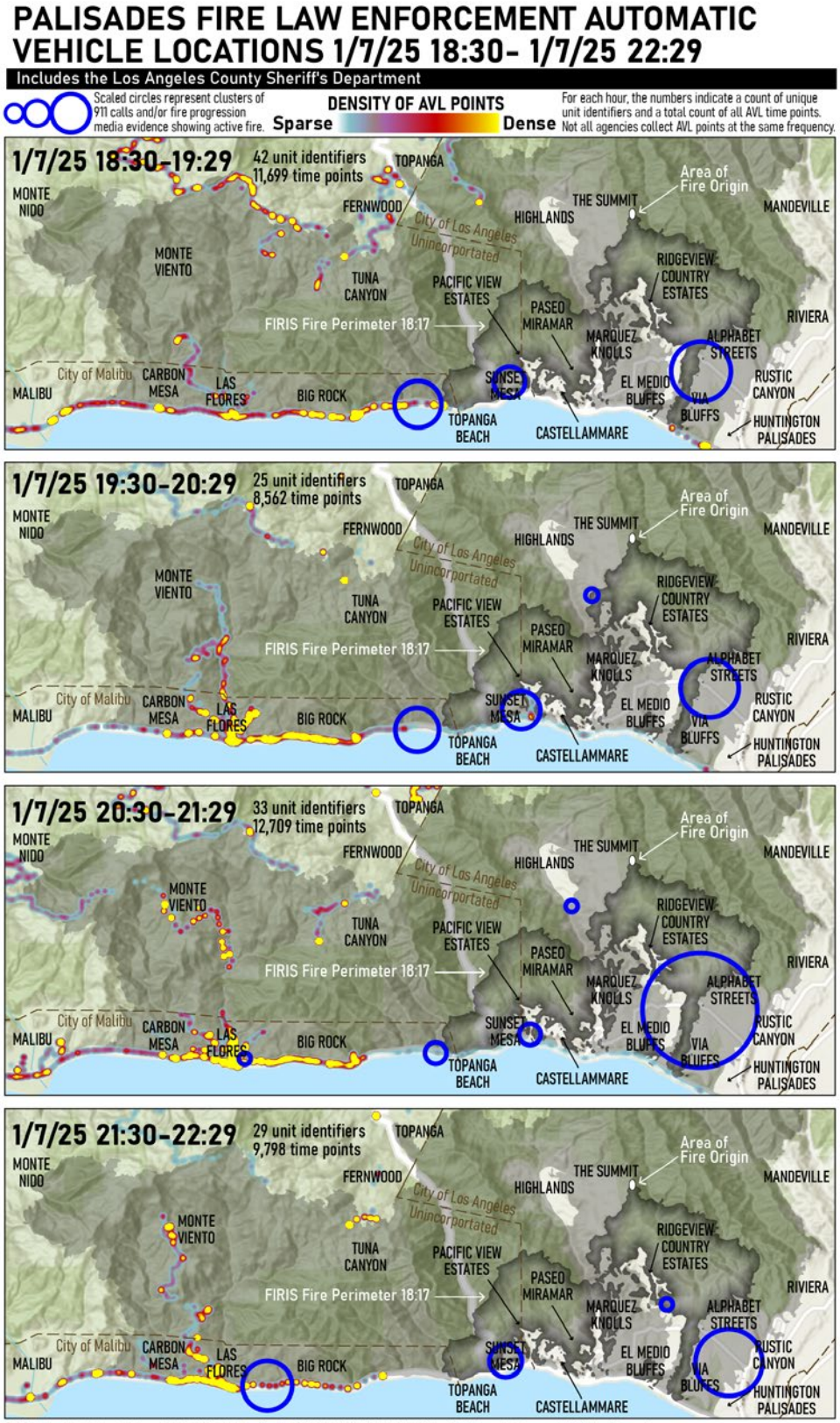
Within an hour, a concentration of resources was also present in the Big Rock community.

After 15:30 and through the rest of January 7, 2025, resources spread west in advance of the fire along PCH and into the Las Flores, Monte Viento, and Carbon Mesa areas of Malibu after 19:30.

In the mid- to late-morning hours of January 8, 2025, LASD resources were distributed throughout most Los Angeles County areas impacted by the fire and along PCH.


PALISADES FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 10:30-1/7/25 14:29
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 10:30-11:29
8 unit identifiers
1,046 time points
1/7/25 11:30-12:29
8 unit identifiers
2,383 time points
1/7/25 12:30-13:29
15 unit identifiers
5,281 time points
1/7/25 13:30-14:29
18 unit identifiers
5,197 time points
MONTE NIDO
MONTE VIENTO
TOPANGA
FERNWOOD
City of Los Angeles Unincorporated
TUNA CANYON
PACIFIC VIEW ESTATES
HIGHLANDS
THE SUMMIT
Area of Fire Origin
RIDGEVIEW COUNTRY ESTATES
MANDEVILLE
PASEO MIRAMAR
MARQUEZ KNOLLS
ALPHABET STREETS
RIVIERA
City of Malibu
MALIBU
CARBON MESA
LAS FLORES
BIG ROCK
SUNSET MESA
EL MEDIO BLUFFS
VIA BLUFFS
RUSTIC CANYON
TOPANGA BEACH
CASTELLAMMARE
HUNTINGTON PALISADES
FIRIS Fire Perimeter 14:11
©2026 Underwriters Laboratories Inc. BASEMAP: Esri, TomTom, Garmin, FAO, NOAA, USGS, NASA, NGA, USGS, OpenStreetMap contributors, and the GIS User Community
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


PALISADES FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 14:30-1/7/25 18:29
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 14:30-15:29
35 unit identifiers
9,676 time points
1/7/25 15:30-16:29
33 unit identifiers
12,304 time points
1/7/25 16:30-17:29
38 unit identifiers
11,803 time points
1/7/25 17:30-18:29
40 unit identifiers
12,410 time points
TOPANGA
MONTE NIDO
FERNWOOD
City of Los Angeles Unincorporated
THE SUMMIT
HIGHLANDS
Area of Fire Origin
MANDEVILLE
RIDGEVIEW COUNTRY ESTATES
MONTE VIENTO
TUNA CANYON
PACIFIC VIEW ESTATES
PASEO MIRAMAR
FIRIS Fire Perimeter 15:17
FIRIS Fire Perimeter 18:17
RIVIERA
MARQUEZ KNOLLS
ALPHABET STREETS
City of Malibu
CARBON MESA
LAS FLORES
BIG ROCK
MALIBU
SUNSET MESA
EL MEDIO BLUFFS
RUSTIC CANYON
VIA BLUFFS
TOPANGA BEACH
CASTELLAMMARE
HUNTINGTON PALISADES
©2026 Underwriters Laboratories Inc. BASEMAP: Esri, TomTom, Garmin, FAO, NOAA, USGS, NASA, NGA, USGS, OpenStreetMap contributors, and the GIS User Community
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


PALISADES FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 18:30- 1/7/25 22:29
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 18:30-19:29
42 unit identifiers
11,699 time points
1/7/25 19:30-20:29
25 unit identifiers
8,562 time points
1/7/25 20:30-21:29
33 unit identifiers
12,709 time points
1/7/25 21:30-22:29
29 unit identifiers
9,798 time points
MONTE NIDO
MONTE VIENTO
TOPANGA
FERNWOOD
City of Los Angeles Unincorportated
TUNA CANYON
PACIFIC VIEW ESTATES
FIRIS Fire Perimeter 18:17
PASEO MIRAMAR
THE SUMMIT
HIGHLANDS
Area of Fire Origin
MANDEVILLE
RIDGEVIEW COUNTRY ESTATES
RIVIERA
MARQUEZ KNOLLS
ALPHABET STREETS
City of Malibu
MALIBU
CARBON MESA
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BIG ROCK
SUNSET MESA
EL MEDIO BLUFFS
VIA BLUFFS
RUSTIC CANYON
TOPANGA BEACH
CASTELLAMMARE
HUNTINGTON PALISADES
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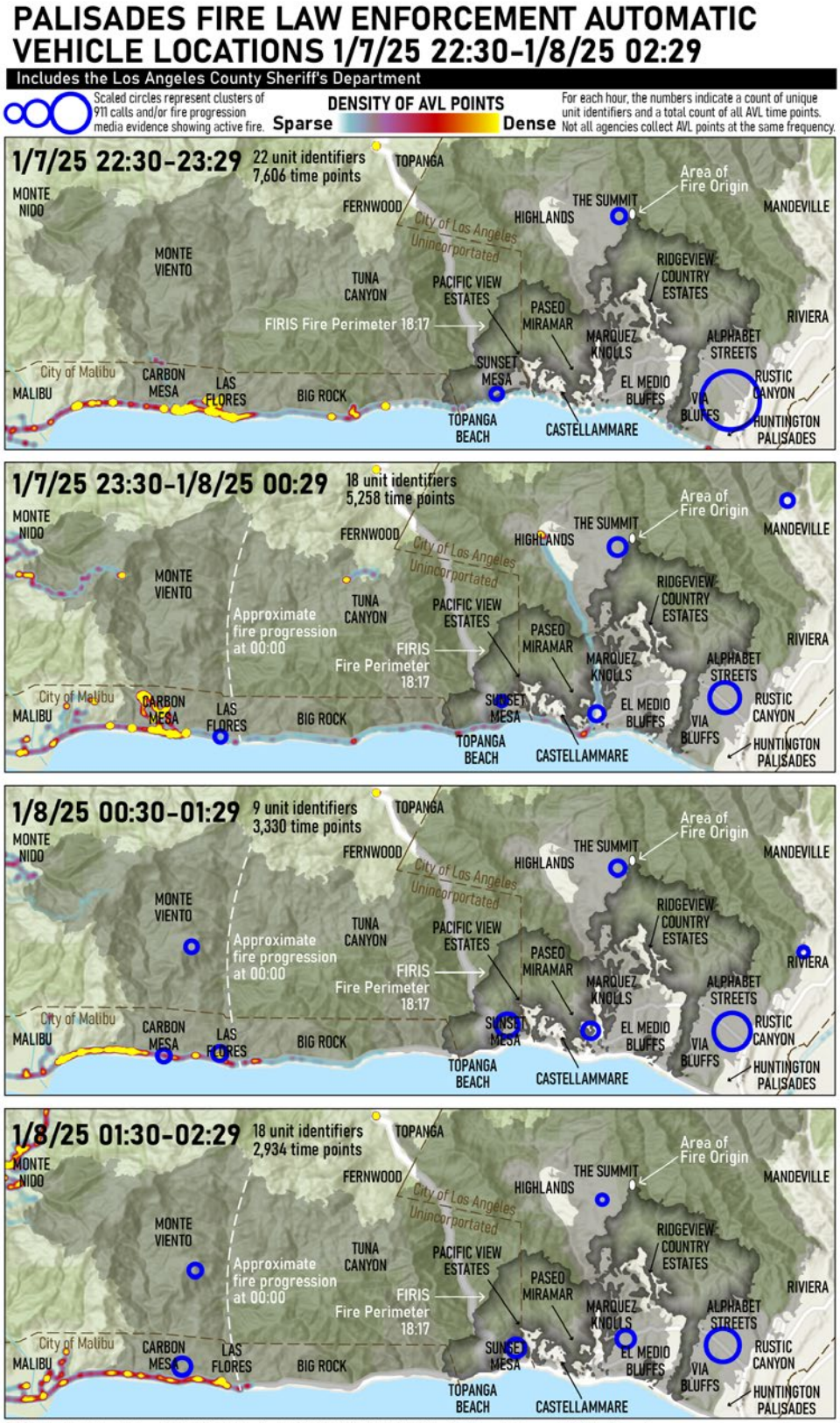
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


PALISADES FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 22:30-1/8/25 02:29
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 22:30-23:29
22 unit identifiers
7,606 time points
1/7/25 23:30-1/8/25 00:29
18 unit identifiers
5,258 time points
1/8/25 00:30-01:29
9 unit identifiers
3,330 time points
1/8/25 01:30-02:29
18 unit identifiers
2,934 time points
Area of Fire Origin
Approximate fire progression at 00:00
FIRIS Fire Perimeter 18:17
City of Los Angeles Unincorporated
City of Malibu
MONTE NIDO
MONTE VIENTO
FERNWOOD
TOPANGA
TUNA CANYON
PACIFIC VIEW ESTATES
PASEO MIRAMAR
THE SUMMIT
HIGHLANDS
MANDEVILLE
RIDGEVIEW COUNTRY ESTATES
RIVIERA
MARQUEZ KNOLLS
ALPHABET STREETS
SUNSET MESA
EL MEDIO BLUFFS
RUSTIC CANYON
VIA BLUFFS
HUNTINGTON PALISADES
CASTELLAMMARE
TOPANGA BEACH
BIG ROCK
LAS FLORES
CARBON MESA
MALIBU
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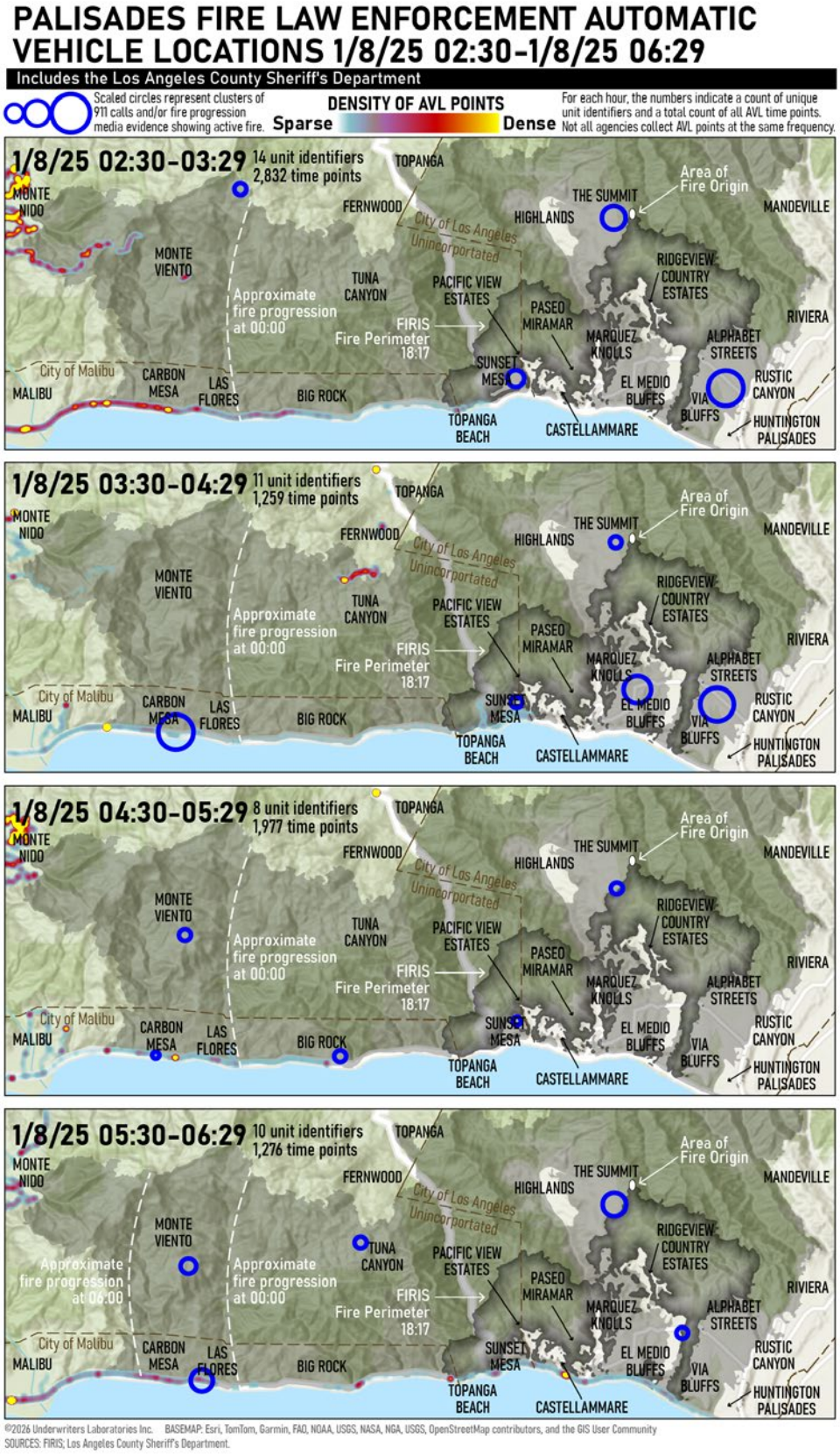
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


PALISADES FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/8/25 02:30-1/8/25 06:29
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/8/25 02:30-03:29
14 unit identifiers
2,832 time points
1/8/25 03:30-04:29
11 unit identifiers
1,259 time points
1/8/25 04:30-05:29
8 unit identifiers
1,977 time points
1/8/25 05:30-06:29
10 unit identifiers
1,276 time points
Area of Fire Origin
Approximate fire progression at 00:00
FIRIS Fire Perimeter 18:17
City of Los Angeles Unincorporated
City of Malibu
MONTE NIDO
MONTE VIENTO
TOPANGA
FERNWOOD
TUNA CANYON
PACIFIC VIEW ESTATES
THE SUMMIT
HIGHLANDS
MANDEVILLE
RIDGEVIEW COUNTRY ESTATES
PASEO MIRAMAR
MARQUEZ KNOLLS
ALPHABET STREETS
RIVIERA
RUSTIC CANYON
SUNSET MESA
EL MEDIO BLUFFS
VIA BLUFFS
HUNTINGTON PALISADES
CASTELLAMMARE
TOPANGA BEACH
MALIBU
CARBON MESA
LAS FLORES
BIG ROCK
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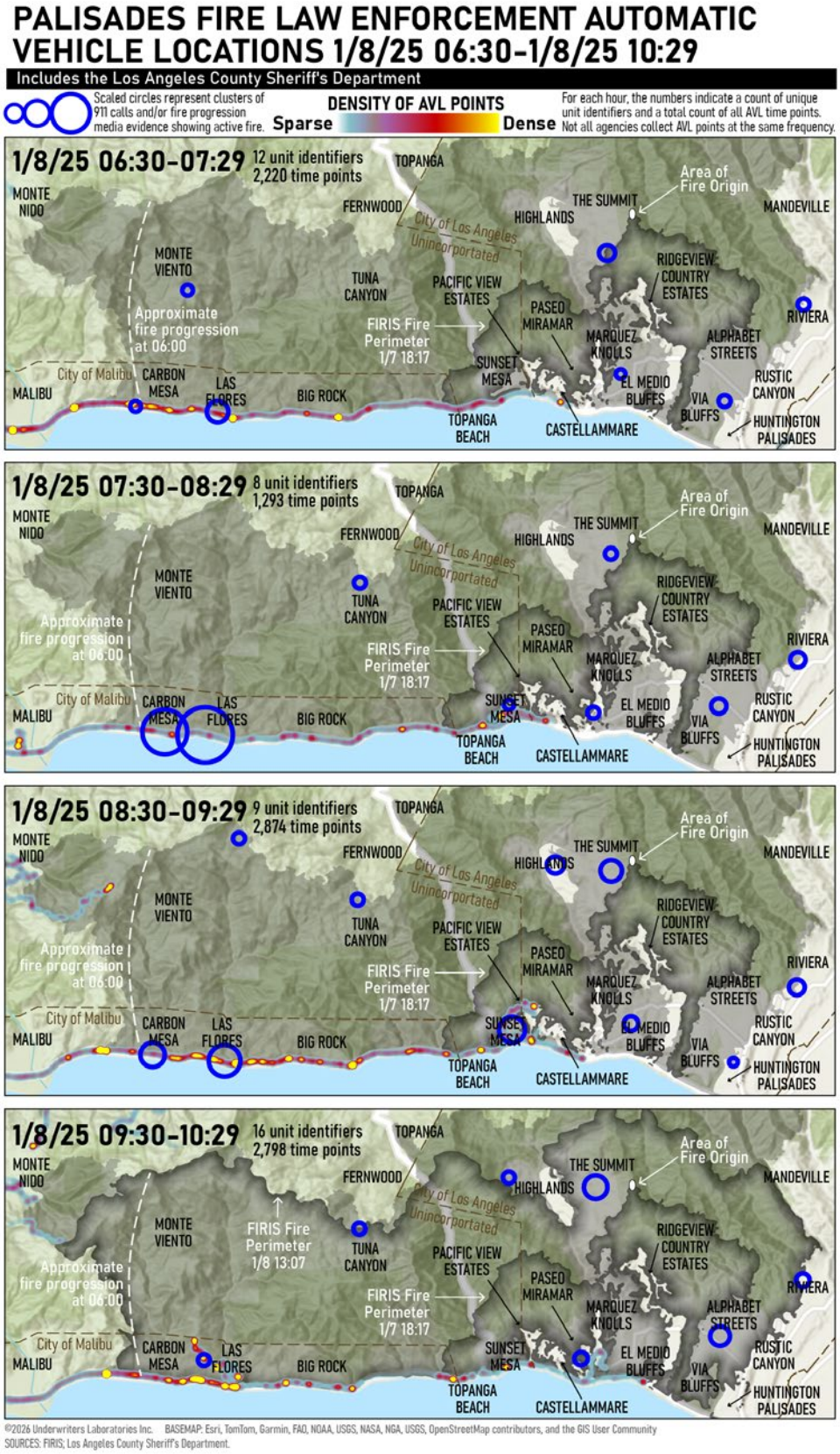


Figure 3.11.12 Palisades Fire Law Enforcement AVL data aggregated to location by hour, for the first 24 hours of the Palisades Fire. These maps include AVL data only from LASD; there were other law enforcement agencies assigned to the incident that did not provide AVL data.

3.11.3 Eaton Evacuation

During the Eaton Fire, traffic control and evacuation operations were primarily conducted by LASD, with support from other local law enforcement agencies in some areas. PPD augmented LASD evacuation and traffic mitigation during the first hours of the fire.

As shown in Figure 3.11.13, the Altadena street grid provided multiple north-south and east-west egress routes, allowing residents to self-evacuate southbound without the same level of corridor congestion seen in the Palisades Fire.

In many cases, Altadena traffic control lights were still operating during the evacuation time period.

The major traffic escape routes from north to south serving Altadena were Allen Avenue, North Altadena Drive, Lake Avenue, El Molino Avenue, Marengo Avenue, North Hill Avenue, North Los Robles Avenue, North Fair Oaks Avenue, and Lincoln Avenue.

Residents used the available street grid to evacuate in vehicles with minimal public safety guidance. No vehicle-related fatalities were identified among those who attempted or successfully completed evacuation.

Figure 3.11.13 Eaton Fire area major roads with Eaton final burn perimeter and area of origin.

3.11.3.1 Eaton Fire Evacuation Coordination

The City of Pasadena produced limited information in response to requests by ULRI and did not participate in TDs with ULRI representatives. As a result, ULRI's understanding of PAS and PPD's operational engagement during the Eaton Fire is based on publicly available information, limited CAD data, redacted PPD BWC footage, and statements shared through podcast discussions that could not be independently verified.

Information related to the formation of an Evacuation Group and the assignment of an Evacuation Group Supervisor to a PAS captain is therefore drawn from secondhand sources. Without participation from PAS, ULRI was unable to further examine or confirm the activities of the Evacuation Group during the first operational period of the Eaton Fire.

HLCO noted at 18:44 on January 7, 2025, that wind speeds were at 70 knots (approximately 80 miles per hour).

At 18:54, HLCO stated the fire was "making a strong push to the east," suggesting evacuation areas to the PAS IC two (2) minutes later.

At 19:18, due to high and erratic winds, HLCO had to return to base. As a result, approximately one (1) hour after the fire started, the ability to gather intelligence on fire progression from the air was lost.

Fire personnel who were at the Rose Bowl ICP by 20:58 (Figure 3.11.14) had limited situational awareness of the fire's location until the morning of January 8, 2025.

Figure 3.11.14 Photograph taken at 21:55 showing fire and law enforcement personnel at the Rose Bowl ICP.

The initial PAS IC established an Evacuation Group consisting of a PAS captain and a PPD sergeant very early in the incident. Command was transferred from PAS to LAC near the intersection of East Washington Boulevard and Allen Avenue between 19:30 and 20:30.

ULRI does not have details about the Evacuation Group's transfer from PAS to LAC or personnel actions as the incident progressed. It appears they worked outside the established command structure and used mutual aid resources from local government agencies to assist with evacuations throughout the night.

During this early period, several different LAC personnel ordered evacuations for areas from Lake Avenue in Altadena to the City of Sierra Madre. And while several chief officers requested evacuations, no single person had final operational accountability.

For the first operational period, the UC structure and individual roles and responsibilities at the Rose Bowl ICP were neither clearly nor formally defined. This contributed to a strategic gap between ICP leadership and operations supervisors in the field who were operating with limited resources and working in extreme fire and weather conditions.

It is known that a Law Branch, which typically handles the evacuation component on an incident, was not established in the LAC Eaton incident organization. Further complicating this fact, some personnel in the UC structure at the Rose Bowl ICP believed that a Law Branch had been established.

In the field, the OSC believed that a Law Branch was being established at 19:35, and that evacuations would be handled by the Law Branch throughout the incident as needed. Branch Directors and DIVS assigned west of Lake Avenue during the fire impact period were operating under the same assumption.

A full command and general staff organization with a Law Branch should have been established early in the incident. During this time, there were ample chief officers from multiple agencies available to fill these roles at both the Farnsworth Park and Rose Bowl ICPs.

However, by 22:30 the Hurst Fire had ignited, and several LAC chief officers left the Rose Bowl ICP to respond to the incident. Also at this time, the ANF chief left the Rose Bowl ICP to address ANF's area of responsibility.

As these experienced officers left the incident, LAC incident command resources were strained for the remainder of the night.

For example, the ANF chief was the only person at the Rose Bowl ICP monitoring satellite images of fire progression using FireGuard. When the ANF chief left, that intelligence was lost to the ICs.

The county now had three (3) major fires burning, each with extreme fire behavior predicted to continue and potentially worsen.

Also at around 22:30, the Branch VII director responsible for a large area west of Eaton Canyon got a flat tire. Therefore, the Branch Director had to travel to LAC Camp 2 in La Crescenta, locate a suitable vehicle, and return to the assigned area of responsibility.

During this period, the fire continued to be reported as pushing east. In response, resources were prioritized to areas east of Eaton Canyon.

The fire was also backing into the foothills and extending to the west. Fire supervisory personnel in the field could not see the fire location due to smoke and embercast. As the evening progressed, conditions deteriorated on both flanks of the fire.

All intelligence reports, including radio reports from the field and 911 calls for service, indicated that the fire was continuing to push east. Situational awareness was compromised by a lack of visibility, a very large fire footprint impacting many neighborhoods, a lack of resources, no aerial surveillance, and a lack of supervisory overhead personnel to effectively cover the area on fire.

The OSC, Branch Directors, and DIVS were forced to respond to many 911 calls and make numerous rescues themselves, diverting them throughout the night from operating at the strategic level, deploying resources, and attempting to monitor fire location.

Activity West of Lake Avenue, Altadena

Shortly before midnight on January 7, 2025, LASD activity west of Lake Avenue around West Loma Alta Drive increased. After this time, LASD evacuation activity became concentrated between Lake Avenue and Lincoln Avenue, and then to the south as the fire progressed.

LASD officers went door-to-door, while patrol cars used PA systems to alert residents to evacuate.

Just after midnight, an LAC paramedic squad responded to Glenrose Avenue and West Loma Alta Drive. In a TD, they reported embercast “like snow” and structures on fire west of Lake Avenue.

Importantly, this resource was not assigned to the incident as discussed in Section 3.5.3.2. They were instructed to respond to 911 calls as part of normal daily operations and were receiving dispatches from LA FCCF and not through the OSC. As a result, no information on what they witnessed was reported to anyone working on the incident.

Had all 911 calls in the vicinity of the fire been routed through the OSC (or preferably a designee), this crucial information on the fire’s progression west of Lake Avenue could have been known and acted upon earlier to trigger additional evacuation notifications.

The first indication to LAC that the fire had slowed its eastward progression occurred at 01:18 on January 8, 2025. The Branch Director reported on the radio that fire behavior had reduced significantly in the brush and that it was hung up in the hills above Baldwin Court in Sierra Madre.

However, fires were still raging in neighborhoods east of Lake Avenue and into Sierra Madre, where hundreds of structures were still on fire (Figure 3.11.15).

Figure 3.11.15 Image from a video taken at 01:23 showing flames through the roof of a structure in Sierra Madre.

At around 02:00 on January 8, 2025, the OSC was directed by incident command to assign resources to protect the NASA JPL. The OSC was informed that the facility contained hazardous materials and could compromise the health of all residents in the San Gabriel Valley if it burned.

Virtually all other fire resources were still east of Lake Avenue and spread out over several miles. They were actively involved in rescue, evacuation, and structure defense, and were far short of the resources needed and requested for those areas.

With this evolving threat coming from west of Altadena, resources were further spread out and strained.

Fire personnel working on the incident and at the ICP were unaware the fire was already burning west of Lake Avenue and it was about to worsen.

A report of fire progression to the west was received by LAC IC at the Rose Bowl ICP at 02:19. The report stated that there was fire in the foothills above Farnsworth Park.

The OSC acknowledged the report and stated that a suitable landmark had been identified, and they would proceed to the Rose Bowl ICP to review the map. LAC IC instructed OEM to initiate an evacuation order west of Lake Avenue.

OEM began entering the order into Genasys at 03:06. Records indicate it was sent to the public at 03:26.

By this time, the fire was already well established in neighborhoods west of Lake Avenue and would make an aggressive push southwest over the next several hours.

At around 02:30, and for the next several hours, the area west of Lake Avenue had several actively burning structures, as described in the Phase One report.[1]

The OSC attempted to shift resources from the eastern portion of the incident, but all available resources were already committed.

The distance from Mt. Wilson Trail in Sierra Madre, where LAC E96 was fighting a house fire, to Lake Avenue and East Loma Alta Drive is approximately 7.5 road miles. It took time for resources to leave their areas in the east and navigate through the fire to areas in the west.

At 02:35, the OSC began receiving calls for structure fires south of Farnsworth Park (Figure 3.11.16). At this time and throughout the night, there were hundreds of structures across the incident that were free burning without any fire apparatus in the vicinity.

By the time the OSC could identify and move some fire resources from the east to the west, multiple fire personnel stated they could not access areas in northwest Altadena. The OSC requested resources to move from JPL at 03:00, however, streets were impassable due to intense fire.

There were no resources in staging, and no additional resources would arrive until later in the day on January 8, 2025. The resources present at the incident were all that could be used.

Figure 3.11.16 Image from a video taken at 02:37 on January 8, 2025, showing the conditions near East Loma Alta Drive and Lake Ave.

Fire apparatus that were engaged west of Lake Avenue were concentrated between Lake Avenue and Lincoln Avenue and north of West Altadena Drive. Most fire resources were forced out of that area by 05:30.

The fire had engulfed much of north-central Altadena and was rapidly moving south. Many parts of west Altadena were untenable due to intense fire and access being cut off by downed trees, utility poles, and overhead wires lying in roadways.

By 06:05, January 8, 2025, fire and law enforcement, assisted by civilians, were actively evacuating residents from a 200-resident senior care home on El Molino Avenue. By this time, the Eaton Fire had reached the southernmost and westernmost extents of the fire perimeter within Altadena.

There was no single person, agency, or reason why some evacuation notifications were sent later than others when the fire impacted west Altadena. However, there was a series of coordination issues exacerbated by an inadequate incident organization, as well as continuing response challenges due to a shift in the fire's spread, an urgent threat to the community from potential JPL exposure, challenges with maintaining situational awareness due to rugged terrain and high/erratic winds grounding aircraft, and limited resources available due to the simultaneous occurrence of multiple large wildfires.

3.11.3.2 LASD Evacuation Response

When the fire started, the LASD ALD and CVS patrol stations had a minimum deployment of deputies available, as 50% of their patrol force had deployed earlier in the day to the Palisades Fire.

The number of LASD patrol units assigned during the first 13 hours of the Eaton Fire was insufficient to conduct multi-community evacuations, rescues, calls for service, and effective traffic control.

As a result, ALD deputies prioritized door-to-door evacuation notifications, rescues, vulnerable population assistance, and response to urgent life-safety calls rather than staffing a formal network of fixed TCPs.

Between 18:18 and 19:18, residents in the eastern part of the Altadena community, nearest to the WUI and in direct fire threat, were being evacuated and rescued primarily by ALD and CVS LASD patrol officers.

ALD deputies would normally patrol the same area day-to-day in single-person patrol cars, but on the day of the fire, they were generally doubled up in patrol cars. This made it safer for deputies in hazardous conditions, but reduced coverage ability for canvassing neighborhoods.

First-on-scene LASD deputies immediately began door-to-door evacuations in the areas of North Altadena Drive, Canyon Close Drive, New York Drive, Fox Ridge Drive, Creekside Court, Homewood Drive, and other streets nearby.

Fire resources from LAC were actively fighting fire in the same area, while deputies evacuated residents using PAs, vehicle sirens, and "door knocks."

From the start of the fire, LAC and LASD units were inundated by the fire's force and speed, the power of the winds, and the housing density of the community in the initial impact area of the fire spread.

At 18:21, an LASD deputy, concerned about evacuation resources, called on the radio requesting LASD Search and Rescue to supplement the available personnel.

At 18:51, the SMFD fire chief called Los Angeles County CEOC requesting Sierra Madre Genasys evacuation zones be added to the list of evacuation notifications. Sierra Madre zones received an evacuation warning at 20:53.

At about 19:00, local ALD deputies were limited and concentrated on evacuations in two (2) localized areas: the North Altadena Drive community and the Kinneloa Mesa and Canyon community.

There were limited traffic management actions during the initial period of the Eaton Fire response.

At 19:02, LASD deputies managed traffic flow on Sierra Madre Boulevard and New York Drive to relieve gridlock and requested aid from PPD for traffic control.

At about 19:30, LASD managed evacuation traffic at New York Drive and Eaton Canyon Drive, a major intersection critical for Kinneloa Mesa residents fleeing the active fire.

At around the same time, LASD deputies were limited in number and concerned about access and egress for residents exiting remote and hillside neighborhoods.

With limited evacuation resources, deputies in two (2) patrol cars began immediate evacuations in the east Altadena/Kinneloa Mesa area, including the areas near Kinclair Drive and Crystal Lane.

At 19:34, PPD officers helped LASD evacuate Altadena homes west of North Altadena Drive and north of New York Drive. Supervisors from both agencies coordinated evacuations at the first ICP at Eaton Canyon and the second ICP at Farnsworth Park.

At about 19:45, a one (1)-deputy LASD patrol car was assisted by two (2) PPD officers as they coordinated evacuations of an equestrian center in the East Altadena area.

During this time, evacuating residents effectively utilized local Altadena streets to self-evacuate south in their cars.

The street patterns in this community offered many options for emergency egress, with the exception of streets north of Loma Alta Drive and northernmost streets in Kinneloa Mesa, Hastings Ranch, and Sierra Madre.

By 19:50, LASD deputies requested that the ICP send deputies to create a TCP for evacuation egress eastbound on New York Avenue and Pepper Drive. The request was received by the ICP and field units were instructed to concentrate on evacuations.

At 20:39, ALD deputies were still waiting for the first two (2) MFF squads to arrive and assist with traffic control. As the Eaton Fire expanded, deputies were required to balance traffic control with rescue operations, including evacuations of elderly residents, mobility-impaired individuals, and assisted living facilities.

Just after 19:00, an LAC BC assumed the IC role from PAS and the ICP was moved to Farnsworth Park until approximately 21:00 when it is moved for the final time to the Rose Bowl.

For nearly two (2) hours, evacuation decisions and priorities were coordinated and established between a field LASD sergeant and the LAC BC. This coordination would deteriorate when the ICP moved to the Rose Bowl, as LAC and LASD moved into separate trailers, and when fire behavior intensified over the next several hours.

When the LASD CVS Watch Commander arrived at Farnsworth Park to officially assume the LASD IC role, a CVS deputy was designated to monitor LAC evacuation orders. These evacuations were managed through Genasys.

The LASD deputy, experienced with Genasys, worked directly with LAC and communicated real-time evacuation zones to deputies in the field.

Prior to 20:00, deputies concentrated on evacuations in two (2) distinct areas: the Kinneloa Canyon and Mesa area, and the residential area of East Altadena and Porter Avenue.

At about 20:19, deputies also conducted evacuation activities at an assisted living facility on North Altadena Drive.

By about 20:45, evacuation alerts were sent, and deputies were spread throughout Altadena responding to 911 calls for emergency evacuations in areas just east of Lake Avenue.

Many 911 calls were for deputies to assist disabled elderly residents who had been notified to evacuate, but were homebound within evacuation zones due to mobility issues. Page Drive in Altadena included elderly wheelchair users needing rescue. Numerous deputies successfully rescued them, while other LASD deputies evacuated the areas of New York and Allen Streets to the east. LASD units continued to be primarily dispatched by radio from a portable ICP trailer across the street from ALS.

By 21:00, LASD still lacked enough resources to effectively evacuate fire-threatened areas.

Deputies in patrol units generally relocated from the Kinneloa Mesa area and concentrated on other evacuation areas of Altadena, including Mendocino Drive, Allen Avenue, and areas north of the Altadena Golf Course, such as Pinecrest Drive.

In addition to receiving evacuation and fire-related calls on patrol car MDCs, they were also sent calls from household security systems. These calls were received by LASD dispatchers from private alarm companies who sent to units in the field. However, these lower-priority call types created confusion for patrol units.

As such, deputies advised dispatch that they were unable to handle these lower-priority alarm calls and continued to concentrate on life safety.

By 22:00, deputies were evacuating eastern foothill neighborhoods and areas throughout Altadena, primarily east of Lake Avenue, and had also moved into Sierra Madre. Deputies were still limited in staffing and were triaging evacuation efforts based on direct movement of active fire fronts.

Around this time, additional LASD MFF deputies began arriving from other LASD stations, such as Norwalk Station, which helped replenish much-needed evacuation patrol resources.

ALD deputies were dispatched via multiple channels, including LASD patrol radio, cellular phone from deputy to deputy, and patrol car MDC. They were dispatched to address emergency evacuation calls, including elderly rescues on Pepper Drive, Roosevelt Avenue, and East Oakwood.

There were no set evacuation TCPs established at this time, nor was there a formal evacuation traffic management plan in effect.

Between 22:30 and 23:00, LASD Search and Rescue units arrived on scene and assisted patrol deputies with evacuations and rescues. LASD evacuation police car units staged out of the parking lot on East Altadena Drive across the street from the ALD. Later, the official LASD evacuation resource staging area was moved to Hansen Dam.

LAC personnel reported that they suggested issuing evacuation orders for the Altadena Foothills before midnight on January 8, 2025. During TDs, however, UC staff did not recall this information and reported the fire was not moving west at that time.

Around midnight through 01:00 on January 8, 2025, LASD units were making resident contacts during “knock and notify” operations in the area of East and West Loma Alta Drive around Fair Oaks Avenue, as units from other stations began to arrive.

At this time, LASD was not systematically evacuating areas west of Lake Avenue, but was responding to specific life safety threats.

Between 00:16 and 00:37, LASD deputies responded to reports of looters entering evacuated neighborhoods, including a call that required deputies to search a residence on Saint James Place west of Lake Avenue. These responses diverted personnel from evacuation and rescue operations at a time when staffing remained limited.

At 00:37, LASD units moved through the area of Grandeur Avenue between West Mariposa Street and West Harriet Street (west of Lake Avenue), making resident contacts and directing occupants to leave threatened areas.

At about 00:41, LASD Search and Rescue units discussed evacuation plans on the radio to facilitate coverage in the Canyon Crest area of Sierra Madre.

Shortly after, at 00:42, deputies concentrated on evacuation and rescue calls for vulnerable populations, including homebound elderly residents in the area of Canyon Crest Drive and Orange Drive.

Deputies typically contacted one another by cell phone for coordination and assistance on rescues and evacuations. Deputies from outlying LASD stations, who were unfamiliar with the area, tended to work in pairs with other patrol cars.

While ambulances were busy with medical evacuations, deputies constructed makeshift ways to rescue trapped, non-mobile persons from homes and transport them to safety zones in south Altadena. These actions were time-consuming, but likely saved many lives.

At 01:17, an ALD patrol sergeant was in the field evaluating evacuation zones between Lake Avenue and Mount Curve Avenue in Altadena, while evacuations were also occurring in the foothills along East Carter Avenue in Sierra Madre.

There were not enough deputies to conduct complete evacuation operations along West Loma Alta Drive and west of Lake Avenue, as many evacuations were still occurring in the foothills to the east of Altadena.

At about 02:00, deputies conducted rescues and evacuations in the Altadena neighborhood of East Mendocino, east of Sinaloa Avenue. There were limited resources committed in central Altadena, west of Lake Avenue.

Just after 02:00, an LAC unit requested LASD help with uncooperative residents at Carriage House Road in Hastings Ranch neighborhood, who were interfering with fire operations.

At 02:11, deputies, a Search and Rescue unit, and a supervisor unit reported to East Palm Street, just west of Lake Avenue, as three (3) looters were detained by Search and Rescue. The looters were searched, detained, and released rapidly due to the priority of life safety calls over property. While difficult, the decision preserved life-safety priorities.

TCPs and hard closures of roadways were not consistently deployed or staffed due to the limited number of resources, though deputies discussed potential TCP hard closure locations over radio traffic.

At 02:40, an LASD unit evacuated multiple houses and relayed to the LASD command post that multiple houses were on fire on Poppyfields Drive in Altadena, west of Marengo Avenue.

At 02:44, deputies located an elderly resident in a home on El Sereno Avenue, north of East Loma Alta Drive and west of Lake Avenue, which was directly threatened by the fire after repeated attempts to make contact initially went unanswered.

With fire conditions rapidly worsening, multiple deputies, assisted by a neighbor, entered the residence and removed the disabled resident to safety. Available information indicates the resident may not have survived without the persistence and actions of the responding deputies with support from the neighbor.

At 02:45, an LAC fire resource requested LASD units to assist with evacuations on East Washington Boulevard and North Altadena Drive.

Between 02:47 and 03:00, LASD units concentrated on evacuating high-threat fire areas west of Lake Avenue and north of West Loma Alta Drive, in the area of north Fair Oaks above West Loma Alta Drive, from Canon Boulevard (near Lake Avenue) to Chaney Trail (northwestern flank of the fire).

This was part of a focused LASD push to evacuate smaller dead-end streets, including Sunset Ridge, Lincoln at West Alta Loma Drive, Taos, Twilight, Purple Sage, Upper Fair Oaks, Glenrose, McNally, Alzada, and Chaney. Deputies conducted evacuations in a pattern that tracked the active fire spread.

Also around 03:00, deputies discussed over the radio a resident near Poppyfields Drive in Altadena who was refusing to evacuate.

At 03:08, deputies established temporary TCP hard closures on East Loma Alta Drive and Hollyslope Road, west of Lake Avenue. Moments later, the TCP had to be abandoned because of active fire progression and officer safety.

At 03:09, deputies reported that the fire was already approaching West Loma Alta Drive and advised the LASD ICP to move LASD units from Canon Boulevard, Hollyslope Road, and Devonwood Road, south to Loma Alta Drive.

By 03:16, LASD MFF units increased in strength, while evacuations were continuing to occur west of Lake Avenue. Units were conducting extensive evacuations in the areas of Loma Alta Drive, Chaney Trail, Sunset Drive, Fair Oaks Avenue, and Altadena Drive.

Between 03:30 and 03:55, deputies were concentrated on evacuating neighborhoods west of Lake Avenue in and around East Loma Alta Drive, Sunset Drive, Lincoln Avenue, Marengo Avenue, Palm Street, and Glenrose Avenue.

Between 04:00 and 04:30, deputies conducted evacuations in two (2)-person patrol units in numerous neighborhoods, including north of East Loma Alta Drive near Chaney Trail, Sunset Ridge Road, Lincoln Avenue, Midwick Drive, New York Drive, Holliston Avenue, and Santa Anita Avenue.

At about 04:45, ALD deputies established a temporary TCP on Fair Oaks Avenue near West Mariposa Street. Deputies advised that LASD units were holding temporary TCP hard closures along Altadena Drive and needed to move them south to increase the safety perimeter.

During that time, there were radio reports of fire burning near Altadena Station at Fontanent Way and El Molino Avenue.

While deputies were evacuating the station, at about 05:30, two (2) resource-intensive LASD evacuation operations involving disabled senior citizens were occurring simultaneously in two (2) different locations in Altadena.

Both senior care facilities were located west of Lake Avenue: one (1) was a small senior care home on the west side of Santa Anita Avenue, south of East Sacramento Street, and the other was a senior care home on El Molino Avenue between East Calaveras and Alameda Streets.

The first residential care facility was a healthcare-style operation housed within a converted single-family residence. At the time of the incident, two (2) caregivers were responsible for nine (9) residents, many of whom had significant mobility and care needs and were unable to evacuate independently.

In a BWC recording, a caregiver stated that concerns about the possibility of such an event had previously been raised with facility management.

Evacuating residents presented substantial challenges due to their care requirements, mobility limitations, and the rapidly evolving fire conditions.

By approximately 05:30, multiple deputies and other personnel became actively involved in the effort, assisting residents with mobility, gathering essential belongings, coordinating transportation, and communicating with facility supervisors. Deputies also worked with caregivers to arrange transportation resources for the residents.

The evacuation was further complicated by the need to bring privately owned vehicles into the area to transport residents to safety. The operation continued until after 06:00, as the evacuation required considerable time and resources, with many residents needing direct assistance to relocate safely.

Also at approximately 05:30, a senior care home on El Molino Avenue needed to be evacuated. The 200-plus patient residential facility is a multi-story, multi-building senior citizen skilled nursing care facility.

LASD evacuation units arrived to find the facility within the fire zone and still fully occupied by senior patients and few staff members.

Many residents were asleep in their rooms when deputies arrived, and some did not respond to initial door knocks due to medical conditions or mobility limitations.

Deputies organized an evacuation effort and were assisted by LAC firefighters and Pasadena Transit bus drivers, who helped transport residents to a safe location. Evacuation and rescue activities at the senior care home continued as late as 07:00.

During the evacuation period from 05:30 to 07:00, LASD continued evacuations in the East Altadena foothills. At the same time, critical records, vehicles, and safety equipment were moved from the ALD station to CVS.

From 07:30 to 11:00 on January 8, 2025, LASD deputies responded to a variety of missions from the ICP. These included reinforcing TCPs at LAC's request, evacuating ALD, patrolling for looters, and responding to evacuation calls from the ICP.

TCPs were staffed by LASD units at strategic locations, including, but not limited to, Sierra Madre Boulevard and New York Drive, East Washington at North El Molino Avenue, and Lincoln Avenue.

At about 09:52, a two (2)-person LASD unit rechecked the senior care home on El Molino Avenue that had been evacuated earlier that morning and discovered and rescued an elderly resident still inside. This emphasizes the importance of secondary evacuation searches.

At approximately 09:55, deputies were conducting evacuations of residents on Devirian Place in Altadena, where houses were on fire and residents were still present in the streets (Figure 3.11.17).

Figure 3.11.17 At 09:55 on January 8, 2025, houses were on fire in the vicinity of Devirian Place and West Altadena Drive.

Into the afternoon on January 8, 2025 (at approximately 12:58), deputies in the area of 8** Alameda Street in Altadena were still evacuating residents who initially chose to stay behind (Figure 3.11.18). Some houses on the street were now fully involved in fire.

Shortly afterward, additional LASD deputies were positioned in the eastern area of La Canada Flintridge, the next community that could have been impacted if the fire continued to push to the west.

Figure 3.11.18 At about 12:58 on January 8, 2025, deputies in the area of 800 Alameda Street in Altadena were still evacuating residents.

Looter patrol and perimeter hardening were paramount between 14:00 and 18:00. Deputies apprehended and arrested multiple looters caught inside an evacuated house in the area of Lincoln Avenue and West Loma Alta.

Between 15:30 and 16:30, LASD units were spread throughout Altadena and Sierra Madre, conducting resident assistance and TCP control. The units were heavily concentrated along and west of Fair Oaks Avenue from West Loma Alta Drive to East Woodbury, consistent with fire spread and evacuation orders throughout the morning and afternoon.

During the critical early hours of the Eaton Fire, limited staffing constrained LASD's ability to manage evacuations, traffic flow, rescues, and security operations simultaneously.

While ICP leadership made the decision to concentrate on evacuations and rescues over traffic management, ALD deputies repeatedly transmitted timely intelligence reports to command staff and identified the need for traffic control from the start of the fire through the early hours of January 8, 2025.

3.11.3.3 AVL Data - Eaton Fire

AVL heatmaps in Figure 3.11.19 display law enforcement location for each hour from the start of the Eaton Fire through 18:17 on January 8, 2025.

AVL data shows LASD resources mostly in areas either under evacuation notifications, impacted by fire, or communities near these areas.

From 18:18 to 20:17 on January 7, 2025, LASD resources were most concentrated in the Eaton Canyon area, where the fire first impacted a community of homes.

For the next several hours, they moved west into the northern boundary of Altadena, and by 21:18, they had begun to establish a presence east of Lake Avenue.

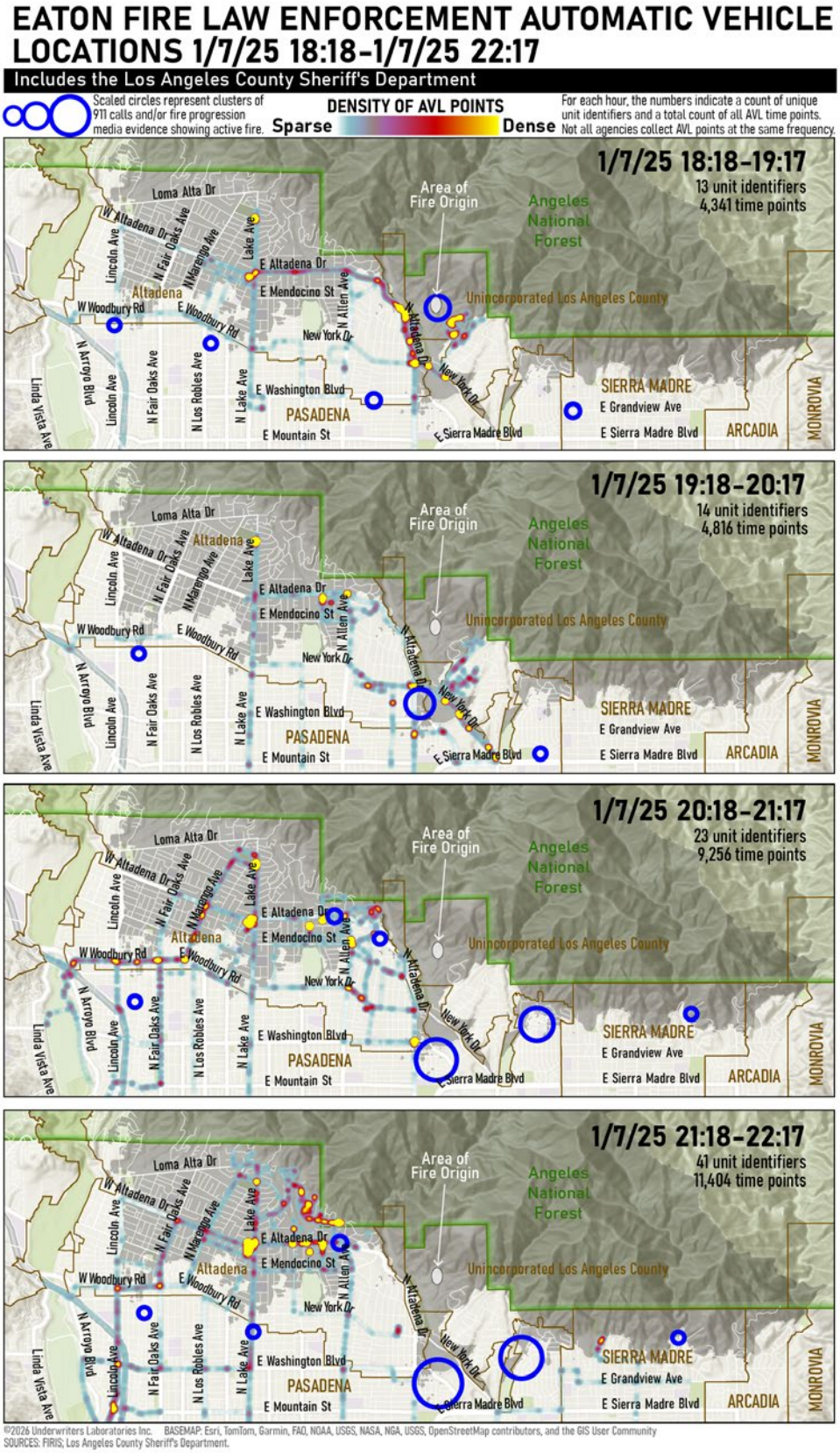
By 22:17, LASD units had also begun to move into Sierra Madre, with a substantial presence in the foothill areas of the community for the next four (4) hours.

At 01:18 on January 8, 2025, LASD's presence in the northern portion of Altadena, west of Lake Avenue, increased, and a high density of units remained until 04:18, as resources were being forced to move south by fire activity.

After approximately 09:18, LASD resources returned to north Altadena between Lake Avenue and Lincoln Avenue and remained operating throughout Altadena through the end of the analysis window at 18:17 on January 8, 2025.

The number of LASD resources on the fire, as per AVL data, shows the initial response of 13 units at 18:18 on January 7, 2025, and a high of 81 units at 16:18 on January 8, 2025.

Note: *Figure 3.11.19 shows limited law enforcement activity in Pasadena, as no AVL data was provided by PPD.*


EATON FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 18:18–1/7/25 22:17
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 18:18–19:17
13 unit identifiers
4,341 time points
1/7/25 19:18–20:17
14 unit identifiers
4,816 time points
1/7/25 20:18–21:17
23 unit identifiers
9,256 time points
1/7/25 21:18–22:17
41 unit identifiers
11,404 time points
Area of Fire Origin
Angeles National Forest
Unincorporated Los Angeles County
Loma Alta Dr
W Altadena Dr
N Fair Oaks Ave
N Marengo Ave
Lake Ave
Lincoln Ave
Altadena
E Altadena Dr
E Mendocino St
N Allen Ave
W Woodbury Rd
E Woodbury Rd
N Arroyo Blvd
N Altadena Dr
New York Dr
Linda Vista Ave
N Los Robles Ave
E Washington Blvd
PASADENA
E Mountain St
E Sierra Madre Blvd
SIERRA MADRE
E Grandview Ave
ARCADIA
MONROVIA
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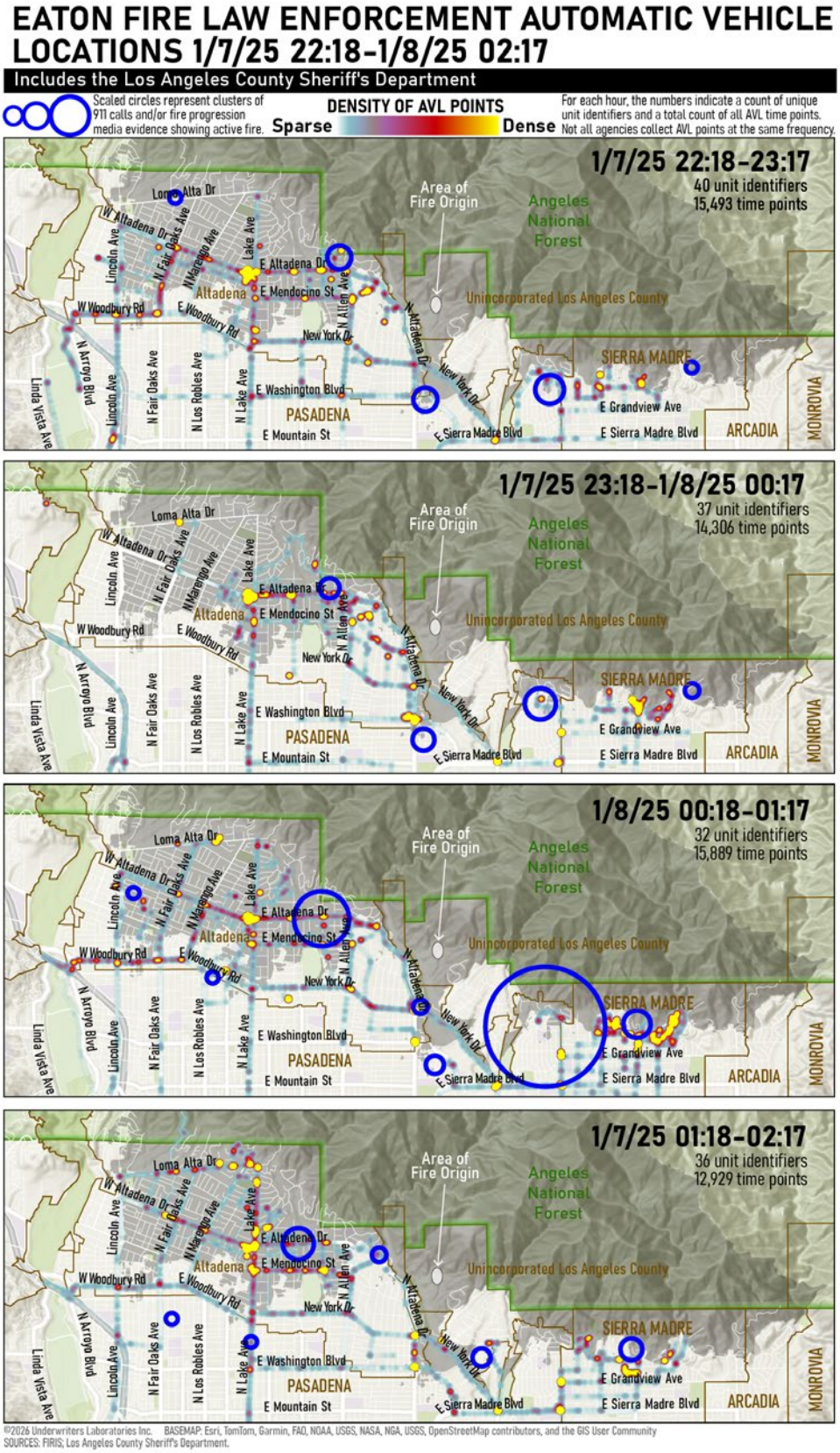
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


EATON FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/7/25 22:18-1/8/25 02:17
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/7/25 22:18-23:17
40 unit identifiers
15,493 time points
1/7/25 23:18-1/8/25 00:17
37 unit identifiers
14,306 time points
1/8/25 00:18-01:17
32 unit identifiers
15,889 time points
1/7/25 01:18-02:17
36 unit identifiers
12,929 time points
Area of Fire Origin
Angeles National Forest
Unincorporated Los Angeles County
SIERRA MADRE
PASADENA
ARCADIA
MONROVIA
Altadena
Loma Alta Dr
W Altadena Dr
E Altadena Dr
E Mendocino St
W Woodbury Rd
E Woodbury Rd
New York Dr
E Washington Blvd
E Mountain St
E Sierra Madre Blvd
E Grandview Ave
Lincoln Ave
N Fair Oaks Ave
N Marengo Ave
Lake Ave
N Allen Ave
N Altadena Dr
N Arroyo Blvd
Linda Vista Ave
N Los Robles Ave
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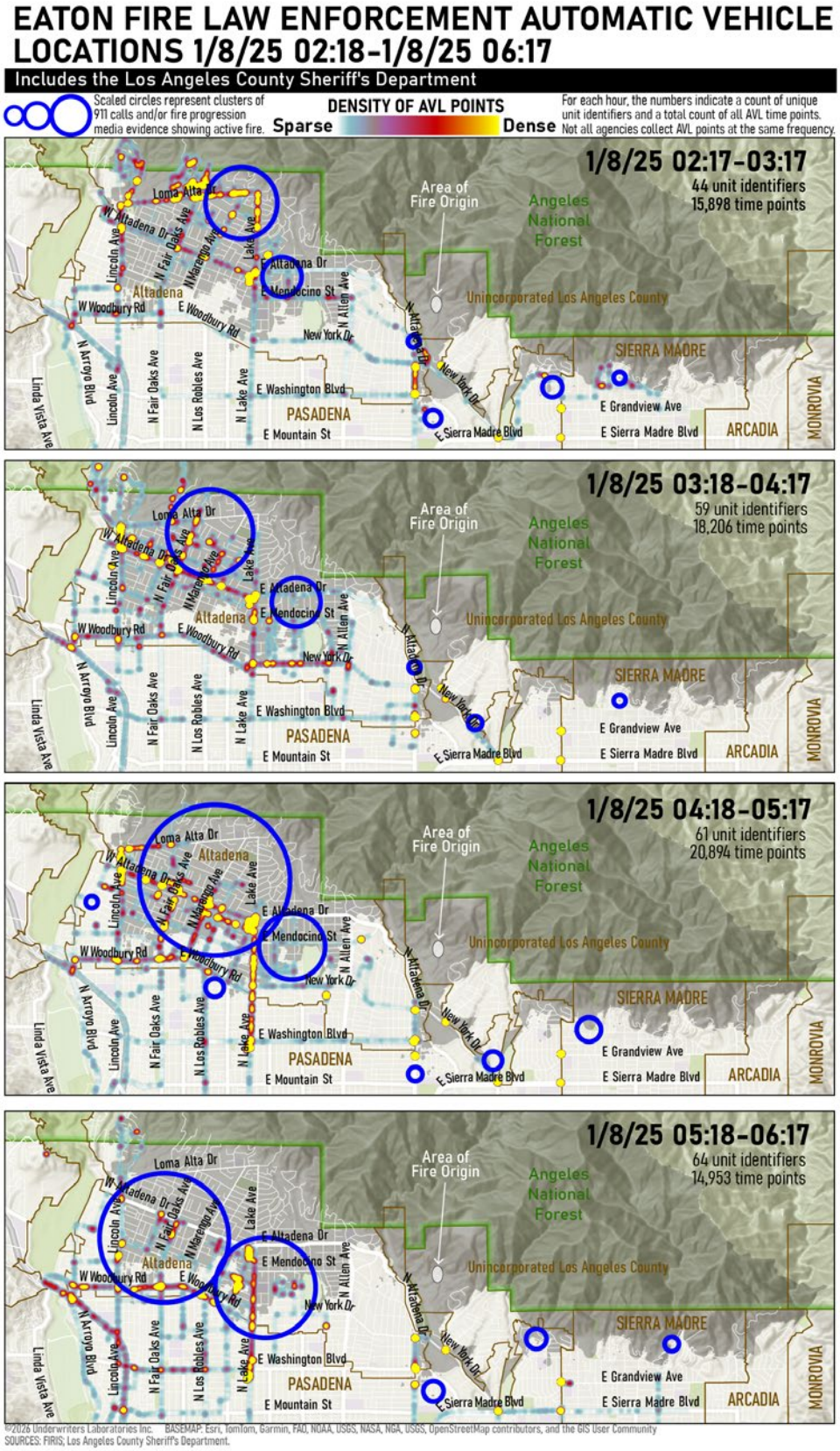
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


EATON FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/8/25 02:18-1/8/25 06:17
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/8/25 02:17-03:17
44 unit identifiers
15,898 time points
1/8/25 03:18-04:17
59 unit identifiers
18,206 time points
1/8/25 04:18-05:17
61 unit identifiers
20,894 time points
1/8/25 05:18-06:17
64 unit identifiers
14,953 time points
Area of Fire Origin
Angeles National Forest
Unincorporated Los Angeles County
Altadena
PASADENA
SIERRA MADRE
ARCADIA
MONROVIA
Loma Alta Dr
W Altadena Dr
E Altadena Dr
E Mendocino St
W Woodbury Rd
E Woodbury Rd
New York Dr
E Washington Blvd
E Mountain St
E Sierra Madre Blvd
E Grandview Ave
Lincoln Ave
N Fair Oaks Ave
N Marengo Ave
Lake Ave
N Allen Ave
N Arroyo Blvd
N Los Robles Ave
Linda Vista Ave
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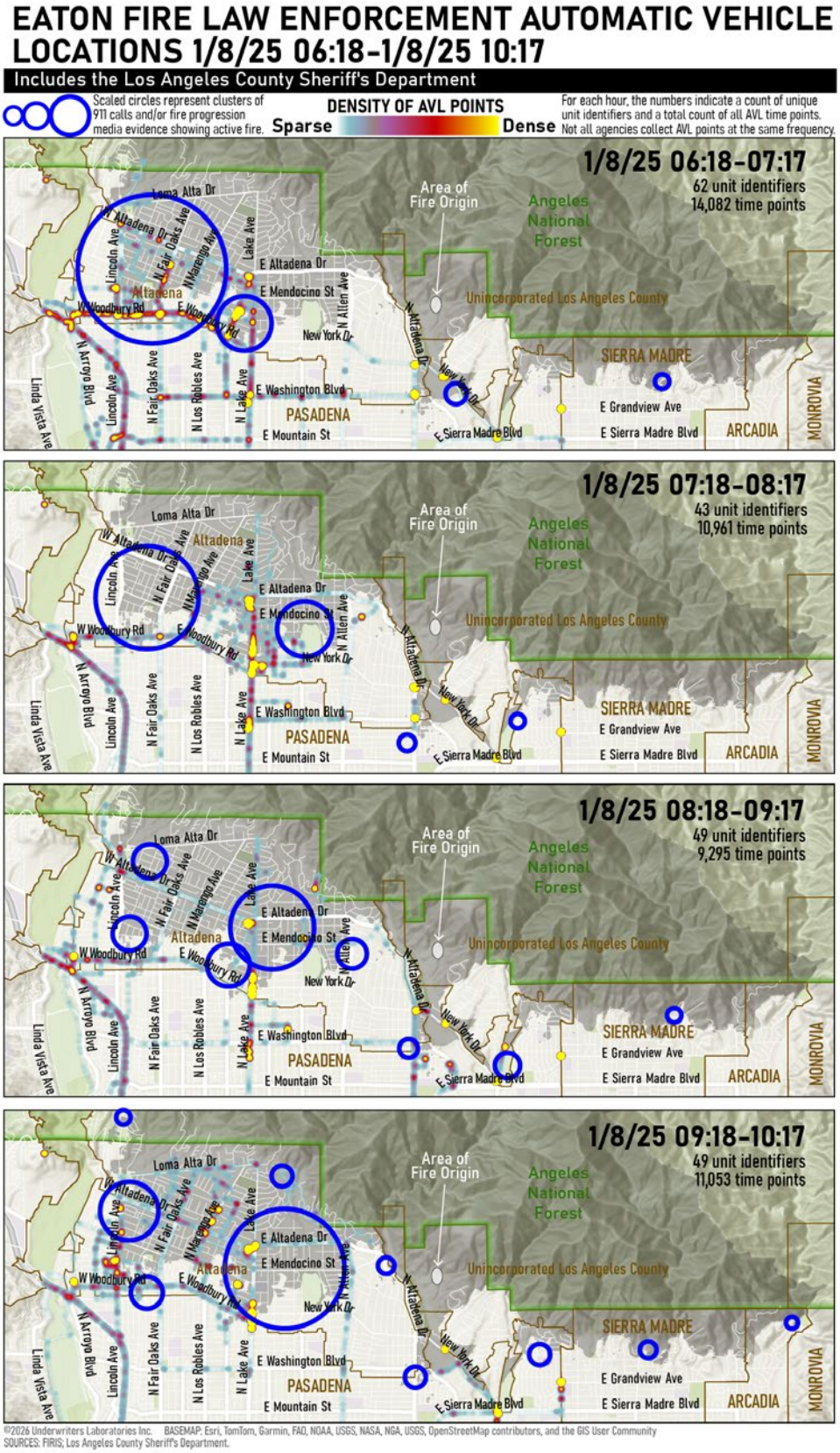
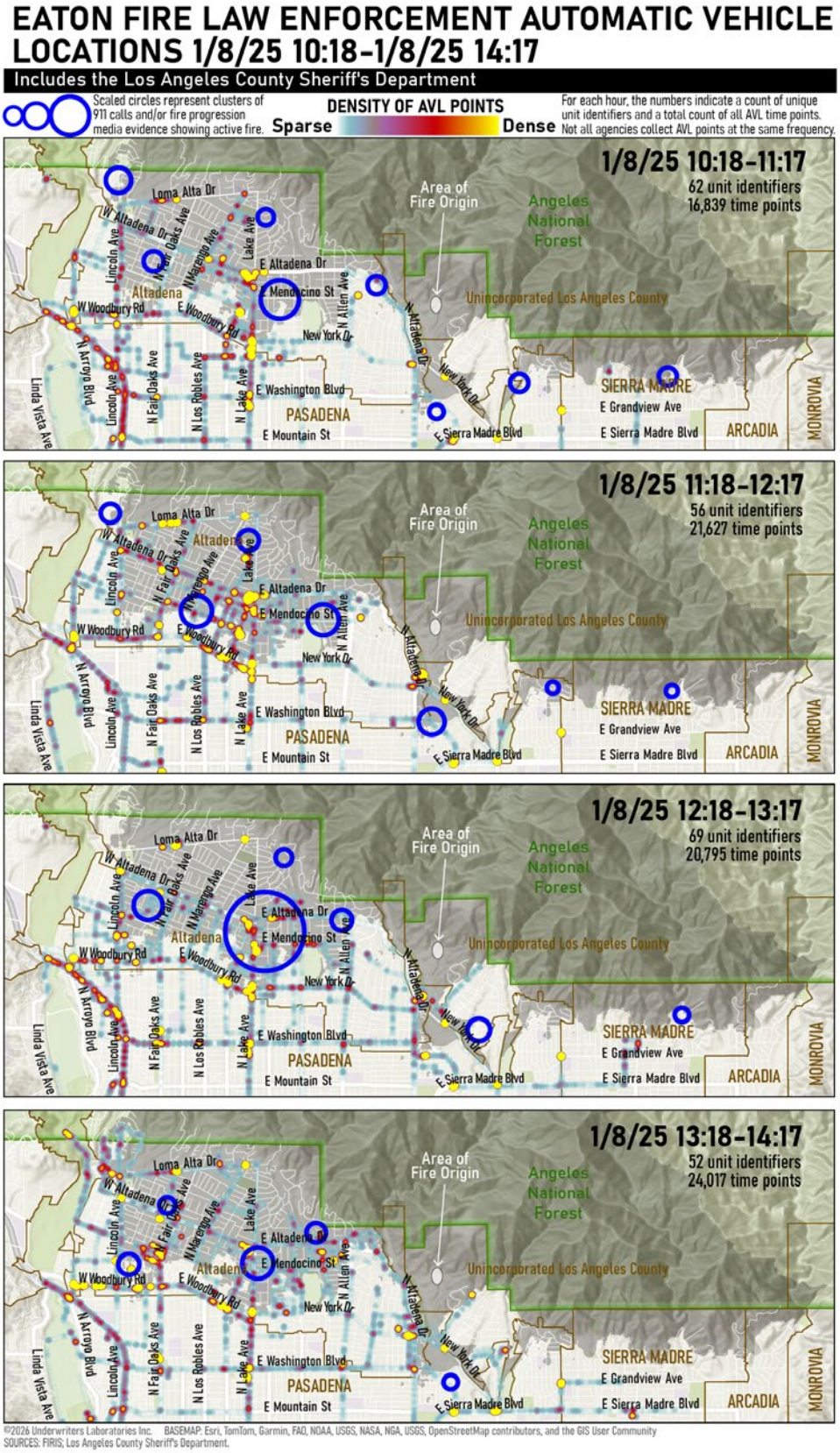
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


EATON FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/8/25 06:18-1/8/25 10:17
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/8/25 06:18-07:17
62 unit identifiers
14,082 time points
1/8/25 07:18-08:17
43 unit identifiers
10,961 time points
1/8/25 08:18-09:17
49 unit identifiers
9,295 time points
1/8/25 09:18-10:17
49 unit identifiers
11,053 time points
Area of Fire Origin
Angeles National Forest
Unincorporated Los Angeles County
Altadena
PASADENA
SIERRA MADRE
ARCADIA
MONROVIA
Loma Alta Dr
W Altadena Dr
E Altadena Dr
E Mendocino St
W Woodbury Rd
E Woodbury Rd
New York Dr
E Washington Blvd
E Mountain St
E Sierra Madre Blvd
E Grandview Ave
Lincoln Ave
N Fair Oaks Ave
N Marengo Ave
Lake Ave
N Allen Ave
N Arroyo Blvd
N Los Robles Ave
Linda Vista Ave
©2026 Underwriters Laboratories Inc. BASEMAP: Esri, TomTom, Garmin, FAO, NOAA, USGS, NASA, NGA, USGS, OpenStreetMap contributors, and the GIS User Community
SOURCES: FIRIS; Los Angeles County Sheriff's Department.


EATON FIRE LAW ENFORCEMENT AUTOMATIC VEHICLE LOCATIONS 1/8/25 10:18–1/8/25 14:17
Includes the Los Angeles County Sheriff's Department
Scaled circles represent clusters of 911 calls and/or fire progression media evidence showing active fire.
DENSITY OF AVL POINTS
Sparse
Dense
For each hour, the numbers indicate a count of unique unit identifiers and a total count of all AVL time points. Not all agencies collect AVL points at the same frequency.
1/8/25 10:18–11:17
62 unit identifiers
16,839 time points
1/8/25 11:18–12:17
56 unit identifiers
21,627 time points
1/8/25 12:18–13:17
69 unit identifiers
20,795 time points
1/8/25 13:18–14:17
52 unit identifiers
24,017 time points
Area of Fire Origin
Angeles National Forest
Unincorporated Los Angeles County
Loma Alta Dr
W Altadena Dr
Lincoln Ave
N Fair Oaks Ave
N Marengo Ave
Lake Ave
E Altadena Dr
E Mendocino St
N Allen Ave
Altadena
W Woodbury Rd
E Woodbury Rd
New York Dr
N Altadena Dr
N Arroyo Blvd
Linda Vista Ave
N Los Robles Ave
E Washington Blvd
PASADENA
E Mountain St
E Sierra Madre Blvd
SIERRA MADRE
E Grandview Ave
ARCADIA
MONROVIA
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SOURCES: FIRIS; Los Angeles County Sheriff's Department.

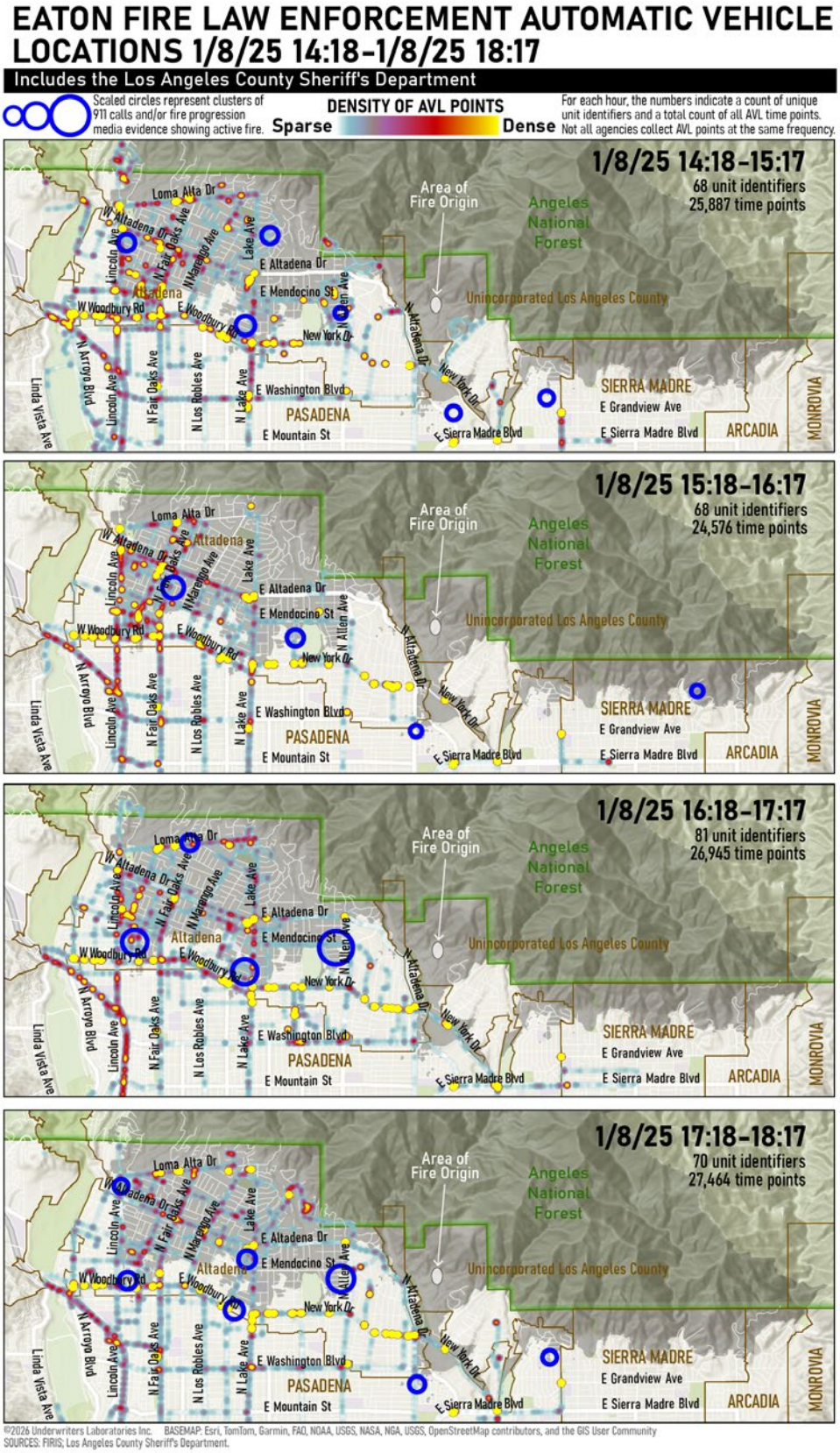


Figure 3.11.19 Law enforcement agency AVL data aggregated to location by hour, for the first twenty-four hours of the Eaton Fire. Although these maps include AVL data only from the Los Angeles County Sheriff's Department, there were other law enforcement agencies assigned to the incident that did not provide AVL data.

3.11.3.4 Assisted Living Facilities, Group Homes, and Vulnerable Populations

Evacuations of assisted living facilities in the vicinity of the Palisades and Eaton Fires significantly strained local law enforcement and fire response teams. These teams were tasked with locating residents without occupant counts and physically transporting patients to safety.

These large-scale evacuations of vulnerable populations, including elderly residents and those with medical dependencies, occurred under compressed time frames and dangerous conditions.

Many of these facilities lacked evacuation and transportation plans sufficient to effectively manage a large-scale incident. As such, operations at these care facilities demanded increased coordination and resource management, including coordination of transportation and other supporting agencies.

These incidents highlight the value of inter-agency collaboration, while also emphasizing the need for more organized pre-incident evacuation planning for these types of critical care facilities.

3.11.3.5 Traffic Management

The Palisades and Eaton Fires reinforced that traffic control during a fast-moving wildfire is fundamentally different from traffic control for a planned event.

Effective emergency traffic management requires officers to understand not only their assigned location, but also greater evacuation objectives, intended direction of travel, alternate routes, downstream capacity, fire progression, and the relationship of their post to the overall evacuation strategy.

3.11.4 Transportation System and Evacuation

The transportation system within the Palisades and Eaton Fire areas had significant impacts on evacuation outcomes during the January 2025 fires, as area road networks, access routes, transit services, sidewalks, and other transportation infrastructure affected how quickly residents could reach safety.

In the Palisades Fire area, limited roadway capacity and few evacuation routes contributed to congestion, while transportation-dependent populations required additional assistance and specialized transportation resources.

Communities with multiple evacuation routes, effective traffic management, transit options, and transportation support for vulnerable populations are generally better positioned to support safe and efficient evacuations during rapidly evolving wildfires.

The Palisades and Eaton Fires demonstrated how transportation system characteristics, including road networks, multi-modal facilities, transit resources, and private vehicle availability, can affect how quickly and safely residents can evacuate threatened areas.

- **Roadway Network:** Allows for greater ease of evacuation, with greater density of roads and intersections providing redundancy should a route become impassable. Fewer cul-de-sacs and single-access neighborhoods allow inbound emergency response and outbound evacuation to occur simultaneously with a lower risk of interference. Curvature and grade of the roadway can influence travel speeds.
- **Multi-Modal Network (sidewalks and bicycle lanes):** Provides more opportunities to evacuate on foot or bicycle. Greater existing network coverage may normalize these modes of transportation, and residents may be quicker to consider these options for evacuation during an emergency.
- **Transit System Access:** Allows for greater ease of evacuating on transit. More bus service means bus vehicles may be available to help evacuate larger groups, if needed. Greater organizational infrastructure can support high-occupancy evacuation (e.g., bus operator personnel helping evacuate a group-residential facility). Regional rail may also offer more destination options to residents who must evacuate but lack a personal vehicle.

- **Vehicle Ownership:** Affects personal timing decisions for evacuation and trip demand during an evacuation, with some car-free residents potentially choosing to self-evacuate before an order, knowing it might take longer or be less reliable than if they had a vehicle available. Multiple vehicle households and licensed drivers may be more likely to evacuate, putting additional demand on the roadway network. The age of the vehicle fleet may serve as a proxy for the overall reliability of household vehicles.

3.11.4.1 Resident Survey Data Relevant to Transportation and Evacuations

During personal conversations with residents and in an on-line format, a survey tool was provided for residents to describe their experiences with evacuation or movement within the fire evacuation areas. See the Appendix Section 6.6 for more information on these surveys.

In the Palisades Fire sample, 83% of respondents reported evacuating, while 17% of respondents reported that they did not evacuate.

Evacuation rates were even higher among Eaton Fire respondents, where 92% of respondents reported evacuating, while only 8% of respondents reported remaining in place.

The timing of evacuation differed notably between the two (2) incidents. Among Palisades Fire respondents, evacuations were concentrated on January 7, 2025, with most reported evacuations occurring that day and additional evacuations occurring on January 8, 2025.

In contrast, Eaton Fire respondents reported relatively few evacuations on January 7, 2025, while the majority occurred on January 8, 2025. This pattern reflects the different progression and warning timelines associated with the two (2) fire incidents.

Respondents were also asked whether they encountered obstructions during evacuation. Among both Palisades and Eaton Fire evacuees, several respondents reported encountering obstructions, though others reported they did not.

These results suggest that evacuation impediments were a common experience during both incidents. High winds, proximity to fire, and smoke or reduced visibility were the most frequently reported factors affecting evacuation.

Eaton Fire respondents reported substantially greater evacuation challenges than Palisades Fire respondents.

Nearly half of Eaton Fire respondents (48%) indicated that high winds hindered their evacuation, compared with only 13% of Palisades respondents. Eaton respondents were also more likely to report difficulties associated with fire proximity and smoke or low-visibility conditions.

This disparity aligns with the difference in fire weather conditions between the two (2) fires. The areas impacted by the Eaton Fire were subjected to extreme winds and fire behavior, oftentimes at night, while the Palisades Fire weather and fire conditions increased over a longer period of time, initially providing less of an impact on evacuation.

The most common obstructions reported by respondents who evacuated were fallen trees, vehicles/traffic, and downed power lines, with respondents from the Eaton Fire more likely to encounter downed power lines and broken utility poles.

Common themes for those who declined to evacuate were related to staying in order to try to fight the fire and save their homes (see Sections 3.9.2.1.3 and 4.4.4.3 for additional information). Other common threads include residents evacuating, then returning to their houses multiple times to check on them, and the lack of electrical power, which made evacuating more difficult.

3.11.4.2 Traffic Conditions

Traffic conditions during Palisades and Eaton Fires were analyzed using StreetLight Data as described in Appendix Section 6.6.3. Anonymized traffic data collected during the fire event is aggregated over hourly time frames and compared to the same period on a baseline day in 2024.

The analysis focused on trip-start activity (only movement starting within the Palisades and Eaton Fire perimeters) across the entire study area between the baseline day and the evacuation day.

3.11.4.2.1 Palisades Fire Traffic Conditions

Overall, the area affected by the Palisades Fire showed a higher level of activity on the baseline comparison day than on the day of evacuation (210K total trips in 2024 vs 180K total trips in 2025).

The area affected by the Palisades Fire is mixed use (residential, employment, and visitor land uses), and the comparison period captures a daytime level of activity on a weekday, when high levels of activity would be expected (Figure 3.11.20).

During the first two (2) hours following the evacuation notices on January 7, 2025, more trip-starts are seen on the evacuation day than typical.

However, after that initial period, most of the remainder of the 12-hour period shows considerably fewer trip-starts than usual, indicating the evacuation's suppressive effect on normal levels of activity in the area.

As shown in Table 3.11.1, the evacuation period trip-starts outpace the baseline again only after 20:00.

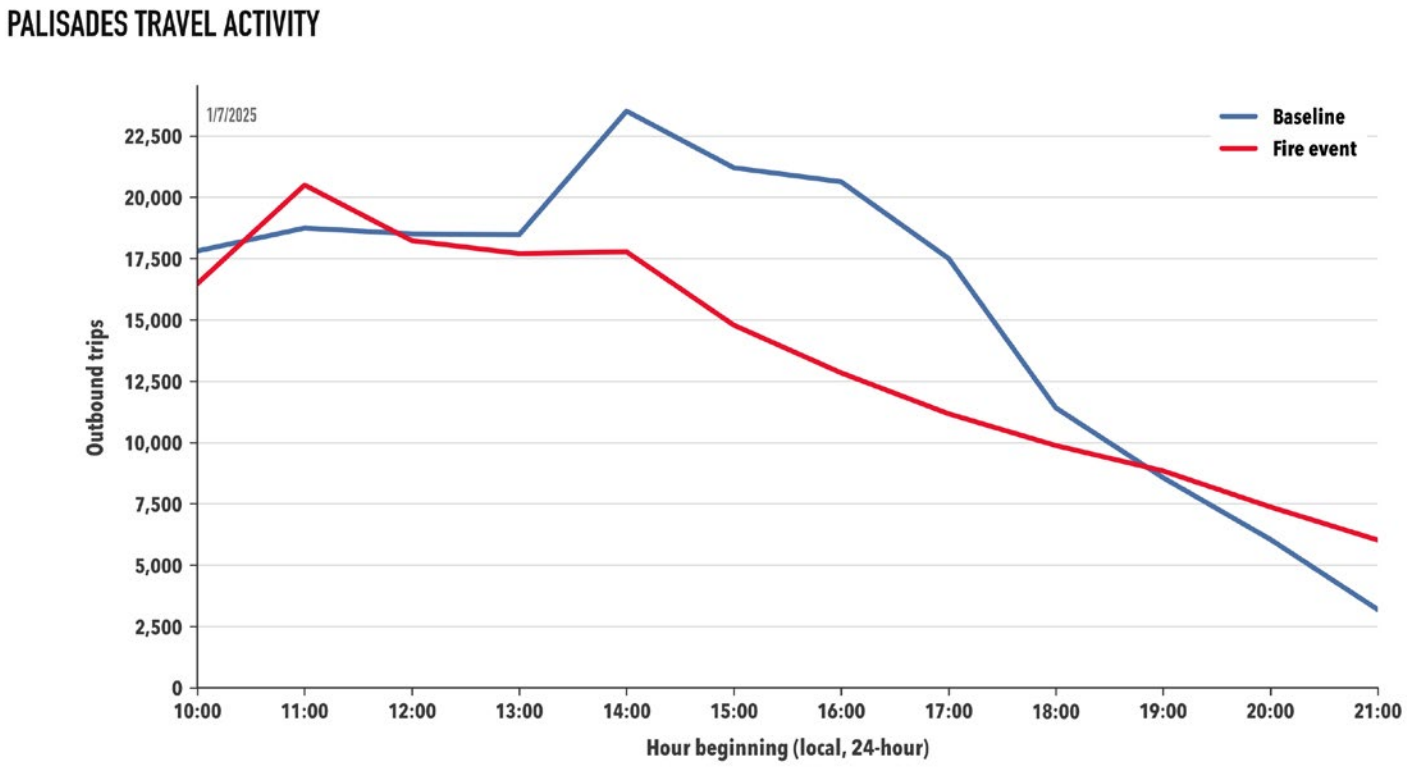


Figure 3.11.20 Aggregate Palisades Fire baseline vehicle travel activity vs. fire event period evacuation activity. (Baseline period: January 8, 2024, Fire event period: January 7-8, 2025). Source: StreetLight Data, Fehr & Peers, 2026.

Table 3.11.1 Palisades Fire hourly evacuation trip starts as a percent of baseline. Source: StreetLight Data, Fehr & Peers, 2026.

Hour	Baseline	Evacuation	Evacuation as a % of Baseline
10:00 (fire start at 10:30)	20,322	18,471	**91%**
11:00	20,864	24,182	**116%**
12:00	20,615	21,101	**102%**
13:00	20,980	19,152	**91%**
14:00	26,792	19,667	**73%**
15:00	24,945	17,040	**68%**
16:00	21,140	14,239	**67%**
17:00	20,169	11,860	**59%**
18:00	13,287	10,245	**77%**
19:00	9,669	9,389	**97%**
20:00	7,154	8,063	**113%**
21:00	3,592	6,404	**178%**

Analysis of StreetLight data also provided insight into the spatial distribution of the evacuation zones driving these hour-by-hour differences.

Figure 3.11.21 shows Genasys evacuation zones within and around the Palisades Fire FIRIS perimeters that provide estimates of fire spread during the Palisades Fire.

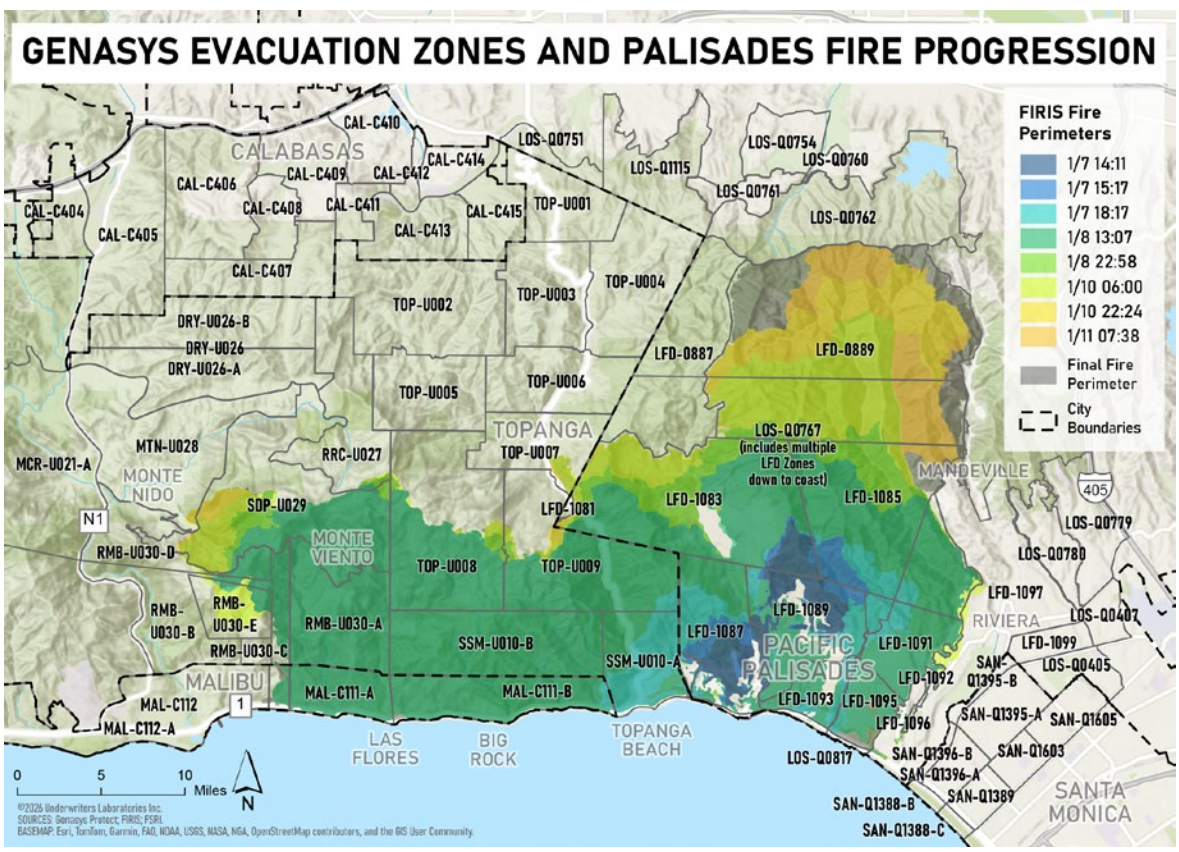


Figure 3.11.21 Genasys evacuation zones mapped with the Palisades Fire FIRIS perimeters from January 7 - 11, 2025.

The spatial distribution of trip-starts can help assess whether evacuation activity corresponded with evacuation warnings and orders.

Figures 3.11.22 through 3.11.25 show the change in trip activity relative to baseline conditions between January 7, from 09:00 to 22:00, alongside the evacuation notification timing of the Genasys zones recorded by Watch Duty and FIRIS perimeters referenced in Section 4.3.1.1.2 of the Phase One report.[1]

Watch Duty evacuation notification times were used in these maps because they aligned most closely with timeline data submitted to ULRI for the Phase One report, while discrepancies between agency records and PBS Warn data created uncertainty regarding notification timing.

The observed evacuations likely represent trips by individuals who were at home or visiting businesses in areas where evacuation warnings or orders were issued.

Note: *As shown in Figure 3.11.20, the total volume of trip activity during each of these hour periods is different; the color scale is consistently visualized as percent change, not net change, in trip activity.*

During the first timeframe of this analysis (10:00-11:00), there were no documented evacuation notifications. Travel activity was generally elevated near the eastern portion of the eventual fire area around Pacific Palisades and Santa Monica, with several zones showing increased trip counts relative to baseline.

The pattern suggests normal midday movement and localized increases in vehicle activity rather than a coordinated evacuation response. Alternatively, zones LFD-1087 and LFD-1089, located just south of the fire origin area, also showed increased trip counts, likely because individuals could see the fire and smoke from this location due to the wind blowing in that direction.

The first documented evacuation notifications were issued shortly before noon on January 7, 2025 (Figure 3.11.22, 11:00-12:00). These notifications were initiated by LAC to address their closest jurisdictional area, which is southwest of the fire's location during this time period.

Zone SSM-U010-A received a warning followed by an order, due to being in the path of the fire and anticipated fire impact. Trip activity increased in several other zones near the fire area and along likely evacuation corridors, although the increases were dispersed and did not yet indicate large-scale population movement.

The notification footprint remained relatively limited compared to the eventual extent of the fire.

Evacuation activity expanded significantly during 12:00-13:00. A large section of the Pacific Palisades, which included the area of origin and multiple LFD zones, received evacuation orders.

These zones did not receive an advisory or warning, but went straight to direct evacuation orders due to their proximity to the fire. LAC Zone MAL-C111-B received a warning followed by an evacuation order, while SSM-U010-B was elevated to a direct order.

Vehicle trips increased in multiple zones adjacent to the fire, while decreases appeared in some coastal and eastern neighborhoods, indicating that population movement had become more directional as residents began leaving affected areas.

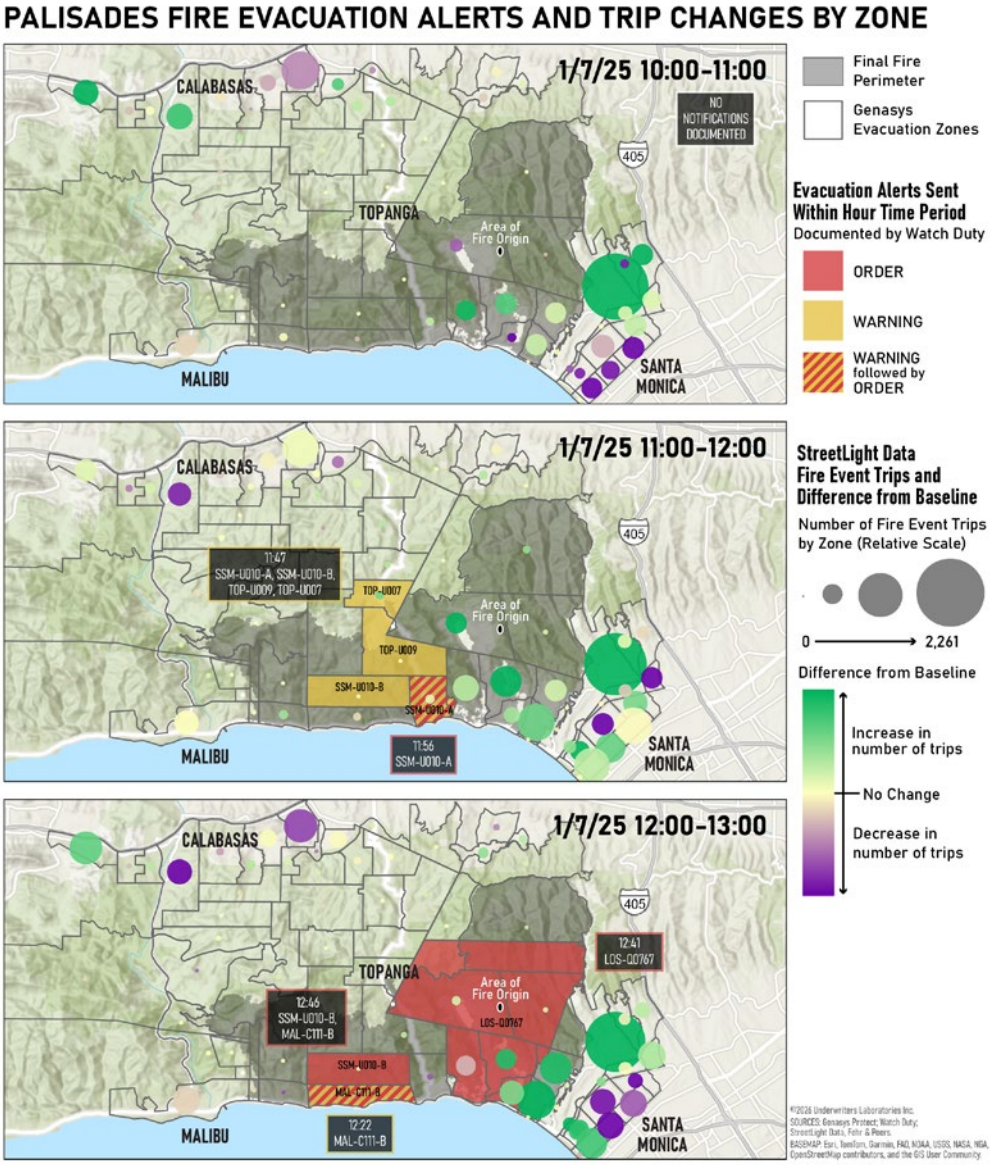


Figure 3.11.22 Palisades Fire evacuation notification timing and change in trips from baseline from 10:00 to 13:00 on January 7, 2025.

From 13:00-14:00 on January 7, 2025, evacuation warnings continued to expand westward into additional Topanga and Malibu-area zones. Travel activity remained elevated around the eastern and southeastern edge of the incident, but changes in trips varied considerably by zone, suggesting uneven public response and differing evacuation timing across the affected communities.

One (1) reason for the small number of vehicle trips, and a lack of difference from baseline in zones receiving warnings, could be the distance from the fire and not being directly in its path.

A major evacuation order expansion occurred between 14:00-15:00, as LOS-Q076, which consisted of multiple zones that previously received an order at 12:41, was extended east toward Mandeville Canyon Road.

At 14:11, the first FIRIS perimeter shows fire progression from the Summit neighborhood to the coast.

Despite the significant geographic enlargement of ordered areas, several zones near Pacific Palisades showed decreases in trip activity compared with baseline, while increases remained concentrated closer to the urban edge. This could be the result of areas previously being evacuated and/or traffic patterns becoming increasingly influenced by road congestion, access restrictions, and evolving evacuation conditions.

No new evacuation notifications were documented between 15:00-16:00. The next FIRIS perimeter at 15:17 shows the fire's flanks extending both east and west, impacting more homes.

Trip activity generally declined in many zones around Pacific Palisades and Santa Monica, while isolated areas continued to experience elevated traffic volumes. The reduction in movement after the earlier order expansion may indicate stabilization of evacuation activity or traffic constraints limiting additional travel.

From 16:00-17:00, limited evacuation activity resumed with new advisories issued for Topanga-area zones, as the fire's western flank widened.

Trip activity across much of the area fell below baseline levels, particularly near the eastern side of the incident. This pattern may reflect reduced accessibility, road closures, or completion of earlier evacuations from the most heavily affected areas.

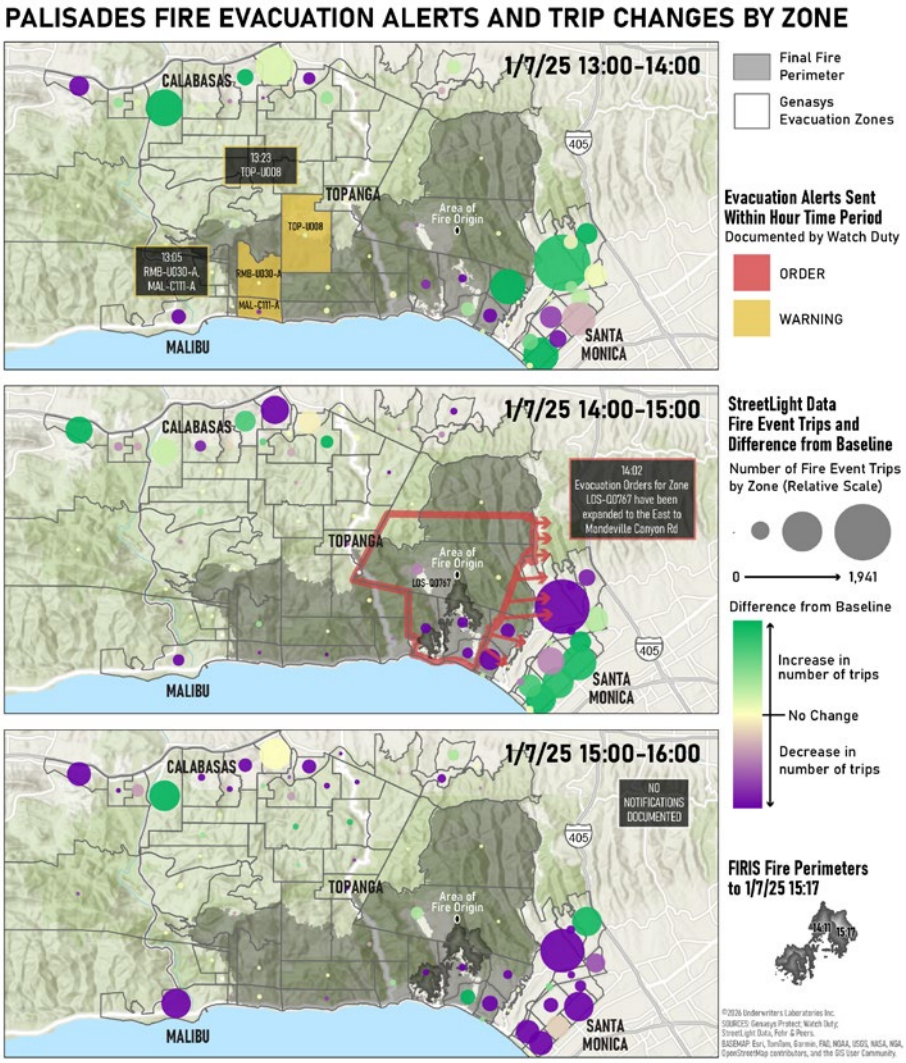


Figure 3.11.23 Palisades Fire evacuation notification timing and change in trips from baseline from 13:00 to 16:00 on January 7, 2025, overlaid with FIRIS perimeters.

The hour between 17:00-18:00 marked the largest expansion of evacuation notifications of the day. LAC issued numerous advisories, warnings, and orders across Topanga, Malibu, and the surrounding Santa Monica Mountain communities, dramatically increasing the geographic area under notification.

Despite the widespread alerting activity, trip counts in many eastern zones remained below baseline, while some southern urban areas experienced increases, suggesting that evacuation traffic was concentrated along specific routes and destinations rather than evenly distributed across all ordered areas.

No new evacuation notifications were documented between 18:00-19:00.

At 18:17, the FIRIS perimeter shows the fire mostly in Pacific Palisades with extension into the LAC area of Sunset Mesa near the coast on the westward flank. Trip activity remained mixed, with increases observed in several Santa Monica area zones and more limited movement elsewhere.

Most alerting activity had already occurred, and the transportation network appeared to be adjusting to the substantial evacuation zone expansion issued during the previous hour.

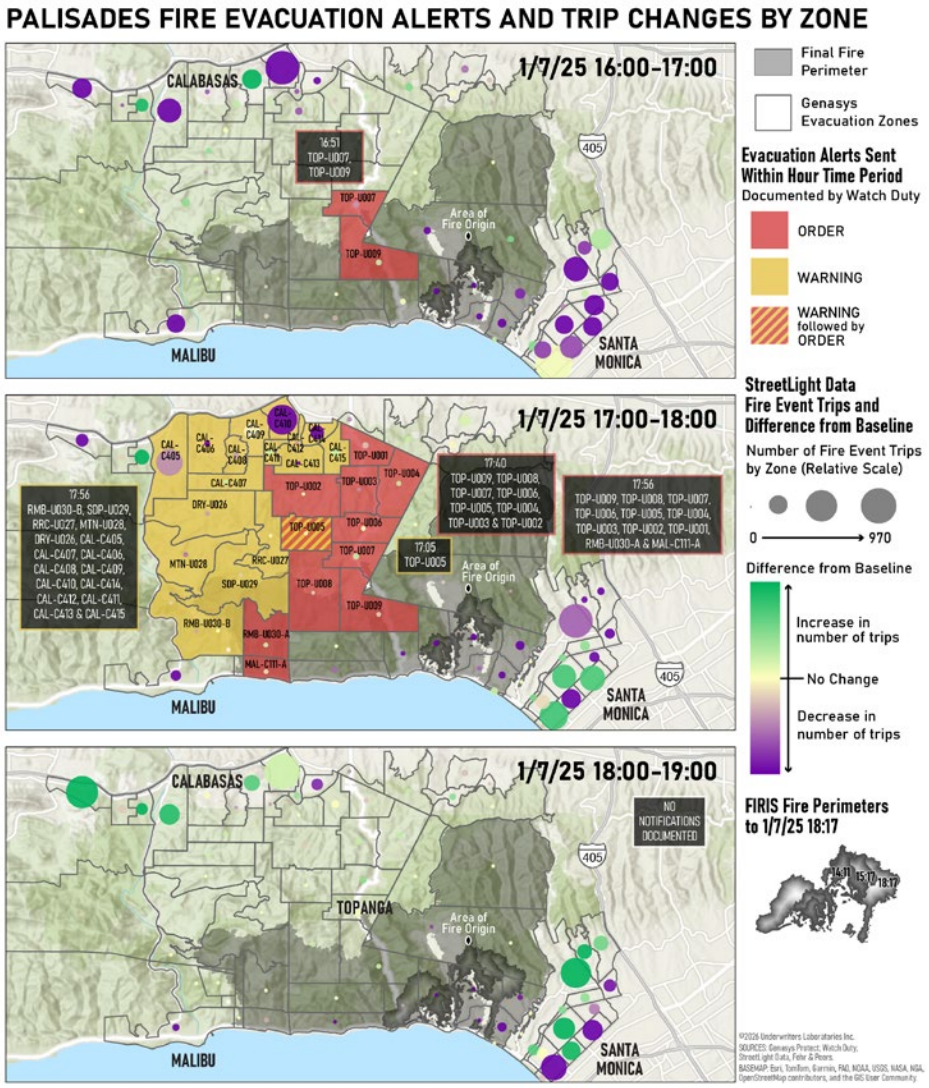


Figure 3.11.24 Palisades Fire evacuation notification timing and change in trips from baseline from 16:00 to 19:00 on January 7, 2025, overlaid with FIRIS perimeters.

Between 19:00-20:00, a City of Santa Monica evacuation order was issued for areas north of San Vicente Boulevard. Trip activity continued to rise in several coastal and urban-edge zones, while some nearby areas experienced decreased travel.

The alerting pattern reflected growing concern about fire spread toward more densely populated urban neighborhoods immediately east of the fire area.

Additional evacuation orders were issued from 20:00-21:00 for Santa Monica-adjacent zones and areas extending north toward Mulholland Drive.

Travel activity increased noticeably in several affected zones near the urban edge, consistent with residents responding to newly issued evacuation orders. The concentration of increased trips near the southeastern perimeter suggests active population movement away from threatened areas during the evening period.

New evacuation orders were issued between 21:00-22:00 for additional Malibu-area zones near Rambla Pacifico and surrounding communities. These areas were impacted by fire later on January 8, 2025.

Trip counts remained elevated in several coastal and eastern zones, while much of the remainder of the study area showed relatively modest changes from baseline.

By this hour, evacuation notifications had expanded well beyond the initial fire area, reflecting continued growth of the incident and ongoing protective actions across multiple communities.

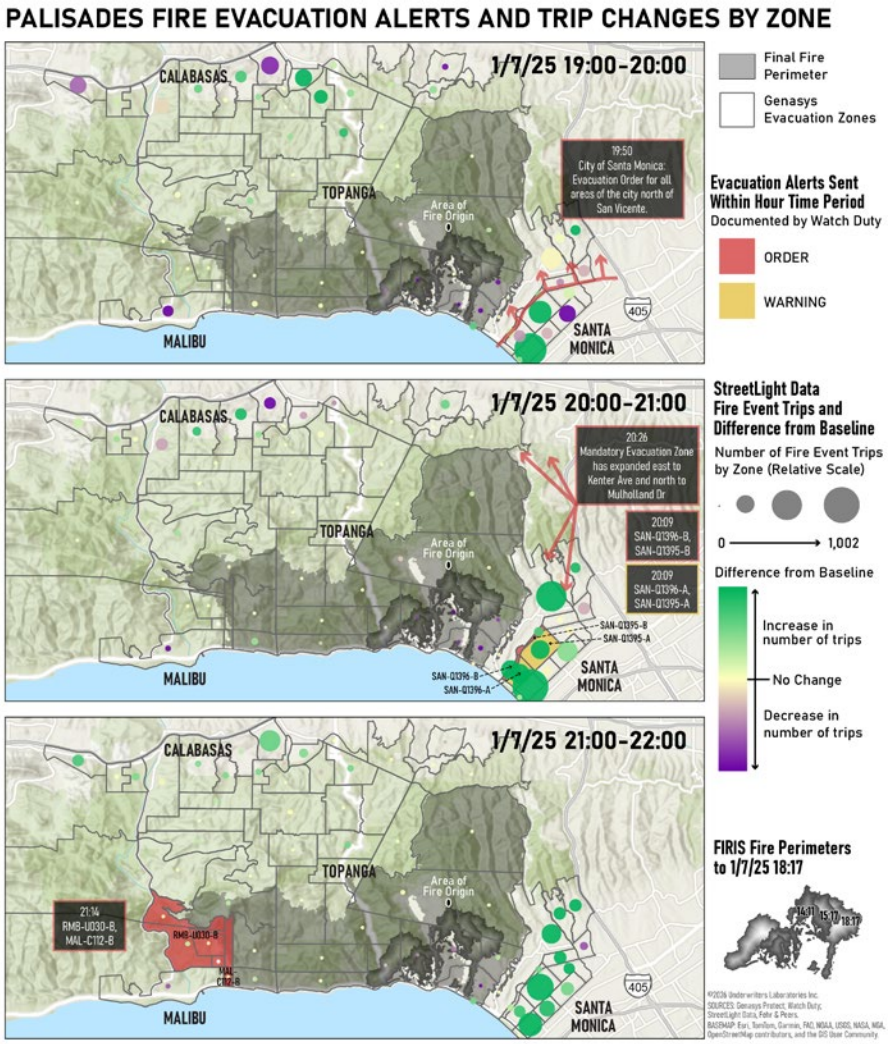


Figure 3.11.25 Palisades Fire evacuation notification timing and change in trips from baseline from 19:00 to 22:00 on January 7, 2025, overlaid with FIRIS perimeters.

3.11.4.2.2 Eaton Fire Traffic Conditions

In contrast to the Palisades Fire, the area affected by the Eaton Fire showed a notable increase in total trips across the entire study period compared to the baseline period. The area affected by the Eaton Fire is primarily residential in use, which generates a baseline condition of lighter activity for trip-starts, especially during the evening, late night, and early morning hours.

Figure 3.11.26 shows Genasys evacuation zones in the Eaton Fire area with the fire progression focus areas where high confidence ground-based evidence indicates the fire's presence throughout a span of time as described in the Phase One report.[1]

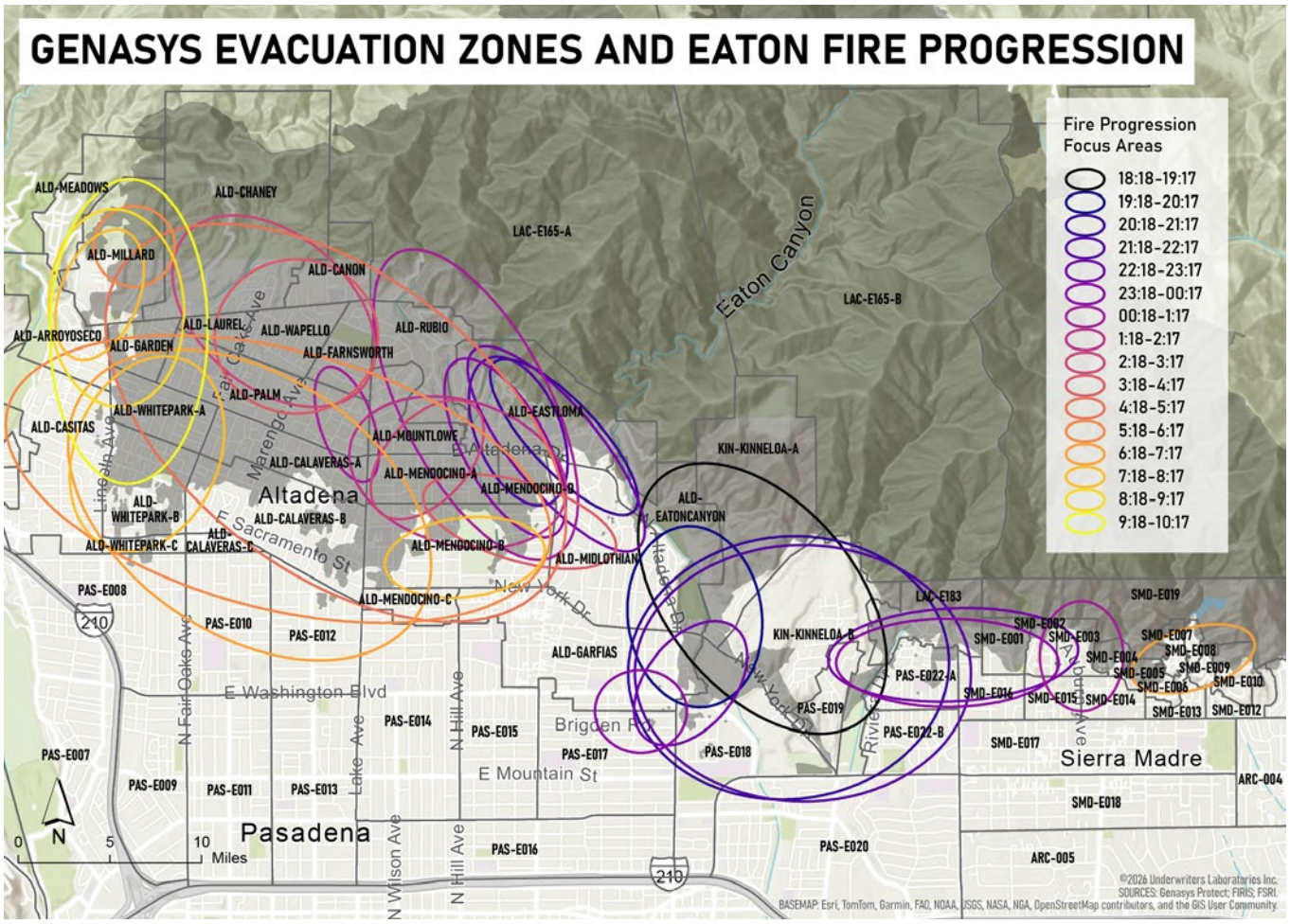


Figure 3.11.26 Eaton Fire area with Genasys evacuation zones overlaid on the first FIRIS perimeter (created at approximately 18:30 on January 8, 2025) and compared to fire progression focus areas where high confidence ground-based evidence indicates the fire's presence throughout a span of time as defined in the Phase One report.[1]

Early evacuation warnings and orders on the evening and night of January 7, 2025, and during early morning hours of January 8, 2025, triggered a heavy residential evacuation, yielding significant activity increases for each hour when compared to baseline conditions (Figure 3.11.27, Table 3.11.2).

During the entire 12-hour period following the first evacuation notices, more trip-starts are seen on the evacuation day than typical, in some cases by as much as a 1200% increase, as seen in the 02:00 hour (though the total number of trip-starts is the lowest of any time block during the baseline period).

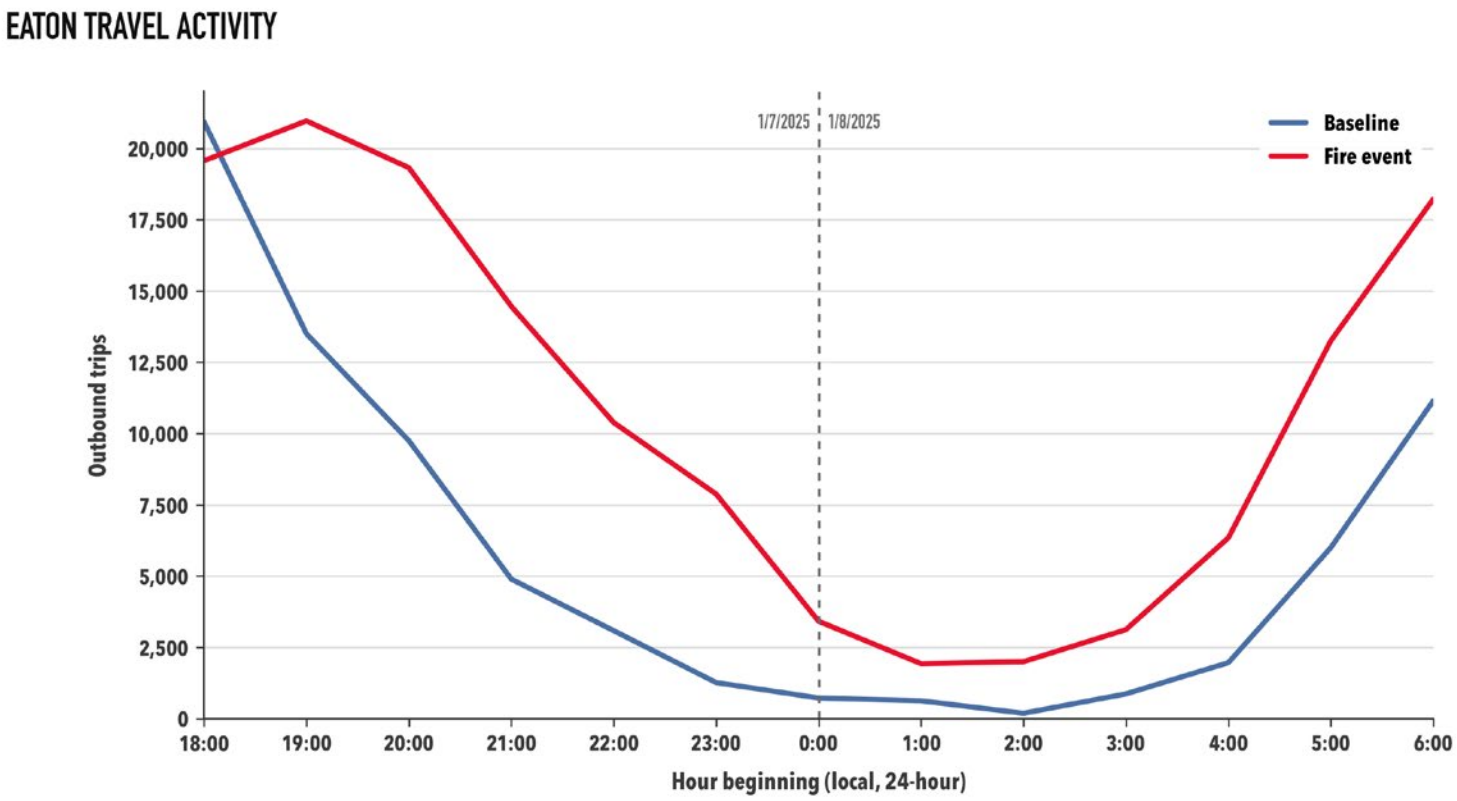


Figure 3.11.27 Aggregate Eaton Fire baseline vehicle travel activity vs. fire event period evacuation activity. (Baseline period: January 8, 2024, Fire event period: January 7-8, 2025). Source: StreetLight Data, Fehr & Peers, 2026.

Table 3.11.2 Eaton Fire hourly evacuation trip starts as a percent of baseline. Source: StreetLight Data, Fehr & Peers, 2026.

Hour	Baseline	Evacuation	Evacuation as a % of Baseline
18:00 (fire start 18:18)	22,387	21,904	**98%**
19:00	14,733	23,584	**160%**
20:00	10,436	21,108	**202%**
21:00	5,292	15,990	**302%**
22:00	3,533	10,840	**307%**
23:00	1,355	8,192	**605%**
00:00	745	3,799	**510%**
01:00	705	2,061	**292%**
02:00	169	2,087	**1235%**
03:00	894	4,066	**455%**
04:00	2,158	7,606	**352%**
05:00	6,459	14,309	**222%**

The spatial distribution of trip-starts can help assess whether evacuation activity corresponded with evacuation warnings and orders.

Figures 3.11.28 through 3.11.31 show the change in trip activity relative to baseline conditions between 18:00 on January 7, 2025, and 06:00 on January 8, 2025.

They also show evacuation notification timing of the Genasys zones recorded by Watch Duty, and fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in ULRI Southern California Fires Phase One Timeline report[1].

Watch Duty evacuation notification times were used in these maps, as they align more closely with timeline data submitted to ULRI for the Phase One report, while discrepancies between agency records and PBS Warn data created uncertainty regarding notification timing.

As in the Palisades Fire, these evacuations likely represent trips by individuals who were at home in areas where evacuation warnings or orders were issued.

Note: *As shown in Figure 3.11.27, the total volume of trip activity during each of these hour periods is different. The color scale is consistently visualized for percent change, not net change, in trip activity.*

During the first hour of the Eaton Fire analysis (18:00-19:00), after the fire was reported at 18:18, evacuation notifications were issued at around 19:00 for areas immediately downslope and west of the Eaton Fire origin in the Eaton Canyon area. These notifications consisted of advisories for portions of Altadena, Kinneloa Mesa, and Pasadena located south of the advancing fire.

At this time, ground-based evidence (and reports from HLCO) indicate fire in the Eaton Canyon area and along the foothill interface. Vehicle trip activity increased in some evacuation zones and along nearby corridors, although overall movement patterns remained mixed and did not yet indicate large-scale evacuation activity.

Evacuation activity expanded substantially between 19:00 and 20:00, as several advisory areas in Altadena and Kinneloa Mesa were elevated to evacuation orders, while warnings were issued for adjacent Pasadena neighborhoods, with PAS-E018 subsequently elevated to an evacuation order. During this time, the fire continued to spread south.

Trip activity increased notably in several newly ordered zones, particularly in areas closest to the fire progression, suggesting residents were beginning to respond to evacuation notifications and visible fire conditions.

Between 20:00-21:00, evacuation warnings were issued for portions of Sierra Madre, east of the active fire area, as fire progression continued eastward past Kinneloa Mesa. At the same time, fire also progressed to the west along the foothills.

Vehicle trip activity increased across several zones in Altadena, Pasadena, and Sierra Madre, although the increase was not uniform across all warned areas, suggesting differences in evacuation timing and public response.

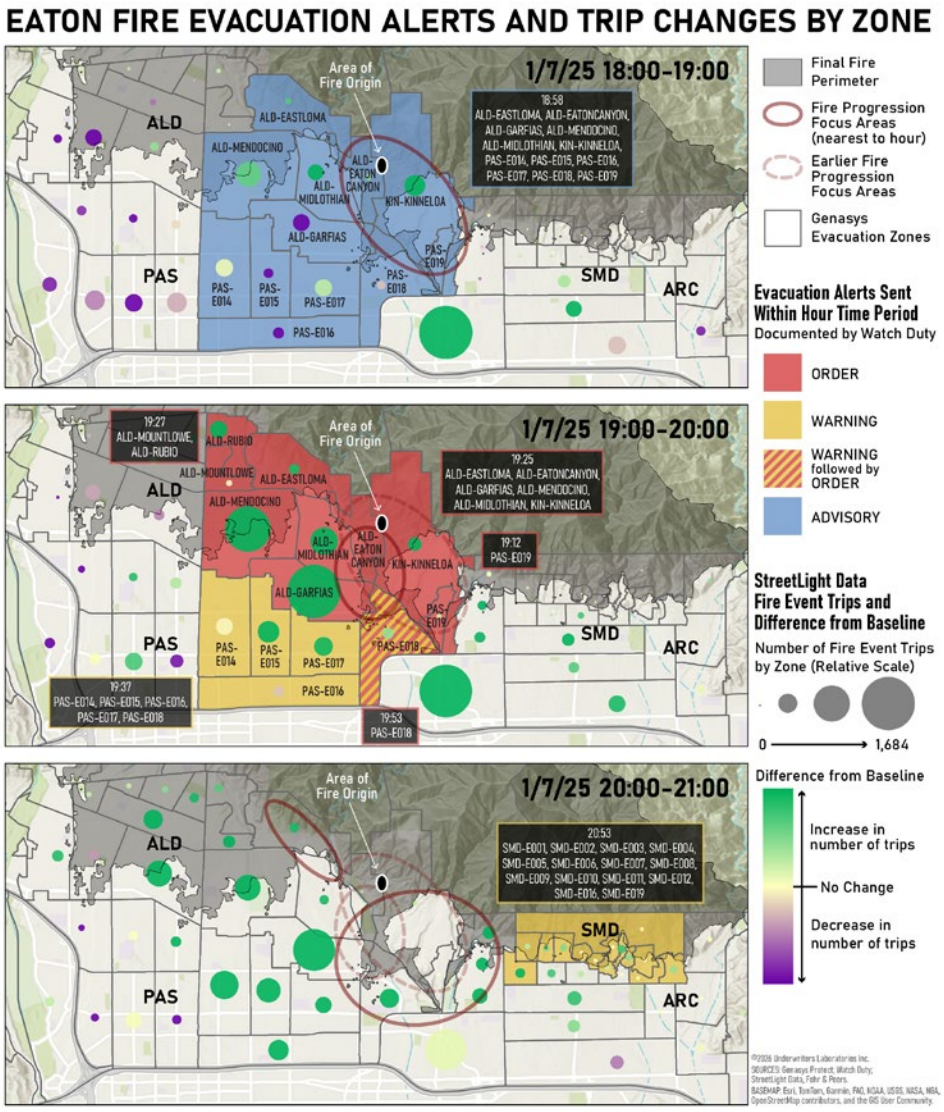


Figure 3.11.28 Eaton Fire evacuation notification timing and change in trips from baseline from 18:00 to 21:00 on January 7, 2025, overlaid with fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in the Phase One report.[1]

Evacuation orders expanded into additional portions of east Altadena as well as western and northern portions of Sierra Madre between 21:00-22:00, as the fire continued to spread through the foothill communities.

Available fire progression evidence shows movement westward across the northern portions of Altadena, while additional fire activity developed west of Sierra Madre.

Vehicle trip activity increased in many affected zones, particularly south of the fire area, consistent with growing evacuation movement following the expansion of evacuation orders.

Evacuation orders and warnings expanded significantly from 22:00-23:00 into portions of Pasadena, Sierra Madre, Arcadia, and Monrovia. Ground-based evidence of fire progression indicates active fire spread along the foothills above Pasadena and Sierra Madre, and continued movement to the east. Additionally, evidence of expanded fire activity was noted in northeast Altadena and south of Eaton Wash.

Vehicle trip activity increased substantially in several ordered and warned zones, particularly within Pasadena and Sierra Madre, indicating increased population movement away from areas threatened by the advancing fire.

Between 23:00-midnight, additional evacuation notifications were issued for Pasadena and Arcadia, as fire progression continued downslope toward more densely populated neighborhoods. At this time, fire progression remained mostly concentrated along the foothill edge above easter Altadena, Pasadena and Sierra Madre.

Trip activity remained elevated in several Pasadena and Sierra Madre zones, suggesting that evacuation activity was continuing as notifications expanded beyond the areas initially identified as being at risk.

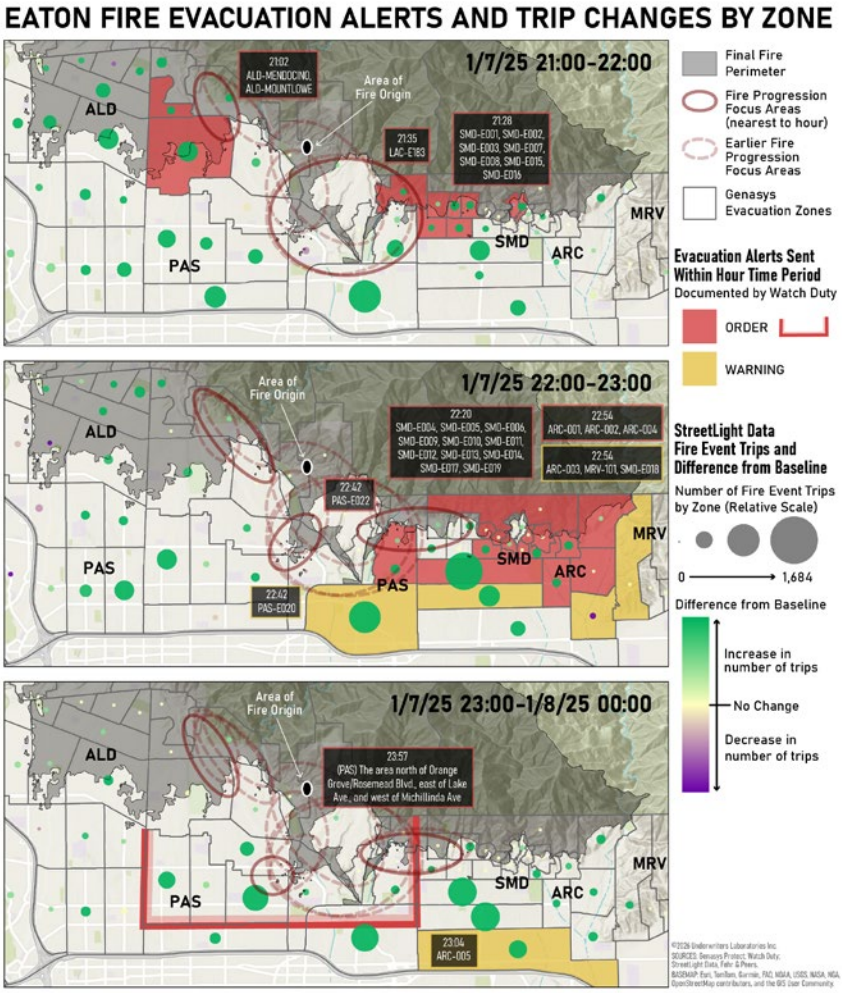


Figure 3.11.29 Eaton Fire evacuation notification timing and change in trips from baseline from 21:00 on January 7, 2025, to 00:00 on January 8, 2025, overlaid with fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in the Phase One report.[1]

The only documented evacuation notification during 00:00-01:00 was a warning issued at 00:05 for portions of Monrovia, east of the primary fire area. Ground-based evidence of fire progression shows active fire impacting multiple locations along the foothill interface and in the vicinity of Lake Avenue in Altadena to Sierra Madre.

Although evacuation notifications were limited, trip activity increased in several zones near the fire perimeter, indicating continued movement despite the absence of major new alerting activity. This increased activity may be attributed to LASD units that were making resident contacts during "knock and notify" operations and directing occupants to leave threatened areas during this time (as noted in Section 3.11.3.2).

No evacuation notifications were documented from 01:00-02:00, though LASD evacuation operations continued in Altadena and Sierra Madres. Available fire progression evidence shows continued fire growth in Altadena and along the foothill communities west of Eaton Canyon.

Vehicle trip activity remained elevated in portions of Pasadena and several foothill zones, suggesting residents continued to leave threatened areas despite the absence of additional documented notifications.

From 02:00-03:00, no evacuation notifications were documented despite continued fire spread across the foothill communities. Evidence of fire progression indicates active fire movement in north-central Altadena and around Lake Avenue.

Elevated trip activity was also noted in north-central Altadena (an area where LASD evacuation operations were ongoing) and Pasadena-area zones, reflecting ongoing population movement as fire conditions deteriorated.

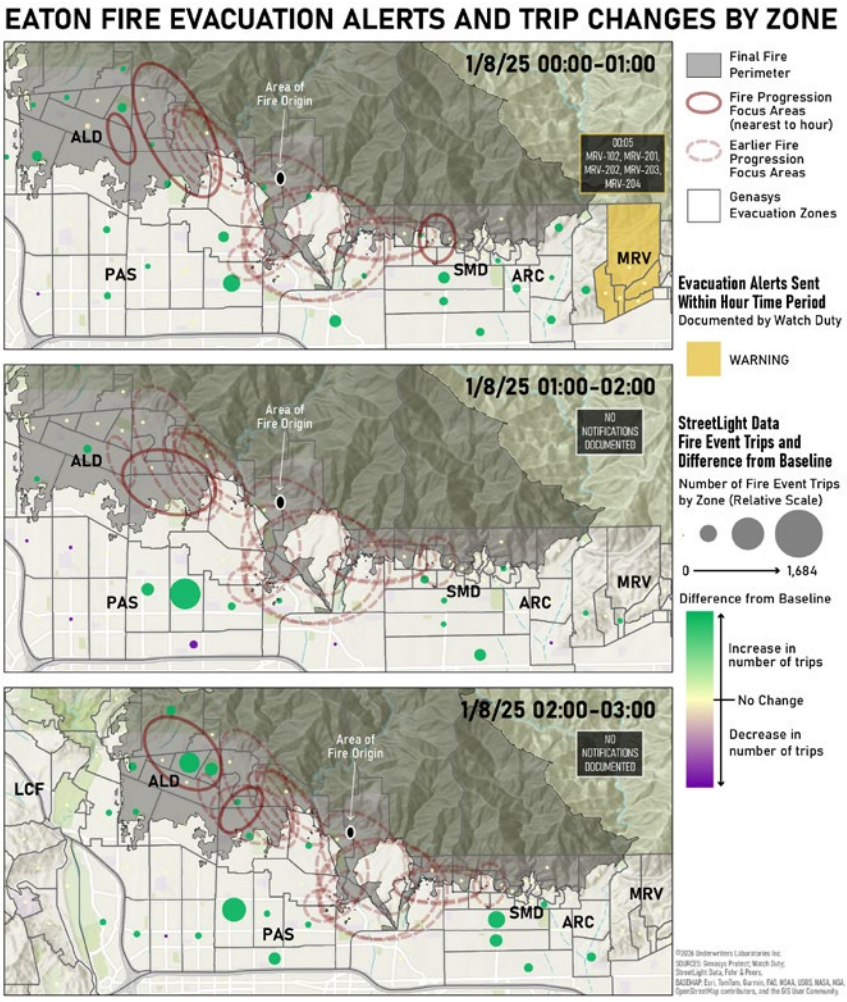


Figure 3.11.30 Eaton Fire evacuation notification timing and change in trips from baseline from 00:00 to 03:00 on January 8, 2025, overlaid with fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in the Phase One report.[1]

Between 03:00-04:00, a major expansion of evacuation orders and warnings occurred across large portions of western Altadena and eastern La Cañada Flintridge, as the fire continued to expand westward.

By this time, fire in the foothills across Altadena had begun advancing into developed neighborhoods.

Vehicle trip activity increased substantially across the evacuation ordered areas in western Altadena as well as increasing in eastern La Cañada Flintridge, reflecting large-scale evacuation movement as the fire threatened structures and communities.

Evacuation notifications expanded eastward into Monrovia, Bradbury, and Duarte, and evacuation warnings in La Cañada Flintridge became orders in the timeframe from 04:00-05:00. During this time, the available evidence of fire progression remained concentrated in central Altadena, where active structure impacts were occurring.

Vehicle trip activity continued to increase across multiple ordered and warned zones during this time, particularly western Altadena and eastern La Cañada Flintridge, indicating widespread evacuation movement as notifications expanded into additional communities.

The hour between 05:00-06:00 marked the largest expansion of evacuation notifications during the Eaton Fire. Numerous warnings and orders were issued across La Cañada Flintridge, Glendale, Pasadena, and Altadena, as the fire continued moving west and southwest through foothill communities.

Ground-based evidence of fire progression remained concentrated within developed portions of Altadena and nearby neighborhoods.

Vehicle trip activity increased across much of the evacuation area, particularly in La Cañada Flintridge, Altadena, and Pasadena, indicating extensive population movement in response to both the expanding fire and evacuation notifications.

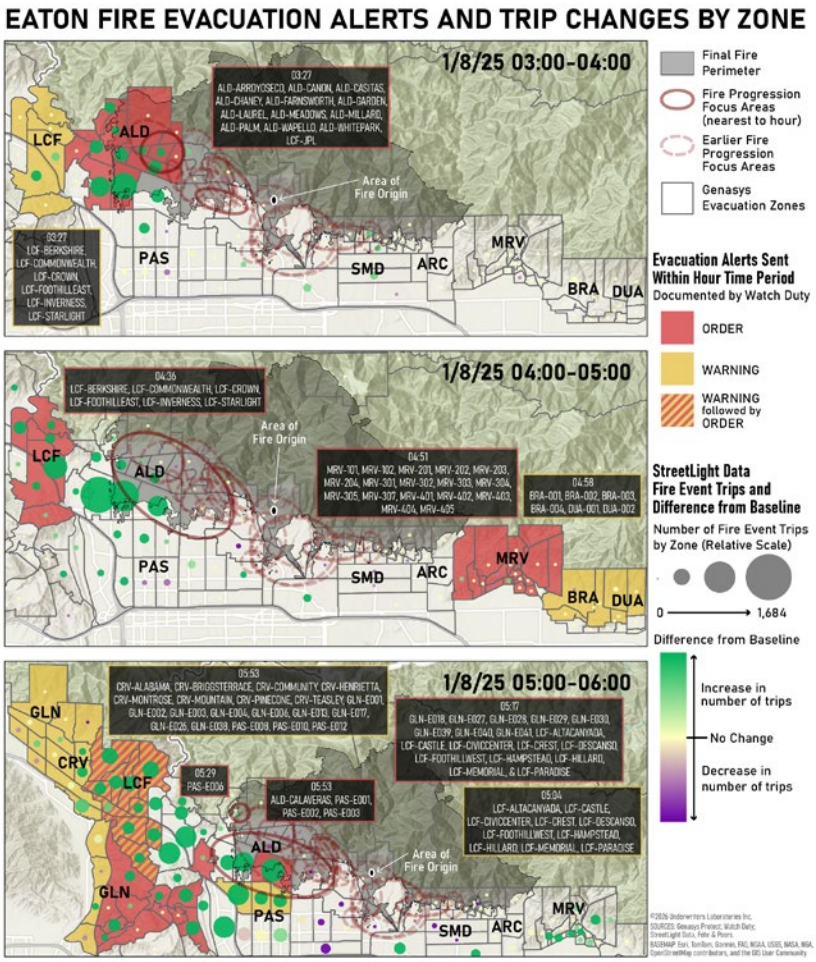


Figure 3.11.31 Eaton Fire evacuation notification timing and change in trips from baseline from 03:00 to 06:00 on January 8, 2025, overlaid with fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in the Phase One report.[1]

Screenshot 2026-08-31 at 5.15.17PM.png

3.11.4.3 Designated Areas of Refuge

As part of a communities' preparation for WUI fires, safe areas of refuge can be designated that residents can go to if needed. This action is highlighted within the National Institute of Standards and Technology (NIST) "WUI Fire Evacuation and Sheltering Considerations: Assessment, Planning, and Execution (ESCAPE)" guide.[170]

This report outlines the relevance and application of creating a "Temporary Fire Refuge Area (TFRA)", which is a "pre-designated location intended to increase survival odds when evacuation is no longer possible". This notion is particularly relevant in remote areas that have limited road access.

For example, evacuation has been a challenge in previous conflagrations, such as the 2018 Camp Fire in Paradise, California, and the 2023 La'haina Fire in La'haina, Hawai'i. [171,172]

Should residents be unable to quickly evacuate, these areas provide a temporary, known place that residents can get to in order to provide refuge from the ensuing fire.

There are several places within a community that can be used as a designated safe area of refuge. Some examples include golf courses, neighborhood clubhouses, community centers, cleared parking lots, and parks.

Local leaders should work with emergency officials to ensure that the designated areas are in easily accessible spots within the community, and if necessary, there is more than one.

These locations should be properly marked and known throughout the community. Figure 3.11.32 provides an exemplar sign from the NIST ESCAPE guide that can be posted to identify the location of a refuge area.

Figure 3.11.32 Exemplar signage designated a place of refuge from the NIST ESCAPE guide.[173]

While a safe and timely evacuation of all residents should be prioritized during a WUI fire, congested roads, downed trees and power lines, and fire conditions can all inhibit the ability of residents to evacuate.

Designating safe, temporary areas of refuge that residents can go to if needed is a way for communities to pre-plan and prioritize life safety in the event of a WUI fire occurring.

The continued safety of these areas can also be prioritized by responders during intervention, further adding to the safety of all residents.

3.11.5 Fire-Related Fatalities

Loss of life during the Palisades, Eaton, and Olivas Fires occurred amid rapidly changing weather and fire conditions, often alongside difficulty maintaining situational awareness, delayed or fragmented evacuation alerts, resident mobility and access difficulties, residents declining to evacuate, and simultaneous incidents that overburdened resources.

A total of 32 decedents in the January 2025 fires have been confirmed: 19 in the Eaton Fire, 12 in the Palisades Fire, and one (1) in the Olivas Fire. This section provides context and insight into the location and circumstances where the fatalities occurred. Data presented in this section was compiled from:

- Coroner reports
- Police reports
- Media reports
- Evacuation notification data
- Fire progression data
- CAD data
- AVL data

Several characteristics of decedents were documented from the available data sources, including age, gender, home address, location recovered, whether there was evidence indicating the person was attempting to evacuate, and other circumstances around their death.

- The average age of the decedents was 72 years old (Palisades: 72.4, Eaton: 72.6)
- The median age of the decedents was 75 years old (Palisades: 75, Eaton: 75)
- The age of the decedents ranged from 32 to 95 years old (Palisades: 32 to 94, Eaton: 40 to 95)
- The gender breakdown of decedents was 15 females and 17 males (Palisades: 5 females, 7 males; Eaton: 10 females, 9 males)

Most decedents — 25 (78%) — were found inside residences. Seven (7) were located outside (22%).

3.11.5.1 Location of Decedents

For the Palisades Fire, eight (8) decedents were found inside of residences, and four (4) were located outside. For the Eaton Fire, 10 decedents were found inside of residences, and two (2) were located outside.

Of the six (6) decedents that were found outside in the Palisades or Eaton Fire perimeters, one (1) appeared to be fleeing the fire. They were reported to have fallen down a hill. The others were located or recovered under the following circumstances:

- Collapsed in front of paramedics near their home with severe thermal injuries
- Recovered adjacent to their home with a garden hose in their hand
- Recovered near their residence and was reported to have stayed behind to water their rooftop
- Recovered in the rear seat of their car with their pets after declining to evacuate
- Recovered on the front steps of their home

Six (6) of the decedents had documented medical conditions that could impact their ability to self-evacuate, including cerebral palsy and diminished health. Seven (7) of the decedents had reported mobility challenges that included balance and vision problems, difficulty walking, limb amputations, and being bedridden.

Eleven (11) of the decedents had someone with them who successfully evacuated. These were relatives, roommates, neighbors, and/or law enforcement. In all of these cases, the decedents declined to evacuate with them.

Decedents in the Palisades Fire were located in areas across the fire footprint (Figure 3.11.33).

Five (5) decedents were located between the area of fire origin and the ocean on the east side of the fire in Pacific Palisades (Figure 3.11.34). The wind-driven conflagration moved rapidly through this area on January 7, 2025, beginning at 10:30.

The remaining seven (7) Palisades Fire decedents were located in Los Angeles County, including Malibu, Big Rock, Las Flores, and Monte Viento (Figure 3.11.35). The fire progressed through this area on the night of January 7, 2025, and through January 8, 2025.

Figures 3.11.34 and 3.11.35 display evacuation notification timing in the Palisades Fire area, location of recovery, associated demographic information, and FIRIS perimeters documented in the Phase One report.[1]

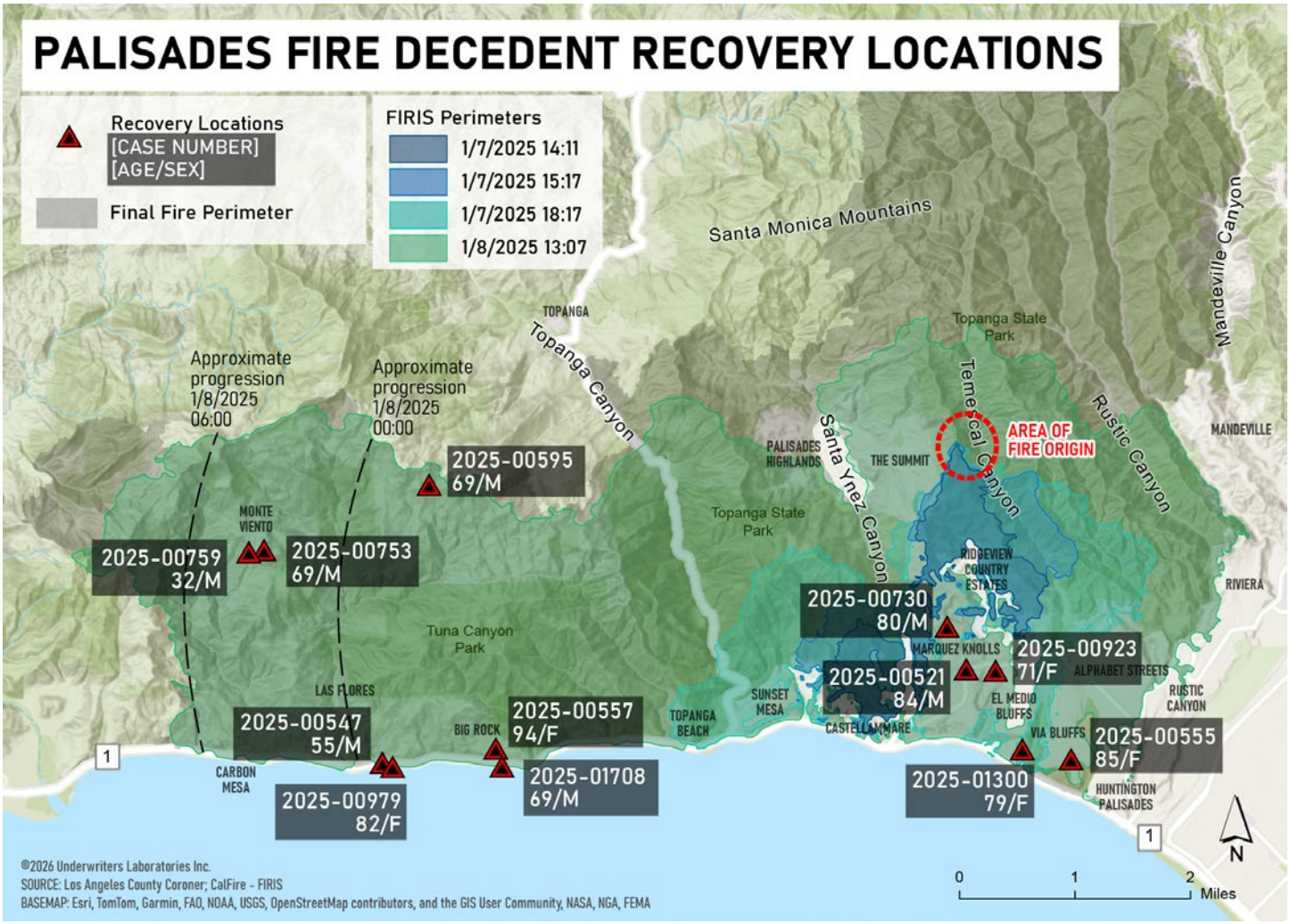


Figure 3.11.33 Palisades Fire decedent recovery locations overlaid with FIRIS perimeters and ULRI estimated fire progression notes.

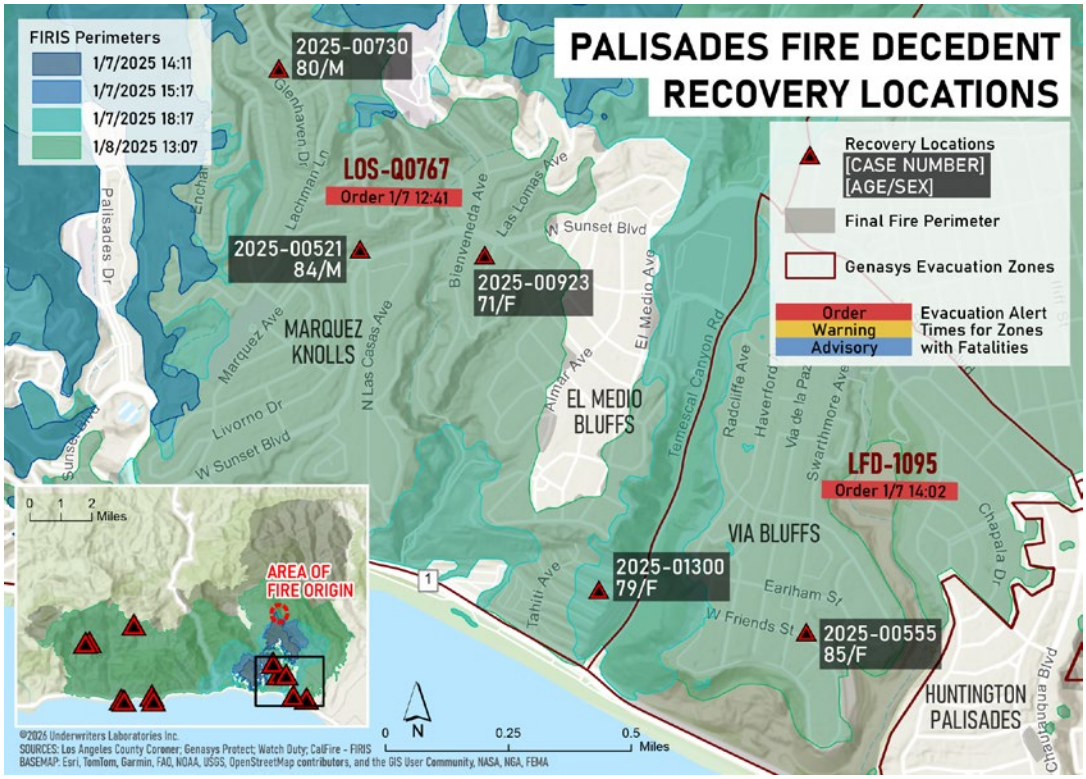


Figure 3.11.34 Pacific Palisades decedent recovery locations overlaid with FIRIS fire perimeters, and Watch Duty evacuation notification timing.

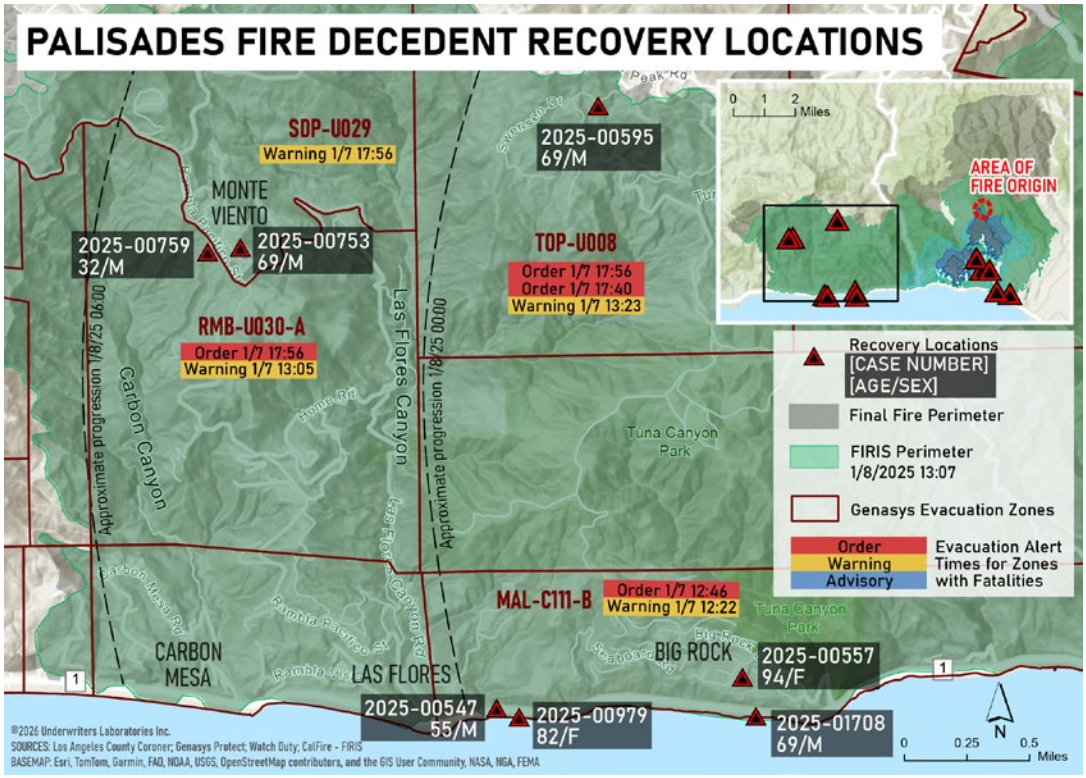


Figure 3.11.35 Palisades Fire decedent recovery locations in Los Angeles County overlaid with FIRIS fire perimeters, ULRI estimated fire progression notes, and Watch Duty evacuation notification timing.

All of the Eaton Fire decedents were located on the west side of the fire perimeter in Altadena (Figure 3.11.36). All were located west of Lake Avenue, except for one (1), which was just east of Lake Avenue.

This area is bound by East and West Loma Alta Drive on the north, Lincoln Avenue on the west, and East Woodbury Road on the south. Based on the fire progression analysis in the Phase One report, the fire progressed toward this area six (6) hours after the start of the Eaton Fire.

At 00:35 on January 8, 2025, there were two (2) reports of bushes on fire west of Lake Avenue on East Altadena Drive.

At 00:55, there was a report of a house on fire near East Las Flores Drive and Santa Anita Avenue. The first structure fires on Lake Avenue were reported at 01:30 near East Palm Street, while reports were received of a garage fire extending into residences near Lake Avenue at 01:45.

Between eight (8) and 11 hours after the start of the Eaton Fire, the fire had progressed throughout the area where the decedents were located.

Figure 3.11.36 displays evacuation notifications in the Eaton Fire area, along with decedents' demographic information and recovery locations, and fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in in the Phase One report.[1]

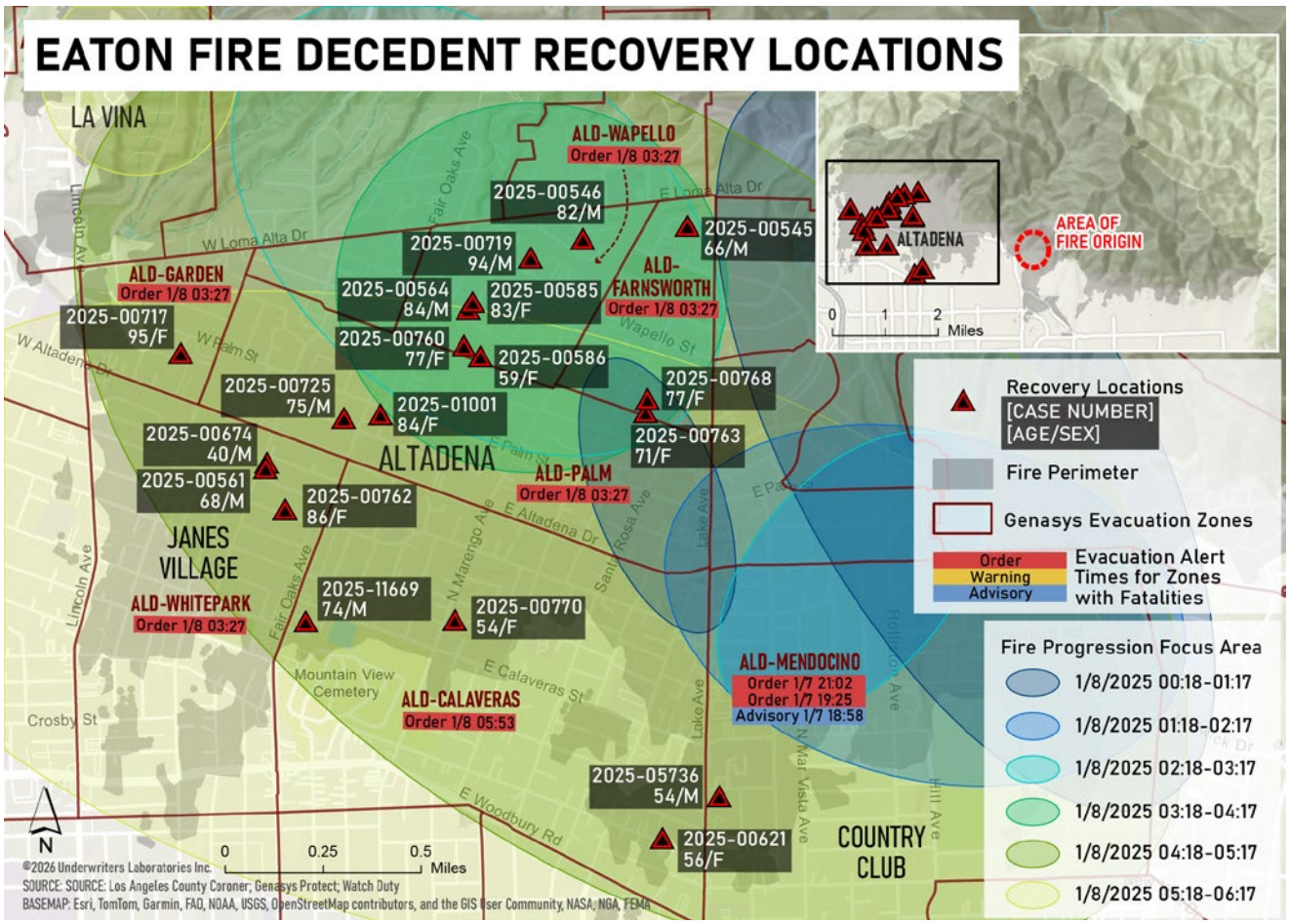


Figure 3.11.36 Eaton Fire decedent recovery locations overlaid with demographic data, FIRIS fire perimeters, fire progression focus areas where high confidence ground-based evidence indicates the fire's presence as defined in in the Phase One report,[1] and Watch Duty evacuation notification timing.

3.11.5.2 Evacuation Circumstances

ULRI utilized the available data to examine the evacuation circumstances for all 32 decedents. Table 3.11.3 provides a demographic overview of the decedents, including coroner case number, age, sex, the address, and location where they were recovered.

Most of the data in this section was received from police reports. Law enforcement officers contacted relatives and others who may have had contact with the individual. They also gathered anecdotes that provided key insights into the circumstances from the last time the individuals were seen, or spoken to, through their recovery and the conditions that existed (Table 3.11.4).

For each case, ULRI also examined the fire progression data from the Phase One report to understand the speed at which the fire approached, and the evacuation challenges the decedent likely experienced.

Table 3.11.3 Fire-related deaths in Palisades, Eaton, and Olivas Fires in January, 2025.

CASE NUMBER	AGE	SEX	ADDRESS	LOCATION OF RECOVERY
2025-00521	84	M	Marquez Avenue, Pacific Palisades	In front of address
2025-00545	66	M	N Monterosa Drive, Altadena	In walkway of address
2025-00546	82	M	Alta Pine Drive, Altadena	In residence
2025-00547	55	M	Pacific Coast Highway, Palisades	Behind residence
2025-00555	85	F	Friends Street, Pacific Palisades	Car port
2025-00557	94	F	Roca Chica Drive, Malibu	In residence
2025-00561	68	M	West Terrace Street, Altadena	In residence
2025-00564	84	M	Tonia Avenue, Altadena	In residence
2025-00585	83	F	Tonia Avenue, Altadena	In residence
2025-00586	59	F	East Las Flores Drive, Altadena	Rear portion of backhouse
2025-00595	69	M	Swenson Drive, Topanga - Palisades	2nd floor of residence
2025-00621	56	F	East Sacramento Street, Altadena	In residence
2025-00674	40	M	West Terrace Street, Altadena	In residence
2025-00717	95	F	Krenz Avenue, Altadena	Concrete stairs leading to the residence
2025-00719	94	M	Wapello Street, Altadena	In residence
2025-00725	75	M	West Pine Street, Altadena	In residence
2025-00730	80	M	Glenhaven Drive, Palisades	In residence
2025-00753	69	M	West Paloma Blanca Drive, Malibu	In residence
2025-00759	32	M	Rambla Pacifico Street, Malibu	In residence
2025-00760	77	F	East Las Flores Drive, Altadena	In residence
2025-00762	86	F	West Mariposa Street, Altadena	Front of residence
2025-00763	71	F	East Las Flores Drive, Altadena	In residence
2025-00768	77	F	Punahou Street, Altadena	In residence
2025-00770	54	F	North Marengo Avenue, Altadena	In residence
2025-00923	71	F	Los Lomas Avenue, Palisades	In residence
2025-00979	82	F	Pacific Coast Highway, Malibu	In residence
2025-01001	84	F	East Palm Street, Altadena	In residence
2025-01300	79	F	Aloha Drive, Palisades	In residence
2025-01708	69	M	Pacific Coast Highway, Malibu	Near Pacific Coast Highway
2025-05736	54	M	Boston Street, Altadena	In residence
2025-11669	74	M	La Venezia Ct, Altadena	In residence
0056-25	55	M	Olivas Golf Course (Ventura)	Encampment in the area

Table 3.11.4 Decedents' evacuation circumstances.

CASE NUMBER	LAW ENFORCEMENT & MEDIA REPORTS RELEVANT TO EVACUATION CIRCUMSTANCES
2025-00521	Did not initially evacuate. Approached paramedics following the Palisades Fire and then had a witnessed collapse.
2025-00545	Family member was helping him evacuate, but had to leave due to worsening conditions. A second family member opted to remain behind. He was noted to be holding a hose. Family member tried multiple times to get him to evacuate, but he did not.
2025-00546	He did not believe the fire would become so intense, so he did not evacuate. As a family member who lived with him packed a car, he declined appeals to evacuate.
2025-00547	The deceased lived with a roommate who evacuated. The decedent chose to stay behind and fight the fire with a garden hose and to water the rooftop.
2025-00555	Her neighbor spoke with her and encouraged her to evacuate with him. She declined to leave. Two (2) neighbors also contacted her. She declined help, saying she wanted to stay with her pets.
2025-00557	A deputy spoke with the decedent at her front door and instructed her to evacuate, but the decedent stated that she would not evacuate. Family members said she may have had a false sense of security after surviving multiple wildfires, in which she also declined to leave.
2025-00561	Sometime around 06:00 on January 8, 2025, the decedent spoke to a family member stating he (an amputee below the knee) and his non-ambulatory son were waiting to be evacuated. The father took care of his son. Both men died in the fire.
2025-00564	The decedent's family member said the decedent did not have a cell phone and would not have gotten any alerts. A family member last spoke with the decedent on January 7, 2025, at 12:35. At 19:30, a neighbor told the family member about the fire, who then tried to call the decedent, but received no answer. On January 8, 2025, the neighbor called a family member at 03:00 about the mandatory evacuation. The family member woke at 05:00 and tried to call the decedent, but did not get a response.
2025-00585	Family members told law enforcement that the decedent declined to leave the residence, despite receiving warnings about the fire rapidly approaching. In the past there had been fire warnings and evacuations, and the fires had never reached her home or posed any danger. As such, she chose to remain at the home.
2025-00586	The decedent lived at the residence with other family members when the Eaton Fire started. The other family members "emergently evacuated" and left the area. After evacuating, the family was unable to reach the decedent.
2025-00595	The decedent was reported to have attempted to save his home from the Palisades Fire. On January 9, 2025, fire and law enforcement personnel discovered the decedent on the 2nd floor near a doorway while performing a welfare check requested by a 911 caller.
2025-00621	When the fire started on January 7, 2025, family members were unable to contact the decedent. She was reported to have mobility challenges.
2025-00674	During a phone conversation earlier in the morning with a family member, the father said he and his son were waiting to be evacuated. The family member last spoke to the decedent and the decedent's father, who had a below-the-knee amputation and limited mobility, around 06:20 on January 8, 2025.
2025-00717	Family members said the decedent spent January 7, 2025, in the hospital for health issues and returned to her home in Altadena exhausted at the end of a long day.
2025-00719	A missing persons report was filed for the decedent after the Eaton Fire. Officials responded to the location and found the residence was completely destroyed by the fire.
2025-00725	On January 8, 2025, at 01:30, the decedent's roommate left the location with police personnel. The decedent decided to stay back and wait for a friend to pick him up. Shortly after, the friend arrived and didn't see him in the driveway. He attempted to yell and knock on the door, but didn't hear from the decedent. The friend's car was on the verge of catching fire and he left the location.
2025-00730	A family member stated the family tried to convince the decedent to leave his residence due to the fires. He declined to evacuate and stayed.
2025-00753	The decedent and a family member were inside the residence when the fires began. She stated no evacuation order was given at this time, but they could see the fire quickly approaching their home. She pleaded with him to leave the residence with her, but he declined and chose to stay behind.
2025-00759	On January 8, 2025, at approximately 22:00, the decedent's family member went to a fire station located down the street from her residence and reported that embers from the Palisades Fire had reached the decedent's residence and she was unable to extinguish them. Upon arrival of fire department personnel, the decedent's house had been engulfed by flames and the building was no longer standing.

Table 3.11.4 Decedents' evacuation circumstances. (continued)

CASE NUMBER	LAW ENFORCEMENT & MEDIA REPORTS RELEVANT TO EVACUATION CIRCUMSTANCES
2025-00760	On January 7, 2025, the decedent's neighbors were leaving their residence due to the Eaton Fire evacuation orders and offered the decedent a ride out of the area, but she declined. On January 8, 2025, another neighbor went to her residence to retrieve additional belongings and sent the decedent a text message offering her a ride out of the area and again the decedent declined.
22025-00762	The decedent lived alone at her residence.
2025-00763	On January 8, 2025, at approximately 04:00, a friend of the deceased was escorted by law enforcement to her residence to convince her evacuate. She declined to evacuate and gave her dog to the friend and told them to stay safe.
2025-00768	Reportedly, the decedent was not able to move on her own. There were no other reported people living in the residence. The decedent had a history of falls and would require a medical walker or a wheelchair to get around. On January 7, 2025, at approximately 19:00, the decedent was last known alive when she spoke to a friend by telephone.
2025-00770	On January 8, 2025, the decedent sent a text message to a family member stating the fire was in her area and she packed a bag in the event she had to evacuate. Her family sent text messages to the decedent to check on her status, but did not receive a response. The decedent's vehicle was located in the driveway.
2025-00923	A family member spoke with the decedent on January 7, 2025, at 17:30 on the phone and stated the decedent told her she declined to evacuate, as the fires were not close to her. The decedent told the family member she would call 911 if the fires got close.
2025-00979	A family member shared that a neighbor of the decedent told him that the neighbor, who was in their 90s, did not realize how close the fire was to their residence until evacuation occurred. The neighbor reportedly attributed this lack of awareness to a power outage and the orientation of their residence, which faced the ocean rather than the approaching fire. Based on this conversation, the family member stated he believed the decedent may have experienced similar circumstances and may not have recognized the immediacy of the threat before conditions became perilous.
2025-01001	The decedent was located by LASD Search & Rescue while they were conducting a home-to-home search of the neighborhood.
2025-01300	Reportedly she declined to evacuate with other residents during the Palisades Fire evacuation notice.
2025-01708	On January 8, 2025, the decedent was attempting to flee the wildfire down the hillside along his residence when he reportedly fell down the hill. The decedent was reportedly an amputee, and detectives believe the decedent fell down the hillside to PCH.
2025-05736	On January 7, 2025, the decedent spoke to an out-of-state family member, who called after seeing reports of fires. He said that he was "OK." His landlord later saw him in his car outside his apartment complex around 21:00. It was his last known sighting.
2025-11669	Individual lived alone in an area where evacuation orders were delayed.
0056-25	The decedent reportedly lived alone with no known family to contact. The medical examiner listed the cause of death as thermal injuries, and accidental. His body was found in the Santa Clara River bottom, near Olivas Park Drive and Harbor Boulevard, Ventura.

Fire-related deaths were mostly located in a relatively small number of neighborhoods that were each impacted by rapid fire spread where conditions deteriorated quickly. The majority of the decedents were elderly adults and/or residents with mobility limitations, highlighting the challenges vulnerable populations face during fast-moving wildfire events.

Some evacuation notifications, particularly in the Eaton Fire west of Lake Avenue, were issued as the fire approached and, in some cases, after it had already begun impacting the area. The circumstances of several fatalities suggest that some individuals may not have been aware of the fire's proximity or their evacuation status. Early warnings are especially important for vulnerable populations because they provide additional time to react and receive support from family members, neighbors, or caregivers.

For several decedents, the available information indicates that they chose not to leave despite receiving warnings, evacuation orders, or direct notifications. In some cases, family members, neighbors, friends, or other occupants evacuated safely from the locations where the decedents declined to evacuate.

From the available evidence, none of the fire-related deaths identified in this analysis involved individuals who were overtaken by the fire while actively evacuating, suggesting that most deaths occurred after evacuation opportunities had been missed or declined.

Despite the tragic loss of life, a relatively large number of residents were able to evacuate from communities impacted by the Palisades and Eaton Fires. The evacuation efforts carried out by residents, emergency responders, and community volunteers (i.e. Community Brigade engagement during the Palisades Fire) took place under exceptionally challenging conditions.

3.11.6 Findings and Recommendations

FINDING 120: The public alert and warning process is overly complex involving multiple organizations — both public and private, in and outside of government — with overlapping and interdependent authorities, technologies, regulations, standards, policies, and capabilities.	**RECOMMENDATION 120.1:** Complete a comprehensive, end-to-end review and analysis of the current public alert and warning system for Southern California, with the goal of describing current capabilities, identifying critical interdependencies or gaps, and assessing potential enhancements that could improve the speed and efficacy of the overall system during fast-moving multi-jurisdictional events.
FINDING 121: Some personnel lacked familiarity with key systems (e.g., evacuation platforms, interoperability tools), resulting in inefficient workflows and missed communications.	**RECOMMENDATION 121.1:** Implement recurring multi-agency training on communications systems and platforms supporting public evacuation notification.
FINDING 122: A limited number of personnel were trained on the Genasys software platform. Genasys was a newly expanded program (implemented in November 2024), and challenges in using the system increased the time it took to draft and send alerts and warnings.	**RECOMMENDATION 122.1:** Increase the number of EOC staff who are trained and authorized to perform advanced functions within Genasys Protect and other evacuation management platforms to improve staffing depth and reduce reliance on a limited number of "Super User" operators. **RECOMMENDATION 122.2:** Ensure all users of Genasys Alert and Genasys Protect receive continuing education and training regarding the use of evacuation mapping software platforms.
FINDING 123: Third-party emergency information platforms, such as Watch Duty, played an important role in providing the public with real-time situational awareness by aggregating and disseminating information from multiple authoritative sources during the Palisades and Eaton Fires.	**RECOMMENDATION 123.1:** Incorporate third-party notification tools into public warning and preparedness strategies by recognizing their role as supplemental situational-awareness resources rather than competitors to official alert systems. **RECOMMENDATION 123.2:** Federal, state, and local government agencies should consider establishing formal information-sharing protocols with trusted third-party providers so that validated incident information can be distributed rapidly while maintaining message accuracy and consistency. **RECOMMENDATION 123.3:** Develop standards for archiving and analyzing third-party notification data to support post-incident investigations, timeline reconstruction, and evaluation of public information dissemination.
FINDING 124: Watch Duty often relayed fire behavior, evacuation-related information, and other incident updates more rapidly than official notification systems, providing residents with time-sensitive information during rapidly evolving conditions.	**RECOMMENDATION 124.1:** Improve integration between official warning systems and third-party platforms to ensure evacuation orders, warnings, and incident updates are transmitted consistently and with minimal delay across all public-facing channels.
FINDING 125: Neighborhood residents who shared information on various communications platforms (e.g., text chains and group chats) felt more informed about the fire's progress than through official public messaging channels alone. They were more apt to have a plan to stay or go. They identified and helped neighbors with evacuation challenges.	**RECOMMENDATION 125.1:** Fire and law enforcement should reach out to communities to promote close-knit communication networks amongst neighbors using available technologies.
FINDING 126: Requests for evacuation warnings and orders were being received through multiple communication channels. As a result, information on who sent the warnings/orders and when was not always captured.	**RECOMMENDATION 126.1:** Create consistent policies on how to capture the data of who has ordered the alerts, who received them within the EOC, and at what time. This information should be entered in the alert tracking software platform.

3.11.6 Findings and Recommendations (cont.)	
FINDING 127: At the time of the Eaton Fire, Los Angeles County (LACoFD, LASD, and OEM) agencies' policies and procedures supporting evacuation notifications and population movement did not fully address the processes and tasks needed for effective execution.	**RECOMMENDATION 127.1:** Update wildfire evacuation policies between LACoFD, LASD, and OEM. Train agency staff on any changes and exercise the process annually. **RECOMMENDATION 127.2:** All three (3) agencies should be co-located in a UC, side-by-side, in order for the system to work properly.
FINDING 128: Inconsistent situational awareness across agencies and concern about the potential impacts of evacuation orders on residents and businesses, at times, delayed and complicated evacuation decision-making.	**RECOMMENDATION 128.1:** Establish pre-defined, risk-based evacuation trigger points tied to fire behavior, weather conditions, and incident intelligence to support timely and consistent evacuation decisions. **RECOMMENDATION 128.2:** Develop a common operating picture that integrates fire progression, weather, field observations, and evacuation status data to improve shared situational awareness among incident personnel and cooperating agencies.
FINDING 129: In partnership with LASD Lost Hills Station, Los Angeles Unified Schools, due to the Red Flag PDS, closed public schools in the Topanga area and adjusted to online classes.	**RECOMMENDATION 129.1:** Consider expanding this policy, especially for schools located in WUI areas, as it limits the need for evacuation efforts at area schools.
FINDING 130: At the start of the Palisades Fire, LASD LHS personnel identified the wind-driven threat and proactively began evacuations before the fire advanced into their jurisdiction. This showed strong situational awareness and a focus on life safety, even though staffing levels did not meet the demands of the fire spread.	**RECOMMENDATION 130.1:** Continue strengthening proactive, life-safety-driven decision-making by backing early evacuation authority, enhancing allied agency coordination, and providing training that encourages proactive actions during rapidly deteriorating incidents.
FINDING 131: During the Palisades Fire, LASD demonstrated a proactive wildfire evacuation model characterized by early evacuation initiation, community integration, and established fire-law enforcement coordination. LAPD evacuation operations relied more heavily on individual initiative and experienced coordination challenges with fire agencies during the incident.	**RECOMMENDATION 131.1:** Implement standardized fire-law enforcement evacuation coordination procedures through joint planning, training, and exercises. **RECOMMENDATION 131.2:** Promote proactive evacuation decision-making by empowering field personnel to communicate emerging threats and initiate protective actions when conditions indicate an imminent risk to life safety.
FINDING 132: The LASD MFF system was challenged to respond to multiple ongoing incidents and MFF units were unprepared for evacuations in fast-moving, wind-driven fire incidents that impact the built environment.	**RECOMMENDATION 132.1:** Modify or replace the MFF system to address immediate evacuation and traffic control needs of community conflagrations.
FINDING 133: LASD ALD, CVS, and LHS personnel supported evacuation efforts, but required paperwork for residents refusing to evacuate, despite BWC recordings, which delayed operations and created uncertainty about evacuation status.	**RECOMMENDATION 133.1:** Develop evacuation tracking and communication systems that leverage existing technologies, such as BWC data, and are supported by standardized protocols and clear field instructions. This approach will enhance situational awareness, minimize inefficiencies, and speed up life-saving efforts. **RECOMMENDATION 133.2:** Consider updating policy to include the BWC as sufficient documentation of refusals.

3.11.6 Findings and Recommendations (cont.)	
FINDING 134: After the Eaton Fire command was transferred to LACoFD from PFD, evacuation operations were not formalized within the incident organization, as evidenced by the absence of a Law Branch, Evacuation Group, or other dedicated evacuation management function during a rapidly expanding incident requiring large-scale evacuations. However, multiple personnel in the command organization and in the field thought that a Law Branch (or Evacuation Group) had been established.	**RECOMMENDATION 134.1:** Establish a dedicated evacuation management function within the incident organization whenever evacuation operations become an incident objective. **RECOMMENDATION 134.2:** Re-educate Fire Chief Officers on the evacuation training presented on September 23, 24, and 30, 2024, which stressed the importance of establishing a Law Branch with fire personnel embedded for communications.
FINDING 135: During the Eaton Fire, the evacuation order for areas west of Lake Avenue was issued as fire conditions were already impacting the area, reducing the time available for residents to self-evacuate. Delays in the evacuation notification process occurred while fire and law enforcement resources in the area were already understaffed and committed to other operational needs.	**RECOMMENDATION 135.1:** Develop procedures to rapidly deploy and augment law enforcement resources for evacuation operations when fire conditions indicate an increased likelihood of large-scale evacuations. **RECOMMENDATION 135.2:** The incident management team should improve and streamline the evacuation notification process to ensure that evacuation needs are recognized and acted on in a timely and efficient manner, from message identification to message entry to message delivery.
FINDING 136: During the Palisades and Eaton Fires, some residents declined to evacuate despite evacuation warnings and orders, as well as personal contact with emergency responders and community members.	**RECOMMENDATION 136.1:** Increase public education on wildfire and community conflagration risks, as well as evacuation procedures, evacuation routes, and household evacuation planning. **RECOMMENDATION 136.2:** Strengthen community preparedness through neighborhood-based communication networks and community emergency preparedness groups. **RECOMMENDATION 136.3:** Conduct interdisciplinary (fire, law enforcement, and research organizations) research to assess the effectiveness, risks, and operational impacts of residents remaining on their property during wildfires.
FINDING 137: In both fires, a large portion of the decedents were older adults located inside homes, underscoring that limited ability to self-evacuate can increase vulnerability.	**RECOMMENDATION 137.1:** Develop community-based programs to identify and assist at-risk populations before and during evacuations.
FINDING 138: During both the Palisades and Eaton Fires, early evacuation planning did not adequately account for vulnerable populations and critical facilities, reducing situational awareness and affecting the prioritization and coordination of evacuation operations.	**RECOMMENDATION 138.1:** Develop mapping and real-time tracking of vulnerable populations and essential facilities into pre-incident and early operational planning to enhance situational awareness and improve evacuation prioritization. **RECOMMENDATION 138.2:** Establish coordination protocols with hospitals, care facilities, and transportation-dependent groups to guarantee timely assistance and efficient evacuations during rapidly changing incidents. **RECOMMENDATION 138.3:** Develop standardized law enforcement and fire agency policies, procedures, and training for the evacuation of vulnerable populations during large-scale incidents.

3.11.6 Findings and Recommendations (cont.)	
FINDING 139: LASD worked with the known unhoused population in fire-affected areas and assisted them with evacuations.	**RECOMMENDATION:** N/A
FINDING 140: Municipal buses played an important role in evacuating vulnerable populations from care facilities in hazardous conditions as the Eaton Fire impacted areas of Altadena and Pasadena.	**RECOMMENDATION 140.1:** Public transportation entities should consider developing training to support large-scale evacuations of vulnerable populations during rapidly escalating emergency incidents.
FINDING 141: Traffic conditions changed rapidly as fire progression, congestion, road closures, abandoned vehicles, and infrastructure impacts affected evacuation routes, highlighting the need for integrated traffic management and real-time coordination among response agencies.	**RECOMMENDATION 141.1:** Establish a unified evacuation traffic management function that integrates law enforcement, fire, transportation, public works, and emergency management agencies to coordinate route management, traffic information, signal operations, and evacuation decision-making.
FINDING 142: During the Palisades and Eaton Fires, effective evacuation traffic management was hindered by the lack of standardized procedures and training to help officers understand how individual traffic control points supported the broader evacuation strategy.	**RECOMMENDATION 142.1:** Develop and train on wildfire-specific traffic management plans that define evacuation routes, traffic control objectives, alternate routes, road closure procedures, and field reporting requirements.
FINDING 143: Land use and time of day are critical during evacuations. In high-activity, mixed-use areas during daylight hours, roadways already carry substantial demand. While an evacuation may shift when that demand occurs, the Palisades Fire evacuation did not increase overall roadway activity — and during normal peak hours, it appears to have reduced it.	**RECOMMENDATION:** N/A
FINDING 144: Evacuation activity did not substantially exceed baseline levels across the Palisades Fire area during the first 12 hours of the incident. However, localized congestion was known to have occurred on key corridors and may not appear in area-wide results.	**RECOMMENDATION:** N/A
FINDING 145: Unlike the Palisades Fire, the Eaton Fire evacuation showed dramatically different travel patterns from normal overnight conditions. Peak travel activity did not greatly exceed typical roadway use, though it occurred at different times.	**RECOMMENDATION:** N/A
FINDING 146: Despite differences, responsiveness to evacuation warnings and orders is consistent: most trips start within 1-2 hours, followed by a longer tail of activity.	**RECOMMENDATION:** N/A
FINDING 147: StreetLight data was a useful source of trip activity data during the Palisades and Eaton Fire evacuations.	**RECOMMENDATION:** N/A
FINDING 148: In previous fires, communities have established designated areas of refuge that provide temporary areas of relief if evacuation is not possible. Examples of these areas include golf courses, community centers, cleared parking lots, and parks.	**RECOMMENDATION 150.1:** Communities should establish and educate the public on designated areas of refuge to prioritize life safety of residents and responders in the event of a fire.

3.11.6 Findings and Recommendations (cont.)	
FINDING 149: During the Palisades and Eaton Fires, emergency response personnel were required to divert resources to secure critical equipment and defend fire and law enforcement facilities threatened by fire.	**RECOMMENDATION 149.1:** Fire and law enforcement agencies should develop and exercise standardized facility evacuation and continuity-of-operations plans that provide procedures for securing critical assets and maintaining essential services when public safety facilities are threatened by wildfire.
FINDING 150: During Eaton Fire evacuations on the morning of January 8, 2025, looting incidents required law enforcement personnel to divert resources from evacuation operations, search and rescue missions, and calls for service.	**RECOMMENDATION 150.1:** Law enforcement agencies should request additional resources early to maintain evacuation operations while providing security and preventing criminal activity within evacuated areas. **RECOMMENDATION 150.2:** Law enforcement agencies should consider requesting mobile booking resources early during large-scale incidents to expedite the processing of individuals engaged in criminal activity and minimize the diversion of personnel from life-safety operations.
FINDING 151: Large wind-driven fires in the Santa Monica Mountains routinely exceed the capacity of local emergency response agencies during extreme fire events. Community Brigades provided additional resources, local intelligence, evacuation support, and structure protection assistance during the Palisades Fire.	**RECOMMENDATION 151.1:** Expand Community Brigade programs within high-risk WUI communities. **RECOMMENDATION 151.2:** Provide the Community Brigade with sustainable funding to support readiness and equipment.
FINDING 152: Community Brigade members improved evacuation compliance by leveraging existing community relationships and local trust.	**RECOMMENDATION 152.1:** Expand Brigade coverage to additional high-risk communities. **RECOMMENDATION 152.2:** Incorporate Brigade members into pre-fire evacuation planning and public preparedness programs.
FINDING 153: Community Brigade integration into the incident management structure was inconsistent during the Palisades Fire.	**RECOMMENDATION 153.1:** Establish formal resource typing and credentialing for the Community Brigade. **RECOMMENDATION 153.2:** Include Community Brigades in drills, exercises, and IAPs. **RECOMMENDATION 153.3:** Develop clear assignment, supervision, and communications protocols.
FINDING 154: Community Brigade personnel operated in conditions that at times necessitated exceeding the roles and operational boundaries envisioned by program doctrine.	**RECOMMENDATION 154.1:** Establish standardized qualifications and operational standards for the Community Brigade. **RECOMMENDATION 154.2:** Define risk-based engagement criteria and accountability requirements for the Community Brigade. **RECOMMENDATION 154.3:** Ensure Community Brigade members have appropriate PPE, communications equipment, and supervision for the hazards within these operational standards.

4.1 Fire Impact on the Built Environment

The Palisades and Eaton Fires' impact on the built environment was analyzed by characterizing the exposures structures faced and the factors that aided in structure survival within the fires' perimeters.

Section 4.2 provides an overview of the methodology used to observe and describe damaged structures in these fires. There is particular focus on conditions that contributed to some structures surviving fire impacts, while oftentimes being in the immediate vicinity of other destroyed properties.

The analysis will provide a review of fire spread in the Palisades and Eaton Fire communities, as well as a general overview of the mechanisms of heat transfer that initially ignited structures and led to structure-to-structure fire spread in these areas (see Section 4.3).

Additionally, the physical damage to structures (from wind-blown debris and toppled vegetation to impacts from nearby structural collapse) is discussed, which may have reduced the ability of some structures to withstand the ignition mechanisms described above.

The analysis will also review common items found near, or attached to, homes that created pathways for the fire to impact structures (see Section 4.4.1).

These include transient items, such as garbage cans, recycling bins, and even personal vehicles, as well as more seasonal materials, such as yard debris gathered near a structure or outdoor furniture located in the immediate vicinity of a home.

Structures within the Palisades and Eaton Fire areas were under intense thermal and physical attack throughout the incident. A key defense mechanism for structures to withstand these conditions is their design and construction.

As such, building construction factors, including understanding the relative performance of components (e.g., materials, designs, interfaces, etc.) utilized in construction, is discussed within the analysis (see Section 4.4.2).

Additional analysis will also examine how the decisions residents made in the preparation and maintenance of their properties played a key role in structure defense (see Section 4.4.3). In both fires, some residents specifically primed items, such as vegetation, landscaping, and home-adjacent accessories, to limit these materials' ability to magnify the fires' impact to their homes.

Some also made further preparations to assist first responders during the emergency response.

Finally, defensive actions taken during the fires are examined across the timeline of the incident from when embers and flames first began to approach communities to after the initial fire impact had moved through these areas (see Section 4.4.4).

Firefighters and law enforcement officers conducted a wide range of emergency response actions during this time, attempting to limit cascading damage from fully involved structures and neighborhoods, as well as addressing individual spot fires.

Some residents also delayed evacuation and/or returned after the initial fire had passed to use garden hoses, buckets of water, and other resources to address spot fires and attempt to slow down the progress of structure damage.

A number of factors often combine to result in structure damage and destruction during large outdoor fire and community conflagrations. And while structure hardening and property preparations cannot alone guarantee a structure's survival in a large, wind-driven community conflagration, these efforts can buy time to allow firefighters to respond and control fire progression as water supplies and weather allow.

4.2 Built Environment Analysis Methodology

ULRI's analysis of the Palisades and Eaton Fires' damage to, and impacts on, the built environment is based on multiple data sources.

In January and February 2025, the ULRI team deployed to Los Angeles to gather data on the impact of the incidents, including on-the-ground damage assessments of over 880 structures and in-person conversations with residents who described their experiences. Many residents also shared photos and videos from before, during, and after the fires.

Supplemental damage assessments were gathered from geographically diverse locations across the incident areas.

Damage assessments in the Palisades and Eaton Fire areas began on January 12, 2025. During this time, CAL FIRE damage inspection (DINS) teams were active on both incidents, assessing structures within the fire perimeter, including those damaged during the incident.

Damage inspectors receive specialized training to conduct assessments after disasters, collect structure construction and fire progression information, and, ultimately, determine damage classification for a given structure.

Affected structures are those with minimal damage or damage to a limited portion of a building (shown in green in Figures 4.2.1 and 4.2.2).

Minor damaged structures include more substantive damage to one (1) or more components and/or a larger portion of the structure (shown in yellow in Figures 4.2.1 and 4.2.2).

Major damaged structures include those that sustained significant structural damage and will require extensive repairs to a significant portion of the structure (shown in orange in Figures 4.2.1 and 4.2.2).

Destroyed structures are those that sustained damage to an extent that repair is not feasible (shown in red in Figures 4.2.1 and 4.2.2). Structures that were inspected and classified as No Damage are shown in black on DINS maps below.

ULRI leveraged the published DINS inspection records, including data and photographs, to prioritize supplemental damage assessments in areas where the structures that were categorized by DINS transitioned from Destroyed to Damaged (i.e., Major, Minor, or Affected) or No Damage.

The damage classification was considered when determining which structures would have supplemental assessments, with a focus on Major and Minor structure damage (Figures 4.2.1 and 4.2.2 and Table 4.2.1).

Additional data that informed this analysis includes:

- Remote sensing imagery (pre- and post-fire)
- Building/property details
- CAD data
- Radio communications
- Responder AVL data
- First- and second-hand accounts, photographs, and video from TDs with emergency responders

Photographs presented in this chapter were collected from ULRI damage assessments, supplemented with those provided by responders, residents, and DINS reports.

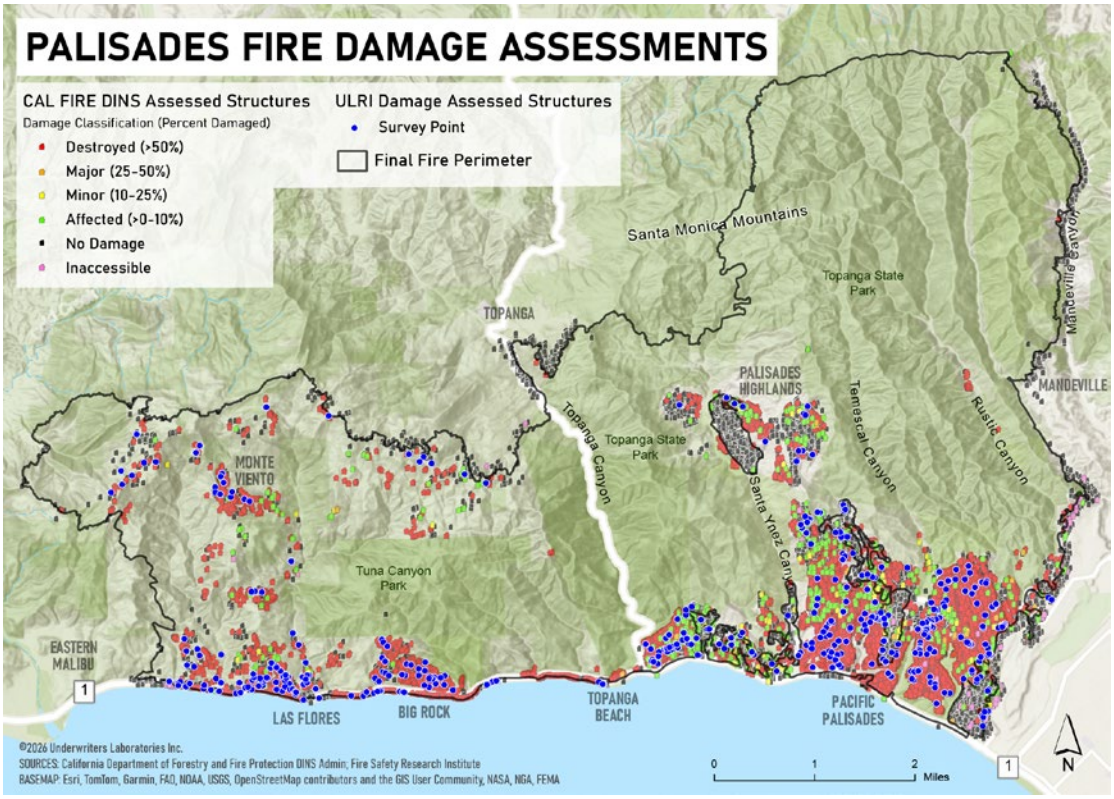


Figure 4.2.1 Palisades Fire DINS and ULRI assessed structures.

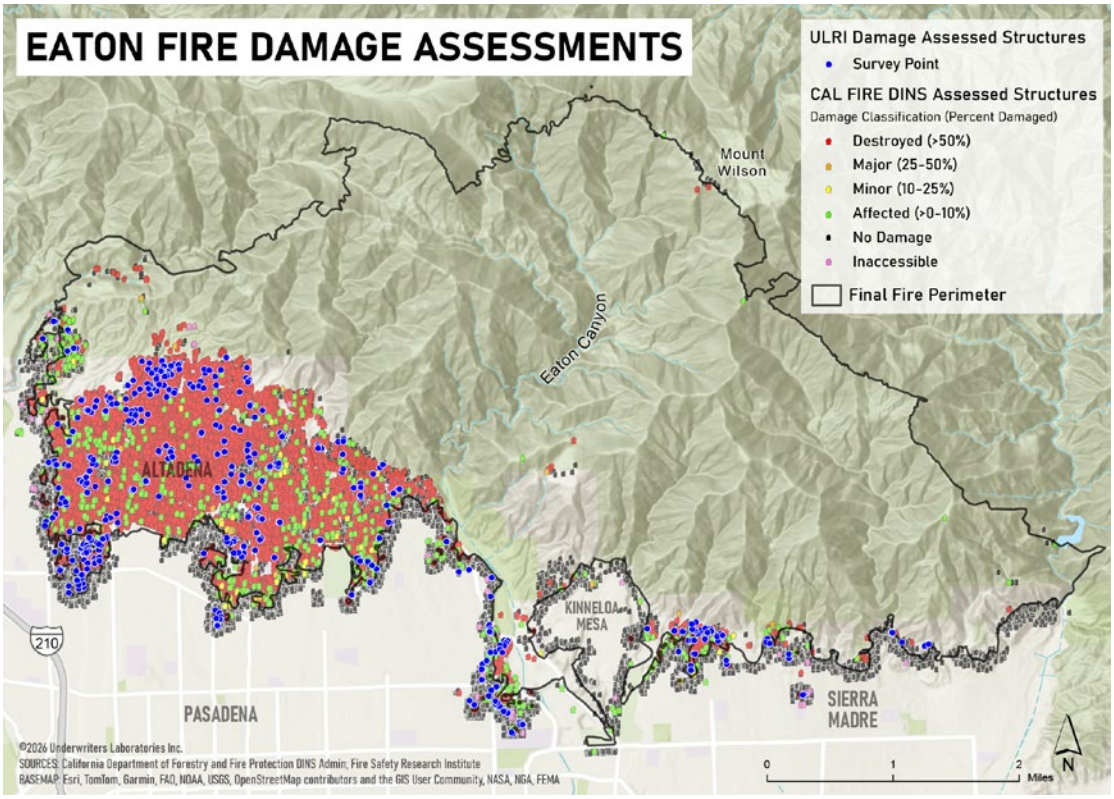


Figure 4.2.2 Eaton Fire DINS and ULRI assessed structures.

Table 4.2.1. Count of structures assessed by DINS inspectors and ULRI supplemental assessments for each of the Palisades and Eaton Fires. Damage classification is based on DINS data. There are three (3) properties in the Palisades Fire and four (4) in the Eaton Fire areas that were assessed by the ULRI team but not by DINS inspectors.

	PALISADES		EATON	
DAMAGE CLASS	DINS	ULRI	DINS	ULRI
Affected	732	234	858	225
Minor	171	107	148	99
Major	72	53	70	53
Destroyed	6,845	17	9,403	19
No Damage	4,261	34	7,820	39
TOTAL	12,081	445	18,299	435

Data collected during the ULRI damage assessments included high-definition videos and photographs of structure and property damage, as well as fire spread pathways.

For most properties where access was possible, a 360-degree assessment was completed around the structure to identify damaged components, potential fire spread mechanisms, and evidence of intervention.

A digital field survey was created on a GIS platform to collect and track initial damage assessment data for each structure. For some structures, the distance between fuels and structures was measured in the field to supplement post-assessment, satellite-based measurements.

In some cases, by the time ULRI team members surveyed a structure, residents or contractors had repaired or covered the damage that DINS inspectors had observed.

A comprehensive, multi-media review tool was then developed to integrate the on-the-ground assessment with additional data sources, including DINS, AVL, CAD, radio communications, resident conversations, and notes from TDs, photographs, and videos.

Information collected during the on-the-ground assessment was reviewed with the context of the other data to establish a more refined assessment of each structure surveyed.

For each structure, the relevant fire spread mechanism(s), damage (e.g., location and magnitude) to building components, and near-home combustibles were evaluated. Potential mitigating actions were also examined, such as resident preparation of the property and interventions conducted before, during, and after fire arrived in the area.

4.3 Fire Spread and Structure Damage in the Built Environment

4.3.1 Initial Fire Spread from Wildland Vegetation to Structures

Both the Palisades and Eaton Fires initially ignited in mature vegetation 1,000+ ft away from the initial structure impacts, which would begin the structure-to-structure fire spread that led to the wider conflagration.

This distance, along with intense winds, produced and distributed embers across a wide area ahead of the growing vegetation fire. While firefighters began to address the rapidly spreading vegetation fires, the multitude and wide distribution of ember-ignited spot fires immediately began to challenge fire department resources.

As noted in the Phase One report[1], within the first hour of the Palisades Fire, the fire spread over a mile south towards the ocean (Figure 4.3.1).

Flames in the vegetation began to widen from the heel. And while firefighters were able to keep the vegetation fire from encroaching on the nearby Summit neighborhood, embers drove the fire south, igniting structures on Lachman Lane and jumping to the west side of Palisades Drive by 11:30 on January 7, 2025.

In the Eaton Fire, embers were reported to be impacting several locations west of Eaton Wash within the first 20 minutes after the fire was reported.[1]

At 18:26, firefighters reported embers impacting structures on Canyon View, approximately 1,000 ft from the area of origin.

By 18:33, there was a report of a “huge ember cast coming down” from near the intersection of Canyon Close and North Altadena Drive (over 2,000 ft from the area of origin).

Shortly thereafter, another report of spotting was received from approximately a mile and a half southeast of the origin, beyond Kinneloa Mesa (Figure 4.3.2).

Fire spread in dense vegetative fuels is oftentimes viewed from a distance as a seemingly continuous fire front, moving mostly in the direction of the wind, while also being heavily influenced by topography. This pattern changes, however, when wildland fires encroach upon the built environment.

Aerial views, such as those shown in Figure 4.3.3, show the Palisades Fire progressing through vegetation in the late afternoon of January 7, 2025 — the fire following a nonlinear, but relatively continuous, path.

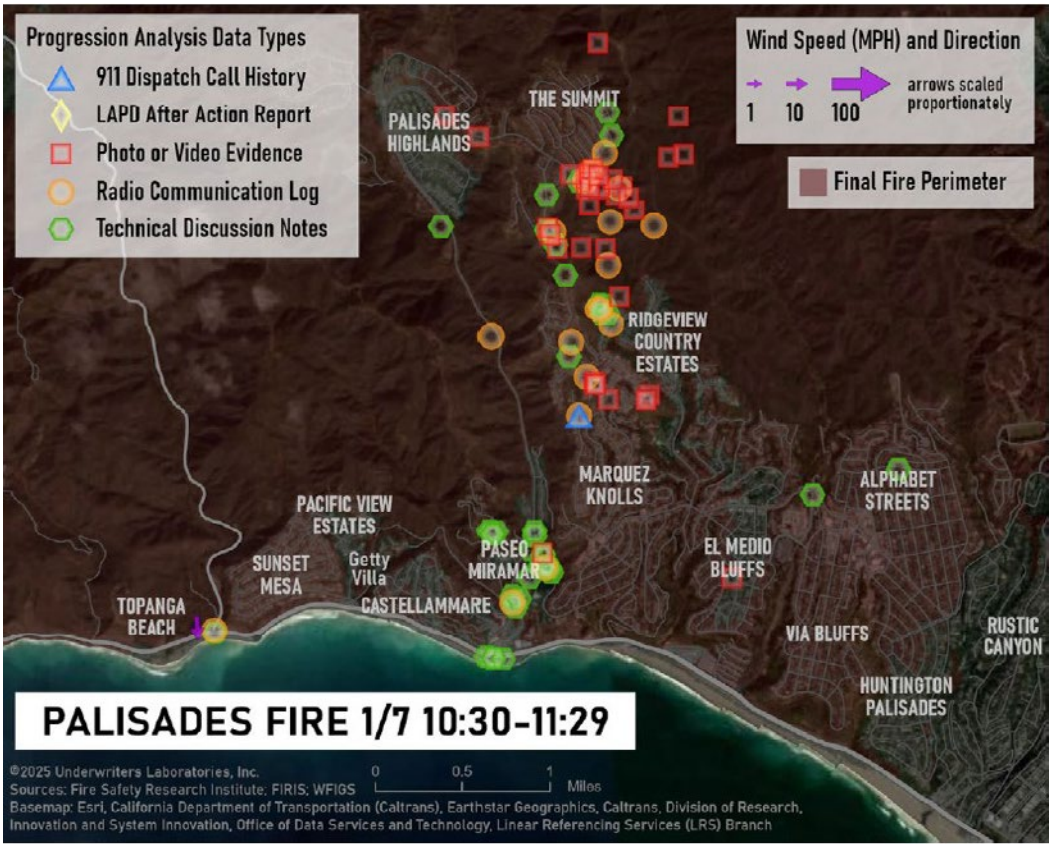


Figure 4.3.1 Map of fire activity in the first hour of the Palisades Fire. Reproduced from the Phase One report.[1]

As the fire approached the built environment (Figure 4.3.4), the makeup and distribution of fuels changed from vegetation to materials common in urban communities.

Vegetation species and spacing in communities are oftentimes different than in the wildland and are typically better maintained. Structure materials and other household belongings have more varied ignition thresholds, flame spread rates, and energy and ember production characteristics.

Noncombustible infrastructure, such as roads, can also create widely distributed fuel breaks. As such, fire spread into, and throughout, the built environment often becomes more discontinuous (Figure 4.3.5) than in wildland environments.

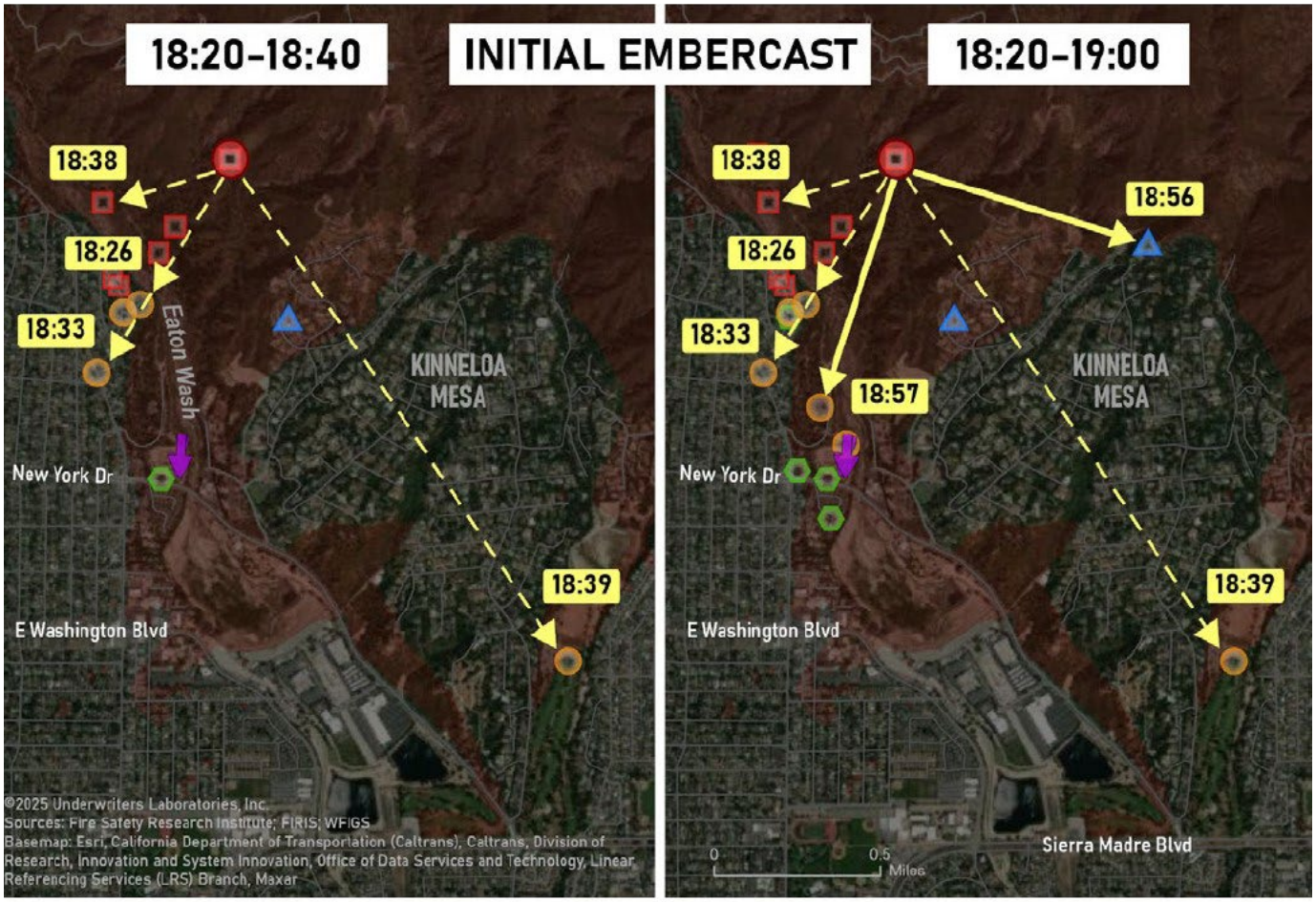


Figure 4.3.2 Map of initial embercast within the first hour of the Eaton Fire. Reproduced from Phase One report.[1]

Figure 4.3.3 Fire spread through wildland vegetation in the Palisades Fire, appearing as a nearly continuous front as viewed from an aerial perspective.

Figure 4.3.4 Fire spread through wildland vegetation as it encroaches on the built environment, as viewed from an aerial perspective.

Figure 4.3.5 Discontinuous fires in the built environment as viewed from an aerial perspective of the Palisades Fire.

A high-level overview of the thermal mechanisms that are commonly acknowledged to drive fires in WUI environments (e.g. embers, radiation, and direct flame contact) is provided below,[174] with specific examples from the Palisades and Eaton Fires.

The physical impacts to structures noted in these wind-driven events, which are not well studied, will also be discussed.

4.3.2 Thermal Mechanisms of Fire Spread To and Between Structures

In both the Palisades and Eaton Fires, fire spread in the built environment was a consequence of three (3) distinct and well-known structure ignition mechanisms: embers, radiant heat, and direct flame contact (Figure 4.3.6).

Oftentimes, exterior fires that impact the WUI begin not with a wall of flame entering the community at once, but with spot fires ignited by embers (Figure 4.3.7).

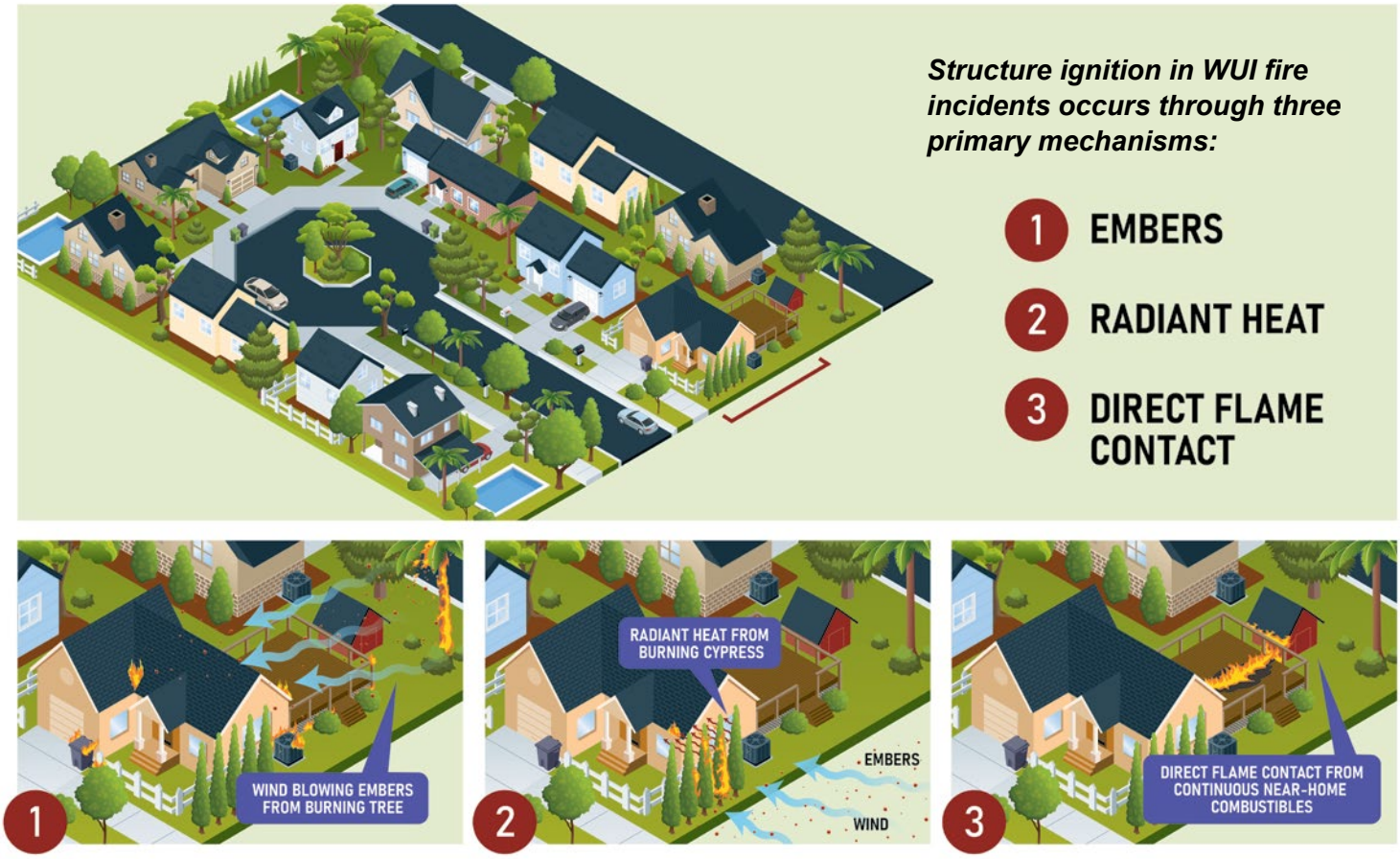


Figure 4.3.6 Schematic illustration of structure ignition mechanisms.

Embers, sometimes referred to as firebrands[1], are small pieces of flaming or smoldering material that break off from burning trees, shrubs, and/or structures (Figure 4.3.7).

Depending on the size and geometry of the embers, as well as the intensity of the fire plume, magnitude and orientation of wind in the area, and the local topography, they may be transported a distance of just a few feet to several miles from where they are created.[176]

If embers with enough remaining thermal energy land on a "receptive fuel bed", they can ignite a spot fire. The receptive fuel bed can be many different things.

For example, if they land on combustible materials that are part of a structure, they have the potential to directly ignite that structure. However, if these embers land near a structure on an ignitable fuel, they may start a spot fire that risks an indirect ignition of the structure.

[1] The terms "ember" and "firebrand" are often used interchangeably to refer to detached small-scale carbon-based particles at elevated temperatures, though some definitions differentiate the terms by limiting "firebrands" to those particles that are airborne.[175] The more general term "ember" is used in this report.

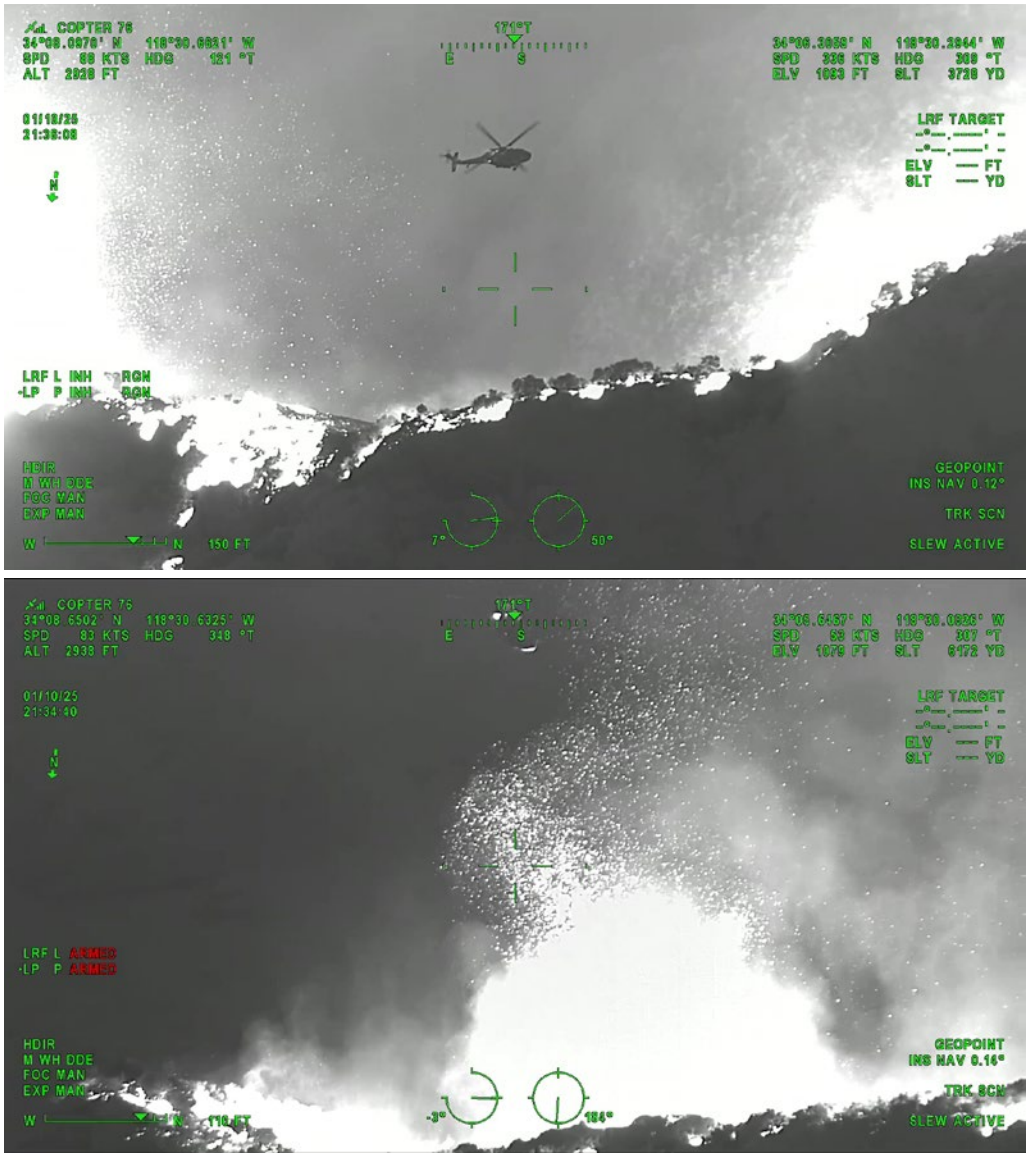


Figure 4.3.7 Infrared camera view of embers lofted from vegetation.

If combustible materials near a structure ignite, the resulting spot fire can impact structures by generating its own embers in close proximity, as well as through radiation and direct flame contact.

Radiation — electromagnetic waves that travel in all directions in free space — can transfer energy over short to intermediate distances from a fire.

However, the closer these spot fires are to a structure, the more energy is available to be transferred over a short period of time, and the more rapidly structural materials may increase in temperature, and potentially, reach their ignition temperature.

As nearby spot fires grow in size, and as flames become larger, they are more likely to come in contact with surrounding structures. Once a structure is impacted by direct flame contact, heating increases in intensity and provides the most severe and rapid ignition mechanism.

On a day when a fully staffed fire department response is available in Los Angeles, a single spot fire, such as that shown in Figure 4.3.8, can be readily controlled.

Figure 4.3.8 Spot fire in vegetation along a hillside behind Lachman Lane, photographed at 11:22 on January 7, 2025.[1]

However, in the Palisades and Eaton Fires, a rapidly growing number of these spot fires were spread across many miles, which dramatically impacted fire department response times and capacity. As such, structural materials, components, and assemblies were required to resist the thermal insult from embers, radiation, and/or direct flame contact for a longer period of time if/until firefighters were able to respond.

These are the cases where the risk of structure-to-structure fire spread increases. Once a structure is ignited and flames begin to consume structure materials and its contents, a larger radiant plume is likely to be produced, which can create and loft additional embers, increase the radiant heat transfer and increase the risk of potential direct flame contact for surrounding structures.

4.3.2.1 Ember Production

Embers are produced when flaming or smoldering materials break off from vegetation or structures and are free to move under external forces.[177,178] This process occurs when the physical stress applied to the material is greater than its remaining strength.[179]

Burning materials may be physically weakened by partial consumption of the fuel, thermal decomposition, and/or temperature-dependent strength. Wind and/or plumes generated by fires are the most common source of external stress to create embers from burning materials.

For example, in wind-driven wildland and WUI fires, large branches may be broken and/or entire trees may be toppled under the force of the wind, often landing immediately adjacent to their initial location.

However, smaller pieces of vegetation, such as thin branches, twigs, and/or leaves (Figure 4.3.9), or some types of building materials (Figure 4.3.10), may be carried long distances from their original source.

Figure 4.3.9 Ember production from vegetation.

Figure 4.3.10 Ember production from structure fires.

In some cases, suppression actions can also provide the force needed to physically separate burning materials from their base structures. Large caliber water streams from fire department operations (sometimes called a monitor or wagon battery) can impact structure elements with a large enough force to break off small structure elements.

Water drops from aerial assets, while critical to suppressing burning materials on the ground, may also create enough force to break off burning material that is not suppressed.

If water does not successfully quench materials that are flaming or smoldering, these burning pieces may be lofted and transported as embers. The resultant air currents from a water drop may also elevate these embers, which can then be carried away by ambient winds (Figure 4.3.11).

Even hand line operations directed toward vegetation fires can break off pieces of burning material and potentially produce embers (Figure 4.3.12).

Figure 4.3.11 Example of embers broken off from vegetation and lofted to the air after aerial water drops captured by a firefighter's video. (left) Vegetation fire as water is dropped. (right) Partially suppressed fire with embers lofted.

Figure 4.3.12 Embers broken off from hand line suppression of a vegetation fire.

4.3.2.2 Ember Transport

After embers are created, they may be lifted into the air by fire plume(s), ambient wind,[176] and/or air currents from suppression efforts (Figure 4.3.13).

Many factors affect the transport of embers, including the density of the material, aerodynamics of the particles (e.g. size, shape, geometry, etc.), the magnitude of the wind, and local topography (Figure 4.3.14).

While the embers are airborne, any sustained combustion will likely change the aerodynamic factors. Depending on the length of time in the air and the characteristics of the wind, the embers may be either flaming, smoldering, or no longer undergoing sustained combustion.

Once embers land on the ground, they may continue to be transported under the influence of wind, particularly along roads or paths with few obstructions for their movement (Figure 4.3.14).

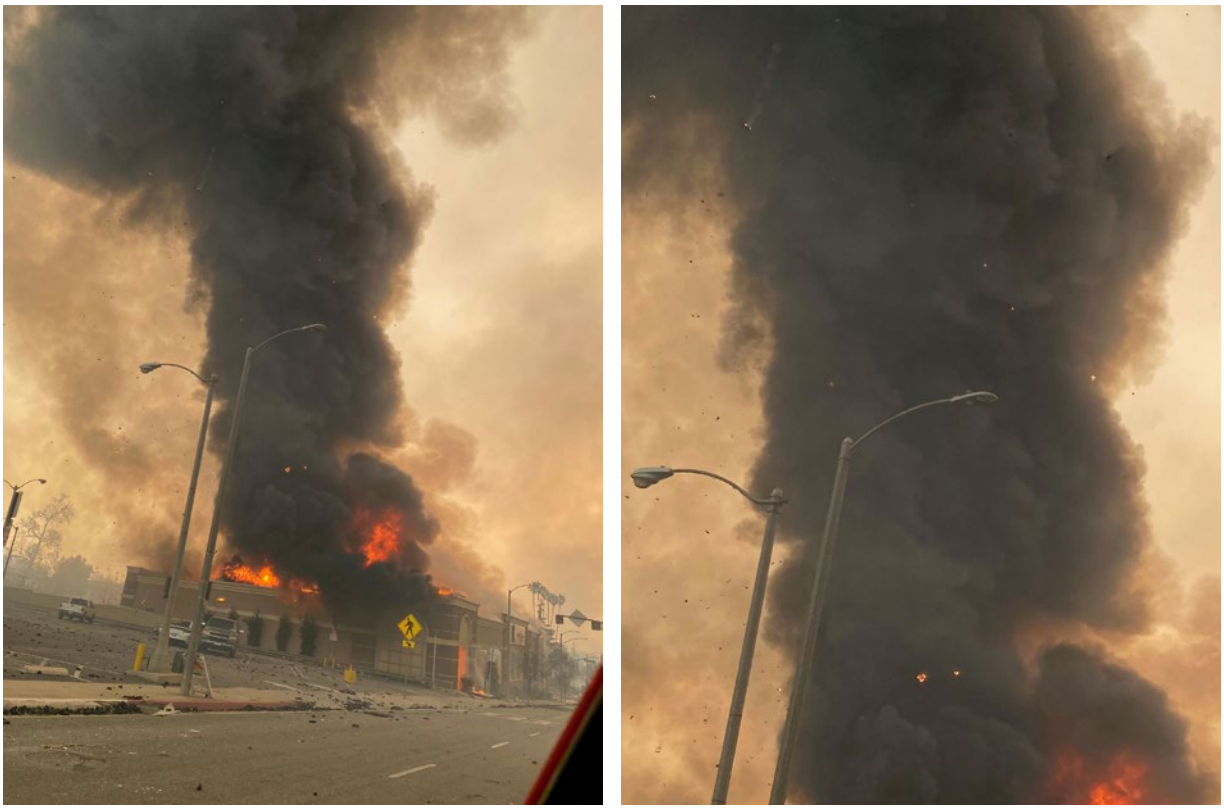


Figure 4.3.13 Embers from a commercial structure fire included large pieces of structural material that fell out of the plume within 100 ft of the fire. The image on the right shows a close-up view of embers falling from the smoke plume.

Figure 4.3.14 Embers from a structure fire with movement through the air and along the ground due to wind currents and gravity.

Additionally, the impact of gravity, particularly in communities with large changes in elevation, including parts of the Palisades and Eaton Fire perimeters, can influence the continued movement of embers along the ground.

The transport, and ultimate deposition, of embers is dependent not only on the dominant wind direction, but also on the local variations in wind that may change due to the landscape/terrain and obstructions, such as structures.

For example, homes along PCH were not only impacted by embers blowing offshore, but also by the recirculation of embers from the ocean-side of the structures (Figure 4.3.15).

As reported in the Phase One report[1] (p.145), “Structures were also being impacted from embers that were igniting combustibles on the ocean side of homes.”

This recirculation challenged firefighters conducting structure protection along PCH, as homes started to catch fire from underneath.

Figure 4.3.15 Ember recirculation and eventual accumulation under a deck on the ocean side of a PCH structure. The deck structure was concrete and did not ignite.

Embers will continue to move until they reach a stable location for deposition. The location of final deposition is where embers settle on a surface without enough transverse force to overcome "friction" with the surface and continue their movement.

Oftentimes, winds can continue to move embers along the ground until they encounter an obstruction,[180] often a vertical surface like a structure, fence, wood pile, etc.

Motion may stop when embers land in a stagnation region where the winds do not penetrate (e.g., below the deck in Figure 4.3.15) or when they get lodged into small gaps and crevices (e.g., mulch, shingles, between deck boards/fences, etc.).

4.3.2.3 Ember Deposition

When embers finally settle in a stable location, they may retain a sufficient thermal energy to rapidly heat receptive fuel beds, decay to the point where little thermal energy remains, or burn out completely.

Even after ember flaming has stopped, continued smoldering, though less efficient, may be able to ignite some fuels, particularly when ember transportation results in accumulated piles.[181,182]

If an ember (or piles of embers) retaining enough thermal energy comes in contact with combustible materials, it may be possible to ignite this receptive fuel bed.[183]

The ignitability of this fuel bed will depend on many factors, including material flammability, thickness (finer fuels are typically easier to ignite), and moisture content, among others.

The likelihood of ignition is also impacted by heat transfer from ember(s) to the material surface, which is influenced by many factors, including but not limited to, the geometry and mass of the ember(s),[184,185] wind speed and orientation relative to the ember(s),[184,185] whether the ember(s) was from natural vegetation or lumber,[185,186] the porosity and height of the pile of embers,[187] and the geometry of the surface (e.g., horizontal, sloped, or corner).[188]

Structures

Structures constructed with combustible materials, such as wooden components in roofs (e.g., support structure, decking, shingles, etc.) (Figure 4.3.16), wood siding (Figure 4.3.17), and wood window frames (Figure 4.3.18) may directly ignite from contact with embers, particularly if ember piles are created and structure geometry (e.g., re-entrant corners) increases the likelihood of embers gathering.

If these fires are extinguished before they spread to involve a large portion of a structure, they are often seen in post-fire damage analysis as isolated sections of burned or charred material with no connection to other thermal damage or a thermal source.

Figure 4.3.16 Ember damage to eaves and roof with wood support structure under clay tiles. This damage is the only component of the structure with fire damage, and no surrounding vegetation or other materials were ignited.

Figure 4.3.17 Ember damage to combustible wall components. Note (top) defensive actions taken with garden hose left in the smoldering cavity and (bottom) differences in damage from embers piling up near combustible wood siding and an aluminum-clad door.

Figure 4.3.18: Ember damage to a wood window frame.

Attachments to Structures

Attachments to homes that are constructed from wood or other combustible materials, such as steps (Figure 4.3.19), decks and porches (Figure 4.3.20), pergolas (Figure 4.3.21), and/or fences (Figure 4.3.22), are also susceptible to ignition, and can bring flames close to structures.

Figure 4.3.19 Ember damage to attached combustible steps onto a noncombustible patio.

Figure 4.3.20 Ember damage to attached wood porch structure.

Figure 4.3.21 Ember damage to attached wood pergola.

Figure 4.3.22 Ember damage to attached wood fence that spread to wood window trim.

Outdoor Furniture

Outdoor placement or storage of combustible materials near structures can also provide a receptive fuel bed. Common household items that are often placed near the home can include outdoor patio furniture, covers, and cushions (Figure 4.3.23), as well as children's toys and play equipment. Decorative items are also commonly placed near residences.

Figure 4.3.23 Evidence of ember impacts to patio furniture shows a wide range of damage from burn through of furniture covers and localized melting of flame retarded cushions to consumption of cushions and furniture. Note bottom left image shows a consumed combustible cushion on a metal patio chair where the noncombustible chair provided protection to the structure from further damage.

Material Storage

In many residences, the long-term storage of materials near secondary structures, like detached garages or sheds, is common (Figure 4.3.24). Structures that are undergoing renovation or construction may also have materials stacked and stored near the structure temporarily (Figure 4.3.25).

Even packages in cardboard boxes, which are commonly delivered throughout the day in many communities, may be ignited by embers (Figure 4.3.26).

While these fuels may be semi-permanent or transient in nature, several examples were found which are not always considered in defensible space (particularly Zone 0) guidance or regulation. More information at Sections 2.1.3 and 3.2.1.

Figure 4.3.24 Ember ignition of materials stored outside of accessory structures resulted in (left) failure of both panes of a nearby window and (right) flames attacking the wall-roof interface, resulting in significant roof damage.

Figure 4.3.25 Ignition of temporarily stored construction material through ember deposition.

Figure 4.3.26 Ignition of delivered package through ember deposition.

Vegetation and Landscaping

Embers may also ignite vegetation (Figure 4.3.27), both live and dead, depending on conditions.

Live fuels typically retain moisture that can increase their resistance to ember ignition. However, depending on the species, current water content, and other parameters, even live fuels may ignite.

At the time of the January 2025 fires, live fuel moisture (LFM) was approximately 62% - 67%, indicating exceptionally dry conditions — a level associated with elevated fire potential in Southern California (see Section 3.3).

Fuels shed by vegetation are more susceptible to ignition, particularly relatively fine fuels like pine straw and fallen leaves. These materials may become easier to ignite the longer they are detached from the tree through dehydration, until the dead fuel moisture is strongly impacted by the moisture in the ambient environment.

Additionally, these materials may be transported by the wind to pile up along walls and in corners of structures, which is where embers can be deposited as well (Figure 4.3.28).

Landscaping materials, such as wood mulch, are often spread out in thin layers along the ground and may be used immediately adjacent to a structure (Figure 4.3.29).

Mulch may also be spread over large areas of a property, potentially carrying fire long distances, even across property lines. Under certain conditions, high winds can displace mulch, increasing the risk of flaming embers moving along the ground or in the air.

Figure 4.3.27 Spot fire in vegetation resulted in broken window and charred siding.

Figure 4.3.28 Embers ignited piled up yard debris in the corner of a structure with noncombustible walls.

Figure 4.3.29 A spot fire in wood mulch allowed fire to spread to the structure and penetrate into the garage through the wall cavity from underneath the assembly (note thermal damage from inside the wall just above the ground). Firefighters entered the garage and suppressed the fire from inside the structure.

Ember deposition and pile formation can ignite many other materials that are regularly located near structures, permanently or temporarily. A more detailed discussion and additional examples are provided in Section 4.4.1.

4.3.2.4 Radiation

Radiation is a key heat transfer mechanism that impacts structure loss, vegetation consumption, fire spread, and firefighting operations in WUI fires and community conflagrations (Figure 4.3.30).

In general, heat is transferred from any element that is at an elevated temperature to other elements that are at a lower temperature. Thus, fuels that are on fire will transfer heat — in the form of electromagnetic radiation — to fuels that have not yet ignited, including firefighters working in the vicinity of a fire.

Figure 4.3.30 A large fire involving both a multi-story structure and tall vegetation with flames more than 30 ft above the ground emits intense radiant heat, which is transferred to nearby vegetation and structures. Firefighter's ability to approach a fire of this magnitude is also limited by the radiant heat transfer to them.

The intensity of heat transferred to a target is a measure of how rapidly energy is being moved from a heat source (such as a fire) to a heat sink (e.g., a target structure, vegetation, or other fuel) over a specific surface area. Several factors impact the intensity of heat transfer relevant to fire spread, including the size of the fire and distance between the fire and the target.

In general, larger fires will emit more thermal radiation (though there are several other important factors such as smoke obscuration, flame emissivity, etc.).

For example, a fully involved structure fire will emit more radiation than a small spot fire (Figure 4.3.31), which will result in increased intensity and duration of radiant heat transfer from the fire.

When fully involved in flames, large multi-story structures will typically emit more thermal radiation than a small single-story structure. Similarly, fires in tall vegetation, such as an Italian Cypress (Figure 4.3.32), will typically emit more thermal radiation than fire in a small shrub.

Figure 4.3.31 Radiant heat transfer to this currently uninvolved structure comes from a fully involved structure fire in the neighboring property to the left (blue arrow) and a smaller spot fire in the vegetation near the structure to the right of the picture (red arrow). The magnitude of radiant heat ultimately transferred to this structure from these sources depends on both fire size and distance.

Figure 4.3.32 Examples of torching of cypress trees can create tall, luminous flames that can generate intense radiant heat.

However, the amount of radiated heat that transfers to a target is also influenced by how far the electromagnetic waves must travel.

A target 2x or 3x closer to the same fire will have 4x or 9x higher incident radiated heat flux. As such, target materials that are closer to a fire will likely face more intense radiant heat transfer than those farther away (Figures 4.3.31, 4.3.33, and 4.3.34).

Additionally, this increase in radiant heat transfer is often the limiting factor in how close fire-fighters can approach a fire and apply water.

Figure 4.3.33 Flames from a fully involved structure are tilted towards the property to the right in this image (likely due to location of fire in the structure and/or ambient wind). Radiant heating has ignited the combustible fascia board of the structure eaves to the right (blue arrow), while the structure to the left is not yet involved.

Figure 4.3.34 A fully involved structure fire exposed a nearby railing to radiant heat transfer. Note the post closer to the structure has heated to the point of ignition (blue arrow), while the one farther away from the structure is off-gassing (red arrow, white cloudy plume emanating to the left and above the railing), but has not yet ignited.

Importantly for fire spread within communities, radiated heat can be absorbed by vegetation and structural targets. As this energy is absorbed, the target material will increase in temperature, which can cause a wide range of reactions depending on the material.

In general, the more rapidly and more focused the energy is transferred to a target, the more rapidly the target material will increase in temperature.

However, the change in temperature of the target material will depend on several material properties, as well as ambient conditions that may provide additional heating or cooling.

If the heat flux from the fires' radiation provides more energy than the material loses through conduction, re-radiation, and convective losses, it will continue to heat up.

Wood and other cellulosic material begin to lose moisture as they increase in temperature, which can increase their ignition propensity (e.g. in cases where embers may deposit on the material).

As the material's temperature increases further, it may begin to thermally decompose, which is often seen through off-gassing (typically emanating a whitish, cloud-like plume) while the material is being heated (Figure 4.3.35).

If off-gassing occurs during a fire, discoloration and/or charring is likely evident when viewed in post-fire analysis. If heating continues, the off-gas may eventually reach its auto-ignition temperature, where ignition can occur without an outside flame or spark (also referred to as non-piloted ignition).

Figure 4.3.35 A utility pole being heated by radiation from fire in nearby destroyed structures is off-gassing (cloudy, whitish plume emanating to the left of the pole).

Many classes of polymers soften as they heat, resulting in the deformation of components like plastic gutters, vent covers, and vinyl window frames.

This softening and deformation (and sometimes melting and dripping for some polymers), may be sufficient for these components to open up gaps or to fall completely away from the structure, either of which allow a pathway for ember entry.

Glass commonly used in windows and doors may partially absorb radiant heat, which can cause the glass to thermally expand. Depending on the design of the window frame, its assembly (which may restrict expansion), and any pre-existing flaws in the glass (edge chips/scratches), this expansion can eventually lead to glass cracking and failing.[189]

Even with the glass remaining intact in a window, some radiation can pass through the assembly and begin heating materials inside structures (Figures 4.3.36 and 4.3.37).

Reports have shown that in some cases, windows may allow enough heat to transfer through their thickness to allow heating and possibly ignition of interior combustibles before the window glass fails.[190,191,192]

Even materials with relatively high thermal stability, such as ceramic/clay roof tiles and concrete fiberboard siding, may eventually degrade through cracking and/or spalling if the radiant heat transfer is intense enough.

Figure 4.3.36 Partially melted plastic bucket located behind an intact window. Radiant heat from the neighboring structure fire (destroyed) was sufficient to soften and melt this material even after passing through the nearby window.

Figure 4.3.37 Charred window treatment behind a patio door with double-pane tempered glass. Radiant heat from fire in vegetation and a fence on property line (approximately 5-7 ft from window) was sufficient to cause failure of exterior tempered glass pane and allow heating of the curtains to the point of charring even though the inner pane remained intact (eliminating embers and direct flame contact).

As with all forms of electromagnetic radiation, structures, vegetation, and other target materials can be protected from radiant heat transfer through time, distance, and shielding.

Reducing the time that a structure is exposed to radiant heat transfer will limit the energy impacting it, as will increasing the distance between a source and target.

Finally, an intermediate material or structure, such as a masonry or noncombustible wall (Figure 4.3.38), may block or reduce radiant heat transfer from a burning structure to a nearby target structure.

Figure 4.3.38 A vehicle parked immediately adjacent to a fully involved structure fire was shielded from radiant heat transfer by the noncombustible wall assembly.

4.3.2.5 Direct Flame Contact

As the distance between fire and an uninvolved structure decreases, heat transfer increases until direct flame contact occurs (Figure 4.3.39). This is more likely to occur with larger fires and if a fire is in close proximity to a structure (Figure 4.3.40).

Once a structure is impacted by direct flame contact, heating occurs due to a combination of radiation and convection, becoming a more severe heat transfer mechanism than radiation alone.

Direct flame contact can rapidly increase the temperature of materials, escalating the rate of pyrolysis (off-gas generation), and act as a pilot to ignite the off-gas. After ignition, the flames on the newly ignited surface may continue to be self-sustained even after the direct flame contact from the adjacent structure stops.

Figure 4.3.39 A spot fire started on a combustible deck is impacting the structure on the left through radiant heat transfer (note off-gassing of the eave and roof from this structure) but is tilted towards the structure on the right resulting in direct flame contact.

Figure 4.3.40 A spot fire that started near a combustible fence and vegetation quickly grew to directly contact the eaves, roof and wall of a nearby structure. Note also the ember generation from this fire, in the air, blowing towards the right side of this image.

Ambient wind and local fluctuations in wind direction around obstructions can tilt flames towards or away from structures, playing an important role in the occurrence and intensity of direct flame contact (Figure 4.3.41).

Figure 4.3.41 From a fire department video, this images shows flames from a large fire tilted towards the structure to the left due to heavy winds, resulting in intermittent flame contact. Note also the embers propagating along the ground are also moving in the same direction at the same time.

In high-density neighborhoods, where structures are tightly packed together, the reduction in separation distance can increase the risk for direct flame contact between structures (Figure 4.3.42).

When a structure is fully involved in fire, flames venting out of failed windows or other openings create locations where direct flame contact may be localized to surrounding structures and other fuels (Figure 4.3.43).

Figure 4.3.42 Flames venting out of the structure on the right were directly contacting the nearby structure on the left. In this image, fire department intervention has just begun to defend the neighboring structure by applying water to the burning structure.

Figure 4.3.43 The vehicle in the foreground appears to have been directly contacted by flames venting out of the structure on the right. However, farther up the parking lot, less damage is noted to the structure with no indications of venting flames. The vehicle closer to the garage has thermal damage from radiant heat transfer (discolored paint, melted plastics), but did not ignite.

4.3.2.6 Combined Impact

Each of these structure ignition mechanisms may present in various combinations. For example, embers may ignite a spot fire near a home in combustible materials that are more easily ignited than the structure itself. While embers may not directly ignite the structure initially, it can be increasingly affected by radiant heating as the nearby fire grows. Ultimately, direct flame contact may occur to the structure, which has been preheated by radiation and ember contact.

Even if the structure does not directly ignite from the nearby spot fire, preheating structural material from radiant heating may increase susceptibility to subsequent ember ignition[193] and increase the rate of flame spread as the combustible materials dry out and/or begin to increase in temperature. Ultimately, the nearby fire may increase the susceptibility of these materials to consecutive or subsequent ember contact or build-up.

4.3.3 Physical Mechanisms That May Support Fire Spread To and Between Structures

While thermal mechanisms that can cause damage to structures are often the focus of post-fire damage analysis, physical interactions with the environment can also impact structure survivability, particularly in wind-driven conflagrations.

Damage from physical impacts can reduce resilience to fire spread by compromising the exterior building envelope that is critical to keeping flames and embers out of a structure.

These physical impacts are often driven by wind, either through direct structural damage or impacts from wind-blown and/or wind-toppled materials.

Neighboring structures or portions of structures that are physically compromised by fire may collapse and impact nearby structures through the force of wind, gravity, and/or possibly fire suppression efforts.

Large sections of burning materials may also physically disconnect from the remainder of the material and, depending on topography, potentially roll down a hill through the force of gravity.

Finally, structure damage and possible compromise may be encountered when ammunition stored in a burning structure discharges and strikes nearby structures, particularly windows.

4.3.3.1 Wind Damage to Structures

The most well-understood physical mechanism of structural compromise is through wind damage, which is often seen as damage to roof assembly. During a fire incident, roofing shingles and underlayment materials can be lifted off a roof structure, leaving access to combustible roof decking, which is often oriented-strand board (OSB) or plywood sheathing (Figure 4.3.44).

Severe wind may be able to lift roof decking panels, providing a large opening for embers to enter interior spaces. Limited evidence of structural wind damage was found during the January 2025 fires, though severe damage to a wall extension was identified on at least one (1) property (Figure 4.3.45).

Figure 4.3.44 Roofing material dislodged by force of wind was noted in several properties in both Fire perimeters.

Figure 4.3.45 Front wall extension sheared off by force of wind.

4.3.3.2 Wind-Blown Materials

As roof shingles, roof underlayment, and, in extreme cases, roof decking materials are displaced from a roof structure, they may become airborne (Figure 4.3.46) and can potentially travel at high rates of speed.

In the January 2025 fires, there were several cases where roofing materials, likely airborne and carried by the wind, were found to have impacted nearby walls and windows, in some cases causing failure to at least one (1) pane of glass (Figure 4.3.47).

Several cases were identified where it was evident that wind-blown materials, likely at high temperatures, left a tar-like imprint and/or splattering on nearby structures (Figure 4.3.48).

Figure 4.3.46 A frame from a firefighter collected video showing a shingle lifting off from the roof while on fire and being carried away by the wind as firefighters attempt to control fully involved structure.

Figure 4.3.47 Shingle impact to a double-pane window resulted in outer pane window failure.

Figure 4.3.48 Tar-like marks on structure walls and windows were noted in several damaged structures, possibly indicating impact with roofing materials at high temperatures.

Additionally, wind impacting trees can cause large branches to break off and, in some cases, cause them to uproot and impact nearby structures (Figure 4.3.49). These impacts from heavy vegetation may compromise roof decking and roof vents.

Furthermore, contact with walls, and particularly windows, can create pathways through the envelope of the structure for fire spread. In cases where parts of a wind-toppled tree are burning, fire may be brought into direct contact with a structure (Figure 4.3.50).

Figure 4.3.49 Fire weakened tree toppled by the wind to contact the roof of the primary structure on the property.

Figure 4.3.50 Large, fire weakened tree branches were broken off and contacted a wall and window of a neighboring structure, carrying fire to the structure and resulting in both physical and thermal damage.

Utility poles were toppled in many locations during the Palisades and Eaton Fires due to the force of the wind. In some cases, these poles were also weakened by the effect of the fire. These fallen utility poles and wires impeded access to some locations, entangled apparatus, and directly impacted structures (Figure 4.3.51).

Finally, outdoor furnishings and materials can also be moved and possibly lifted into the air through the force of wind and impact nearby structures (Figure 4.3.52).

Figure 4.3.51 Utility pole along PCH fell on to a structure.

Figure 4.3.52 Patio furniture appeared to have been blown over and impacted the screen on patio door.

4.3.3.3 Structural Collapse

The acute risk of structural collapse of fire-damaged structures is well known to firefighters. This hazard is particularly relevant for multi-story structures and commercial buildings that have a parapet wall. Guidelines for establishing collapse zones are common in firefighting and apparatus operator training materials.[194,195]

However, this guidance typically focuses on firefighter safety to operate outside of the collapse zone, not how one structure might impact a neighboring structure and contribute to fire spread.

In the Palisades and Eaton Fires, multi-story residential buildings, particularly those with exterior cladding using noncombustible materials, such as thick stucco or stone/brick veneer, were found to remain partially standing during post-fire analysis, even after the structural wooden framing material was partially or fully consumed.

In several cases, when the structure was compromised and transverse forces outside the structure footprint were large enough, these exterior walls were found to collapse towards neighboring structures.

This transverse force may be caused by high winds, but also through fire department activities such as the use of large caliber master streams.

The impact of a collapsing structure on neighboring buildings is particularly important for roof (Figure 4.3.53), wall (Figure 4.3.54), and window (Figure 4.3.55) damage.

The collapse can compromise the building envelope, reducing resilience to ember and/or flame contact. Additionally, if some burning structural material is still present when the wall system collapses, it can fall with the structure and transport this material to directly impact the outer envelope of a nearby structure (Figure 4.3.56).

Burning structural material could also deposit inside a nearby building if the roof, window, or wall fails due to the physical impact of a collapse.

Figure 4.3.53 Roof damaged by collapse of neighboring structure.

Figure 4.3.54 Examples of walls damaged by collapsed neighboring structure.

Figure 4.3.55 Examples of windows damaged by collapsed neighboring structure. In these cases, structures collapsed towards these walls and debris was found near the base of these windows.

Figure 4.3.56 (top, left) Post-fire images of structural collapse of a neighboring structure impacting this surviving, damaged structure. (top, right) Structural members were hot enough to discolor concrete fiberboard siding and leave a char mark on the wall due to contact. (bottom) Photograph showing the neighboring structure still standing with flaming structural members and ongoing structure protection.

In several properties where structural collapse occurred, the impact of the falling wall system appeared to be (at least partially) mitigated by masonry walls and/or tall vegetation on the property lines (Figure 4.3.57)

When collapsed walls impacted masonry walls, they tended to break and fold over at that location, as opposed to falling straight out. Tall vegetation was found to “catch” the collapsed wall and reduce the magnitude of the impact or limit the extent of the collapse field.

Figure 4.3.57 Examples of components of collapsed walls where impact was at least partially mitigated by masonry walls and/or vegetation on property lines.

During TDs, a fire officer described how structure collapse created significant operational challenges and frustration during suppression efforts.

The officer relayed an experience during structure fire protection where firefighters focused their resources on structures where wind conditions appeared favorable for containment, however, collapsing walls, chimneys, or other structural elements confounded these efforts by helping spread fire to adjacent homes.

These collapse events undermined suppression progress, contributed to structure-to-structure fire spread, and complicated efforts to protect surrounding properties. The officer noted that structural collapse had not initially been considered a major factor in fire spread, but became an increasingly important operational consideration as the incident evolved.

4.3.3.4 Rolling Burning Materials

Structural collapse and structural component burn-through may also cause burning dimensional lumber and structural members to become disconnected from structures, decks, and fences and then fall and/or roll down embankments through the force of gravity.

Large, heavy materials can potentially travel a long distance until they reach level ground or other obstructions, such as a structure.

This mechanism of both structure damage and potential fire spread is particularly relevant when decks and railings that are built from combustible materials overhang steep inclines, allowing fire to move downhill at higher rates of spread than may be expected.

Wildland firefighters are aware of this occurring, which is one of the “Watch Out” situations for working “on a hillside where rolling material can ignite fuel below.”[196]

While not often described in WUI or structural firefighting settings, evidence of this occurring through fire department pictures and videos, as well as post-fire damage assessments, shows that it was likely a consideration in some areas during the January 2025 fires (Figure 4.3.58).

Figure 4.3.58 (left) Damaged structure was ignited from materials rolling down the hill from the destroyed structure on the same property. (right) Charred materials piled up at the location where the wall and roofline were built into the embankment. Fire entered the structure from this location but was suppressed before complete structure damage occurred. Siding was removed prior to damage assessment, showing the smoke and fire damage to the interior with no other signs of exterior fire on the other three (3) sides of the structure.

4.3.3.5 Stored Ammunition

While not likely a commonly encountered challenge, ammunition stored inside structures has been shown to heat to the point of discharging in structure fires.

The direction of travel for fire-ignited ammunition is unpredictable and creates an immediate hazard for firefighters operating in the area. Additionally, in at least one (1) case during the January 2025 fires, the impact of ammunition to nearby structures was found to break a window.

In this instance, which was recorded during post-fire assessment, the ammunition appeared to only cause failure of the outer pane with the inner pane remaining intact (Figure 4.3.59).

However, it is feasible that both panes could be compromised by discharged ammunition, which could also create a pathway for ember entry into structures.

Besides this structure, there were at least two (2) radio reports of firefighters encountering discharging ammunition during emergency responses:

- On V-1 “Sheriff on scene advising live ammunition rounds going off near Wakecrest and Surfwood. Wakecrest and Surfwood from multiple houses on fire.” - January 7, 2025 (15:07)
- On V-3 “Eaton Operations, be advised. We’re getting callers advising of firearms, ammunitions, cooking off near the address...” - January 8, 2025 (10:43)

Figure 4.3.59 Ammunition in neighboring structure discharged and impacted this window causing outer pane cracking and failure. Multiple spent casings and projectiles were found on the ground and in vegetation between the structures.

4.4 Factors in Fire Spread

4.4.1 Near-Home Combustibles

Combustible materials that are commonly placed, stored nearby, and/or even possibly attached to structures can provide a conduit for spot fires that ignite near a building or for flames to spread closer to a structure.

These combustible materials are particularly important if they are within the first 5 feet around a structure (i.e., Zone 0). However, as described in Section 4.3.2, mechanisms of fire spread can impact buildings from even longer distances and may even include materials or objects on an adjacent property.

There is a wide range of items that might be considered near-home combustibles, including vegetation, attachments to structures, outdoor living spaces, and objects stored or placed near a structure.

While this section will not cover all possible near-home combustibles that contributed to fire spread in the Palisades and Eaton Fires, it provides an overview of recurring themes that were identified in ULRI's post-fire analysis.

Some of these items (e.g., vegetation, fences, and decks) have been identified in previous post-fire analyses as contributing factors to fire spread, and research has been conducted to further understand their impacts.

Others, including vehicles, garbage/recycling receptacles, and outdoor HVAC units, have received less attention in past analyses and are presented here to describe their contribution and motivate additional research.

4.4.1.1 Ornamental Vegetation Near Structures

As mentioned throughout the previous section, vegetation can play a wide-ranging role in fire spread to structures, from providing a key source of ember production and radiant heat transfer (see Section 4.3.2) to physical impacts from collapse onto structures, causing structural damage and possibly depositing flaming/smoldering materials onto or inside a structure (see Section 4.3.3.3).

Dry, flammable vegetation and litter from vegetation can also be a receptive fuel bed for ember deposition (see Section 4.3.2.3), and can also be ignited from radiant heat and direct flame contact from nearby combustibles.

Individual plants close to structures can each lead to direct flame contact. Oftentimes, vegetation may be arranged in a continuous manner, providing a pathway for flames to move long distances within and across properties. A spot fire in these fuels may grow to engulf dry grasses, shrubs, bushes, and even trees (Figure 4.4.1).

Figure 4.4.1 Decorative vegetation used as ground cover can have a range of ignition characteristics. Some plants may readily ignite and spread fire, allowing fire to potentially move long distances, while others may resist ignition and survive.

If close enough to a structure, radiant heating, and potentially direct flame contact, can spread the fire along the ground and to the first floor of a building (Figure 4.3.27), or even elevate the fire to eaves (Figure 4.4.2), rooflines, and upper levels of multi-story structures (Figure 4.4.3).

Figure 4.4.2 Flammable bushes and shrubs can create thermal impacts on walls and windows through radiation and direct flame contact. As vegetation increases in height, the risk for involving eaves and rooflines increase.

*Figure 4.4.3 Tall, flammable vegetation can elevate fire impacts above the ground level. At 154** Sunset Blvd, fire impacted three (3) different floors, the eaves, and roofline due to torching, though noncombustible construction helped the structure survive. At 18** Woolworth, cypress torching impacted combustible siding in the attic space, and despite no damage to the first floor, fire made its way into the structure.*

While ember production, radiant heat transfer, and direct flame contact from any species of vegetation can create a risk for fire spread, Italian Cypress (Figure 4.3.32 and Figure 4.4.4) were reported as common contributors to flame spread during the Palisades and Eaton Fires, while palm trees were noted as key contributors to ember production (Figure 4.3.9 and Figure 4.4.4).

Figure 4.4.4 Post fire images showing (left) damage from Italian Cypress torching and (right) large embers produced by a fire in a palm tree (quenched by landing in a pool, which suppressed the combustion process and allow visualization of the size range).

Continued research is needed to study the impact of species and conditions (e.g., size/moisture content) of ornamental vegetation that contribute to structure-to-structure fire spread and potentially those that may slow down or resist fire spread.

Multiple examples within the fires' perimeters show locations where well-watered vegetation may have played a role in reducing the radiant heat transfer from a destroyed structure to a nearby surviving structure by providing shielding (Figure 4.4.5).

If the vegetation is dense enough, it may also block some or all of the ember transport towards a structure.

Figure 4.4.5 Example of well-maintained vegetation between property lines that may have provided the surviving structure with some level of protection from radiant heat. Note that the side of the vegetation near the destroyed structure was impacted by radiant heat, but resisted ignition (though it did not survive). On the opposite side, the vegetation survived and remained green.

4.4.1.2 Fences

Combustible fences have been shown to be an important conduit for fire to spread along property lines and to structures,[197,198] as the continuous, horizontal expanse of fencing in many neighborhoods makes them an efficient "wick" for fires to move throughout a community.

Wood fences that nearly touch, or are in contact with the ground, are particularly susceptible as embers can often pile up at their base, with long, vertical combustible surfaces and a nearly continuous horizontal surface to travel (Figure 4.4.6).

Combustible fences can also be ignited through direct flame contact if embers ignite windblown combustible materials, such as yard debris or man-made trash, that is gathered near the fence base, or the fence is near a structure or vegetation that has already ignited.

Figure 4.4.6 Ember ignition of a wood fence at the corner of four (4) lots near the south edge of the Eaton Fire. Flames spread from this location in four (4) directions, damaging several accessory structures. Residents used pool water to assist in controlling further fire spread.

In order to enclose a section of a property, fences are often directly connected to the structure. Fire can be carried along combustible fences within a property or between properties and directly impact structures (Figure 4.4.7).

This mechanism of fire spread was noted particularly in wood fences, including fences with metal posts that had wood slats.

Figure 4.4.7 Wood fences can provide a conduit to bring fire directly into contact with structures.

Fences can bring fire close to structures even in areas where they do not directly connect to the structure. For example, combustible fences that run parallel to structures along property lines impacted structures through radiant heat (and direct flame contact if in close enough proximity), damaging windows, walls, and eaves in many buildings (Figure 4.4.8).

The relative exposure of property line fences to structures increases in high-density neighborhoods where setback distances from property lines are short.

Figure 4.4.8 Fires in sections of fence that run parallel to structures can damage windows, walls and eaves through radiant heat transfer and potentially direct flame contact, particularly when structures are near property lines.

Noncombustible fence materials, such as metal and masonry, will not ignite. However, homeowners often plant vines or shrubs that grow around, and in, fence designs, such as chain-link fences, along property lines to increase privacy and/or visual appearance.

If these plants can be ignited and support fire spread, these vegetation-lined "noncombustible" fences can also provide a conduit for fire to move along, and between, properties, and also bring fire near, or in contact with, structures (Figure 4.4.9).

Figure 4.4.9 Flammable vegetation growing in a noncombustible chain link fence can move fire similar to a wood fence.

4.4.1.3 Decks, Porches, and Patios

Outdoor living spaces, including decks, porches, and patio, are often connected directly to structures and can provide an important pathway for fire spread in the built environment from ember deposition, radiant heat transfer, and/or direct flame contact.

Materials used in the construction of these spaces can vary broadly, from combustible (e.g., untreated wood, Figure 4.4.10) to limited combustibility under certain conditions (e.g., some composites, flame-retarded polymers, and fire retardant-treated wood, Figure 4.4.11) to non-combustible (e.g., metal, brick, and concrete, Figure 4.4.12).

Figure 4.4.10 Examples of wood decks damaged by fire.

Figure 4.4.11 Examples of damaged decks with vinyl and/or composite materials.

The relative difference in resistance to fire spread in decks constructed from both noncombustible and wood components is highlighted in Figure 4.4.12, where wood components are completely consumed or largely destroyed, while the stone, brick, and masonry components survived, oftentimes with cosmetic damage.

In several instances where noncombustible components of these outdoor living spaces were incorporated near the structure, the path of flame spread was interrupted, which likely contributed to limiting damage to surviving structures.

Figure 4.4.12 Examples of decks, porches, patios that included both combustible and noncombustible materials, highlighting marked difference in fire performance.

It is important to note that, oftentimes, other fuels (e.g., patio furniture and outdoor decorations) are utilized and/or stored on these attached outdoor spaces.

Even if the construction of these spaces within 5-10 ft of the structure is from noncombustible materials, these furnishings and decorations can provide receptive fuel beds where embers can gather, and eventually ignite the materials, bringing the fire closer to, or in direct contact with, structures (Figure 4.4.13).

Figure 4.4.13 (top) Noncombustible tile porch with combustible furnishings that ignited and damaged a nearby wall and failed both panes of annealed glass window. (bottom) Noncombustible brick patio with combustible furnishings that caused moderate damage to a nearby noncombustible wall and two (2) wall vents.

As seen in Figures 4.4.10 — 4.4.13, these outdoor living spaces commonly abut siding, doors, and sometimes windows on primary and/or secondary structures. Deck, porch, or patio designs often provide a long flat surface where embers can deposit and then gather near obstructions, particularly in corners and door frames, depending on local wind conditions.

As such, these features provide a location near vulnerable components of the structure where embers will not only land, but potentially pile up. Vulnerabilities of walls, windows, and doors are discussed in Section 4.4.2.

In addition to vertical surfaces on or near these spaces, embers can lodge in gaps between deck boards. Individual embers or piles can form and begin burning combustible construction materials, even in the middle of a deck or porch (Figure 4.4.14).

Figure 4.4.14 Wood deck damaged by embers piling in gaps between boards as viewed from the top and bottom.

As noted in Section 4.3.2.2, these outdoor spaces can also be impacted by ignition sources below the surface due to recirculation of embers on the downwind side of a structure (e.g., Figure 4.4.15).

In the geographical areas of the Palisades and Eaton Fires, decks were often built over embankments, canyons, and other steep terrain, which creates a vulnerability for upslope flame propagation towards the deck from below, initially preheating materials through radiation, then direct flame contact (Figure 4.4.12, top).

Decks built over these steep terrain features also led to instances where relatively large sections of burning material could detach and roll to lower elevations, providing a path for rapid fire movement downslope (see Section 4.3.3.4).

4.4.1.4 Pergolas

Pergolas, and similar shade features, may be included as a part of outdoor living spaces around structures. They are often directly attached to the structure or within Zone 0.

Much like decks and fences, these features provide a location where embers can ignite near-home combustible materials and/or carry flames from nearby burning structures and materials to a previously uninvolved structure (Figure 4.4.16).

Figure 4.4.15 Several decks on structures along PCH were impacted from underneath by embers recirculating from the ocean side. (left) Flames are visible under the deck while firefighters are working to suppress flames in the neighboring structure. (right) Post-fire images (different structure) show consumption of combustible materials below the noncombustible deck supports, along with remaining piles of embers.

Figure 4.4.16 Examples of wood pergolas attached to structures where (top) fire directly ignited the structure and (bottom) pergolas were ignited from nearby structures or combustibles.

In the areas impacted by the Palisades and Eaton Fires, these features were commonly constructed from wood, though other materials (particularly metal, Figure 4.4.17) were noted. Some features included both wood and metal components, which highlights the relative difference in performance of the construction materials (Figure 4.4.18).

Figure 4.4.17 Examples of a metal pergola and shade structure impacted by fire.

Figure 4.4.18 Examples of outdoor living spaces with pergolas constructed from both wood and metal. (top) Fire damage resulted in charring between wood deck boards and complete burn through in a nearby section of the wood deck while the metal pergola remains standing. (bottom) This pergola was designed with mostly wood components, but decorative metal columns on the front. While the wood was largely consumed or heavily charred and the feature partially collapsed, the metal columns remained standing.

Designs of these features vary dramatically, but typically include a slatted roof to provide partial shade while allowing airflow. These features often include a large number of connections between the slats and structure support beams, as well as exposed column-beam connections where airborne embers can deposit and gather (Figure 4.4.19).

Figure 4.4.19 Examples of wood pergolas where embers gathered and burned exposed connections between slats and beams, as well as column-beam connections.

These features are typically elevated high enough from the ground for a person to stand or walk below them. As such, when they ignite, flames can be brought closer to eaves, roofs, and elevated windows and walls (Figure 4.4.16, top).

On many properties within the footprints of the January 2025 fires, these features were used to support climbing plants or vines. In some cases, the dense vegetation growing in these features provided additional gathering points for ember deposition, as well as additional fuel once the material ignited (Figure 4.4.20).

Figure 4.4.20 Examples of pergolas supporting combustible vegetation where both were ignited by embers.

4.4.1.5 Vehicles Near Homes

Within both fire perimeters, multiple vehicles were partially or fully involved by fire (Figure 4.4.21) on streets, in parking lots, along driveways, and within garages (Figure 4.4.22).

Figure 4.4.21 Vehicle burning on the street.

Figure 4.4.22 Multiple fire-damaged vehicles in driveways and parking lots.

In many cases, these vehicles were parked outside, but near structures (Figure 4.4.23). Radiant heat and/or direct flame contact from these vehicle fires resulted in structure damage ranging from cosmetic to significant and, in several cases, included flames reaching the inside of the compartment.

The peak heat release rate from a burning vehicle can vary based on design, typically between 5-16 megawatts (MW),[199,200] and the time from ignition to full burnout may last an hour.

Thus, they provide a close, high-energy fire source that can sustain exposure to structures for a relatively long period of time.

While vehicles are commonly parked near structures, they are not often recognized as components of Zone 0, or Home Ignition Zone, as they are temporary or mobile sources that may not be present on a regular basis.

Figure 4.4.23 Vehicles ignited in immediate proximity to structures resulting in significant damage to walls and windows.

Overhead garage doors represent a particularly vulnerable component of a structure's exterior envelope that will be discussed in Section 4.4.2.6. Typical construction uses a long, wide span of material, which may be combustible or non-combustible, that is not rigidly confined, with several joints and gaps, and often have single-pane windows (Figure 4.4.24).

Throughout the Palisades and Eaton Fire perimeters, vehicles were regularly found parked within a few feet of these garage doors.

Figure 4.4.24 Examples of vehicle fires spreading to and damaging structures through overhead garage doors, surrounding walls, and eaves.

However, fires in vehicles parked beyond a structure's Zone 0 can still cause damage to vulnerable components such as windows, doors, and vent covers through radiant heat transfer (Figure 4.4.25).

Figure 4.4.25 Examples of vehicle fires damaging structures through radiant heat transfer from 8–15 ft away.

In high density neighborhoods, or where a neighbor's driveway may be on the edge of a property, vehicle fires within these fire perimeters were found to cause damage to structures across property lines (Figure 4.4.26).

Figure 4.4.26 Fire in a vehicles parked on neighboring driveways were found to have contributed to the eave, wall, and window damage nearby structures.

Thus, vehicle fires near buildings, particularly those within five (5) feet of structures, represent a potentially important pathway for structure damage and ignition.

More research is needed related to vehicle fire ignition mechanisms from exterior fires (principally vulnerabilities to embers and radiant heat) in community conflagrations, as well as heat transfer from these vehicle fires to residential structures, particularly when impacted by strong, gusty winds.

4.4.1.6 Garbage and Recycling Receptacles

Another temporary, but common, source of ignitable materials around many structures is outdoor garbage and recycling receptacles (Figure 4.4.27).

For most single-family residential structures, these receptacles are made from plastic with relatively light covers that may easily blow open by the wind. If the cover blows open, the contents — very often including combustible materials that are relatively easy to ignite — may be directly exposed to airborne embers.

Even if the cover remains closed, embers can come in contact with the containers along the ground and form piles, increasing heat transfer to, and through, the plastic receptacle.

Figure 4.4.27 Examples of garbage and recycling receptacles that appear to have been ignited by embers, causing structure and/or vegetation damage. Molten plastic and metal axles are often all that remains of the receptacles.

These plastic garbage receptacles can also be damaged by radiated heat, resulting in deformation of the outer shell and lid, which can create openings large enough for embers (Figure 4.4.28).

While the plastic is likely to melt and drip under this radiant heating, the materials inside may have different thermal properties.

Depending on the materials inside the receptacles and heating conditions, the radiated heat may increase material temperature to make them more susceptible to ember ignition or possibly heat them to the point of ignition without a pilot (e.g., autoignition).

Figure 4.4.28 Examples of garbage and recycling receptacles impacted by radiant heat, resulting in softening and deformation of the outer shell.

Regardless of the mechanism of ignition, melted remnants of these containers were noted at properties across both fire perimeters (see Figure 4.4.29). Container melting and flowing, as well as the spilling of potentially combustible materials within the containers, can provide another potential route for fire spread.

Figure 4.4.29 Examples of garbage and recycling receptacles that have melted and spilled contents, which may flow away from the initial location of the receptacle.

Dedicated receptacle storage areas were present on some properties, which were typically constructed from noncombustible masonry half walls on at least three (3) sides (Figure 4.4.30).

These half-walls provided some level of protection from radiant heat and ground-level embers on the enclosed sides, though they did not completely isolate these containers from potential fire exposure.

When fires did occur inside these areas, the containment helped to (at least partially) shield surrounding structures from radiant heat and contain spilled combustible materials.

However, even large metal-constructed dumpsters inside these containment areas were found to ignite by ember deposition if their lid was dislodged (Figure 4.4.30, right).

Figure 4.4.30 Outdoor trash and recycling receptacles located within storage areas with masonry walls were found to have ignited, but the half-walls provided some level of containment. (right) Even trash containers constructed largely from metal were susceptible to ember deposition. Based on damage patterns, this dumpster most likely had plastic lids that were left open or lifted open by the wind, allowing direct access for ember entry from above.

4.4.1.7 Outdoor Components of HVAC Systems

In the Palisades and Eaton Fires, outdoor components of Heating, Ventilation, and Air Conditioning (HVAC) systems may have played an important role in contributing to spot fires near structures and creating vulnerabilities for fire spread.

Air conditioning (AC) condenser units or heat pump units are often placed next to exterior walls of structures, often within one (1) foot — i.e. within Zone 0 (Figures 4.4.31 and 4.4.32).

Outdoor components of AC systems are typically housed in a metal enclosure to protect the heat exchange elements.

However, these enclosures often contain a large number of vents to allow airflow. These vents also provide locations where yard debris can enter and gather in the enclosure, making it difficult to identify and clean out.

Additionally, close proximity to structures can provide a potential location for vegetative debris to gather around the units. Even if regularly maintained, debris deposited during wind events may be able to rapidly pile up.

Yard debris, both inside and outside of the unit, is likely to be regularly exposed to high velocity airflow at elevated temperatures from fans within the units, which can drive off moisture from these flammable materials.

Thus, this fuel bed may be primed for ignition. At the same time, these locations are also potential gathering points for wind-blown embers, piling up inside or outside the HVAC unit.

Depending on the design, some interior components of HVAC units may be combustible and contribute to the fire. Additionally, some refrigerants are flammable, and if the pressurized piping heats to the point of failure, these refrigerants may be ejected under high pressure.

Figure 4.4.31 Examples of ignition in and around outdoor HVAC units resulting in direct flame impacts on structures.

Figure 4.4.32 Additional examples of ignitions in and around outdoor HVAC units and structure impacts.

Future generations of HVAC design are likely to include flammable refrigerants as older chemistries of fluorocarbon refrigerants are phased out. Thus, there may be an increased risk of fire impacting structures from these near-home HVAC components in future fires.

Additional research is needed to study ignition mechanisms and fire spread within HVAC units.

Finally, stand-alone window AC units, common in structures without central AC, can provide relatively large horizontal surfaces where embers can pile up and directly impact window framing and glazing. The design of the window frame for units that do not completely occlude the window opening may create an additional vulnerability.

Many commercially available designs of side panels are relatively thin accordion shaped components made from plastic. When exposed to radiant heat, these materials can soften and warp, leaving open pathways for embers to enter a structure (Figure 4.4.33).

Figure 4.4.33 Example of window AC unit and supporting frame impacted by radiated heat. The outer pane of the window failed while the inner pane remained intact. However, the accordion style adjustable side panels softened and deformed to the point where an opening large enough for potential ember entry was created.

4.4.1.8 Multiple Impacts

While the above sections describe discrete mechanisms of fires' impact on structures, it is important to note that, structures were often damaged by multiple routes, potentially at different times throughout the fire progression.

For example, in Figure 4.4.34, a multi-family structure along PCH appears to have been impacted by ground vegetation fires from both the southeast and southwest corners independently. The deck was ignited from each end, bringing fire close to the structure at both corners.

However, interventions (as seen through fire department hoses still present at the southeast corner and deployed fire extinguishers) may have limited fire from spreading further, including sparing the central portion of the wood deck.

Independently, the second floor of the northeast corner was impacted (likely from embers igniting the roof or gathering on the porch igniting the top floor), resulting in fire reaching the interior of the unit on this corner. However, the fire was suppressed before consuming the entire structure.

Figure 4.4.34 Structure impacted from fire in three (3) separate locations including ember and/or vegetation fires igniting wood deck at both the southeast and southwest corners of the structure on the walkout ground level as well as second floor fire on the northeast corner that entered the structure. Firefighters' defensive actions likely saved this structure.

A second example is from a two (2)-story structure with stucco siding, tile roof, and wood-framed, annealed glass windows situated between two (2) destroyed structures (Figure 4.4.35).

Radiant heat from the destroyed structures on either side of this property resulted in significant window damage, with glazing broken completely out of the windows and charring of the wood window frames. Damage to the stucco walls was mostly cosmetic, with soot staining and paint bubbling near the failed windows.

The destroyed structure to the southeast collapsed towards this property, resulting in sections of the stucco wall impacting this damaged structure. The failed window on this side of the structure may have also been impacted by the collapse.

Window failure on the west corner of this structure was most likely from radiant heat generated by nearby tall vegetation. On this corner, the first and second floor wood window frames are much more deeply charred than the other window failure.

Figure 4.4.35 Single-family structure impacted by fire in three (3) separate locations, including radiation from fires in destroyed structures to the northwest and southeast, and tall vegetation to the west. Additionally, the structure to the southeast collapsed towards this property, impacting the wall and possibly contributing to the window damage (bottom, middle image). Interventions from an interior sprinkler system and confirmed fire department actions contributed to saving this structure.

A third example is from another two (2)-story structure with fiber cement board siding, asphalt shingle roof, and double-pane annealed glass windows situated on a corner lot with destroyed structures across the street to the east and south (Figure 4.4.36).

The east-facing wall of the garage was impacted by radiant heat from the nearby destroyed structure, resulting in moderate damage to the window (broken outer glass pane (inner pane remained intact), deformed vinyl frame) and siding (notable discoloration with limited cracking).

An exterior wood attachment at the southeast corner of the garage ignited from embers and/or radiant heat from the destroyed structure, resulting in direct flame contact with the corner of this structure.

Further to the west, plastic garbage/recycling containers appeared to have been placed near the overhead garage doors, which ignited through a combination of embers and/or radiant heat, severely damaging the doors (and windows within the door) and causing moderate damage to the siding.

Figure 4.4.36 Single-family structure impacted by fire from three (3) separate sources including radiation from destroyed structures to the east, direct flame contact from a nearby wood feature that was destroyed to the south, and garbage/recycling receptacles in front of an overhead garage door.

4.4.2 Building Construction Factors

The construction of a building — including design and material selection — can greatly impact its potential for survival during a WUI fire incident.

During exterior fire exposure, various components of a structure may be vulnerable to failure by exposure to embers, radiant heat, and/or direct flame contact. Such failure can create a pathway for hot gases, embers, and/or flames to enter and potentially ignite interior contents.

These components include, but are not limited to, exterior walls, windows, eaves, doors, roofs, and vents (Figure 4.4.37).

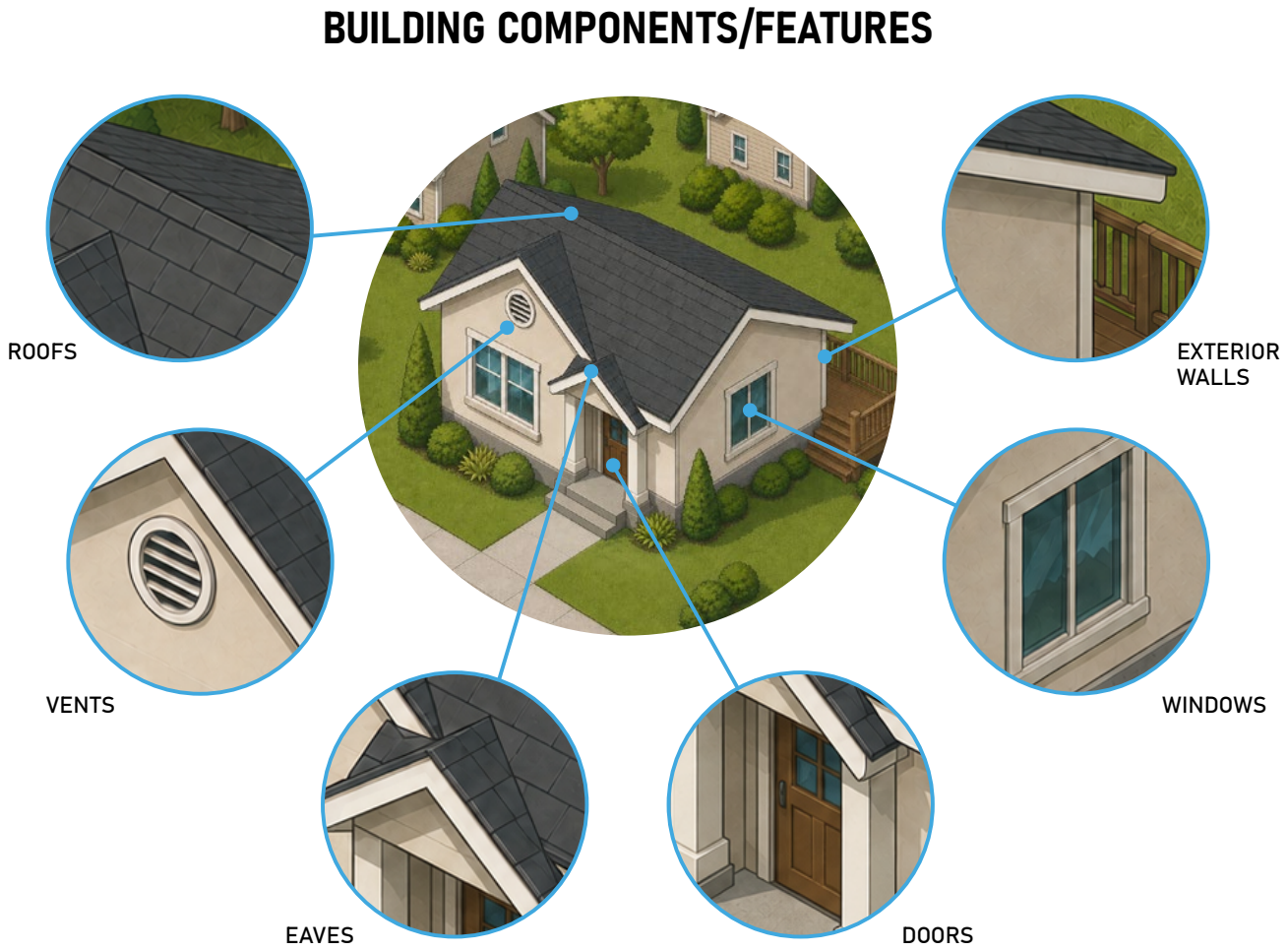


Figure 4.4.37 Vulnerable components of a structure during exterior fire exposure.

Many codes, standards, and guidance documents related to construction in WUI areas address these components (see Section 3.2). In general, much of the guidance involves replacing combustible materials with noncombustible or ignition-resistant materials.

One example of a guidance document is the WUI Structure/Parcel/Community Fire Hazard Mitigation Methodology[198] from the National Institute of Standards and Technology (NIST). This document provides 40 recommendations related to the construction of roofs, exterior wall cladding (siding), vents, windows, doors, and attachments to the structure to resist ignition from embers. Additional guidance for hardening a structure against ignition from fire via radiation and direct flame contact is also provided.

Some of the recommendations include the use of a Class A roof, noncombustible wall cladding, double-pane tempered glazing (i.e., glass panes) in windows and doors with a noncombustible frame, and soffited (horizontal) or enclosed (angled) eaves with a noncombustible material.

Furthermore, CAL FIRE provides resources related to home hardening.[201] Recommendations include:

- Repair all gaps, holes, or rot in exterior siding and replace any combustible siding with a noncombustible or ignition-resistant material option
- Windows should use double-pane tempered glass and a noncombustible metal material for framing
- Doors should be constructed from a noncombustible material, metal flashing should be installed at garage door jambs and headers, and gasketing should be added to garage doors to prevent ember intrusion
- Metal mesh screens should be installed over doors and windows to block radiant heat and ember intrusion
- Vents should be covered with a noncombustible, corrosion-resistant metal mesh with 1/8 in. or smaller openings
- Eaves should be enclosed using a noncombustible material, and all gaps around rafter roof tails and blocking should be plugged or caulked
- Roofs should be Class A-rated, and gaps between the roof covering and sheathing should be filled
- Combustible siding at the roof-to-wall intersections should be replaced with noncombustible material

Previous analyses of WUI fire incidents have linked fire-resistant construction to an increase in structure survivability.

A report from the National Fire Protection Association (NFPA) on the 1991 Oakland/Berkeley Hills Fire highlighted the vulnerability of combustible roofs as well as the additional protection provided by double-pane windows.[202]

More recently, an analysis of a dataset of building inspectors' reports from more than 40,000 wildfire-exposed structures in California from 2013–2018 concluded that "structural characteristics explained more of a difference between survived and destroyed structures than defensible space distance."[203] The authors identified enclosed eaves, vent screens, and multi-pane windows as the "most consistently important structural characteristics." Fire-resistant siding material was also found to result in lower relative risk ratios in certain cases.

An analysis of structures impacted by the 2018 Camp Fire found improvements to windows and siding closest to neighboring structures increased the survival probability of structures.[204] The authors speculated that a higher proportion of newer homes were able to better withstand ember exposures. Therefore, these structures' survivability depended more on the degree of radiant heat exposure from nearby burned structures.

The incident analysis report from the 2023 Lahaina Fire[172] found that ember penetration through roofs, vents, and windows was likely a common pathway for building ignition. The report also highlighted the protection provided by noncombustible exterior walls and instances where vinyl-framed windows "were the potential weak link for fire spread from structure-to-structure," in part due to warping and deformation of the vinyl frames.

4.4.2.1 Methodology

The ULRI assessment of damaged structures focused on six (6) building components: exterior walls, windows, eaves, doors, roofs, and vents.

A specified level of damage was assigned to each of these components for each structure. If there was no damage to a given component or if the component was not present, the level was marked as "none."

Otherwise, the damage was marked as one of the following:

1. Cosmetic: Surface-level damage that did not consume or remove material from the outer building envelope
2. Moderate: Damage resulting in some material removal or consumption that did not completely propagate through the building envelope
3. Significant: Complete thickness damage of the component that created an opening through the building envelope that could allow embers and/or flames to enter the structure

In the case of a structure with a component damaged at various levels (e.g., one window is cosmetic and another window is moderate), the most severe damage level was selected for the given component.

Table 4.4.1 provides common examples of these damage levels for each of the six (6) components analyzed. Additionally, Figures 4.4.38–4.4.43 contain exemplar photographs of cosmetic, moderate, and significant damage for the six (6) building components.

Table 4.4.1 Description of damage levels assigned to structure components during ULRI's assessment.

	Cosmetic	Moderate	Significant
Exterior walls	Bubbled paint, soot staining, discoloration	Surface burning, deformed/detached siding (with sheathing still intact), spalling/cracking	Fire or physical penetration, through thickness (cladding and sheathing if present) failure
Windows	Thermal damage to trim, discoloration of frame, cracked pane(s) that remained in place	Outer pane fall out (in case of multi-pane glass), surface burning, deformation of sash/ frame	Opening through window assembly due to fall out of all panes or burning/deformation of frame
Eaves	Bubbled paint, soot staining, discoloration	Surface burning, detached material, spalling/ cracking	Fire or physical penetration, through thickness failure
Doors	Thermal damage to trim, discoloration, cracked glass that remained in place	Surface burning, warped/deformed or delaminated, outer pane fall out (in case of door with multi-pane glass)	Fire or physical penetration, opening through door due to burn through or glass pane assembly fall out
Roofs	Cracked tiles that remained in place, soot staining, discoloration	Uplifted roof covering (with sheathing still intact), surface burning, charred roof covering	Fire or physical penetration, through thickness (shingle, underlayment, and sheathing) failure
Vents	Bubbled paint, soot staining, discoloration	Surface burning, warped mesh	Mesh detachment, warped or melted cover, opening to interior

Figure 4.4.38 Exemplar photographs of cosmetic (left), moderate (middle), and significant (right) exterior wall damage.

Figure 4.4.39 Exemplar photographs of cosmetic (left), moderate (middle), and significant (bottom) window damage.

Figure 4.4.40 Exemplar photographs of cosmetic (left), moderate (middle), and significant (right) eave damage.

Figure 4.4.41 Exemplar photographs of cosmetic (left), moderate (middle), and significant (right) door damage.

Figure 4.4.42 Exemplar photographs of cosmetic (left), moderate (middle), and significant (right) roof damage.

Figure 4.4.43 Exemplar photographs of cosmetic (left), moderate (middle), and significant (right) vent damage.

Damage level data of the six (6) components from ULRI's structure assessment were analyzed individually to identify trends across the impacted built environment.

The analysis excluded structures with a No Damage or Destroyed damage classification from the CAL FIRE DINS data. As such, the dataset utilized for the analysis included 771 of the structures evaluated by ULRI.

The total number of structures from this dataset with a given component marked at each damage level (cosmetic, moderate, significant) was calculated for each of the six (6) components to determine the most commonly damaged components and the distribution across damage levels for each component.

The ULRI structure assessment data were also combined with the CAL FIRE DINS data, which include information about the construction (e.g., type, material, etc.) of certain components (Table 4.4.2), to evaluate how component construction was related to the level of damage incurred.

Table 4.4.2 Field name and available selection options for components from the CAL FIRE DINS assessment. Note, the DINS assessment does not include any selection option for doors.

Field	Selection Options
Exterior siding	stucco/brick/cement, wood, vinyl, metal, other, unknown
Window panes	multi-pane, single-pane, no windows, unknown
Eaves	unenclosed, enclosed, no eaves, unknown
Roof construction	asphalt, tile, metal, concrete, wood, other, unknown
Vent screen	mesh screen > 1/8 in., no vents, mesh screen ≤ 1/8 in., unscreened, unknown

In the following subsections, an overview of the number of structures from ULRI's assessment with damage to different components is provided. Then, DINS data are presented and discussed along with other trends observed during ULRI's assessment for each structure component.

This analysis is intended to provide insight into trends in damage levels for several key building components to assess the process of failure in structures' exterior envelopes when impacted by fire.

More detailed analyses on the subset of structures considered by ULRI, as well as all structures assessed by the CAL FIRE DINS teams, may uncover deeper insights into damage progression.

4.4.2.2 Overview of Component Damage

Table 4.4.3 lists the number of structures that were identified with each level of component damage as well as the total number of structures with any damage for each of the six (6) components from the ULRI assessment.

The percentage of the total number of structures with each damage level has been included parenthetically for each component. Many structures had more than one component damaged, so the total number of damage observations exceeds 771.

Table 4.4.3 Breakdown of the number of structures and type of component damaged, sorted by damage level. Percentage is relative to the total number of structures with the specific component damaged.

	Cosmetic	Moderate	Significant	Total
Exterior walls	323 (51%)	229 (36%)	79 (13%)	631
Windows	158 (31%)	140 (27%)	216 (42%)	514
Eaves	154 (39%)	128 (33%)	108 (28%)	390
Doors	80 (35%)	60 (26%)	90 (39%)	230
Roofs	46 (20%)	102 (45%)	78 (35%)	226
Vents	26 (25%)	23 (22%)	55 (53%)	104

Exterior walls were the most commonly damaged component in the sample of structures surveyed. Of the 771 damaged structures surveyed by ULRI, 631 (82%) had some level of exterior wall damage.

The relatively high number of damaged wall systems may be attributed to the large ratio of wall to total structure surface area compared to other components; if a fire exposure causes damage to a structure from any side, it's likely that an exterior wall is impacted to some extent.

Exterior walls also had the highest percentage of cosmetic damage (51%) and the lowest percentage of significant damage (13%) of the six (6) components assessed, likely due to the prevalence of noncombustible construction common in the affected communities.

Windows were the second most commonly damaged component identified in this sample of structures. Windows are often installed on all sides of a structure, which increases the likelihood of damage from an exterior fire exposure.

Furthermore, radiant heat from a fire exposure can cause panes to break and fall out of a window, resulting in an opening to the interior of the structure for smoke, embers, and flames to enter and ignite interior contents. This susceptibility of windows may explain why windows had the largest number of significant damage observations (216 of 771 structures observed) of the six (6) components.

Similar to exterior walls, damage to eaves was most commonly classified as cosmetic (39%), followed by moderate (33%), and then significant (28%).

The orientation of eaves and the duration of an exposure needed to cause moderate and significant damage may have contributed to the eave damage level results.

Eaves are typically elevated at roof height and may be impacted less by low-lying burning fuels compared to other components, such as exterior walls or windows. Additionally, the majority of a typical eave's surface area is parallel with the ground, so the view factor relative to a burning fuel that is not directly below the eave (e.g., a neighboring structure) may be less than that of a component perpendicular to the ground, like an exterior wall or window.

A common source of damage to eaves was burning vegetation and/or other fuels against or near a structure. These fuels are typically considered to be in Zone 0 (0–5 ft from the structure). Zone 0 fuel management is a commonly discussed tactic for the protection of a structure against WUI fires (see Sections 3.2.1 and 4.4.3). It's possible that many homeowners took precautions and had little to no fuel in Zone 0, which reduced the likelihood of eave damage from exposure to burning fuels.

Garage doors, pedestrian doors, and sliding glass doors were all included in the "doors" component for the ULRI assessment. Damage to doors was more commonly classified as significant (39%) or cosmetic (35%) than moderate (26%).

Of the structures with damaged roofs, it was more likely that the roof damage was considered moderate (45%) or significant (35%) than cosmetic (20%). Roofs were the component most susceptible to wind damage (see Section 4.3.3.1); high winds caused roofing material (tiles or shingles) to become detached in many cases.

The vents component included ventilation openings into a structure (located in the roof, eaves, walls, and/or foundation), such as attic vents, laundry/exhaust vents, or crawlspace/underfloor vents. Typically, vents were covered by a metal mesh screen and/or by a housing or cover. Vents were the least commonly damaged component of the six (6) building components assessed. Vent damage, when present, was most commonly classified as significant (53%).

4.4.2.3 Exterior Walls

For structures where exterior wall damage was noted, the damage level determined by the ULRI assessment was further grouped based on the exterior wall material as recorded in the DINS data (Table 4.4.4).

The following analysis is focused on stucco/brick/cement and wood wall types because these were the only classified wall systems with a large enough number of structures to make a meaningful comparison.

Table 4.4.4 Exterior wall damage levels based on DINS selection options.

	Cosmetic	Moderate	Significant	Total
Stucco/brick/cement	278	179	43	500
Wood	40	36	32	108
Vinyl	3	10	1	14
Metal	1	0	2	3
Other	1	1	1	3
Unknown	0	3	0	3

Stucco/brick/cement was the most common exterior wall material of the damaged structures assessed by ULRI; 500 of the 631 structures with exterior wall damage were in this category. Importantly, over half of the structures with this type of exterior wall material (56%) sustained only cosmetic damage.

Furthermore, only 43 (9%) of these structures were classified as having significant wall damage, but this number is an overestimate of the fire-related wall damage to this construction type.

For 12 of these 43 structures, the significant wall damage was to a portion of the wall constructed of wood. Based on DINS protocol, these structures should have been marked as wood rather than stucco/brick/cement because wood is the more vulnerable material.

Additionally, eight (8) of the 43 structures that had stucco/brick/cement exterior walls marked as significant damage appeared to have been damaged by fire department intervention and not by a fire exposure.

Taking these cases into consideration, the percentage of stucco/brick/cement walls that were significantly damaged by fire is below 5% (23 of 500), which is considerably lower than that of the wood walls at 30% (32 of 108). The noncombustible nature of stucco/brick/cement walls resulted in increased resilience to fire exposure compared to combustible wood walls.

The majority of the remaining 23 stucco/brick/cement walls with significant damage were due to either the collapse of the roof/wall or the consumption of burning roof joists, which resulted in an opening through the exterior wall (Figure 4.4.44).

Alternatively, wood walls marked as having significant damage typically had a larger surface area of damage, and through-thickness failure was caused by prolonged burning of the wall material (Figure 4.4.45).

Figure 4.4.44 Stucco exterior wall with significant damage caused by roof collapse. The red arrow highlights the opening through the wall formed by the roof collapse.

Figure 4.4.45 Wood exterior wall with significant damage caused by prolonged burning of the wall material.

The relative difference in fire damage to noncombustible versus combustible designs was noted in structures where both noncombustible and combustible wall components were exposed to similar fire conditions.

In a number of assessed structures, significant exterior wall damage was due to the combustible portion of the wall igniting, while the noncombustible portion only sustained cosmetic or moderate damage (Figure 4.4.46).

The top images in Figure 4.4.46 are of a home with nearly all exterior walls constructed of a noncombustible material except for one (1) room on the second level. The exposure from a nearby burning pergola (not pictured) and vegetation caused the wood portion of the wall to ignite, resulting in significant damage, whereas the noncombustible portion of the wall only sustained moderate damage.

An exterior wall constructed from stucco on the bottom half and wood siding on the upper half is shown in the bottom left image of Figure 4.4.46.

Some home hardening guidance[199,201] suggests using a noncombustible material for the bottom 2 ft of the exterior wall to help reduce the cost of hardening the entirety of exterior walls while still protecting against ember and other near-ground exposures. In this case, however, the primary exposure that caused the wood to ignite was taller vegetation against the house that impacted the wall well above this 2 ft level.

The bottom right image in Figure 4.4.46 is of a damaged structure (left side of photograph) that had side and rear exterior walls constructed of stucco and a front exterior wall with wood siding. The exposure from the destroyed adjacent structure (right side of photgraph) and vegetation caused the wood siding to ignite, and fire spread to the interior of the structure. The stucco portion of the exterior wall remained intact despite the thermal impact from the fire and potential physical impact from the neighboring structure's collapsed wall.

Figure 4.4.46 Damage to exterior walls that were constructed from a combination of combustible and noncombustible materials.

Another rather unique example of the hazard associated with a portion of an exterior wall constructed from combustible material is presented in Figure 4.4.47. This structure was a beachfront property with exterior walls constructed primarily of metal cladding, concrete, and glass. However, there was exposed wood along the foundation underneath the deck on the beach side of the structure.

While the metal cladding provided protection against embers and radiant heat exposure from an adjacent destroyed structure, the exposed wood under the deck ignited due to embers that recirculated under the attachment (see Section 4.3.2.2).

Figure 4.4.47 A structure with noncombustible exterior construction (top) except for exposed wood along the foundation underneath the deck, which ignited due to embers (bottom).

It is also important to consider that exterior walls are often constructed as a system with several sub-components, including the sheathing and other materials behind the visible cladding.

Previous research has shown that a combustible material behind a noncombustible exterior wall material may ignite during a fire exposure, especially if the noncombustible exterior cladding begins to degrade.[205]

One assessed structure had noncombustible fiber cement board siding that was heated to a point where the material started to crack/spall and detach from the structure. Then, the exposed combustible sheathing material, which in this case was OSB, ignited due to the fire exposure (Figure 4.4.48).

Figure 4.4.48 Charred sheathing behind a noncombustible cladding material. This picture also appears to show punctures through the OSB sheathing, likely from fire department operations to check for fire extension into the wall cavity.

4.4.2.4 Windows

Damage to window assemblies from exterior fire exposures can occur through multiple routes, though the most commonly identified failures during ULRI's assessment were related to glazing breakage (cracking and fall out of glass panes) and frame damage (charring and burning or softening and deforming depending on frame material).

DINS options for describing windows were solely based on whether the glazing was single or multi-pane and did not address the frame material.

For structures where window damage was noted, the damage level determined by the ULRI assessment was further grouped based on the pane assembly design as recorded in the DINS data (Table 4.4.5).

The six (6) structures with "no windows" selected by DINS that ULRI marked as having some level of window damage was due to a difference in how DINS defined a window versus how ULRI defined a window. Specifically, if a door had a window in it or was a sliding glass door, ULRI treated this as both a window and a door, whereas DINS may not have.

Table 4.4.5 Window damage levels based on DINS selection options.

	Cosmetic	Moderate	Significant	Total
Multi-pane	103	109	141	353
Single-pane	53	30	67	150
No windows	1	1	4	6
Unknown	1	0	4	5

Multi-pane windows were more common than single-pane windows in the assessed damaged structures. Of the 514 structures with window damage, 353 had multi-pane windows and 150 had single-pane windows. For both designs, significant damage was noted most often in structures with window damage.

Damage levels of structures with damaged multi-pane windows (29% cosmetic, 31% moderate, 40% significant) were distributed similarly to those with damaged single-pane windows (35% cosmetic, 20% moderate, 45% significant), other than a notably larger percentage of moderate damage in multi-pane windows.

For single-pane windows, a cracked pane was classified as cosmetic damage, but if any portion of the pane had fallen out, it was classified as significant damage because there was an opening into the structure. However, if an outer pane fell out of a multi-pane window and the inner pane remained in place, the window was classified as moderate damage.

The extra protection provided by multiple panes in a window assembly is reflected in the larger percentage of multi-pane windows with moderate damage compared to single-pane windows. Moderate damage for single-pane windows was typically attributed to a deformed sash/frame or surface burning to the sash/frame.

In addition to the number of glass panes in a window assembly, the type of glass used for the panes can play an important role in damage progression. It is well established that tempered glass provides better protection against fire exposure than annealed glass.[206,207,208,189,209,192] This difference in fire performance was observed numerous times during the ULRI structure survey.

For example, in Figure 4.4.49, a fuel source in the corner of two (2) exterior walls burned and impacted the window next to the door as well as the one on the adjacent wall. The fire spread to the wood door jamb, causing significant damage to the doors. However, no panes failed in the window next to the door, which was a double-pane design with both panes tempered glass (though there was damage to the screen and vinyl frame of the window). The window on the connecting wall was a double-pane design with both panes annealed glass, and the outer pane cracked and fell out of the window assembly.

Figure 4.4.49 Tempered glass window and annealed glass window damage from exposure to the same fire source. No tempered glass panes failed (bottom, right) whereas the outer pane of the annealed glass pane assembly cracked and fell out of the window assembly (bottom, left).

The frame construction of a window has also been shown to impact the failure of the assembly during an exterior fire exposure.[210,208,211,212]

Many examples of frame damage and failure were documented during the ULRI assessment. In one such case, the vinyl frame of a double-hung window melted and deformed to a point where the top sash folded in on itself before complete pane failure occurred (Figure 4.4.50).

In another case, deformation of a vinyl frame due to radiation from an adjacent burning structure caused the outer glass pane to fall from the window assembly while still intact (Figure 4.4.51).

Metal reinforcement for vinyl frame window sashes has been recommended to increase rigidity and prevent deformation.[213,198] However, it was observed in at least one instance that a cross member on a vinyl-framed window still failed despite it being reinforced with metal (Figure 4.4.52).

Figure 4.4.50 Vinyl window frame that deformed to a point where it folded in on itself while window panes were still intact.

Figure 4.4.51 Deformation of a vinyl window frame caused the outer pane to fall out while still intact.

Figure 4.4.52 Failure of a metal-reinforced rail (red arrow) in a vinyl-framed window.

There were also numerous cases in which wood window frames were a key vulnerability in the failure of a window assembly.

Figure 4.4.53 presents photographs from a structure where wood window frames allowed fire to spread to the interior.

The primary fire exposure to the structure was from a burning adjacent structure and vegetation. The structure had a noncombustible exterior wall and eaves enclosed with a noncombustible material. The only combustible materials along the exposed portion of the structure were the wood window frames on the first and second levels. Both window frames ignited and burned for a sustained period, as evidenced by charring and soot staining around their perimeters.

The photograph on the right side of Figure 4.4.53 was captured by firefighters who suppressed the remaining fire and shows the interior side of the second-level window. It is evident from the upper portion of the window that the fire spread into the interior through the wood window frame.

Figure 4.4.54 provides another example of a structure with charred wood window frames mounted in a noncombustible wall assembly.

The top photographs show a wood window frame where embers collected on the sill and burned through the outer portion of the window frame. The bottom photograph shows wood window frames from the same property that were significantly charred due to radiant heat exposure from an adjacent wood fence and neighboring structure. In both cases, the panes were still intact, indicating the wood frames were the most vulnerable part of these window assemblies.

Figure 4.4.53 Example of wood window frame vulnerability. The wood frames of the windows in the left photograph ignited, allowing fire to spread to the interior of the structure, as seen in the right photograph captured by firefighters who entered the structure to suppress the fire.

Figure 4.4.54 Ignition of wood frames due to an ember exposure (top) and radiant heat exposure (bottom).

The manner in which windows, trim, and ventilation systems such as fans and HVAC systems are installed in windows can also impact the likelihood of failure. Previously, Figure 4.4.33 showed the hazard associated with side panels used to seal the openings on the sides of a window air conditioning unit. The side panel deformed due to a nearby vegetative exposure, which created an opening through the window assembly before complete failure of the window panes occurred.

Additionally, decorative combustible materials, such as exterior wood trim, may ignite and cause window damage. Figure 4.4.55 shows an example where decorative wood trim around a sliding glass door ignited and caused glass pane failure and exterior wall damage.

Figure 4.4.55 Decorative wood trim around a sliding glass door ignited and caused glass pane failure and exterior wall damage.

In locations where an exterior fire exposure is impacting an area of a structure that's constructed with noncombustible materials, windows may be a likely first point of failure.

The structure shown in Figure 4.4.56 was impacted by fire from a neighboring destroyed home. The exterior wall of the damaged structure was noncombustible and sustained only cosmetic damage from the exposure (soot deposition, discoloration, minor cracking). However, many of the windows on this same wall were significantly damaged, including several that were completely destroyed, which resulted in large openings that allowed fire to spread to the interior.

The windows installed in this structure were a combination of single and double-pane designs with annealed glass and wood frames. For the windows where material remained in the window opening, several had charred wood frames (indicating the frames ignited during the exposure) and complete pane fall out.

Figure 4.4.56 Example of windows as a first point of failure in a structure. Multiple wood-framed windows mounted in a noncombustible exterior wall failed and allowed fire to spread to the interior of the structure.

Wood window frames are also susceptible to smoldering ignition and failure. Figure 4.4.57 shows a scenario where a potted plant on a brick patio abutted a structure and ignited from embers depositing in the pot. Neither the siding of the structure nor the patio ignited from the exposure because they were constructed of noncombustible materials. The glass in a nearby window frame was tempered and appeared to have remained intact during the initial exposure from the nearby smoldering material.

However, the frame of the nearby window was constructed of wood and eventually ignited from the smoldering exposure. The fire burned through the thickness of the window frame, ignited the wood wall frame members, and spread up the void space to the ceiling (Figure 4.4.58). Home hardening guidance from CAL FIRE[201] and elsewhere[198,214,215] recommends the use of a noncombustible material (e.g., metal) for window framing. Had the window frame been constructed from such a material, fire spread to the interior of the structure may have been prevented.

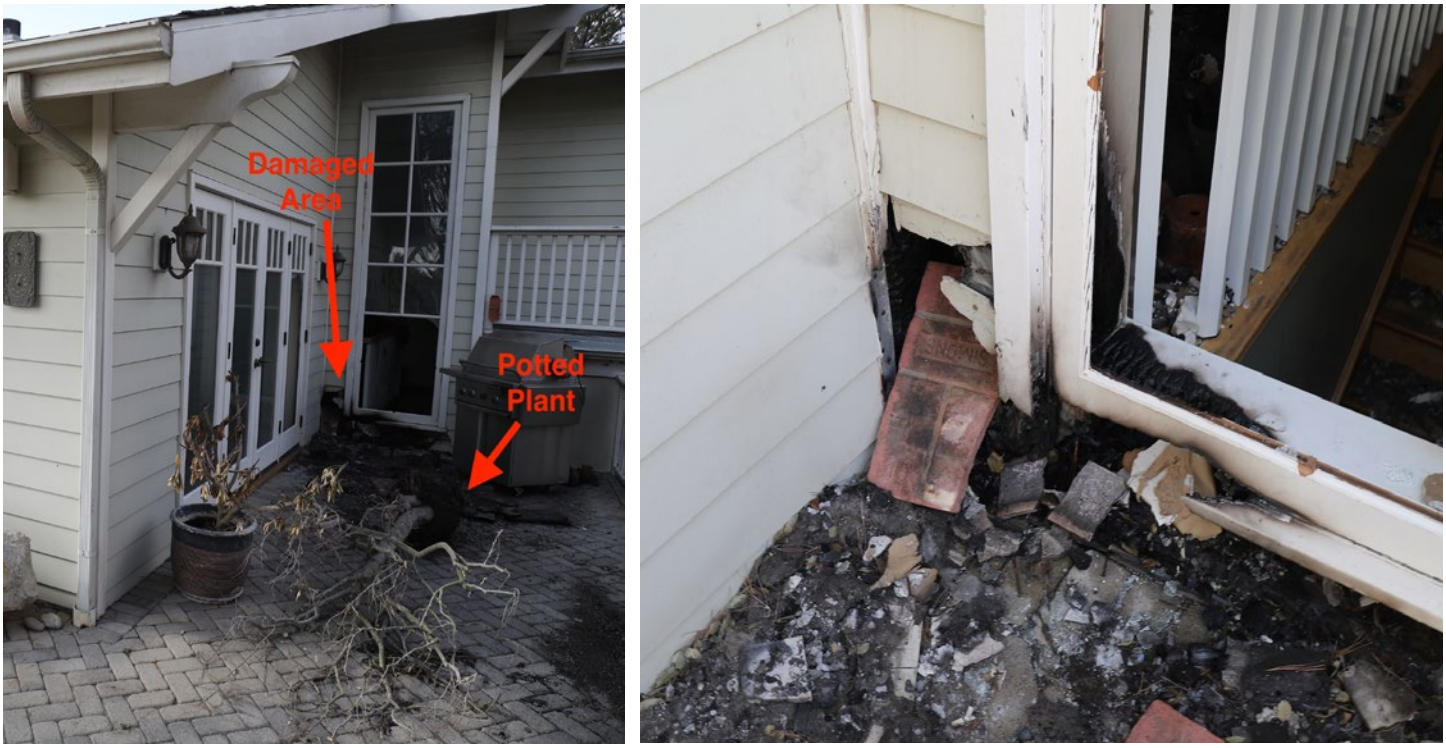


Figure 4.4.57 Fire spread from a potted plant against the corner of a house to a wood window frame, which allowed fire to spread to the interior of the structure.

Figure 4.4.58 Fire eventually spread to the wall frame members and up the void space to the ceiling. The top photograph is looking up the void space towards the ceiling, and the bottom photograph shows the charred wood behind the ceiling drywall that was removed during firefighting operations.

The final window example in this section, Figure 4.4.59, shows a structure that was exposed to a fire involving a wood retaining wall and a small structure with a wood perimeter (possibly a hot tub or storage shed) located 7 ft from the impacted structure.

Based on the amount of fuel consumed and the damage to the retaining wall timbers, the fire appeared to have burned for a considerable amount of time.

The structure included noncombustible exterior siding, noncombustible enclosed eaves, and double-pane tempered glass windows with metal frames, all of which are recommended for hardening a home against exterior fire exposure and helped prevent ignition of the structure.

The window panes were also 1/4 in. thick and contained a low-emissivity (Low-E) coating, which has been shown to increase glass survivability during a fire exposure. [216,217,192] Despite these hardened characteristics, failure of the outer pane of the window still occurred, but the inner pane remained intact, and fire did not penetrate the building envelope.

Had the window assembly not been hardened or if the exposure was more severe (in magnitude or duration), the window assembly may have incurred significant damage, and fire could have spread to the interior of the structure.

This example shows the benefit of hardening windows (and other components of a structure) but also shows that with a severe enough exposure, windows can still be a key structural vulnerability, and failure of hardened window panes (double-pane, 1/4 in. thick tempered glass, Low-E coated) can still occur.

Figure 4.4.59 Damage to a structure (left) caused by an adjacent high intensity fire (right). The structure included hardened components (including double-pane, 1/4 in. thick tempered glass windows with a Low-E coating) withstood the exposure, yet the outer pane of the window failed. Had the exposure been more severe (in magnitude or duration), the inner pane may have also failed, creating a pathway for fire spread to the interior of the structure.

4.4.2.5 Eaves

For structures where eave damage was noted, the damage level determined by the ULRI assessment was evaluated based on the DINS classification for eave design (Table 4.4.6).

DINS options for characterizing a structure's eaves were based on whether the eaves were unenclosed or enclosed and did not address the material from which the eaves were constructed.

The 35 cases of "no eaves" that were marked as having some level of damage by the ULRI analysis are due to differences between what was considered to be an eave. The ULRI assessment considered any overhang at the intersection of a wall and a roof to be an eave. For example, if there was decorative molding along this intersection, this would be considered an eave by ULRI. In other cases, DINS marked "no eaves" when the ULRI team determined the structure did have eaves.

Unenclosed eaves were more common than enclosed eaves in the damaged structures assessed by ULRI. Of the 390 structures with eave damage, 256 had unenclosed eaves and 98 had enclosed eaves.

Thirty percent (76 of 256) of the structures with damaged unenclosed eaves were categorized as sustaining significant eave damage, while only 20% (20 of 98) of those with damaged enclosed eaves were categorized as such.

This analysis may suggest that enclosed eaves provided better protection against fire exposure than unenclosed eaves, but more in-depth analyses are needed before any conclusions are made.

Other factors may have impacted these results. Specifically, many of the enclosed eaves on the structures evaluated during the ULRI assessment were enclosed by a noncombustible material, while many of the unenclosed eaves were constructed from wood.

It is also important to consider that for enclosed eaves, if fire penetrates the fascia or soffit, flames and embers may have a direct pathway to enter the attic. Alternatively, with unenclosed eaves, fire may burn through the thickness of the roof structure above the eave but will not have a similar pathway to the attic if the blocking remains in place.

Of the 20 structures that had enclosed eaves with significant damage, two (2) of them should have been categorized as unenclosed by DINS.

Four (4) of the enclosed eaves with significant damage had a soffit constructed from wood, and fire spread to and burned through the soffit (Figure 4.4.60).

In six (6) cases of significantly damaged enclosed eaves, the eave had a noncombustible soffit with a wood fascia or barge board that ignited and caused significant damage to the eave (Figure 4.4.61). Such observations demonstrate the potential hazard associated with using wood fascia and barge boards on otherwise noncombustible enclosed eaves.

Table 4.4.6 Eave damage levels based on DINS selection options.

	Cosmetic	Moderate	Significant	Total
Unenclosed	101	79	76	256
Enclosed	41	37	20	98
No eaves	12	11	12	35
Unknown	0	1	0	1

Figure 4.4.60 An enclosed eave with a wood soffit that ignited and caused significant damage to the eave.

Figure 4.4.61 Significant damage to an enclosed eave with a noncombustible (stucco) soffit caused by ignition of the wood fascia board.

Figures 4.4.62 and 4.4.63 present two (2) examples of significant damage to unenclosed wood eaves caused by bushes, shrubs, and trees immediately adjacent to the structure that ignited.

For comparison, Figure 4.4.64 shows a damaged unenclosed eave with an underside and barge board constructed of noncombustible materials. The exposure to this structure was from fire involving vegetation immediately adjacent to the structure, a wood fence, and an adjacent structure. The cementitious underside material of the eave only sustained cosmetic damage, though the exposed wood purlins were charred.

The damage presented in Figures 4.4.62 and 4.4.63 versus that in Figure 4.4.64 demonstrates the vulnerability of unenclosed eaves constructed of wood compared to those constructed of noncombustible materials.

Figure 4.4.62 Significant damage to an unenclosed wood eave caused by near-home vegetation that ignited.

Figure 4.4.63 Photographs of significant damage to an unenclosed wood eave caused by near-home vegetation that ignited.

Figure 4.4.64 Cosmetic damage to an unenclosed eave constructed of noncombustible materials caused by fire involving near-home vegetation, a wood fence, and an adjacent structure.

Additionally, Figures 4.4.65 and 4.4.66 show examples of similar exposures to noncombustible enclosed eaves.

In Figure 4.4.65, a burning wood fence and vegetation only caused cosmetic damage to an enclosed eave. In Figure 4.4.66, decorative wood siding on a wall underneath a noncombustible enclosed eave ignited and caused moderate damage to the eave. In this case, direct flame contact to the eave likely occurred, but fire did not spread to the enclosed eave due to the noncombustible soffit.

Figure 4.4.65 Cosmetic damage to an eave enclosed by a noncombustible material caused by a burning wood fence and vegetation.

Figure 4.4.66 Moderate damage to an eave enclosed by a noncombustible material (bottom) caused by burning wood siding underneath the eave (top).

4.4.2.6 Doors

The CAL FIRE DINS assessment tool does not provide an opportunity for specialists to report specific design information regarding doors, so an analysis of DINS data related to door materials or construction is not provided.

Garage doors, pedestrian doors, and sliding glass doors were all included in the “doors” category for the ULRI assessment.

Exterior doors are commonly located at ground level and within a frame that may be inset from the wall, making them especially susceptible to exposure from ember deposition and pile up.

Numerous instances of ignition of combustible doors due to ember exposures were observed during the ULRI assessment. Furthermore, wood door jambs and trim were found to be a key vulnerability of door assemblies (Figure 4.4.67).

In multiple cases, fire spread to the combustible jamb or trim of a door assembly with a non-combustible door due to ember accumulation at the combustible feature (Figure 4.4.68).

To increase resistance to piles of embers, doors themselves, as well as the door jambs and trim, should either be constructed of or protected by a noncombustible material. For example, CAL FIRE home hardening guidance[201] recommends using metal flashing as a means of doing so.

Figure 4.4.67 Burned wood door caused by ember exposure.

The interfaces between garage doors and their jamb and between garage doors and the ground surface are often protected with some type of weather seal, usually made of rubber or other flexible polymer. These seals can be prone to deforming, melting, and/or dripping during an exterior fire exposure, which could create an opening for embers to pass through (Figure 4.4.69).

Additionally, garage doors constructed from a combustible material (e.g., wood) are vulnerable to ignition when exposed to embers, radiant heat, or direct flame contact (Figure 4.4.70).

Garage doors often have windows installed (commonly single-pane design), which can break similarly to windows in a wall if subjected to an intense enough exposure. Figure 4.4.71 shows a property where multiple windows of a noncombustible garage door failed due to the exposure from a burning vehicle in front of the garage. In this example, the garage door was constructed of metal and withstood the exposure from the vehicle, and the windows were the first point of failure for the garage door.

Figure 4.4.68 A wood jamb around a metal garage door burned due to ember exposure, which allowed fire to spread to the interior of the structure.

Figure 4.4.69 Examples of melted garage door seals.

Figure 4.4.70 Charred wood garage door that was ignited by embers.

Figure 4.4.71 Broken garage door windows in a metal overhead garage door as a result of exposure from a burning vehicle.

The effectiveness of pedestrian doors to withstand an exterior fire exposure is largely predicated on the materials from which the door is constructed. Ignition of wood pedestrian doors was noted in numerous damaged structures.

For example, Figure 4.4.72 shows a wood side door to a garage that ignited from exposure to a nearby vegetation fire. The fire burned through the top portion of the door and its jamb, which provided a pathway for the fire to spread to the interior of the garage.

Alternatively, metal pedestrian doors were better able to withstand fire exposures. In many of the assessed damaged structures, metal pedestrian doors only sustained cosmetic or moderate damage from fire exposures and did not ignite (Figure 4.4.73).

Pedestrian doors may also contain windows, which can be vulnerable to failure during a fire exposure (Figure 4.4.74).

Figure 4.4.72 A wood pedestrian door ignited and allowed fire to spread to the interior of the garage.

Figure 4.4.73 Damage to a metal pedestrian door caused by a nearby fire exposure from an outdoor garbage/ recycling receptable.

Figure 4.4.74 A wood-framed door with a glass pane assembly. The wood frame of the door ignited, and the outer pane of the double-pane assembly failed during the fire exposure.

The window failure pathways described in Section 4.4.2.4 also apply to sliding glass doors. Typically, these doors are constructed with dual-pane tempered glass assemblies, so they are more resistant to thermal exposure than annealed glass assemblies.

However, sliding glass doors in homes constructed before tempered glass was a requirement may contain annealed glass panes. For example, the structure pictured in Figure 4.4.75 was built in 1952, and the outer panes of annealed glass on the sliding door cracked as a result of exposure to a burning detached garage that was approximately 20 ft away from the door.

Similar to windows, the frames of a sliding glass door can also impact failure. Figure 4.4.76 shows photographs of a sliding glass door where vinyl frame deformation caused the double-pane assembly to fall out of the frame before either of the tempered panes failed.

Figure 4.4.75 Cracked annealed glass panes in a sliding glass door.

Figure 4.4.76 A double tempered glass pane assembly fell out of a sliding glass door due to deformation of the vinyl frame.

4.4.2.7 Roofs

For structures where roof damage was identified, the damage level determined by the ULRI assessment was further grouped based on the outermost material in the roofing assembly as recorded in the DINS data (Table 4.4.7).

The following analysis is focused on asphalt and tile roofs because these were the only roof types with a sufficient number of observations to make a meaningful comparison.

Table 4.4.7 Roof damage levels based on DINS selection options.

	Cosmetic	Moderate	Significant	Total
Asphalt	27	74	61	162
Tile	16	19	10	45
Metal	1	3	3	7
Concrete	1	4	1	6
Wood	1	1	1	3
Other	0	1	1	2
Unknown	0	0	1	1

Asphalt roofs were the most common roof type on the damaged structures surveyed by ULRI, followed by tile roofs.

Thirty-eight percent of damaged asphalt roofs were classified as significant damage compared to only 22% for damaged tile roofs.

The most commonly observed damage category for both types of roofs was moderate. Furthermore, 32 of the 74 (43%) asphalt roofs and 8 of the 19 (42%) tile roofs with moderate damage were damaged by wind uplifting shingles or tiles (Figure 4.4.77) as opposed to direct fire damage.

Such wind damage exposes the underlayment, and, in some cases, the wood decking of a roof assembly, increasing the risk for embers to accumulate and eventually ignite combustible materials below the shingles/tiles. Some traditional roof designs use skip sheathing, particularly with wood shake or clay tile roofs, where uplifted roofing could result in direct access to the structure's attic.

Figure 4.4.77 Moderate roof damage caused by wind uplifting shingles.

Much of the documented moderate and significant roof damage from fire was due to flame impingement from adjacent or connecting structural components that had ignited. In other words, the roof was not the first structural component to incur fire damage. There were many instances of significant roof damage that originated from fire burning through the underside of an eave (Figure 4.4.78).

There were also documented cases of roof damage caused by fire propagating from burning fascia boards or barge boards, like that pictured in Figure 4.4.79.

Additionally, there was evidence of firefighter roof operations (e.g., vertical ventilation) for 13 of the structures with significant roof damage (Figure 4.4.80).

Figure 4.4.78 Two (2) structures with significant roof damage initiated by fire burning through the underside of an eave.

Figure 4.4.79 Roof damage caused by fire propagating from a burning barge board.

Figure 4.4.80 Example of a structure with significant roof damage where vertical ventilation was performed by firefighters (red circle and arrow).

When fire spread to the roof decking, significant damage to the structure was commonly noted. Sometimes, roof decking was ignited by a fire already burning inside a structure (Figure 4.4.81). In other cases, fire spread to the roof decking via the exterior. The path to roof damage may involve several other items, such as burning vegetation to a wood fascia board, eave, and eventually the wood decking of an asphalt shingle roof (Figure 4.4.82).

In communities where large elevation changes may occur between properties, burning vegetation on a hillside and vegetative debris in gutters may contribute to exterior fire spread to the wood decking of a roof (Figure 4.4.83).

Outdoor storage of combustibles can lead to significant roof damage due to the ignition of roof decking. In one such case, flame impingement at the interface of the noncombustible wall and roof of a garage resulted in fire spread to the roof decking and rafters underneath a barrel tile roof, which caused a partial collapse of the roof (Figure 4.4.84).

Figure 4.4.81 Example of fire spreading from the interior of a structure to the exterior of a roof.

Figure 4.4.82 Significant roof damage caused by fire spread from burning vegetation to the eaves and then roof decking of a structure.

Figure 4.4.83 Significant roof damage caused by burning vegetation and/or embers igniting the roof decking.

Figure 4.4.84 Significant roof damage where fire spread from the near-home combustibles stored behind the structure to the underlayment and decking of a barrel tile roof, resulting in partial collapse of the roof.

Although there were few identified instances of structures with wood shake shingle roofs in the sample assessed by ULRI, it is important to highlight the hazard associated with these types of roofs, as well as other non-Class A-rated combustible roofs.

These roofs present an additional hazard given their propensity to ignite, particularly from ember accumulation (Figure 4.4.85).

Figure 4.4.85 A wood shake roof that ignited due to embers.

4.4.2.8 Vents

Vents located in the roof, eaves, walls, and/or foundation were analyzed as a group, with the damage level determined by the ULRI assessment further broken down based on the type of screening in place as recorded in the DINS data (Table 4.4.8).

The 26 structures marked “no vents” by the DINS team that had some level of vent damage were structures that had a vent opening that they did not record. The following analysis is focused on the vents with a mesh screen that had openings greater than 1/8 inch and those with a mesh screen that had openings less than or equal to 1/8 inch.

Table 4.4.8 Vent damage levels based on DINS selection options.

	Cosmetic	Moderate	Significant	Total
Mesh screen > 1/8 in.	13	12	29	54
No vents	5	7	14	26
Mesh screen ≤ 1/8 in.	7	4	6	17
Unscreened	0	0	4	4
Unknown	1	0	2	3

Mesh screened vents with openings in the screen greater than 1/8 inch were more common than those with 1/8 inch or smaller openings.

Twenty-nine of the 54 (54%) structures with damaged vents covered by mesh screens with the larger openings (> 1/8 inch) had significant vent damage, while only six (6) of the 17 (35%) structures with damaged vents covered by mesh screens with the smaller openings (≤ 1/8 inch) had significant vent damage.

This difference may be a result of the increased effectiveness of preventing ember intrusion associated with the screens with smaller openings,[213,218] but there are other important factors, such as the materials and attachments holding the screens in place as well as other damage in the vicinity of the vent.

There were numerous structures with plastic vent covers that deformed and/or melted due to fire exposure, commonly through radiant heat (Figure 4.4.86) or contact with embers. Oftentimes, these vents did not have a screen incorporated beyond the outer housing. So, once the housing melted, there was a direct and unscreened pathway for embers to enter the structure beyond the outer wall.

One such case is presented in Figure 4.4.87. Debris that had accumulated at the corner of an exterior wall was ignited by ember deposition. The noncombustible wall had only cosmetic damage due to soot deposition. However, a plastic vent cover near the burning debris melted, and fire spread to the interior and charred an interior structural member.

Another potential failure pathway observed with vents involved wood framing around vent screens. Multiple cases were observed during the ULRI assessment where the wood frame around a vent screen ignited (Figure 4.4.88), which could create a direct pathway for flames into a wall cavity.

Even if flames from these burning frames do not ignite the structure, the vent screen would likely be compromised and could fall away after the frame was damaged, providing a potential pathway into a structure for embers.

Figure 4.4.86 Examples of melted plastic vent covers.

Figure 4.4.87 Fire spread into a wall cavity through a melted vent. The photograph on the left shows soot deposition on the wall from burning debris at the corner of the structure as well as the location of the melted vent (denoted by the red arrow). The photograph on the right shows a charred interior structural member.

Figure 4.4.88 Crawlspace vents with wood frames that ignited.

4.4.3 Property and Structure Preparations

Prior to the Palisades and Eaton Fires, there were important actions that many residents undertook to prepare their property and structure(s) to improve the likelihood of mitigating the impacts of the approaching fires. This preparation included routine property maintenance, pre-evacuation actions, and taking steps that could help support successful structure defense.

While taking these actions doesn't guarantee structure survival, property and structure preparation prior to the fire's arrival can reduce potential fire exposure by limiting the impact of fire spread to a structure.

The International Association of Fire Chiefs (IAFC) "Ready, Set, Go!" program is a free, national wildfire preparedness initiative that helps fire departments educate residents in high-risk and WUI communities on how to prepare for wildfire, stay situationally aware, and evacuate early and safely.[219]

Some guidance from this campaign includes best practices regarding vegetation management, building with noncombustible materials, and having pre-identified evacuation routes.

Additionally, CAL FIRE has published a "Go! Evacuation Guide" that outlines pre-evacuation steps such as closing doors and windows, moving combustibles away from windows, turning off utilities, moving outdoor items away from a structure, sealing vents, and evacuating early.[220]

Many local fire departments also have instructional materials via their websites regarding property preparation and home hardening.[221-225]

Additionally, prior to and during the Palisades and Eaton Fires, LACoFD released messages relating to preparation and evacuation for the forecasted weather via social media channels.[226]

Across the over 880 structure damage assessments completed by ULRI and more than 200 post-fire surveys filled out by residents within the Palisades and Eaton Fire areas (Appendix Section 6.8), 133 addresses were identified where residents were known to take actions to prepare their property and/or structure prior to the Fires.

Note that these 133 addresses had confirmed preparation evidence based on conversations with residents and/or firefighters, or evidence remained on the property at the time of ULRI's structure damage assessment (i.e., pool signage, pump set up, etc.). It is likely that many additional preparation actions were conducted at other properties assessed by ULRI and others within the Palisades and Eaton Fire footprints, but those instances were not confirmed and are not discussed in this section. Table 4.4.9 lists the various types of preparation actions documented.

In cases where the ULRI team was unable to speak with the resident, the timing of these preparations could not be confirmed. It is also important to consider that even when residents prepared their structures prior to the Palisades and Eaton Fires, not all structures survived. However, preparing a structure prior to evacuating can slow and limit the spread of fire to a structure and allow time for responders to intervene if needed.

Table 4.4.9 Preparation actions documented during ULRI's assessment.

Preparation Action	Documented Total
Fire Resistive Landscaping	4
Applied Water to House/Vegetation	78
Cleared Vegetation	29
Relocated Near Home Combustibles	5
Covered Structure Vulnerabilities	24
Preparation and Defense Equipment	18
Signage and/or Securement of Utilities	7
Applied Gel/Retardant	3
Additional Water Supplies	4
Other	23

For the purposes of this analysis, the types of preparation identified in the damage assessments have been subdivided into three (3) categories based on the tactic used, including:

- Vegetation and property preparation
- Structure preparation
- Preparation for intervention

4.4.3.1 Vegetation and Property Preparation

Several property owners followed published best practices regarding vegetation and landscaping preparation. Managing and clearing vegetation can limit fire spread and reduce a structure's fire exposure.

More specifically, these best practices include using fire-resistive landscaping, conducting routine brush maintenance, clearing undergrowth and brush near structures to maintain a defensible space, and hydrating vegetation.

Fire-Resistive Landscaping

There are many resources available that detail types of fire-resistive landscaping (also known as fire-smart or fire-safe landscaping) a resident can use to determine which vegetation is appropriate for their property.

In particular, CAL FIRE has produced a guide to "Fire-Smart Landscaping" that is designed to "help prevent the spread of wildfires with fire-smart landscaping practices."[227] This guide includes resources for fire-safe landscape recommendations specific to the California environment, suggested location of vegetation relative to a structure, and maintenance tips.

For example, a resident whose structures survived the Palisades Fire noted that they had specifically landscaped their property to resist the spread of fire (Figure 4.4.89). The property had well-maintained ornamental vegetation with no combustible ground cover on the perimeter of the property. The resident stated that this vegetation was routinely cleared to prevent undergrowth and limit the potential for fire spread throughout the property.

The types of vegetation used were specifically selected with fire in mind due to their fire-resistive properties and ability to survive in California's climate. There were also designated fuel breaks throughout the property to maintain space between vegetation.

The structure on this property sustained minimal damage (classified as Affected in DINS) due to fire propagating from a neighbor's combustible mulch. While fuel breaks will not be able to stop all fire spread, they are an important measure that can slow and potentially limit fire spread and allow more time for effective intervention to control the fire.

Figure 4.4.89 Fire-resistive landscaping and fuel breaks in a back yard.

Brush Clearance

Creating a defensible space around a structure is a critical pre-fire preparation action to limit fire spread from vegetation to a structure. Vegetation provides a potential ignition point for embers that land, and if nearby a structure, this provides a pathway for fire spread to the structure.

Figure 4.4.90 provides an example where vegetation directly adjacent to a structure was a source of damage to the exterior wall and windows of a structure. Refer to Section 4.4.1.1 for additional discussion of ornamental vegetation near structures.

Figure 4.4.90 Example of vegetation in Zone 0, where a burning plant directly adjacent to a structure damaged the exterior wall and windows.

Figure 4.4.91 shows an example of a residence impacted by the Eaton Fire, where vegetation was trimmed and cleared prior to the resident evacuating.

The resident stated that when they became aware of the fire threat, one of their preparation actions was to trim trees near the structure and relocate the brush away from the structure and toward the street. Doing so limited potential pathways of fire spread to the structure.

Figure 4.4.91 Example of brush that was cleared around a structure by a resident prior to the Eaton Fire.

Another benefit of conducting routine brush maintenance and clearing vegetation prior to evacuating is the impact on responders during intervention. If there is enough time, responders may trim trees and clear brush to reduce fire spread risk.

However, if there is already good brush clearance, responders have more time to conduct other structure defense operations. For example, early in the Eaton Fire, responders reported that proper brush clearance in the Kinneloa Mesa area improved structure defense operations.[1]

There are many resources to guide residents on creating and maintaining a defensible space. For example, CAL FIRE provides specific actions that should be taken around a property based on distance from a structure.[228]

Research has shown that the area closest to a structure, or Zone 0, should be clear of combustibles, which includes vegetation.[229] For example, within Zone 0, it is recommended to use hardscape, remove all dead and dying plants, and remove all branches within 10 ft of chimneys.[228]

At distances farther than five (5) feet away from a structure, it is important to maintain brush and landscaping around the property. This maintenance should be done routinely and prior to evacuating.

Hydrated Vegetation

Ensuring that vegetation on a property is routinely watered is an important action that residents can take to be prepared even before a fire occurs. There are resources available that explain how to efficiently water vegetation based on its type and surroundings (soil).[230]

Furthermore, if resources and time allow, additional vegetation hydration throughout the forecasted Red Flag weather timeframe (begins several days before the weather event), and prior to evacuation during a fire may help slow or limit fire spread throughout a property by increasing the resistance of vegetation to ignite.

This action is another method to allow time for responders to intervene before fire spreads further to additional vegetation, a structure or another property.[229]

Pre-fire vegetation hydration can be achieved by activating irrigation sprinklers for a defined time period before evacuating. Plants can also be watered manually using a hose or a watering can.

Figure 4.4.92 shows an example of an ad hoc watering system that was set up on a street by residents impacted by the Palisades Fire prior to their evacuation. Multiple sprinklers were attached to ladders and a fence to water vegetation that was on the hillside below their respective street.

These sprinklers and mounting approach were relatively easy to install in a timely fashion and were connected to spigots by each residence. In addition to the garden sprinklers on the fence line, a sprinkler was used in a similar fashion in the back yard of one of the residences.

This sprinkler was installed on a tripod near combustible fencing, a portion of which was ignited by the Palisades Fire (Figure 4.4.93).

Figure 4.4.92 A sprinkler system that was set up by residents impacted by the Palisades Fire to water vegetation on the hill across the street from structures.

Figure 4.4.93 A garden sprinkler that was set by a resident impacted by the Palisades Fire to hydrate vegetation and water the wood fence in the back yard.

Hydrating vegetation prior to evacuating during wind-driven conflagration conditions does not ensure structure survival, but it can improve vegetation resilience and reduce the likelihood of ignition.

Figure 4.4.94 shows four surviving structures and one destroyed along the street with ad-hoc sprinklers shown in Figure 4.4.93. DINS data identified the four surviving structures as either Affected or No Damage. The hillside that the sprinklers were installed over still had green vegetation after the fire despite the presence of destroyed structures below.

Figure 4.4.94 Post-fire aerial image that shows the demarcation between burned and unburned vegetation near the watering system identified in Figure 4.4.92. The red circles indicate the approximate locations where the sprinklers were placed overlooking the hillside.

Additionally, a resident who was impacted by the Eaton Fire had previously installed sprinklers throughout their property (Figure 4.4.95) that were specifically for pre-fire preparedness and fire mitigation.

The resident installed these sprinklers after learning about their property's specific vulnerabilities from fire department personnel who inspected the property prior to the Eaton Fire. The piping for these sprinklers was PVC, which is a readily available material at local hardware stores.

A garden sprinkler was attached to the head of the pipe. Note that during the Eaton Fire, some of the PVC piping suffered thermal damage and needed to be replaced. The resident stated that they planned to replace the sprinkler piping with galvanized steel, which is also a readily available material that will better survive future fire impacts.

This resident also regularly conducted routine brush clearance to limit undergrowth and worked with arborists and fire officials to determine what types of fire-resistive vegetation were best suited for planting on their specific property.

Railroad ties (an important vulnerability that was not mitigated prior to the fire) on the hillside adjacent to the property and the decking, eaves, and roofs of the structure on the property did sustain some fire damage.

However, due to the preparedness actions slowing the fire and timely intervention by responders during the fire, damage was contained to local sections and did not continue to spread throughout the property or further into the structure.

Figure 4.4.95 Sprinklers that a resident impacted by the Eaton Fire installed throughout their property specifically for pre-fire preparedness and fire mitigation.

Using fire-smart landscaping, conducting routine brush clearance, and ensuring that any vegetation on or near a property is well hydrated collectively aided in slowing and limiting fire spread to several properties in the Palisades and Eaton Fires and likely supported structure survival and limited damage Doing so is critical to allow more time for responders to effectively intervene on both the prepared property and neighboring structures.

4.4.3.2 Structure Preparation

Throughout the Palisades and Eaton Fire areas, there were several examples of protective measures taken by residents that involved preparations of their structure prior to fire arriving on their property.

These included covering structure vulnerabilities such as doors, vents, and windows; relocating outdoor combustibles away from a structure; spraying a structure with water or retardant; and closing all interior and exterior doors.

While each of these actions does not guarantee structure survival, they can aid responders during intervention, limit fire spread pathways to a structure, and slow fire spread into a structure.

Covering/Sealing Structure Vulnerabilities

Certain structure components, such as doors, vents, and windows, may be susceptible to ignition and/or failure from embers, radiation, and/or direct flame contact. Failure of these components provide a direct pathway for embers and flames to move into a structure (see Section 4.4.2).

In addition to selecting noncombustible building components during design or remodeling, there were preparation actions that residents took to protect structure vulnerabilities prior to evacuating from the Palisades and Eaton Fires.

Covering and/or sealing structure vulnerabilities adds further protection to a structure and can buy time for intervention if fire is approaching.

Figure 4.4.96 shows an example of a garage door where a resident in the Eaton Fire area sealed gaps with fire caulk.

The resident also strategically placed plastic water bottles and jugs around the structure that could be used to put out spot fires (see Section 4.4.4). Several of these bottles were placed in locations where embers are known to accumulate (e.g., corners of walls, door frames), which could provide a source of local suppression if the bottle melted from ember accumulation.

If not sealed properly, exterior doors (including garage doors) can provide a pathway for embers to move into a structure. Using a sealant, aluminum foil, tape, or other means to seal the interface between the door and exterior wall or ground may be an effective way to mitigate this specific ember intrusion vulnerability.

Figure 4.4.96 A garage door that was sealed with fire caulk at a structure in the Eaton Fire area. Jugs of water were also strategically placed in front of the garage door.

Vents (see Section 4.4.2.8) are another potential structure vulnerability that can be sealed and/or covered to prevent ember penetration and potential failure. The roof vent in Figure 4.4.97 shows an example where a resident in the Eaton Fire area sealed the vent-roof interface to mitigate the potential effects of ember accumulation.

The vent shown is also specifically designed to be ember-resistant. If ember accumulation and subsequent ignition were to occur at the interface of the vent and roof covering, fire could spread into the attic of the structure.

Figure 4.4.97 also shows an example of a ground-level foundation vent at a residence impacted by the Palisades Fire that was covered with concrete pavers.

It is unknown if this action was taken by the resident prior to evacuating or by responders during intervention. Nonetheless, placing noncombustible barriers over a vent prior to evacuating can help prevent embers from accumulating directly next to a vent and/or passing through, depending on the vent's construction.

Figure 4.4.97 Examples of a sealed roof vent (top, Eaton Fire) and a covered ground vent (bottom, Palisades Fire) as a form of structure preparedness.

Additional examples of residents using a variety of approaches to cover and/or seal foundation, exterior wall, and roof vents were seen in the Palisades Fire area (Figure 4.4.98). While residents were found to have employed commonly available items to cover vents, materials with a higher level of thermal performance are more likely to remain in place when impacted by embers.

Noncombustible materials such as ceramic tiles were also found placed on the ground in front of walls and exterior doors, likely to prevent ember accumulation directly against the door (Figure 4.4.99).

Figure 4.4.98 Vents that were covered or sealed by residents prior to or during the Palisades Fire.

Figure 4.4.99 Noncombustible material placed against the back of a structure to limit ember accumulation directly against the wall and doors prior to or during the Palisades Fire.

As discussed in Section 4.4.2.4, windows are another well-documented structure vulnerability.[208,189,209,212,192]

Heat transfer through windows can cause interior combustibles to melt, char, and potentially ignite prior to glass failure (see Section 4.3.2.4), and if the glass fails, the window opening provides a direct pathway for flames, hot gases, and/or embers to enter a structure.

On several properties, residents covered windows and glass components of doors to decrease the potential for glass failure. This covering can provide shielding that decreases the radiative and direct flame contact exposures to the glass. Additionally, covering combustible window frames can limit the potential for ember accumulation and subsequent ignition of the frames.[231,232]

Examples of window and door coverings include purpose-built shutters and ad-hoc window protections such as plywood, corrugated steel, fiber cement board, or other readily available noncombustible materials.

Figure 4.4.100 shows an example of purpose-built shutters that were installed over windows and doors on a structure impacted by the Palisades Fire.

Figure 4.4.100 Example of a purpose-built door and window covering deployed by a resident prior to the Palisades Fire.

Examples of ad-hoc window protections were also noted during ULRI's structure damage assessment. For example, a resident in the Eaton Fire area pre-cut and labeled sheets of corrugated steel to hang over windows and sliding glass doors on the first floor in preparation for an exterior fire in the community (top and middle photographs in Figure 4.4.101).

The resident affixed hangers to the panels to make them easy to rapidly install on decorative exterior window treatments. As seen in the top photograph in Figure 4.4.101, the structure adjacent to this residence was destroyed, but the ad hoc coverings reduced the fire exposure to the windows until intervention by responders occurred.

Additionally, a resident impacted by the Palisades Fire indicated that they used fiber cement board to cover the windows on their structure (bottom photograph in Figure 4.4.101). The fiber cement board was leaning next to the windows when ULRI completed the structure damage assessment.

This structure was marked as having Major damage by DINS, and there was known responder intervention. Some windows on the structure sustained damage in the fire, but the coverings likely reduced the thermal exposure to the windows, preventing complete failure.

Window and door coverings do not provide unlimited protection, and it is important to address additional structure vulnerabilities. However, covering these vulnerabilities prior to evacuation may increase the duration for which windows and doors are able to withstand exposure to radiant heat and direct flame contact, allowing more time for effective responder intervention.

Figure 4.4.101 Ad-hoc window and door protections that were placed over windows and doors by residents impacted by the Eaton and Palisades Fires prior to evacuating.

Relocated Near-Home Combustibles

Combustible materials used and stored outdoors can ignite due to embers, radiant heat, and/or direct flame contact (see Section 4.4.1).

Furniture cushions are especially susceptible to igniting due to embers that land and potentially accumulate on the cushions (see Section 4.3.2.3). If the cushions are near or directly next to a structure, ignition can damage susceptible components, particularly walls, windows, doors and eaves.

Moving outdoor combustibles away from a structure prior to evacuating is a preparation action that is referenced in “Ready, Set, Go!”.[219]

Figure 4.4.102 shows an example in the Palisades Fire perimeter where embers ignited furniture below a balcony. The structure sustained exterior wall damage and the wood fence ignited. According to a neighbor, an exterior sprinkler head activated and suppressed the fire prior to its extension into the structure.

Note that the majority of the outdoor furniture outside of this fire-damaged area was relocated away from the structure and into the pool. This relocation could include placing furniture cushions into a pool if available or moving all furniture as far away from a structure as possible.

Covering these relocated furnishings may add an additional layer of protection from ember accumulation.

Figure 4.4.102 Example of furniture igniting and being relocated further away from the structure at a residence in the Palisades.

Figure 4.4.103 shows additional examples of relocated furniture found during ULRI's structure damage assessments in the Palisades. It is unknown the time at which the furniture was relocated (either before or during the Palisades Fire).

Regardless of whether the furniture was moved as a preparation action or during intervention, these examples highlight the value that moving near-home combustibles can have on reducing fire exposure to a structure.

Relocating outdoor furnishings prior to the fire also alleviates the need for responders to do so during the fire, which can aid responders in focusing efforts on suppressing fire rather than using this time for actions that could have been done in preparation.

Figure 4.4.103 Examples of furniture that was relocated away from structures that were impacted by the Palisades Fire, such as into a pool (top) or at the edge of a property (bottom).

Application of Water or Retardant to Structure

Along with ensuring that vegetation on a property was as hydrated as possible prior to evacuation, some residents also sprayed their structure with water, foams, gels, or retardants as a means of structure preparation.

For example, a resident in the Palisades stated that they used drafting equipment prior to evacuation to wet down their structure and the surrounding property with water from their pool (Figure 4.4.104).

The structures on both sides of this property were destroyed, however, this structure had minimal damage and was marked as Affected by DINS. Importantly, there was also known responder intervention in the area, highlighting the intersection of structure preparation and responder intervention.

Figure 4.4.104 Example of pool drafting equipment that was used by a resident to wet down a structure prior to the Palisades Fire.

Placing sprinklers on a roof can also be a means of wetting down a structure prior to a fire. Figure 4.4.105 (left) shows a structure in the Eaton Fire area with exterior sprinklers that were activated before evacuation to wet the structure as a pre-fire preparedness measure.

If this type of installed system isn't present, an alternative option is placing a garden sprinkler on a tripod on a roof (Figure 4.4.105, right). It is unknown whether these sprinklers were activated prior to or during the Palisades Fire. The structure was marked as having no damage by DINS.

Figure 4.4.105 Examples of an installed roof sprinkler from a property impacted by the Eaton Fire (left) and a sprinkler set on a roof from a property impacted by the Palisades Fire (right) that could be used for wetting down a structure prior to evacuating.

Fire-retardant gel was used by some residents to prepare the exterior of their structure prior to evacuating. The top left photograph in Figure 4.4.106 shows a structure that was sprayed with a fire-retardant gel. This gel was also evident on the surrounding outdoor furniture and landscaping. (Note that there were known responder interventions to this property, and it is unknown whether this gel was applied by the resident or by responders during intervention.)

The structures surrounding this house on the block were destroyed, and the only damage to this structure was a cracked window (the structure was marked as Affected in DINS).

The top right photograph in Figure 4.4.106 shows an example where gel was applied to a vent at a residence that survived the Palisades Fire without damage on a block of homes that were all destroyed. A contractor applied retardant every two (2) years to the structure and double covered all of the vents on the structure prior to the Palisades Fire.

Additionally, all of the palm trees on the property had been cut down in the two (2) years leading up to the Palisades Fire as part of pre-fire property preparation.

The bottom photographs in Figure 4.4.106 show a structure within the Palisades Fire perimeter that had a built-in fire retardant system as a means of fire preparedness.

The construction of the structure was specifically designed with fire resistance in mind, as all exterior components were noncombustible. Exterior sprinklers were also installed on the structure. Prior to evacuating, the residents activated their installed retardant application system and sprayed the back of the structure. This structure remained undamaged, though the surrounding structures were destroyed.

Though water, retardant, and/or gel application to a structure will not ensure its survival, it may increase the time responders have available to conduct operations contributing to both structure survival and fire suppression.

Figure 4.4.106 Examples of structures that were sprayed with gel/retardant within the Palisades Fire area.

Impact of Closed Doors

As described in CAL FIRE's "Go! Evacuation Guide,"[220] prior to evacuation, residents should ensure that all doors and windows of a structure are closed.

During ULRI's structure damage assessment, one (1) resident described intentionally leaving a back door open to allow their pet that had escaped to get back into the home. This structure was ultimately destroyed, while other surrounding structures were damaged but survived.

Leaving exterior doors and windows open allows a direct pathway for embers and/or fire to spread into a structure, whereas closing them provides a barrier to fire spread.

Closing interior doors may also have an impact on slowing fire progression. A resident in the Eaton Fire area noted that prior to evacuating, they ensured all doors on the exterior and interior of the structure were closed. This structure was marked as having Minor damage in DINS, and there were responders known to be in the area of the residence.

Should fire breach a structure and become an interior fire, closed interior doors can help limit fire flow paths within the structure.

For example, if a fire were to spread from the outside of a structure into a room, a closed door to that room can, at least temporarily, act as a barrier and delay the time in which the fire will grow and develop throughout the structure.

The effectiveness of a closed door in a fire has been heavily researched for fires that start on the interior of a structure.[233,234,235] On exterior fires that move into a structure, a closed door will not necessarily extinguish the fire, however, it can slow the progression of structure involvement.

Figure 4.4.107 provides an example of the impact that a closed door had on limiting fire spread within a structure in the Eaton Fire. The structure was marked as having Major damage by DINS, and most likely survived due to responder intervention.

The closed door may have allowed additional time for responders to intervene and preserve part of the structure and contents for the residents.

Figure 4.4.107 The impact that a closed door had on limiting fire spread from one compartment to another during the Eaton Fire. The structure most likely survived due to responder intervention.

Closing all exterior and interior doors, along with the other preparation actions discussed in this section, were examples of pre-fire preparation actions that were documented in the Palisades and Eaton Fires. These actions likely contributed to structure survival and limited fire spread.

In addition to protecting the structure itself, these actions were also critical to aiding in the effectiveness of responder intervention.

4.4.3.3 Preparations for Intervention

While many of the preparation actions already discussed in Section 4.4.3 also aid in helping the effectiveness of interventions, there were some actions that residents undertook to specifically aid responders (refer to Section 4.4.4.2 for more information on responder interventions) during the Palisades and Eaton Fires.

These actions include having equipment to prepare and defend property available and ready, marking sources of additional water supplies, and securing utilities when possible.

Intervention Equipment

Residents employed several types of equipment for both property and structure preparation and intervention. Figure 4.4.108 shows examples of equipment that was identified on properties during ULRI's structure damage assessment in the Palisades Fire area.

For example, several discharged fire extinguishers were seen placed around structures. Having fire extinguishers readily available and easily accessible (e.g., staged at various locations on a property) prior to a fire is a preparation action that can aid potential intervention during a fire, specifically to mitigate small spot fires.

Figure 4.4.108 Examples of equipment left on properties within the Palisades Fire area that could be used for property and structure preparation.

Hose lines, whether a garden hose or a larger diameter hose, were stretched and connected to water supplies (Figure 4.4.109). These actions can help with both preparation and intervention. Using a hose to hydrate vegetation on a property and water down a structure prior to evacuating can help slow fire spread along the property/structure.

Additionally, leaving the hoses connected provides a means for responders to rapidly access a water supply and, in turn, shorten the time that it takes for them to intervene.

On several properties, residents set up drafting equipment by a pool, which can allow responders to use that additional water source. This means of obtaining water is critical if responders are experiencing water supply issues.

Figure 4.4.109 Designated hookups for large diameter hoses that were installed throughout a property in the Palisades Fire area.

The examples shown in Figures 4.4.108 and 4.4.109 are not the only types of equipment that can be used for preparation and defense. Other examples include garden/landscape sprinklers, additional water supplies, and respiratory protection.

One resident in the Eaton Fire area had built a separate “fire bunker” structure on their property that was constructed from noncombustible materials. The bunker included a dedicated water supply with pump, firefighting equipment and PPE, air supplies, a generator, and additional preparedness and intervention equipment (Figure 4.4.110).

All equipment was clearly labeled with instructions that could be used by responders or neighbors during intervention. Additionally, if needed, this structure could serve as a temporary place of refuge for responders and residents if fire conditions warranted.

The bottom, right image in Figure 4.4.110 shows an additional storage area for firefighting equipment, such as a fire hydrant wrench and gated wye valves. If feasible, having this type of equipment readily accessible can further expedite responder operations.

While it’s not feasible for most property owners to maintain this level of preparedness, it provides an example of the level of sophistication one can go to while preparing for a wind-driven fire event.

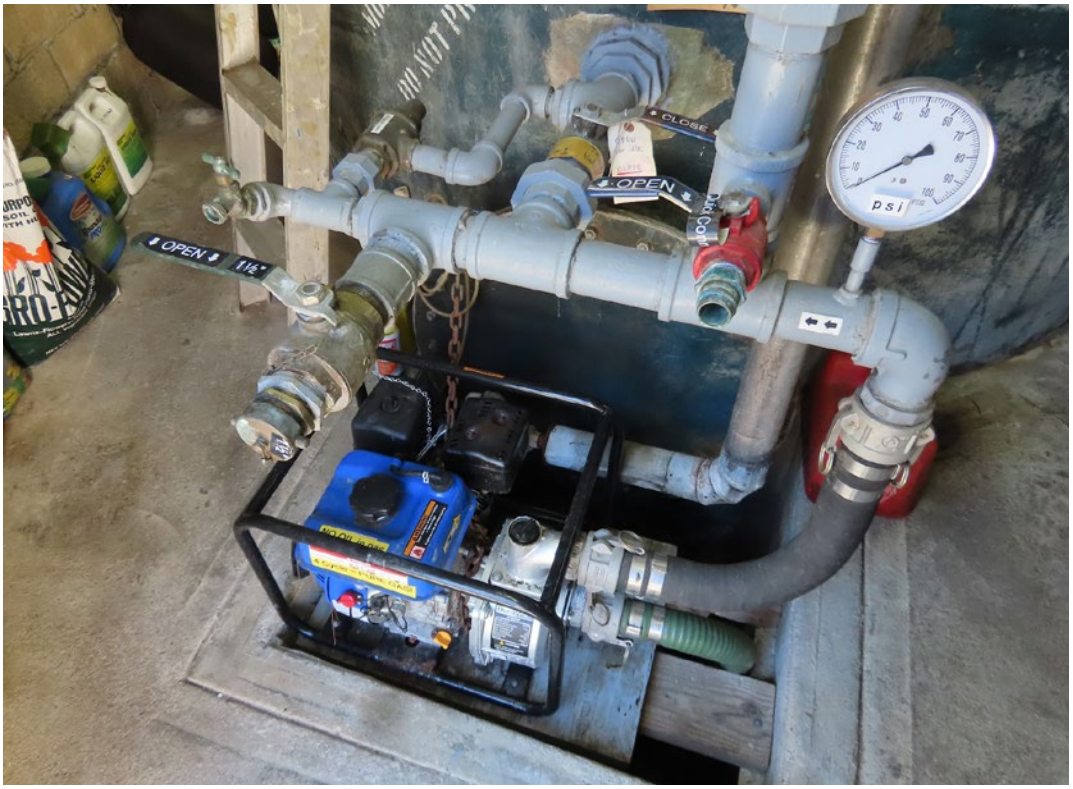


Figure 4.4.110 Equipment that was housed in a "fire bunker" and around the property at a residence in the Eaton Fire area in preparation for emergency fire response.

It is important to note that having and using this equipment does not ensure structure survival during wind-driven conflagrations, as there were destroyed structures throughout the Palisades and Eaton Fire areas that had evidence of preparation and defense equipment on the property (Figure 4.4.111).

However, being equipped with a range of supplies for structure preparation and potential pre-evacuation intervention can aid in structure survival.

Figure 4.4.111 A destroyed structure in the Palisades that had equipment to utilize water from the pool on the property.

Additional Water Supplies

In many areas throughout the Palisades and Eaton Fires, fire hydrants experienced a loss of water pressure due to the number of burning structures and damaged water distribution system components, resulting in municipal water flowing in the streets (see Section 3.4.2.3).

In these areas, residential pools were distributed throughout, but were not always utilized. Throughout ULRI's structure damage assessment, there were several instances where residents prepared their pool for use during a potential firefight and made efforts to notify responders (Figure 4.4.112).

Whether a temporary sign was put up prior to evacuating (such as using tape, as in the photograph on the left in Figure 4.4.112) or a permanent sign was installed (right photograph in Figure 4.4.112), this signage can help responders identify where additional water supplies are available.

Having this information easily accessible from the road is critical for responders, especially when there are water supply challenges.

Figure 4.4.112 Examples of pool signage at structures in the Palisades Fire perimeter..

In addition, some residents provided information for responders on how to access other water supply sources on their property. Figure 4.4.113 shows examples where residents in the Palisades and Eaton Fire areas left instructions on how to get water flowing through hoses connected near the structure (top) and how to pressurize lines from a built-in pump (bottom).

The signage in the photograph on the right was located in the “fire bunker” described in Figure 4.4.110.

Again, though this information does not directly contribute to property or structure survival, it can make interventions more rapid and potentially effective for responders, allowing them to defend more structures and properties in less time.

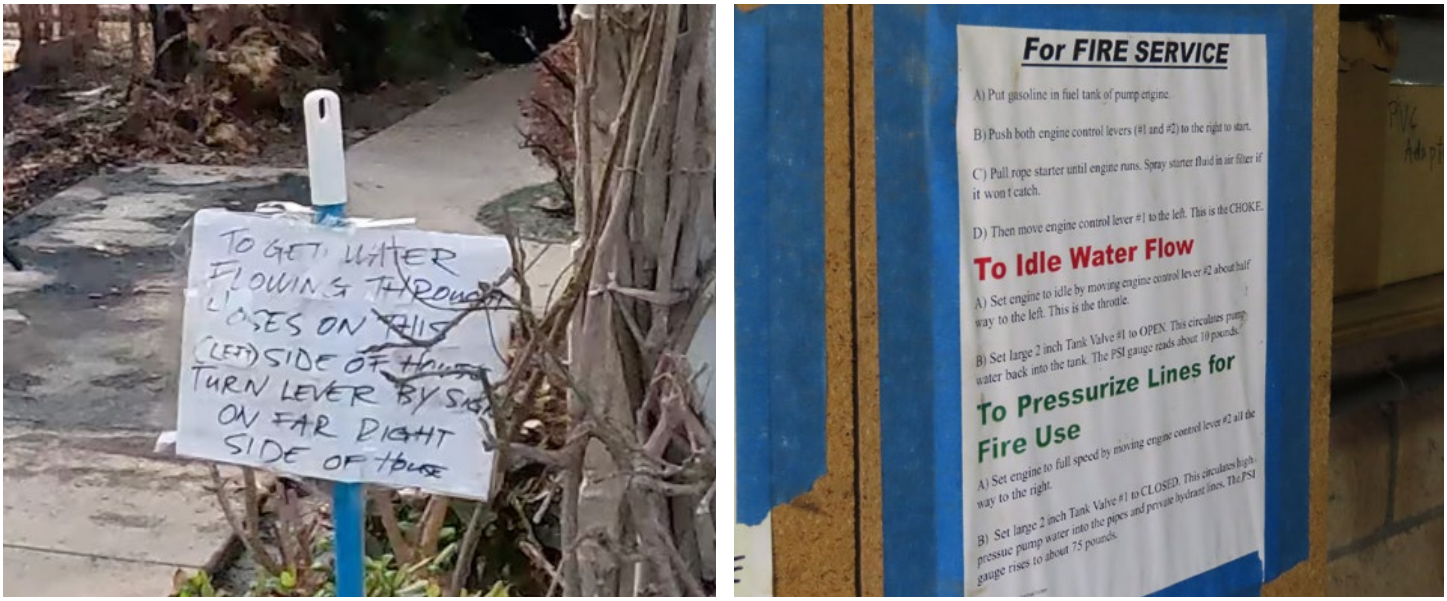


Figure 4.4.113 Examples of instructions in the Palisades and Eaton Fire perimeters left for the fire department on how to hook up to water.

Similar to fire extinguishers, strategic placement of small sources of water around a structure can be advantageous for putting out spot fires around a property.

Figure 4.4.114 shows an example where a resident in the Eaton Fire area left water bottles and jugs (Figure 4.4.96) around the structure. These bottles still had water in them during ULRI’s structure damage assessment; however, they could melt if embers piled up in these areas, with the intention that the water within would suppress a spot fire.

Figure 4.4.114 Example of water bottles left around a structure in the Eaton Fire perimeter for an additional source of water.

Rainwater collection systems also provided an effective means of maintaining a readily accessible alternative supply of water on several properties. This water could be used to hydrate vegetation and water down a structure prior to evacuation.

In addition, this water could also be used during intervention operations to extinguish small spot fires. Figure 4.4.115 provides an example of how a resident impacted by the Palisades Fire connected a hose to a rain collection system, allowing for easy access and use of any water that was in the system.

Figure 4.4.115 Example of a rain collection system at a structure in the Palisades Fire perimeter that could be used as an additional source of water for pre-fire preparedness and/or intervention.

Signage and Securing of Utilities

Several residents indicated that they turned off the gas supply to their structure prior to evacuating. Other residents noted that during the fire, if they had not yet evacuated, arriving responders instructed them to turn off the gas to the structure.

Completing this as a pre-fire preparedness action alleviates an additional step that responders may need to take during intervention.

Alternatively, some residents had signs on their structures to notify responders of the location of utility shutoffs. Figure 4.4.116 shows an example of signage that a resident in the Eaton Fire area posted to indicate the locations of both the water and gas shutoff valves to their structure.

Figure 4.4.116 Example of signage placed by a resident in the Eaton Fire perimeter that indicates where to shut off utilities to a structure, such as water and gas.

The preparation actions listed in this section are all actions that can aid in effective emergency interventions by responders.

Pre-planning, having proper equipment, indicating, and/or leaving additional water supplies, securing utilities, and noting where utility control valves are on a structure all play a positive role in decreasing the amount of time for responders to effectively fight the fire.

4.4.3.4 Community Fire Brigades

One action that some communities have undertaken to prepare for WUI fires is establishing community brigades, including through programs such as the Los Angeles Emergency Preparedness Foundation.[236]

The goal of this program is to provide continuity between residents and responders in the face of disasters such as wildfire, including during preparedness, response, and recovery. Members of brigades focus on pre-fire mitigation strategies, including prioritizing community awareness, identifying community vulnerabilities, and supporting structure assessments.[236]

All of these actions contribute to increased awareness for residents prior to a fire in order to minimize the potential for fire spread throughout a community. See Section 3.9.2.3 for more information.

4.4.4 Interventions

Fire is unique among natural hazards, such as high winds (e.g., hurricanes and tornadoes) and floods, in that interventions during the incident can potentially mitigate damage to structures.

In addition to construction and building features that can resist ignition or damage from the flames and embers (see Section 4.4.2), the hazard from burning fuels can be reduced by suppressing fire or removing or treating (i.e., use of retardants or Class A Foam type product) fuels in the fire's path.

Firefighters are trained to address these fire hazards, and in several cases, law enforcement and residents' actions contributed to the range of interventions that affected the manner and magnitude of these fires' impact on the built environment.

While many published post-fire analyses of WUI incidents have highlighted the importance of building construction elements to structure survival, relatively few have identified interventions (also referred to as defensive actions) as an important contributing factor.

However, in the Waldo Canyon[237] and Lahaina Fires,[172] emergency interventions were noted to play a key role in preventing some structures from being destroyed. Responders' and residents' accounts documented in post-fire assessments from these fires show that actions, from small to substantial, can reduce the hazard and the potential for ignition and structural damage from fire.

In the Palisades and Eaton Fires, some form of intervention was identified as a potential contributing factor in 658 of the structures assessed by ULRI. The high number of interventions in ULRI's sample of structures assessed is likely influenced by the focus on damaged (but not destroyed) structures in the vicinity of destroyed structures.

While interventions have previously been identified as an important factor in limiting damage to the built environment, in most cases, they are not the only factor. The type, intensity, and timing of fire spread mechanisms discussed in Section 4.3, along with the weather/winds impacting the area, determine the hazard posed to the built environment, including structures. Preparations addressed in Section 4.4.3 contribute to the susceptibility and defensibility of structures.

Features, including materials and design, of structures (see Section 4.4.2) are important factors in their ability to withstand wind and fire hazards, influencing which structures can be effectively defended.

4.4.4.1 Methodology

Analysis

During ULRI's assessment of impacted structures, three (3) categories of intervention were considered: responders, residents, and fixed systems. The categories describe who (or what) was the source of the intervention.

The most common types of intervention actions included applying water (with or without additives) and relocating or removing fuel. Water application can be further differentiated by where it was applied or to what.

In some cases, water was applied to structures (and vegetation) that were not yet on fire to remove heat and increase moisture in an effort to prevent ignition from heat sources.

Water was also applied directly to burning fuels or to suppress flames, thereby reducing the thermal hazard posed to adjacent (unburned) fuels. Often, a combination of these water application methods was used in attempts to control the fire and defend structures.

Data sources and limitations

The contribution of interventions to mitigating the impact of fire on the built environment was evaluated using multiple data sources as described in Section 4.2.

While best efforts were made to identify interventions that were undertaken on the structures assessed by ULRI, there is inherent uncertainty. Sources of uncertainty include the time and location of some photos/videos that lacked meta-data, as well as recollections from responders during TDs and residents during conversations.

For the purposes of this analysis, reports of interventions that were conducted, but where no scene-documented evidence was available, are considered "potential", while those reports with additional evidence are referred to as "likely." In some cases, physical evidence of interventions was present during damage assessments; in others, cleanup and recovery were underway, which may have altered or removed that evidence.

Some photos and videos captured during the fires depict interventions that are timestamped and geolocated, providing high confidence of when and where those actions occurred. It is important to note that these photos and videos are snapshots in time and do not capture the fire's previous or subsequent progression or the effectiveness of previous or subsequent interventions.

During TDs, responders recalled suppression and structure defense both in general areas and, in some cases, on specific structures. Similarly, some residents provided both firsthand and secondhand accounts of interventions during the fire's progression and after the initial impact had passed. These accounts were often provided weeks or months after the fires.

Radio communications, CAD reports, and AVL data indicated responders were working in certain areas and the potential for interventions at specific addresses, but these pieces of evidence may not be definitive in nature without additional confirmation.

DINS surveys included an optional field for the DINS specialists to identify structure defensive actions taken based on evidence noted during their inspection in the immediate aftermath of the fire (some of which may not have been present at the time of ULRI's assessment).

The DINS data collection survey tool includes an optional field titled “Structure Defense Actions Taken”. For the Palisades and Eaton Fires, this field was completed on 3,702 and 7,581 structures, respectively. Of the 880 structures assessed by both ULRI and DINS, 182 had this optional field completed, excluding those marked Unknown.

ULRI assessments and DINS records both indicated that structure defense actions were taken on 149 structures. For 33 structures, DINS records indicated interventions while ULRI assessments did not find evidence of intervention which may be attributed to cleanup activities before the ULRI assessments.

Additionally, the ULRI assessments found some evidence of interventions on 476 structures that DINS surveys did not document as having defensive actions. This difference may be attributed to the amount of time and data (photos/video taken during the incident, technical discussions, resident discussions, and AVL) available to ULRI in assessing these structures.

The ULRI damage assessment focused primarily on structures that were damaged but not destroyed, often in the vicinity of destroyed structures. Interventions may have also been a contributing factor in structures that were ultimately classified as No Damage.

For destroyed structures, interventions such as applying water may have reduced the exposure from the burning structure, limiting damage to adjacent structures.

For this report, the analysis was limited to structures that showed evidence of intervention, which may have helped limit or stop the damage from progressing to destruction. This analysis does not resolve the type and extent of the intervention(s), which are likely important contributing factors to successful structure defense.

For example, firefighter interventions using apparatus and potentially multiple water streams will deliver more water in less time than residents using garden hoses, bottles of water, or buckets from pools.

4.4.4.2 Responder Interventions

Responders, both fire and law enforcement, conducted wide-ranging, impactful interventions that lessened the destructive impact of these fires while also carrying out other critical actions, including evacuation notification and facilitation.

Firefighters used their apparatus and equipment to control fires and defend structures. Law enforcement personnel utilized fire extinguishers to suppress fires. In addition, both utilized resources available to them at the scene, such as residential garden hoses and pool water.

Responder interventions occurred over the full timescale of these incidents.[1] From initial response actions to vegetation fires through community conflagration and mop-up, responder actions contributed to incident stabilization and property conservation.

TDs provided examples of more than 600 instances of responder intervention (though many of these actions were taken on structures other than those included in ULRI’s damage assessment). These examples provide insight into the wide range of actions taken, but are only a small subset of the interventions employed to limit damage in the built environment.

Without these interventions, in addition to those from residents and fixed systems, more homes and property would have been destroyed by these fires.

Perimeter Control

Firefighting efforts to limit the widening of the fire front progression through the vegetation (i.e., perimeter control) are critical to limiting fire spread into and through the built environment.

In these fires, perimeter control attempts were inhibited by rapid wind-driven fire spread in steep topography, limited access, and the need to coordinate evacuations, forcing firefighters to transition to evacuation assistance and structure defense tactics.

During the Palisades Fire, firefighters initially attempted to control the fire's perimeter near its area of origin. This effort resulted in ground and aerial resources limiting fire spread into The Summit neighborhood along the west flank (Figure 4.4.117).

However, the fire's intensity, burning in mature dry fuel, and steep topography exceeded the safe operating conditions for ground resources (Figure 4.4.118) and would ultimately spread into steep canyons, where aircraft were unable to limit its growth on the flanks.

Figure 4.4.117 Responders defending structures along Chastain Parkway from ground (top) and air (bottom) on the morning of January 7, 2025, from the west flank of the fire.

Figure 4.4.118 Firefighting hand crew operating near the heel of the Palisades Fire.

Aircraft can provide a critical resource for perimeter control operations when appropriate conditions exist, and when hand crews and engine companies with hose lines can coordinate ground operations. Aircraft were in the air dropping water on the Palisades Fire early (Figure 4.4.119).

Figure 4.4.120 shows a retardant drop near Split Rock Fire Road and Via la Costa. However, due to the high, erratic wind conditions, the vegetation's maturity and drought-stricken state, and the lack of sufficient ground resources, effective perimeter control could not be achieved. Ultimately, aircraft were grounded just after 19:00 due to wind conditions.

The fire's flanks continued to widen, without sufficient ground or aviation resources to slow the growth, until late morning on January 8, 2025. This spread in wildland vegetation led to a wider section of the built environment being impacted by massive ember casts.

Figure 4.4.119 Super scooper dropping water in the area of Temescal Canyon around 12:30 on January 7, 2025.

Figure 4.4.120 (Left) Firefighting aircraft (airtanker) making a retardant drop along the western flank of the Palisades Fire near the area of origin. (Right) Photograph of fire retardant (pink) on the built environment.

As conditions allowed, hand crews worked to secure fire breaks created by retardant drops (Figure 4.4.121). Ultimately, perimeter control would take a more defensive posture with dozers constructing fuel breaks on ridgelines to the east.

Figure 4.4.121 Hand crews reinforcing a fire break created by a retardant drop.

Conditions for firefighters to engage in perimeter control in the Eaton Fire were entirely unfavorable early in the incident as the fire behavior limited ground resources' ability to safely and effectively conduct perimeter control operations (Figure 4.4.122).

Firefighting aircraft were unable to operate on the first day of the Eaton Fire due to high and erratic winds.

These operational limitations contributed to the Eaton Fire widening from its origin and ultimately extending into multiple adjacent drainages, where it would find alignment with the wind and push into Altadena, Pasadena, and Sierra Madre.

Figure 4.4.122 Firefighters initially engaged in perimeter control along Eaton Canyon Trailhead but were forced for retreat shortly before 19:00.

Structure Defense

As fire spread into the built environment (Figure 4.4.123), responders suppressed fires around structures.

Burning vegetation caused radiant heat and direct flame contact on structures, and embers ignited spot fires in near-home combustibles (see Section 4.4.1). Suppressing structure fires also contributed to incident stabilization by reducing the flame and ember hazards that might have ignited additional structures.

Responders utilized a range of tactics to defend structures, including fuel relocation (Figure 4.4.124, water application using hand lines (Figure 4.4.125) and master streams (Figure 4.4.126), and covering openings and other vulnerabilities (Figure 4.4.127).

Figure 4.4.123 Vegetation fire spreading towards the built environment and impacting structures (spot fire).

Figure 4.4.124 A firefighter near a burning fence that was removed in order to limit fire spread towards the structure.

Figure 4.4.125 Firefighters applying water to a burning structure with a hand line to limit exposure to the adjacent (unburned) structure.

Figure 4.4.126 Firefighters setting up for master stream (e.g., deck gun, wagon battery) operations on a burning structure with roof collapse, likely in attempt to limit flame impact and ember pro-duction on adjacent structures.

Figure 4.4.127 Ventilation opening covered by responders with materials available on site to limit the potential for ember penetration.

Applying water to burning fuels removes heat, which can reduce the intensity of burning and ultimately suppress flames. The amount and rate of water application required to control fire depend on several factors, including the type and amount of fuel burning, airflow to the burning fuel (including wind impacts), and the amount of energy being released.

Responders used a range of water-delivery techniques, including hose reels, hand lines, master streams (e.g., deck guns, wagon battery, and aerial devices), and water curtains carried on their engines as well as garden hoses and other sources available on the property being protected.

Figure 4.4.128 shows firefighters using hand lines and garden hoses (arrows) to suppress a burning structure. Responders reported reduced or near-nonexistent hydrant pressure in many locations during both fires, which, in some cases, limited their ability to use water for structure defense and perimeter control.

When water was available, strong, gusty winds impacted the reach and dispersion of their water streams, limiting the amount of water delivered to the burning materials and the accuracy of water placement.

Figure 4.4.128 Firefighters utilizing multiple hose streams, including hand lines and garden hoses, to apply water to a burning structure.

As the Palisades Fire spread along Temescal Canyon, it impacted the built environment at the interface with El Medio Avenue. Units from LAFD and the Malibu Community Brigade were operating in this area in the afternoon on January 7, 2025 (Figure 4.4.129).

Structure defense actions on these homes reduced the ember and flame exposure to adjacent and downwind homes, which may have been a contributing factor in limited damage and destruction to structures downwind.

Figure 4.4.129 Firefighters used hand lines to suppress fully involved structures to protect nearby properties in the area of El Medio Avenue and Anoka Drive on the afternoon of January 7, 2025.

In another area of the Palisades Fire, the Sunset Mesa neighborhood, responders, both firefighters and law enforcement, were actively engaged in evacuating residents and defending structures.

AVL data shows fire resources were operating in the neighborhood shortly after 12:00 on January 7, 2025. Radio traffic, technical discussions, and AVL data all indicate that responders were engaged in structure defense around the time the fire initially impacted the neighborhood along Surfview Drive.

The area was in alignment with the fire's head, creating conditions where the entire community was blanketed by embers. Firefighters positioned in the area were outnumbered by the quantity of fires igniting in the ornamental vegetation, combustible building materials, and near home combustibles.

Although firefighters experienced a measure of success defending structures, fire spread and new ignitions overwhelmed available resources, resulting in numerous spot fires and burning structures. Some reports indicate firefighters evacuated out of the community, while others defended in place.

Videos captured during the incident around 18:00 show multiple resources in the neighborhood and a directive to keep units in the area and engage when needed and where able (Figure 4.4.130).

Figure 4.4.130 Image from a video taken at 16:14 near the intersection of Wakecrest Drive and Malibu Vista Drive. Firefighters were operating in the Sunset Mesa neighborhood to defend structures and control fire while structures and near-home combustibles were burning.

When structure fires were too large to control with direct water application, firefighters often turned to water application to adjacent fuels or structures.

This tactic is intended to cool nearby fuels which can be impacted through radiant heat transfer from burning structures.

For example, Figure 4.4.131 shows firefighters using hand lines to cool structures being heated from neighboring burning homes.

Figure 4.4.131 Examples of firefighters spraying water on structures in order to cool the wall, eaves, and roof and reduce the potential for fire spread from the burning adjacent structure.

Often, multiple structure defense tactics were employed at the same time. Figure 4.4.132 shows firefighters using a hand line to control a vegetation fire spread towards the structure, having also moved combustible outdoor furniture away from the home.

In another example from the Eaton Fire, firefighters used multiple hand lines to suppress a burning structure and protect and adjacent home, which interrupted the cascade of destruction (Figure 4.4.133).

Figure 4.4.132 Firefighters defending a structure — outdoor furniture was relocated away from the structure, and a fire hose was utilized on the vegetation fire encroaching on the structure.

Figure 4.4.133 Firefighters used multiple hand lines in the early morning hours of January 8, 2025, to apply water to burning structures on Marquez Avenue. These interventions contributed to the survival of several homes in a block of otherwise destroyed structures.

Early in the Eaton Fire incident, fire spread in the neighborhood along Eaton Wash, just south of New York Drive. The fire likely spread through the vegetation and into the neighborhood from the east. Firefighters were able to defend and save several structures near the entrance to the neighborhood (Figure 4.4.134).

Figure 4.4.134 Firefighter utilizing hand lines to defend structures along Creekside Lane shortly after 22:00 on January 7, 2025.

In the Palisades Fire, several structures along a stretch of PCH were on fire simultaneously. Figure 4.4.135 shows firefighters on a deck applying water to an adjacent burning home in an attempt to reduce the intensity of radiant heat produced by the flames, while also cooling the structure they are defending to limit the potential for fire spread.

In some cases, firefighters worked to protect structures from multiple sides simultaneously, from the roadway with master streams and hand lines and from the beach with hand lines (Figure 4.4.136).

Figure 4.4.135 Firefighters defending structures along PCH from a deck over the beach.

Figure 4.4.136 Firefighters defending structures along PCH on two (2) sides, from the road with master streams (top) and from the beach with hand lines (bottom).

While responders had many notable successes defending structures, in some cases, despite their efforts, the fires ultimately destroyed the structure they worked vigorously to defend.

For example, in the Sunset Mesa neighborhood, firefighters used hand lines and master streams to defend a structure against fire spreading from the backyard (Figure 4.4.137).

However, due to alignment of extreme weather, topography, and critical fuel conditions, along with the vulnerable location of some structures to these conditions, and a myriad of other factors, fire conditions overwhelmed the suppression capabilities.

While firefighters' interventions did not ultimately prevent this structure from being destroyed, they likely contributed to the survival of adjacent homes.

Figure 4.4.137 Firefighters using hand lines and master stream to defend a home from vegetation fire on the south side. Unfortunately, this structure was destroyed, but these interventions likely contributed to limiting damage to adjacent structures.

Multiple structure defense tactics were employed on these fires, including prep and defend, anchor and hold, and fire front following[94] (see Section 3.9.2.1 for more information on firefighting strategies and tactics).

During TDs, firefighters reported that holding resources in an area after the initial fire impact was often more effective than moving those resources to locations as they became threatened by the advancing fire. This tactic resulted in the suppression of small fires that often appear after the initial fire impact.

An example of this tactic working successfully was in The Summit neighborhood, where some of the initially responding resources remained through the night. The photograph in Figure 4.4.125 was taken at 01:08, more than 12 hours after the structure defense operations began in this area.

Firefighters from across the region responded to these incidents. Figure 4.4.138 shows firefighters from Kern County working to suppress a fire burning in vegetation and possibly other near-home combustibles to limit damage to an adjacent home.

Responders patrolled the neighborhoods for weeks to monitor burned structures and limit fire spread to adjacent homes.

Figure 4.4.138 Firefighters suppressing ground fires threatening homes on the morning of January 8, 2025.

Water Additives

Some fire apparatus are equipped with appliances that can apply water with specialized additives that may enhance the effectiveness for structure protection. Water additives for firefighting, such as foams and gels, can aid in structure protection by helping to keep the energy absorbing water on vertical surfaces.[238]

However, eventually gels and foams will dehydrate, particularly in hot, dry, and windy environments, limiting their effectiveness.

During one TD, responders mentioned using a gel product as part of their interventions to defend a structure in the Palisades Highlands neighborhood (Figure 4.4.139). The areas of this structure protected by gel were undamaged.

In another example, firefighters in the Eaton Fire used foam in an attempt to control burning structures (Figure 4.4.140).

Figure 4.4.139 (Top) Firefighters using a gel product to defend structures in the Palisades Highlands neighborhood on the morning of January 8, 2025. (Bottom) Water additive residue on the same structure, more than a month after it was applied.

Figure 4.4.140 Firefighter applying foam with a hand line on a burning accessory structure.

Covering Openings and Other Vulnerabilities

When time allowed during these fires, responders utilized materials available on-scene to cover these openings to resist ember penetration.

In the Eaton Fire, in an area with destroyed structures, a trail camera captured a firefighter suppressing fire with garden hoses and covering a crawlspace vent with materials that were available (see Figure 4.4.127).

Ventilation openings, often into the attic or underfloor area, are a well-known pathway for embers to enter a structure, which can then cause ignition.[239]

Salvage and Overhaul

As the fire outpaced suppression efforts, and where hydrant water pressure was reduced beyond operational levels, some firefighters engaged in salvage operations, moving valuable items from inside structures impacted by fire to protected locations in an attempt to keep them from being destroyed (Figure 4.4.141).

Unfortunately, the structure in Figure 4.4.141 was destroyed, but interventions by responders helped save personal property.

Figure 4.4.141 Firefighter salvaging property to limit losses from fire.

As time and conditions allowed, responders conducted labor-intensive operations to suppress fires in void spaces of burning structures to limit further growth and reduce the potential for full structure involvement and additional structure-to-structure spread.

These operations often involved cutting holes in roofs (Figure 4.4.142), walls, and eaves to suppress fires that have spread into void spaces in walls and ceilings as well as attic and cocklofts. Embers and smoldering fires can remain in these spaces and ignite structures hours or even days after the fire initially impacted the area.

While these actions are resource-intensive, they likely contributed to the survival of several structures as well as aiding the survivability of those around them (Figure 4.4.143 and 4.4.144).

Figure 4.4.142 Firefighters cutting holes a roof, looking to suppress any additional or smoldering fire damage.

Figure 4.4.143 Examples of surviving structures where responders opened up exterior roofs, walls, and eaves, likely in an attempt to find and suppress concealed or smoldering fires in walls, attics and void spaces.

Figure 4.4.144 Examples of surviving structures where responders opened up interior walls and ceilings, likely in an attempt to find and suppress concealed or smoldering fires in void spaces behind the interior finish.

Firefighter interventions to defend structures continued for days after the fires started. These extended activities often involved breaking apart partially burned structures and fuels to suppress smoldering fires (Figure 4.4.145).

In multiple areas, structures were ignited or were still burning several days after the fire initially impacted the area. For example, in the Marquez Knolls neighborhood, which was first impacted in the early afternoon of January 7, 2025, firefighters responded to a structure fire around 11:00 on January 9, 2025 (Figure 4.4.146).

Figure 4.4.145 Firefighters utilizing hand lines with water additives (foam) to suppress smoldering wood members, likely pressure-treated due to ground contact.

Figure 4.4.146 Firefighters responding to a structure fire in Marquez Knolls on the morning of January 9, 2025.

Law Enforcement

Law enforcement also made important contributions to limiting the impact of the fire on the built environment. Officers and deputies' primary role was aiding in evacuation efforts, which allowed firefighters to focus on fire control and structure defense.

When time and conditions allowed, officers reported (and confirmed through BWC footage) using fire extinguishers from their vehicles and garden hoses that were available on properties to suppress spot fires.

During the Palisades Fire, in the Sunset Mesa neighborhood, LASD deputies engaged in structure defense and suppressed spot fires while conducting their primary mission of evacuating residents.

Returning after sunrise on the morning of January 8, 2025, deputies found several structures they helped defend still standing. These actions, along with those of firefighters and residents, likely contributed to the survival of numerous homes and structures.

During the Eaton Fire, LASD deputies also attempted to suppress small fires and limit damage while evacuating residents. BWC video shows a deputy speaking with residents early in the morning on January 8, 2025, in the area of Auburn Avenue in Sierra Madre who were defending structures.

The deputy used a garden hose, likely left by a resident, to cool a propane cylinder and control a burning fence. Without appropriate firefighting PPE and with the need to continue the evacuation effort, the deputy had to abandon the burning fence.

Firefighters were operating in this area at the same time, an example of multiple responders and residents whose interventions likely contributed to limit the damage to the built environment in this area.

Volunteers and Private Firefighters

During the Palisades Fire, several Community Brigade members assisted with evacuations, structure preparations in advance of the fire, and WUI operations. Lives and structures were saved due to their courageous efforts.

Brigade members reported operating in the Pacific Palisades on the afternoon of January 7, 2025, alongside firefighters.

Later in the evening, members were supporting evacuation operations in the Shadow Moon neighborhood and defending properties through the morning (Figure 4.4.147). These volunteers are trained and equipped to support WUI operations as described in Section 3.9.2.3.1 (Figure 4.4.148).

Figure 4.4.149 shows brigade members using multiple hand lines to defend a property from an adjacent burning structure and spot fires.

Wind-driven fires impacting the built environment are extremely dangerous. Conditions can change from viable to lethal in minutes with little to no advanced warning.

Professional firefighters are trained to operate in these conditions, however, even trained resources can find themselves in dangerous situations. This is important context in considering trained volunteers, private firefighters, and resident engagement during the January 2025 fires.

Figure 4.4.147 Community Brigade units conducting WUI operations in the Shadow Moon neighborhood on the morning of January 8, 2025.

Figure 4.4.148 Community Brigade members applying water on a structure as wind-blown embers are landing on and around it.

Figure 4.4.149 Images from a video taken by Community Brigade members as they defend a property with multiple hand lines.

In addition to public safety and volunteer organizations, there were reports of private (contract) firefighters defending structures on these fires. The integration of these resources with the overall incident is discussed in Section 3.9.2.3.

While private firefighters were known to be operating on the incident, their interventions and actions were not fully captured. In the Palisades Fire, one (1) resource communicated to the ICs that they were operating in the Via Bluffs neighborhood (Radcliffe Ave) around 18:00 on January 7, 2025, with multiple structures threatened and only two (2) private fire resources in the area.

Subsequent radio reports indicated that Community Brigade resources were also operating in the area and that additional structures had been impacted. During TDs, some local firefighters reported observing and interacting with private firefighters while conducting structure defense operations.

4.4.4.3 Resident Interventions

In addition to emergency responders, and sometimes alongside them, resident interventions helped limit fire damage in the built environment. Homeowners and renters alike took actions to defend their properties, and often their neighbors', against flames and embers.

From garden hoses to containers of pool water and individual bottles of drinking water to portable pumps, actions small and large affected the spread of fire.

Resident actions to defend structures and suppress fires helped limit damage to the built environment. While there were a number of instances where property was preserved, it is important to understand that life safety for both residents and responders is the top incident priority.

One of the decedents in the Eaton Fire was found with a garden hose in their hand, potentially an indication that they were attempting to defend their home when the fire overwhelmed them. In the Palisades Fire, there were several cases of fire-related injuries to residents who delayed their evacuation and attempted to defend their property.

Stay-and-defend approaches for residents during wildfires exist at the policy level in Australia. There are notable differences between Australia and the United States that are relevant factors for residents to consider when deciding to stay and defend their property, including the nature of fire risk, agency roles and responsibilities, education and shared responsibilities, and human-dimensions and decision making.[240]

Residents who stay at their property during and after a fire should understand fire behavior (smoke and embers precede flames, vegetation generally burns more quickly than structures, etc.), structure and community risks (density and combustibility of fuels, roadway limitations from delayed evacuation, areas of refuge, etc.), as well as the physical and psychological challenges of staying during a wildfire or conflagration.

This analysis identified more than 50 resident interventions that helped limit the impact of fire on the built environment in the areas where ULRI conducted damage assessments.

Residents shared firsthand accounts, as well as photos and videos, of their intervention actions on at least 38 structures. Several (18) residents reported knowledge of neighbors who were defending homes.

Based on these discussions and damage assessments, there were likely many more cases in which residents aided in the survival of structures.

Capabilities and Limitations of Resident Interventions

Residents' water application interventions were often limited to garden hoses and buckets/bottles/cups of water, except for some who had larger-diameter fire hoses and pumps prepared in advance (see Section 4.4.3.3).

The flow rates of water for these methods, typically 5 to 17 gallons per minute (gpm), are much lower than those of firefighter water applications, which range from 30 to more than 1,000 gpm.

Additionally, the reach of most residents' water delivery applications is limited, meaning residents need to be close to the fire to apply the water.

Intense radiant heat generated by larger fires, like those from burning vehicles and structures, will limit residents (particularly without protective equipment) from getting close enough to be effective. Strong, gusty winds will further limit the reach and effectiveness of garden hose streams.

As a result of these limitations, resident interventions are most often limited to addressing spot fires on the outside of structures, surface-level damage (Cosmetic or Moderate) to exterior building components, or smoldering fires on the outside of structures.

There were a few cases of residents suppressing fires that spread inside structures, but the intensity of the hazard and potential harm to residents with limited protective equipment make these interventions high risk, while relatively low water application rates limit the likelihood of eventual success.

Timeline of Resident Interventions

Residents took action to defend their properties and their neighbors' properties over the course of these incidents (Figure 4.4.150). As discussed in Section 4.4.3, some residents had prepared their properties and homes to be resilient to wildfire.

Some residents who received evacuation notifications took last-minute actions to reduce the exposure in their homes and defend against embers before evacuating to safety. When fire impact was imminent, some residents further delayed evacuation in order to continue defending their properties.

As fires and winds increased in intensity, the conditions posed a considerable risk to the health and safety of those who stayed. Some residents did not evacuate as conditions deteriorated and remained on their property to defend their homes.

On the other hand, some residents who had evacuated, later returned and worked to address spot fires and smoldering materials on their own and neighboring properties for hours and days after the initial fire impact.

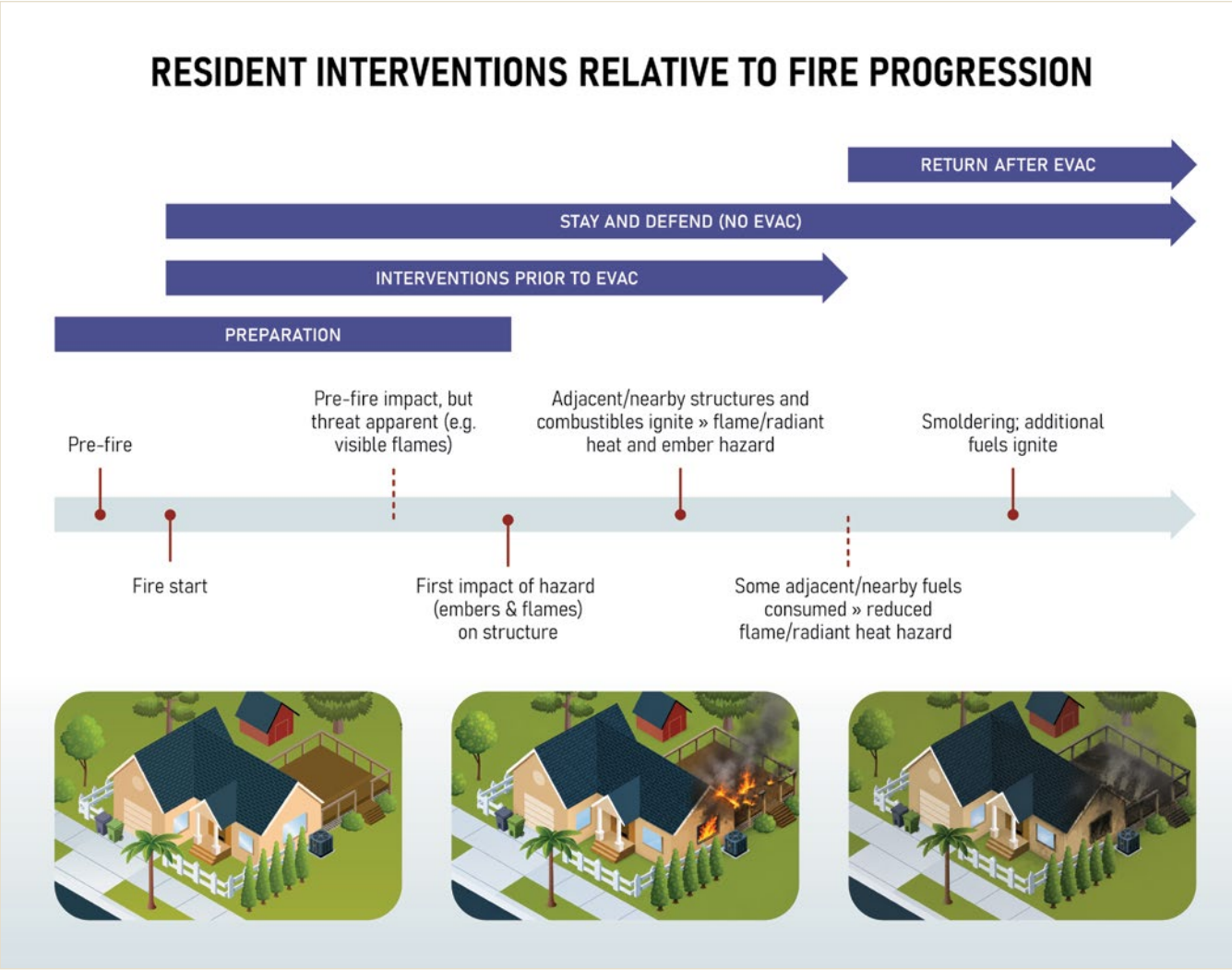


Figure 4.4.150 Timeline of resident actions and interventions to defend structures and protect their properties.

Pre-Evacuation

Several residents reported using garden hoses and irrigation systems to pre-wet vegetation and structures prior to the fires' arrival. For example, in the Palisades Fire, some residents in the Marquez Knolls neighborhood chose not to evacuate because traffic was stopped.

Instead, they prepared and eventually defended their homes. They used garden hoses to pre-wet vegetation before flames arrived and, later, while adjacent vegetation was actively burning (Figure 4.4.151).

These residents continued to defend their home and neighboring structures, which most likely aided in the survival of several of these homes while others nearby were destroyed.

Figure 4.4.151 (Left) Residents using a garden hose to pre-wet vegetation before flames arrived (approximately 12:23) and (right) when adjacent vegetation was burning (approximately 12:52), less than 30 minutes later.

Spot and Smoldering Fires

Residents were often most successful in suppressing small spot and smoldering fires. Left unchecked, these fires may continue to burn, grow, and potentially spread for hours or even days after the initial fire passes.

Figure 4.4.152 shows a resident spraying water on an outdoor HVAC unit (see Section 4.4.1.7). Residents also used readily available resources for interventions, such as buckets and pool water (Figure 4.4.153).

Figure 4.4.152 Resident applying water from a garden hose to a mini-split HVAC unit adjacent to a home.

Figure 4.4.153 Resident using buckets of water from a pool to suppress smoldering vegetation fires.

Residents were resourceful in finding ways to suppress fire and protect their structures and properties. One (1) resident in Topanga shared how they used a front-end loader to suppress fires with dirt and sand.

In another case, when the water pressure was too low to use garden hoses, residents filled a large (e.g., 55-gallon) garbage can and wheeled it to where they could use cups and buckets to apply water to the fire.

Structure Defense

In addition to spot and smoldering fires around structures, residents reported attempting to suppress both smoldering and flaming components of structures. Some of these actions and efforts were documented in news articles,[241] but likely many more engaged in efforts to suppress flames on and approaching structures.

In another example, one (1) resident used a garden hose to suppress a wood eave in a neighboring structure that ignited, likely from burning vegetation (Figure 4.4.154).

Unfortunately, this structure continued to burn and was ultimately destroyed despite interventions from both residents and firefighters.

Figure 4.4.154 Resident using a garden hose to spray water on a smoldering eave (left). Despite these interventions the structure continued to burn (right) and was destroyed.

The same resident later helped defend another neighbor's home (Figure 4.4.155) by spraying water on the roof after it had ignited, likely from adjacent vegetation. Almost three (3) hours later, they continued to use a garden hose on flames that ultimately burned through the roof.

The resident's water flow rate was unable to completely suppress the flames, but may have slowed it long enough that firefighters who later arrived in the area were able to extinguish the fire. In this case, residents were aided by elevation differences and wind direction, which allowed them to apply water from a distance.

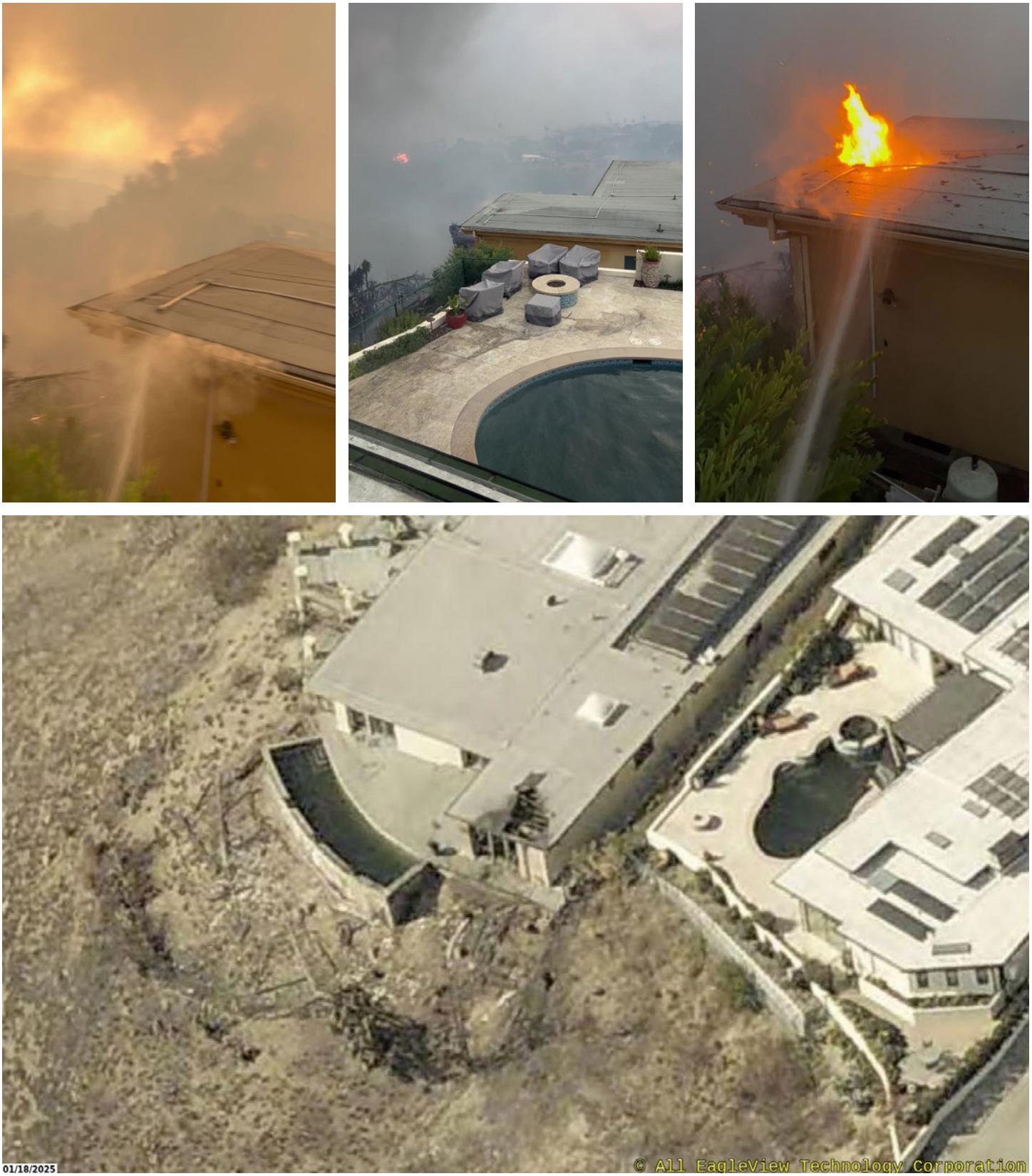


Figure 4.4.155 A series of images depicting fire damage and resident interventions to the roof. Water application to the roof was aided in this instance by the elevated location of the neighboring deck from which defensive actions were taken. Post-fire aerial image of damage.

Post-Evacuation

Several residents returned to their property as soon as they felt it was safe to do so. Even where structures remained standing, many properties were still threatened by nearby fires in vegetation, vehicles, and surrounding structures, as well as smoldering fires throughout the property.

For example, in Altadena, residents who returned on the morning of January 8, 2025, worked to suppress small fires throughout the neighborhood where water was available (Figure 4.4.156).

They used garden hoses to wet down the roof and walls of structures, as well as applied water to vegetation, fences, and other residential fuels to keep nearby fires from propagating to their property (Figure 4.4.157).

The garden hoses did not provide a high enough water flow rate to control fires in the surrounding fully involved structures, but they were able to address risks that threatened the property.

Figure 4.4.156 Residents using a garden hose to suppress a burning bush in Altadena on the morning of January 8, 2025.

Figure 4.4.157 Resident defending their home in Altadena on the morning of January 8, 2025.

Figure 4.4.158 (top picture) shows a resident using a garden hose, attempting to limit the fire spread from a burning structure to an adjacent home.

These homes were separated by only six (6) feet, and the heat from the burning structure overwhelmed the energy absorption capacity of the garden hose, while also limiting how close the resident could approach the flames.

Approximately 10 minutes later, a fire engine arrived and was able to flow water at a much higher flow rate through the combined use of a hose reel, hand line, and master stream (Figure 4.4.158, bottom image).

The burning structure was destroyed, but the combined interventions by residents and responders limited damage to adjacent homes.

Figure 4.4.158 (Top) Resident using a garden hose to limit fire spread from a burning structure at approximately 08:38 on January 8, 2025. (Bottom) Firefighters using hand lines and a master stream to apply water to the same burning structure approximately 10 minutes later.

In the Eaton Fire, homes along the foothills, including Stonehill Drive and Zane Grey Terrace, were initially impacted by embers and burning vegetation.

Reports indicate the fire reached this area late in the evening on January 7, 2025, and by 23:00 spot fires in vegetation had ignited and built environment fuels were burning (Figure 4.4.159).

Some residents reported that they delayed evacuation and defended structures using hoses and hand tools to control fire as conditions allowed.

Figure 4.4.159 Residents used garden hoses to defend homes while spot fires and structures were burning during the Eaton Fire.

Residents continued to defend structures in this area throughout the morning, including some who returned after evacuating. Figure 4.4.160 shows residents using a hand line, supplied by pool water and a portable pump, to suppress smoldering fires.

Firefighters responding from Northern California arrived by midday and helped defend these structures (Figure 4.4.161).

Figure 4.4.160 Residents used a portable pump and pool water to suppress smoldering fires on the morning of January 8, 2025.

Figure 4.4.161 Firefighters supporting resident's efforts to defend structures and suppress fire. (left) Firefighters using a hand line from their engine to suppress a burning deck and fence that residents had been attempting to control. (right) A firefighter using a thermal imaging camera (TIC) to check for fire in void spaces.

4.4.4.4 Fixed System Interventions

In addition to human interventions, installed water application systems in, on, and around several structures were found to have provided protection from the hazards of exterior fire in both the Palisades and Eaton Fires.

These systems include fire sprinkler systems installed for general fire safety (e.g., NFPA 13R/D)[242], exterior sprinkler systems specifically designed for wildfire hazards, and garden/landscape sprinkler systems.

Automatic fire sprinkler systems in typical residential homes are designed for life safety, providing residents with time to escape in the event of a fire.

For this reason, most fire sprinkler heads are located in habitable spaces inside of structures. In some of these designs in both fire perimeters, sprinklers were also located on the exterior of structures for outdoor living spaces.

For example, one (1) structure in the Palisades Highlands neighborhood was likely saved in part by an automatic fire sprinkler system. Firefighters responded on the morning of January 8, 2025, to find fire had activated a sprinkler inside the structure.

Figure 4.4.162 shows a concealed sprinkler head in a bathroom on the second floor that had discharged. This is the same structure shown in Figure 4.4.53 as an example of the susceptibility of wood window frames.

In this instance, the vulnerability of a wood window frame was mitigated by an automatic fire sprinkler system and subsequent responder interventions that limited the damage to this structure.

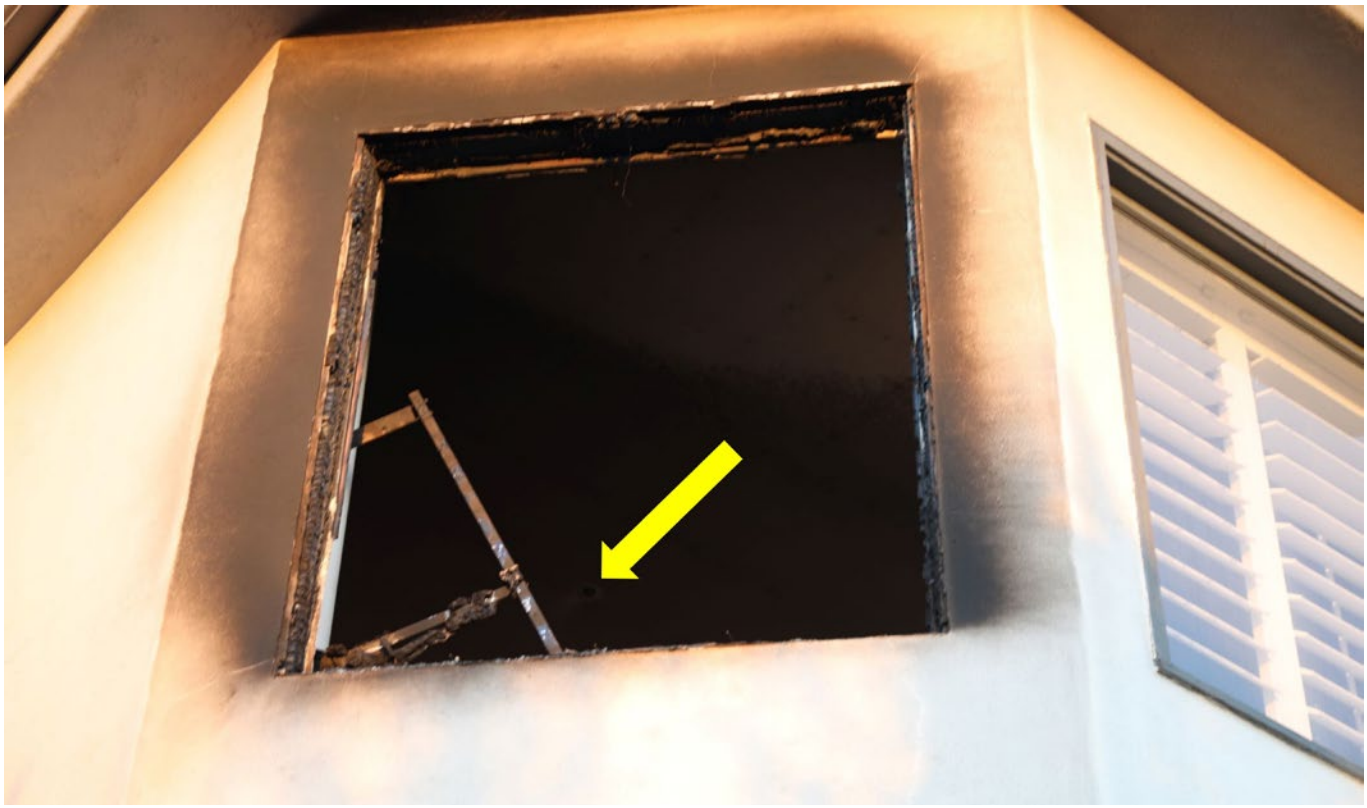


Figure 4.4.162 Photograph taken from the ground looking into the second-floor bathroom window. The yellow arrow points to a concealed automatic fire sprinkler head that activated.

Additionally, there were several examples of automatic fire sprinklers located on the outside of a structure activating when nearby combustibles ignited.

Figure 4.4.163 shows a structure on the ocean side of PCH that had an outside sprinkler activate to suppress a fire near the entryway doors and windows from a nearby garbage can fire (initiated by embers) that spread to debris gathered under this overhang. Windows in the entryway cracked from the fire exposure, but the fire sprinkler system likely helped control the fire before the structure was further damaged.

Figure 4.4.164 shows a concealed fire sprinkler activated by combustible items that ignited and spread to a wood garage door. See Section 4.4.2.6 Doors for additional information on the vulnerability of garage doors. While the garage door in the next bay over (towards the top of this image) was damaged, the activated sprinkler likely assisted in limiting the spread to this door.

Figure 4.4.163 Example of an automatic fire sprinkler system with an outside sprinkler head that activated due to thermal exposure.

One of the benefits of having a fixed system protecting a structure is that they may be able to intervene without humans being present. Because life safety is the number one priority for fire incidents, this feature can enable structure defense while reducing risk to human life.

However, many of these systems have limited flexibility and adaptability due to the lack of human presence to make decisions about when and how to intervene. Some fixed systems combine detection and suppression capabilities, which can better inform decision making for system activation. For example, some systems incorporate weather monitoring and heat sensors to automatically activate the exterior sprinklers.

One (1) home impacted by the Palisades Fire was surrounded by destroyed structures, but was undamaged itself.[243] In addition to building materials and features designed to resist exterior fire hazard, and established defensible space, this home was equipped with an exterior fire protection sprinkler system (Figure 4.4.165).

One company reported 61 systems within or near the Palisades Fire perimeter activated.

Figure 4.4.164 An outside concealed automatic fire sprinkler head dropped (blue arrow) due to a burning garage door, likely providing protection for this garage bay door.

Figure 4.4.165 Sprinkler head mounted on the roof, part of an exterior sprinkler system designed for wildfire hazards.

While sprinkler systems specifically designed for exterior fire can have a positive impact, not all structures with these systems survived the fire.

In the Palisades Fire, a home with an exterior fire protection sprinkler system was destroyed; however, this system reportedly activated, which may have reduced the hazard to an adjacent building that was damaged but not destroyed.

The ability of exterior sprinkler systems to protect structures from wildfire is challenged by the effects of wind on the dispersion and application of water to the desired location and in the intended amount.[244]

Additionally, these systems require reliable water supply and power required to operate effectively, which can be addressed with alternative water supply on the property and backup power.

4.5 Findings and Recommendations

FINDING 155: Transient near-home combustibles, such as vehicles and garbage/recycling receptacles, contributed to fire spread and structure damage and are an under-recognized contributor to fire spread to and between structures.	**RECOMMENDATION 155.1:** Recognize fire spread risk for these transient fuel sources that are often not considered as part of Zone 0. Strengthen Defensible Space Zone 0 guidance to definitively encourage relocating garbage and recycling containers as well as boats, RVs, and vehicles outside of this zone (e.g., currently this action is stated as a consideration[228]). **RECOMMENDATION 155.2:** Additional research is needed to study ignition mechanisms and potential control measures for both sources.
FINDING 156: Outdoor components of HVAC systems contributed to fire spread and structure damage and are an under-recognized component of Zone 0.	**RECOMMENDATION 156.1:** Address risk for fires in and around these units, including the likelihood of gathering windblown debris and embers near structures. When these units are located within Zone 0, the structure cladding and eaves should be noncombustible, and they should be located away from windows. **RECOMMENDATION 156.2:** Additional research is needed to study ignition mechanisms and evolving risk as the HVAC industry shifts towards mildly flammable (A2L) and highly flammable (A3) refrigerants.
FINDING 157: Vegetation on properties contributed to fire spread and structure damage.	**RECOMMENDATION 157.1:** Residents should consider how vegetation on their property could contribute to fire spread and conduct routine property maintenance to reduce the hazard of structure ignition (e.g., no vegetation in Zone 0, routine brush maintenance, hydrated vegetation, and strategically placed fire-resistive landscaping).
FINDING 158: In high-density neighborhoods, structural collapse contributed to structure-to-structure fire spread and damage by bringing burning materials closer to neighboring structures and, in some cases, causing structural damage and compromise due to impact.	**RECOMMENDATION 158.1:** Additional research is needed to understand the factors that influence collapse potential (e.g., building construction, wind, fire suppression streams) and potential mitigation strategies in high-density neighborhoods.
FINDING 159: Exterior walls were the most commonly damaged component of structures surveyed during the ULRI assessment. Due to the prevalence of noncombustible wall construction, only 13% of the structures assessed had significant wall damage. Exterior walls constructed from a combination of combustible and noncombustible materials were still susceptible to significant damage, especially when near-home combustibles were located in Zone 0.	**RECOMMENDATION 159.1:** Exterior walls should be constructed entirely of a noncombustible material for the highest level of fire resistance. **RECOMMENDATION 159.2:** In cases where it is not feasible to construct or protect a wall entirely with noncombustible material (e.g., due to cost), the bottom half (or at least 2 ft from the ground) should be constructed of or covered by a noncombustible material to protect against ember ignition, and extra attention should be given to clearing Zone 0 of any combustibles that could ignite and cause fire spread to the combustible portion of the wall above this level.
FINDING 160: Windows were the second most commonly damaged component of structures surveyed during the ULRI assessment but were the building component with the highest number of significant damage observations (an opening formed through the building envelope).	**RECOMMENDATION 160.1:** For the highest level of fire resistance, windows should be considered a key vulnerability of structures and should therefore be constructed to withstand exterior ember, radiant heat, and direct flame contact. Noncombustible framing material and double-pane tempered glass are recommended for increased resistance to ember, radiation, and flame impacts. **RECOMMENDATION 160.2:** Homeowners should be educated and informed of methods of window protection.

4.7 Findings and Recommendations (cont.)	
FINDING 161: Fascia and barge boards on eaves were vulnerable to damage from radiant heat transfer from nearby structures. If eaves are enclosed with a noncombustible soffit, but these boards are constructed of a combustible material (e.g., wood), the eaves are still susceptible to ignition.	**RECOMMENDATION 161.1:** Fascia and barge boards of eave assemblies should be constructed from or protected by a noncombustible material (e.g., metal cladding).
FINDING 162: Door and window frames can be important vulnerabilities of a structure and can impact glass pane failure during fire exposure. Combustible frames can ignite and provide a pathway for fire to spread to the interior of the structure. Frames that ignite (e.g., wood) or soften, melt, and/or deform (e.g., vinyl) during a fire exposure can lead to early failure of glass panes or openings through the window assembly, which can also result in a pathway for fire into the structure.	**RECOMMENDATION 162.1:** Door and window frames (including the jambs) should be constructed of or protected by noncombustible material to prevent ignition from fire and ember exposures.
FINDING 163: Property and structure preparation contributed to reducing the hazard from burning fuels and/or the susceptibility of structures to igniting on many properties impacted by the Palisades and Eaton Fires.	**RECOMMENDATION 163.1:** Property owners should comply with local vegetation management regulations and ignition-resistant building standards while working collaboratively with neighbors and community members to continuously reduce hazards, support preparedness efforts, and strengthen community resilience.
FINDING 164: Many structure preparation actions involved using materials that are readily available at local stores.	**RECOMMENDATION 164.1:** Residents should be encouraged to have a property and structure preparation plan so that, in the event of a fire, they can quickly protect their structure prior to evacuating. Educate the public about resources outlining steps they can take to best protect their structures.
FINDING 165: Interventions contributed to reducing hazard from burning fuels and/or susceptibility of structures to ignition, and were an important factor in mitigating structure damage in the Palisades and Eaton Fires. Any analysis of structure damage, destruction, and survival from community conflagrations must consider the impact of emergency interventions..	**RECOMMENDATION:** N/A
FINDING 166: Interventions' effectiveness depends on mechanisms of fire spread, building/construction factors, and capabilities and resources of the intervener.	**RECOMMENDATION 166.1:** Firefighters and others engaged in structure defense should be trained to assess built environment vulnerabilities along with current and anticipated fire behavior to determine where to prioritize suppression resources, and the best strategy and tactic to employ.
FINDING 167: Residents who defended their properties and communities had an impact on damage in the built environment, but it also may have been a contributing factor in residents' injuries and deaths.	**RECOMMENDATION 167.1:** It is not recommended that the system of structure defense rely upon untrained residents to intervene when structures are being impacted by fire. However, residents should be trained and encouraged to prepare their properties and harden structures in a manner that supports effective fire department response. In cases where residents are unable to evacuate, these same preparations will likely aid them if forced to stay and defend. **RECOMMENDATION 167.2:** Fire service and law enforcement agencies should consider developing training programs supporting appropriate, risk-informed volunteer engagement during conflagrations, such as expanding the Community Brigade.

8. ACRONYMS AND ABBREVIATIONS

The January 2025 Southern California fires demonstrated the growing complexity of wildfire disasters in California, and the increasing challenges associated with protecting communities exposed to wind-driven fire events. The Palisades and Eaton Fires occurred under conditions characterized by critically dry vegetation, powerful Santa Ana winds, complex topography, and extensive development within wildfire-prone areas.

While wildfire has long been a part of California's landscape, the scale and consequences of these fires illustrate how the interaction of environmental conditions, community development, infrastructure systems, preparedness efforts, and emergency response operations can combine to produce catastrophic outcomes.

A central conclusion of this report is that wildfire outcomes are not determined by any single action, decision, policy, or organization. Rather, outcomes emerge from the combined performance of an interconnected system comprised of landscapes, communities, infrastructure, emergency management programs, and response organizations.

The analysis found examples of effective prevention, preparedness, and response efforts before and during the fires. However, it also identified implementation gaps, operational challenges, and policy limitations that affected the overall performance of the system. The January 2025 fires demonstrated that strengths in one area can be diminished by weaknesses in another, while improvements across multiple components can significantly enhance community resilience.

While California has invested heavily in wildfire mitigation, preparedness, and response capabilities, many mitigation activities remain focused on individual properties, regulatory compliance, or agency-specific responsibilities.

The fires demonstrated that wildfire risk increasingly operates at the neighborhood, community, and regional scales. Embers, interconnected fuels, structure-to-structure fire spread, infrastructure dependencies, and evacuation challenges frequently extend beyond parcel boundaries and jurisdictional lines.

Future success will require greater emphasis on community-scale resilience and coordinated implementation of risk-reduction activities.

Additionally, planning and preparedness assumptions were challenged by the speed and intensity of the fires. Wind-driven community conflagrations place demands on emergency management systems that differ substantially from those associated with traditional wildland fires.

Situational awareness, incident management, interagency coordination, evacuation operations, resource accountability, and infrastructure resilience all became increasingly important as the incidents expanded. While responders successfully saved lives and protected communities under extremely difficult conditions, the fires illustrate the need for greater preparedness for rapidly evolving, large-scale wildfire events that impact both wildland and urban environments simultaneously.

The built environment also played a significant role in wildfire outcomes. Structure loss occurred through multiple ignition pathways, including ember exposure, radiant heat, direct flame contact, and structure-to-structure fire spread.

Although modern building codes and home hardening measures provided benefits in some locations, the findings suggest that individual structure resilience is most effective when combined with community-scale mitigation efforts, defensible space, infrastructure improvements, and sustained preparedness activities.

The rebuilding efforts now underway in affected communities present an opportunity to incorporate lessons learned and improve wildfire resilience for future generations.

The report's findings related to circumstances present for those who perished in the fires reinforce the importance of evacuation preparedness, public warning systems (including early warnings and orders), and support for residents with access and functional needs.

Similarly, the independent review of the January 1, 2025, Lachman Fire highlighted the importance of coordinated and communicated post-suppression procedures and documentation as well as the need for standardized containment verification, patrol, and mop-up procedures. The Lachman and Palisades Fires highlight the importance of reassessment for recently controlled wildland fires when critical fire weather is forecasted. Together, these findings demonstrate that wildfire resilience extends across the entire incident lifecycle, from prevention and preparedness to response, recovery, and post-fire operations.

Ultimately, the January 2025 fires in Southern California reinforce a lesson increasingly evident across California and other wildfire-prone regions: no single intervention can eliminate wildfire risk.

Future resilience depends on strengthening the entire wildfire system through coordinated action that integrates landscape management, community preparedness, resilient infrastructure, effective emergency management, informed decision-making, and adaptive response capabilities.

The lessons identified throughout this report provide an opportunity for California to continue improving its wildfire policies, programs, and operational systems while helping communities better prepare for the increasingly complex wildfire environments of the future.

6.1 Lachman Fire (January 1, 2025) Analysis

The Los Angeles Fire Department (LAFD) Arson Unit and the Bureau of Alcohol, Tobacco, Firearms and Explosives determined that the Palisades Fire, which began on January 7, 2025, originated from a holdover fire associated with the Lachman Fire that ignited on January 1, 2025.

On February 3, 2026, the California Governor's Office approved the addition of the Lachman Incident within the *Southern California Fires Analysis Report*. This required UL Research Institutes (ULRI) to conduct an independent review of all activities associated with the incident to create a timeline and complete an analysis of suppression efforts.

ULRI's review is not an origin-and-cause investigation. Instead, it examines the operational actions, procedures, communications, and conditions involved in the fire's suppression, and the activities that occurred after the fire was controlled and before the Palisades Fire was first reported.

6.1.1 Analysis of Background

Information on the Pacific Palisades area and regional conditions within Southern California in January 2025 is provided in the Phase One report[1]. That report includes a broader description of the region, as well as the environmental, geographic, and operational conditions that shaped the January 2025 fire environment.

The Phase One report should also be referenced for information on regional climate and weather patterns, vegetation and fuel conditions, land use, infrastructure, and the emergency response organizations operating in Southern California at the time.

ULRI developed data requests specifically for the Lachman Fire to support both the timeline and operational analysis. These requests were designed to identify:

- What occurred during response and suppression;
- Actions taken after forward progress was stopped;
- How the incident was managed and documented; and
- How resources were released from the fire area.

Data provided by LAFD, the Los Angeles County Fire Department (LACoFD), and California State Parks (referred to as State Parks) includes Computer Aided Dispatch (CAD) reports, dispatch records, response data, unit history, radio transmissions, incident documentation, maps, photographs, videos, policies and procedures, mop-up and patrol documentation, and agency records related to resource deployment and command actions. ULRI also referenced deposition narratives.

Some information was also taken from publicly available sources like websites and media stories. See Appendix Section 6.10 for requested data, production dates, and notes.

ULRI identified key individuals for Technical Discussions (TDs) after reviewing the produced data. These individuals were selected based on their assigned roles, command responsibilities, field assignments, involvement in suppression or post-suppression operations, participation in mop-up or patrol, knowledge of area access and terrain, and/or their ability to provide context on agency procedures and interagency coordination.

The purpose of the TD requests was to better understand:

- Personnel actions
- Strategic and tactical decision-making
- Assessment of conditions
- Level of compliance with policies and procedures
- How decisions were made to release resources

These TDs were an important part of ULRI's analysis, providing the opportunity for record clarification, timeline validation, and a better understanding of operational intent.

The Lachman Fire analysis followed the same methodology used for the Palisades and Eaton Fires. However, the analysis was limited, as LAFD personnel assigned to the Lachman Fire were unavailable for TDs during ULRI's scheduled timeframe. One (1) retired LAFD command officer did participate in a TD and was able to provide important context.

As such, references to LAFD actions are based on the data provided and publicly available sources. While deposition narratives provided important information, they did not allow the ULRI team to ask follow-up questions or conduct detailed operational TDs that are supportive of this type of review.

ULRI did conduct TDs with LACoFD and State Parks personnel. These discussions provided context on the overall operations, regional fire environment, access, terrain, vegetation, motorways, interagency coordination, agency responsibilities, and area conditions.

6.1.2 State Parks Area Description and Responsibility

State Parks is the lead land management agency for Topanga State Park. The park's 11,525 acres make it the largest State Park in the Santa Monica Mountains. The park is located largely within the City of Los Angeles jurisdiction, with portions in the unincorporated area of Los Angeles County (Figure 6.1.1).

A large portion of the park's boundary is contiguous with, or in close proximity to, the wildland-urban interface (WUI) with various building densities. Much of the park consists of steep, rugged terrain with heavy chaparral and coastal sage scrub fuels.

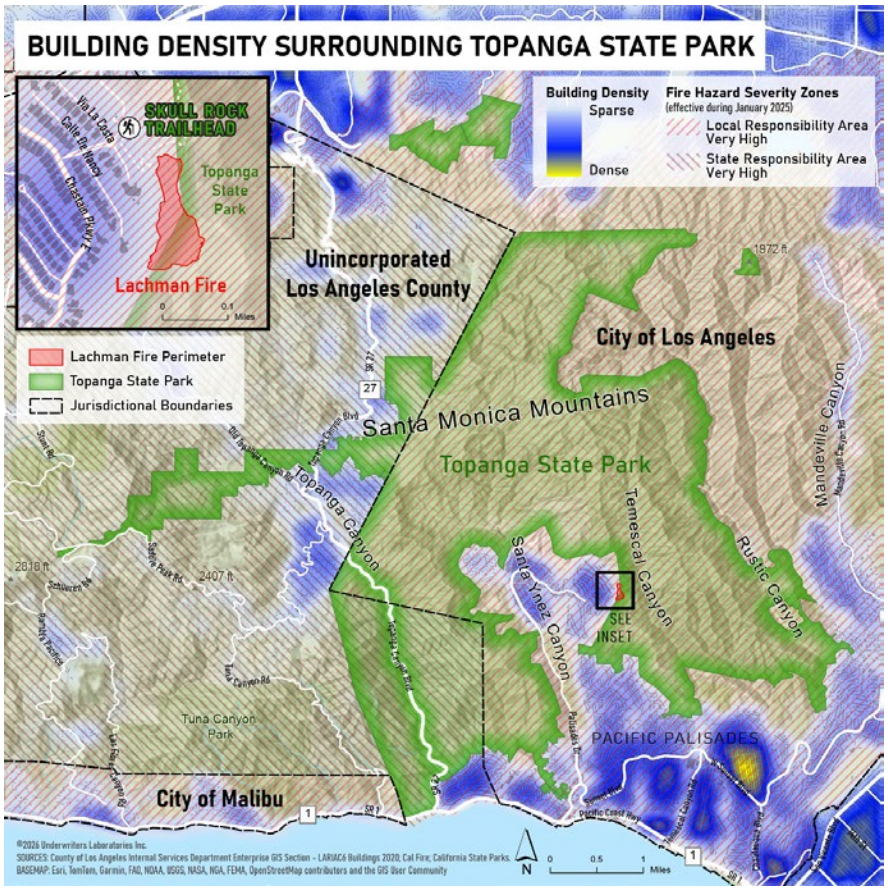


Figure 6.1.1 Map illustrating the Lachman Fire perimeter and its interface with the City of Los Angeles and Topanga State Park, including building density in the vicinity.

State Parks is focused on law enforcement, resource protection, and visitor protection. It typically operates with a small regional staff. Some, but not all, State Parks staff have limited wildfire training to safely conduct evacuations and to serve as “resource advisors” with fire agencies to achieve resource protection goals during pre-fire work and fire response.

State Parks does not include wildfire suppression as part of its mission and instead relies on local, state, and federal cooperating agencies for fire management, including contractual arrangements with LAFD, LACoFD, CAL FIRE, and United States Department of Agriculture Forest Service (USFS).

A key part of its mission is to balance policies that can have competing priorities, such as the effective management of vegetation and wildfire response with the need to preserve environmental and cultural resources.

The draft of the Topanga State Park Wildfire Management Plan (WMP)[245] does acknowledge that life safety is the primary incident priority.

6.1.3 Weather Preceding the Lachman Fire

In the days leading up to January 1, 2025, Southern California experienced a prolonged period of dry, windy conditions, with multiple Santa Ana wind events throughout December 2024. These conditions prompted three (3) Red Flag Warnings and one (1) Particularly Dangerous Situation (PDS) Red Flag Warning during the period just prior to the start of the Lachman Fire in the early morning hours of January 1, 2025.

See Section 3.3 for more information on the weather conditions prior to January 1, 2025.

A Red Flag Warning that was issued on December 30, 2024, for Los Angeles County expired at 09:20 on December 31, 2024. Gusty Santa Ana winds were forecasted to continue through Wednesday, January 1, 2025, with the forecast emphasizing that critical fire weather conditions would persist through Thursday, January 2, 2025.

The forecast highlighted extremely dry air, locally breezy conditions, and critically dry vegetation due to the lack of meaningful rainfall during the fall and winter season, leaving fuels highly receptive to ignition.[246]

Weather data in Table 6.1.1, was taken from the surrounding weather stations (Figure 6.1.2). The weather station nearest the Lachman Fire area was Monte Alto, a personal weather station (elevation 1,216 ft) located just southwest of the burn perimeter. Monte Alto recorded mostly light winds, 1-3 mph from variable directions, with 97% relative humidity.

Although all the weather stations recorded relatively light winds throughout the early morning of January 1, 2025, relative humidity readings were variable, ranging from close to 100% to as low as 48%, as recorded by the Dix Canyon Southern California Edison (SCE) weather station.

See Table 6.1.1 for a more detailed listing of weather data from surrounding stations.

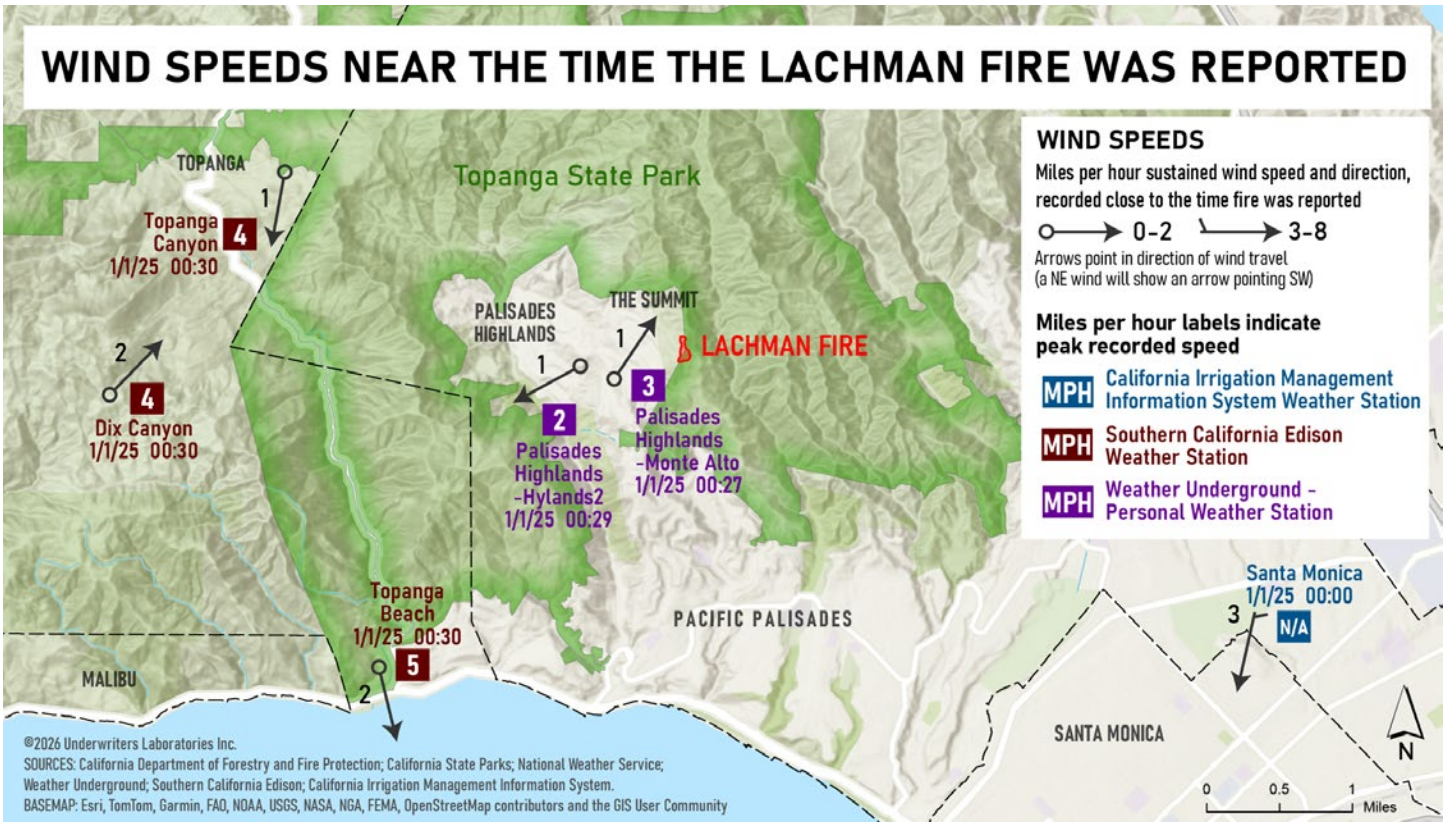


Figure 6.1.2 Weather observations at 00:00 on January 1, 2025, in the area of the Lachman Fire.

Table 6.1.1 Weather observations at the approximate time of fire report.

Station	Wind Speed	Wind Direction	Temperature (°F)	Relative Humidity
Palisades Highlands-Monte Alto	1	SSW	45	97
Palisades Highlands-Hylands2	1	ENE	42	98
Topanga Beach	2	NNW	47	75
Topanga Canyon	1	NNW	52	55
Dix Canyon	2	SW	51	48
Santa Monica	3	NNE	50	94

The Lachman Fire occurred near an area that includes local, state, and federal lands, and where multiple response and jurisdictional boundaries intersect, including LAFD, LACoFD, and Topanga State Park, as shown in Figure 6.1.3.

However, the fire perimeter was located in the LAFD area of response and was outside the Initial Action Zone (IAZ) — a pre-designated area where automatic dispatch agreements and resource assignments are intended to support a coordinated initial attack across jurisdictional boundaries. As such, only LAFD was dispatched.

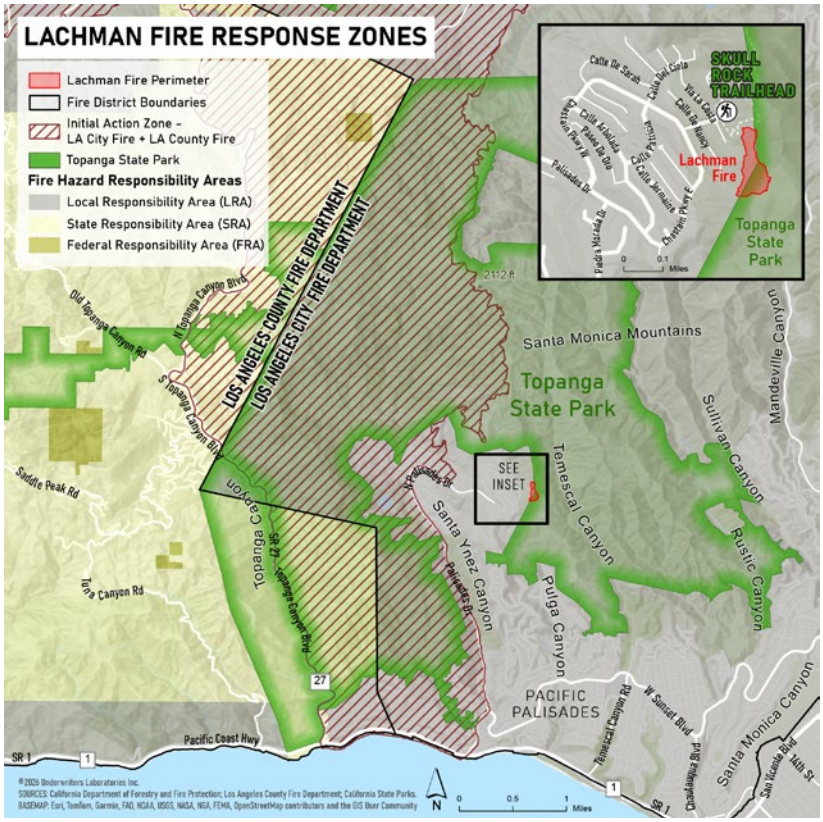


Figure 6.1.3 Map of jurisdictional boundaries between LFD and LAC, along with the IAZ in the area of the Lachman Fire.

6.1.4 Lachman Fire Timeline Narrative — January 1, 2025

To ensure clarity, as well as consistency with Appendix B-1 of the California Agency Designators by Agency in FIRESCOPE Field Operations Guide 2022 edition, three (3) letter identifiers (highlighted below) will be used in operational contexts.

- Los Angeles County Fire Department (LACoFD = LAC)
- Los Angeles Fire Department (LAFD = LFD)
- CAL FIRE (CDF)
- Ventura County Fire Department (VNC)
- Orange County Fire Authority (ORC)
- Pasadena Fire Department (PFD = PAS)

On January 1, 2025, at 00:16, Metropolitan Fire Communications (LA Metro) received a report of a brush fire at 16** Via Las Palmas with a cross street of Via La Costa in the hills near the Palisades Highlands neighborhood of Pacific Palisades.

Note: *The location provided in CAD gives an address of 16** Via Las Palmas with a cross street of Via La Costa. However, this address does not exist. The cross streets of Via Las Palmas and Via La Costa are closest to the Lachman Fire.*

The fire was burning in heavy brush northeast of the reported address, in an area generally bordered by 166** Via La Costa, Split Rock Fire Road, and the Temescal Ridge Trail.

At 00:18, LA Metro dispatched LFD resources to the incident, including Engine (E) 23, Brush Patrol (BP) 23, Rescue Ambulance (RA) 23, E69, Truck (T) 69, E269, RA69, E19, E63, T63, E263, E37, E90, T90, E290, one (1) Emergency Medical Services Captain (EM), and two (2) Battalion Chiefs (BCs). LFD Water Tenders (WT) 77 and 88 also responded.

The initial dispatch communications plan included Los Angeles City 800 MHz Dispatch Channel 7, Channel 5, staging on TAC 1, and tactical operations on TAC 12 and TAC 13. The incident was later identified as the Lachman Fire.

Previously, at 00:21 hours, LFD Air Operations reported that aircraft were unable to respond due to weather conditions. Weather data suggests localized variations in moisture conditions across the Los Angeles area, which may have resulted in patchy fog and reduced visibility that affected aircraft operations.

The Santa Ynez Reservoir was identified as the ground-fill helispot. LA Metro reported that the Santa Monica Mountains Conservancy (SMMC) had no personnel available to respond.

SMMC is a regional conservation agency that is funded by the state. It focuses on open space, habitat protection, and wildlife corridors in Los Angeles and Ventura counties. Day-to-day patrol and property management are generally handled by partner agencies, including the Mountains Recreation and Conservation Authority (MRCA). MRCA employs full-time, paid-call, and volunteer wildland firefighters.

For clarification, while State Parks is responsible for operating, maintaining, and managing public access across California's state park system, SMMC is primarily a regional land preservation agency.

At approximately 00:32, an LFD BC assumed the role of Incident Commander (IC) and announced that the Incident Command Post (ICP) would be established at Fire Station (FS) 23. The IC then designated the staging location at Sunset Boulevard and the Pacific Coast Highway (PCH) and assigned an EM as the STAM.

By 00:35, the IC requested assistance from LAC, and at approximately 00:37, the Lachman Fire Incident Command was established.

TAC 12 radio traffic indicated that E23 reported gaining access via the Lachman access road at 00:36.

At 00:41, E69 provided the initial radio report, describing the fire as approximately three (3) to four (4) acres in heavy brush that was running uphill toward approximately six (6) homes.

At approximately 00:43, Los Angeles Police Department (LAPD) West Bureau, West Los Angeles Division, and the Los Angeles Department of Transportation (LADOT) were re-quested for traffic control. LAC Call History, the Fire Command and Control Facility (LA FCCF) dispatched one (1) LAC BC, three (3) LAC superintendents, and three (3) LAC camp crews to the incident.

At approximately 01:00, State Parks contacted an off-duty park ranger and requested a response to the incident.

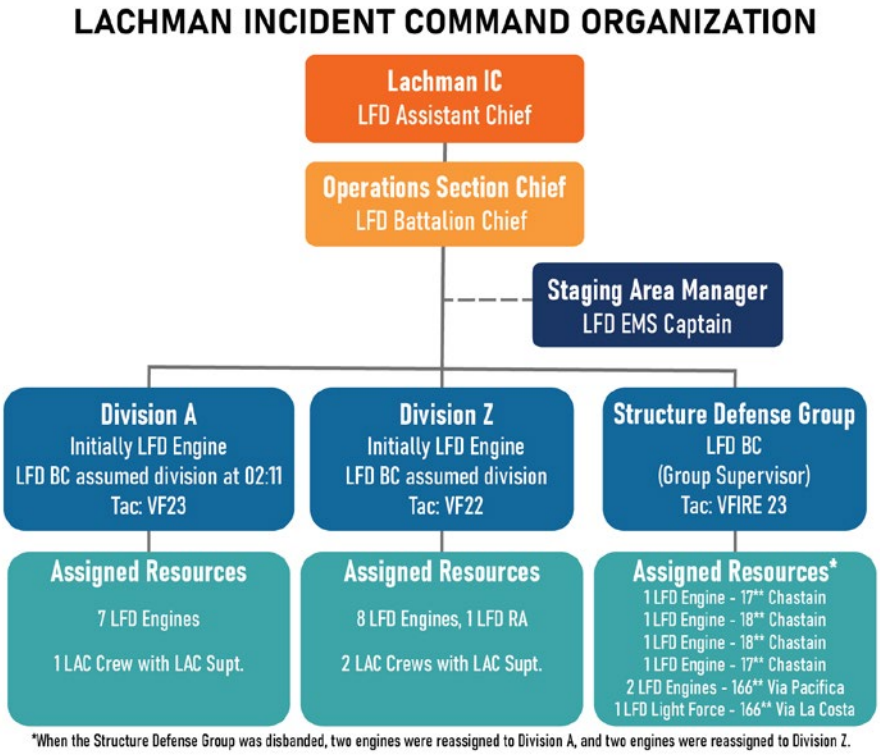
By 01:09, an update to LA Metro described the fire as "4 to 5 acres with ember cast," with 15 mph winds, heavy brush, and several homes threatened.

At 01:22, after LAC resources were added to the incident, a VHF communications plan was assigned. The plan included:

- LAC V1 command channel
- VFIRE 22 primary tactical channel
- VFIRE 23 secondary tactical channel
- LFD air-to-ground
- Victor 119.975 for air-to-air communications

The on-scene switch to the VHF communications plan occurred by 01:35. When the LAC BC arrived on scene, the IC requested air support from the county. LAC Helicopter (Copter) 22 was en route to the incident at 01:23.

By 01:25, the IC updated LA Metro that the fire was approximately eight (8) to nine (9) acres. An LFD Assistant Chief (AC) arrived at the ICP at 01:38 and assumed the role of IC. They designated the LFD BC as the Operations Section Chief (OSC). This updated command organization and map is shown in Figure 6.1.4.



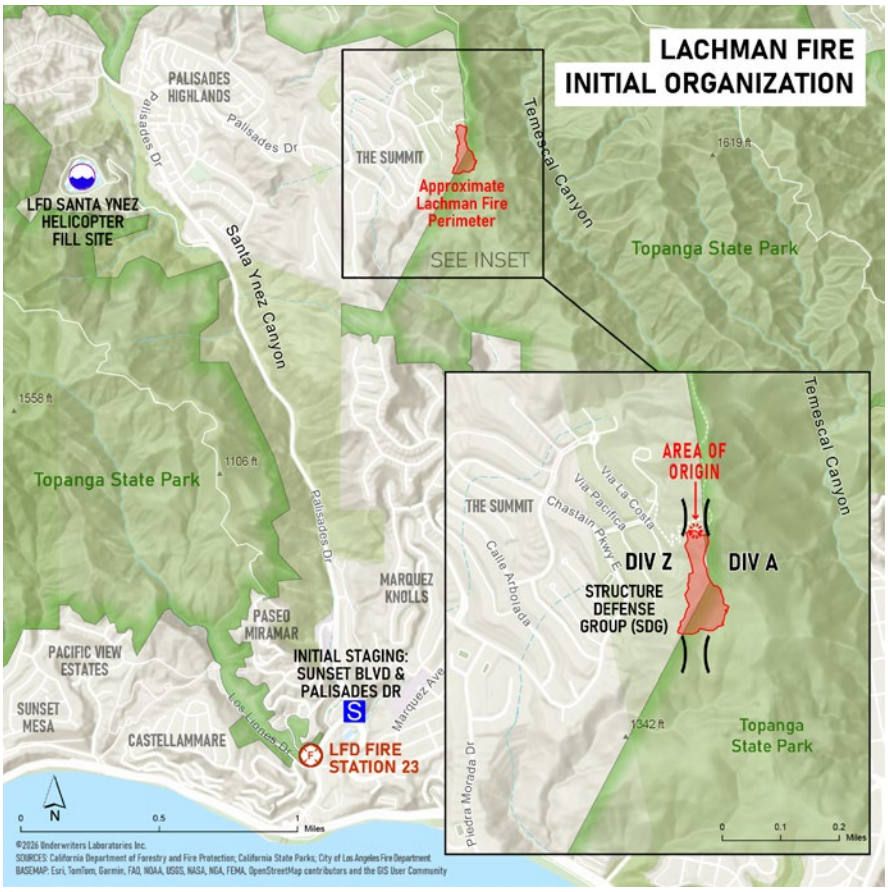


Figure 6.1.4 Lachman incident command structure and initial organization.

The OSC established two (2) divisions for perimeter control, with one (1) on each flank of the fire: Division A and Division Z. Each division had a Division/ Group Supervisor (DIVS), multiple engine companies conducting progressive hose lays, and LAC camp crews constructing control lines.

Three (3) LAC camp crews were assigned to the Lachman Fire. Normally, four (4) LAC crews would be assigned to an incident of this type, however, due to overnight staffing of only five (5) total LAC crews, only three (3) were allocated to the incident. The two (2) remaining available crews later responded to another fire near Pyramid Lake.

By 01:44, an additional request was made for LFD E5 to respond to the Santa Ynez Helispot. LA Metro notified the IC that LFD Copters Fire 2, Fire 3, and Fire 4 were en route to the Lachman Fire from Van Nuys Airport. Aircraft response was likely possible due to improving weather conditions.

At 01:46, LA Metro provided notification to the IC that State Parks would be sending a representative.

Sometime after the assignment of the OSC, the State Park's ranger met with the LFD OSC and provided a standard binder that identifies avoidance areas found throughout the entire park that fire personnel should, if possible, avoid or protect during suppression and mop-up operations, including sensitive cultural, historical, archaeological, environmental, and natural resource areas. The LFD OSC did not review the binder.

Figure 6.1.5 shows a photograph of the fire taken at 01:52 on January 1, 2025, from Tuna Canyon looking east.

At 02:06, the OSC asked the structure defense group (SDG) for an update on evacuation status. The SDG supervisor reported that residents were sheltering in place.

Steady progress was made toward controlling the fire using LAC and LFD aircraft water drops, LAC hand crew line construction, and LFD engine company hose lines around the fire perimeter.

At 03:01, Helicopter Command (HLCO) provided an update to the OSC, stating that the fire was "looking real good" and that he wanted to release LAC Copter 22.

At 03:02, HLCO reported, "We've got the bulk of the fire knocked down. I would say forward progress is stopped, but we're still working on getting hand lines all the way around it."

At 03:22, DIVS A reported, "We are getting hose plumbed along the block tied in with the crews working. We do not have any more embercast that structure defense was referencing earlier, and if we're looking to get 100% mop-up with a complete line plumbed around the fire, we're probably going to need more engines out of the structure defense group."

At 03:53, DIVS Z notified DIVS A, "Looking across the bowl here, it looks like you have a spot outside of your line. Are you aware of it? I've made face to face with LAC superintendent **. He's saying that the crews cut a line around it, but we still got to plumb it."

At 04:03, HLCO contacted DIVS Z and reported, "All right, the camp crew that you have that's working in the Zulu flank that's almost out towards the head, there's a small spot fire that's mostly knocked out. We're going to come in on it, but it's just outside of your line at the head, at the Zulu flank, for your situational awareness. Make your guys clean it up."

Figure 6.1.5 Photograph taken at 01:52 showing an early view of the Lachman Fire from Tuna Canyon, looking east.

At approximately 04:06, HLCO updated the OSC that crews had mostly surrounded the fire, except for a small portion at the head and one (1) spot on Division A. Aircraft would make several additional drops in the area of the spot fire.

By approximately 04:13, HLCO reported that conditions were “looking real good” and confirmed that all aircraft could be released and placed available.

At approximately 04:29, the OSC began releasing engine companies from other areas of the city, but retained Battalion 9 resources.

At about the same time, DIVS A reported to the OSC that a hose line was around the perimeter of the fire and that the divisions were close to tying in with one another. The SDG was disbanded.

By approximately 04:49, DIVS Z reported to the OSC that additional companies would be needed. The request was later clarified as a need for additional hose packs rather than additional personnel.

Around 05:49, DIVS Z reported that Division Z had tied in with Division A and that crews were working toward achieving 100% mop-up on the western flank (Division Z).

At approximately 06:00, LFD resources on scene began planning for relief of assigned personnel.

At approximately 06:07, Superintendent ** updated the OSC that hose line was around the fire, but LAC crews still needed to complete line construction. The estimated time to complete that work was one (1) to 1.5 hours.

At approximately 06:45, two (2) LAC camp crews were released by the OSC.

The State Parks ranger remained near the ICP until approximately 07:00, then traveled to the fire area to assess conditions. Numerous firefighters were actively suppressing the fire, and multiple smoke plumes were visible within the burned areas. The ranger did not engage with personnel on the fireline and departed to begin regular duties.

At approximately 07:19, the LAC crew coordinator at the ICP contacted LA FCCF and reported that the remaining hand crew had been released. The VHF communications plan was released, and communications reverted back to LFD 800MHz TAC 12.

The documented plan for the remainder of the day was to continue working the fire area and hold E69 and E37 until 12:00. E94 and E39 were planned to replace E69 and E37 around noon.

6.1.5 Mop-Up Procedures, Incident Closeout, and Follow-Up

Mop-Up Operations — January 1, 2025

As mop-up operations continued at the fire, the OSC and assigned resources developed a plan to relieve crews at the incident.

LFD shift change occurs at 07:00. The incoming LFD BC, who was assigned to relieve the OSC, arrived at FS37 at approximately 06:00 to prepare for the shift.

After being notified by station personnel that a brush fire had occurred earlier that morning in Pacific Palisades, the BC gathered his equipment and drove a utility pick-up truck to the Lachman ICP at LFD FS23.

Upon arrival at the ICP, the incoming OSC received a briefing from the outgoing OSC on the incident status and current conditions. The briefing included:

- Control lines and hose lines were in place around the fire perimeter on both Division A and Division Z.
- Fire companies remained assigned to Division A and Division Z, with additional hose lines extended through the interior of the fire area in Division M (geographic location of the fire area not on the flanks).
- Mop-up was continuing, and the fire area looked “really good.”
- Crews had “done a really good job putting this fire out.”

The incoming OSC later stated that the outgoing OSC did not mention the presence of a State Parks representative at the ICP, and the incoming OSC did not observe any State Parks personnel at the ICP.

The incoming OSC and Emergency Incident Technician (EIT- chief driver) walked the entire perimeter of the fire area, from Division A and Division Z. While in Division A, an LFD captain reported that crews had identified a couple of hot spots and were continuing mop-up. The OSC directed the captain that the expectation was to “take down any hot spots to mineral soil.”

For this incident, 100% mop-up meant that all hot spots within the entire fire area were expected to be extinguished. On larger fires, or fires with difficult terrain or other safety concerns, mop-up may be limited to a defined distance from the control line, commonly 100 to 300 ft. The OSC stated he later met with a captain who was working in Division Z and issued the 100% mop-up expectations.

As the OSC left the fire area, command was passed to a Light Force (LF) Captain so the OSC could address incident logistics.

The LF Captain met with a State Parks representative several times and had multiple conversations at 10:30 and again between 14:00 and 15:00. They walked together and discussed the fire conditions, the work completed by crews, and the trail that had been used as a control feature.

The State Parks representative was directed by a supervisor to determine whether sensitive resources had been damaged and whether suppression repair actions were needed. The representative reported that no historical or archaeological sites were located within the fire area.

The representative did identify a hose line lying on a constructed line down to mineral soil that extended through unburned vegetation. The line had been constructed by LAC hand crews to access the fire’s flank.

State Parks asked an LFD officer whether the beginning of that access route could be covered so members of the public would not inadvertently use the fire access path as a new trail. Crews covered the first 15 to 20 ft of the access route, all within green unburned vegetation that had been cut during the initial attack.

The representative also requested the hose be removed when crews were finished, noting that hose had been left in the area for approximately one (1) year after a previous fire.

An LFD officer reported walking the fire perimeter four (4) times with different personnel at approximately 07:30, 09:30, 12:30, and 16:00 before departing the incident.

Hose Removal — January 2, 2025

The LFD oncoming shift on January 2, 2025, included the BC and units that were assigned to the initial Lachman Fire response on January 1, 2025. The BC directed the EIT to assign the battalion’s engine companies to retrieve the hose that had remained in place on the Lachman Fire since the early morning of January 1, 2025. E19, E37, E69, and RA23 were assigned to remove the hose.

A captain stated that he told the EIT that, in his opinion, it was not a good idea to remove the hose at that time. The captain believed it would be easier to leave the hose in place on the hill in case additional mop-up was needed. He also stated that he later had the same conversation with the BC about leaving the hose on the hill.

The captain stated that he assumed the BC would walk the burn area and evaluate whether it was prudent to leave the hose in place for an additional period.

While removing the hose, which did not have water in it at the time, the captain observed a small wisp of smoke and returned to the engine to retrieve a backpack water pump. He later determined that the smoking area was an ash pit.

An ash pit is a hole in the ground containing hot material, often associated with a burned root system, and can be difficult to identify. The E69 crew brought hand tools onto the hill in case they encountered additional hot spots.

An RA firefighter paramedic (FFP) walked the hose line to the end of the lay to begin removing the hose from that location and moving it toward Temescal Ridge Trail. From there, other personnel carried the hose to the location where the fire apparatus were parked.

The FFP stated that he observed several areas emitting smoke in a depressed area of the burn and described the smoke as significant and believed it indicated that material within the burn area remained hot. He reported these observations to an on-scene captain.

The FFP also stated that, in his opinion, the control line cut near the smoking material was not well defined and that the brush inside the burn area was only partially burned. He specifically remembered an ash pit because the heat coming from it was too hot for him to use his hand to check for heat.

This LFD observation differs from information provided during LAC TDs. An LAC superintendent stated the line had been walked and was considered sufficient sometime before releasing the camp crews and the communications plan at around 07:00 on January 1, 2025.

As stated previously, ULRI's request for a TD with LFD personnel, such as the RA FFP, was unable to occur during ULRI's scheduled timeframe. This limited ULRI's understanding of conditions required to clarify the specific location, conditions observed, and whether the area was an island (unburned vegetation within the perimeter), eyebrow (unburned crescent-shaped patch of vegetation along the edge of the fire perimeter), or other unburned fuel feature inside the perimeter.

As a result, ULRI treated this as a documented conflict in observations and evaluated it against other available records, deposition narratives, radio traffic, and completed TDs.

Another captain was positioned above the area where the RA FFP observed smoking material while removing hose. The captain stated that he did not observe smoldering embers, did not hear crackling sounds, and did not feel anything that was too hot to touch.

A firefighter on this engine also stated that he did not encounter hot spots that day while picking up hose and moving it to the fire apparatus staged in a cul-de-sac. This is another instance of a documented conflict.

A third captain, who was also retrieving hose with his crew, stated that he did not observe anything that required additional fire suppression or mop-up. He also stated that he did not see any State Parks personnel on scene. All hose was removed from the fire area, brought down to the cul-de-sac in the neighborhood, and bundled for transport to a nearby fire station.

As per State Parks, two (2) resource advisors visited the site on January 2, 2025. They determined that there was no damage to sensitive resources.

Report of Smoke in the Lachman Fire Area — January 3, 2025

The following information was identified from CAD records provided by LFD, LFD depositions, and LAC TDs.

At 11:53 on January 3, 2025, LA Metro received a report of a "wisp of smoke" approximately a half mile south of the previous Lachman Fire.

At 11:56, LA Metro dispatched LFD E23, E269, and a BC.

At 12:08, E23 reports nothing showing.

At 12:14, E23 canceled the response of E269.

The engine captain stated that he did not smell anything, did not see smoke, and did not see fire. The captain and two firefighters walked to a high point to obtain a 360-degree view of the area.

The firefighters separated and went to different portions of the high point to look for smoke or fire.

The LFD BC arrived on scene and met with the captain. The BC stated that he did not walk into the burn area and did not attempt to contact the person who called 911. LA Metro documented that a callback to the reporting party went to voicemail.

The captain stated that he did not see any State Parks personnel at the fire area. The LFD engine was on scene for approximately 34 minutes. Additional information added to the CAD printout indicated that, at 12:20, a LAC fire crew was on scene training and would remain in the area until the afternoon.

This information was confirmed during a TD: an LAC foreman and crew returned to the Lachman Fire area on January 3, 2025, at approximately the same time as LFD dispatch, as part of a training activity. During that training, they did not observe smoke, fire, or other indicators of active burning.

Mop-Up Procedures, Incident Closeout, and Follow-Up Inspection

ULRI's analysis of LFD's mop-up, inspection, and closeout activities in the Lachman Fire identified that the agency's existing wildland procedures did not contain a detailed, comprehensive mop-up, patrol, and incident closeout process for vegetation fires.

LFD Book 99,[247] which includes wildland operational guidance, should be updated to provide clearer direction for containment confirmation, mop-up standards, hose line management, patrol status, documentation, and follow-up inspection after fire control.

Based on the records reviewed, ULRI identified that LFD personnel followed existing policy, procedures, and past department practices during the Lachman Fire mop-up. During the initial operational period, mop-up appeared to be a priority for the initial IC and OSC. Control line, hose placement, hand crew work, and continued mop-up were included in the incident actions

Following the morning shift change on January 1, 2025, the same focus continued. The incoming command personnel and assigned crews appeared to understand the expectation to complete mop-up, identify remaining heat sources, and secure the fire area.

However, in the absence of detailed written mop-up procedures, post-suppression operations relied on individual experience, prior training, company-level practices, supervisor expectations, and incident-specific judgment.

While experienced personnel may still perform effective mop-up, the absence of a written standard can create variability in how containment is confirmed, how much of a fire area is mopped up, when hose lines are removed, when patrol status is appropriate, and what conditions require follow-up inspection.

A comprehensive procedure reduces that variability by defining expectations before the incident, providing a common framework during operations, and creating a basis for review after the incident.

Strong procedures create an operational cycle. The procedure is written, trained on, implemented on scene, reviewed after use, and revised when gaps are identified.

This cycle helps ensure that lessons from incidents are converted into standard practice and that personnel at the task, tactical, and strategic levels have a clear understanding of what must occur before a wildland fire is placed in patrol status or released.

The January 2, 2025, hose removal period included conflicting observations regarding smoke, heat, and ash pit conditions within the burn area. Regardless of conflicting reports, any indication of residual fire activity should be verified and resolved through continued observation and, when necessary, additional suppression actions. Written procedures should explicitly establish these requirements.

Since LFD TDs were unable to occur during the scheduled timeframe, ULRI was unable to conduct follow-up interviews to better understand the specific locations, observations, decision-making, or operational significance of the differing accounts. This limited ULRI's ability to fully reconcile the conflicting observations from January 2, 2025.

The absence of a detailed mop-up and follow-up inspection procedure was compounded by the continued Red Flag Warnings, PDS warnings, critically dry fuels, and anticipated wind conditions following the Lachman Fire. Under those conditions, recently burned areas with any potential for residual heat sources should receive additional scrutiny.

A formal reassessment of the fire area, including perimeter inspection, interior heat checks, review of known smoke or ash pit locations, and confirmation of hose line and patrol status, would provide additional assurance that the fire area remained secure before the arrival of forecasted wind and low-humidity conditions.

In addition to creating formal policies, procedures, and training curricula addressing vegetation fire containment declaration, as well as mop-up and patrol expectations, LFD should also establish and prioritize a culture of empowering personnel to inform their superiors of operational and safety concerns.[248]

Mop-Up Operations Following Wildland Fires

Mop-up, patrol, hose line management, and incident management post initial suppression are critical components of wildland fire operations. After forward progress of the fire is stopped, a vegetation fire may still contain heat in ash pits, root systems, stump holes, partially burned vegetation, and/or other concealed fuel sources.

These hazards can remain capable of holding heat and re-emerging when exposed to wind, low humidity, or receptive fuels. For this reason, mop-up should be managed as a defined operational phase with clear task, tactical, and strategic level responsibilities.

Wildland mop-up best-practice guidance is available in the National Wildfire Coordinating Group (NWCG) S-130 Unit 12: Mop-up and the NWCG Incident Response Pocket Guide (IRPG).[249, 250]

NWCG S-130 identifies mop-up as a critical suppression phase, as remaining burning material can rekindle and threaten the control line. It also includes guidance on cold trailing, safety considerations, wet and dry mop-up methods, and systematic gridding to detect remaining heat sources.

The 2025 IRPG includes related guidance on cold trailing, hotspot detection, increased fireline patrol and monitoring, resource advisor coordination, and fire origin protection.

Strategic Level: Command Post Positions

The IC is responsible for identifying conditions or risks that may affect incident control, as well as firefighter and public safety. That responsibility continues after forward progress is stopped and guides decisions related to mop-up, hose removal, patrol, and final release of the fire area.

On January 2, 2025, hose lines were removed from the area despite several conditions indicating they should remain in place, including fuels capable of retaining heat, forecasted critical fire weather, difficult access to the burn area, and proximity to the WUI. These conditions increased the importance of confirming that remaining heat, smoke, or ash pit concerns had been fully evaluated before reducing suppression capability.

Appropriate follow-up actions include:

- Continued patrol
- Additional mop-up
- Systematic gridding of the burn area
- Use of heat-detection tools
- Investigation of reported smoke or hot spots
- Coordination with land management personnel
- Retention of hose lines where access was limited

The records reviewed did not identify a documented plan for continued patrol, additional heat detection, site monitoring, or reassessment before the forecasted critical fire weather event.

The IC and OSC should establish mop-up, patrol, and incident closeout as formal operational phases of the incident. Command should determine when forward progress has stopped, establish containment status, confirm that control lines are expected to hold under current and forecasted conditions, and define the mop-up standard for the incident.

Command should base mop-up objectives on fire size, fuel type, terrain, access, weather, spotting history, resource availability, and the potential for rekindling, which they did for the Lachman Fire by requiring 100% mop up, as all burned areas were cooled with water and checked for hot spots.

For larger fires, command should establish a minimum mop-up depth from the perimeter and increase that depth when fuels, topography, wind, access limitations, or forecasted fire weather increase the potential for escape.

Before transitioning the incident to patrol status or releasing resources, command should confirm that each division has reported containment status, mop-up progress, remaining hot spot concerns, hose line status, and any areas requiring follow-up. Fires should not be left unstaffed while mop-up remains incomplete.

When a wind event, Red Flag Warning, low humidity period, or other elevated fire weather is forecasted after a wildland fire, departments should reassess recently controlled fire areas before the weather arrives. This reassessment should include the fire perimeter, known heat source locations, patrol history, hose line status, fuel conditions, access limitations, and expected severity of the forecast.

Command should consider holding resources, reassigning patrols, deploying drones and/or infrared technology, rechecking the perimeter, delaying hose removal, and postponing final release until the fire area can reasonably be expected to remain secure under forecasted conditions.

Command should also ensure that the fire origin and potential evidence are protected, deviations from mop-up procedures are documented, and post-incident reviews evaluate containment, mop-up, patrol, and release decisions.

These expectations should be incorporated into command officer training, company drills, wild-land refreshers, and after-action reviews, so mop-up is performed with the same discipline and accountability as initial attack.

Tactical Level: Branch Directors and Supervisors

Branch Directors, DIVS, Group Supervisors, and hand crew supervisors should verify that mop-up objectives are completed within their assigned areas before resources are released. This includes confirming the status of the control line, hose placement, cold trailing, interior heat sources, patrol needs, and areas where mop-up cannot be completed because of access, terrain, safety, or resource limitations.

DIVS and Group Supervisors should personally inspect, or otherwise validate, the condition of their assigned perimeter and interior hazard areas. They should maintain accountability for what has been completed and what remains unfinished.

If a division cannot meet the expected mop-up standard, that limitation should be communicated to the OSC or IC and documented. Patrol status should be treated as an active assignment with assigned resources, defined objectives, a reporting process, and clear expectations for continued inspection and the extinguishing of heat sources.

When forecasted high winds, low humidity, or other elevated fire weather is expected, tactical supervisors should increase the level of review before releasing crews. This may include expanding mop-up depth, holding hose lines in place, increasing patrol frequency, assigning additional crews, using infrared and/or drone support, and rechecking areas with known hot spots, heavy fuels, or difficult access.

Task Level — Firefighters, Company Officers, Hand Crews, and Equipment Operators

Firefighters, company officers, hand crews, and equipment operators should treat mop-up as an active fire assignment, not as a cleanup function. Crews should locate, expose, and extinguish remaining heat sources within their assigned area.

Crews should construct, improve, and inspect the control line to separate burned fuel from unburned fuel. Where possible, the fireline should be scraped to mineral soil and cleared of vegetation or other material that could allow heat transfer across the line. Crews should cold-trail the perimeter using a gloved hand, hand tools, or heat-detection equipment to identify and extinguish remaining hot spots.

Dozers and other heavy equipment should be used when appropriate to support containment, improve access, strengthen control lines, remove fuel continuity, and support mop-up operations.

Equipment operators should coordinate with command, DIVS, ground crews, and State Parks personnel to ensure dozer line construction supports the incident objectives and does not create un-necessary environmental impacts, access concerns, or unsafe working conditions for crews operating near equipment.

When water is available, crews should use it for mop-up and consider supplementing with Class A foam or approved water additives, as appropriate. When water is unavailable or terrain limits access, crews should conduct dry mop-up by digging, stirring, and turning burned material until sources of heat are removed down to cool mineral soil.

Fire departments should operate in a culture where fire-ground concerns are expected to be identified, communicated, and addressed.[248]

Firefighters, company officers, hand crews, and equipment operators should have a clear opportunity to report concerns through the chain of command, including observed smoke, hot spots, incomplete line construction, unsafe conditions, access limitations, equipment access issues, or areas where mop-up objectives have not been fully met.

These concerns should be acknowledged, evaluated, and resolved or elevated before crews are released from the assignment.

Hose lines should remain in place and available until mop-up is complete or command confirms they are no longer needed. Hose removal should not occur until the assigned area has been inspected, remaining heat sources have been addressed, and the company officer has communicated the condition of the area through the chain of command.

6.1.6 State Parks Response Analysis

State Parks uses a statewide template to develop WMPs for State Park facilities, and a plan for Topanga State Park was under development at the time of the Lachman Fire.

These plans focus on environmental resource and visitor protection, however, when they include preferred suppression outcomes or limitations on containment actions, they can affect fire agency tactics, mop-up effectiveness, defensible space, and protection of adjacent WUI areas.

Since State Parks does not have a fire suppression mission, these plans should be developed with direct input from fire agencies and wildfire professionals. This would help ensure that resource protection goals are balanced with operationally practical suppression strategies, site-specific fire behavior considerations, and public safety needs.

During the Lachman Fire, State Parks personnel had a limited role in the response and management of the incident. TDs with personnel indicated that they viewed their role as advisory and reported no direct involvement or responsibility for mop-up operations following initial containment.

State Parks personnel initially responded to the ICP and provided fire personnel with information identifying avoidance areas within the impacted area. State Parks responded after the fire was extinguished to assess whether any damage to State Park property occurred after the fire spread into their jurisdiction.

State Parks Operational, Training, and Post-Fire Integration

TDs with State Parks personnel who responded to the Lachman Fire indicated that State Parks staff consistently yielded environmental and cultural resource priorities to fire suppression priorities during the incident. This approach appeared consistent with the operational needs of the fire.

However, TDs also identified a perceived misalignment within State Parks between park ranger operations and environmental/resource management functions during wildfire preparedness and response.

Some personnel expressed concern that organizational emphasis on environmental resource management and regulatory compliance can, at times, reduce focus on park safety, visitor protection, emergency readiness, and operational capability. This perception may contribute to disconnects in wildfire planning, vegetation management, field-level decision-making, and safety prioritization during rapidly evolving incidents.

The Lachman Fire highlighted the need for clearer alignment between State Park's environmental needs and public safety responsibilities. State Parks should ensure that environmental and cultural resource goals are integrated with emergency operations expectations, incident command practices, communications procedures, and wildfire preparedness standards.

State Parks should also develop wildfire preparedness, vegetation management, and resource protection plans in coordination with partner agencies, including local and regional fire service agencies. These plans should identify shared objectives, access routes, communication methods, resource advisor roles, collaborative and realistic suppression repair expectations, and actions to be taken before and during Red Flag Warnings or other elevated fire weather forecasts.

State Parks wildfire training and equipment standards are not consistent for personnel who support wildfire operations. State Parks should develop a wildfire preparedness standard for rangers, resource staff, supervisors, and other field personnel, including annual wildland fire refresher training, participation in regional exercises, basic ICS education, familiarity with regional communication plans, and appropriate wildland fire personal protective equipment (PPE).

The Lachman Fire highlighted the need for a formal system to document post-fire patrol activities, resource protection observations, suppression repair needs, and follow-up actions within State Parks. Early and sustained coordination with incident command and cooperating fire agencies would help ensure park concerns are communicated and addressed during incident response.

6.1.7 Findings and Recommendations

FINDING 168: LAFD did not have a detailed procedure for wildland mop-up operations.	**RECOMMENDATION 168.1**: Fire departments with wildland and WUI responsibility should maintain a written mop-up, patrol, hose line management, follow-up inspection, and incident closeout procedure for vegetation fires.
FINDING 169: LAFD did not have a formal process requiring reassessment of recently controlled wildland fires when critical fire weather was forecasted.	**RECOMMENDATION 169.1:** Departments should require additional reassessment when a low-humidity period or significant wind event is forecast after a wildland fire, with particular vigilance in the case of a Red Flag Warning or PDS warning.

6.1.7 Findings and Recommendations (cont.)	
FINDING 170: Hose lines were removed on January 2, 2025, and the records reviewed did not identify a documented plan to reassess the fire area before the forecasted critical fire weather event.	**RECOMMENDATION 170.1:** When elevated or extreme fire weather is forecast after initial control, command should consider holding resources, reassigning patrols, deploying drones or infrared support, rechecking the perimeter, delaying hose removal, and/or postponing final release.
FINDING 171: The records reviewed did not identify a documented patrol plan after hose removal that assigned resources to monitor the fire area based on remaining heat concerns, fuel conditions, or forecasted fire weather.	**RECOMMENDATION 171.1:** Departments should define patrol status as an active operational assignment with assigned resources, objectives, reporting expectations, and authority to extinguish remaining heat sources. The operational assignment of Patrol should consider the current and predicted fire weather and fuel status.
FINDING 172: LAFD personnel assigned to the Lachman Fire did not consistently view upward communication of fire conditions and suppression effectiveness as part of the operational reporting process.	**RECOMMENDATION 172.1:** Departments should create a culture where personnel at all levels are expected to identify, communicate, and elevate fireground concerns.
FINDING 173: The draft Topanga State Park Wildfire Management Plan (WMP) did not include input from fire agencies.	**RECOMMENDATION 173.1:** Federal, State and/or Local fire agencies should participate in the development of the State Park WMP to ensure it addresses wildfire prevention, preparedness, and operational response.

6.2 Historical Review of After-Action Reports

Emergency response agencies across California document past wildland and WUI incidents using After Action Review (AAR) reports, which analyze the response to these events to find where improvements to planning and response can be made.

ULRI completed a high-level review of several AAR reports (some as far back as the 1950s/60s), with the goal of capturing major themes within the reports, such as the topics addressed (appearing as sections/chapters in the report), findings, challenges, lessons learned, and recommendations. The review was not a comprehensive assessment of all past wildland and WUI incidents. Instead, incidents were selected from many areas and timeframes that included publicly available AARs with actionable findings.

Analyzing major themes across decades can not only help recognize trends, but also identify the recurrence of certain themes over time, which could indicate a lack of responsiveness to address and/or correct an issue.

By comparing historical data to the Palisades and Eaton Fires, ULRI was able to see how well past lessons have been applied to current incidents, while also gaining a clearer picture of current agency (and resident) readiness and remaining gaps.

Past published incident AAR reports selected for the analysis were based on two (2) criteria:

1. The incident was a fast-moving fire that included a vegetation fuel component.
2. The incident occurred in California.

SMEs reviewed the reports, organized the data by topic in a spreadsheet, and, with data scientists, created graphs to present the information more clearly.

Table 6.2.1 includes summary information on the AAR reports that were included in the analysis. These reports were provided by fire agencies or were publicily available.

Table 6.2.1 AAR reports reviewed. (CAL FIRE: California Department of Forestry and Fire Protection, USFS: United States Department of Agriculture Forest Service).

Date	Incident Name	Jurisdictional Agency	Acreage
December 27, 1953	Monrovia Peak[251]	Los Angeles County Fire Department	14,135
November 6, 1961	Bel Air[252]	Los Angeles City Fire Department	6,090
August 20, 1993	Glen Allen[253]	Los Angeles County Fire Department	100
November 2, 1993	Old Topanga[254]	Los Angeles County Fire Department	16,516
October 25, 2003	Old	CAL FIRE San Bernardino Unit / San Bernardino National Forest / San Bernardino County Fire	91,281
August 26, 2009	Station[255,256]	Los Angeles County Fire Department	160,577
June 24, 2015	Calgrove	Los Angeles County Fire Department	415
July 17, 2015	North[257]	CAL FIRE San Bernardino Unit / San Bernardino National Forest / San Bernardino County Fire	4,250
July 17, 2015	Pines	USFS Angeles National Forest	200
July 22, 2015	Wragg[257]	CAL FIRE Sonoma-Lake-Napa Unit	8,051
July 29, 2015	Rocky[257]	CAL FIRE Sonoma-Lake-Napa Unit	69,438
August 16, 2015	Lincoln	Los Angeles County Fire Department / Montebello Fire Department	374
August 16, 2015	Warm	USFS Angeles National Forest	300
September 9, 2015	Butte[257]	CAL FIRE Amador - El Dorado Unit	7,868
September 12, 2015	Valley[257]	CAL FIRE Sonoma-Lake-Napa Unit	76,067
June 23, 2016	Erskine[258]	Bureau of Land Management Kern	48,019
July 22, 2016	Sand[258]	Los Angeles County Fire Department	41,386
July 22, 2016	Soberanes[258]	USFS Los Padres National Forest	132,127
August 13, 2016	Clayton[258]	CAL FIRE Sonoma-Lake-Napa Unit	3,929
August 13, 2016	Chimney[258]	CAL FIRE San Luis Obispo Unit	46,235
August 16, 2016	Blue Cut[258]	San Bernardino National Forest	36,274
December 4, 2017	Thomas[259,260]	Ventura County Fire Department / USFS Los Padres National Forest	281,893
December 5, 2017	Creek[261]	Los Angeles City Emergency Management Department / Los Angeles City Fire Department	15,619
December 6, 2017	Skirball[261]	Los Angeles City Fire Department	422
November 8, 2018	Woolsey[262,263,264]	Los Angeles City Fire Department / Los Angeles County Fire Department / Ventura County Fire Department	96,949
November 8, 2018	Hill[264]	Ventura County Fire Department	4,381
August 25, 2019	Colorado	Los Angeles City Fire Department	45
October 10, 2019	Saddleridge	Los Angeles City Fire Department	8,799
October 21, 2019	Palisades	Los Angeles City Fire Department	45
October 24, 2019	Tick	Los Angeles County Fire Department	4,615
October 28, 2019	Getty	Los Angeles City Fire Department	745

(Continued)

Date	Incident Name	Jurisdictional Agency	Acreage
November 9, 2019	Barham	Los Angeles City Fire Department	70
August 12, 2020	Lake	Los Angeles County Fire Department	31,089
September 6, 2020	Bobcat	Los Angeles County Fire Department	115,758
November 6, 2024	Mountain	Ventura County Fire Department	19,904
January 7, 2025	Palisades[265]	Los Angeles City Fire Department	23,448

These incidents illustrate the heightened wildfire risk that persists through late fall, as shown in Figure 6.2.1, when critically dry fuels coincide with offshore wind events.

The majority of the reports analyzed were not written using a standardized format. This resulted in each report being organized differently and having a slightly different focus. As a result, ULRI focused on identifying commonalities across reports to group the data by a shared topic.

The analysis of the data shows persistent recurrence of operational and organizational challenges across incidents, alongside a smaller, but meaningful, set of improvements over time.

Areas requiring attention include:

- Interagency communication gaps related to radio capabilities and coordination with dispatch centers
- Delayed or incomplete UC and resistance amongst agencies to collaborate and unify objectives
- Inconsistent use of the ICS/NIMS
- Suboptimal information transfer between the ICP, DOC, and the field

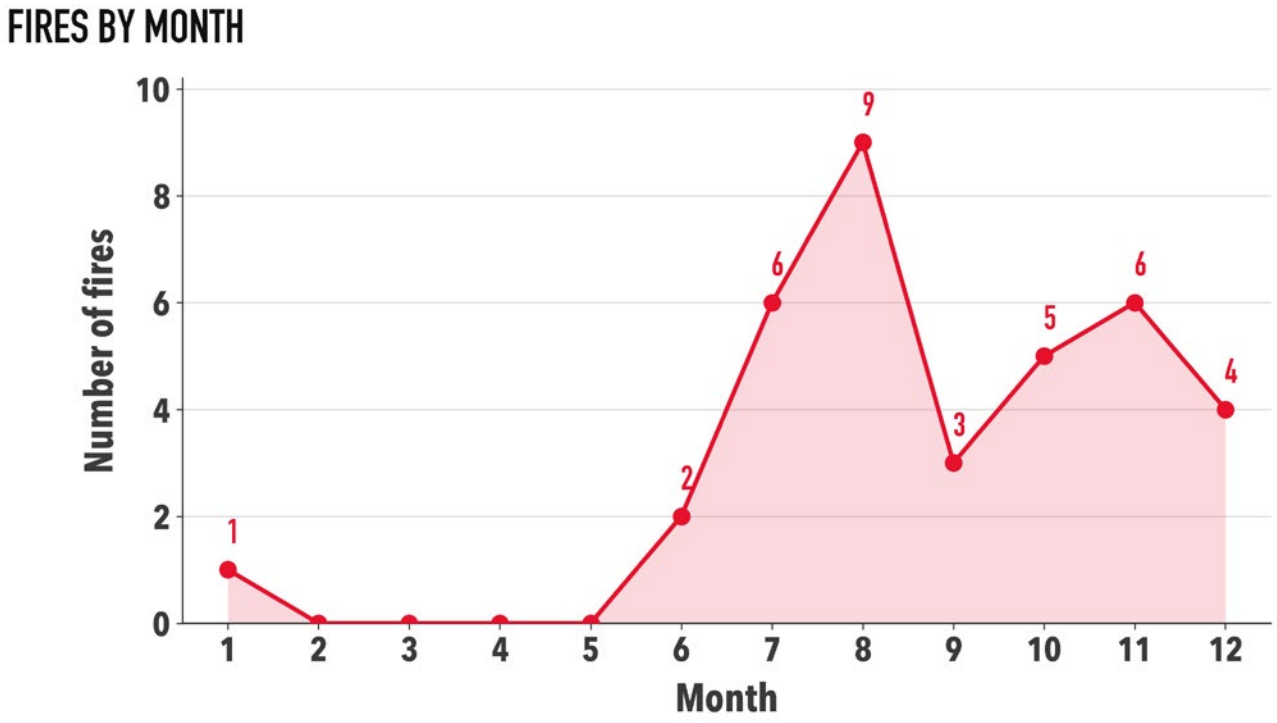


Figure 6.2.1 The month that fires included in the AAR review began illustrating extension of the fire season into October-November.

- Lack of clarity regarding authority, operational priorities, leader's intent, and focus of mission
- Fragmented resource ordering, accountability, and situational awareness
- Inconsistent use of GIS, CAD, alerting platforms, and decision-support technology at ICPs and reliance on paper-based systems
- Deficiencies in interagency planning, commitment, and training affecting wildfire and WUI incident mutual aid, lack of unified efforts in MTZs.
- Rank-based assignment to positions instead of qualification- or experience-based
- Insufficient WUI evacuation and predictive modeling
- Inconsistent use of ICS/NIMS
- Lack of regard for first responder fatigue, exposure, and behavioral health integration
- Delayed and uncoordinated community messaging and conflicting evacuation directions
- Gaps in training and qualifications

Common themes in the AAR reports are shown in Figure 6.2.2.

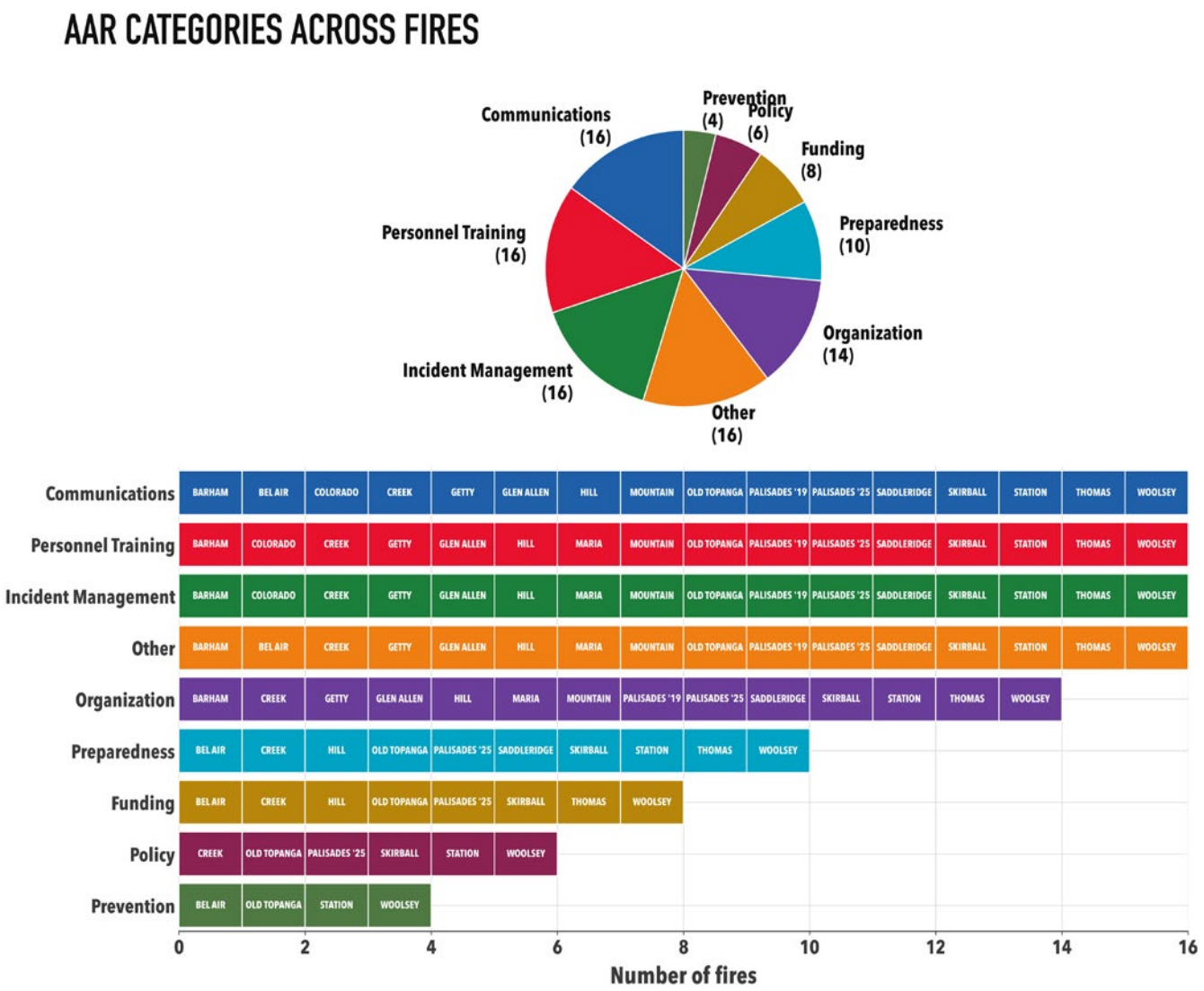


Figure 6.2.2 Common themes in the findings of AAR reports included in this analysis. Fires included in this figure are limited to those with publicly available AARs that include findings.

The significance of regional drivers was also particularly evident within the AARs. Santa Ana winds were identified as prevalent in the Bel Air (1961), Old Topanga (1993), Thomas (2017), Woolsey (2018), Saddleridge (2019), Getty (2019), and Tick (2019) Fires, though they may have been impactful in others.

The Station (2009), Rocky (2015), Valley (2015), Erskine (2016), Sand (2016), and Soberanes (2016) Fires all occurred during or immediately after drought cycles.

Low fuel moisture, accumulated dead fuels, prolonged warm and dry weather, and recurring Santa Ana wind events contributed to several major Southern California wildfires, including Woolsey (2018), Hill (2018), Saddleridge (2019), Getty (2019), and Barham (2019) fires, all of which took place in either October or November.

Southern California's canyons and topography can also impact fire planning and response, helping facilitate erratic and rapid fire spread, as well as challenging aerial firefighting operations, prolonging and intensifying wind gusts, and limiting traffic corridors for evacuation.

These topography challenges were found to have influenced the Monrovia Peak (1953), Old Topanga (1993), Sand (2016), Bobcat (2020), and Lake (2020) Fires.

Several positive trends relative to past fires were identified, indicating improvement has been made in many areas:

- Increased use of ICS and NIMS, improved documentation, and better use of UC
- Improvements to the development of the built environment, including improved zoning, building materials, and vegetation management
- Efforts to increase incident safety and recognize the limits of physical and cognitive function
- Introduction of proactive alerting and evacuation strategies, which are supported by improved evacuation zoning, trigger points, technology, and policies

The findings from the Palisades and Eaton Fires — that pre-fire conditions and community resilience are a critical component to consider in the modern wildfire environment — reinforce the need to expand the scope of future AAR methodologies beyond suppression-centered analysis.

Fire prevention bureaus, emergency management agencies, planners, PIOs, and Community Risk Reduction (CRR) specialists can add depth to future AARs.

To maximize the value and reach of future AARs, there should also be a formalized mechanism to track recommendations and implementation progress over time. By establishing a process for accountability and continuous improvement, agencies can move beyond merely documenting lessons learned and begin supporting sustained progress in both improving operations and promoting mitigation measures that enhance comprehensive regional wildfire resilience.

This partial review of some past AAR's should serve as a precursor for a more in-depth analysis of all past wildland and WUI fire incidents.

6.2.1 Findings and Recommendations

FINDING 174: Current and historical wildfire after-action review processes remain largely suppression-focused and do not consistently evaluate the pre-fire conditions, community preparedness, resilience measures, and multi-disciplinary factors that influenced incident outcomes.	**RECOMMENDATION 174.1:** Expand after-action review methodologies to include fire prevention, emergency management, planning, public information, and community risk reduction perspectives, ensuring that pre-fire conditions and community resilience are systematically assessed alongside suppression activities.
FINDING 175: The absence of a formal mechanism to track recommendations across jurisdictions limits accountability and reduces the long-term implementation of lessons learned from major wildfire incidents.	**RECOMMENDATION 175.1:** Establish a centralized corrective action tracking process that monitors recommendation implementation, assigns ownership, measures progress, and vali-dates improvements through periodic reporting, training, and exercises to support continuous wildfire resilience improvement.

6.3 First Responder Health and Safety

6.3.1 Firefighter and Law Enforcement Health, Safety, and Operational Considerations

The Palisades and Eaton Fires exposed both fire service and law enforcement personnel to numerous and rapidly shifting hazards as incidents transitioned from wildland fires to wind-driven WUI fires, and ultimately, into community conflagrations.

Although catastrophic injuries were avoided among responders, they experienced major gaps in access to adequate PPE, particularly respiratory protection, as well as roadway access, situational awareness, accountability, rehabilitation, and long-term health monitoring.

Key challenges responders encountered during the Palisades and Eaton Fires include:

- Significant exposure for responders due to severe winds, burning materials, large volumes of smoke, and long operational periods.
- Operated in high-risk environments that were misaligned with issued gear and initial mission profile.
- Strained situational awareness as conditions changed faster than communication pathways could adapt.

These shortcomings highlight the urgent need for unified, interagency reforms that safeguard health, operational readiness, and long-term wellness of emergency responders.

Additionally, while leadership and resilient safety culture prevented fatal outcomes, the long-term health impacts for responders remain a critical concern and require coordinated monitoring across all agencies.

6.3.2 Responder Health and Exposure Impacts

The Palisades and Eaton Fires reinforce a broader, evolving reality: first responder health and wellness must be approached as a long-term, system-wide discipline, not just a situational postscript.

These fires highlight significant responder health hazards from prolonged wildfire operations and underscore the need for improved exposure tracking, medical monitoring, and long-term health surveillance.

Reported impacts on responders included:

- Widespread eye injuries, smoke inhalation, respiratory irritation, and chemical exposure
- Required hospital evaluation and lingering symptoms
- Hazardous smoke and chemical exposure over an extended response period with limited PPE (particularly respiratory protection)

Organizations, such as NFPA (Standards 1500, 1582, 1584) and the National Institute for Occupational Safety and Health (NIOSH), provide guidance that emphasizes proactive risk identification, continuous exposure monitoring, and sustained medical support well beyond incident termination.

As fire environments grow more complex, agencies must realign their policies, training, and proactive treatment to address the cumulative health impacts emerging in the profession. Agencies must also expand cross-disciplinary exposure tracking and post-incident medical availability.

Ensuring early intervention and providing clarity and transparency in extended health monitoring will address the associated gaps in preparing for the downrange effects of exposure, while institutionalizing a culture that prioritizes both immediate safety and lifelong responder well-being will help better protect the first responder community.

6.3.3 PPE and Equipment Limitations

Standard-issue PPE for both fire and law enforcement personnel proved insufficient during the Palisades and Eaton Fires, specifically due to the rapid transition from vegetation fire to community conflagration. Eye protection failed under the intense wind conditions and embercasts. Most law personnel lacked any fire-rated garments or PPE.

The following inadequacies and efforts to improvise solutions were seen in both fires:

Eye Protection

Existing standards (NFPA 1971, 1977, American National Standards Institute (ANSI) Z87.1) have been predicated on legacy assumptions: that firefighters operate in either wildland or structure fire environments, when in fact they can operate in both during incidents like the Palisades and Eaton Fires.

Eye protection-related challenges faced by responders during the January 2025 fires included:

- Goggles failed under wind, heat, embers, and debris.
- Eye irritation and injury were widespread.
- Improvised alternatives, such as motorcycle goggles, were used by some firefighters.

Purpose-built eye protection suited for WUI fire and community conflagration conditions is needed. PPE manufacturers should consider design adjustments to their products to ensure effectiveness in protecting first responders in these types of extreme environments.

Respiratory Protection

The Palisades and Eaton Fires demonstrated important limitations in respiratory protection for responders. Existing self-contained breathing apparatus (SCBA) systems, wildland respirators, and improvised face coverings are not effective for extended operations, especially as wildland fires spread into the WUI and then into communities.

Respiratory protection-related challenges experienced during the fires included:

- Responders operating without adequate respiratory protection in structure-dominated fire environments.
- Cloth hoods, scarves, and basic masks were insufficient for respiratory protection.
- SCBA systems were impractical for extended-duration use.

These PPE challenges left responders increasingly vulnerable to irritant and toxic inhalation risks.

Current standards, including NFPA 1984 and Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.134, do not fully address extended-duration WUI and community conflagration environments. As such, long-duration, yet wearable respiratory solutions must be developed.

Law Enforcement Fire Environment Personal Protective Equipment

Many law enforcement personnel operated in hazardous fire conditions without access to basic protective equipment, such as goggles, fire-resistant jackets, or respiratory protection. During the incident, LASD LHS had implemented a locally funded “Fire Go Bag” initiative that provided personnel with a medical face mask, fire jacket, and goggles.

However, the program was unique to that station, supported through donations, and was neither mandatory nor available to all responders. The experiences from the Palisades and Eaton Fires suggest that a standardized “Fire Go Bag” program should be expanded across entire law enforcement organizations, including personnel assigned through surge staffing and/or mutual aid.

In regions prone to wildland fires and WUI incidents, agencies should consider establishing minimum Red Flag PPE requirements and ensuring that responders have ready access to fire-specific PPE whenever elevated fire weather conditions are forecasted.

6.3.4 Long-Term Health Risks

Following the Palisades and Eaton Fires, multiple health surveillance efforts were initiated to evaluate responder exposures. Programs involving LFD, PFD, and the multi-institutional LA Fire HEALTH Study included blood testing, medical evaluations, and long-term health monitoring.

Preliminary findings identified elevated levels of certain per- and polyfluoroalkyl substances (PFAS) compounds, lead, and mercury in some firefighters, underscoring the need for continued biomonitoring and longitudinal health surveillance of personnel exposed to community conflagration environments.[266]

6.3.5 Fatigue, Rehabilitation, and Basic Welfare

As crews engaged in extended operations upwards of 24-72 hours, cumulative sleep deprivation, dehydration, and sustained stress exposure likely impacted cognitive function, reaction time, and the ability to adjust to rapidly changing environments, compounding risk during a fast-paced event with life-threatening conditions.

Law enforcement personnel, due to not being assigned rest periods at the incidents, faced an additional exposure risk from extended commutes to and from home after a full shift in intense conditions.

6.3.6 Mental Health and Post-Incident Support

The Palisades and Eaton Fires also highlighted both the importance of behavioral health support and the barriers that can limit its use. Although some agencies offered psychological and peer support resources, TDs reported limited incident stress debriefings despite significant emotional strain.

Concerns regarding confidentiality, stigma, and potential career impacts reduced some responders’ willingness to seek assistance. Behavioral health programs are most effective when integrated throughout an incident, supported by leadership, and accessible to all personnel, including support staff who may experience stress from prolonged operations and repeated exposure to traumatic information.

Expanding trusted peer-based support systems and institutionalizing long-term wellness programs may help normalize help-seeking behaviors, improve participation, and strengthen workforce resilience following major incidents.

6.3.7 Training, Education, and Preparedness

The Palisades and Eaton Fires demonstrated that existing emergency responder preparedness programs did not fully address the unique health and safety hazards of wind-driven, regional incidents impacting communities.

In these fires, there were variations in tactics and strategies for response to fire spread under wind-driven fire conditions, responder exposure risks, coordinated operations, and roadway hazards.

Improvements to training and education should include:

- Understanding wildland to community fire transitions, toxic exposure risks, and roadway hazards
- Collaborative training between fire and law enforcement
- Scientific data gathered from these fires that informs future curriculum

Additionally, law enforcement assigned to or near WUI zones should complete basic wildland fire awareness and safety education, such as the NWCG S-130 and S-190 courses or law enforcement-specific equivalent(s). Law enforcement vehicles assigned to areas in or near the WUI should also be equipped with fire shelters for each occupant.

6.3.8 Future Preparedness and Generational Improvements

The Palisades and Eaton Fires represent a pivotal inflection point for addressing first responder health and wellness. The realities of today's fire environments demand a forward-looking approach.

Aligning equipment, policy, training, and leadership is essential to keep pace with the needs of the profession. Unified guidance from NFPA, NIOSH, and FEMA provide a foundation, however, these incidents highlight the urgency to evolve beyond existing standards.

Research entities and PPE manufacturers must accelerate the development of advanced protective systems suited for prolonged, high-exposure WUI fire and community conflagration conditions. There needs to be more support for the development of evidence-based NIOSH and NFPA standards and guides for wildland and WUI firefighting PPE, while incentivizing manufacturers to design and produce equipment that reduces emergency responder exposure to hazardous contaminants, heat, and other occupational risks.

Fire and law enforcement should prioritize financial investment for training, large-scale regional exercises, and risk management support that directly address identified gaps.

Agency leadership must take an active role in driving this transformation, ensuring that lessons learned translate into institutional change, improved partnerships, and operational trust within the organization.

6.4 Fire Department Defensible Space Programs

The underlying purpose of vegetation management requirements extends beyond simple fuel reduction. The concept of 'defensible space' is intended to reduce fire intensity, slow fire spread, create safer operational areas for firefighters, and decrease the likelihood that a vegetation or near-home combustible material fire will transition to structure ignition.

As wildfire moves from wildland fuels toward communities, vegetation management functions as a critical buffer intended to reduce flame contact, limit ember production, and provide opportunities for suppression resources to protect structures and evacuation routes.

6.4.1 LAFD Defensible Space Inspection Program Detail

Defensible Space Responsibility

Under the LAFD Brush Clearance Program, property owners within the VHFHSZ are required to perform vegetation management within 200 ft of structures and within 10 ft of roadways or combustible fences.

Unlike California's baseline defensible space framework under Public Resources Code §4291,[29] which is generally centered on vegetation management occurring on, or immediately adjacent to, the structure owner's property, the LAFD brush clearance program applies exposure-based clearance requirements across parcel boundaries.

In practice, responsibility for managing defensible space around structures by maintaining vegetation to applicable regulations is often assigned to the owner of the property where the vegetation is located, even when the purpose of the clearance is to reduce wildfire exposure to structures on adjacent parcels.

For example, vegetation located on Property A may be required to be reduced or maintained because it falls within 200 ft of a structure located on adjacent Property B.

This creates a broader, interconnected vegetation management framework in which wildfire exposure and mitigation responsibilities extend beyond individual parcel ownership and frequently involve multiple adjacent private and public property owners.[35]

This framework can create operational and enforcement complexities in densely developed hillside communities where wildfire exposure frequently crosses parcel boundaries and where ownership patterns include a mix of private, municipal, county, utility, parkland, and other public agency properties.

According to stakeholder conversations, TDs, and information provided during this analysis, when hazardous vegetation conditions exist on publicly owned parcels, including land owned by the City of Los Angeles, Los Angeles County, or LADWP, notices to comply may still be issued.

However, mitigation activities and follow-through do not always appear to occur consistently, within the same timelines expected of private property owners, or at the scale necessary to maintain continuous risk reduction across adjacent landscapes.

These conditions illustrate broader implementation and coordination challenges associated with cross-boundary wildfire mitigation responsibilities, particularly in areas where wildfire risk extends continuously across adjacent properties, infrastructure corridors, open space areas, and multiple jurisdictions.

Inspection Completion and Workload

LAFD's 2023 Fire Prevention Inspection Activity Report documented 158,646 brush clearance inspections during 2023, with an overall initial inspection compliance rate (e.g., parcel owners maintaining their vegetation according to defensible space regulations) of approximately 91%.

The report also identified substantially lower compliance rates among parcels controlled by certain government entities. LADWP parcels recorded an approximately 10% compliance, while MRCA parcels showed approximately 77% compliance. All parcels within the program reportedly received at least one (1) inspection during the reporting period.

Follow-up activity included an additional 13,799 inspections, resulting in approximately 172,445 total inspections during that year.

With 13 inspector positions — approximately 9.6 effective full-time equivalents after accounting for leave and staffing availability — the reported workload equates to roughly 86 inspections per inspector per day.

At this pace, inspectors would have approximately five (5) to six (6) minutes available per inspection during an eight (8)- or 10-hour operational period, excluding travel, documentation, coordination, and administrative responsibilities.

Due to the large number of inspections that must take place in the spring through early summer, inspectors assigned to other roles (i.e., high-rise inspection programs) and personnel from operations are used to augment staffing.

Additional inspection workload data provided to ULRI demonstrates the scale and concentration of LAFD's brush inspection program over the 2022–2025 period, with annual inspections totaling between approximately 163,324 to 172,445 per year (Table 6.4.1).

Inspection activity was highly seasonal, with surges occurring during spring and early summer inspection periods associated with annual brush clearance enforcement cycles (Figure 6.4.1).

The workload distribution analysis further indicates that a relatively small number of inspectors conducted a disproportionately large share of total inspections (Figure 6.4.2).

While many inspectors conducted relatively limited numbers of inspections, a much smaller subset of personnel accounted for nearly all inspection activity over the four (4)-year study period, illustrating highly concentrated operational workload distribution.

Of the 81 individuals who completed an inspection during this timeframe, 30 conducted less than 1,000 inspections, accounting for less than 3% of the workload (15,917 inspections). The remaining 51 inspectors completed the rest of the 660,000+ inspections. Among this group, 17 inspectors conducted over 10,000 inspections each.

Table 6.4.1 Annual LAFD brush clearance inspection volume (2022-2025).

Year	Number of Inspections
2022	169,563
2023	172,445
2024	163,324
2025	170,545

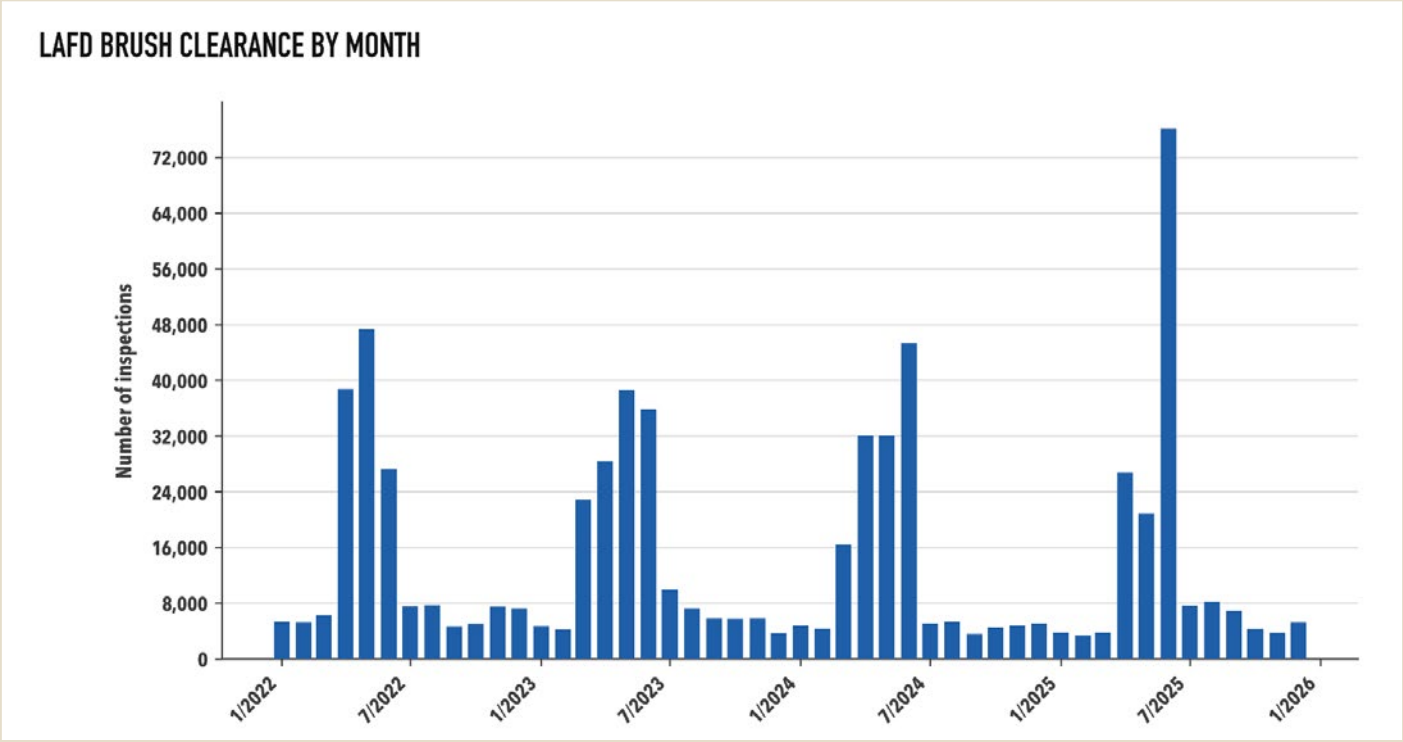


Figure 6.4.1 LAFD brush clearance inspections by month (2022-2025).

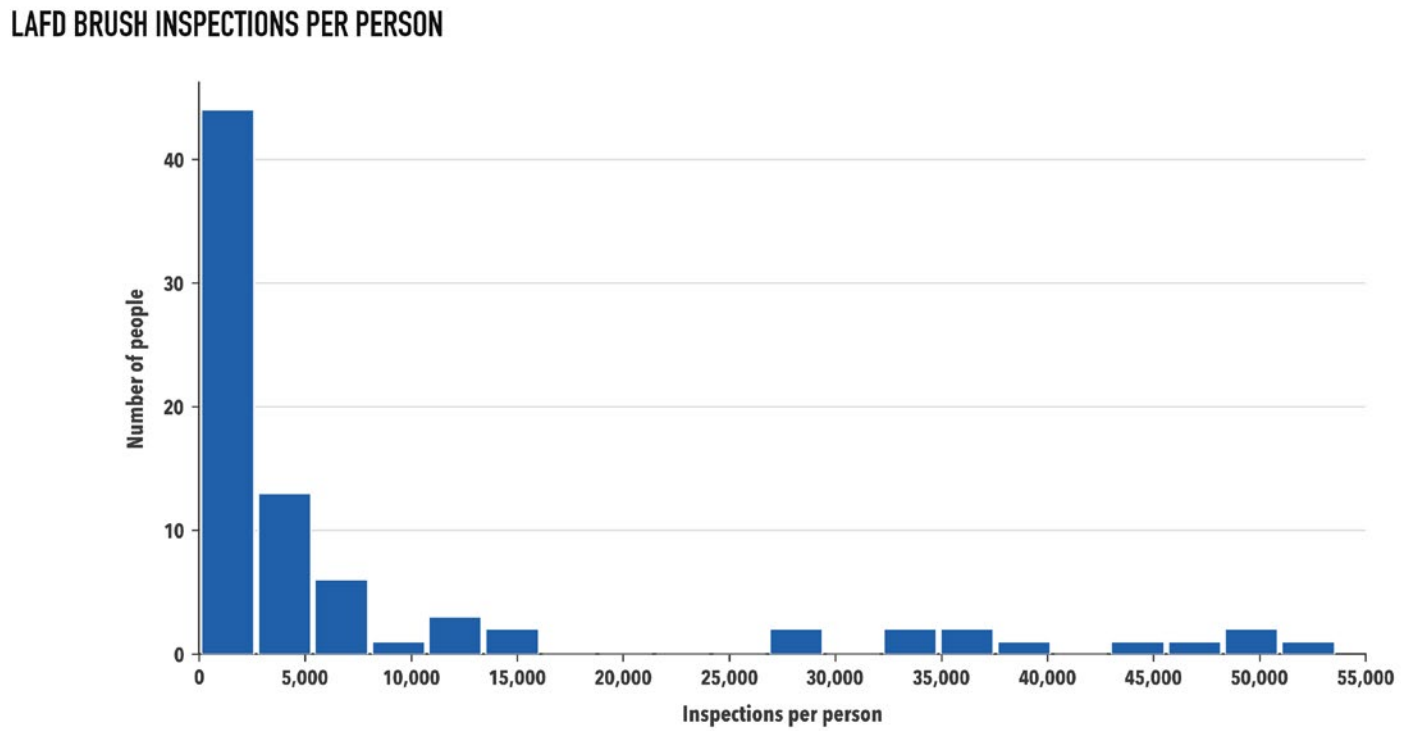


Figure 6.4.2 Concentration of LAFD brush inspection workload among inspectors (2022-2025).

Of these 17, five (5) inspectors conducted over 40,000 inspections each. Thus, 36% of the workload was carried by 6% of the inspectors. This concentration of inspection activity may reflect operational staffing constraints, specialized assignment structures, geographic workload distribution, or limitations in overall inspection capacity.

Compliance data indicate that first inspection compliance rates generally remained near 90% between 2022 and 2025, while second inspection compliance rates exceeded approximately 95% to 99%, depending on the year (Table 6.4.2).

Although these reported compliance rates appear relatively high overall, they do not independently confirm the quality, durability, consistency, or long-term maintenance of mitigation activities across all inspected properties.

Table 6.4.2 LAFD inspection compliance rates by year (2022-2025).

Inspection Year	Compliant on 1st Inspection (%)	Compliant on 2nd Inspection (%)
2022	91.3	99.0
2023	90.0	98.7
2024	91.6	95.0
2025	89.9	97.3
Overall	90.7	97.5

Compliance statistics should be interpreted cautiously when evaluating wildfire risk reduction outcomes. Inspection programs primarily measure adherence to established standards at a specific point in time rather than the long-term effectiveness of treatments under extreme fire conditions.

Inspection records generally do not capture vegetation regrowth, seasonal maintenance consistency, ember exposure, home hardening characteristics, neighborhood fuel continuity, or the cumulative interaction between structures and surrounding fuels. Consequently, compliance rates alone may not fully reflect actual community resilience or wildfire survivability.

Inspection Program Challenges

Collectively, these data illustrate the scale and operational complexity of implementing a large WUI vegetation management program across Los Angeles' extensive VHFHSZ.

They also reinforce broader findings identified throughout this report, regarding staffing demands, inspection workload concentration, documentation limitations, follow-up verification challenges, and the difficulty of sustaining consistent wildfire mitigation implementation across a large and highly fragmented urban landscape.

These findings also highlight persistent challenges associated with vegetation management responsibilities on publicly owned lands and utility-controlled properties.

As discussed earlier in this report, TDs and operational observations indicate that hazardous vegetation conditions identified on publicly owned parcels, do not always appear to be mitigated within the same timelines or to the same standards expected of private property owners.

The elevated non-compliance rates on publicly owned lands and utility-controlled properties identified in the 2023 Fire Prevention Inspection Activity Report are consistent with broader coordination, operational, maintenance, and accountability challenges associated with wildfire mitigation responsibilities across public agency and utility-owned landscapes.

Although the inspection workforce is supplemented by personnel from other divisions assisting with initial inspections, the overall workload illustrates the substantial operational demands placed on the program and suggests practical limitations associated with inspection depth, follow-up capacity, and sustained implementation consistency under current staffing conditions.

LAFD operational planning materials also demonstrate recognition of the broader complexity of wildfire management within Los Angeles.

The Department's Brush Inventory Program and Brush Fire Operations Manual include pre-fire planning, fire behavior modeling, evacuation planning, infrastructure and water supply considerations, traffic control, exposure analysis, and interagency coordination components.[247,267]

Despite the existence of extensive wildfire planning documents, vegetation management requirements, and inspection programs, the January 2025 fires demonstrated that these measures did not consistently translate into effective community-scale risk reduction outcomes.

Large numbers of homes were destroyed within areas subject to longstanding wildfire mitigation requirements and brush clearance programs.

Available operational records, inspection data, and stakeholder TDs and conversations identified recurring challenges associated with implementation consistency, follow-up verification, maintenance, and documentation across such a large and operationally complex urban environment. See Section 3.2.1 for more information.

6.4.2 LACoFD Defensible Space Inspection Program Detail

The LACoFD operates one of the largest local defensible space inspection programs in California, encompassing a geographically diverse mix of wildland, suburban, hillside, and rural environments across both SRA and LRA jurisdictions. For 2026, the county identified approximately 130,812 parcels within the defensible space inspection program area.

Inspection Completion and Workload

Inspection activity more than doubled between 2022 and 2025, as seen in Table 6.4.3.

Table 6.4.3 LACoFD's defensible space inspections (2022-2025).

Year	Number of Defensible Space Inspections
2022	51,200
2023	111,183
2024	127,532
2025	129,647
Total (2022-2025)	419,562*

**The total number of inspections in this table do not represent the actual number of lots in the program due to discrepancies between the LACoFD and County Assessor databases.*

This increase appears to reflect changes in program coverage and parcel identification methods rather than a sudden increase in wildfire risk alone. LACoFD personnel reported that the department expanded inspection coverage to include all eligible parcels within mapped fire hazard areas, whereas previous programs focused on selected portions of those areas.

In addition, beginning in 2022, the department implemented a GIS-based parcel identification system that more accurately identifies residential structures located within VHFHSZ. Department documentation indicates that the new system identified numerous parcels that had not previously been included in the inspection program.

Continued development within fire-prone areas and expansion of mapped hazard zones have further increased the number of parcels subject to annual inspection requirements. These factors largely explain the rapid growth in inspection activity during the study period.

As a result, year-to-year inspection totals should not be interpreted solely as a measure of program productivity, but also as a reflection of expanded parcel identification, inspection coverage, and program scope.

Beyond the overall growth in inspection activity, analysis of county inspection data reveals several important operational characteristics related to:

- Inspection seasonality
- Workforce distribution
- Inspection throughput
- Compliance outcomes
- Implementation continuity

As with LAFD, inspection activity is highly seasonal, with the majority occurring during late spring and summer months, with substantially reduced activity occurring during winter periods.

TDs with LACoFD personnel indicated that inspection timing is intentionally aligned with regional fuel curing patterns, with inspections beginning in desert areas in April, inland areas in May, and coastal areas in June.

The scale of the county program creates substantial operational, staffing, coordination, and consistency challenges across a large and environmentally diverse jurisdiction. These challenges are amplified by the county's diverse fuel types, topography, jurisdictional boundaries, and the large number of personnel participating in annual inspection activities.

Figure 6.4.3 demonstrates the substantial scale of LACoFD's defensible space inspection program, with inspection workloads varying significantly across the county's wildfire-prone communities.

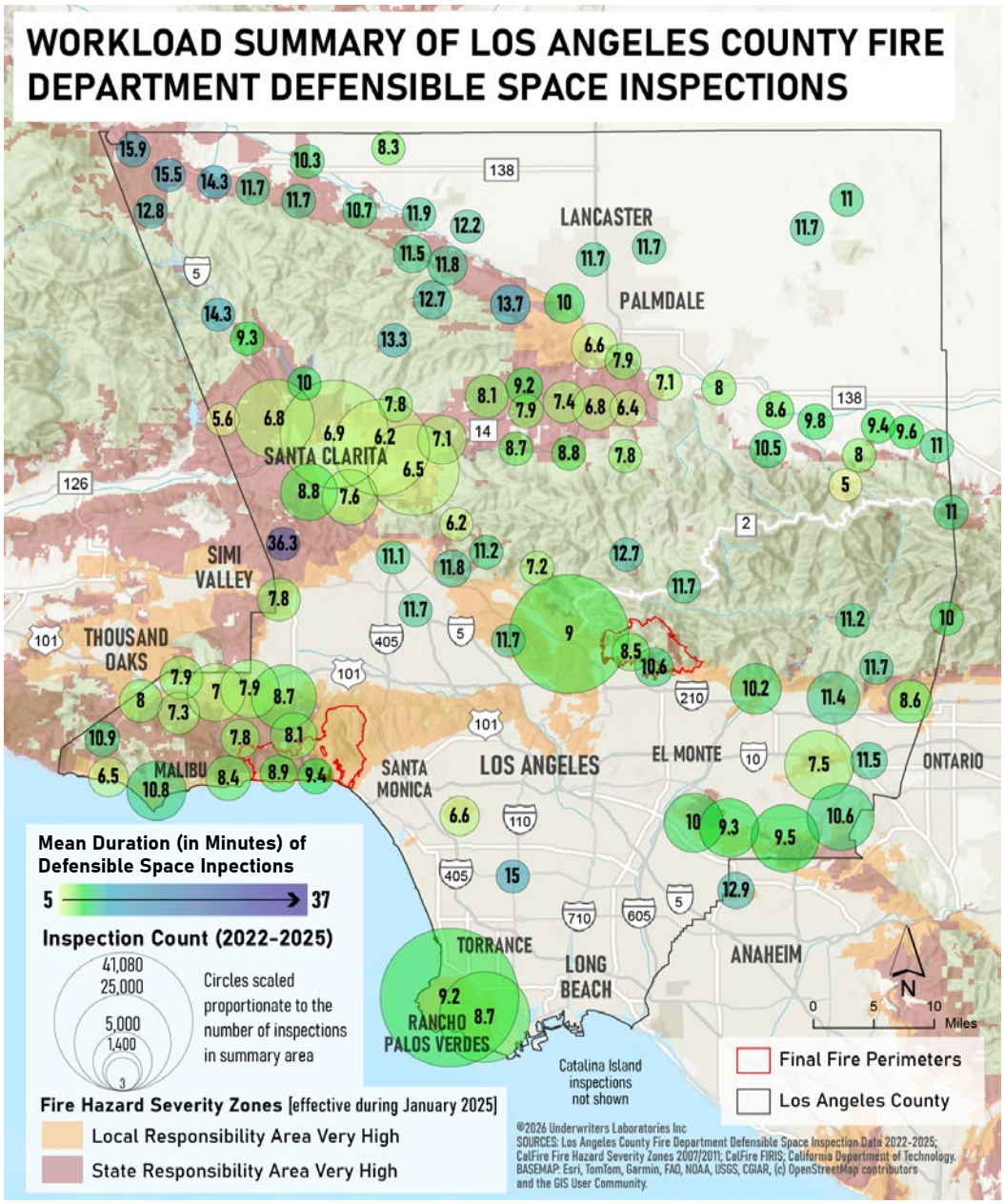


Figure 6.4.3 Map showing the geographic distribution and mean duration (in minutes) of LACoFD defensible space inspections (2022-2025).

The Palisades and Eaton Fires demonstrated that wildfire impacts can extend beyond traditionally regulated hazard zones during extreme wind-driven fire events.

While defensible space remains an important component of community wildfire resilience, the observed damage patterns highlight that wildfire exposure is influenced by factors beyond mapped hazard classifications, including ember transport, topography, vegetation conditions, development patterns, and structure-to-structure fire spread.

As a result, inspection workload and regulatory coverage do not necessarily correspond to the full extent of community wildfire risk.

Although inspection activity is concentrated seasonally (Figure 6.4.4), LACoFD Forestry Unit personnel described year-round responsibilities extending beyond inspection operations alone. These activities include:

- Wildfire preparedness outreach
- Assembly Bill 38[268] implementation support
- Pre-fire planning
- Vegetation management coordination
- Ecological restoration support
- Public education
- Community risk reduction activities
- Suppression-related training

The seasonal nature of the inspection cycle nevertheless raises important operational questions regarding workforce utilization, inspection continuity, follow-up mitigation support, and opportunities for expanded pre-season preparedness and post-inspection coordination activities outside peak inspection periods.

The county inspection workforce is large, but operationally uneven in terms of inspection distribution and workload concentration. Between 2022 and 2025, approximately 10,139 personnel were recorded as participating in defensible space inspections.

However, approximately half completed fewer than five (5) inspections during the four (4)-year study period, while approximately 89% completed fewer than 100 inspections. Conversely, a relatively small percentage of inspectors completed a disproportionate share of the overall workload.

Approximately 1.2% of inspectors conducted roughly 21% of all inspections completed between 2022 and 2025 (Figure 6.4.5 and Table 6.4.4).

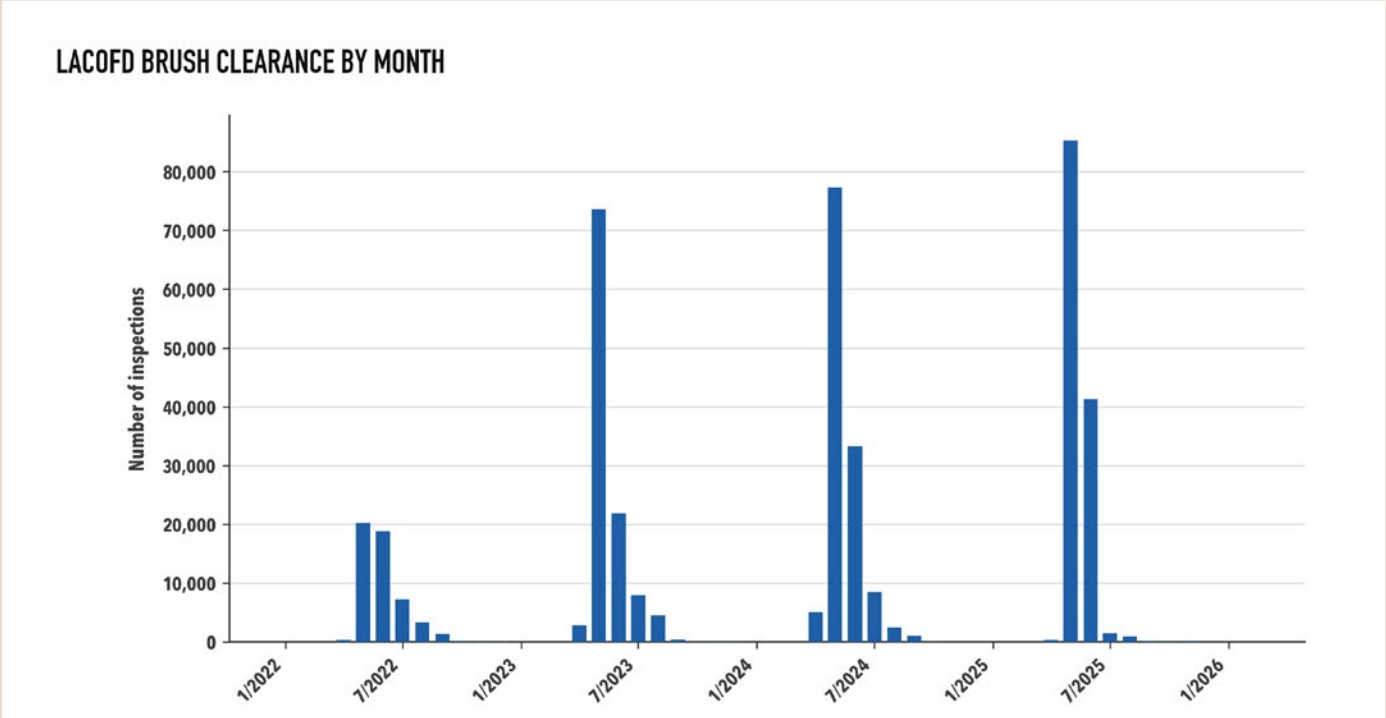


Figure 6.4.4 LACoFD defensible space inspections shown by month indicate concentration in the spring and early summer months (2022-2025).

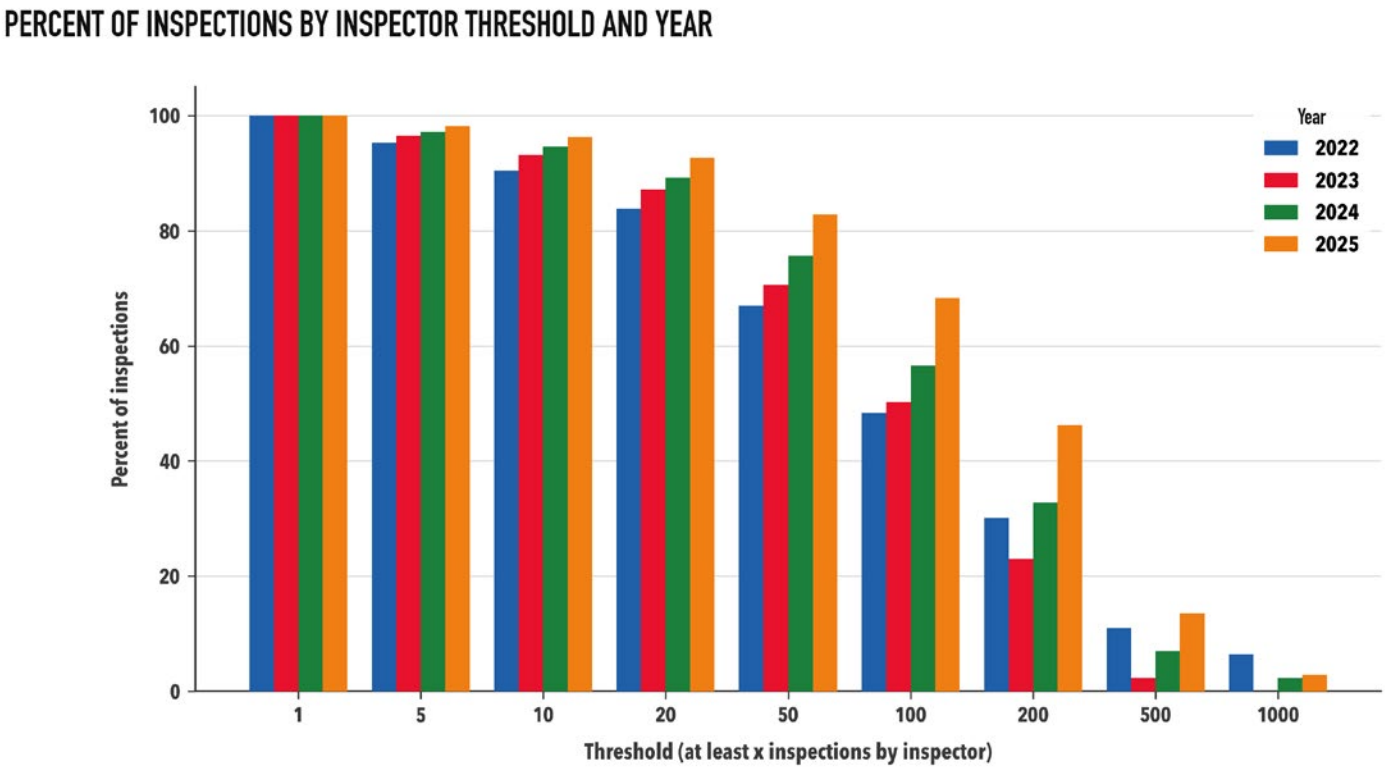


Figure 6.4.5 LACoFD inspection workload (2022-2025).

LACoFD personnel confirmed that fire station crews primarily conduct initial inspections, while Forestry Unit personnel perform follow-up inspections, enforcement coordination, and more complex defensible space evaluations.

TDs also described weekly regional coordination meetings, in-house training drills, and quality assurance reviews intended to improve consistency across the large number of personnel participating in inspection activities.

Despite these efforts, staff acknowledged that variability in inspection interpretation, mitigation recommendations, and overall inspection quality can still occur across such a geographically large and operationally distributed system.

Key findings from inspection workload analysis include:

- Nearly 60% of inspectors performed fewer than 10 inspections over the four (4)-year study period, while only approximately 11% performed between 100 to more than 1,000 inspections each.
- Inspection activity was highly concentrated among a group of inspectors. Inspectors performing between 100 and 499 inspections accounted for approximately 49% of all inspections conducted during the study period.
- Inspectors performing more than 500 inspections represented a small minority of personnel (111 inspectors), but collectively accounted for more than 87,000 total inspections, indicating substantial workload concentration within the program.

Table 6.4.4:LACoFD inspection workload analysis (2022-2025).

Number of Inspections Performed	Number of Inspectors (%)	Total Number of Inspections (2022-2025)	Percentage of Total Inspections
1-4	4,935 (49%)	9,662	2.3
5-9	939 (9.5%)	7,220	1.7
10-19	938 (9.5%)	14,135	3.4
20-49	1,162 (11.8%)	38,452	9.2
50-99	771 (7.8%)	55,818	13.3
100-199	566 (5.7%)	80,410	19.2
200-499	419 (4.2%)	126,513	30.2
500-999	95 (1%)	63,562	15.2
1,000+	16 (0.2%)	23,790	5.7
TOTAL	9,841* (100%)	419,562	100

** Excludes 298 names as suspected anomalies*

Collectively, the workload data indicate that, although the program relies on broad departmental participation, a comparatively small subset of personnel conducts a disproportionate share of inspections.

This concentration may improve consistency among high-volume inspectors, but it also highlights operational dependence on a limited number of personnel to sustain annual inspection throughput and follow-up capacity.

Incomplete inspections represent an additional operational limitation affecting mitigation continuity and verification. Although incomplete inspections account for a relatively small percentage of overall activity (Table 6.4.5), barriers, including inaccessible parcels, locked gates, hazardous terrain, and vacant properties, can prevent verification of mitigation conditions in all locations.

These gaps remain operationally important to address, as untreated or unverified parcels may compromise defensible space continuity within high-exposure communities.

Table 6.4.5 LACoFD incomplete inspections (2022-2025).

Year	Number of Incomplete Inspections
2022	45
2023	87
2024	80
2025	173
Total Number of Incomplete Inspections	385

Inspection Performance and Compliance Outcomes

Table 6.4.6 shows that inspection activities were overwhelmingly brief, with 68% of inspections conducted in five minutes or less and nearly 99% completed within 15 minutes. Only 1.3% of inspections exceeded 15 minutes, illustrating the high-volume nature of the program and the limited time available for detailed parcel assessments.

Mean inspection durations averaged approximately eight (8) minutes across the study period, enabling high inspection throughput but potentially limiting the level of detail possible during individual parcel evaluations, particularly within complex hillside and urban-interface environments (Figure 6.4.3). Compliance rates averaged nearly 98 percent following completion of initial inspections (Table 6.4.7).

Table 6.4.6 LACoFD average time per inspection (2022-2025).

Time Spent Per Inspection	Number of Inspections	Percent of Total Inspections Performed
5 Minutes	285,783	68.2
15 Minutes	127,749	30.5
30 Minutes	5,218	1.2
45 Minutes	221	0.1
1 Hour	154	< 0.1
1.25 Hour	14	< 0.1
1.50 Hour	12	< 0.1
1.75 Hour	9	< 0.1
2 Hours	19	< 0.1
Total	419,179	99.99

Table 6.4.7 LACoFD inspection rate of compliance (2022-2025).

Inspection Year	Percent Compliance 1st Inspection	Percent Compliance 2nd Inspection	Percent Compliance 3rd Inspection
2022	96.4	99.0	99.5
2023	97.1	99.5	99.6
2024	98.6	99.7	99.8
2025	98.6	99.8	99.8
Overall Averages	97.9	99.6	99.7

While these compliance rates appear exceptionally high from an administrative perspective, post-fire observations and TD findings suggest that compliance metrics alone may not fully reflect wildfire resilience outcomes under extreme wind-driven fire conditions.

ULRI field observations conducted within portions of the Eaton Fire area less than 90 days after the fire, along with conversations with residents conducted within the fire perimeter, identified varying levels of defensible space conditions, differing levels of contact with LACoFD personnel, and inconsistent perceptions regarding inspector expertise and mitigation effectiveness.

These observations highlight an important distinction between administrative compliance and functional wildfire resilience.

Parcel-level compliance does not necessarily eliminate wildfire exposure pathways associated with:

- Ember intrusion
- Connective fuels
- Ornamental vegetation
- Adjacent untreated fuels
- Structure-to-structure fire spread
- Broader landscape fuel continuity

This distinction was also recognized by LACoFD personnel, who noted that current program effectiveness is measured primarily through inspection completion rates, workload accomplishment, and compliance outcomes rather than direct measures of wildfire resilience or structure survivability.

While these metrics provide valuable information regarding program activity and enforcement performance, they provide limited insight into whether mitigation actions ultimately reduce structure loss, interrupt fire spread, or improve community outcomes during extreme wildfire events.

Multiple TDs and guidance documents emphasized that mitigation effectiveness remains highly dependent on surrounding landscape conditions, including adjacent untreated fuels, parkland interfaces, canyon topography, and interconnected vegetation continuity across parcels and jurisdictions.

The Eaton Fire area illustrates this distinction particularly well, where substantial defensible space inspection activity and generally high levels of documented compliance existed prior to the January 2025 fire despite widespread structure loss within portions of the community.

Parcel-level defensible space inspection records within the Eaton Fire area (Figure 6.4.6) and Kinneloa Mesa community (Figure 6.4.7) indicate generally high levels of documented compliance prior to the January 2025 Eaton Fire.

There were scattered concentrations of properties exhibiting one (1) or more violations, but even fewer received citations due to continual non-compliance.

Note: *Defensible space inspection data from the fire agencies in Pasadena, Sierra Madre, Arcadia, and Monrovia are not included in these figures.*

The maps illustrate how defensible space implementation varies at the parcel scale within a community directly adjacent to wildland fuels and demonstrate the difficulty of achieving continuous mitigation conditions across interconnected residential environments.

Parcel-level defensible space inspection records within the La Viña and The Meadows communities similarly indicate generally high levels of documented compliance prior to the January 2025 Eaton Fire (Figure 6.4.8).

Compared with older or more irregular hillside development patterns, these communities exhibit more uniform parcel layouts and mitigation conditions, while still demonstrating the ongoing challenge of reducing wildfire exposure along community edges directly adjacent to wildland fuels.

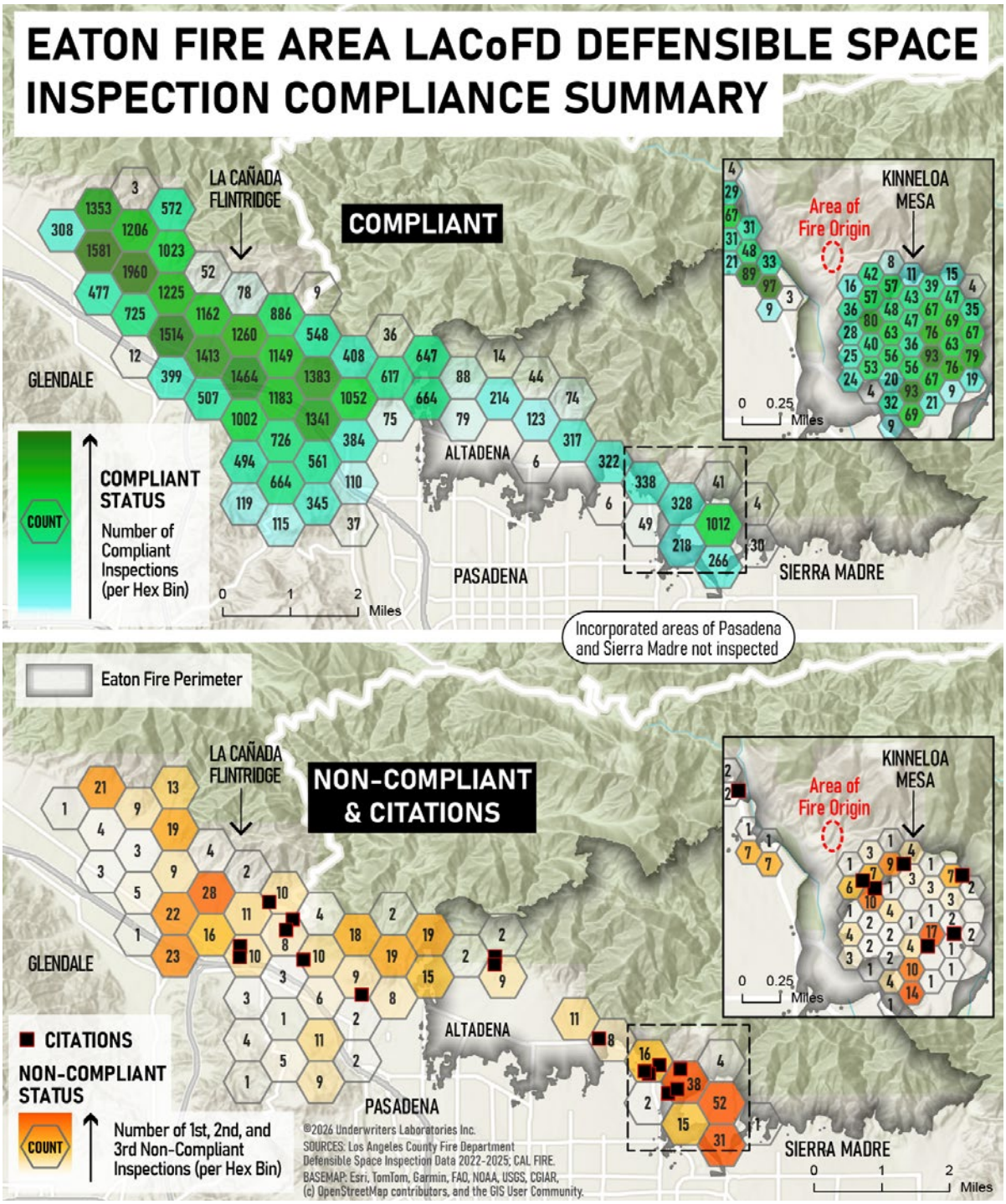


Figure 6.4.6 Defensible space inspection activity and compliance conditions in the Eaton Fire area.

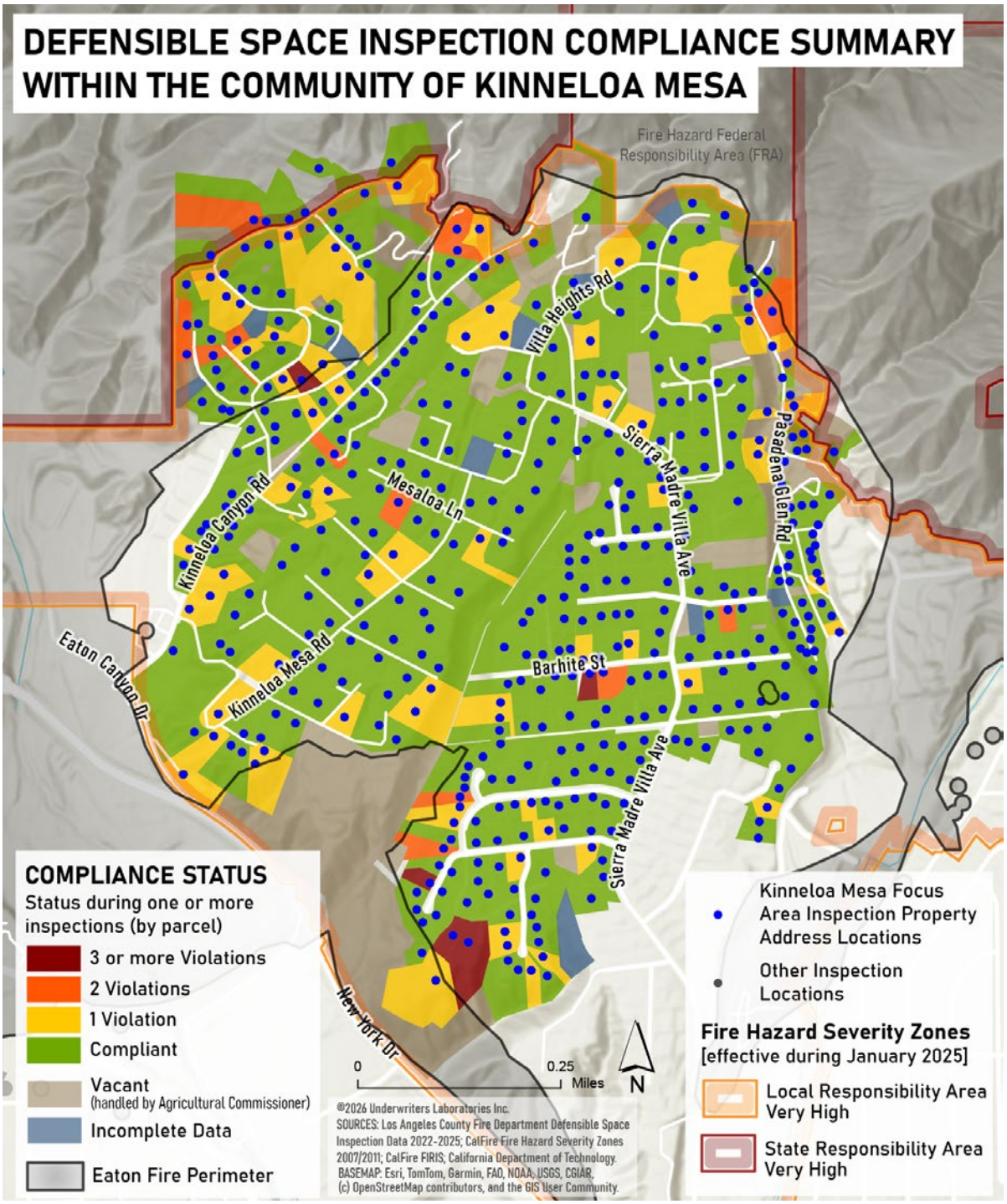


Figure 6.4.7 Defensible space inspection status in the Kinneloa Mesa community.

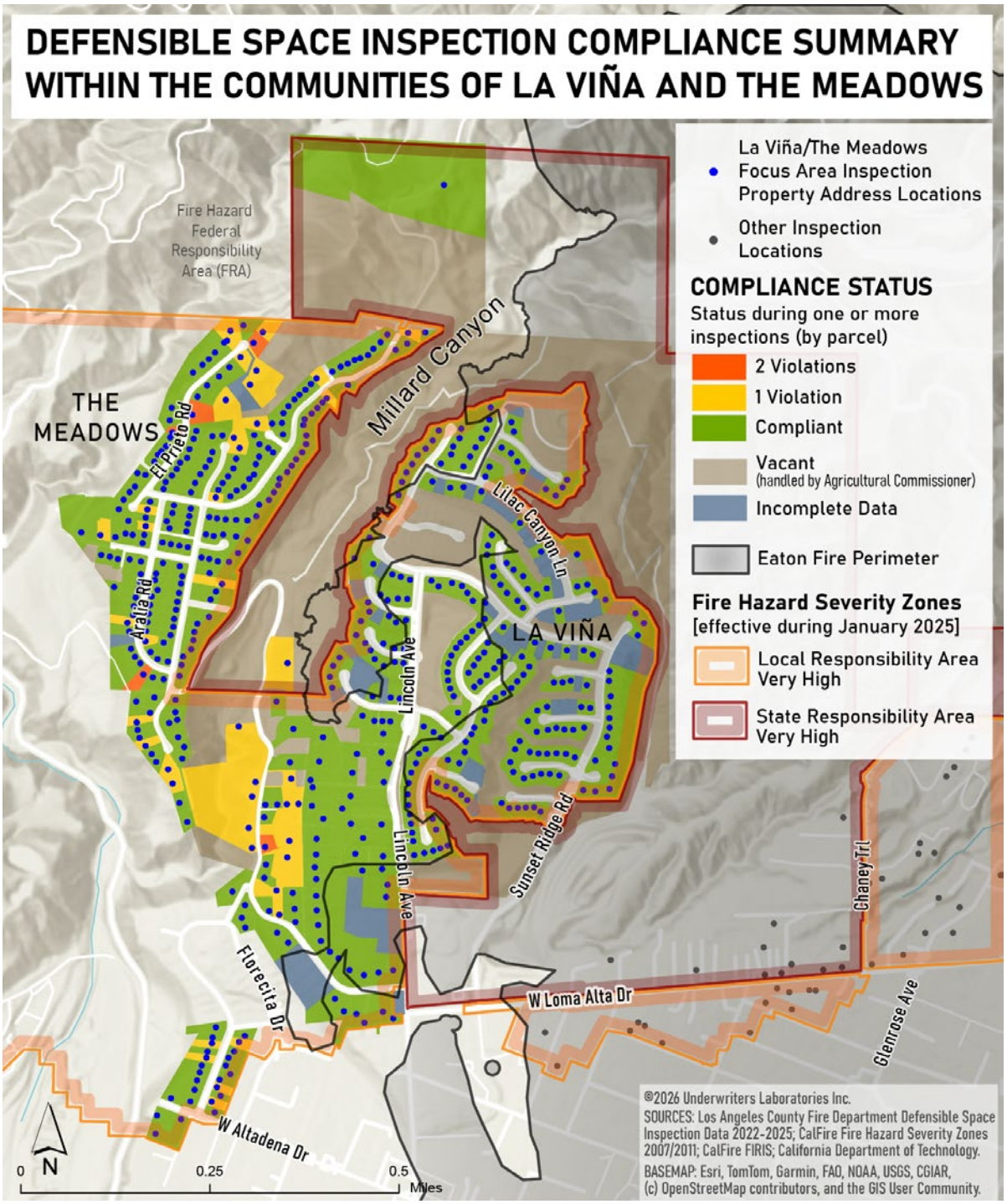


Figure 6.4.8 Defensible space inspection status in La Viña and The Meadows communities.

Collectively, the Eaton Fire examples demonstrate that documented parcel-level compliance can coexist with significant wildfire exposure where communities remain directly connected to surrounding wildland fuels, steep topography, ornamental vegetation, and interconnected built-environment fuel pathways.

Compliance rates should therefore be interpreted within the broader context of inspection methodology, enforcement thresholds, maintenance continuity, and community-scale exposure conditions rather than as standalone indicators of wildfire survivability.

TD participants emphasized that completion-based compliance metrics do not necessarily reflect wildfire resilience outcomes or structure survivability under extreme fire conditions.

During several TDs, it was noted that defensible space is most effective when applied holistically to reduce the full range of hazards known to contribute to fire spread and structure ignition, rather than focusing solely on vegetation management. They emphasized integration with:

- Home hardening
- Zone 0 implementation
- Structure spacing
- Reduction of connective fuels between structures

Compliance timelines further highlight implementation challenges, with an average of approximately 89 days required for properties to move from non-compliance to compliance. These delays reduce the effectiveness of defensible space as a time-sensitive mitigation strategy, particularly within rapidly curing fuel environments and during periods of elevated fire weather conditions.

The timing and concentration of inspection activity also raise questions regarding how inspection cycles align with Southern California's peak wind-driven fire season.

Based on the inspection activity data analyzed, the majority of annual brush clearance inspections appeared to be completed approximately 90 days before the onset of the region's most destructive Santa Ana wind-driven fire period, which historically occurs between October and January.

While this schedule may provide property owners additional time to achieve compliance, vegetation regrowth, fuel accumulation, maintenance lapses, and changing environmental conditions may occur prior to peak fire season.

As a result, inspection completion earlier in the year does not necessarily ensure vegetation conditions remain consistent with intended mitigation objectives during periods of highest wildfire exposure.

Inspection Violations

The most common violations identified during inspections are summarized by type and frequency in Table 6.4.8. Approximately 60% of the properties that were included in this table exhibited multiple violations, indicating that hazardous conditions frequently occur in combination rather than isolation.

The identified violation patterns appear generally consistent with other defensible space inspection programs throughout Southern California and reflect real-world fuel conditions recognized within statewide defensible space regulations.

Table 6.4.8 LACoFD inspection violation type and frequency (2022-2025).

Inspection Violation	Violation Count	Percent of Rows with Any Violation
E. Remove or separate live flammable ground cover and shrubs	5,046	48.7
C. Remove dead/dying trees, branches, shrubs, plants adjacent to or over buildings	4,868	47.0
D. Remove dead/dying grass, plants,shrubs, trees, branches, leaves, weeds and needles	3,883	37.5
G. Relocate exposed wood outside zone 1 unless covered in a fire resistive material	2,841	27.4
B. Remove leaves, needles or vegetation on roofs, gutters, decks, porches, stairways	2,293	22.1
F. Remove flammable items near combustible decks, balconies and stairways	1,158	11.2
A. Remove branches within 10 ft of any chimney or stovepipe outlet	1,094	10.6
H. Cut annual grasses and forbs to max height of 4 inches	589	5.7
I. Remove fuels in accordance with the fuel separation or CTC guidelines	504	4.9
M. Outbuildings and LPG tanks have 10 ft clearance and no flammable veg for additional 10 ft	373	3.6
K. Dead and dying woody surface fuels and aerial fuels shall be removed	306	3.0
O. Equip chimney or stovepipe openings with a 3/8-1/2 inch metal screen opening	285	2.8
N. Address # display contrast colors (four (4) inch minimum) and readable from street/access road	284	2.7
J. Exposed woodpiles have a minimum of 10 ft clearance, down to bare mineral soil	252	2.4
Q. All fire apparatus access roads shall have unobstructed vertical clearance of not less than 13 ft 6 inches	160	1.5
P. Maintain a minimum of 10 ft of defensible space from each side of a driveway	131	1.30
L. Logs or stumps embedded in the soil must be removed or isolated from other veg	75	0.7
R. Maintain a minimum of 10 ft of defensible space from public or private road adjacent to parcel	0	0.0

6.4.3 Los Angeles City and County Program Challenges

While both city and county defensible space programs operate under the same statewide regulatory framework, differences in geographic scale, land ownership patterns, staffing structure, and operational organization substantially influence implementation.

A particular challenge for county programs is that they must address extensive FRA, SRA, LRA, and intermix conditions while also coordinating across multiple jurisdictions, landowners, and public agencies.

Additional operational constraints further influence program effectiveness across both systems Inspection and enforcement activities require significant administrative coordination involving:

- Property owner communication
- Documentation
- Contractor coordination
- Appeals processes
- Follow-up verification activities

Jurisdictional limitations also restrict the ability to address hazards located outside local enforcement authority, particularly where residential communities directly interface with public lands or publicly managed open space.

LACoFD personnel described ongoing operational challenges associated with vegetation management adjacent to publicly owned lands, including State Parks and MRCA properties. They noted that encroachment permits may require environmental review, prescribed treatment conditions, and coordination with multiple agencies, potentially delaying or limiting implementation of adjacent fuel reduction activities.

The city program reflects challenges associated with concentrated staffing and extremely high inspection throughput, while the county program reflects the complexity of a highly distributed inspection system involving substantial variability in participation, inspection frequency, and operational consistency.

When considered together, both the city and county inspection data illustrate different, but complementary, operational constraints affecting program performance. Across both systems, common constraints include:

- High inspection volumes relative to staffing capacity
- Delayed compliance timelines
- Limitations in inspection depth
- Inconsistent treatment continuity
- Incomplete inspections
- Jurisdictional gaps affecting fuel mitigation continuity

Collectively, these conditions highlight an important distinction between regulatory intent and on-the-ground wildfire risk reduction outcomes. While defensible space requirements are well-defined and widely implemented, overall effectiveness remains constrained by operational scale, staffing capacity, environmental complexity, fuel continuity, and implementation consistency across interconnected landscapes.

The effectiveness of defensible space and vegetation management programs cannot be evaluated solely based on inspection completion or compliance rates, but rather on whether mitigation activities meaningfully reduce the likelihood of fire spread through the built environment during extreme wildfire conditions.

In Southern California's wind-driven, fast-fire environment, wildfire exposure is also strongly influenced by adjacent wildland fuel conditions, vegetation type, fuel continuity, topography, and ember production potential.

Dense mature chaparral communities can generate large quantities of embers capable of retaining heat and traveling long distances during high-wind events, increasing the potential for spot fire ignition and structure-to-structure fire spread even in areas where parcel-level vegetation management requirements have been implemented.

Program outcomes are also influenced by property owner behavior and community participation. Willingness to implement and maintain defensible space varies based on perceived responsibility, cost, fairness, aesthetics, and individual perceptions of wildfire risk, resulting in uneven mitigation conditions across communities.

These behavioral and social factors further reinforce that defensible space effectiveness depends not only on regulatory requirements, but also on sustained community-wide participation and long-term maintenance across interconnected WUI environments.[269]

6.4.4 Implementing Effective Defensible Space Programs

Defensible space programs implemented throughout the city and county demonstrate substantial scale, staffing commitment, and inspection activity. However, current implementation models face a wide range of operational constraints that may limit their ability to consistently interrupt wildfire spread within highly interconnected WUI environments.

These limitations become increasingly important when addressing risks for community conflagration, where fire spread is driven not only by wildland vegetation, but also by combustible fuels distributed throughout the built environment, including ornamental vegetation, fencing, decks, vehicles, and other near-home combustibles, as well as accessory structures and adjacent buildings.

TDs with LACoFD personnel emphasized the increasing importance of Zone 0 conditions, home hardening measures, and reduction of connective fuels immediately adjacent to structures.

LACoFD Forestry personnel described examples where structures with noncombustible near-home zones, reduced ember-entry vulnerabilities, and hardened construction features survived, de-spite widespread surrounding losses.

Personnel also emphasized that ornamental landscaping, attached vegetation, combustible fencing, and other near-home fuels increasingly contribute to fire spread within developed communities during extreme fire weather conditions, as illustrated in Figure 6.4.9.

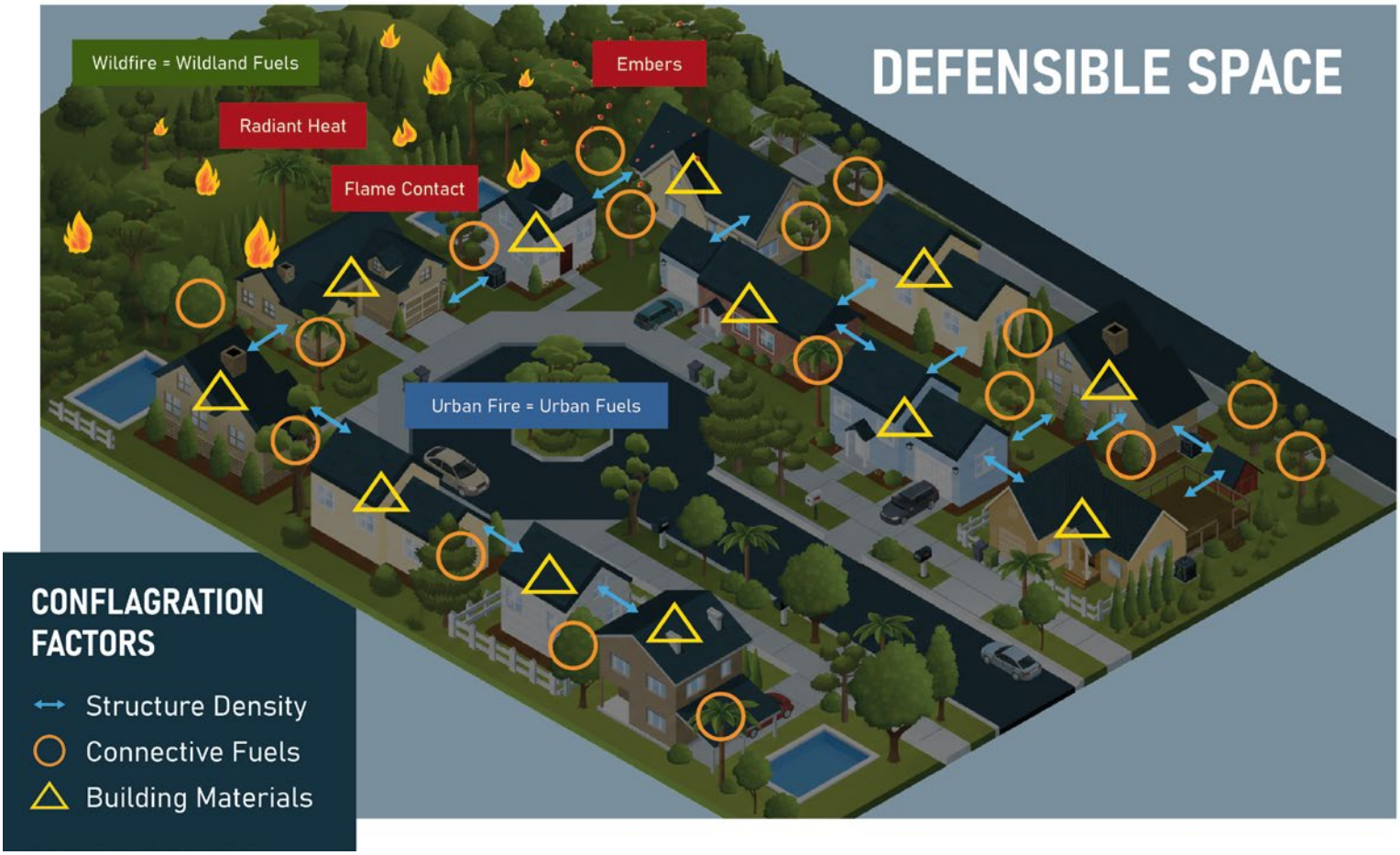


Figure 6.4.9 Conceptual illustration showing how continuous fuels can create interconnected wildfire spread pathways extending from wildland vegetation into transitional fuels, structures, and adjacent buildings across property boundaries, which can make isolated parcel-level mitigation be less effective.

The figure illustrates a key operational challenge identified throughout both city and county defensible space programs: wildfire spread increasingly occurs across interconnected fuel pathways spanning both natural and built environments.

Under these conditions, isolated parcel-level mitigation may provide reduced effectiveness where adjacent fuels, ornamental vegetation, structures, or connective combustible materials remain untreated across neighboring parcels and community edges.

While defensible space inspection programs administered by both LAFD and LACoFD operate at a large scale and inspect well over 100,000 parcels, differences in staffing structure, inspection practices, and available performance data described above illustrate the operational challenges associated with implementing wildfire mitigation programs across large and complex jurisdictions.

Both city and county programs operate under the same statewide defensible space requirements, but their implementation reflects different operational structures and constraints.

Although inspection coverage and compliance activity are substantial, the observed conditions suggest potential gaps between administrative program performance and measurable wildfire risk-reduction outcomes (Table 6.4.9).

Table 6.4.9 Defensible space program performance indicators.

Performance Metric	Observed Condition	Implication
Inspection Coverage	High (LAFD near 100%)	Coverage does not ensure risk reduction
Reinspection Rates	Incomplete in some areas	Non-compliant parcels remain unresolved
Time to Compliance	Extended (LACoFD average 89 days)	Mitigation may not occur before peak fire conditions
Inspection Duration	Short (LACoFD mean 8 minutes)	Limited ability to assess complex risk
Workforce Distribution	Uneven (LACoFD)	Variability in inspection quality and consistency
Seasonal Timing	Concentrated in late Spring	Misalignment with year-round fire risk

Collectively, the performance indicators demonstrate that inspection throughput and administrative compliance metrics do not necessarily equate to wildfire risk reduction outcomes under extreme fire conditions.

High inspection coverage may still coexist with unresolved fuel continuity, delayed mitigation, incomplete reinspections, or insufficient identification of more complex exposure conditions involving structure spacing, ember vulnerability, or interconnected built-environment fuels.

Several recurring operational constraints were identified across both systems and each is associated with fire risk implications (Table 6.4.10). These constraints influence implementation consistency, treatment continuity, and the ability to maintain defensible space effectiveness across interconnected landscapes.

Table 6.4.10 Los Angeles city and county defensible space inspection system constraints and risk implications.

Constraint	Description	Risk Implication
Staffing Capacity	High inspection volumes per inspector	Reduced inspection depth and follow-up
Enforcement Delays	Extended compliance timelines	Hazardous conditions persist during fire season
Inspection Model	Throughput-focused	Complex fuel conditions may be missed
Jurisdictional Limits	Public/adjacent lands untreated	Fuel continuity remains unbroken
Access Barriers	Locked, inaccessible properties	Gaps in mitigation coverage
Workforce Variability	Uneven inspection participation	Inconsistent implementation

City and county programs illustrate that defensible space effectiveness depends not only on regulatory compliance but also on the timely and consistent reduction of hazards that contribute to wildfire spread and structure ignition.

Findings from program records and TDs indicate that defensible space is most effective when implemented as part of a broader wildfire resilience strategy that integrates home hardening, Zone 0 mitigation, fuel continuity reduction, and coordinated risk-reduction efforts across parcels, neighborhoods, and jurisdictions.

Prevention findings and recommendations are included within Section 3.2 and the full list of findings and recommendations in Appendix Section 6.9.

6.5 Water System Detailed Information and Analysis

6.5.1 Southern California's Water Supply System

Establishing water supplies and moving water in California is accomplished through a complex system of federal, state, regional, and local entities. Water supplies at the retail level use a variety of sources, including groundwater, surface water, recycled water, desalinated water, and imported water.

Imported water supplies supplement locally sourced water supplies. Major importation systems are shown in Figure 6.5.1 and include the Los Angeles Aqueduct (LAA), Central Valley Project (CVP), Colorado River Aqueduct (CRA), and State Water Project (SWP).

Figure 6.5.1 Map of California's major water importation systems. Source: Department of Water Resources, CWP 2013.

Los Angeles Aqueduct

The LAA was built by the City of Los Angeles and started operation in 1913. The 233-mile-long facility delivers water that originates from the Eastern Sierra Nevada mountain range to Los Angeles. LAA water is treated at the Los Angeles Aqueduct Filtration Plant at the northern boundary of the city and is used in the storage and distribution system. This water supply was available to Los Angeles Department of Water and Power (LADWP) for firefighting efforts during the Palisades Fire.

Central Valley Project

CVP is a federal water project that delivers water originating in Northern California. The CVP was built by the U.S. Bureau of Reclamation and reaches approximately 400 miles from the Cascade Mountains near Redding to the Tehachapi Mountains near Bakersfield. It delivers water to over 250 water contractors in 29 counties. None of these contractors were impacted by the Palisades or Eaton Fires, and water from the CVP was not used during the fire events.

Colorado River Aqueduct

CRA is owned and operated by Metropolitan. The 242-mile facility delivers water originating at the Colorado River to Metropolitan's service area. Water from the CRA was available to Metropolitan member agencies during the fire events.

State Water Project

SWP is owned and operated by the California Department of Water Resources. The 444-mile system delivers water that originates in Northern California to 29 water contractors. SWP supplies stored in the system's southern reservoirs (i.e., Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris) were available for delivery during the Palisades and Eaton Fires. Metropolitan was the only SWP contractor impacted by the fires. Water from SWP was available to Metropolitan for use during the fire event.

Wholesale Water Providers

Metropolitan Water District of Southern California

Metropolitan is the major, regional supplier of wholesale water to Southern California. The service area for Metropolitan encompasses all, or portions of, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Metropolitan provides both treated and untreated water to its 26 member agencies.

These member agencies are both wholesale and retail water purveyors. This service area covers both the Palisades and Eaton Fire perimeters. More detailed information about Metropolitan can be found in Section 3.4.2.

Metropolitan's distribution system and reservoirs are shown in Figures 6.5.2 and 6.5.3.

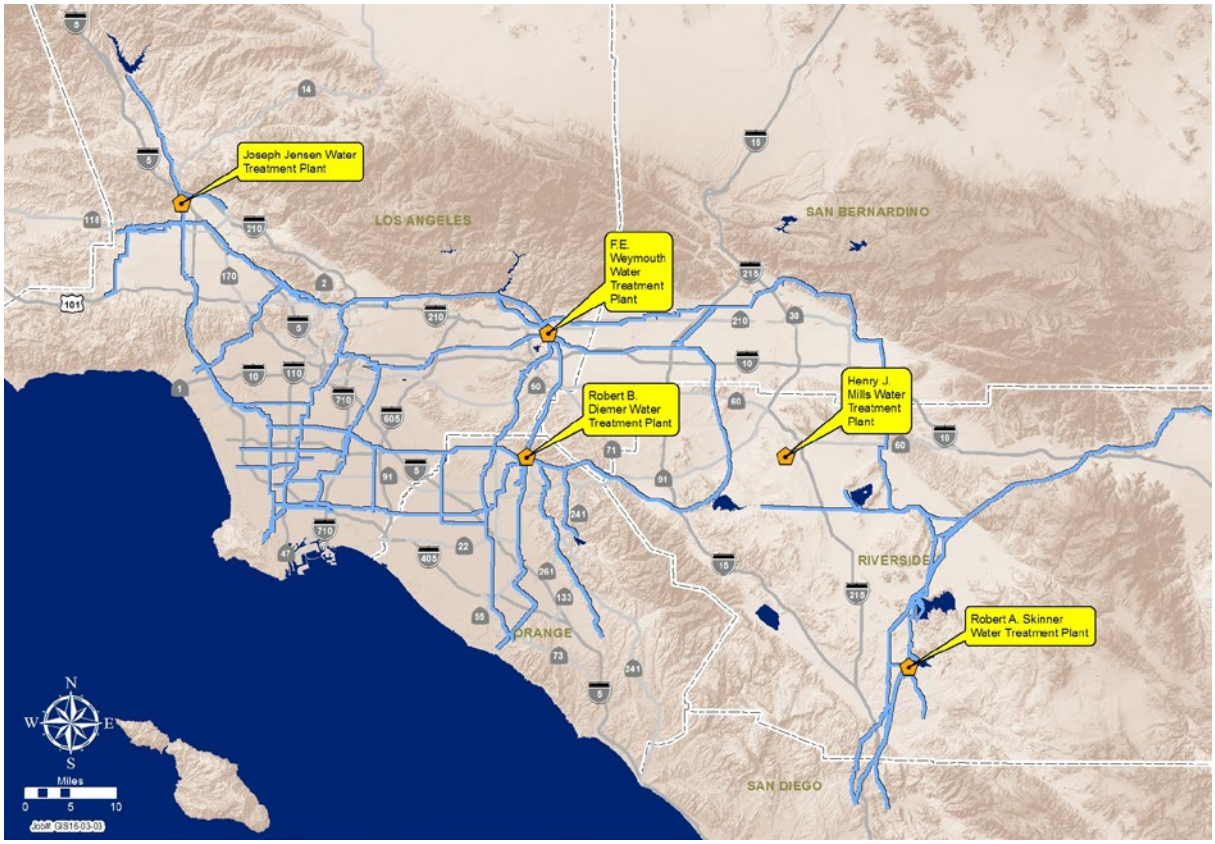


Figure 6.5.2 Metropolitan Water District of Southern California water treatment plants.

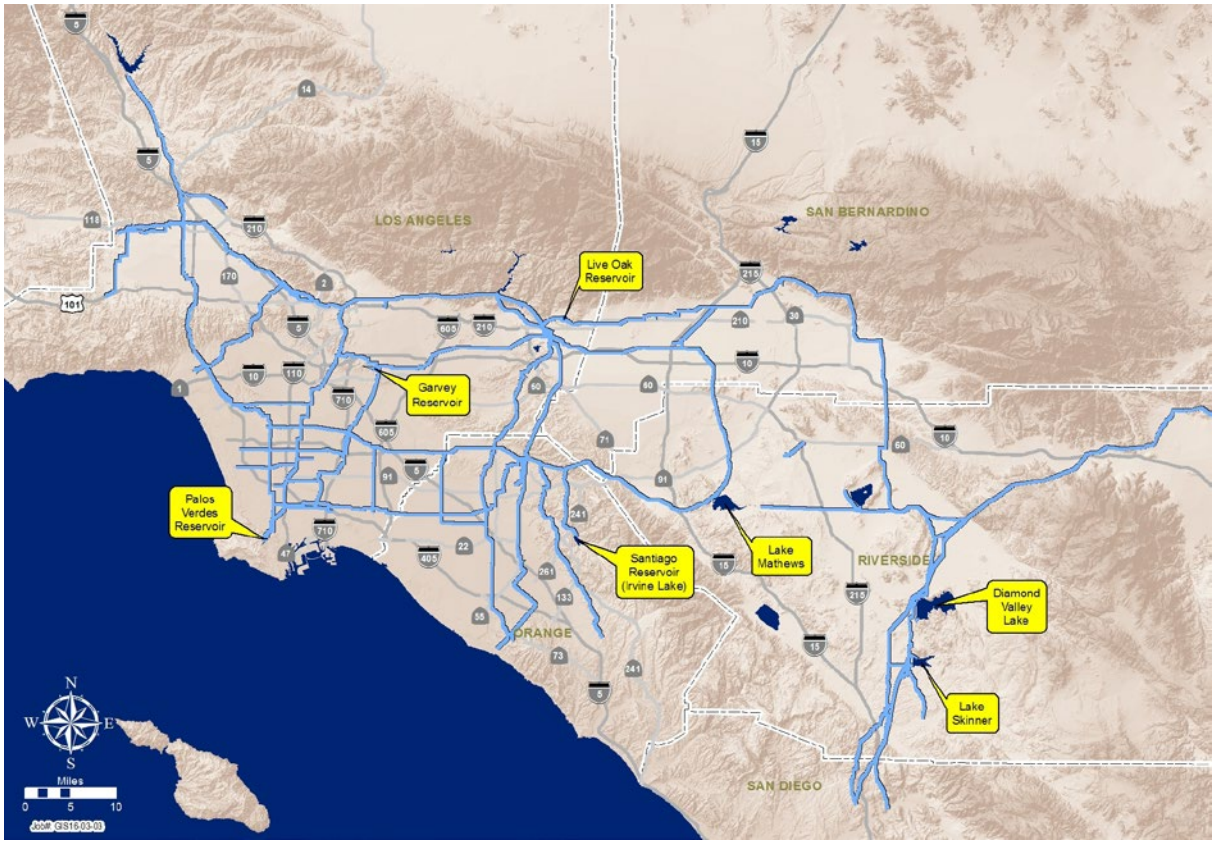


Figure 6.5.3 Metropolitan Water District of Southern California reservoirs.

West Basin Municipal Water District

The West Basin MWD provides wholesale imported water and produces recycled water for nearly one (1) million residents in 17 cities and unincorporated areas in Los Angeles County from two (2) sources. Imported water is supplied through service connections to Metropolitan, while recycled water is provided through West Basin's extensive recycled water distribution system.

West Basin's impact from the Palisades Fire was mostly within the Los Angeles County Waterworks District 29 area in Topanga and Malibu. Since West Basin's system was not directly used during the Palisades Fire, a detailed discussion of that system is not included in this report.

Foothill Municipal Water District

FMWD provides wholesale imported water to a service area in Los Angeles County of approximately 22 square miles. There are eight (8) retail agencies in FMWD's service area. Imported water is delivered using a treated water connection with Metropolitan that is pumped to a higher elevation for delivery and storage in FMWD's distribution system.

FMWD provides water for approximately 90,000 people in this service area. The eastern portion of FMWD's service area was severely impacted in the Eaton Fire. Additional information on FMWD is presented in Section 3.4.2.

6.5.2 Code-Based Water System Requirements for a Fire Event

In a residential area, the Water Code[270] requires a minimum flow of 1,000 gpm for a one (1)-hour duration, while maintaining a minimum pressure of 20 psi at fire hydrants used to combat the fire. The system shall also be designed to meet the maximum daily demand of the pressure zone while the fire event is active.

In commercial or industrial areas, the Water Code is more complex, taking into account building size, type of construction, and occupancy requirements. As such, it is calculated for buildings individually. The system is also designed to meet the maximum daily demand of the pressure zone while the fire event is active and maintaining a minimum pressure of 20 psi in the system.

The Water Code requirements are applied to the design of facilities in each pressure zone of an overall water distribution system and dictate the design of pumps, pipelines, storage, and pressure regulating facilities to meet the specific requirements of an area considering the type of development served.

A real-world example summarizing how storage is calculated for the 1645, 1345, and 1137 pressure zones of the LADWP system is included in Table 3.4.4 in Section 3.4.2.2.1.

Each water system pressure zone impacted by the Palisades and Eaton fires was designed to meet the operational requirements of the Water Code.

6.5.3 Water System Schematics

Las Virgenes Municipal Water District

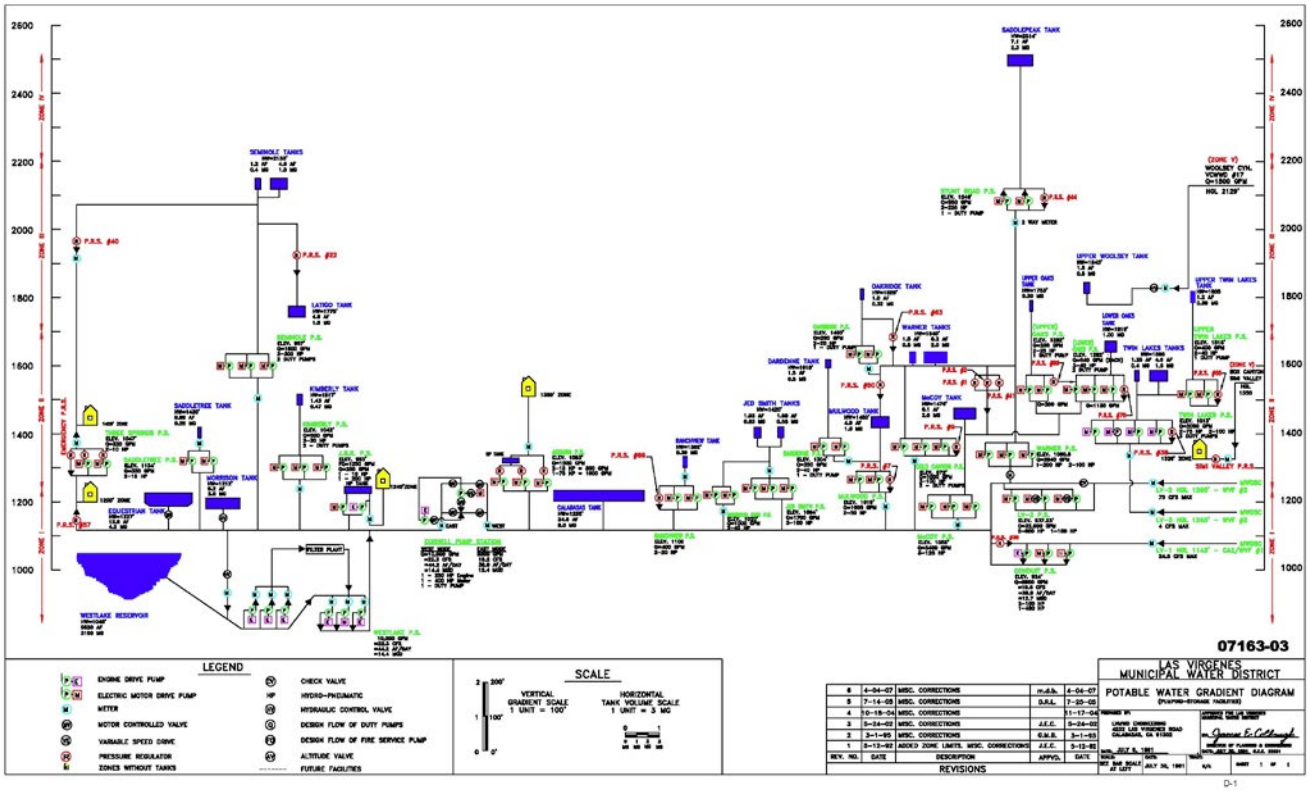


Figure 6.5.4 Las Virgenes Municipal Water District schematic of distribution system (2014).

Foothill Municipal Water District

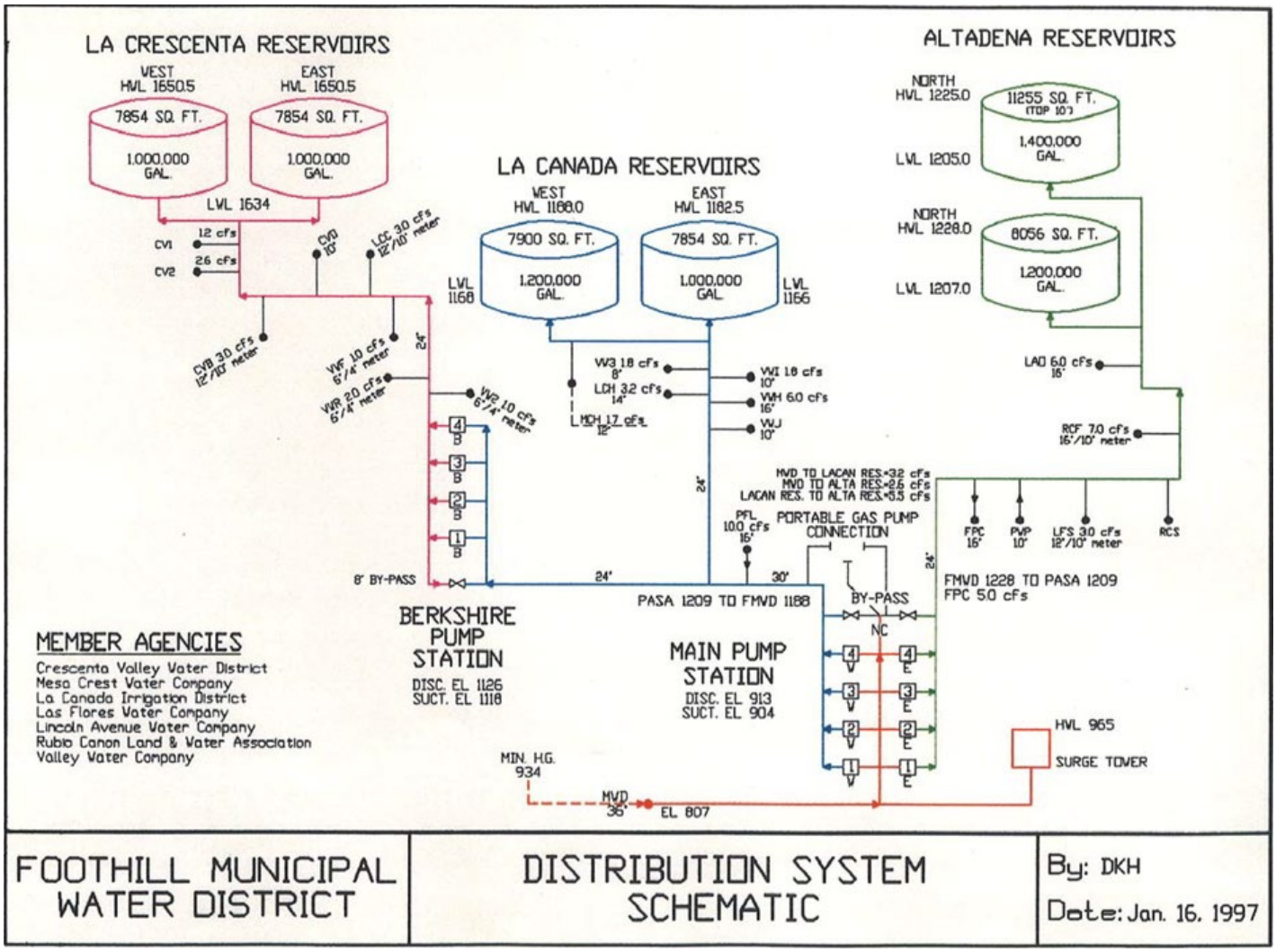


Figure 6.5.5 Foothill Municipal Water District distribution system schematic.

Pasadena Water and Power

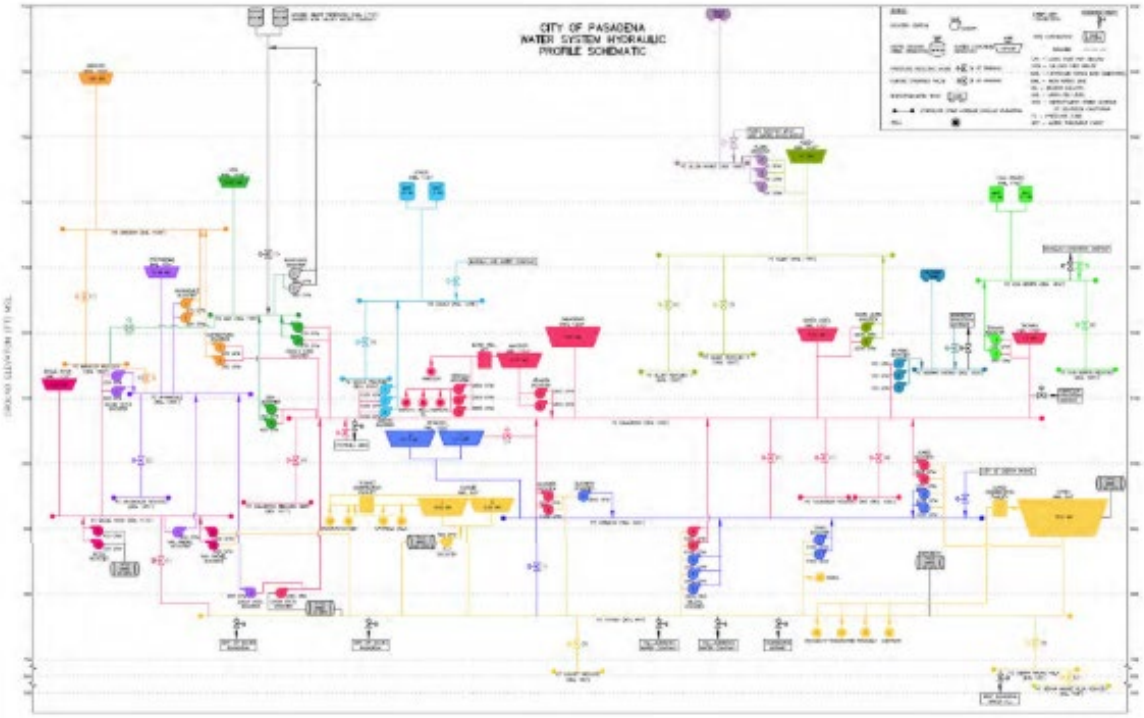


Figure 6.5.6 Pasadena Water and Power water system and resources plan.

6.5.4 Metropolitan Fire Experience Details

Metropolitan made a number of operational changes during the response to the January 2025 fire incidents to ensure flow and pressure were maintained in the distribution system in order to maintain supplemental water availability for firefighting efforts, which ultimately took effect on January 8, 2025. These included:

- Activated the EOC at 07:00 on January 8, 2025
- Moved staff from the Eagle Rock facility to the backup Operations Command Center at La Verne and Union Station between January 7-12, 2025
- Activated the Weymouth, Jensen, and Western Conveyance & Distribution ICPs
- Embedded a representative in the Los Angeles County EOC
- Delivered an emergency response trailer and embedded staff with CAL FIRE IMT at the Rose Bowl for the Eaton Fire coordination
- Embedded an agency representative in the Palisades Fire ICP on January 10, 2025
- Embedded an agency representative in the Hughes Fire ICP on January 22, 2025

Deliveries from Castaic Lake to the Jensen WTP were scheduled to be out for work on the Castaic Outlet Tower from January 6-12, 2025. Metropolitan coordinated with the California Department of Water Resources (DWR) to bring the outlet tower online and resumed deliveries to the Jensen WTP to provide water to LADWP at service connection LA-29. Delivery to the Jensen WTP began on January 9, 2025.

Prior to deliveries from Castaic Lake being available on January 8, 2025, the Greg Avenue Pumping Plant was activated to support delivery of water to LADWP.

Approximately 500 acre-feet (163 MG) of water was placed in Live Oak Reservoir, near the Weymouth WTP, for potential firefighting use (aerial filling from an open surface water reservoir). Deliveries from the Jensen, Weymouth, and Diemer WTPs were increased during the fire events to support affected agencies with supplemental water supplies.

Metropolitan also coordinated with LADWP to maintain flow at emergency service connection LA-29. Flows to LADWP began at 20:45 on January 8, 2025, and continued until 08:15 on January 9, 2025. Flow resumed for approximately 30 minutes on January 10, 2025, from 11:30-12:00.

Flow was reactivated at 10:45 on January 14, 2025, and continued uninterrupted until 23:45 on January 31, 2025, when the fire was declared extinguished.

Metropolitan also maintained flow through service connection WB-26 for delivery to Los Angeles County Waterworks District #29. Average daily flows through WB-26 peaked at 25 cfs on January 7, 2025 (Figure 6.5.7).

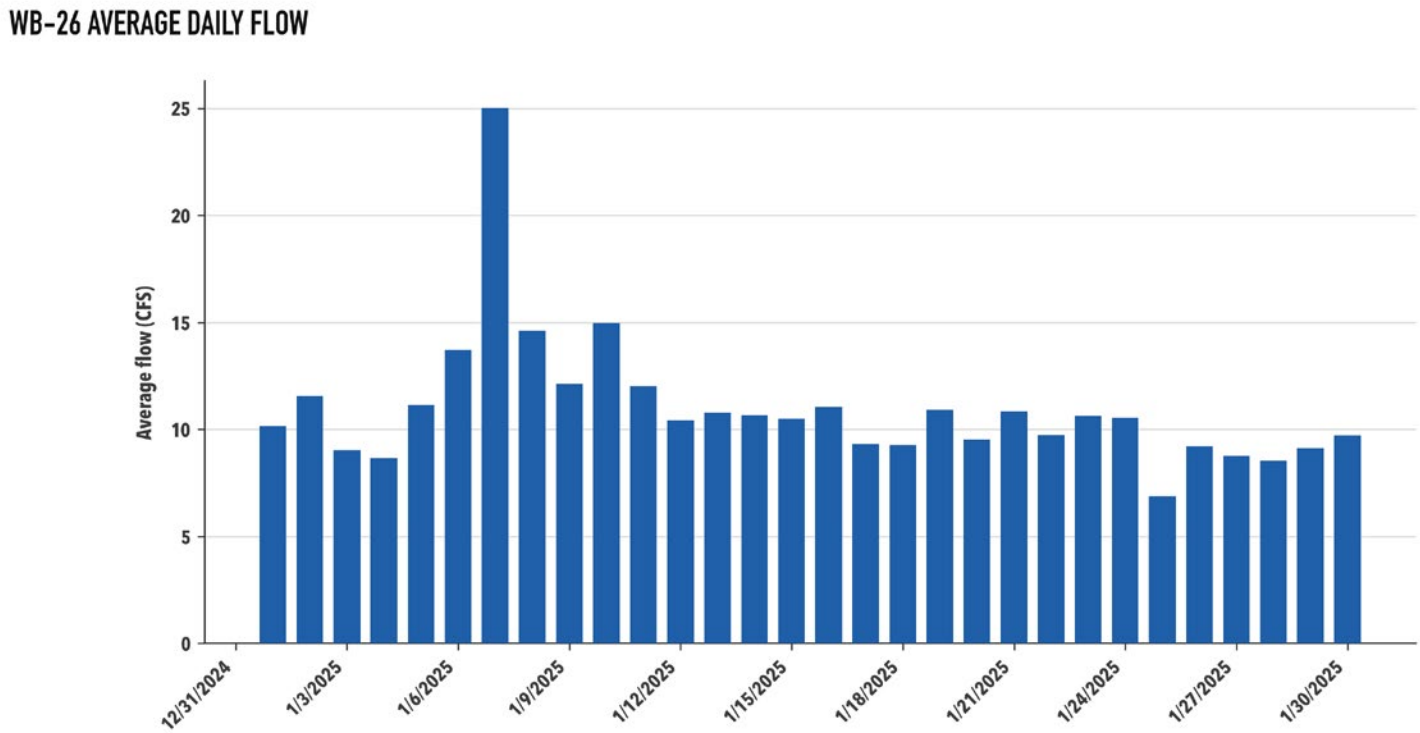


Figure 6.5.7 Average daily flows through WB-26. The increase on January 7, 2025, is reflective of the increased flow in the main coastal transmission line, in an attempt to provide additional water supply and increase system pressure to fire hydrants.

Raw water storage in the distribution system remained nearly constant over the course of the fire incident. Storage levels in SWP and Metropolitan reservoirs are shown in Table 6.5.1 and Figures 6.5.8 and 6.5.9, illustrating that high levels of storage were maintained throughout the Palisades and Eaton Fire incidents.

Table 6.5.1 Storage levels in the SWP and Metropolitan reservoirs during the January 2025 fires.

Reservoir	Capacity (acre-feet)	Percent Storage (January 2025)
Castaic Lake	325,000	76.1 - 77.4
Pyramid Lake	180,000	83.7 - 86.8
Lake Perris	131,452	80.1 - 81.8
Lake Silerwood	78,000	91.3 - 93.2
Diamond Valley Lake	810,000	97.1 - 97.3
Lake Mathews	182,000	81.8 - 86.3
Lake Skinner	44,200	85.6 - 92.2

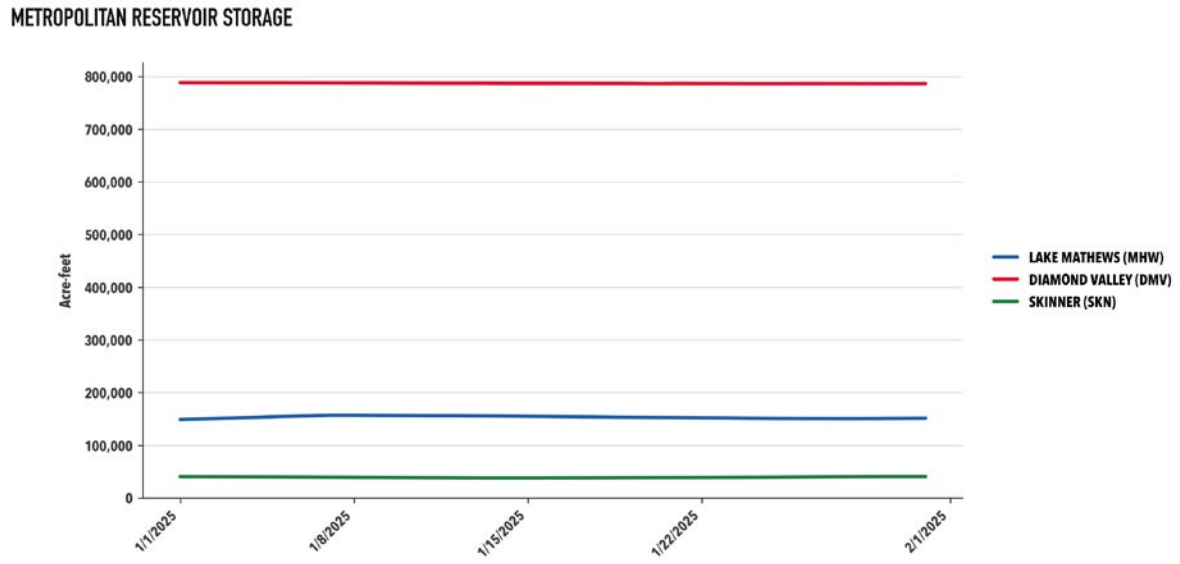


Figure 6.5.8 SWP reservoir storage levels remained stable throughout the fires.

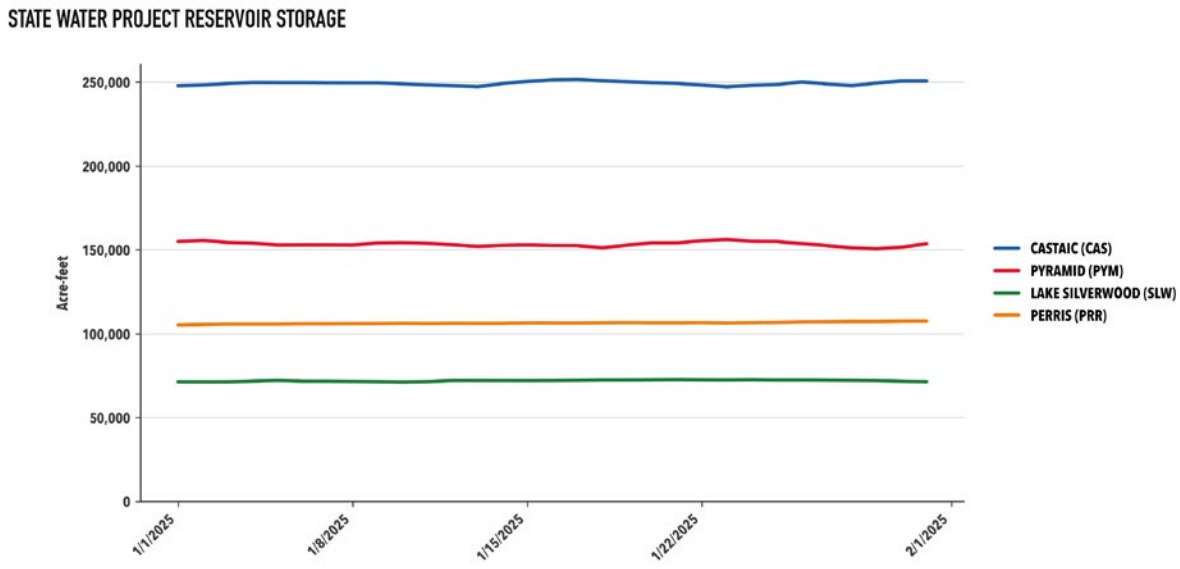


Figure 6.5.9 Metropolitan reservoir storage levels remained stable throughout the fires.

A number of facilities utilized emergency generators due to PSPS outages, including the Skinner WTP, Sepulveda Canyon PCS, Foothill PCS, and San Dimas PCS. Metropolitan's staff ensured that these facilities had diesel fuel for their backup generators.

6.5.5 Additional Water System Flow and Storage Level Data During Fires

Pasadena Water and Power

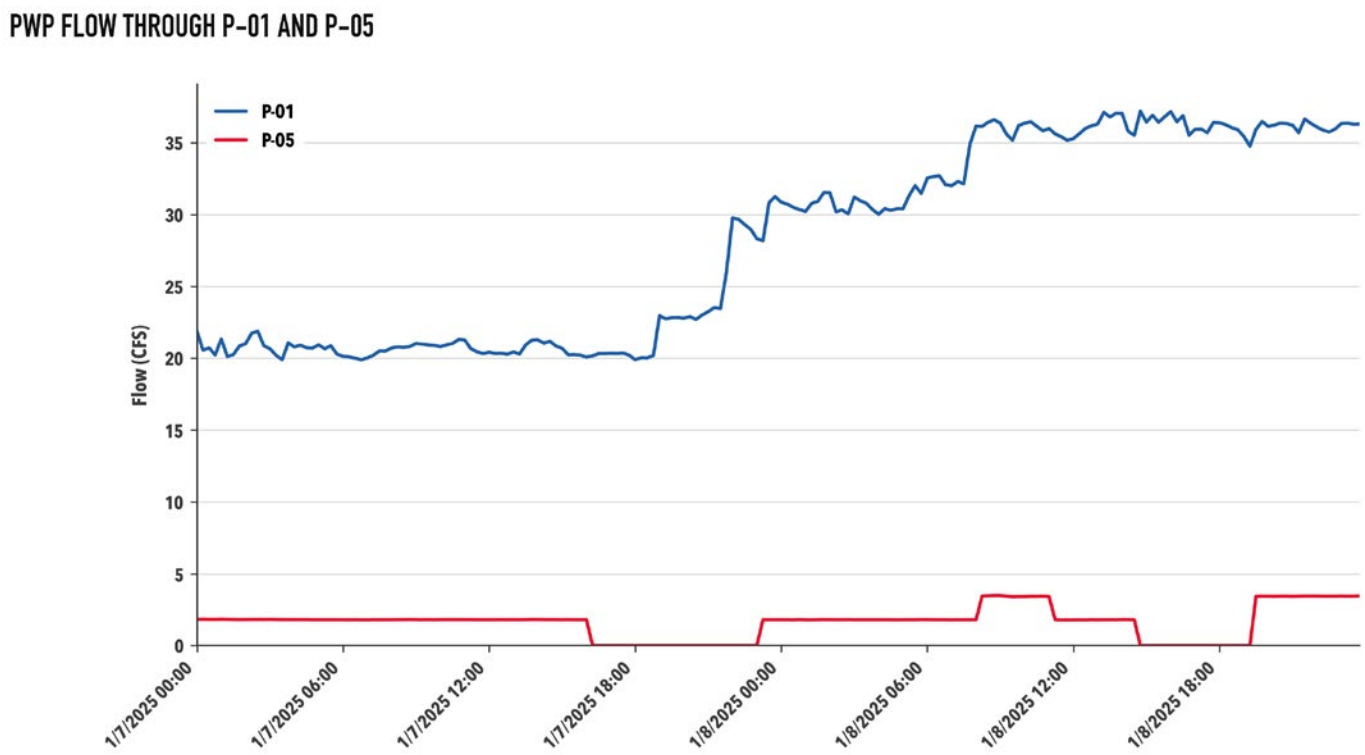


Figure 6.5.10 15-minute flow readings through PWP connections P-1 and P-5, January 7-8, 2025.

Rubio Cañon Land and Water Association

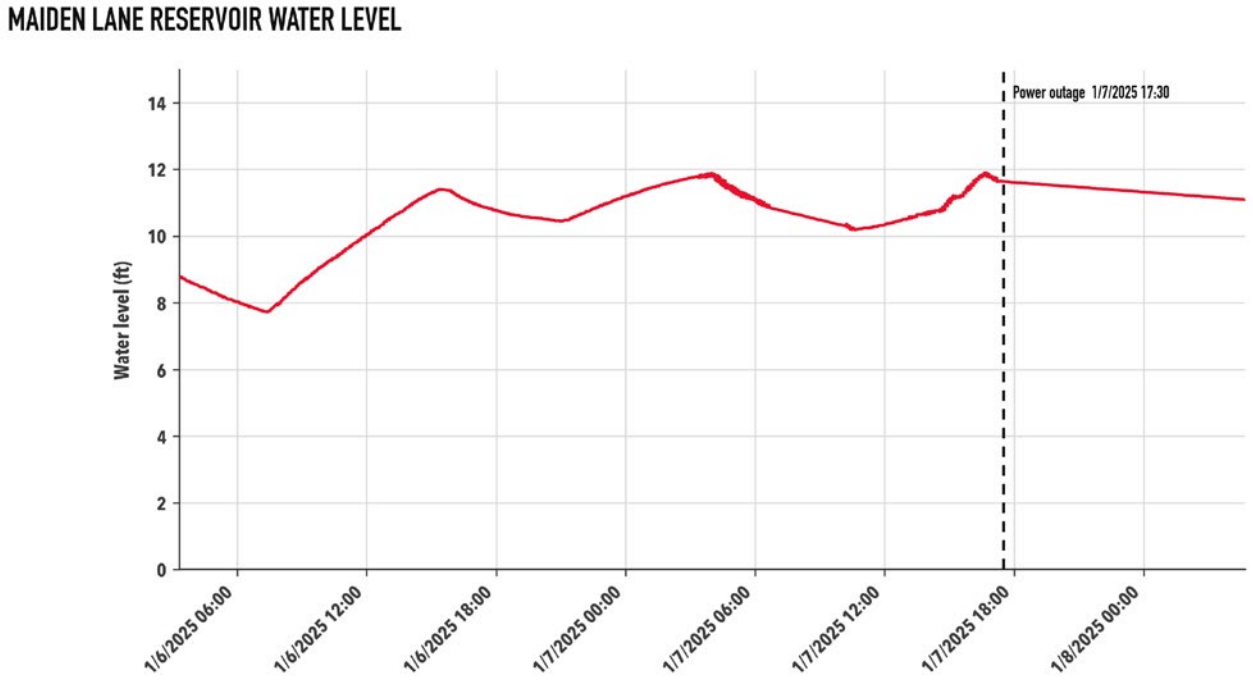


Figure 6.5.11 Maiden Lane Reservoir 1 water levels from January 6-8, 2025. Rubio Cañon Land and Water Association lost power around 17:30 January 7, 2025 and readings after this time are not reliable.

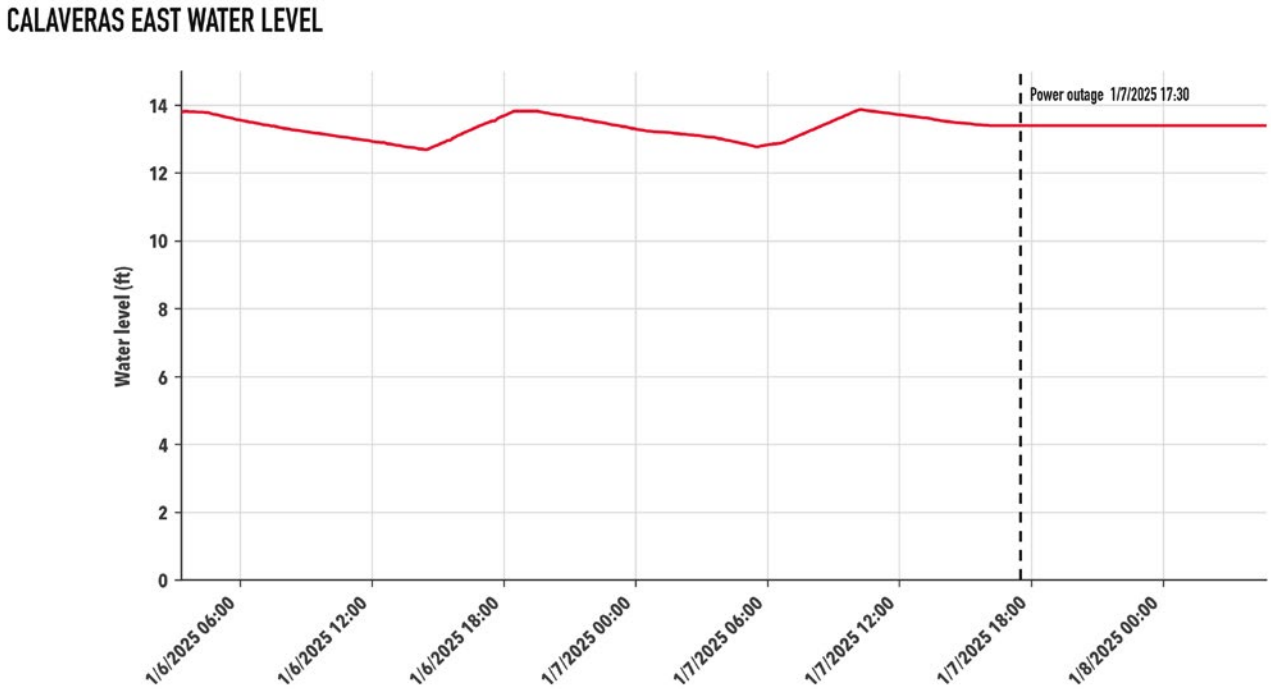


Figure 6.5.12 Calaveras East Reservoir water levels from January 6-8, 2025. Rubio Cañon Land and Water Association lost power around 17:30 January 7, 2025 and readings after this time are not reliable.

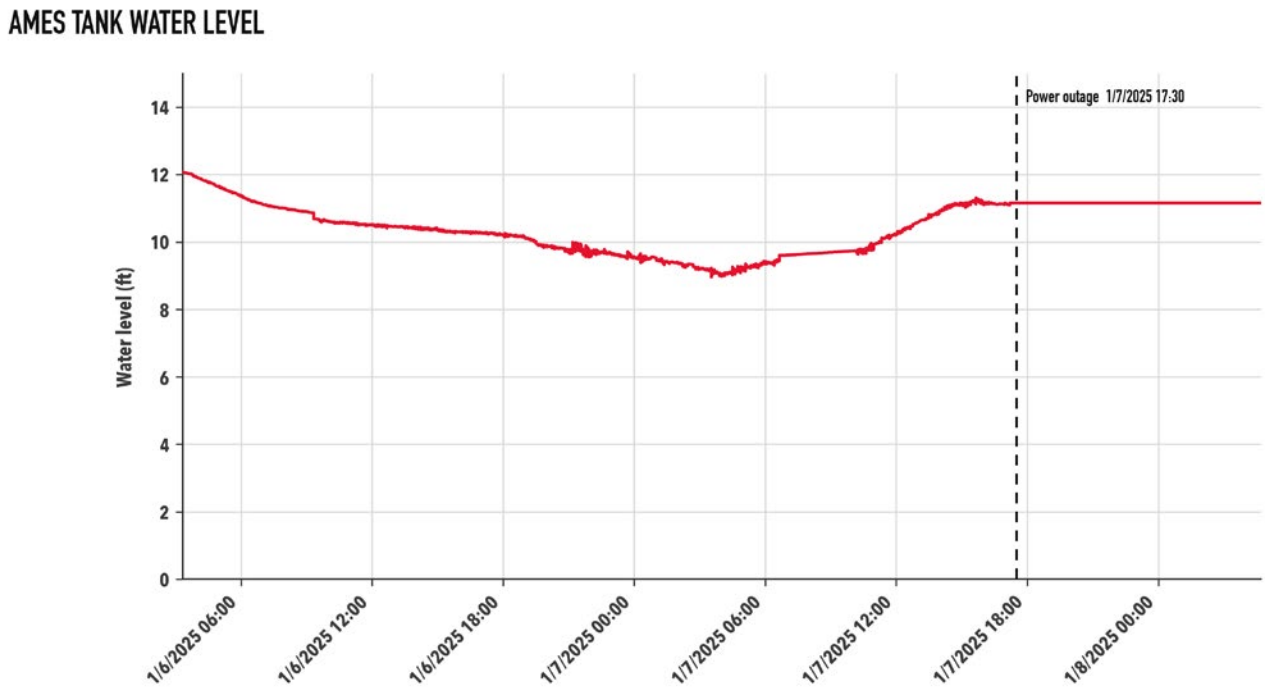


Figure 6.5.13 Ames Reservoir water levels from January 6-8, 2025. Rubio Cañon Land and Water Association lost power around 17:30 January 7, 2025 and readings after this time are not reliable.

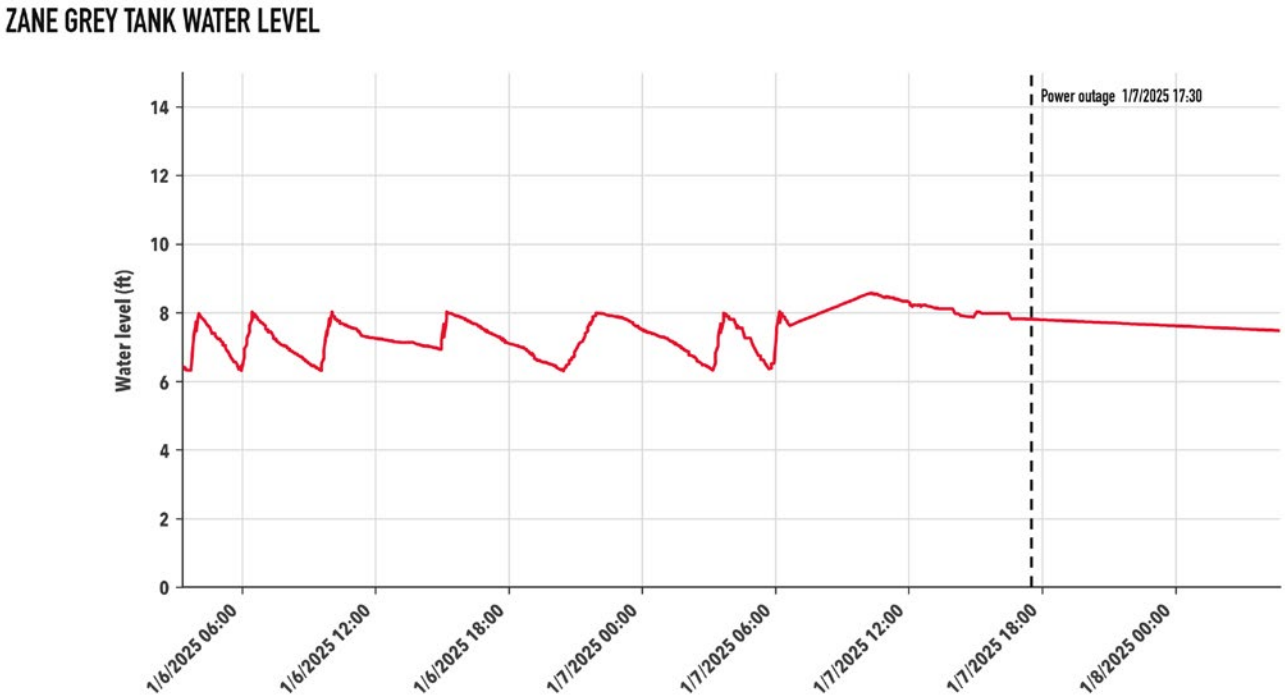


Figure 6.5.14 Zane Grey water levels from January 6-8, 2025. Rubio Cañon Land and Water Association lost power around 17:30 January 7, 2025 and readings after this time are not reliable.

6.6 Transportation System and Evacuation Data

6.6.1 Transportation Resident Survey Data

ULRI resident survey data, collected during personal conversations and online surveys, were reviewed for mentions of evacuation or movement of individuals within the fire evacuation areas. Of the 254 responses to ULRI's survey (Appendix Section 6.8), 229 contained information that was evacuation-related (69 responses for Palisades and 144 responses for Eaton).

The 16 evacuation responses that were unrelated to the Palisades or Eaton Fires pertained to other January 2025 fires listed in the survey.

Did you evacuate?

PALISADES
Yes: 48 (83%) No: 10 (17%)

EATON
Yes: 122 (92%) No: 11 (8%)

Number of reported evacuations that occurred on January 7, 2025:

PALISADES: 21

EATON: 9

Number of reported evacuations that occurred on January 8, 2025:

PALISADES: 17

EATON: 80

Did you encounter obstructions?

PALISADES
Yes: 15 No: 12

EATON
Yes: 41 No: 48

6.6.2 Body-Worn Camera Footage and Metadata

Law enforcement BWC footage was reviewed to evaluate vehicle movement during evacuation. Footage from first responders riding in the passenger seat, in particular, can provide useful visual validation of traffic signal status, whether roads are passable or impassable, and other disruptions encountered on the roadway network during an evacuation.

In addition to footage from the cameras, spatial metadata from the cameras allows for GPS location pings to be linked to visual markers, such as street signs, creating a dynamic map that interpolates vehicle speed during the evacuation. This resulting map is a reasonable extrapolation of the conditions that an evacuating resident would have encountered during their evacuation.

Due to limited access to Palisades Fire BWC from LAPD, no movement data was extrapolated for Pacific Palisades evacuations. For the Eaton Fire, LASD BWC footage was used to create a dynamic map of vehicle movement by capturing road speed and direction of travel in areas where deputies were engaged.

From this effort, no notable obstructions to evacuation were observed. Vehicle travel speeds were maintained within a reasonably expected range, at an average of 20 miles per hour.

Note that this is slower than posted speeds, but review of camera footage did not show congestion on the network; rather, the slower speeds may be the result of cautious driving and law enforcement's goal of visually assessing the surroundings rather than reaching a destination as quickly as possible.

While time-intensive, the process of reviewing and reconstructing a dynamic map of an evacuation event from BWC footage and metadata shows promise in understanding conditions of the roadway network during a period when limited data is available.

6.6.3 StreetLight Data

StreetLight Data is a transportation analytics platform that uses anonymized location data from mobile devices and connected vehicles to estimate travel patterns and behavior at various geographic and temporal scales. By processing large volumes of passively collected data, it provides insight into trip volumes, origins and destinations, travel times and speeds, and route choice.

The data is aggregated and modeled to protect privacy while ensuring sufficient sample data, making it well-suited for understanding broad travel trends where traditional data sources may be limited, unsuitable, or unavailable. For this analysis, StreetLight Data was provided by the Southern California Association of Governments (SCAG) through their local partner jurisdiction portal, with permission to use the data for this effort.

Hourly time frames for January 8, 2024, were used as the baseline period to compare data from January 7-8, 2025, as the study period. The data was aggregated to the Genasys evacuation zones along with evacuation status type (i.e., Advisory, Warning, Order). The hour-by-hour changes in overall vehicle activity (trips) by evacuation zone of the study period were compared to the baseline date of the Palisades and the Eaton Fire-affected areas.

More specifically, vehicle trips that started in an evacuation zone were isolated to ensure that only outbound trips were captured during the baseline and study periods. Table 6.6.1 summarizes the activity patterns that emerged from this analysis.

A 12-hour period was set for both the baseline and evacuation days, based on the hour of fire report for each area. The analysis included a comparison of overall trip-start activity across the entire study area between the baseline day and the evacuation day.

See Section 3.11.4.2 for results and discussion of this analysis.

Table 6.6.1 Summary of Streetlight Activity. Source: StreetLight Data, Fehr & Peers, 2026.

	Palisades Fire (10:00 - 22:00)	Eaton Fire (18:00 - 06:00)
Context	Mixed-use tourist attraction area, heavier activity under Baseline conditions. Daytime evacuation event triggered a short concentration of activity and then a drop off of activity compared to peak activity period under Baseline conditions	Residential area, lighter activity under Baseline conditions, especially after evening peak ends. Overnight evacuation event triggered heavy residential activity, compared to Baseline of activity
Total Baseline (2024)	210k trips	69k trips
Total Evacuation (2025)	180k trips	136k trips
Total Change	-30k trips (14% decrease)	+67k trips (97% increase)

6.7 Third-Party Emergency Notification Messaging

Third-party emergency notification and situational-awareness applications have emerged in response to the public's demand for continuous, real-time information during disasters, often filling gaps between official alerts and the rapidly evolving conditions experienced on the ground.

Platforms such as Watch Duty, Genasys Protect, PulsePoint, and similar services aggregate and organize information from authoritative sources, including incident command announcements, evacuation orders, NWS products, public safety radio traffic, CAL FIRE incident information, law enforcement updates, emergency management agencies, and other official communications.

These tools do not replace government warning systems; instead, they synthesize and disseminate information through user-friendly maps, notifications, and status updates, providing situational awareness for residents seeking frequent updates.

During the January 2025 fires in Southern California, many residents reported relying on third-party applications — particularly Watch Duty — which became one of the most frequently referenced and trusted sources of incident information throughout both the Palisades and Eaton Fires.

Watch Duty is a free, non-profit, public-access wildfire monitoring and alert platform that provides real-time information on wildfire incidents, including evacuation information. During the January 2025 fires, Watch Duty relied on official Los Angeles City and County emergency responder radio communications and a network of local, on-the-ground volunteers who provided real-time information on conditions.

Watch Duty was able to rapidly relay information from frontline responders directly to the public, often disseminating updates more quickly than official notification systems. In addition to relaying official evacuation notices mentioned during incident radio communications and issued through Genasys, Watch Duty also provided the public with timely situational awareness throughout the incidents.

The platform issued notifications for both the Palisades and Eaton Fires within five (5) minutes of the initial reports and continued to provide timely updates throughout each incident.

According to Watch Duty's internal AAR, notifications related to the Palisades Fire received more than 40 million page views, indicating that the platform served as a source of information during the emergencies and in their aftermath. (Note: Watch Duty information did not include the geographical location of message recipients or the time frames in which messages were viewed.)

One example of Watch Duty providing information ahead of official notifications involved Genasys Zone LOS-Q0767.

As depicted in Figure 6.7.1, at 11:04 on January 7, 2025, Watch Duty posted an update stating that "radio traffic indicates that resources are actively engaged in structure protection and that the fire will impact structures in the Floresta Place area in approximately 10 minutes," while also reporting "significant spotting out to 1/2 to 3/4 mile."

This update indicated an immediate threat to residents within LOS-Q0767, a risk that was further reinforced by subsequent Watch Duty reports detailing the fire's location, spread, and severity. An official evacuation order for the zone was issued at 12:41, more than 1.5 hours later.

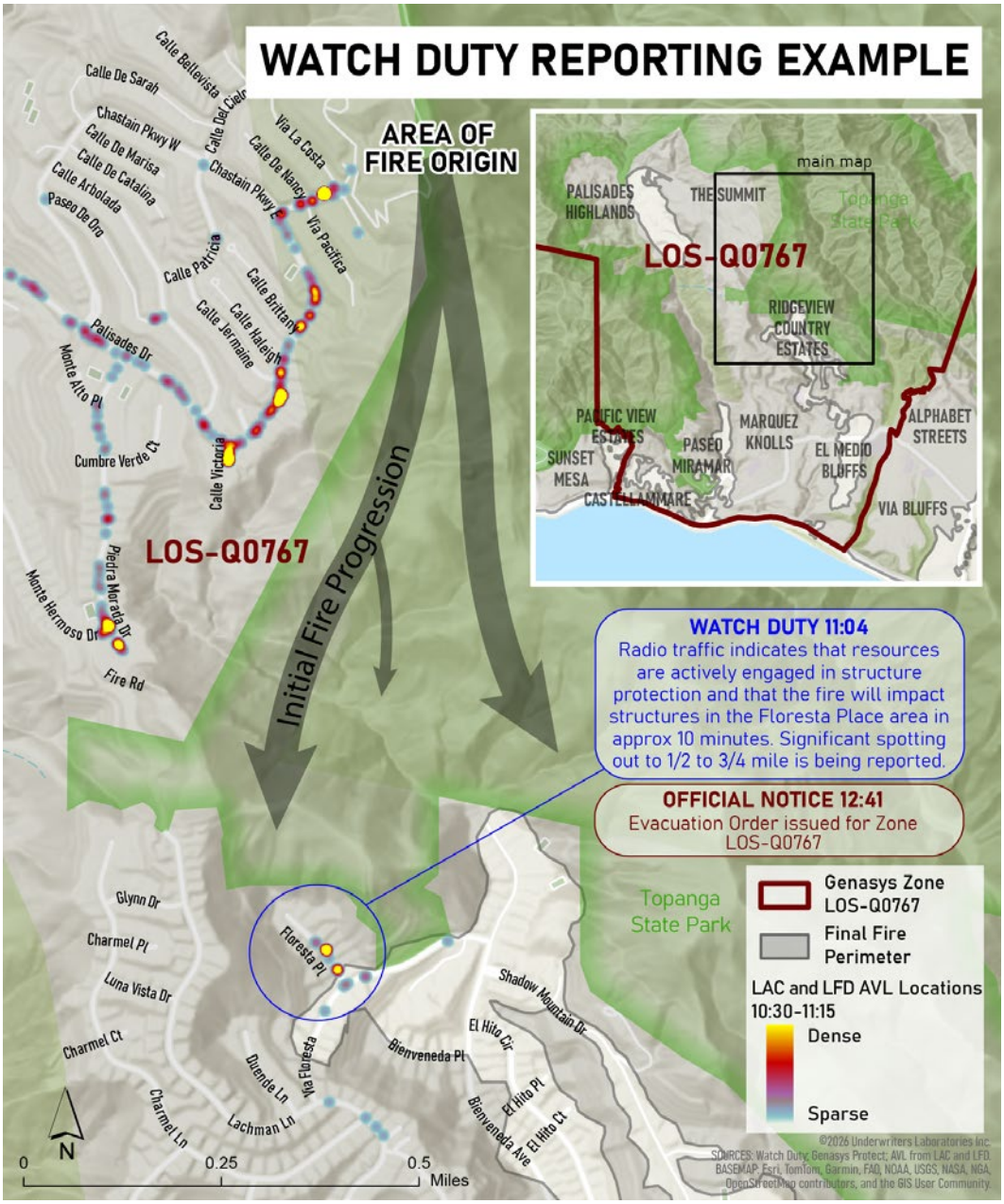


Figure 6.7.1 Example of Watch Duty's ability to capture critical incident information and alert residents of the fire's location and the potential for evacuation well before an evacuation alert was sent.

This example highlights the role that third-party information platforms can play during rapidly evolving emergencies. When official notification systems experienced limitations — whether due to heavy user demand, technical issues, or delays in disseminating alerts — platforms such as Watch Duty may have served as an important supplementary channel for delivering time-sensitive information to the public.

The alerts and updates published by Watch Duty closely align with ULRI's reconstructed timeline of events and documented key developments related to fire behavior, evacuation orders, traffic conditions, road closures, and available resources such as evacuation shelters (see https://s.ul.org/fsri-califonia-data-p2).

6.8 Southern California Resident Survey

The following survey data was aggregated from resident conversations during numerous site visits to the Palisades and Eaton Fire perimeters and through an online survey tool.

The site visits took place from January 2025 through May 2025. Residents encountered during these visits were asked if they would be willing to share their experiences and answer survey questions listed below. Many residents also shared time-stamped and geo-referenced pictures and videos.

The survey was also accessible via a virtual link shared on ULRI's various social media channels. Flyers including a link to the survey were also distributed at community gatherings. The survey and flyers were available in English, Castilian (Spain) Spanish, and Latin American Spanish.

Some questions were fill-in, resulting in a wide range of responses. These responses are not included in the summary data.

Figure 6.8.1 displays the resident survey participant location of those disclosing their addresses relative to the Palisades and Eaton Fire perimeters.

Responses to survey questions are tabulated below. For some tables, the column "All Response" included data from each respondent, regardless of Fire location and may not equal the sum of the Palisades and Eaton Fire respondents. Note that percentages within each category may not add up to 100% due to rounding of the results.

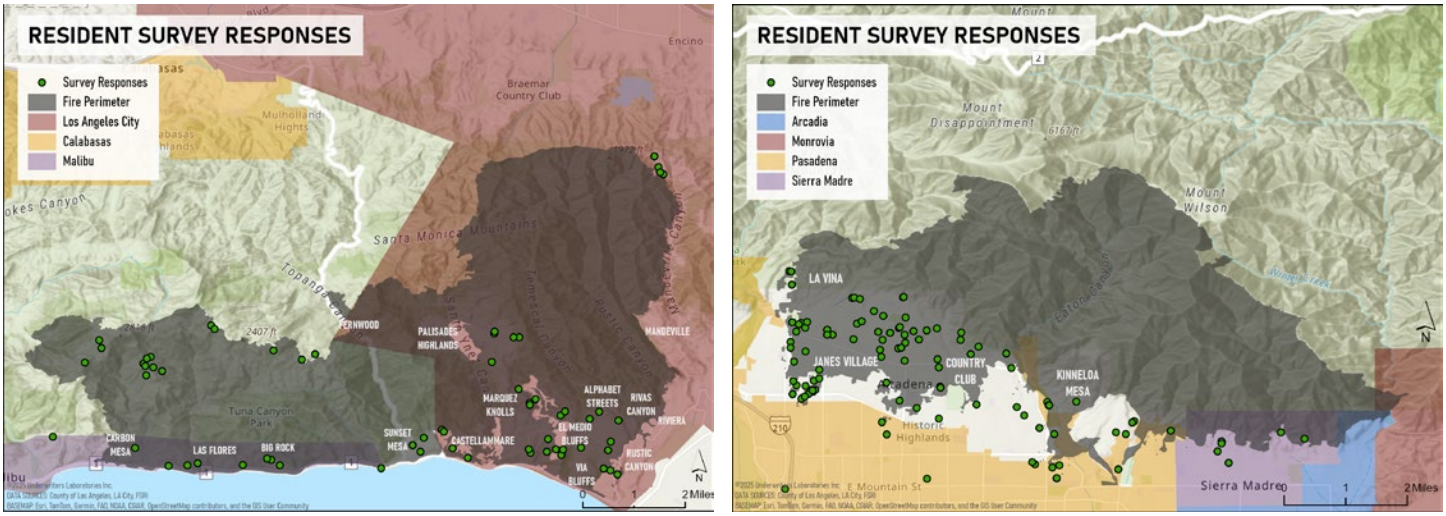


Figure 6.8.1 Resident survey respondent locations relative to Palisades and Eaton Fire perimeters.

1. How long have you lived in Southern California?

Answer	All Responses	Palisades	Eaton
Less than 1 year	3.6% (6/168)	2.3% (1/44)	0.9% (1/111)
1-5 years	3.6% (6/168)	4.6% (2/44)	1.8% (2/111)
6-10 years	5.4% (9/168)	-	6.3% (7/111)
11-15 years	1.8% (3/168)	-	2.7% (3/111)
More than 15 years	85.7% (144/168)	93.2% (41/44)	88.3% (98/111)

2. What LA Fire area do you live within?

Eaton	65.0%	(145/223)
Palisades	32.3%	(72/223)
Sunset	0.9%	(2/223)
Hurst	0.5%	(1/223)
Lidia	0.5%	(1/223)
Kenneth	0.5%	(1/223)
Hughes	0.5%	(1/223)

3. Were you aware in advance that the day of the fire was going to be a windy day?

Answer	All Responses	Palisades	Eaton
Yes	92.0% (160/174)	92.0% (46/50)	92.0% (104/113)
No	8.0% (14/174)	8.0% (4/50)	8.0% (9/113)

4. How would you describe the intensity of wind you encountered during the January 2025 fires? 1 = no wind to 5 = greatest wind velocity experienced

Answer	All Responses	Palisades	Eaton
1	1.1% (2/177)	4.8% (2/42)	-
2	2.3% (4/177)	2.4% (1/42)	1.6% (2/124)
3	6.8% (12/177)	11.9% (5/42)	5.7% (7/124)
4	33.9% (60/177)	35.7% (15/42)	33.1% (41/124)
5	55.9% (99/177)	45.2% (19/42)	59.7% (74/124)

5. Did you lose electricity on January 7 or sometime during the fire?

Answer	All Responses	Palisades	Eaton
Yes	72.7% (125/172)	60.5% (26/43)	79.3% (96/121)
No	27.3% (47/172)	39.5% (17/43)	20.7% (25/121)

6. What day and approximately what time did you become aware that you lost electricity?

Answer	All Responses	Palisades	Eaton
January 6, 2025	4.4% (4/90)	-	5.1% (4/79)
January 7, 2025 00:00 to 04:00	1.1% (1/90)	11.1% (1/9)	-
January 7, 2025 04:00 to 08:00	1.1% (1/90)	-	1.3% (1/79)
January 7, 2025 08:00 to 12:00	3.3% (3/90)	11.1% (1/9)	2.5% (2/79)
January 7, 2025 08:00 to 12:00	4.4% (4/90)	-	5.1% (4/79)
January 7, 2025 20:00 to 23:59	3.3% (3/90)	-	3.8% (3/79)
January 7, 2025 20:00 to 23:59	15.6% (14/90)	22.2% (2/9)	15.2% (12/79)
January 8, 2025 00:00 to 04:00	38.9% (35/90)	55.6% (5/9)	38.0% (30/79)
January 8, 2025 04:00 to 08:00	18.9% (17/90)	-	21.5% (17/79)
January 8, 2025 08:00 to 12:00	2.2% (2/90)	-	1.3% (1/79)
January 8, 2025 12:00 to 16:00	3.3% (3/90)	-	3.8% (3/79)
January 8, 2025 20:00 to 23:59	2.2% (2/90)	-	1.3% (1/79)
January 9, 2025	1.1% (1/90)	-	1.3% (1/79)

7. Did you lose water on January 7 or sometime during the fire?

Answer	All Responses	Palisades	Eaton
Yes	30.8% (45/146)	46.0% (17/37)	25.7% (27/105)
No	69.2% (101/146)	54.1% (20/37)	74.3% (78/105)

8. What day and approximately what time did you become aware that you lost water?

Answer	All Responses	Palisades	Eaton
January 7, 2025 08:00 to 12:00	4.5% (1/22)	16.7% (1/6)	-
January 7, 2025 08:00 to 12:00	4.5% (1/22)	16.7% (1/6)	-
January 8, 2025 00:00 to 04:00	9.1% (2/22)	33.3% (2/6)	-
January 8, 2025 04:00 to 08:00	4.5% (1/22)	-	6.2% (1/16)
January 8, 2025 08:00 to 12:00	18.2% (4/22)	33.3% (2/6)	12.5% (2/16)
January 8, 2025 12:00 to 16:00	13.6% (3/22)	-	18.8% (3/16)
January 8, 2025 16:00 to 20:00	13.6% (3/22)	-	18.8% (3/16)
January 8, 2025 20:00 to 23:59	27.3% (6/22)	-	37.5% (6/16)
January 9, 2025	4.5% (1/22)	-	6.2% (1/16)

9. Did you receive an emergency notification regarding the potential for high winds or fire danger at any point?

Answer	All Responses	Palisades	Eaton
Yes	50.7% (74/146)	50.0% (15/30)	51.4% (55/107)
No	49.3% (72/146)	50.0% (15/30)	48.6% (52/107)

10. What day and approximately what time did you receive the notification?

Answer	All Responses	Palisades	Eaton
January 7, 2025	2.8% (1/36)	20.0% (1/5)	-
January 7, 2025 00:00 to 04:00	5.6% (2/36)	20.0% (1/5)	3.3% (1/30)
January 7, 2025 12:00 to 16:00	5.6% (2/36)	-	6.7% (2/30)
January 7, 2025 00:00 to 23:59	5.6% (2/36)	40.0% (2/5)	-
January 8, 2025 00:00 to 04:00	41.7% (15/36)	20.0% (1/5)	46.7% (14/30)
January 8, 2025 04:00 to 08:00	11.1% (4/36)	-	13.3% (4/30)
January 8, 2025 08:00 to 12:00	22.2% (8/36)	-	26.7% (8/30)
January 8, 2025 12:00 to 16:00	2.8% (1/36)	-	3.3% (1/30)
January 8, 2025 20:00 to 23:59	2.8% (1/36)	-	-

11. How did you receive the notification?

Answer	All Responses	Palisades	Eaton
Cell phone emergency notification	51.5% (34/66)	38.5% (5/13)	58.0% (29/50)
Text message	37.9% (25/66)	30.8% (4/13)	42.0% (21/50)
Other	34.9% (23/66)	30.8% (4/13)	32.0% (16/50)
Phone call	3.0% (2/66)	7.7% (1/13)	2.0% (1/50)

Note: *24.2% of responses included multiple means of receiving evacuation notifications. Common "Other" responses included emails, local news, and word of mouth from neighbors or friends.*

12. Did you see or hear TV or radio newscasts regarding the high winds and high fire danger?

Answer	All Responses	Palisades	Eaton
Yes	63.5% (94/148)	78.8% (26/33)	57.0% (61/107)
No	36.5% (54/148)	21.2% (7/33)	43.0% (46/107)

13. Did you see the fire at any point on January 7th or thereafter?

Answer	All Responses	Palisades	Eaton
Yes	90.2% (175/194)	86.2% (50/58)	92.8% (116/125)
No	9.8% (19/194)	13.8% (8/58)	7.2% (9/125)

14. What day and at approximately what time did you first see the fire?

Answer	All Responses	Palisades	Eaton
January 7, 2025 00:00 to 04:00	1.4% (2/138)	-	2.0% (2/99)
January 7, 2025 08:00 to 12:00	1.4% (2/138)	-	1.0% (1/99)
January 7, 2025 12:00 to 16:00	2.2% (3/138)	-	3.0% (3/99)
January 7, 2025 16:00 to 20:00	18.1% (25/138)	61.8% (21/34)	3.0% (3/99)
January 7, 2025 20:00 to 23:59	1.4% (2/138)	5.9% (2/34)	-
January 8, 2025 00:00 to 04:00	50.7% (70/138)	23.5% (8/34)	61.6% (61/99)
January 8, 2025 04:00 to 08:00	10.1% (14/138)	5.9% (2/34)	12.1% (12/99)

14. What day and at approximately what time did you first see the fire? (cont.)

Answer	All Responses	Palisades	Eaton
January 8, 2025 08:00 to 12:00	6.5% (9/138)	-	9.1% (9/99)
January 8, 2025 12:00 to 16:00	3.6% (5/138)	2.9% (1/34)	4.0% (4/99)
January 8, 2025 16:00 to 20:00	1.4% (2/138)	-	2.0% (2/99)
January 8, 2025 20:00 to 23:59	2.2% (3/138)	-	2.0% (2/99)
January 9, 2025	0.7% (1/138)	-	-

15. Did it appear that your home was in the path of the fire when you first saw the fire?

Answer	All Responses	Palisades	Eaton
Yes	59.2% (84/142)	60.0% (21/35)	58.0% (58/100)
No	40.8% (58/142)	40.0% (14/35)	42.0% (42/100)

16. At any point did you see any structures on fire from your property?

Answer	All Responses	Palisades	Eaton
Yes	46.6% (62/133)	64.3% (18/28)	43.3% (42/97)
No	53.4% (71/133)	35.7% (10/28)	56.7% (55/97)

17. Did you take any actions to protect your home?

Answer	All Responses	Palisades	Eaton
Applied water to house or vegetation	66.0% (68/103)	78.1% (25/32)	63.6% (42/66)
Other	32.0% (33/103)	21.9% (7/32)	36.4% (24/66)
Cleared vegetation	17.5% (18/103)	15.6% (5/32)	31.8% (21/66)
Covered protected structure opening	10.7% (11/103)	12.5% (4/32)	10.6% (7/66)

Note: *26.2% of responses included multiple actions taken. Common "Other" responses included turning off gas and preparing water and tools to defend home.*

18. Did you use any tools to protect your home?

Answer	All Responses	Palisades	Eaton
Garden hose or sprinkler	76.0% (57/75)	76.0% (19/25)	80.4% (37/46)
Water bucket	26.7% (20/75)	28.0% (7/25)	39.1% (18/46)
Alternative water source	18.7% (14/75)	28.0% (7/25)	19.6% (9/46)
Other	14.7% (11/75)	24.0% (6/25)	15.2% (7/46)
Hand tools	9.3% (7/75)	4.0% (1/25)	10.9% (5/46)
Fire extinguisher	6.7% (5/75)	4.0% (1/25)	8.7% (4/46)

Note: *37.3% of responders reported that they used multiple types of tools to protect their homes.*

19. What prompted you to take protective actions?

Answer	All Responses	Palisades	Eaton
Conditions were worsening	42.5% (34/80)	34.8% (8/23)	47.2% (25/53)
Spot fires had ignited	42.4% (34/80)	56.5% (13/23)	37.7% (20/53)
I was about to evacuate	21.3% (17/80)	21.7% (5/23)	22.6% (12/53)
Part of a structure was on fire	18.8% (15/80)	13.0% (3/23)	20.8% (11/53)
Other	15.0% (12/80)	4.4% (1/23)	18.9% (10/53)
Someone told me to	7.5% (6/80)	4.4% (1/23)	9.4% (5/53)

Note: *36.3% of responders listed multiple reasons why they were prompted to take protective actions.*

20. Did you take any actions to prepare for first responders?

Answer	All Responses	Palisades	Eaton
Unlocked opened driveway gate	51.2% (22/43)	37.5% (3/8)	59.4% (19/32)
Other	32.6% (14/43)	37.5% (3/8)	31.3% (10/32)
Pulled out garden hoses	25.6% (11/43)	12.5% (1/8)	31.3% (10/32)
Removed potential hazards	18.6% (8/43)	12.5% (1/8)	18.8% (6/32)
Posted signage	11.6% (5/43)	12.5% (1/8)	9.4% (3/32)
Put out fire extinguishers	9.3% (4/43)	-	9.4% (3/32)

Note: *32.6% of responders listed multiple actions they took to prepare for first responders. Common "Other" responses included unlocking gates and doors and specifically mentioned turning off the gas.*

21. Do you have automatic fire sprinklers in your structure(s)?

Answer	All Responses	Palisades	Eaton
Yes	9.3% (12/129)	20.0% (5/25)	6.2% (6/97)
No	85.3% (110/129)	68.0% (17/25)	89.7% (87/97)
I'm not sure	5.4% (7/129)	12.0% (3/25)	4.1% (4/97)

22. Did any of the automatic sprinklers activate?

Answer	All Responses	Palisades	Eaton
Yes	25.0% (3/12)	40.0% (2/5)	16.7% (1/6)
No	58.3% (7/12)	20.0% (1/5)	83.3% (5/6)
I'm not sure	16.7% (2/12)	40.0% (2/5)	-

23. Were you instructed to evacuate?

Answer	All Responses	Palisades	Eaton
Yes	53.4% (94/176)	69.4% (34/49)	48.3% (58/120)
No	46.6% (82/176)	30.6% (15/49)	51.7% (62/120)

24. When were you first instructed to evacuate?

Answer	All Responses	Palisades	Eaton
January 7, 2025 08:00 to 12:00	1.5% (1/66)	4.8% (1/21)	-
January 7, 2025 12:00 to 16:00	1.5% (1/66)	-	2.3% (1/43)
January 7, 2025 16:00 to 20:00	4.5% (3/66)	14.3% (3/21)	-
January 7, 2025 20:00 to 23:59	9.1% (6/66)	28.6% (6/21)	-
January 8, 2025 00:00 to 04:00	33.3% (22/66)	23.8% (5/21)	39.5% (17/43)
January 8, 2025 04:00 to 08:00	21.2% (14/66)	23.8% (5/21)	20.9% (9/43)
January 8, 2025 08:00 to 12:00	19.7% (13/66)	-	27.9% (12/43)
January 8, 2025 12:00 to 16:00	1.5% (1/66)	-	2.3% (1/43)
January 8, 2025 16:00 to 20:00	3.0% (2/66)	4.8% (1/21)	2.3% (1/43)
January 8, 2025 20:00 to 23:59	1.5% (1/66)	-	-
January 9, 2025	3.0% (2/66)	-	4.7% (2/43)

25. Who instructed you to evacuate?

Answer	All Responses	Palisades	Eaton
Cell phone emergency notification	49.4% (40/81)	34.5% (10/29)	58.0% (29/50)
Police officer	37.0% (30/81)	34.5% (10/29)	38.0% (19/50)
Other	16.1% (13/81)	17.2% (5/29)	16.0% (8/50)
Family, friend, neighbor, etc.	14.8% (12/81)	13.8% (4/29)	16.0% (8/50)
Fire department	13.6% (11/81)	24.1% (7/29)	8.0% (4/50)

Note: *23.5% of responses included multiple sources. Five (5) "Other" responses included Watch Duty as a source.*

26. Did you evacuate?

Answer	All Responses	Palisades	Eaton
Yes	88.4% (175/198)	82.8% (48/58)	91.7% (122/133)
No	11.6% (23/198)	17.2% (10/58)	8.3% (11/133)

27. When did you evacuate?

Answer	All Responses	Palisades	Eaton
January 7, 2025 00:00 to 04:00	0.7% (1/150)	-	1.0% (1/104)
January 7, 2025 04:00 to 08:00	0.7% (1/150)	-	1.0% (1/104)
January 7, 2025 08:00 to 12:00	3.3% (5/150)	2.4% (1/41)	2.9% (3/104)
January 7, 2025 12:00 to 16:00	2.0% (3/150)	-	2.9% (3/104)
January 7, 2025 16:00 to 20:00	3.3% (5/150)	12.2% (5/41)	-
January 7, 2025 20:00 to 23:59	12.0% (18/150)	36.6% (15/41)	2.9% (3/104)
January 8, 2025 00:00 to 04:00	28.7% (43/150)	26.8% (11/41)	30.8% (32/104)
January 8, 2025 04:00 to 08:00	22.7% (34/150)	14.6% (6/41)	26.0% (27/104)
January 8, 2025 08:00 to 12:00	8.0% (12/150)	-	11.5% (12/104)
January 8, 2025 12:00 to 16:00	12.0% (18/150)	2.4% (1/41)	15.4% (16/104)
January 8, 2025 16:00 to 20:00	2.0% (3/150)	2.4% (1/41)	1.9% (2/104)
January 8, 2025 20:00 to 23:59	2.0% (3/150)	-	1.9% (2/104)
January 9, 2025	2.0% (3/150)	2.4% (1/41)	1.0% (1/104)
January 10, 2025	0.7% (1/150)	-	1.0% (1/104)

28. What conditions impacted your ability to evacuate?

Answer	All Responses	Palisades	Eaton
High winds	66.7% (64/96)	37.5% (6/16)	73.4% (58/79)
Proximity of fire	44.8% (43/96)	31.3% (5/16)	46.8% (37/79)
Smoke, low visibility	44.9% (43/96)	31.3% (5/16)	46.9% (37/79)
Other	35.4% (34/96)	62.5% (10/16)	30.4% (24/79)

Note: *59.4% of responses included multiple conditions. Common "Other" responses included lack of electricity, debris and embers, and traffic, including abandoned cars.*

29. What street(s) did you use to evacuate?

118 Responses with a diverse range of streets were noted.

30. Did you encounter obstructions during the evacuation?

Answer	All Responses	Palisades	Eaton
Yes	47.5% (57/120)	55.6% (15/27)	46.1% (41/89)
No	52.5% (63/120)	44.4% (12/27)	53.9% (48/89)

31. What kind of obstructions did you encounter?

Answer	All Responses	Palisades	Eaton
Fallen trees	54.4% (31/57)	7.1% (1/14)	71.4% (30/42)
Vehicles, traffic	43.9% (25/57)	57.1% (8/14)	40.5% (17/42)
Other	28.1% (16/57)	28.6% (4/14)	26.2% (11/42)
Downed power lines	17.5% (10/57)	-	23.8% (10/42)
Broken utility poles	10.5% (6/57)	7.1% (1/14)	11.9% (5/42)
Road closures	8.8% (5/57)	14.3% (2/14)	7.1% (3/42)

Note: *36.84% of responses included multiple obstructions. Common "Other" responses included other windblown debris and tree branches.*

32. What was the approximate location of these obstructions? (e.g., address, cross streets, place of business, etc.)

43 responses with a diverse range of streets and addresses were noted.

6.9 Full List of Findings and Recommendations

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
2.7	Analysis of Background	All	Policy, Prevention	1. Despite significant investments in fuels projects, grant funding, response capabilities, building standards, and legislative support, California's wildfire risk continues to grow due to increasingly severe fire weather and wildfire conditions.	1. Continue to expand statewide investments in wildfire prevention, preparedness, mitigation, and response capabilities with a focus on measurable reductions in community wildfire risk.
2.7	Analysis of Background	All	Policy, Prevention	2. The absence of a single entity responsible for coordinating and ensuring landscape-scale wildfire mitigation contributes to fragmented implementation across jurisdictional and ownership boundaries.	1. Create a regional or statewide coordination mechanism responsible for prioritizing, tracking, and evaluating cross-jurisdictional wildfire mitigation activities.
2.7	Analysis of Background	State of California	Policy, Prevention	3. At the time of the January 2025 fires, local jurisdictions were operating under fire hazard maps developed in 2007, while updated hazard classifications identifying additional Moderate and High hazard areas were not issued until after the fires.	1. Consider replacing maps by establishing a more frequent and data-driven process for identifying wildfire risk conditions for application statewide.
2.7	Analysis of Background	All	Policy, Preparedness, Prevention	4. Public outreach and education alone are insufficient to drive community-scale wildfire resilience, as awareness does not consistently translate into action.	1. Expand wildfire preparedness programs by pairing public education with implementation support, including technical assistance, incentives, and funding to increase adoption of defensible space, home hardening, and evacuation planning. Leverage trusted local partners to improve participation, broaden reach, and sustain long-term community engagement.
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	5. Current defensible space regulations are primarily structured around parcel-level compliance, while wildfire risk increasingly reflects fuel continuity across parcels and into interconnected built environments. As wildfire spread pathways can also include ornamental vegetation, vehicles, fencing, accessory structures, adjacent buildings, and other connective fuels, isolated parcel-level mitigation may be insufficient to interrupt fire spread at neighborhood or community scales.	1. Incorporate fuel continuity and structure-to-structure exposure considerations into defensible space policy and regulatory frameworks. 2. Support community-scale mitigation planning approaches addressing wildfire exposure beyond individual parcels. 3. Integrate defensible space implementation to include all of the following: home hardening, Zone 0 mitigation, structure spacing, and landscape-scale fuels reduction efforts. 4. Develop local planning tools and ordinances supporting neighborhood-scale wildfire resilience strategies.
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	6. Fragmented regulatory frameworks, distributed authority, jurisdictional boundaries, conflicting mandates, and limited local implementation capacity create inconsistent wildfire mitigation actions, accountability gaps, and coordination challenges. These conditions hinder timely and effective mitigation across property, community, and jurisdictional boundaries.	1. Establish a coordinated statewide wildfire mitigation governance framework with clear authority, consistent standards, defined accountability mechanisms, streamlined regulatory processes, and sufficient implementation capacity. Support cross-boundary coordination and community-scale mitigation strategies to ensure effective risk reduction across jurisdictions. 2. All WUI regulations and authorities should be consolidated with the State Fire Marshal's Office, including those currently overseen by the Board of Forestry.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	7. The current regulatory structure separates defensible space standards development from primary inspection and enforcement functions, limiting alignment between policy, operations, and evolving wildfire risk.	1. Evaluate opportunities to improve alignment between defensible space standards development, fire prevention enforcement, and code implementation functions. 2. Assess potential governance, statutory, operational, and implementation impacts associated with alternative regulatory alignment structures. 3. Evaluate whether increased integration could improve consistency between standards and enforcement practices, streamline updates, and improve responsiveness to evolving wildfire conditions.
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	8. Defensible space is constrained at the private–public land interface, where landowners may lack authority to treat fuels beyond parcel boundaries, creating gaps that reduce effectiveness. Encroachment permitting processes often add administrative, environmental, and financial barriers, resulting in inconsistent treatment and unmanaged fuels in high and very high fire hazard areas.	1. Establish a state-led vegetation management approach for publicly owned lands adjacent to residential structures in high-risk interface areas. 2. Develop shared responsibility frameworks for adjacent public and private lands. 3. Evaluate alternatives to the current encroachment permit model, including: streamlined authorization pathways, pre-approved vegetation management standards, and state-performed treatment programs where appropriate. 4. Develop risk-based prioritization systems identifying publicly owned parcels where treatment would provide the greatest reduction in structure exposure. 5. Align defensible space implementation with regional fuels management strategies and landscape-scale mitigation efforts.
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	9. Defensible space inspection programs in Los Angeles City and County operate at a scale that exceeds available staffing and operational capacity. High inspection volumes, short inspection durations, distributed workforce participation, and uneven inspector experience levels limit the ability to conduct detailed assessments, evaluate complex exposure pathways, and ensure consistent follow-up and enforcement outcomes.	1. Establish performance-based staffing benchmarks tied to parcel volume, hazard level, and inspection complexity. 2. Differentiate between baseline inspections and enhanced inspections for higher fire hazard areas. 3. Expand specialized forestry-led inspection and assessment programs emphasizing: home hardening, Zone 0 conditions, connective fuels, and structure-to-structure exposure. 4. Develop and utilize standardized inspector training and certification frameworks. 5. Implement quality assurance, audit, and consistency review mechanisms. 6. Expand technology-assisted inspection and data collection systems.
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	10. Data and reporting limitations hinder accurate assessment of defensible space program performance. Legacy systems, data inconsistencies, and reporting challenges in both Los Angeles County and City reduce the ability to track inspections, measure compliance, and support effective decision-making.	1. Modernize defensible space data and reporting systems by standardizing data practices, improving integration with parcel records, and enhancing analytics tools. Prioritize maintaining an accurate inspection universe, reconciling data gaps, and enabling clear tracking of inspection coverage, compliance, enforcement, and program outcomes.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.2.2	Prevention: Defensible Space	All	Policy, Preparedness, Prevention	11. Current defensible space programs rely heavily on inspection and compliance activities that may not result in timely risk reduction. Delays in resolving non-compliance, performance measures focused on compliance rather than outcomes, and inspection schedules tied to specific months rather than a year-round fire season can reduce program effectiveness, particularly as wildfire risk becomes more dynamic.	1. Establish a risk-based, year-round inspection and compliance framework that incorporates dynamic wildfire risk indicators, prioritizes high-risk properties, and ensures mitigation is completed before periods of elevated fire danger. 2. Implement statewide performance standards and metrics that track time-to-compliance, resolution of identified hazards, and risk-reduction outcomes, including reduced fuel continuity, improved structure survivability, and post-fire performance. 3. Expand proactive, pre-season mitigation and compliance efforts to accelerate hazard reduction and improve community resilience before peak wildfire conditions occur.
3.2.2	Prevention: Defensible Space	All	Policy, Prevention, Research	12. The Palisades and Eaton Fires show that high defensible space compliance does not necessarily reduce structure loss during large wind-driven fire events, as current metrics emphasize regulatory compliance over actual risk reduction. Consequently, it remains difficult to assess whether mitigation efforts meaningfully reduce wildfire exposure at parcel, neighborhood, or community scales.	1. Agencies should supplement compliance-based programs with performance-based measures that assess factors tied to wildfire outcomes — such as fuel continuity, structure-to-structure fire spread risk, home hardening, and post-fire loss patterns — and integrate inspection, hazard, and post-fire data to better evaluate risk reduction and survivability.
3.2.2.2	Prevention: Fire-Adapted Communities	All	Policy, Prevention	13. Prior to the January 2025 fires, LACoFD and LAFD had established comprehensive vegetation management, defensible space, preparedness, and community engagement programs aligned with Fire-Adapted Communities principles and California's Wildfire and Forest Resilience Action Plan.	N/A
3.2.2.2	Prevention: Fire-Adapted Communities	All	Organizational, Policy, Prepardness, Prevention	14. Implementation of wildfire resilience measures remains uneven throughout Los Angeles City and County, and wildfire exposure exceeds the reach of existing programs, leaving many communities vulnerable.	1. Develop a regional Wildfire Resilience Implementation Strategy at the county level (all California counties) that establishes measurable targets for home hardening, defensible space compliance, Firewise USA (R) participation, Fire Safe Council engagement, CWPP implementation, and neighborhood-scale risk reduction activities. Program success should be evaluated using community resilience outcomes rather than solely program outputs, such as inspections completed, acres treated, or outreach events conducted.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.2.2.2	Prevention: Fire-Adapted Communities	All	Policy, Preparedness, Prevention	15. Wildfire preparedness, mitigation, and recovery resources are dispersed across multiple agencies and platforms, while community-based partners such as Fire Safe Councils, Firewise USA® communities, and other local organizations extend mitigation capacity but operate with uneven participation, staffing, funding, and coordination, limiting residents' ability to access authoritative information, prioritize effective risk reduction actions, and receive support in underserved and high-risk communities.	1. Leverage state universities, NGOs, and community-based expertise to develop a unified, user-centered wildfire resilience information and support system that integrates preparedness, mitigation, and recovery resources into a single accessible platform organized around resident needs, 2. Increase sustainable funding, training, technical assistance, and coordination for community-based wildfire organizations to strengthen local capacity and expand risk reduction efforts in underserved and high-risk communities. 3. Integrate wildfire resilience objectives more directly into future updates of community plans, hazard mitigation plans, circulation plans, infrastructure investment programs, CWPPs, and emergency management strategies. Planning efforts should include measurable actions to improve structure survivability, evacuation performance, infrastructure resilience, and neighborhood-scale wildfire adaptation.
3.2.2.2	Prevention: Fire-Adapted Communities	All	Policy, Preparedness, Prevention	16. California's wildfire mitigation framework is fragmented across hazard zone designations, regulatory authorities, and program areas, resulting in inconsistent alignment between defensible space, home hardening, inspections, enforcement, vegetation management, and community-scale mitigation despite evidence that wildfire exposure and structure survivability depend on integrated risk reduction beyond mapped boundaries.	1. Align defensible space, home hardening, inspection, enforcement, and hazard severity zone programs within a statewide risk-based wildfire mitigation framework that prioritizes mitigation based on actual wildfire exposure rather than regulatory jurisdiction alone, incorporating factors such as structure density, topography, fuel conditions, ember exposure, historical fire behavior, evacuation complexity, structure-to-structure ignition potential, vegetation conditions, and community-level risk reduction needs. 2. Establish statewide implementation standards, performance expectations, and reporting requirements for wildfire mitigation programs to improve consistency across jurisdictions, including standardized guidance, regular local reporting, inspection coverage, reinspection completion rates, time to compliance, percentage of parcels mitigated before peak fire conditions, neighborhood-scale fuel continuity reduction, structure survivability, post-fire performance, and other outcome-based measures that evaluate actual wildfire risk reduction rather than administrative compliance alone. 3. Create a centralized statewide coordination and oversight function with sufficient technical assistance and funding support to align vegetation management, defensible space enforcement, fire prevention, fuels reduction, building/fire code implementation, home hardening, and community-scale mitigation programs; improve cross-jurisdictional coordination; standardize data; identify implementation gaps; and support jurisdictions with limited staffing or operational capacity.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.2.2.2	Prevention: Fire-Adapted Communities	LAFD	Organizational, Policy, Prepardness, Prevention	17. LAFD's partnership with MySafe:LA and other nonprofits expanded wildfire preparedness and outreach, but many services relied on external funding and capacity rather than being fully institutionalized. This dependence introduces risks to program continuity, coverage, staffing stability, and long-term sustainability.	1. LAFD should assume greater ownership of wildfire preparedness, public education, Fire Adapted Communities initiatives, Firewise USA (R) support, home assessment programs, and community outreach functions. While partnerships with organizations such as MySafe:LA should continue and be encouraged, core preparedness and prevention responsibilities should be supported through dedicated Department staffing, stable funding, formal program objectives, and performance measures to ensure continuity regardless of grant cycles or external organizational capacity.
3.2.2.2	Prevention: Fire-Adapted Communities	All	Policy, Preparedness, Prevention	18. Prior to the January 2025 fires, mitigation efforts focused primarily on vegetation management and preparedness, while post-fire observations show that ember exposure, structure vulnerability, and structure-to-structure spread were major drivers of loss. Community adoption of home hardening measures lagged behind vegetation-focused programs.	1. Expand wildfire resilience initiatives to increase emphasis on home hardening, retrofit assistance, structure survivability, and ignition-resistant construction. Future outreach, incentive, and technical assistance programs should integrate home hardening with defensible space and vegetation management efforts.
3.2.2.2	Prevention: Fire-Adapted Communities	All	Policy, Preparedness, Prevention	19. The loss of thousands of homes has created a large-scale rebuilding effort that presents a rare opportunity to enhance wildfire resilience beyond what incremental retrofits can achieve. Reconstruction can integrate home hardening, defensible space, infrastructure improvements, evacuation planning, and neighborhood-scale risk reduction into both individual properties and communities.	1. State and local agencies should incorporate wildfire resilience objectives into rebuilding programs, permitting processes, technical assistance efforts, financial incentives, and community planning initiatives. Rebuilding efforts should encourage not only the construction of more wildfire-resistant homes, but also the implementation of neighborhood-scale resilience measures that improve the survivability of entire communities during future wildfire events. 2. Prioritize pilot implementation of Wildfire Prepared Neighborhood, Firewise USA(R), and other community-scale resilience approaches within rebuilding areas to demonstrate how coordinated mitigation measures can improve neighborhood survivability.
3.3.6	Weather and Vegetative Fuel Conditions	All	Preparedness	20. Consecutive wet winters in 2022-2024 produced substantial vegetation growth across Southern California, while record heat, prolonged drought, and repeated Santa Ana wind events during the second half of 2024 cured this vegetation into highly combustible fuels. Together, these climate and weather factors created an environment that increased the likelihood of rapid fire spread and large-scale urban conflagration once ignitions occurred.	N/A

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.3.6	Weather and Vegetative Fuel Conditions	All weather services	Preparedness, Research	21. Currently, NWS Oxnard Fire Weather Decision Support process includes limited Live Fuel Moisture (LFM) sampling/monitoring data from federal and state agencies, and three (3) counties: Los Angeles, Ventura, and Santa Barbara.	1. Include other counties in the sampling / monitoring effort to provide higher resolution fuels data throughout the region, especially WUI areas. 2. Make fuels data easily accessible to encourage more widespread reference and use.
3.3.6	Weather and Vegetative Fuel Conditions	All	Operational, Preparedness	22. NWS-Los Angeles/Oxnard appears to have effectively communicated the January 7, 2025, extreme fire weather threat; however, outdated stakeholder webinar distribution lists may have limited participation by some agency decision-makers.	1. Use a system, tool, and/or process that ensures stakeholder webinar invite lists are maintained with active agency decision-makers.
3.3.6	Weather and Vegetative Fuel Conditions	All	Operational, Preparedness	23. Due to the large number of Red Flag Days starting in October 2024 and throughout the fire period, there may have been alert fatigue amongst residents and emergency responders by the time the January 2025 fires occurred.	1. PDS warnings need to be impactful and motivate a response from both emergency responders and residents. They should also encourage appropriate actions. 2. Provide more education and training for departmental, regional, or county-level meteorologists.
3.4.4	Water	All water system purveyors	Operational	24. The Palisades and Eaton area water systems consist of treated water servicing hydrants and structures.	N/A
3.4.4	Water	All water system purveyors, All Los Angeles-area fire agencies	Equipment, Operational	25. Water utilities provided the required water storage as defined by water and fire codes in preparation for the forecasted red flag event, but it was insufficient in addressing the water needs for the community conflagration.	1. Reevaluate agency policies to identify best practices for managing water supply and maintaining water pressure during high demand and fire impact on the system during conflagrations. 2. Review and update drinking water system design standards to account for extreme water usage events. 3. Utilities should perform a hydraulic analysis of their storage and distribution systems for extreme water usage events
3.4.4	Water	LADWP	Equipment	26. Santa Ynez Reservoir (SYR) was empty, and although it is not required to meet daily service needs, it could have provided an additional water supply for fire suppression.	1. Perform hydraulic modeling with details of water distribution system design and estimates of unrestricted water flow to determine the supply benefit of SYR to the system. 2. Repair cover and return to service as soon as possible to augment firefighting capability in the Pacific Palisades area. 3. Consider replacement with concrete tank(s) on site to avoid the potential of floating cover tears and removal from service.
3.4.4	Water	All water system purveyors	Equipment	27. Some water utility structures burned, particularly tanks with wooden roofs.	1. Harden tanks, pumps, and SCADA systems. 2. Add fire-resistant venting materials at the reservoirs and storage facilities and roof covers to protect timber support framing.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.4.4	Water	All water system purveyors	Equipment	28.Water utility crews had difficulty accessing their distribution system pipes, hydrants, and service zones during the fires.	1. Elevate the status of water utilities in the Incident Command System (ICS) such that, with proper identification, water utilities can aid emergency responders in emergency incidents and ensure water remains available during emergency incidents. 2. Train and plan with other agencies ahead of time so they know who water personnel are and the critical role they have in maintaining a viable water supply and distribution system during conflagrations.
3.4.4	Water	All water system purveyors	Equipment, Operational	29. Fire hydrants lost pressure in several locations in both the Palisades and Eaton Fires during the course of the community conflagration due to pressure and water loss in the distribution systems.	1. Investigate the installation of a separate fire suppression storage and distribution system (similar to San Francisco). Cost and time to develop are primary issues with this approach. 2. Investigate the feasibility of a separate seawater fire suppression system. 3. Isolate destroyed and burned-down areas that create water loss more rapidly. 4. Interconnect systems in as many locations as practical to provide additional flow capability 5. Install fire hydrants on high-pressure reservoir supply lines, where feasible, to provide direct access to stored water and increase the availability of water for firefighting operations.
3.4.4	Water	All water system purveyors	Equipment, Operational	30. Shutting off the water meter (services) in areas with destroyed structures helped maintain water pressure in the area.	1. Service Shutoffs should be installed as either SCADA-controlled service shutoffs or free-flowing detection shut-off valves. 2. Service shutoff teams could consist of firefighters paired with utility workers during a fire event as resources become available.
3.4.4	Water	All water system purveyors, All Los Angeles-area fire agencies	Equipment, Operational	31. Water tenders augmented the water supply, but were in short supply early in the incident when they were most needed.	1. Water utility and fire agencies should coordinate to prepare a water tender staffing plan when extreme fire weather is forecasted to ensure usage during the initial action stage of the incident. 2. Water utility agencies should ensure tender operators are trained and are provided with the appropriate PPE to operate within the operational area of a WUI fire.
3.4.4	Water	All water system purveyors, All Los Angeles-area fire agencies	Equipment, Operational	32. Alternate Water Sources, like swimming pools, included millions of gallons of water that were not widely used for fire suppression when hydrant pressure dropped to levels too low to withdraw water.	1. State and local fire agencies should collaborate to develop guidance for the strategic and tactical use of swimming pool water during community conflagrations.
3.4.4	Water	All water system purveyors	Equipment, Operational	33. Water utility Mutual Aid Groups supported utilities during the fire event.	1. Ensure water utilities are represented in mutual aid groups for extreme water usage events. 2. Ensure water utilities have mutual aid agreements with other utilities in the event of extreme water usage events.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.4.4	Water	All water system purveyors	Equipment, Operational	34. Drinking water was contaminated during the fires and persisted post-fire.	1. The decontamination procedure for drinking water systems should be reevaluated and updated periodically as needed.
3.4.4	Water	All water utilities, All emergency response agencies	Equipment, Operational, Training	35. A lack of training was observed for extreme water-usage events (i.e., catastrophic events beyond the system design parameters) for all participants.	1. Develop and practice tabletop exercises for water utilities for extreme water usage events, which include utilities and fire and law enforcement agencies as equal participants.
3.4.4	Electrical	LADWP	Operational, Organizational	36. LADWP established a scalable incident command structure with core functions and City EOC coordination.	1. LADWP should retain this command structure as a core best practice and formalize a standing wildfire electric incident framework with predefined rosters, trigger-based escalation, and standardized shift transitions. 2. Future records should also clearly link key decisions to ICS roles to strengthen accountability and post-incident review.
3.4.4	Electrical	LADWP	Operational, Organizational	37. LADWP did not increase pre-event staff in preparation for the extreme fire weather forecast.	1. Identify fire weather forecast thresholds to trigger pre-event briefings and operational preparedness staffing before the weather event arrives.
3.4.4	Electrical	LADWP	Operational, Organizational	38. Situational awareness was constrained by older infrastructure and the absence of dedicated spotter or sensor coverage.	1. LADWP should enhance wildfire situational awareness in high-risk areas through layered monitoring (telemetry, SCADA, cameras, and remote sensing) and defined patrol protocols, with criteria for targeted pre-positioning or intensified coverage during extreme fire conditions.
3.4.4	Electrical	LADWP	Operational	39. LADWP did not implement clearly defined PSPS actions; instead, it relied on targeted de-energization, not characterized in the record as a formal PSPS program.	1. LADWP should standardize terminology for wildfire-driven shutoffs, clearly classifying each as PSPS, emergency de-energization, sectionalizing, or restoration hold. For each action, it should document triggers, approval, expected public safety impact, and customer messaging in real time to strengthen situational awareness, consistency, and post-incident accountability.
3.4.4	Electrical	LADWP	Operational, Preparedness	40. LADWP focused customer messaging on broader weather-related notifications rather than proactive fire preparedness and the potential for de-energization.	1. LADWP should develop and establish a fire-related messaging program in accordance with California Public Utilities Code § 8387's expectation for appropriate and feasible customer notification procedures related to de-energization.
3.4.4	Electrical	LADWP, All Los Angeles-area fire agencies	Operational, Preparedness	41. LADWP appropriately prioritized electric-water-fire interdependencies, but ongoing fire activity limited access and slowed restoration in the Palisades.	1. LADWP should institutionalize electric-water-fire interdependency planning for high-risk service areas by developing station- and feeder-level decision matrices that identify what can be isolated, what must remain energized, what backup measures are available, and what public-safety consequences attach to each option.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.4.4	Electrical	SCE	Operational, Preparedness	42. SCE reacted to forecasted extreme fire weather by staffing critical field operations positions and assembling a functional incident management organization.	1. SCE should preserve this pre-built incident posture as a standing wildfire/PSPS readiness model. 2. Future activations should explicitly document the forecast trigger, command transition plan, and branch staffing logic so early setup decisions are easy to defend and repeat during fast-moving wind events.
3.4.4	Electrical	SCE	Operational, Preparedness	43. Several circuits west of Lake Avenue suffered outages well before pre-planned PSPS circuits were impacted by environmental conditions, suggesting more circuits, especially those west of Lake Avenue, should have been pre-identified as PSPS.	1. Utilize data from the Eaton Fire to improve models to better identify PSPS circuits.
3.4.4	Electrical	SCE	Operational, Preparedness	44. Within the pre-noon January 8, 2025, window, the record provided to ULRI does not clearly show the circuit-level logic used to demonstrate PSPS as a last resort versus utilizing available alternatives.	1. SCE should describe the early event decision record for each district or circuit cluster in PSPS scope to capture the threat picture, the operational alternatives considered, such as sectionalization, segmentation, patrol-only posture, or equipment settings, and the reason those alternatives were judged insufficient at that time.
3.5.4	Communications: Radio	Communication infrastructure organizations, All emergency response agencies	Equipment, Operational	45. During the Palisades Fire, rugged terrain, inadequate repeater placement, and loss or degradation of critical infrastructure created wide-ranging radio coverage gaps and unreliable communications during operations.	1. Expand and harden repeater infrastructure in high-risk and topographically complex areas. 2. Pre-stage portable/mobile repeaters and redundancy systems for rapid deployment. 3. Conduct comprehensive radio propagation and coverage modeling to address known dead zones.
3.5.4	Communications: Radio	Communication infrastructure organizations, All emergency response agencies	Equipment, Operational	46. Palisades and Eaton Fire communications systems (radio, cellular, dispatch) were quickly overwhelmed, and insufficient redundancy forced reliance on improvised workarounds, reducing command effectiveness.	1. Develop surge capacity and redundancy plans for dispatch, radio, and cellular systems. 2. Establish preplanned fallback communication pathways (radio, cellular, satellite)
3.5.4	Communications: Radio	Communication infrastructure organizations, All emergency response agencies	Equipment, Operational	47. Lack of portable satellite-based systems, internet access, and deployable communications technology limited command and field operations.	1. Equip command staff with portable satellite, internet, and communications kits. 2. Decentralize critical technology capabilities to field-level leadership.
3.5.4	Communications: Radio	LASD	Equipment, Operational	48. Outdated or incompatible systems (MDCs, evacuation platforms, data tools) limited interagency coordination, situational awareness, and operational efficiency.	1. Modernize MDC and data systems to enable cross-agency interoperability. 2. Integrate evacuation, mapping, and tracking platforms into field systems.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.5.4	Communications: Radio	LAFD	Equipment, Operational	49. Communications and resource management were not executed through a single, consistently applied framework. The use of, and capability for, dispatch centers to communicate/monitor through VHF frequencies, such as LA RICS, was not universal.	1. LAFD leadership should commit to utilizing communication plans predesignated for multiagency response. 2. Leadership should make efforts to engrain discipline and competence aligned with ICS-205 and NFPA communication standards.
3.5.4	Communications: Radio	All emergency response agencies	Equipment, Operational	50. Limited interoperability (e.g., lack of universal VHF use) and frequency congestion led to widespread use of unassigned channels, reducing coordinated command communications.	1. Ensure full multi-band interoperability (VHF/UHF/700/800) at dispatch and field levels. 2. Expand frequency allocations and scalability for large incidents. 3. Enforce adherence to communications plans while providing structured auxiliary channels. 4. Consider creating a pre-assigned MTZ communications plan for the City and County areas of the Santa Monica Mountains and other regions with similar geographic features.
3.5.4	Communications: Radio	LAFD	Equipment, Operational, Training	51. A Palisades wildland VHF communication plan was requested early in the incident, however, not all LAFD personnel used the channels in the plan to communicate due to a weak signal, lack of familiarity with the VHF plan, and/or lack of familiarity with the handheld radio capabilities.	1. Require all Los Angeles Area fire agencies to complete RTG and local agency radio communications training to ensure proficiency using VHF handheld radios to access VHF communication plan channels.
3.5.4	Communications: Radio	All emergency response agencies	Equipment, Operational, Policy, Training	52. Most agencies used alternate frequencies that were outside of the incident communication plan. When information about the fire or tactical directives was shared on these alternate frequencies, it was not heard by personnel using assigned incident radio channels, potentially compromising situational awareness.	1. All agencies must train to high radio proficiency standards. Personnel must be adept at radio programming, channel selection, and usage standards. To keep their incident situational awareness, personnel who migrate to squirrel channels must also monitor the appropriate incident frequencies. 2. Formalize controlled secondary channel use within the communications plan.
3.5.4	Communications: Radio	All emerency response agencies	Equipment, Operational, Policy	53. Hybrid communication approaches (radio + cellular + LA-RICS) and community-based information networks enhanced coordination, early detection, and public information sharing.	1. Formalize hybrid communications strategies within incident planning. 2. Expand the use of interoperable systems such as LA-RICS across agencies. 3. Incorporate vetted community information networks into emergency communication strategies.
3.5.4	Communitcations: CAD	All emergency response dispatch centers	Operational, Policy, Preparedness	54. CAD data did not show an increase in 911 call center terminal use or upstaffing of call-takers and dispatchers in preparation for the forecasted fire weather. The lack of additional staff likely contributed to increased call processing times as the number of fire calls increased.	1. Anticipate greater call volume and increase terminal availability, upstaffing dispatch centers prior to the arrival of forecasted extreme weather.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.5.4	Communitcations: CAD	All emergency response agencies	Operational, Policy	55. Incidents such as wires-down and secondary fire events were a major driver of system degradation, as these incidents pulled the same resources that were also needed for the major fire response.	1. Preparations should be made to account for distributed collateral damage during severe weather incidents. Ancillary utility response should be strategically positioned to free up suppression resources.
3.5.4	Communitcations: CAD	All emergency response agencies	Operational, Policy	56. Major data gaps exist within and between jurisdictions that understate the true burden and impact on CAD systems – particularly around mutual aid and regional resource load.	1. Data standardization and CAD reconciliation across regional mutual aid systems is needed to not only measure system response, but to ensure visibility and accountability of all mutual aid resources.
3.5.4	Communitcations: CAD	LAFD, LACoFD	Operational, Policy	57. During both the Palisades and Eaton Fires, rapidly expanding fire conditions resulted in resources being dispatched to separate incidents within the incident footprint before being integrated into the established command structure, limiting supervisory oversight, resource accountability, and situational awareness.	1. Implement procedures and technology at dispatch and the ICP that improve the rapid identification, tracking, and assignment of responding resources to the appropriate Branches and Divisions during rapidly expanding incidents.
3.5.4	Communitcations: CAD	LAFD, LACoFD	Operational, Policy	58. Fire agencies were driven to modify and reduce normal response patterns outside of major fire areas in order to maintain basic, system-wide response services.	1. Modification of response allowed agencies to maintain system-wide services and meet emergency demands. The patterns of modified deployment were successful and should be institutionalized for future needs. This was a best practice.
3.5.4	Communitcations: CAD	LAFD, LACoFD	Operational, Policy	59. EMS operations outside the fire perimeter remained mostly stable, as these fire incidents did not require a large-scale EMS response. This stability may not hold in a future event.	1. EMS mutual aid support should be prioritized when planning for large-scale fire events.
3.6.3	Wildfire Leadership, Culture, and Training	LAFD, LACoFD	Policy, Training	60. Limited statewide training opportunities and qualification pathways have constrained the development of incident management personnel and reduced preparedness for managing fast-moving wildfires during the critical first operational period.	1. Increase the frequency and availability of statewide incident management training courses to expand the pool of qualified personnel and support succession planning. 2. Establish a foundational wildfire leadership curriculum focused on command, coordination, and decision-making during the first operational period of fast-moving WUI fires. 3. Streamline qualification processes for Type 3 and local-level positions to accelerate the development of future incident management personnel. 4. Incorporate lessons learned from recent California WUI fires and community conflagrations into statewide training, exercises, and certification programs.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.6.3	Wildfire Leadership, Culture, and Training	LAFD	Policy, Training	61. LAFD's intermittent participation in California's statewide wildfire training, qualification, and preparedness programs limited the development of wildfire-specific expertise, interagency relationships, and operational integration needed for complex wildfire incidents such as the Palisades Fire.	1. Reestablish and sustain participation in CICCS qualification programs to increase the number of personnel qualified for wildfire incident management positions.
3.6.3	Wildfire Leadership, Culture, and Training	LAPD, LASD, LAFD, LACoFD	Operational, Policy, Training	62. Despite established interagency coordination frameworks, LAPD, LAFD, LASD, and LACoFD experienced challenges operating under Unified Command during these large-scale incidents. Gaps in joint training and coordination limited their ability to effectively manage resources and conduct unified operations across agencies.	1. Agency leadership should prioritize regional coordination and joint training to build trust, improve interoperability, and enable seamless Unified Command and resource management during major incidents. 2. The Los Angeles Area Fire Departments should embrace the RTG program design and mission. The Los Angeles Area Fire Chiefs Association (LAAFCA) should redefine and prioritize regional training in the wildland and WUI and ensure all regional partners are accountable for the training.
3.6.3	Wildfire Leadership, Culture, and Training	All emergency response agencies	Operational, Policy	63. Critical Incident Debriefings and/or Behavioral Health Support were not readily available and took several weeks.	1. Prioritize behavioral health, incident stress debriefs, and peer counseling as one of the core elements of incident management.
3.7.3	Pre-Incident Preparedness and Mobilization	LACoFD	Operational, Policy	64. LACoFD's upstaffing decisions on January 6, 2025, and the decision to hold the off-going shift on January 7, increased their readiness before fire occurrence.	N/A
3.7.3	Pre-Incident Preparedness and Mobilization	LAFD	Operational, Policy, Preparedness	65. LAFD maintained its normal task force staffing configuration of 42 trucks, each paired with two (2) engines, despite forecasted extreme fire weather, limiting staffing flexibility and the number of deployable Type 1 engines available for wildfire/WUI response.	1. Prioritize staffing of Type 1, Type 3, and Type 6 engines in preparation for fast-moving wind-driven vegetation fires extending into the built environment.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.7.3	Pre-Incident Preparedness and Mobilization	LAFD, LACoFD	Operational, Policy, Preparedness	66. Los Angeles County and the City of Los Angeles used widely different methods to determine regional upstaffing and augmentation. LAFD initiated recall efforts after the origin of the Palisades Fire. The recall was poorly executed, resulting in unorganized and unproductive staff recall and utilization. LAFD failed to modify its daily TF staffing pattern to make additional resources available following the activation of recall. They maintained normal patterns instead of splitting for deployment flexibility, as had been the past practice.	1. LAFD should follow its own internal procedure and upstaff and deploy to meet elevated wildfire risk conditions. 2. LAFD should revisit labor agreement constraints that may prohibit it from meeting emergency staffing needs.
3.7.3	Pre-Incident Preparedness and Mobilization	LAPD, LASD	Operational, Policy, Preparedness	67. LASD and LAPD lacked standardized, agency-wide processes for pre-positioning resources and increasing staffing (including dispatch) in response to extreme fire weather forecasts, resulting in inconsistent preparedness actions, limited law enforcement capacity in high-risk areas, and delayed response during the early stages of the fires.	1. LASD and LAPD should establish standardized wildfire preparedness protocols that define activation thresholds, staffing increases, and resource pre-positioning actions for extreme fire weather events to ensure consistent readiness and adequate law enforcement capacity in high-risk areas.
3.7.3	Pre-Incident Preparedness and Mobilization	Cal OES, CAL FIRE	Operational, Policy, Preparedness	68. Despite resource ordering challenges with the current state Wildland and Wind Mobilization Score Sheet, state pre-positioning of firefighting resources improved local response capability and agility.	1. Increased collaboration with local fire agencies could lead to better utilization and placement of pre-positioned resources to meet regional needs. 2. CAL OES should continue to optimize their updates to the Wildland and Wind Mobilization Score Sheet to ensure appropriate risk-level determination for local departments. 3. Pre-position should be expanded to include law enforcement resources.
3.7.3	Pre-Incident Preparedness and Mobilization	Cal OES, CAL FIRE	Operational, Policy, Preparedness	69. IROC struggled to meet resource ordering demands as multiple incidents escalated concurrently.	1. State-of-the-art systems and automation are needed to support mutual aid and wildland resource ordering systems. 2. Priorities for ordering system delivery improvement should include increasing the speed of canvassing for mobilization, increasing the speed of dispatch, predetermination of unit availability, and enhanced automation for resource tracking and deployment. 3. The state should consider consolidation of dual (mutual aid and wildland) resource ordering systems and responsibilities into a single entity/ agency.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.7.3	Pre-Incident Preparedness and Mobilization	LAPD, LASD	Operational, Policy, Preparedness	70. LASD and LAPD filled law enforcement resource requests from within their own agency rather than using the Cal OES Mutual Aid system to request outside agency assistance. For LASD, this decision resulted in staffing shortages requiring the reassignment of personnel from jails and courts, straining operations due to using personnel with limited patrol experience.	1. LASD and LAPD should consider utilizing the well-established Cal OES Mutual Aid System to request assistance from surrounding agencies, rather than handling such large-scale events using their agency resources. 2. Establish clear mutual aid activation criteria linked to incident complexity indicators, such as Red Flag or PDS forecasts, and support with predefined staffing thresholds and scenario-based exercises to enable timely requests during escalating incidents, or when situational awareness is compromised.
3.8.4	Incident Management	All emergency management agencies	Equipment, Operational	71. The EOC and field personnel experienced communication challenges due to overloaded and damaged infrastructure.	1. Invest in back-up satellite-based communication infrastructure for all emergency response organizations in California.
3.8.4	Incident Management	All emergency management agencies	Operational, Policy	72. The emergency management A-Reps in the field provided an important connection between incident command personnel and the EOC by providing situational awareness, evacuation warnings, and orders issued by field command.	1. Expand the emergency management A-Rep program to ensure there are sufficient personnel capable of responding to multiple incidents requiring multiple incident command posts.
3.8.4	Incident Management	All emergency management agencies	Operational, Policy	73. As per policy, emergency management A-Reps are required to travel to a designated location and pick up a city/county vehicle that is outfitted with supplies and equipment for the A-Reps. In order to provide rapid response, several A-reps responded to the ICP in their personal vehicles.	1. Ensure on-call emergency management A-Reps have immediate access, such as a take-home vehicle, for rapid response over the large geographic area without having to respond to the EOC first, particularly during forecast high-risk wind events.
3.8.4	Incident Management	All emergency management agencies	Organizational, Policy, Prepareness	74. Both Los Angeles City EMD and Los Angeles County OEM are under-resourced and under-staffed relative to peer jurisdictions, population served, risk profiles, workload, and community expectations.	1. Recommend comprehensive staffing and management studies, performed by independent firms, to determine appropriate staffing for both agencies. 2. Increase staffing levels based on the comprehensive study.
3.8.4	Incident Management	LASD	Organizational, Policy, Prepareness	75. LASD's EOB assists IMTs by coordinating resources and providing the facilities and equipment to support the incident management organization. However, IMT roles are secondary, placing strain on home divisions and, without formal incentives, leading to recruitment and retention issues despite dedicated personnel.	1. Implement incentive programs and career development pathways to acknowledge EOB assignments and enhance recruitment and retention. 2. Provide organizational support functions, such as backfill staffing or workload adjustments, to reduce strain on personnel and their home divisions during deployments.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.8.4	Incident Management	LASD	Organizational, Policy, Prepareness	76. Although some proactive actions were taken, LASD patrol staffing levels remained the same on January 7, 2025, as on a normal day, with no broader pre-positioning or increased operational staffing in preparation for the extreme fire risk.	1. Consider increased staffing models during high-risk wind events in WUI patrol divisions. 2. Integrate pre-event unified situational awareness briefings with allied agencies to identify and mitigate traffic challenges and choke-points.
3.8.4	Incident Management	LASD	Organizational, Policy, Prepareness	77. LASD has a centralized EOB, which houses the DOC and CEOC. It monitors incidents and offers liaison support to Incident Commanders, improving situational awareness, ICS deployment, and coordination during complex events.	1. Maintain and expand the EOB model by including leadership support roles, utilizing Subject Matter Experts (SMEs) for wildland fire response, and exploring regional IMT capabilities to improve readiness for WUI fire incidents.
3.8.4	Incident Management	All Los Angeles-area fire agencies	Organizational, Policy, Prepareness	78. Despite the complex wildfire threats facing Los Angeles County, fire and law enforcement agencies maintain varying levels of commitment to IMT staffing, qualification, and long-term program sustainment.	1. Los Angeles-area agencies should maintain qualified IMTs capable of responding to the region's wildfire and community conflagration risk, and other planned and emergent events. 2. Engage in the development of regional IMTs to enhance response capability to critical incidents.
3.8.4	Incident Management	LACoFD	Organizational, Policy, Prepareness	79. All LACoFD Division Supervisors and Operations Branch Directors were CICCS-qualified at the division level or higher and had extensive WUI fire experience. These individuals quickly mobilized to the Palisades and Eaton Fires to assume roles within the incident management organization.	1. LACoFD should continue to build out additional qualified personnel to assets with managing multiple incidents simultaneously, as well as to replace personnel who are retiring.
3.8.4	Incident Management	LAFD	Organizational, Policy, Prepareness	80. LAFD's Palisades Fire initial command structure, lacking CICCS-qualified individuals, did not incorporate experienced and qualified fire officers from other agencies who were at the ICP.	1. LAFD should provide a pathway for CICCS qualification attainment to be able to maintain a roster of qualified personnel capable of performing incident command roles. 2. Whenever possible, command positions on major incidents should be assigned to CICCS-qualified (or trainees for the positions) individuals. 3. Experienced and qualified chief officers from other agencies should be assigned to Command and General Staff roles early in the incident.
3.8.4	Incident Management	LAFD	Organizational, Policy, Prepareness	81. Based on TDs, LAFD Captain IIs, instead of command staff, were perceived as leaders with trusted operational capabilities. As a result, LAFD line personnel reportedly deferred to Captain IIs often instead of ranking chief officers.	1. LAFD should evaluate organizational structure to ensure an appropriate chain of command to support effective leader/subordinate relationships.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.8.4	Incident Management	LAFD, LACoFD, LAPD, LASD	Operational, Preparedness	82. The rapid growth and complexity of the Palisades and Eaton Fires outpaced the development and expansion of the incident management organization, reducing situational awareness, coordination, and operational effectiveness.	1. Work cooperatively with fire and law enforcement agencies to identify complexity-based triggers that rapidly expand incident management organizations, staffing, and support functions as fire conditions escalate.
3.8.4	Incident Management	LAFD	Operational, Organizational	83. During the Palisades Fire initial attack resource ordering period, LAFD command staff expressed concern over their agency being responsible for paying for additional resource engagement. LAFD's posture may have contributed to LACoFD organizing a separate command structure to address LACoFD jurisdictional areas.	1. All emergency response agencies should be knowledgeable of the California Mutual Aid System and reimbursement process during large multi-jurisdictional incidents.
3.8.4	Incident Management	LAFD, LACoFD	Operational, Organizational	84. The Palisades Fire staging was not sized for the scale of the incident; it was not staffed with experienced and qualified staging area managers (STAMs); and the location at Palisades Drive and Sunset Boulevard was in the path of a major evacuation route and was also overrun by fire just hours into the incident.	1. Fire agencies should pre-identify multiple possible staging locations for large-scale incidents that do not interfere with evacuation routes. 2. Staff staging with multiple individuals when large numbers of resources are expected in staging.
3.8.4	Incident Management	LAFD, LACoFD, LAPD, LASD	Operational	85. Each time the ICP location moved, interagency interaction was reduced, situational awareness was impaired, and Unified Command lost operational pace in their management of the incident.	1. ICP locations should be selected based on current and anticipated fire conditions and their ability to sustain incident management functions across multiple operational periods.
3.8.4	Incident Management	LAFD, LACoFD, LAPD, LASD	Operational, Organizational, Training	86. Unified Command was not consistently operationalized, resulting in unclear roles, ineffective communication of objectives and priorities, parallel agency operations, and poor coordination of resources and incident activities.	1. Strengthen multiagency Unified Command through standardized training, clearly defined roles and responsibilities, interoperable communications, and shared processes for establishing and communicating incident objectives, priorities, and resource assignments. 2. Utilize the RTG to develop a multi-agency Unified Command training curriculum addressing wildfire-initiated community conflagrations.
3.8.4	Incident Management	LACoFD	Operational, Organizational	87. When LACoFD took over command of the Eaton Fire incident from PFD at approximately 19:30 on January 7, 2025, it took LACoFD several hours to reorganize the incident and account for and reconcile resource assignments, due to different incident organizational structures/approaches between departments.	1. Agencies that respond to an MTZ incident should be in alignment with how an incident with a large growth potential should be organized. 2. LACoFD should establish and communicate a standardized incident management framework through regional training so that incoming and outgoing command staff can transition seamlessly during large incidents.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.8.4	Incident Management	LACoFD, LASD	Operational	88. As the Eaton Fire burned into hours of darkness and backed into narrow canyons, personnel were not in a position to be able to visualize active areas of the fire, causing command and operational personnel to lose situational awareness.	1. DIVS and/or Branch Directors should ensure there is a lookout to monitor the location of the fire for both community and firefighter safety. Adhere to Standard Firefighting order #2: Know what your fire is doing at all times. and #5; Post lookouts when there is possible danger. 2. When air resources are not available, the IC/OSC should assign scouts or FOBSs to monitor the location and behavior of the fire and provide regular status updates.
3.8.4	Incident Management	LAFD, LACoFD, LAPD, LASD	Operational, Preparedness, Training	89. Limited command and supervisory staffing reduced strategic oversight, exceeded span-of-control capabilities, and hindered the effective coordination and execution of operations.	1. Develop staffing models and mobilization triggers that rapidly expand command and supervisory capacity to maintain span of control, situational awareness, and strategic oversight during complex incidents.
3.8.4	Incident Management	LAFD, LACoFD	Equipment, Operational	90. The absence of a shared resource-tracking platform created operational challenges for LAFD, while LACoFD used Tablet Command (TC) to track resources.	1. Ensure all cooperating agencies can access a common resource-tracking tool/application to maintain consistent resource accountability and situational awareness during large incidents.
3.8.4	Incident Management	LAPD, LASD	Operational, Policy, Preparedness, Training	91. The Palisades and Eaton Fires revealed longstanding gaps in law enforcement preparedness for rapidly evolving wildland-urban interface fires.	1. Establish a baseline law enforcement WUI readiness program that includes training, PPE, and coordination with fire department partners.
3.9.3	Fire Suppression	LAFD, LACoFD	Policy, Preparedness, Training	92. Both LACoFD and LAFD had pre-fire plans for the Palisades and Eaton Fire areas, however, they were outdated and reportedly not used, even though some were accessable via the Fire Sync Ops app.	1. Emergency response agencies should update, regularly maintain, and train on comprehensive pre-fire plans for areas at risk for wildfire impact, particularly in the WUI. 2. Establish a statewide pre-fire planning tool and standardized template to improve consistency, usability, and interoperability.
3.9.3	Fire Suppression	LAFD, LACoFD, LAPD, LASD	Operational, Policy, Preparedness, Training	93. A written joint agency plan was not created for either fire.	1. Fire, law enforcement, and emergency management agencies should regularly conduct joint training on all-hazard evacuation scenarios.
3.9.3	Fire Suppression	All emergency management agencies	Operational, Organizational, Policy, Preparedness	94. Other local jurisdictions in Southern California, within and adjacent to Los Angeles County, organize and resource their local emergency management agencies in different ways, with different authorities, reporting relationships, and capabilities; all of these agencies are key partners during a fast-moving multi-jurisdictional/disciplinary emergency or disaster event.	1. Conduct a region-wide study of local emergency management agencies in Southern California, with the goal of describing current capabilities, identifying any resource/capability gaps, and assessing resource needs.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.9.3	Fire Suppression	LAFD, LACoFD	Operational, Preparedness	95. On the Palisades and Eaton Fires, the initial resource order after dispatch was for 20 additional engine companies, which was inadequate for the current and predicted fire weather and the resource needs of the incident.	1. Resource orders should be based on current and expected fire behavior, which allows command officers to make strategic decisions, implement effective tactics, and effectively order resources 2. Develop a standard ordering guideline for ordering resources (1st alarm, 2nd alarm, 3rd alarm, closest number of engines, STs, etc.), along with sufficient overhead to manage the resource order.
3.9.3	Fire Suppression	CAL OES, LAFD, LACoFD	Operational, Policy, Prepardness	96. The early activation of EMAC resources demonstrated the importance of initiating interstate resource requests well before critical shortages develop.	N/A
3.9.3	Fire Suppression	CAL OES, LACoFD	Operational, Policy, Prepardness	97. Cal OES Region 1/LACoFD Command and Control executed the mutual aid requests effectively throughout the fire incident.	1. Cal OES Region 1/LACoFD should document its best practices for use in future training for similar events.
3.9.3	Fire Suppression	LAFD	Operational, Policy, Prepardness	98. LAFD largely depended on their internal, day-to-day deployment models, which are designed for single-structure fire response, resulting in instances of inefficient and resource-deficient tactical deployment during the Palisades Incident.	1. Use the standardized wildland fire resource configurations for more efficient deployment and utilization.
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Equipment, Operational, Preparedness	99. Extreme wind-driven fire behavior, receptive fuels, limited available resources, and equipment configurations not optimized for the conditions overwhelmed conventional WUI suppression tactics, contributing to the extensive structure losses in both fires.	1. Invest in research to identify evidence-based WUI tactical considerations, vehicle types, and suppression equipment to prevent wildfires from becoming community conflagrations.
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Equipment, Operational, Preparedness	100. Tactical patrol was essential for identifying and extinguishing spot fires caused by ember cast, and in many cases, structures that were initially saved later burned when follow-up patrol and suppression were not maintained.	1. Allocate resources for sustained tactical patrol in impacted neighborhoods to detect and extinguish ember-caused ignitions following initial structure defense efforts.
3.9.3	Fire Suppression	LAFD, LACoFD	Equipment, Operational, Policy, Preparedness	101. Due to fire behavior, fuel type and condition, topography and weather, perimeter control utilizing direct line construction was limited for the Palisades Fire and non-existent for the Eaton Fire until late morning on January 8, 2025.	1. Maintain a network of access roads in wildland areas to facilitate firefighter access and effective perimeter control. 2. Consider using hand crews normally assigned to perimeter control / line construction for structure defense missions if firefighter safety, public safety, and security can be maintained.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Operational, Policy, Training	102. Take Initiative Engage & Report (TIER) was effectively applied by individuals trained in its use when leadership was unable to provide direction due to the demands of the highly dynamic incident.	1. Incorporate TIER into WUI tactical operations training addressing early stages of wind driven community conflagrations when supervision and the Division and Group level is in short supply.
3.9.3	Fire Suppression	LAFD	Equipment, Operational	103. The use of ladder trucks without water on the Palisades Fire reduced operational effectiveness due to limited maneuverability, roadway congestion, and tactics that were not always aligned with incident conditions.	1. Prioritize the deployment of apparatus and resource configurations that are best suited for fast-moving WUI fires and community conflagrations, and limit the use of ladder trucks without water in situations where they may impede mobility, increase congestion, or provide limited operational value.
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Equipment, Operational, Preparedness, Training	104. A small number of resources used their eductors (siphon ejectors) to draft water from the numerous pools within both fire areas.	1. Fire service should develop a curriculum supporting a water supply technical specialist in the pre-planning phase of forecasted fire weather and for operational performance during community conflagration. 2. Fire service should practice with water siphon ejectors on a more regular basis to ensure their use is prioritized during periods of reduced hydrant pressure.
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Equipment, Operational, Preparedness, Training	105. Water-enhancing agents, including foam and fire-suppression gels, demonstrated some value as structure defense tools but were not widely employed.	1. Incorporate foam and gel-based structure protection into WUI pre-planning, training, and tactical decision-making where appropriate.
3.9.3	Fire Suppression	All Los Angeles-area fire agencies	Equipment, Operational, Preparedness, Training	106. While there were some successful salvage operations, the salvage of resident private property did not occur consistently throughout the incidents and was not prioritized by ICs.	1. Salvage operations prioritization should be and clearly stated within the strategic objectives of the IAP. 2. Training should be developed to educate firefighters on the proper way to plan for and execute salvage during a community conflagration.
3.9.3	Fire Suppression	All Los Angeles-area fire and law enforcement agencies	Operational, Preparedness, Training	107. Secondary searches were not conducted as the fire progressed, limiting rescue opportunities. However, post-fire hazards were significant, and law enforcement officers and other stakeholders lacked the proper PPE to carry out such operations safely.	1. Establish protocols that prioritize secondary search operations using appropriately equipped fire/USAR resources, with law enforcement providing support for coordination and access control rather than directly entering hazardous areas.
3.9.3	Fire Suppression	All Los Angeles-area fire and law enforcement agencies	Operational, Preparedness, Training	108. AVL data can provide valuable insights for operational analysis; however, not all agencies were able to share this data because some vehicles lacked AVL capabilities and some agencies restricted data sharing through policy.	1. Agencies should standardize AVL capabilities and data-sharing policies to ensure vehicle location data is available for incident management, coordination, and after-action analysis.1.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.9.3	Fire Suppression	LAFD, State Parks	Operational, Policy	109. LAFD is responsible for fire suppression on portions of Topanga State Park located within the City of Los Angeles. Although these lands are state-owned, they are classified as Local Responsibility Area (LRA).	1. Given the size, fuel conditions, and WUI exposure of certain state-owned lands located within LRAs, the Legislature may wish to evaluate whether the current responsibility-area framework appropriately aligns ownership, risk, operational responsibility, and funding.
3.9.3	Fire Suppression	Private fire companies	Equipment, Operational, Policy	110. Private fire companies provided value on the Palisades Fire by successfully defending structures they were hired to protect, which also protected neighboring structures they were not paid to defend.	N/A
3.9.3	Fire Suppression	Private fire companies, CAL OES	Equipment, Operational, Policy	111. Private firefighting resources were deployed in the operational area and functioned outside of Palisades Incident Command.	1. Statewide standards and regulations for management, fireground accountability, certification, and bonding of private fire services are needed and should be established by State regulation. 2. Appropriate fireground access by private fire services should be determined by regulation and be consistent across the State.
3.9.3	Fire Suppression	FIRESCOPE, Private fire companies, CAL OES	Equipment, Operational, Policy	112. FIRESCOPE policy addressing private fire resources is not in alignment with how these resources operated during the Palisades Fire.	1. The State of California needs expanded regulation and procedure to define and standardize the roles and resources of private fire brigades/companies and their staff. These standards must establish minimums for training, deployment, operation, coordination, and communications, and include stronger coordination with field commanders deployed by public agencies. 2. The proposed new standards should certify firefighters employed by such organizations as competent. The improved regulation should include stronger integration with public firefighting efforts, including enhanced command and control and improved fireground accountability. These standards should be codified into State law, and, with compliance with said regulations, private fire services should be granted access to lawfully restricted fireground areas.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES	Equipment, Operational, Policy	113. There are inconsistencies in the stated goals, objectives, and limitations of FireGuard regarding its use in operations.	1. Clarify the goals, objectives, and limitations of FireGuard to address the inconsistency between what is stated and what is in practice.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, All Los Angeles-area fire agencies	Equipment, Operational, Policy	114. The FireGuard perimeters missed key spread along the coast in the Palisades Fire and into some urban areas in the Palisades and Eaton Fires. The source of these errors is unclear, as the raw reflectance measurements and detection algorithms are classified.	1. These systematic errors need to be reduced to improve trust in these perimeters when applied to fires in the WUI and community conflagrations.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, CAL Fire, All Los Angeles-area fire agencies	Equipment, Operational, Policy	115. The wildfire models are not configured to create a continuous update of the fire perimeters based on the latest evidence.	1. More frequent assimilation of the FireGuard perimeters and initializing using the entire history of the FireGuard perimeters (as opposed to just the most recently released polygon) would improve the overall accuracy of the predicted state of the fire.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, CAL Fire, All Los Angeles-area fire agencies	Equipment, Operational, Policy	116. While the various simulation perimeters are available to users of the software, there is no clear indication of the quality of the individual simulations or the purpose of the smaller-domain individual simulations.	1. Improved data management of the set of simulations would improve the ability of analysts, incident managers, and emergency responders to rapidly find the latest accurate predictions.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, CAL Fire, All Los Angeles-area fire agencies	Operational, Policy, Research	117. While the wildfire models were available to fire officers and analysts, these predictions were not mentioned by ground based firefighters as important for decision-making. During the Palisades and Eaton Fires, intelligence products were shared with individuals via texts, emails, and other department tools. From here, how the products were used was at the discretion of the incident commanders and other decision makers.	1. Additional training on the use and application of these models would improve consistency in fireground decision-making and operations.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, CAL Fire, All Los Angeles-area fire agencies	Operational, Policy, Research	118. The current models were unable to capture the rate and distance of fire spread observed in the Palisades and Eaton Fires.	1. The underlying data, fire spread models, and/or weather models need to be improved, such that the forecasts can provide better predictions of lateral flame spread, particularly when encountering structures and the built environment.
3.10.4	Operational and Intelligence Tools for Situational Awareness	CAL OES, CAL Fire, All Los Angeles-area fire agencies	Operational, Policy, Research	119. The strategic investments made into wildfire intelligence and modeling by the State of California have enabled analysts to make rapid predictions of fire behavior. While additional work is needed to improve the modeling predictions, the capability of collecting and distributing this information is well beyond what has been available historically.	1. The State of California should be commended for making (and continue to make) strategic investments into improving wildfire perimeter tracking and modeling approaches. 2. Additional progress could be made by increasing collaboration across the various agencies, groups, and other stakeholders.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy	120. The public alert and warning process is overly complex involving multiple organizations — both public and private, in and outside of government — with overlapping and interdependent authorities, technologies, regulations, standards, policies, and capabilities.	1. Complete a comprehensive, end-to-end review and analysis of the current public alert and warning system for Southern California, with the goal of describing current capabilities, identifying critical interdependencies or gaps, and assessing potential enhancements that could improve the speed and efficacy of the overall system during fast-moving multi-jurisdictional events.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy, Training	121. Some personnel lacked familiarity with key systems (e.g., evacuation platforms, interoperability tools), resulting in inefficient workflows and missed communications.	1. Implement recurring multi-agency training on communications systems and platforms supporting public evacuation notification.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy, Training	122. A limited number of personnel were trained on the Genasys software platform. Genasys was a newly expanded program (implemented in November 2024), and challenges in using the system increased the time it took to draft and send alerts and warnings.	1. Increase the number of EOC staff who are trained and authorized to perform advanced functions within Genasys Protect and other evacuation management platforms to improve staffing depth and reduce reliance on a limited number of "Super User" operators. 2. Ensure all users of Genasys Alert and Genasys Protect receive continuing education and training regarding the use of evacuation mapping software platforms.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy, Training	123. Third-party emergency information platforms, such as Watch Duty, played an important role in providing the public with real-time situational awareness by aggregating and disseminating information from multiple authoritative sources during the Palisades and Eaton Fires.	1. Incorporate third-party notification tools into public warning and preparedness strategies by recognizing their role as supplemental situational-awareness resources rather than competitors to official alert systems. 2. Federal, state, and local government agencies should consider establishing formal information-sharing protocols with trusted third-party providers so that validated incident information can be distributed rapidly while maintaining message accuracy and consistency. 3. Develop standards for archiving and analyzing third-party notification data to support post-incident investigations, timeline reconstruction, and evaluation of public information dissemination.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy, Training	124. Watch Duty often relayed fire behavior, evacuation-related information, and other incident updates more rapidly than official notification systems, providing residents with time-sensitive information during rapidly evolving conditions.	1. Improve integration between official warning systems and third-party platforms to ensure evacuation orders, warnings, and incident updates are transmitted consistently and with minimal delay across all public-facing channels.
3.11.8	Evacuation	All emergency response and management agencies	Equipment, Policy	125. Neighborhood residents who shared information on various communications platforms (e.g., text chains and group chats) felt more informed about the fire's progress than through official public messaging channels alone. They were more apt to have a plan to stay or go. They identified and helped neighbors with evacuation challenges.	1. Fire and law enforcement should reach out to communities to promote close-knit communication networks amongst neighbors using available technologies.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy	126. Requests for evacuation warnings and orders were being received through multiple communication channels. As a result, information on who sent the warnings/orders and when was not always captured.	1. Create consistent policies on how to capture the data of who has ordered the alerts, who received them within the EOC, and at what time. This information should be entered in the alert tracking software platform.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	LACoFD, LASD, OEM	Operational, Policy	127. At the time of the Eaton Fire, Los Angeles County (LACoFD, LASD, and OEM) agencies' policies and procedures supporting evacuation notifications and population movement did not fully address the processes and tasks needed for effective execution.	1. Update wildfire evacuation policies between LACoFD, LASD, and OEM. Train agency staff on any changes and exercise the process annually. 2. All three (3) agencies should be co-located in a UC, side-by-side, in order for the system to work properly.
3.11.8	Evacuation	All emergency response and management agencies	Operational, Policy	128. Inconsistent situational awareness across agencies and concern about the potential impacts of evacuation orders on residents and businesses, at times, delayed and complicated evacuation decision-making.	1. Establish pre-defined, risk-based evacuation trigger points tied to fire behavior, weather conditions, and incident intelligence to support timely and consistent evacuation decisions. 2. Develop a common operating picture that integrates fire progression, weather, field observations, and evacuation status data to improve shared situational awareness among incident personnel and cooperating agencies.
3.11.8	Evacuation	All emergency response agencies	Operational, Policy	129. In partnership with LASD Lost Hills Station, Los Angeles Unified Schools, due to the Red Flag PDS, closed public schools in the Topanga area and adjusted to online classes.	1. Consider expanding this policy, especially for schools located in WUI areas, as it limits the need for evacuation efforts at area schools.
3.11.8	Evacuation	LASD	Operational, Policy	130. At the start of the Palisades Fire, LASD LHS personnel identified the wind-driven threat and proactively began evacuations before the fire advanced into their jurisdiction. This showed strong situational awareness and a focus on life safety, even though staffing levels did not meet the demands of the fire spread.	1. Continue strengthening proactive, life-safety-driven decision-making by backing early evacuation authority, enhancing allied agency coordination, and providing training that encourages proactive actions during rapidly deteriorating incidents.
3.11.8	Evacuation	LAPD, LASD	Operational, Policy	131. During the Palisades Fire, LASD demonstrated a proactive wildfire evacuation model characterized by early evacuation initiation, community integration, and established fire-law enforcement coordination. LAPD evacuation operations relied more heavily on individual initiative and experienced coordination challenges with fire agencies during the incident.	1. Implement standardized fire-law enforcement evacuation coordination procedures through joint planning, training, and exercises. 2. Promote proactive evacuation decision-making by empowering field personnel to communicate emerging threats and initiate protective actions when conditions indicate an imminent risk to life safety.
3.11.8	Evacuation	LASD	Operational, Policy, Preparedness	132. The LASD MFF system was challenged to respond to multiple ongoing incidents and MFF units were unprepared for evacuations in fast-moving, wind-driven fire incidents that impact the built environment.	1. Modify or replace the MFF system to address immediate evacuation and traffic control needs of community conflagrations.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	LASD	Operational, Policy	133. LASD ALD, CVS, and LHS personnel supported evacuation efforts, but required paperwork for residents refusing to evacuate, despite BWC recordings, which delayed operations and created uncertainty about evacuation status.	1. Develop evacuation tracking and communication systems that leverage existing technologies, such as BWC data, and are supported by standardized protocols and clear field instructions. This approach will enhance situational awareness, minimize inefficiencies, and speed up life-saving efforts. 2. Consider updating policy to include the BWC as sufficient documentation of refusals.
3.11.8	Evacuation	LACoFD, PFD	Operational, Policy, Training	134. After the Eaton Fire command was transferred to LACoFD from PFD, evacuation operations were not formalized within the incident organization, as evidenced by the absence of a Law Branch, Evacuation Group, or other dedicated evacuation management function during a rapidly expanding incident requiring large-scale evacuations. However, multiple personnel in the command organization and in the field thought that a Law Branch (or Evacuation Group) had been established.	1. Establish a dedicated evacuation management function within the incident organization whenever evacuation operations become an incident objective. 2. Re-educate Fire Chief Officers on the evacuation training presented on September 23, 24, and 30, 2024, which stressed the importance of establishing a Law Branch with fire personnel embedded for communications.
3.11.8	Evacuation	LACoFD, LASD, OEM	Operational, Policy	135. During the Eaton Fire, the evacuation order for areas west of Lake Avenue was issued as fire conditions were already impacting the area, reducing the time available for residents to self-evacuate. Delays in the evacuation notification process occurred while fire and law enforcement resources in the area were already understaffed and committed to other operational needs.	1. Develop procedures to rapidly deploy and augment law enforcement resources for evacuation operations when fire conditions indicate an increased likelihood of large-scale evacuations. 2. The incident management team should improve and streamline the evacuation notification process to ensure that evacuation needs are recognized and acted on in a timely and efficient manner, from message identification to message entry to message delivery.
3.11.8	Evacuation	LACoFD, LASD, OEM	Operational, Policy	136. During the Palisades and Eaton Fires, some residents declined to evacuate despite evacuation warnings and orders, as well as personal contact with emergency responders and community members.	1. Increase public education on wildfire and community conflagration risks, as well as evacuation procedures, evacuation routes, and household evacuation planning. 2. Strengthen community preparedness through neighborhood-based communication networks and community emergency preparedness groups. 3. Conduct interdisciplinary (fire, law enforcement, and research organizations) research to assess the effectiveness, risks, and operational impacts of residents remaining on their property during wildfires.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Training	137. In both fires, a large portion of the decedents were older adults located inside homes, underscoring that limited ability to self-evacuate can increase vulnerability.	1. Develop community-based programs to identify and assist at-risk populations before and during evacuations.
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Training	138. During both the Palisades and Eaton Fires, early evacuation planning did not adequately account for vulnerable populations and critical facilities, reducing situational awareness and affecting the prioritization and coordination of evacuation operations.	1. Develop mapping and real-time tracking of vulnerable populations and essential facilities into pre-incident and early operational planning to enhance situational awareness and improve evacuation prioritization. 2. Establish coordination protocols with hospitals, care facilities, and transportation-dependent groups to guarantee timely assistance and efficient evacuations during rapidly changing incidents. 3. Develop standardized law enforcement and fire agency policies, procedures, and training for the evacuation of vulnerable populations during large-scale incidents.
3.11.8	Evacuation	LASD	Operational, Policy	139. LASD worked with the known unhoused population in fire-affected areas and assisted them with evacuations.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	140. Municipal buses played an important role in evacuating vulnerable populations from care facilities in hazardous conditions as the Eaton Fire impacted areas of Altadena and Pasadena.	1.Public transportation entities should consider developing training to support large-scale evacuations of vulnerable populations during rapidly escalating emergency incidents.
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	141. Traffic conditions changed rapidly as fire progression, congestion, road closures, abandoned vehicles, and infrastructure impacts affected evacuation routes, highlighting the need for integrated traffic management and real-time coordination among response agencies.	1. Establish a unified evacuation traffic management function that integrates law enforcement, fire, transportation, public works, and emergency management agencies to coordinate route management, traffic information, signal operations, and evacuation decision-making.
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	142. During the Palisades and Eaton Fires, effective evacuation traffic management was hindered by the lack of standardized procedures and training to help officers understand how individual traffic control points supported the broader evacuation strategy.	1. Develop and train on wildfire-specific traffic management plans that define evacuation routes, traffic control objectives, alternate routes, road closure procedures, and field reporting requirements.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	143. Land use and time of day are critical during evacuations. In high-activity, mixed-use areas, roadways already carry substantial demand. While an evacuation may shift when that demand occurs, the Palisades Fire evacuation did not significantly increase overall roadway activity — and during normal peak hours, it appears to have reduced it.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	144. Evacuation activity did not substantially exceed baseline levels across the Palisades Fire area during the first 12 hours of the incident. However, localized congestion was known to have occurred on key corridors and may not appear in area-wide results.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	145. Unlike the Palisades Fire, the Eaton Fire evacuation showed significantly different travel patterns from normal overnight conditions. Peak travel activity did not greatly exceed typical roadway use, though it occurred at different times.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	146. Despite differences, responsiveness to evacuation warnings and orders is consistent: most trips start within 1-2 hours, followed by a longer tail of activity.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	147. StreetLight data was a useful source of trip activity data during the Palisades and Eaton Fire evacuations.	N/A
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	148. In previous fires, communities have established designated areas of refuge that provide temporary areas of relief if evacuation is not possible. Examples of these areas include golf courses, community centers, cleared parking lots, and parks.	1. Communities should establish and educate the public on designated areas of refuge to prioritize life safety of residents and responders in the event of a fire.
3.11.8	Evacuation	All emergency response agencies	Operational, Policy, Preparedness	149. During the Palisades and Eaton Fires, emergency response personnel were required to divert resources to secure critical equipment and defend fire and law enforcement facilities threatened by fire.	1. Fire and law enforcement agencies should develop and exercise standardized facility evacuation and continuity-of-operations plans that provide procedures for securing critical assets and maintaining essential services when public safety facilities are threatened by wildfire.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
3.11.8	Evacuation	LAPD, LASD	Operational, Policy	150. During Eaton Fire evacuations on the morning of January 8, 2025, looting incidents required law enforcement personnel to divert resources from evacuation operations, search and rescue missions, and calls for service.	1. Law enforcement agencies should request additional resources early to maintain evacuation operations while providing security and preventing criminal activity within evacuated areas. 2. Law enforcement agencies should consider requesting mobile booking resources early during large-scale incidents to expedite the processing of individuals engaged in criminal activity and minimize the diversion of personnel from life-safety operations.
3.11.8	Evacuation: Community Brigade	LACoFD	Operational, Policy, Preparedness, Prevention, Training	151. Large, wind-driven fires in the Santa Monica Mountains routinely exceed the capacity of local emergency response agencies during extreme fire events. Community Brigades provided additional manpower, local intelligence, evacuation support, and structure protection assistance during the Palisades Fire.	1. Expand Community Brigade programs within high-risk WUI communities. 2. Provide the Community Brigade with sustainable funding to support readiness and equipment.
3.11.8	Evacuation: Community Brigade	LACoFD	Operational, Policy, Preparedness, Prevention, Training	152. Community Brigade members improved evacuation compliance by leveraging existing community relationships and local trust.	1. Expand Brigade coverage to additional high-risk communities. 2. Incorporate Brigade members into pre-fire evacuation planning and public preparedness programs.
3.11.8	Evacuation: Community Brigade	LACoFD	Operational, Policy, Preparedness, Prevention, Training	153. Community Brigade integration into the incident management structure was inconsistent during the Palisades Fire.	1. Establish formal resource typing and credentialing for the Community Brigade. 2. Include Community Brigades in drills, exercises, and Incident Action Plans. 3. Develop clear assignment, supervision, and communications protocols.
3.11.8	Evacuation: Community Brigade	LACoFD	Operational, Policy, Preparedness, Prevention, Training	154. Community Brigade personnel operated in conditions that at times necessitated exceeding the roles and operational boundaries envisioned by program doctrine.	1. Establish standardized qualifications and operational standards for the Community Brigade. 2. Define risk-based engagement criteria and accountability requirements for the Community Brigade. 3. Ensure Community Brigade members have appropriate PPE, communications equipment, and supervision for the hazards within these operational standards.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	155. Transient near-home combustibles, such as vehicles and garbage/recycling receptacles, contributed to fire spread and structure damage and are an under-recognized contributor to fire spread to and between structures.	1. Recognize fire spread risk for these transient fuel sources that are often not considered as part of Zone 0. Strengthen Defensible Space Zone 0 guidance to definitively encourage relocating garbage and recycling containers as well as boats, RVs, and vehicles outside of this zone (e.g., currently this action is stated as a consideration [citation#]. 2. Additional research is needed to study ignition mechanisms and potential control measures for both sources.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	156. Outdoor components of HVAC systems contributed to fire spread and structure damage and are an under-recognized component of Zone 0.	1. Address risk for fires in and around these units, including the likelihood of gathering windblown debris and embers near structures. When these units are located within Zone 0, the structure cladding and eaves should be noncombustible, and they should be located away from windows. 2. Additional research is needed to study ignition mechanisms and evolving risk as the HVAC industry shifts towards mildly flammable (A2L) and highly flammable (A3) refrigerants.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	157. Vegetation on properties contributed to fire spread and structure damage.	1. Residents should consider how vegetation on their property could contribute to fire spread and conduct routine property maintenance to reduce the hazard of structure ignition (e.g., no vegetation in Zone~0, routine brush maintenance, hydrated vegetation, and strategically placed fire-resistive landscaping).
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	158. In high-density neighborhoods, structural collapse contributed to structure-to-structure fire spread and damage by bringing burning materials closer to neighboring structures and, in some cases, causing structural damage and compromise due to impact.	1. Additional research is needed to understand the factors that influence collapse potential (e.g., building construction, wind, fire suppression streams) and potential mitigation strategies in high-density neighborhoods.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	159. Exterior walls were the most commonly damaged component of structures surveyed during the ULRI assessment. Due to the prevalence of noncombustible wall construction, only 13% of the structures assessed had significant wall damage. Exterior walls constructed from a combination of combustible and noncombustible materials were still susceptible to significant damage, especially when near home combustibles were located in Zone 0.	1. Exterior walls should be constructed entirely of a noncombustible material for the highest level of fire resistance. 2. In cases where it is not feasible to construct or protect a wall entirely with noncombustible material (e.g., due to cost), the bottom half (or at least 2~ft from the ground) should be constructed of or covered by a noncombustible material to protect against ember ignition, and extra attention should be given to clearing Zone 0 of any combustibles that could ignite and cause fire spread to the combustible portion of the wall above this level.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	160. Windows were the second most commonly damaged component of structures surveyed during the ULRI assessment but were the building component with the highest number of observed significant level of damage (an opening formed through the building envelope).	1. For the highest level of fire resistance, windows should be considered a key vulnerability of structures and should therefore be constructed to withstand exterior ember, radiant heat, and direct flame contact. Noncombustible framing material and double-pane tempered glass are recommended for increased resistance to ember, radiation and flame impacts. 2. Homeowners should be educated and informed of methods of window protection.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Prevention, Preparedness	161. Fascia and barge boards on eaves were vulnerable to damage from radiant heat transfer from nearby structures. If eaves are enclosed with a noncombustible soffit, but these boards are constructed of a combustible material (e.g., wood), the eaves are still susceptible to ignition.	1. Fascia and barge boards of eave assemblies should be constructed from or protected by a noncombustible material (e.g., metal cladding).
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	162. Door and window frames can be important vulnerabilities of a structure and can impact glass pane failure during fire exposure. Combustible frames can ignite and provide a pathway for fire to spread to the interior of the structure. Frames that ignite (e.g., wood) or soften, melt, and/or deform (e.g., vinyl) during a fire exposure can lead to early failure of glass panes or openings through the window assembly, which can also result in a pathway for fire into the structure.	1. Door and window frames (including the jambs) should be constructed of or protected by a noncombustible material to prevent ignition from fire and ember exposures.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	163. Property and structure preparation contributed to reducing the hazard from burning fuels and/or the susceptibility of structures to igniting on many properties impacted by the Palisades and Eaton Fires.	1. Property owners should comply with local vegetation management regulations and ignition-resistant building standards while working collaboratively with neighbors and community members to continuously reduce hazards, support preparedness efforts, and strengthen community resilience.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	164. Many structure preparation actions involved using materials that are readily available at local stores.	1. Residents should be encouraged to have a property and structure preparation plan so that, in the event of a fire, they can quickly protect their structure prior to evacuating. Educate the public about resources outlining steps they can take to best protect their structures.
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	165. Interventions contributed to reducing hazard from burning fuels and/or susceptibility of structures to ignition and was an important factor in mitigating structure damage in the Palisades and Eaton Fires. Any analysis of structure damage, destruction, and survival from community conflagrations must consider the impact of emergency interventions.	N/A
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	166. Interventions' effectiveness depends on mechanisms of fire spread, building/construction factors, and capabilities and resources of the intervener.	1. Firefighters and others engaged in structure defense should be trained to assess built environment vulnerabilities along with current and anticipated fire behavior to determine where to prioritize suppression resources, and the best strategy and tactic to employ.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
4.7	Analysis of the Built Environment	State of California, Local Governments	Policy, Preparedness, Prevention	167. Residents who defended their properties and communities had an impact on damage in the built environment, but it also may have been a contributing factor in residents' injuries and deaths.	1. It is not recommended that the system of structure defense rely upon untrained residents to intervene when structures are being impacted by fire. However, residents should be trained and encouraged to prepare their properties and harden structures in a manner that supports effective fire department response. In cases where residents are unable to evacuate, these same preparations will likely aid them if forced to stay and defend. 2. Fire service and law enforcement agencies should consider developing training programs supporting appropriate, risk-informed volunteer engagement during conflagrations, such as expanding the Community Brigade.
6.1.7	Lachman Fire (January 1, 2025) Analysis	LAFD	Operational, Policy	168. LAFD did not have a detailed procedure for wildland mop-up operations.	1. Fire departments with wildland and WUI responsibility should maintain a written mop-up, patrol, hose line management, follow-up inspection, and incident closeout procedure for vegetation fires.
6.1.7	Lachman Fire (January 1, 2025) Analysis	LAFD	Operational, Policy	169. LAFD did not have a formal process requiring reassessment of recently controlled wildland fires when critical fire weather was forecasted.	1. Departments should require additional reassessment when a low-humidity period or significant wind event is forecast after a wildland fire, with particular vigilance in the case of a Red Flag Warning or PDS warning.
6.1.7	Lachman Fire (January 1, 2025) Analysis	LAFD	Operational, Policy	170. Hose lines were removed on January 2, 2025, and the records reviewed did not identify a documented plan to reassess the fire area before the forecasted critical fire weather event.	1. When elevated or extreme fire weather is forecast after initial control, command should consider holding resources, reassigning patrols, deploying drone or infrared support, rechecking the perimeter, delaying hose removal, and postponing final release.
6.1.7	Lachman Fire (January 1, 2025) Analysis	LAFD	Operational, Policy	171. The records reviewed did not identify a documented patrol plan after hose removal that assigned resources to monitor the fire area based on remaining heat concerns, fuel conditions, or forecasted fire weather.	1. Departments should define patrol status as an active operational assignment with assigned resources, objectives, reporting expectations, and authority to extinguish remaining heat sources. The operational assignment of Patrol should consider the current and predicted fire weather and fuel status.
6.1.7	Lachman Fire (January 1, 2025) Analysis	LAFD	Operational, Policy	172. LAFD personnel assigned to the Lachman Fire did not consistently view upward communication of fire conditions and suppression effectiveness as part of the operational reporting process.	1. Departments should create a culture where personnel at all levels are expected to identify, communicate, and elevate fireground concerns.
6.1.7	Lachman Fire (January 1, 2025) Analysis	State Parks	Operational, Policy, Preparedness, Prevention	173. The draft Topanga State Park Wildfire Management Plan (WMP) did not include input from fire agencies.	1. Federal, State and/or Local fire agencies should participate in the development of the State Parks WMP to ensure it addresses wildfire prevention, preparedness and operational response.

Reference Section	Section	Relevant Department(s)	Actionable Areas	Finding	Recommendation
6.2.1	Historical Review of AfterAction Reports	All emergency reponse and management agencies	Policy	174. Current and historical wildfire after-action review processes remain largely suppression-focused and do not consistently evaluate the pre-fire conditions, community preparedness, resilience measures, and multi-disciplinary factors that influenced incident outcomes.	1. Expand after-action review methodologies to include fire prevention, emergency management, planning, public information, and community risk reduction perspectives, ensuring that pre-fire conditions and community resilience are systematically assessed alongside suppression activities.
6.2.1	Historical Review of AfterAction Reports	All emergency reponse and management agencies	Policy	175. The absence of a formal mechanism to track recommendations across jurisdictions limits accountability and reduces the long-term implementation of lessons learned from major wildfire incidents.	1. Establish a centralized corrective action tracking process that monitors recommendation implementation, assigns ownership, measures progress, and validates improvements through periodic reporting, training, and exercises to support continuous wildfire resilience improvement.

6.10 Data Requests

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
All Risk Shield	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.	19-May-25	Received
	Email	16-Apr-25	Associated training and compliance records.	19-May-25	Received
Burbank Fire Department	TD	8-Dec-25	Eaton Fire Incident	9-Feb-26	Received
California Department of Forestry and Fire Protection (CAL FIRE)	Email	7-Feb-25	(1) Response matrix for all types of incidents.		Pending
	Email	7-Feb-25	(2) Policies, procedures, SOG's supporting incident response and operational performance.		Pending
	Email	7-Feb-25	(3) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.		Pending
	Email	7-Feb-25	(4) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank. Include outside agency resources pre-positioned in LA City areas.	4-Jun-25	Received
	Email	7-Feb-25	(5) Palisades Incident CAD/Call History from January 7 through January 12.		Pending
	Email	7-Feb-25	(6) Palisades Incident MDC messages from January 7 through January 12.		Pending
	Email	7-Feb-25	(7) Palisades Incident dispatch communications January 7 through January 12.		Pending
	Email	7-Feb-25	(8) Palisades Incident radio communications January 7 through January 12.		Pending
	Email	11-Mar-25	(1) Completed post fire flights of the Palisades and Eaton using HiDef video and LIDAR.	9-Jul-25	Received
	Email	11-Mar-25	(2) Automatic vehicle location (AVL) data for resources assigned to, or staged for, the Eaton and Palisades incidents form January 7 through 12.	2-May-25	Received
	Email	11-Mar-25	(3) Additional information for pre-positioning.	4-Jun-25	Received
	Email	11-Mar-25	(4) ALERT Wildfire Camera CA UCSD.	24-Apr-25	Received
	Email	11-Mar-25	(5) CAL FIRE post inceident analysis (PIA).	1-May-25	Received
	Email	11-Mar-25	Eaton/Palisades DSM and DEM Files	21-Mar-25	Received
	Email	12-Mar-25	(1) CALFIRE agency resources during the period Jan. 4-12, 2025.	4-Jun-25	Received
	Email	12-Mar-25	(2) CAL FIRE contracted private resources during the period Jan. 4-12, 2025.	4-Jun-25	Received
	Email	12-Mar-25	(3)CAL FIRE Contract County agreement acquired resources during the period Jan. 4-12, 2025.	4-Jun-25	Received
	Email	12-Mar-25	(4) Federal agency resources requested by CAL FIRE during the period Jan. 4-12, 2025.	4-Jun-25	Received
	Email	12-Mar-25	(5) EMAC (Multi-State Compact) agreement resources requested by CAL FIRE during the period Jan. 4-12, 2025.	18-Aug-25	Received
	Email	12-Mar-25	(6) Resources assigned to CAL FIRE CSR (Southern Region) Preposition, or direct to any of the following incidents: Palisades, Eaton, Hurst, Woodley, Olivas, Lidia, Sunset, Kenneth, Archer, Auto, Hughes.	4-Jun-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
California Department of Forestry and Fire Protection (CAL FIRE)	Email	12-Mar-25	(7) Summary of number and type of resources returned to home after initial dispatch without fire assignment.	4-Jun-25	Received
	Email	12-Mar-25	(8) All incident /prepositioned resources reassigned from initial assignment, Date/time of request, date/time mobilized, date/time/ onscene, date/time demobilized.	4-Jun-25	Received
	Email	12-Mar-25	(9) Agreement type paying for resource deployment.	4-Jun-25	Received
	Email	12-Mar-25	(10) Each Incident ICS 201- Incident Briefing.	4-Jun-25	Received
	Email	12-Mar-25	(11) Each Incident ICS 202- Incident Objectives.	4-Jun-25	Received
	Email	12-Mar-25	(12) Each Incident ICS 207-Incident Org Chart.	4-Jun-25	Received
	Email	12-Mar-25	(13)Each Incident ICS 209-Incident Status Summary.	4-Jun-25	Received
	Email	12-Mar-25	(14) Each incident ICS 220-Air OPS Summary.	4-Jun-25	Received
	Email	16-Apr-25	Access to the satellite images for Eaton/ Palisades.	10-Jun-25	Received
	Email	2-Jul-25	(1) Summary of aircraft, hand crews, dozers, and water tenders assigned to various incidents.	19-Aug-25	Received
	Email	2-Jul-25	(2) Final summary of EMACS (out-of state) resources ordered and how/where deployed.	19-Aug-25	Received
	Email	2-Jul-25	(3) Statement on purpose and use of mobilization centers and staging of out of state resources, how many units were processed through, time in staging, etc.	19-Aug-25	Received
	Email	2-Jul-25	(4) Records for large incident orders received (IROC data preferred). Looking for large, multi-strike team resource ordering for Palisades and Eaton Fires, also want to get a sense of where fulfillment was coming from at the time requests were made.	19-Aug-25	Received
	Email	2-Jul-25	(1) Normal staffing and positioning of aircraft (type and quantity with tail numbers) that supports Southern California.	14-Jul-25	Received
	Email	2-Jul-25	(2) Pre-event/augmented staffing and pre-positioning of aviation assets in response to forecasted weather prior to January 7, 2025.	14-Jul-25	Received
	Email	2-Jul-25	(3)Flight information related to state aircraft assigned to each of the fires on the attached list.	14-Jul-25	Received
	Email	11-Aug-25	(1) CAL FIRE timeline on the Palisades and Eaton Fires.	19-Aug-25	Received
	Email	11-Aug-25	(2) For the period Jan. 5-10: CAL FIRE CSR IROC ordering records for engines, crews, dozers, aircraft, water tenders, and overhead for preposition.	19-Aug-25	Received
	Email	11-Aug-25	(3) CAL FIRE CSR Morning Reports.	19-Aug-25	Received
	Email	11-Aug-25	(4) CAL FIRE Staffing Pattern reports affecting CSR.	19-Aug-25	Received
	Email	11-Aug-25	(5) Total number of CAL FIRE resources deployed (by type) to the various incidents.	19-Aug-25	Received
	Email	11-Aug-25	(6) Total CAL FIRE resources deployed to all incidents during the January fires.	19-Aug-25	Received
	Email	11-Aug-25	(7) Contract County resources mobilized by CAL FIRE on State Mission for incident response.	19-Aug-25	Received
	Email	11-Dec-25	Predictive Models for Palisades and Eaton 1st 24 hours.	21-Mar-26	Received
	Email	11-Dec-25	Palisades and Eaton Simulation Data request.	31-Mar-26	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
California Department of Forestry and Fire Protection (CAL FIRE)	Email	16-Dec-25	Intelligence and Preparedness Vendor Contracts.	19-Feb-26	Received
	Email	16-Dec-25	Fire Modeling Contracts.	19-Feb-26	Received
	Email	28-Jan-26	Office of Wildfire Technology R&D (OWTRD) Org Chart.	13-Feb-26	Received
	Email	28-Jan-26	OWTRD Strategic Plans.	13-Feb-26	Received
	Email	28-Jan-26	OWTRD Multi-Year Budget.	13-Feb-26	Received
	Email	28-Jan-26	FireGuard Satellite Perimeters for Palisades and Eaton Fires.	23-Feb-26	Received
	Email	28-Jan-26	FireGuard Video and Information Sheet.	9-Feb-26	Received
	Email	9-Mar-26	GIS Data for FHSZ Maps.	9-Mar-26	Received
California Highway Patrol (CHP)	CPRA R005760	11-Jun-25	(1) Eaton CHP Staffing.	18-Aug-25	Received
	CPRA R005760	11-Jun-25	(2) Palisades CHP Staffing.	18-Aug-25	Received
	CPRA R005760	11-Jun-25	(3) Use of Force Reports.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(1) Officer & Supervisor Reports - January 7, 2025 - January 12, 2025.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(2) Arrest Reports.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(3) CAD/Call History Logs – Full Computer-Aided Dispatch (CAD) records for law enforcement calls related to the LA Fires from January 7 through January 12.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(4) MDC Messages (Mobile Data Computer Logs).	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(5) Dispatch Communications.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(6) Radio Communications.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(7) Automatic Vehicle Location (AVL) Data – GPS tracking for law enforcement units.	8-Nov-25	Received
	CPRA R005760	11-Jun-25	(8) In-Car Camera Footage.	8-Nov-25	Received
	Email	29-Aug-25	(1) CAD Report.	8-Nov-25	Received
	Email	29-Aug-25	(2) Dispatch Audio.	8-Nov-25	Received
	Email	29-Aug-25	(3) Reports.	8-Nov-25	Received
	Email	29-Aug-25	(4) International Criminal Court (ICC) Mobile Video/Audio Recording System (MVARS).	8-Nov-25	Received
California Governor's Office of Emergency Services (CAL OES)	Email	12-Mar-25	Video, LIDAR, infrared, or any other aerial imagery reconnaissance/data collection flights during the early phases of the Palisades and Eaton, and sometime after the fires were nearly contained for damage assessment.	20-Jun-25	Received
	Email	16-Jul-25	(1) Normal staffing and positioning of aircraft (type and quantity with tail numbers) that supports Southern California.	24-Aug-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
California Governor's Office of Emergency Services (CAL OES)	Email	16-Jul-25	(2) Pre-event/augmented staffing and pre-positioning of aviation assets in response to forecasted weather prior to January 7, 2025.	24-Aug-25	Received
	Email	16-Jul-25	(3) Flight information related to QRF aircraft assigned to each of the fires on the attached list (January 2025 LA fires).	24-Aug-25	Received
	Email	16-Jul-25	(4) Fire perimeter products, or supporting information, prepared for any of the LA fires.	24-Aug-25	Received
	Email	11-Aug-25	OES Form F-42s.	22-Aug-25	Received
	Email	2-Dec-25	Intelligence & Preparedness Vendor Contracts.	2-Jan-26	Received
	Email	19-Dec-25	OES AVL/Dispatch Data.	2-Jan-26	Received
	Email	2-Feb-26	Mutual Aid Request.	24-Feb-26	Received
	Email	19-Feb-26	Predictive Modeling Products - FIRIS.	2-Mar-26	Received
California State Parks	Email	20-Oct-25	Lachman Fire - Maintenance Records and Responsible Agency Agreements	9-Mar-26	Partial
	Email	20-Mar-26	Lachman Fire - Public Safety Reports on Encroachment	6-May-26	Received
	Email	20-Mar-26	Lachman Fire - ROE/Enforcement Compliance, Preparedness & Reference Material, Communications	6-May-26	Received
	Email	20-Mar-26	Lachman Fire - Burned Area Recovery Report	6-May-26	Received
	Email	20-Mar-26	Lachman Fire - Serious Incident Notification (SIN)	8-Apr-26	Received
	Email	24-Feb-26	Lachman Fire - State Park, Fire Avoidance, Protected Area Maps	8-Apr-26	Received
	Email	24-Feb-26	Lachman Fire - Emergency Operation Plans	6-May-26	Received
Capstone Fire and Safety Management	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.	19-May-25	Received
	Email	16-Apr-25	Associated training and compliance records.	19-May-25	Received
Chloeta	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.		Pending
	Email	16-Apr-25	Associated training and compliance records.		Pending
Colorado Multi-Mission Aircraft (MMA)	Email	22-May-25	Electro-Optical and Infrared Imagery Collection for Eaton and Palisades.	23-Jul-25	Received
Ember Defense Wildfire Solutions	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.	28-Apr-25	Received
	Email	16-Apr-25	Associated training and compliance records.	28-Apr-25	Received
ERC Wildland Services LLC	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.		Pending
	Email	16-Apr-25	Associated training and compliance records.		Pending
Federal Emergency Management Agency (FEMA) Department of Homeland Security (DHS)	Email	17-Feb-26	Ground Level Situation Awareness and Damage Dat.a		Pending
	Email	17-Feb-26	Process to receive US&R collected ground/field data for LA Fires.		Pending

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Fehr and Peers	Meeting	16-Dec-25	Transportation Infrastructure and Evacuation data for the Palisades and Eaton Fires	2-Apr-26	Received
	Meeting	7-Jan-26	Azira location intelligence platform data	5-Jun-26	Received
	Meeting	7-Jan-26	Transportation agency pre-event and response activities	5-Jun-26	Received
	Meeting	7-Jan-26	LE traffic control activities	5-Jun-26	Received
FireAway LLC	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions		Pending
	Email	16-Apr-25	Associated training and compliance records		Pending
Foothill Municipal Water District	Open Source	15-Jun-25	(1) Updated System Master Plan.	18-Nov-25	Received
	Open Source	15-Jun-25	(2) Detailed description of the pumping, storage, and distribution system components on East side of the system impacted by the fire: Las Flores Water, Lincoln Avenue Water, Rubio Canyon Land and Water Association, and Kinneloa Irrigation District.	18-Nov-25	Received
	Open Source	15-Jun-25	(3) Distribution and storage system map for the East side of the system.	18-Nov-25	Received
	Open Source	15-Jun-25	(4) Interconnections with other agencies and their size and capacity.	18-Nov-25	Received
	Open Source	15-Jun-25	(5) Available storage capacity in the system under normal operating conditions.	18-Nov-25	Received
	Open Source	15-Jun-25	(6) The water level in the storage tanks under normal operating conditions, just before and during the fires.	18-Nov-25	Received
Kern County Fire Department (KCFD)	Email	22-Dec-25	(1) AVL data.		Pending
	Email	22-Dec-25	a. Eaton- KRN 5201A – Dispatched 1/8/2025 at approximately 0900.		Pending
	Email	22-Dec-25	b. Palisades- KRN 5200 A 6230A and KRN 5201C - Dispatched 1/8/2025 at approximately 0400.		Pending
Kinneola Irrigation District	Email	15-Jun-25	(1) A system master plan.	16-Jun-25	Received
	Email	15-Jun-25	(2) A distribution and storage system map.	28-Jun-25	Received
	Email	15-Jun-25	(3) Provide design criteria for the storage and distribution system.	28-Jun-25	Received
	Email	15-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	28-Jun-25	Received
	Email	15-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	28-Jun-25	Received
	Email	15-Jun-25	(6) The types of pipe materials used in the distribution system.	28-Jun-25	Received
	Email	15-Jun-25	(7) The typical depth of the pipes in the distribution system.	28-Jun-25	Received
	Email	15-Jun-25	(8) Available fire storage capacity under normal operating conditions.	28-Jun-25	Received
	Email	15-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	28-Jun-25	Received
	Email	15-Jun-25	(10) The emergency operating plan.	28-Jun-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Las Flores Water Company	TD	15-Jun-25	(1) A system master plan.	18-Feb-26	Received
	Email	15-Jun-25	(2) A distribution and storage system map.	18-Nov-25	Received
	TD	15-Jun-25	(3) Provide design criteria for the storage and distribution system.	18-Feb-26	Received
	Email	15-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	18-Nov-25	Received
	Email	15-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	18-Nov-25	Received
	Email	15-Jun-25	(6) The types of pipe materials used in the distribution system.	18-Nov-25	Received
	TD	15-Jun-25	(7) The typical depth of the pipes in the distribution system.	18-Feb-26	Received
	TD	15-Jun-25	(8) Available fire storage capacity under normal operating conditions.	18-Feb-26	Received
	TD	15-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	18-Feb-26	Received
	TD	15-Jun-25	(10) The emergency operating plan.	18-Feb-26	Received
Las Virgenes Municipal Water District	Open Source	11-Feb-26	(1) A system master plan.	11-Feb-26	Received
	Open Source	11-Feb-26	(2) A distribution and storage system map.	11-Feb-26	Received
	Open Source	11-Feb-26	(3) Provide design criteria for the storage and distribution system.	11-Feb-26	Received
	Open Source	11-Feb-26	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	11-Feb-26	Received
	Open Source	10-Apr-26	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	10-Apr-26	Received
	Open Source	11-Feb-26	(6) The types of pipe materials used in the distribution system.	11-Feb-26	Received
	Email	15-Jun-25	(7) The typical depth of the pipes in the distribution system.		Pending
	Open Source	11-Feb-26	(8) Available fire storage capacity under normal operating conditions.	11-Feb-26	Received
	Email	15-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).		Pending
	Email	15-Jun-25	(10) The emergency operating plan.		Pending
Lincoln Avenue Water Company (LAWC)	Email	26-Jun-25	(1) A system master plan.	26-Jun-25	Received
	Email	26-Jun-25	(2) A distribution and storage system map.	26-Jun-25	Received
	Email	26-Jun-25	(3) Provide design criteria for the storage and distribution system.	26-Jun-25	Received
	Email	26-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	26-Jun-25	Received
	Email	26-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	26-Jun-25	Received
	Email	26-Jun-25	(6) The types of pipe materials used in the distribution system.	26-Jun-25	Received
	Email	26-Jun-25	(7) The typical depth of the pipes in the distribution system.	26-Jun-25	Received
	Email	26-Jun-25	(8) Available fire storage capacity under normal operating conditions.	26-Jun-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Lincoln Avenue Water Company (LAWC)	Email	26-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	26-Jun-25	Received
	Email	26-Jun-25	(10) The emergency operating plan.	26-Jun-25	Received
	Email	20-Oct-25	(1) A confirmation of all tank sizes in your storage and distribution system.	12-Jul-25	Received
	TD	20-Oct-25	(2) A copy of the SCADA system information from the month before the fire event.	18-Feb-26	Received
	TD	20-Oct-25	(3) A copy of the SCADA system information for the two weeks after the fire event;.	18-Feb-26	Received
	Email	20-Oct-25	(4) Any additional information you may have obtained during the fire event that you have not previously sent us that you think would be helpful.	12-Jul-25	Received
Long Beach Fire Department (LBFD)	Email	9-Jan-26	AVL Data for Units dispatched on Jan 7, 2025.		Pending
Los Angeles City Emergency Management Department (EMD)	Email	1-May-25	**General Document Request (in effect on/prior to January 7, 2025)**		
	Email	1-May-25	(1) All general organization EOPs/SOPs/SOGs.	26-Jun-25	Received
	Email	1-May-25	(2) Daily staffing rosters, roles and responsibilities.	26-Jun-25	Received
	Email	1-May-25	(3) Organizational chart(s) for daily staffing.	26-Jun-25	Received
	Email	1-May-25	(4) Training/certification and exercise records for EM employees (2023-2025).	26-Jun-25	Received
	Email	1-May-25	(5) After-action reports (AAR) for significant wildfire events (2015-2025).	26-Jun-25	Received
	Email	1-May-25	(6) After-action reports (AAR) of any training exercises (table-top, functional, full-scale, etc.) (2015-2025).	26-Jun-25	Received
	Email	1-May-25	(7) Memorandum of Undertsandings/Mutual aid agreements with other emergency management organizations.	26-Jun-25	Received
	Email	1-May-25	(8) Memorandum of Understandings/Mutual Aid agreements with NGOs, community, or other emergency assistance organizations.	26-Jun-25	Received
	Email	1-May-25	(9) Hazard Mitigation Plan(s).	26-Jun-25	Received
	Email	1-May-25	(10)Threat and Hazard Identification Risk Assessments (THIRAs).	26-Jun-25	Received
	Email	1-May-25	**Document Request for the Incident Timeline (for pre-activation/planning period relating to January 7 through all operational periods through January 11, 2025)**		
	Email	1-May-25	(1) Information on any preparedness or emergency messaging distributed prior to and throughout the defined incident timeline such as media releases, outreach campaigns, social media, wireless emergency alerts, etc., including content of the messaging, targeted audience, date, and time of distribution.	26-Jun-25	Received
	Email	1-May-25	(2) Emergency operations center (EOC) staffing rosters, roles, and responsibilities.	25-Nov-25	Received
	Email	1-May-25	(3)Sign-in/Sign-out sheets.	25-Nov-25	Received
	Email	1-May-25	(4) Any/all ICS forms completed (including 214s).	6-Aug-25	Received
	Email	1-May-25	(5) Formal or informal incident action plans, situational reports, flash reports, and section reports for each operational period.	26-Jun-25	Received
	Email	1-May-25	(6) Transcripts or records maintained by any electronic emergency management system.		Pending

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Los Angeles City Emergency Management Department (EMD)	Email	1-May-25	(7) Electornic or otherwise documented communications with other EOCs.		Pending
	Email	1-May-25	(8) Electornic or otherwise documented communications with other DOCs.		Pending
	Email	1-May-25	(9) Any/all formal and/or informal requests for assistance.		Pending
	Email	1-May-25	(10) Handwritten notes/files or other physical/electronic incident-related documentation developed by EOC personnel.	26-Jun-25	Received
	Email	1-May-25	(11) Recordings and/or photos taken within, or of, the EOC.	26-Jun-25	Received
	Email	1-May-25	(12) Recordings and/or photos received by the EOC.		Pending
	Email	1-May-25	(13) Emergency Management Assistance Compacts (if applicable).		Pending
	Email	1-May-25	(14) Communications regarding development and submission of Fire Management Assistance Grants (FMAGs).		Pending
	Email	1-May-25	(15) List of municipal, state, tribal or federal agencies that provided assistance, including time of request, assets provided, time of arrival, and duration of use.	26-Jun-25	Received
	Email	1-May-25	(16) List of private contractors that provided assistance, including time of request, assets provided, time of arrival, and duration of use.	25-Nov-25	Received
Los Angeles City Fire Department (LAFD)	Email	7-Feb-25	(1) Response matrix for all types of incidents.	5-May-25	Received
	Email	7-Feb-25	(2) Policies, procedures, SOG's supporting incident response, management, and operational performance for all types of incidents.	5-May-25	Received
	Email	7-Feb-25	(3) Wildland pre-attack plans, structure defense plans, evacuation plans, or any other pre-plan developed to address a WUI fire.	20-Aug-25	Received
	Email	7-Feb-25	(4) After action reports for WUI fires in the past ten years.	11-Aug-25	Received
	Email	7-Feb-25	(5) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.	16-Apr-25	Received
	Email	7-Feb-25	(6) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank.	17-Apr-25	Received
	Email	7-Feb-25	(7) Eaton and Palisades Incident CAD/Call History from January 7 through January 12.	09-Sept-25	Received
	Email	7-Feb-25	(8) Eaton and Palisades incident MDC messages from January 7 through January 12.		Pending
	Email	7-Feb-25	(9) Eaton and Palisades incident dispatch communications January 7 through January 12.	8-Jul-25	Received
	Email	7-Feb-25	(10) Eaton and Palisades incident radio communications January 7 through January 12.	18-Aug-25	Received
	Email	7-Feb-25	(11) Automatic vehicle location (AVL) data for resources assigned to, or staged for, the Eaton and Palisades incidents form January 7 through 12.	10-Jul-25	Received
	Email	7-Feb-25	(12) Documentation completed by chief and/or company officers pertaining to the actions they and their crews were involved with during the evacuation and structure defense period of the Eaton and Palisades incidents.	6-May-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Los Angeles City Fire Department (LAFD)	Email	7-Feb-25	(13) Eaton and Palisades incident notes and/or reports produced by an incident management tool like Tablet Command, or similar product.	6-May-25	Received
	Email	7-Feb-25	(14) Location of deceased found on or after January 7th within the Eaton and Palisades burn scar.	8-Aug-25	Partial
	Email	7-Feb-25	(15) Any other information related to fire department preparedness and operations.	7-May-25	Received
	Email	7-Feb-25	(16) All Eaton and Palisades incident EMS care and transport data January 7 through January 12.		Pending
	Email	18-May-25	Full CAD in Tabular Format.	29-Dec-25	Received
	Email	1-Jun-25	(1) IAP Palisades January 8, 2025.	2-Jun-25	Received
	Email	1-Jun-25	(2) Training records or individual certificates for CICCS positions.	27-Jul-25	Received
	Email	14-Jul-25	NIMS (National Incident Management System) training records for all personnel.	26-Jul-25	Received
	Email	17-Sep-25	Fire Fleet Management Policies and Procedures.		Pending
	Email	17-Sep-25	Fire Fleet Unit Inventory and Maintenance Support.		Pending
	Email	17-Sep-25	Preventative Maintenance Compliance Report.		Pending
	Email	17-Sep-25	Unit Availability Report.		Pending
	Email	17-Sep-25	Unit Downtime Report.		Pending
	Email	17-Sep-25	Management Reports.		Pending
	Email	29-Jan-26	Preparedness and Prevention Files-General (Participants, Scope, Partners, Budget, AARs.		Pending
	Email	29-Jan-26	Preparedness and Prevention Files - Cohesive Strategy for Resilient Landscape and Fire Adapted Communities.		Pending
	Email	29-Jan-26	Community Planning and Land Use Policies Folder.		Pending
	Email	29-Jan-26	Fuel Management and Hazard Reduction.		Pending
	Email	29-Jan-26	Emergency Preparedness and Evacuation Plans.		Pending
	Email	29-Jan-26	Education/Public Outreach.		Pending
	Email	7-Feb-25	Lachman Fire Audio and Radio Comms.	5-May-25	Partial
	Email	5-Feb-26	Lachman Fire LAFD Records and Systems.		Pending
	Email	5-Feb-26	Lachman Fire Plans, Policies, Agreements, Training Material.		Pending
	Email	5-Feb-26	Lachman Fire Operational Documentation.		Pending
	Email	5-Feb-26	Lachman Fire Audio Recordings.		Pending
	Email	5-Feb-26	Lachman Fire Records, Systems, and Incident Documentation.		Pending
	Email	5-Feb-26	Lachman Communications (Emails, Texts, Incident Photos).		Pending
	Email	5-Feb-26	Lachman Fire Deposition Data.	27-Feb-25	Received
Los Angeles City Police Department (LAPD)	Email	11-Mar-25	**Law Enforcement Incident Preparedness & Response Protocols**		
	Email	11-Mar-25	(1) Incident Response Matrix & Deployment Protocols.		Pending
	Email	11-Mar-25	(2) Mutual Aid & Interagency Agreements.		Pending
	Email	11-Mar-25	(3) Evacuation & Traffic Control Plans including WUI (Wildland-Urban Interface) fire scenarios.		Pending
	Email	11-Mar-25	(4) Training Records & After-Action Assessments.		Pending

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Los Angeles City Police Department (LAPD)	Email	11-Mar-25	**Law Enforcement Staffing, Deployment & Tactical Execution**		
	Email	11-Mar-25	(5) Normal Staffing & Patrol Assignments.		Pending
	Email	11-Mar-25	(6) Augmented Staffing & Special Deployments.		Pending
	Email	11-Mar-25	**Law Enforcement Communications & Decision-Making**		
	Email	11-Mar-25	(7) CAD/Call History Logs – Full Computer-Aided Dispatch (CAD) records for listed from January 7 through January 12.	7-Nov-25	Partial
	Email	11-Mar-25	(8) MDC Messages (Mobile Data Computer Logs).		Pending
	Email	11-Mar-25	(9) Dispatch Communications.		Pending
	Email	11-Mar-25	(10) Radio Communications.		Pending
	Email	11-Mar-25	(11) Automatic Vehicle Location (AVL) Data – GPS tracking for law enforcement units assigned to, or staged for (Listed) from January 7 through January 12.		Pending
	Email	11-Mar-25	**Operational Actions & Incident Reporting**		
	Email	11-Mar-25	(12) Officer & Supervisor Reports.		Pending
	Email	11-Mar-25	(13) Incident Management System Notes.		Pending
	Email	11-Mar-25	(14) Use of Force & Arrest Reports.		Pending
	Email	11-Mar-25	**Casualty & Public Safety Impacts**		
	Email	11-Mar-25	(15) Fatality Reports – Information on deceased individuals found within the burn perimeter on or after January 7.	8-Aug-25	Partial
	Email	11-Mar-25	(16) EMS Care & Transport Records.		Pending
	Email	11-Mar-25	**Additional Law Enforcement-Related Data**		
	Email	11-Mar-25	(17) Any Other Relevant Records – Any additional law enforcement reports, operational documents, or analysis related to preparedness, execution, and interagency coordination during these incidents.	21-Jan-26	Received
	Email	11-Mar-25	LAPD Brush Fire Safety Evacuation.	21-Jan-26	Received
	Email	11-Mar-25	**Request for Video Footage & Digital Evidence**		
	Email	11-Mar-25	(1) Body-Worn Camera (BWC) Footage.		Pending
	Email	11-Mar-25	(2) Unmanned Aerial Vehicle (UAV) / Drone Footage.		Pending
	Email	11-Mar-25	In-Car Camera (ICC) Dashcam Footage.		Pending
	Email	11-Mar-25	(3) Traffic Camera Footage.		Pending
	Email	11-Mar-25	(4) Downloaded Civilian Camera Footage.		Pending
	Email	11-Mar-25	(5) Helicopter Surveillance or Aerial Law Enforcement Footage.		Pending
	Email	11-Mar-25	(6) Stationary Surveillance or Incident Command Videos.		Pending
	Email	11-Mar-25	(7) Any Other Video Recordings Related to the Law Enforcement Response.		Pending
	Email	11-Mar-25	**Request for Law Enforcement Emergency Operations Center (EOC), Incident Command Center (ICC), and Department Operations Center (DOC) Information under Unified Command**		
	Email	11-Mar-25	**Incident Command Logistics & Operational Planning**		
	Email	11-Mar-25	(1) Incident Command Structure Documents.	16-Jul-25	Received
	Email	11-Mar-25	(2) Operational Goals, Objectives & Outcomes.	16-Jul-25	Received
	Email	11-Mar-25	(3) Logistical Coordination & Resource Allocation.	16-Jul-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Los Angeles City Police Department (LAPD)	Email	11-Mar-25	**Incident-Specific Challenges & Critical Decision-Making**	16-Jul-25	Received
	Email	11-Mar-25	(4) Challenges Encountered by Law Enforcement.	16-Jul-25	Received
	Email	11-Mar-25	(5) Operational Notes on Life Saves & Critical Response Actions.	16-Jul-25	Received
	Email	11-Mar-25	(6) Evacuation Successes, Challenges, and Failures.	16-Jul-25	Received
	Email	11-Mar-25	(7) Law Enforcement's Role in Unified Command Decision-Making.	16-Jul-25	Received
	Email	11-Mar-25	**Other Relevant Records**	16-Jul-25	Received
	Email	11-Mar-25	(8) Any Additional Records Related to Law Enforcement's Role in Incident Command.	16-Jul-25	Received
	Email	20-May-25	**Operational Actions & Incident Reporting**		
	Email	20-May-25	(1) LAPD organization and regular staffing for all City areas.		Pending
	Email	20-May-25	(2) Pre-incident augmented staffing directive and records – Agency directives requiring the staffing of additional resources prior to 10A on 1/7.		Pending
	Email	20-May-25	(3) Officer & Supervisor Reports for the Palisades Fire 1/7 through 1/10.		Pending
	Email	20-May-25	(4) Use of Force & Arrest Reports for the Palisades Fire 1/7 through 1/10.		Pending
	Email	20-May-25	**Casualty & Public Safety Impacts**		
	Email	20-May-25	(1) Fatality Reports – Information on deceased individuals found within the Palisades burn perimeter on or after 1/7.	8-Aug-25	Partial
	Email	20-May-25	(2) EMS Care & Transport Records.		Pending
	Email	20-May-25	**Law Enforcement Communications & Decision-Making**		
	Email	20-May-25	(1) CAD/Call History Logs – Full Computer-Aided Dispatch (CAD) records for law enforcement calls related to the Palisades Fire, and for all parts of the City, from 1/7 through 1/10.	7-Nov-25	Received
	Email	20-May-25	(2) Dispatch Communications – Audio and transcriptions of 911 calls, dispatch-to-officer communications, and inter-agency radio traffic specific to the Palisades Fire from 1/7 through 1/10.		Pending
	Email	20-May-25	(3) Radio Communications – Audio and transcriptions of all radio traffic involving law enforcement agencies responding to the Palisades Fire, including evacuation orders, tactical deployment, and mutual aid coordination 1/7 through 1/10.		Pending
	Email	20-May-25	(4) Automatic Vehicle Location (AVL) Data – GPS tracking for law enforcement units assigned to, or staged, for the Palisades Fire from 1/7 through 1/12.		Pending
	Email	20-May-25	(5) Body-Worn Camera (BWC) Footage for Palisades Fire from 1/7 through 1/12.		Pending
	Email	20-May-25	**Administration/Organizational**		
	Email	20-May-25	Current agency policies, procedures, guidelines.		Pending
	CPRA 25-8566	17-Jun-25	(1) Officer & Supervisor Reports and Daily patrol staffing rosters from the morning of January 7, 2025 - January 12, 2025.		Pending
	CPRA 25-8566	17-Jun-25	(2) Use of Force & Arrest Reports.		Pending
	CPRA 25-8566	17-Jun-25	(3) CAD/Call History Logs – Full Computer-Aided Dispatch (CAD) records for law enforcement calls related to the LA Fires from January 7 through January 12.	7-Nov-25	Received

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Los Angeles City Police Department (LAPD)	CPRA 25-8566	17-Jun-25	(4) MDC Messages (Mobile Data Computer Logs) –MDC communications related to these incidents during the same timeframe.		Pending
	CPRA 25-8566	17-Jun-25	(5) Dispatch Communications.		Pending
	CPRA 25-8566	17-Jun-25	(6) Radio Communications.		Pending
	CPRA 25-8566	17-Jun-25	(7) Automatic Vehicle Location (AVL) Data – GPS tracking for units assigned to, or staged for, the LA Fires from January 7 through January 12.		Pending
	CPRA 25-8566	17-Jun-25	(8) In-Car Camera Footage while responding to fire-related operations.		Pending
	CPRA 25-8566 Redefined	30-Jun-25	(1) LAPD Personnel who responded to Pacific Palisades, Topanga, Malibu, Altadena, and Pasadena between January 7-12.		Pending
	CPRA 25-8566 Redefined	30-Jun-25	(2) AVL Data and narrowed down the search areas for the LAPD response to the Pacific Palisades, Topanga, Malibu, Altadena, and Pasadena areas.		Pending
	CPRA 25-8566 Redefined	13-Jul-25	(1) Officer & Supervisor Reports from January 7, 2025 - January 10, 2025. (Specifically related to the initial response to the LA Fires from January 7 through January 10 where LAPD Personnel responded to the areas of Pacific Palisades, Topanga, Malibu, Altadena, and Pasadena.)		Pending
	CPRA 25-8566 Redefined	13-Jul-25	(2) Daily patrol staffing rosters from the morning of January 7, 2025 - January 10, 2025. (Specifically related to the initial response to the LA Fires from January 7 through January 10 where LAPD Personnel responded to the areas of Pacific Palisades, Topanga, Malibu, Altadena, and Pasadena.)		Pending
	CPRA 25-8566 Redefined	13-Jul-25	(3) CAD/Call History Logs – Full Computer-Aided Dispatch (CAD) records for law enforcement calls related to the LA Fires from January 7 through January 10. (Specifically related to the initial response to the LA Fires from January 7 through January 10 where LAPD Personnel responded to the areas of Pacific Palisades, Topanga, Malibu, Altadena, and Pasadena.)	7-Nov-25	Received
	TD	5-Nov-25	Palisades Fire CAD Record and ASB Files.	7-Nov-25	Received
	Email	9-Feb-26	Video Records, Directives and Policies.	6-Mar-26	Partial
Los Angeles County Fire Department (LACoFD)	Email	7-Feb-25	(1) Response matrix for all types of incidents.	1-Apr-25	Received
	Email	7-Feb-25	(2) Policies, procedures, SOG's supporting incident response, management, and operational performance for all types of incidents.	17-Apr-25	Received
	Email	7-Feb-25	(3) Wildland pre-attack plans, structure defense plans, evacuation plans, or any other pre-plan developed to address a WUI fire.	17-Apr-25	Received
	Email	7-Feb-25	(4) After action reports for WUI fires in the past ten years.	17-Apr-25	Received
	Email	7-Feb-25	(5) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.	17-Apr-25	Received
	Email	7-Feb-25	(6) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank.	17-Apr-25	Received
	Email	7-Feb-25	(7) Eaton and Palisades Incident CAD/Call History from January 7 through January 12.	31-Jul-25	Received

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Los Angeles County Fire Department (LACoFD)	Email	7-Feb-25	(8) Eaton and Palisades incident MDC messages from January 7 through January 12.	18-Apr-25	Received
	Email	7-Feb-25	Hughes MDC data.	13-Mar-26	Received
	Email	7-Feb-25	(9) Eaton and Palisades incident dispatch communications January 7 through January 12.	18-Apr-25	Received
	Email	7-Feb-25	Hughes Incident dispatch comms data.	13-Mar-26	Received
	Email	7-Feb-25	(10) Eaton and Palisades incident radio communications January 7 through January 12.	18-Apr-25	Received
	Email	7-Feb-25	Hurst Radio Traffic.	14-Mar-26	Received
	Email	7-Feb-25	(11) Automatic vehicle location (AVL) data for resources assigned to, or staged for, the Eaton and Palisades incidents form January 7 through 12.	17-Apr-25	Received
	Email	7-Feb-25	(12) Documentation completed by chief and/or company officers pertaining to the actions they and their crews were involved with during the evacuation and structure defense period of the Eaton and Palisades incidents.	28-May-25	Received
	Email	7-Feb-25	(13) Eaton and Palisades incident notes and/or reports produced by an incident management tool like Tablet Command, or similar product.	17-Apr-25	Received
	Email	7-Feb-25	(14) Location of deceased found on or after January 7th within the Eaton and Palisades burn scar.	8-Aug-25	Received
	Email	7-Feb-25	(15) Any other information related to fire department preparedness and operations.	17-Apr-25	Received
	Email	7-Feb-25	(16) All Eaton and Palisades incident EMS care and transport data January 7 through January 12.	17-Apr-25	Received
	Email	11-Aug-25	(1) AC Drew Smith's emails to alert personnel of forecasted high fire danger conditions; attachment sent prior to 1/7 sent several days before event.		Pending
	Email	11-Aug-25	(2) Recordings of LAC Air to Ground for Palisades (10:30A, 1/7 to 11:00A, 1/8) and Eaton (6:18P, 1/7 to 4:00P, 1/8).	1-Mar-26	Received
	Email	1-Jun-25	Training records or individual certificates for CICCS positions.	27-Jul-25	Received
	Email	14-Jul-25	NIMS (National Incident Management System) training records for all personnel.	27-Jul-25	Received
	Email	15-Sep-25	Fleet Unit Data.	18-Feb-26	Received
	Email	15-Sep-25	Fire Fleet Management Policies and Procedures.	18-Feb-26	Partial
	Email	15-Sep-25	Fire Fleet Unit Inventory and Maintenance Support.	26-Feb-26	Received
	Email	15-Sep-25	Preventative Maintenance Compliance Report.		Pending
	Email	15-Sep-25	Unit Availability Report.		Pending
	Email	15-Sep-25	Unit Downtime Report.		Pending
	Email	15-Sep-25	Management Reports.		Pending
	Email	20-Oct-25	Road Restrictions.		Pending
	Email	20-Oct-25	Fuel Break Data.		Pending
	Email	26-Nov-25	Preparedness and Prevention Files.	13-Mar-26	Received
	Email	26-Nov-25	Landscape-Scale Collaboration.	13-Mar-26	Received
	Email	26-Nov-25	Watershed Protection and Enhancement.	13-Mar-26	Received

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Los Angeles County Fire Department (LACoFD)	Email	26-Nov-25	Large Scale Fuel Veg Management.	13-Mar-26	Received
	Email	26-Nov-25	Natural Fire Regimes.	13-Mar-26	Received
	Email	26-Nov-25	Preparedness and Prevention Files-General (Participants, Scope, Partners, Budget, AARs.	13-Mar-26	Received
	Email	26-Nov-25	Preparedness and Prevention Files - Cohesive Strategy for Resilient Landscape and Fire Adapted Communities.		Pending
	Email	26-Nov-25	Community Planning and Land Use Policies Folder.		Pending
	Email	26-Nov-25	Fuel Management and Hazard Reduction.	13-Mar-26	Received
	Email	26-Nov-25	Emergency Preparedness and Evacuation Plans.	13-Mar-26	Received
	Email	4-Dec-25	Fire And Law Enforcement Injury Report.	5-Mar-26	Received
	Email	4-Dec-25	Incident within the Incident Documentation.		Pending
	Email	4-Dec-25	Private Agency data checking into the ICP.		Pending
	Email	4-Dec-25	LA County Aerial Project Map Index.		Pending
	Email	4-Dec-25	Pre-Attack Plans for Jurisdictional Fire Stations.		Pending
	Email	4-Dec-25	LA-RICS Channel 3.		Pending
	Email	19-Dec-25	Outstanding Fatality Reports.	10-Feb-26	Received
	Email	19-Dec-25	Full CAD Request.	20-Apr-26	Received
	Email	23-Dec-25	Fire Training and CICCS Qualification Files.	5-Mar-26	Received
	Email	23-Dec-25	Coordination Meetings addressing the use of WUI Intelligence Tools.		Pending
	Email	23-Dec-25	Coordination Meetings addressing evacuation preparation/ execution.		Pending
	Email	9-Feb-26	Lachman Fire Call Log.	17-Feb-26	Received
	Email	9-Feb-26	Lachman Fire Air to Ground Transcribed Spreadsheet.	27-Feb-26	Received
	Email	9-Feb-26	Lachman Fire Apparatus and Personnel.	17-Feb-26	Received
	Email	9-Feb-26	Lachman Fire Radio Comms Transcribed Spreadsheet.	20-Mar-26	Received
Los Angeles County Office of Emergency Management (OEM)	Email	1-May-25	**General Document Request (in effect on/prior to January 7, 2025)**		
	Email	1-May-25	(1) All general organization EOPs/SOPs/SOGs.	6-Aug-25	Received
	Email	1-May-25	(2) Daily staffing rosters, roles and responsibilities.	6-Aug-25	Received
	Email	1-May-25	(3) Organizational chart(s) for daily staffing.		Pending
	Email	1-May-25	(4) Training/certification and exercise records for EM employees (2023-2025).		Pending
	Email	1-May-25	(5) After-action reports (AAR) for significant wildfire events (2015-2025).	14-Nov-25	Received
	Email	1-May-25	(6) After-action reports (AAR) of any training exercises (table-top, functional, full-scale, etc.) (2015-2025).		Pending
	Email	1-May-25	(7) Memorandum of Undertsandings/Mutual aid agreements with other emergency management organizations.		Pending
	Email	1-May-25	(8) Memorandum of Understandings/Mutual Aid agreements with NGOs, community, or other emergency assistance organizations.		Pending
	Email	1-May-25	(9) Hazard Mitigation Plan(s).	6-Aug-25	Received
	Email	1-May-25	(10)Threat and Hazard Identification Risk Assessments (THIRAs).		Pending

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Los Angeles County Office of Emergency Management (OEM)	Email	1-May-25	**Document Request for the Incident Timeline (for pre-activation/planning period relating to January 7 through all operational periods through January 11, 2025)**		
	Email	1-May-25	(1) Information on any preparedness or emergency messaging distributed prior to and throughout the defined incident timeline such as media releases, outreach campaigns, social media, wireless emergency alerts, etc., including content of the messaging, targeted audience, date, and time of distribution.	6-Aug-25	Received
	Email	1-May-25	(2) Emergency operations center (EOC) staffing rosters, roles, and responsibilities.		Pending
	Email	1-May-25	(3)Sign-in/Sign-out sheets.	6-Aug-25	Received
	Email	1-May-25	(4) Any/all ICS forms completed (including 214s).	6-Aug-25	Received
	Email	1-May-25	(5) Formal or informal incident action plans, situational reports, flash reports, and section reports for each operational period.	6-Aug-25	Received
	Email	1-May-25	(6) Transcripts or records maintained by any electronic emergency management system.		Pending
	Email	1-May-25	(7) Electornic or otherwise documented communications with other EOCs.		Pending
	Email	1-May-25	(8) Electornic or otherwise documented communications with other DOCs.		Pending
	Email	1-May-25	(9) Any/all formal and/or informal requests for assistance.		Pending
	Email	1-May-25	(10) Handwritten notes/files or other physical/electronic incident-related documentation developed by EOC personnel.		Pending
	Email	1-May-25	(11) Recordings and/or photos taken within, or of, the EOC.		Pending
	Email	1-May-25	(12) Recordings and/or photos received by the EOC.		Pending
	Email	1-May-25	(13) Emergency Management Assistance Compacts (if applicable).		Pending
	Email	1-May-25	(14) Communications regarding development and submission of Fire Management Assistance Grants (FMAGs).		Pending
	Email	1-May-25	(15) List of municipal, state, tribal or federal agencies that provided assistance, including time of request, assets provided, time of arrival, and duration of use.		Pending
	Email	1-May-25	(16) List of private contractors that provided assistance, including time of request, assets provided, time of arrival, and duration of use.		Pending
	Email	1-May-25	Genasys Manual 3.7.	18-Sep-25	Received
	Email	1-May-25	IPAWS Best Practices 202.3	18-Sep-25	Received
	Email	1-May-25	Evacuation Alert Maps.	9-Feb-26	Received
Los Angeles County Sheriff's Department (LASD)	Email	17-Feb-25	(1) Incident Response Matrix & Deployment Protocols.	12-May-25	Received
	Email	17-Feb-25	(2) Mutual Aid & Interagency Agreements.	12-May-25	Received
	Email	17-Feb-25	(3) Evacuation & Traffic Control Plans.	13-Jun-25	Received
	Email	17-Feb-25	(4) Training & After-Action Assessments.	13-May-25	Received
	Email	17-Feb-25	(5) Normal Staffing & Patrol Assignments.	13-Jun-25	Received
	Email	17-Feb-25	(6) Augmented Staffing & Special Deployments.	12-May-25	Received
	Email	17-Feb-25	(7) CAD/Call History Logs.	28-May-25	Received
	Email	17-Feb-25	(8) MDC Messages.	12-Jun-25	Received

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Los Angeles County Sheriff's Department (LASD)	Email	17-Feb-25	(9) Dispatch Communications.	12-Jun-25	Received
	Email	17-Feb-25	(10) Radio Communications.	12-May-25	Received
	Email	17-Feb-25	(11) AVL Data.	12-Jun-25	Received
	Email	17-Feb-25	(12) Officer & Supervisor Reports.	12-Jun-25	Received
	Email	17-Feb-25	(13) Incident Management System Notes.	12-Jun-25	Received
	Email	17-Feb-25	(14) Use of Force & Arrest Reports.	12-Jun-25	Received
	Email	17-Feb-25	(1) Fatality Reports – Information on deceased individuals found within the Eaton and Palisades and all listed fires burn perimeter on or after 1/7.	8-Aug-25	Partial
	Email	17-Feb-25	(16) EMS Care & Transport Records.	12-May-25	Received
	Email	17-Feb-25	(17) Any Other Relevant Records.	12-Jun-25	Received
	Email	17-Feb-25	(18) Video Footage & Digital Evidence.	18-Jun-25	Received
	Email	17-Feb-25	(19) Law Enforcement Emergency Operations Center (EOC), Incident Command Center (ICC), and Department Operations Center (DOC) Information under Unified Command.	18-Jun-25	Received
	Email	20-Oct-25	Preattack Maps and Planning Documents, Preincident Documentation.	15-Apr-26	Received
	Email	20-Oct-25	Mutual Aid Requests, Approvals, Assignments.	15-Apr-26	Received
	Email	4-Dec-25	Unit Specific Officer Names and Mobile Field Force Rosters.		Pending
Los Angeles County Waterworks District 29 (District 29)	Email	15-Apr-25	(1) A system master plan.	9-Jul-25	Received
	Email	15-Apr-25	(2) A distribution and storage system map.	9-Jul-25	Received
	Email	15-Apr-25	(3) Provide design criteria for the storage and distribution system.	9-Jul-25	Received
	Email	15-Apr-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	9-Jul-25	Received
	Email	15-Apr-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	9-Jul-25	Received
	Email	15-Apr-25	(6) The types of pipe materials used in the distribution system.	9-Jul-25	Received
	Email	15-Apr-25	(7) The typical depth of the pipes in the distribution system.	9-Jul-25	Received
	Email	15-Apr-25	(8) Available fire storage capacity under normal operating conditions.	9-Jul-25	Received
	Email	15-Apr-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	9-Jul-25	Received
	Email	15-Apr-25	(10) The emergency operating plan.	9-Jul-25	Received
	Email	30-Jul-25	(1)Clarify origin of imported water flows from Metropolitan Water District system. Were deliveries from service connection XXXX or XXXXX (XXXX Feeder or XXXX Feeder)?	29-Aug-25	Received
	Email	30-Jul-25	(2)Provide flow data through XXXX and XXXX interconnections during the Palisades Fire.	29-Aug-25	Received
Los Angeles Department of Water and Power (LADWP) - Palisades Electrical	Email	15-Jun-25	(1) Date and time of spotter deployment and locations, and date, time and reports from spotters.	19-Sept-25	Received
	Email	15-Jun-25	(2) Dates and times of IMT staffing, including organizational structure and personnel assignments. Include documents such as pre-event IAP, and other forms of communications confirming the status of the IMT.	19-Sept-25	Received

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Los Angeles Department of Water and Power (LADWP) - Palisades Electrical	Email	15-Jun-25	(3) Date, time, and message delivery method used for notifications or warnings sent to customers, and/or cooperating, assisting, and stakeholder agencies regarding high winds, fire danger, PSPS, or other issues pertaining to safety or power interruptions before and after ignition. Share location of specific areas receiving notifications if communications were targeted to a specific area.	19-Sept-25	Received
	Email	15-Jun-25	(4) Records (including dates) of grid-hardening work conducted in the burn areas and adjacent locations. This may include vegetation clearance, sectionalizing/isolating circuits, disabling automatic reclosers, remote switching/isolating faults and rerouting power away from fire-prone areas. Please provide GIS maps if available.	19-Sept-25	Received
	Email	15-Jun-25	(5) Records of public calls or complaints into LADWP and Edison dispatch centers related to arcing, pole hazards (broken/fallen), outages, or unusual activity prior to fire ignition and throughout fire operations, and any staff dispatched to these type of incidents (include date, time and AVL/GIS map data if available).	23-Jan-26	Received
	Email	15-Jun-25	(6) Date, time and location of deployment of remote sensing tools (i.e. cameras, fire sensing equipment and AI tools, etc), focused on high-risk circuits and infrastructure.	19-Sept-25	Received
	Email	15-Jun-25	(7) Date, time and location of power outages, grid disruptions (not related to PSPS), fallen utility poles, and downed electrical lines.	19-Sept-25	Received
	Email	15-Jun-25	Power Outage Start/End dates for Palisades locations.	23-Jan-26	Received
	Email	15-Jun-25	(8) Time-stamped camera footage showing relevant events (e.g., arcing, downed poles and lines, evacuations, fire ignition, fire in the surrounding area).	19-Sept-25	Received
	Email	15-Jun-25	(9) Date, time and content of emergency communications during the fire between electrical utility workers, and between electrical utility workers and fire suppression, law enforcement and emergency management agencies.	19-Sept-25	Received
	Email	15-Jun-25	Audio Recordings from Area Control Operations (AOC)	23-Jan-26	Received
	Email	15-Jun-25	(10) Date and time of request for mutual aid, and when the resources were on scene.	19-Sept-25	Received
	Email	15-Jun-25	(11) Date, time and location of circuits that were re-energized if this occurred prior to Jan. 17, 2300 hours.	19-Sept-25	Received
Los Angeles Department of Water and Power (LADWP) Water	Email	15-Jun-25	(1) A system master plan.	7-Jul-25	Received
	Email	15-Jun-25	(2) A distribution and storage system map.	7-Jul-25	Received
	Email	15-Jun-25	(3) Provide design criteria for the storage and distribution system.	7-Jul-25	Received
	Email	15-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	7-Jul-25	Received
	Email	15-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	7-Jul-25	Received
	Email	15-Jun-25	(6) The types of pipe materials used in the distribution system.	7-Jul-25	Received
	Email	15-Jun-25	(7) The typical depth of the pipes in the distribution system.	7-Jul-25	Received
	Email	15-Jun-25	(8) Available fire storage capacity under normal operating conditions.	7-Jul-25	Received
	Email	15-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	7-Jul-25	Received

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Los Angeles Department of Water and Power (LADWP) Water	Email	15-Jun-25	(10) The emergency operating plan.	7-Jul-25	Received
	Email	30-Jul-25	(1)The capacity of the Encino, Upper Stone Canyon, and Hollywood Reservoirs.	9-Sep-25	Received
	Email	30-Jul-25	Clarification that Encino Reservoir was used to help fight fires via helicopter dipping.	9-Sep-25	Received
	Email	30-Jul-25	Clarification that the Upper Stone Canyon Reservoir feeds the Westgate Trunk Line in Zone XXXX through a regulating station between XXXX and XXXX.	9-Sep-25	Received
	Email	30-Jul-25	(2)The amount of water (if any) sent to Los Angeles Water Works District 29 through the interconnection at the XXXX Pump Station during the Palisades Fire.	9-Sep-25	Received
	Email	30-Jul-25	The pressure settings that determine whether the pumping stations shut off or continued to operate.	9-Sep-25	Received
	Email	30-Jul-25	(3)Clarification that LADWP started service connection shutoffs occurred somewhere between January 8th and 9th, 2025.	9-Sep-25	Received
	Email	30-Jul-25	About how long (in days) it took to complete shutoffs and restabilize the system.	9-Sep-25	Received
	Email	30-Jul-25	(4)Approximately how many LADWP water tankers were deployed to aid in fire fighting efforts.	9-Sep-25	Received
	Email	30-Jul-25	(5)The capacity, pressure settings and flow through the PRVs feeding the XXX, XXX, XXX, XXX and XXX regulated zones.	9-Sep-25	Received
Los Angeles Regional Interoperable Communications System (LA_RICS)	Email	14-Jul-25	(1) LA-RICS Ch. 1-Admin – Starting 1/8 through end of day 1/9.	7-Aug-25	Received
	Email	14-Jul-25	(2) LA-RICS Ch. 5-Chiefs – Starting 1/7, 10:30A through end of day 1/9.	7-Aug-25	Received
	Email	14-Jul-25	(3) LA-RICS Ch. 20-Fire 7 – Starting 1/8 through end of day 1/9.	7-Aug-25	Received
	Email	14-Jul-25	(4) Full CAD (1/7-1/22) and Call Hx for the Hughes Fire (1/22).	7-Aug-25	Partial
Community Fire Brigade (Malibu and Topanga Canyon)	TD	29-Apr-25	(1) Presuppression Activities.		Pending
	TD	29-Apr-25	(2) Response Activities.		Pending
	TD	29-Apr-25	(3) Response Data and Records.		Pending
	TD	29-Apr-25	(4) Post-Incident Analysis.	19-Aug-25	Received
	TD	29-Apr-25	(5) Fire Prevention Programs.		Pending
	TD	29-Apr-25	(6) Standards Followed.	19-Aug-25	Received
Metropolitan Water District of Southern California	Email	15-Apr-25	(1) A system master plan.		Pending
	Email	15-Apr-25	(2) A distribution and storage system map.	18-Nov-25	Received
	Email	15-Apr-25	(3) Provide design criteria for the storage and distribution system.	18-Nov-25	Received
	Email	15-Apr-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	18-Nov-25	Received
	Email	15-Apr-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.		Pending
	Email	15-Apr-25	(6) The types of pipe materials used in the distribution system.	18-Nov-25	Received
	Email	15-Apr-25	(7) The typical depth of the pipes in the distribution system.	18-Nov-25	Received
	Open Source	15-Apr-25	(8) Available fire storage capacity under normal operating conditions.	18-Nov-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Metropolitan Water District of Southern California	Open Source	15-Apr-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	18-Nov-25	Received
	Email	15-Apr-25	(10) The emergency operating plan.		Pending
	Email	15-Jun-25	(1) System Map for Metropolitan Water XXXX.	18-Nov-25	Received
	Email	15-Apr-25	(2) SCADA information for any connections with XXXX and XXXX.	12-Sep-25	Received
	Email	15-Apr-25	(3) Web EOC Logs.		Pending
	Email	15-Apr-25	(4) Timeline of events for the fire from the WEB EOC.		Pending
	TD	15-Apr-25	(5) Information on how water companies were integrated into the CAL Fire Indecent Command Centers and Emergency Operations Centers.	19-Feb-26	Received
	Email	15-Apr-25	(6) Operational changes implemented to maintain water pressure to help XXXX maintain system pressure and storage volumes during the Palisades fire.	12-Sep-25	Received
	Email	15-Apr-25	(7) Mutual aid immediately surrounding the fire events.	12-Sep-25	Received
National Aeronautics and Space Administration (NASA)	Email	3-Dec-25	Documentation on the use of satellite imagery for fire perimeter production.	4-Dec-25	Received
	Email	3-Dec-25	Documentation on image sharing with response agencies and modelers.	4-Dec-25	Received
National Interagency Fire Center (NIFC)	Email	20-Jan-26	Number of different satellites used to prepare the perimeters.		Pending
	Email	20-Jan-26	Resolution of different satellites.		Pending
	Email	20-Jan-26	Timestamping of satellite perimeters.		Pending
	Email	20-Jan-26	Perimeter preparation by the Analyst.		Pending
	Email	20-Jan-26	Final resolution of the perimeters.		Pending
	Email	20-Jan-26	Product confidence level.		Pending
National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Oxnard	FOIA / DOC-NOAA-2025-00059	15-Apr-25	(1) Registration log of all confirmed participants of the fire weather webinar's conducted by NWS Oxnard between January 3 through January 8, 2025.	15-Aug-25	Received
	FOIA / DOC-NOAA-2025-00059	15-Apr-25	(2) NWS Oxnard distribution list of all names and/or email addresses of those invited to attend the 1:30pm fire weather webinar's and the 1pm fire weather coordination call.	15-Aug-25	Received
Orange County Fire Authority (OCFA)	Email	16-Jul-25	(1) Normal staffing and positioning of aircraft (type and quantity with tail numbers) that supports Southern California.		Pending
	Email	16-Jul-25	(2) Pre-event/augmented staffing and pre-positioning of aviation assets in response to forecasted weather prior to January 7, 2025.		Pending
	Email	16-Jul-25	(3) Flight information related to QRF aircraft assigned to each of the fires on the attached list.		Pending
	Email	16-Jul-25	(4) Fire perimeter products, or supporting information, prepared for any of the listed fires.		Pending
	Email	1-Dec-25	AVL data beginning 10:00 on January 7 through 20:00 on January 8, 2025.	10-Dec-25	Received
	Email	8-Dec-25	Additional AVL data beginning 10:00 on January 7 through 20:00 on January 8, 2025.	10-Dec-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Orange County Fire Authority (OCFA)	Email	8-Dec-25	Any associated dispatch or CAD records for the above resources, including timestamps, assignments, and updates made through the ECC.	10-Dec-25	Received
	Email	8-Dec-25	3) Operational documentation such as task force logs, resource orders, or situation reports that may help clarify unit actions during this timeframe.	10-Dec-25	Received
Pasadena Fire Department (PFD)	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(1) Response matrix for all types of incidents.	29-Oct-25	Received
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(2) Policies, procedures, SOG's supporting incident response, management, and operational performance for all types of incidents.	29-Oct-25	Received
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(3) Wildland pre-attack plans, structure defense plans, evacuation plans, or any other pre-plan developed to address a WUI fire	29-Oct-25	Partial
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(4) After action reports for WUI fires in the past ten years.		Pending
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(5) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.	29-Oct-25	Received
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(6) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank.	29-Oct-25	Partial
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(7) Eaton Incident CAD/Call History from January 7 through January 12.	29-Oct-25	Partial
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(8) Eaton incident MDC messages from January 7 through January 12.		Pending
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(9) Eaton incident dispatch communications January 7 through January 12.	29-Oct-25	Received
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(10) Eaton incident radio communications January 7 through January 12.		Pending
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(11) Automatic vehicle location (AVL) data for resources assigned to, or staged for, the Eaton incidents form January 7 through 12.		Pending
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(12) Documentation completed by chief and/or company officers pertaining to the actions they and their crews were involved with during the evacuation and structure defense period of the Eaton incidents.	29-Oct-25	Partial
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(13) Eaton incident notes and/or reports produced by an incident management tool like Tablet Command, or similar product.		Pending
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(14) Location of deceased found on or after January 7th within the Eaton burn scar.	8-Aug-25	Partial
	Email/ CPRA 0036540	25-Apr-25/ 15-May-25	(15) Any other information related to fire department preparedness and operations.	1-Aug-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Pasadena Fire Department (PFD)	Email/CPRA 0036540	25-Apr-25/ 15-May-25	(16) All Eaton incident EMS care and transport data January 7 through January 12.		Pending
	Email	1-Dec-25	Dispatch Records and AVL Data for all Units responding.		Pending
	Email	1-Dec-25	Internal messages/ communications.		Pending
	Email	1-Dec-25	Mutual Aid Entries prior to first Dispatch.		Pending
Pasadena Police Department (PPD)	CPRA 0036982	18-Jun-25	(1) Officer & Supervisor Reports and Daily patrol staffing rosters from the morning of January 7, 2025 - January 12, 2025.		Pending
	CPRA 0036982	18-Jun-25	(2) Use of Force & Arrest Reports.	10-Sep-25	Received
	CPRA 0036982	18-Jun-25	(3) CAD/Call History Logs.	29-Oct-25	Received
	CPRA 0036982	18-Jun-25	(4) MDC Messages (Mobile Data Computer Logs).		Pending
	CPRA 0036982	18-Jun-25	(5) Dispatch Communications.		Pending
	CPRA 0036982	18-Jun-25	(6) Radio Communications.		Pending
	CPRA 0036982	18-Jun-25	(7) Automatic Vehicle Location (AVL) Data.		Pending
	CPRA 0036982	18-Jun-25	(8) In-Car Camera Footage.	29-Oct-25	Received
	Email	20-Oct-25	Mutual Aid Requests, Approvals, and Assignments.		Pending
	Email	20-Oct-25	LE Deployment Documentation (ICS 204, Resource Orders).		Pending
Pasadena Water Department	Open Source	20-Mar-25/ 20-Jun-25	(1) A system master plan.	18-Nov-25	Received
	Open Source	20-Mar-25/ 20-Jun-25	(2) A distribution and storage system map.	18-Nov-25	Received
	Email/CPRA 0037022	20-Mar-25/ 20-Jun-25	(3) Provide design criteria for the storage and distribution system.		Pending
	Email/CPRA 0037022	20-Mar-25/ 20-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.		Pending
	Open Source	20-Mar-25/ 20-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	18-Nov-25	Received
	Open Source	20-Mar-25/ 20-Jun-25	(6) The types of pipe materials used in the distribution system.	18-Nov-25	Received
	Email/CPRA 0037022	20-Mar-25/ 20-Jun-25	(7) The typical depth of the pipes in the distribution system.		Pending
	Open Source	20-Mar-25/ 20-Jun-25	(8) Available fire storage capacity under normal operating conditions.	18-Nov-25	Received
	Open Source	20-Mar-25/ 20-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	18-Nov-25	Received
	Email/CPRA 0037022	20-Mar-25/ 20-Jun-25	(10) The emergency operating plan.		Pending
	Email	3-Aug-25	(1) Design criteria for the water storage and distribution system.		Pending

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Pasadena Water Department	Open Source	3-Aug-25	(2) Distribution system interconnection capacities with other agencies.	18-Nov-25	Received
	Email	3-Aug-25	(3) Distribution system interconnections used during the Eaton Fire.		Pending
	Open Source	3-Aug-25	(4) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	18-Nov-25	Received
	Email	3-Aug-25	(5) Available fire storage capacity in the system under normal operating conditions.		Pending
	Email	3-Aug-25	(6) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).		Pending
	Email	3-Aug-25	(7) The emergency operating plan.		Pending
RedZone Software LLC	Email	16-Apr-25	1) Company identifiers, assignments, locations, and operational actions.	19-May-25	Received
	Email	16-Apr-25	2) Associated training and compliance records.	19-May-25	Received
Riverside County Fire Department	Email	19-Dec-25	AVL data for RVC 6001A – Dispatched 1/7/2025.	13-Jan-26	Received
	Email	19-Dec-25	AVL data for RVC 6002A – Dispatched 1/7/2025.	13-Jan-26	Received
	Email	19-Dec-25	AVL data for RVC 6003A – Dispatched 1/8/2025.	13-Jan-26	Received
Rubio Canon Land and Water Association	Email	26-Jun-25	(1) A system master plan.	8-Jul-25	Received
	Email	26-Jun-25	(2) A distribution and storage system map.	12-Jul-25	Received
	TD	26-Jun-25	(3) Provide design criteria for the storage and distribution system.	12-Jul-25	Received
	Email	26-Jun-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	12-Jul-25	Received
	Email	26-Jun-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	12-Jul-25	Received
	Email	26-Jun-25	(6) The types of pipe materials used in the distribution system.	12-Jul-25	Received
	Email	26-Jun-25	(7) The typical depth of the pipes in the distribution system.	12-Jul-25	Received
	Email	26-Jun-25	(8) Available fire storage capacity under normal operating conditions.	12-Jul-25	Received
	Email	26-Jun-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17). From SCADA data.	12-Jul-25	Received
	Email	26-Jun-25	(10) The emergency operating plan.		Pending
San Bernadino Fire Protection District (SBFPD)	Email	19-Dec-25	AVL data for Eaton OES 682C dispatched on 1-7-25.		Pending
	Email	19-Dec-25	AVL data for Palisades XBO 6230A dispatched on 1-8-25.		Pending
Santa Monica Fire Department (SMFD)	Email	19-Dec-25	AVL data for XLA 1075A.	2-Jan-26	Received
	Email	19-Dec-25	Dispatch and Fire Call Report.	20-Dec-25	Received
	Email	19-Dec-25	Mutual Aid Report 25-378.	2-Jan-26	Received
Santa Monica Police Department (SMPD)	Email	19-Dec-25	Santa Monica police Emergency Utilities policy.	23-May-25	Received
	Email	19-Dec-25	Santa Monica Police Patrol Operations 423 Mobile Audio Video.	23-May-25	Received
	Email	19-Dec-25	Santa Monica Police Roll Call Briefing.	23-May-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Sierra Madre Water Department	Email	15-Apr-25	(1) A system master plan.	15-Jul-25	Received
	Email	15-Apr-25	(2) A distribution and storage system map.	15-Jul-25	Received
	Email	15-Apr-25	(3) Provide design criteria for the storage and distribution system.	15-Jul-25	Received
	Email	15-Apr-25	(4) Distribution system interconnections with other agencies with the interconnection capacity identified.	15-Jul-25	Received
	Email	15-Apr-25	(5) The size of the distribution system pipes connected to the fire hydrants in the fire areas.	15-Jul-25	Received
	Email	15-Apr-25	(6) The types of pipe materials used in the distribution system.	15-Jul-25	Received
	Email	15-Apr-25	(7) The typical depth of the pipes in the distribution system.	15-Jul-25	Received
	Email	15-Apr-25	(8) Available fire storage capacity under normal operating conditions.	15-Jul-25	Received
	Email	15-Apr-25	(9) The water level in the storage tanks under normal operating conditions, just before the fires and during the fires (January 7 through January 17).	15-Jul-25	Received
	Email	15-Apr-25	(10) The emergency operating plan.	15-Jul-25	Received
	Open Source	20-Oct-25	Electronic Copy of System Map.	18-Nov-25	Received
	Open Source	20-Oct-25	Detailed information on the Tank Sizes in the System.	18-Nov-25	Received
	Open Source	20-Oct-25	Detailed information on the Pumps in the System.	18-Nov-25	Received
Southern California Edison (SCE) - Palisades Electrical	Email	15-Jun-25	(1) Date and time of spotter deployment and locations, and date, time and reports from spotters.	13-Oct-25	Received
	Email	15-Jun-25	(2) Dates and times of IMT staffing, including organizational structure and personnel assignments. Include documents such as pre-event IAP, and other forms of communications confirming the status of the IMT.	28-Jan-26	Received
	Email	15-Jun-25	(3) Date, time, and message delivery method used for notifications or warnings sent to customers, and/or cooperating, assisting, and stakeholder agencies regarding high winds, fire danger, PSPS, or other issues pertaining to safety or power interruptions before and after ignition. Share location of specific areas receiving notifications if communications were targeted to a specific area.	13-Oct-25	Received
	Email	15-Jun-25	(4) Records (including dates) of grid-hardening work conducted in the burn areas and adjacent locations. This may include vegetation clearance, sectionalizing/isolating circuits, disabling automatic reclosers, remote switching/isolating faults and rerouting power away from fire-prone areas. Please provide GIS maps if available.	28-Jan-26	Received
	Email	15-Jun-25	(5) Records of public calls or complaints into LADWP and Edison dispatch centers related to arcing, pole hazards (broken/fallen), outages, or unusual activity prior to fire ignition and throughout fire operations, and any staff dispatched to these type of incidents (include date, time and AVL/GIS map data if available).	28-Jan-26	Received
	Email	15-Jun-25	(6) Date, time and location of deployment of remote sensing tools (i.e. cameras, fire sensing equipment and AI tools, etc), focused on high-risk circuits and infrastructure.	13-Oct-25	Received
	Email	15-Jun-25	(7) Date, time and location of power outages, grid disruptions (not related to PSPS), fallen utility poles, and downed electrical lines.	28-Jan-26	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Southern California Edison (SCE) - Palisades Electrical	Email	15-Jun-25	(8) Time-stamped camera footage showing relevant events (e.g., arcing, downed poles and lines, evacuations, fire ignition, fire in the surrounding area).	13-Oct-25	Received
	Email	15-Jun-25	(9) Date, time and content of emergency communications during the fire between electrical utility workers, and between electrical utility workers and fire suppression, law enforcement and emergency management agencies.	13-Oct-25	Received
	Email	15-Jun-25	(10) Date and time of request for mutual aid, and when the resources were on scene.	13-Oct-25	Received
	Email	15-Jun-25	(11) Date, time and location of circuits that were re-energized if this occurred prior to Jan. 17, 2300 hours.	28-Jan-26	Received
Technosylva	Email	21-Nov-25	Fire Predictive Models for Palisades and Eaton.	31-Mar-26	Received
	Email	18-Dec-25	Data Snapshots of Automated Models preceding/during Eaton/ Palisades.	31-Mar-26	Received
	Email	18-Dec-25	Data Snapshots of Manual Models preceding/during Eaton/ Palisades.	31-Mar-26	Received
	Email	18-Dec-25	Any other relevant information, slides/analysis.	31-Mar-26	Received
United States Bureau of Alcohol, Tobacco, Firearms (ATF)	Email	18-Feb-26	Lachman Fire - Scope of Interest.		Pending
	Email	18-Feb-26	Lachman Fire - Timeline and Technical Discussions.		Pending
	Email	18-Feb-26	Lachman Fire - Fire Perimeter and Mapping Products.		Pending
	Email	18-Feb-26	Lachman Fire - Documented Suppression Actions.		Pending
	Email	18-Feb-26	Lachman Fire - Terrain, Access, and State Parks Coordination.		Pending
	Email	18-Feb-26	Lachman Fire - Scene Documentation.		Pending
United States Department of Agriculture (USDA) US Forest Service (USFS) Angeles National Forest (ANF)	Email	2-May-25	(1) Response matrix for all types of incidents.	2-Jun-25	Received
	Email	2-May-25	(2) Policies, procedures, SOG's supporting incident response, management, and operational performance for all types of incidents.	2-Jun-25	Received
	Email	2-May-25	(3) Wildland pre-attack plans, structure defense plans, evacuation plans, or any other pre-plan developed to address a WUI fire.	2-Jun-25	Received
	Email	2-May-25	(4) After action reports for WUI fires in the past ten years.	2-Jun-25	Received
	Email	2-May-25	(5) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.	2-Jun-25	Received
	Email	2-May-25	(6) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank.	2-Jun-25	Received
	Email	2-May-25	(7) Eaton incident CAD/Call History from January 7 through January 12.	2-Jun-25	Received
	Email	2-May-25	(8) Eaton incident MDC messages from January 7 through January 12.	2-Jun-25	Received
	Email	2-May-25	(9) Eaton incident dispatch communications January 7 through January 12.	2-Jun-25	Received
	Email	2-May-25	(10) Eaton incident radio communications January 7 through January 12.	5-May-25	Received
	Email	2-May-25	(11) Automatic vehicle location (AVL) data for resources assigned to, or staged for, the Eaton incident form January 7 through 12.	5-May-25	Received

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United States Department of Agriculture (USDA) US Forest Service (USFS) Angeles National Forest (ANF)	Email	2-May-25	(12) Documentation completed by chief and/or company officers pertaining to the actions they and their crews were involved with during the evacuation and structure defense period of the Eaton incidents.	5-May-25	Received
	Email	2-May-25	(13) Eaton incident notes and/or reports produced by an incident management tool like Tablet Command, or similar product.	5-May-25	Received
	Email	2-May-25	(14) Location of deceased found on or after January 7th within the Eaton burn scar.	9-Feb-26	Received
	Email	2-May-25	(15) Any other information related to fire department preparedness and operations.	5-May-25	Received
	Email	2-May-25	(16) All Eaton incident EMS care and transport data January 7 through January 12.	5-May-25	Received
	Email	26-Jan-26	Preparedness and Prevention Files - Cohesive Strategy for Resilient Landscape and Fire Adapted Communities.		Pending
	Email	26-Jan-26	Community Planning and Land Use Policies Folder.		Pending
	Email	26-Jan-26	Fuel Management and Hazard Reduction.		Pending
	Email	26-Jan-26	Emergency Preparedness and Evacuation Plans.		Pending
	Email	26-Jan-26	Education/Public Outreach.		Pending
University of California San Diego (UCSD)	Email	12-Feb-25	(1) Time stamps for each of the 11 fires but mostly the Eaton and Palisades.	24-Apr-25	Received
	Email	12-Feb-25	(2) Ignition points and images/video that shows unburned fuel, topography and fire progressing through the landscape that could also help explain evacuation challenges.	21-Jul-25	Received
	Email	12-Feb-25	(3) Any data or source regarding fire history, vegetation management efforts (mechanical and prescribed burning), previous ignition points.	3-May-25	Received
	Email	12-Feb-25	(4) LIDAR datasets of fuels before/after treatment or burns, fuel moistures before fire, impact of high winds on electrical infrastructure, and vegetation management around electrical infrastructure.	3-Jul-25	Received
	Email	22-Jan-26	WIFIRE Shape Files for Eaton, Palisades, Hurst Initial Attack Model.	10-Apr-26	Received
Ventura County Fire Department (VCoFD)	Email	14-Feb-25	(1) Response matrix for all types of incidents.	1-May-25	Received
	Email	14-Feb-25	(2) Policies, procedures, SOG's supporting incident response, management, and operational performance for all types of incidents.	1-May-25	Received
	Email	14-Feb-25	(3) Wildland pre-attack plans, structure defense plans, evacuation plans, or any other pre-plan developed to address a WUI fire.	1-May-25	Received
	Email	14-Feb-25	(4) After action reports for WUI fires in the past ten years.	1-May-25	Received
	Email	14-Feb-25	(5) Normal staffing department wide by administrative site location to include number of personnel by position/rank, and front-line and reserve apparatus by type and number.	1-May-25	Received
	Email	14-Feb-25	(6) Augmented staffing by date and time in preparation for January 7 and by administrative site, type and number of apparatus, and number of personnel by position/rank.	1-May-25	Received
	Email	14-Feb-25	(7) Palisades, Eaton, Olivas, Kenneth, and Auto Incident CAD/Call History from January 7 through January 12.	1-May-25	Partial

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Ventura County Fire Department (VCoFD)	Email	14-Feb-25	(8) Palisades, Eaton, Olivas, Kenneth, and Auto incident MDC messages from January 7 through January 12.	1-May-25	Partial
	Email	14-Feb-25	(9) Palisades, Eaton, Olivas, Kenneth, and Auto incident dispatch communications January 7 through January 12.	1-May-25	Partial
	Email	14-Feb-25	(10) Palisades, Eaton, Olivas, Kenneth, and Auto incident radio communications January 7 through January 12.	1-May-25	Partial
	Email	14-Feb-25	(11) Automatic vehicle location (AVL) data for resources assigned to, or staged for the Palisades, Eaton, Olivas, Kenneth, and Auto incidents from January 7 through 12.	19-May-25	Received
	Email	14-Feb-25	(12) Documentation completed by chief and/or company officers pertaining to the actions they and their crews were involved with during the evacuation and structure defense period of the Palisades, Eaton, Olivas, Kenneth, and Auto incidents.	1-May-25	Partial
	Email	14-Feb-25	(13) Palisades, Eaton, Olivas, Kenneth, and Auto incident notes and/or reports produced by an incident management tool like Tablet Command, or similar product.	1-May-25	Partial
	Email	14-Feb-25	(14) Location of deceased found on or after January 7th within the Olivas burn scar.	30-Apr-25	Received
	Email	14-Feb-25	(15) Any other information related to fire department preparedness and operations.	1-May-25	Received
	Email	14-Feb-25	(16) All Palisades, Eaton, Olivas, Kenneth, and Autos incident EMS care and transport data January 7 through January 12.	1-May-25	Received
	Email	7-May-25	(1) VCoFD AVL for the Eaton, Palisades, and Archer fires.	19-May-25	Received
	Email	7-May-25	(2) CAD data for all incidents requiring a VCoFD response, this includes 911 calls received and addressed via response that were not associated with incidents in list.	15-May-25	Received
	Email	26-Nov-25	Preparedness and Prevention Files - Cohesive Strategy for Resilient Landscape and Fire Adapted Communities.		Pending
	Email	26-Nov-25	Community Planning and Land Use Policies Folder.		Pending
	Email	26-Nov-25	Fuel Management and Hazard Reduction.		Pending
	Email	26-Nov-25	Emergency Preparedness and Evacuation Plans.		Pending
	Email	26-Nov-25	Education/Public Outreach.		Pending
Verdugo Fire Communications Center (VFCC)	CPRA 3953405	25-Apr-25	(1)Normal staffing for all Verdugo agencies.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(2)Augmented resource staffing.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(3) Pre-designated Strike Team assignments.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(4) Deployment locations/instructions if different from home.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(5) Any other special instructions communicated to each agency.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(6) Verdugo agencies dispatched to Palisades and Eaton Fires 1/7/2025 through 1/10/25.	18-Dec-26	Received
	CPRA 3953405	25-Apr-25	(7) CAD record of all Verdugo dispatch activities from 0800, January 7, 2025 through 2400 hours January 12, 2025.	16-May-25	Received

AGENCY/ ENTITY	REQUEST TYPE/ ID	REQUEST/ SERVICE DATE	DESCRIPTION (SUMMARY)	RESPONSE DATE	RESPONSE STATUS
Verdugo Fire Communications Center (VFCC)	CPRA 3953405	25-Apr-25	(8) Audio recordings/transcripts radio channel Red 8 pertaining to Eaton for period beginning 1814 hours, January 7, 2025 to 2400 hours, January 9, 2025.	18-Dec-26	Received
	Email	18-Dec-25	CAD and Call Log Data for all Dispatches.	18-Dec-26	Received
	Email	18-Dec-25	AVL from Jan 7 to Jan 9 2025.	18-Dec-26	Received
Watch Duty	Email	5-Jan-26	Number of subscribers with Palisades and Eaton Fire burn areas.		Pending
	Email	5-Jan-26	Home addresses of subscribers within the fire's footprint.		Pending
	Email	5-Jan-26	Time stamps of fire location confirmed by Alert Wildfire Camera/ Source.	17-Feb-26	Received
	Email	5-Jan-26	Time stamps when Watch Duty posted evacuation warnings by zone.	17-Feb-26	Received
	Email	5-Jan-26	Time stamp communications captured via crowd source network.	17-Feb-26	Received
	Email	15-Mar-26	Eaton and Palisades Fire AAR	23-Mar-26	Received
	Email	15-Mar-26	Number of accesses made to the system by geographical area.	23-Mar-26	Received
Wildfire Defense Systems	Email	16-Apr-25	Company identifiers, assignments, locations and operational actions.		Pending
	Email	16-Apr-25	Associated training and compliance records.		Pending
2MCFire Inc	Email	16-Apr-25	Company identifiers, assignments, locations, and operational actions.	30-May-25	Received
	Email	16-Apr-25	Associated training and compliance records.	30-May-25	Received

7. GLOSSARY

Term	Definition
Access and Functional Needs	Circumstances that may require additional assistance before, during, or after an emergency. These may relate to mobility, communication, transportation, health, supervision, or the ability to understand and act on emergency information.
After-Action Report	A document prepared after an incident or exercise to describe what occurred, identify effective practices and challenges, and recommend improvements.
Apparatus	Emergency response vehicles (fire engines, trucks, ambulances, etc.) used to deliver personnel and equipment to incident locations
Automatic Vehicle Location (AVL) Time Points	A fixed, predetermined geographic location or virtual checkpoint along a transit route where a vehicle's passing time is tracked and recorded by an AVL tracking system.
Auto-reclosers	Automated electrical devices that disconnect a circuit when a fault is detected, then automatically reconnect it after a set time period.
Branch	An incident management organizational level between the Operations Section Chief and Division/Group Supervisors that oversees a major functional or geographic area of incident operations.
Booster	Device or equipment that amplifies or increases pressure in a water system; also can refer to signal amplification in wireless systems.
Built Environment	Human-made surroundings, including buildings, accessory structures, roads, utilities, landscaping, fences, vehicles, and other features that may influence wildfire exposure and fire spread.
CAD Incident Type	Classification code entered in the CAD system to categorize the nature of the emergency (fire, medical, traffic, etc.).
Chain of Command	The hierarchical line of authority and responsibility that flows from the highest-ranking official down through successive levels of management to the lowest-ranking personnel. It establishes who reports to whom, who has decision-making authority at each level, and ensures clear accountability throughout an organization.
Circuit	Path through which electric current flows, consisting of a power source, conductor, and load; controlled by switches and protective devices.
Circuit Outage	Loss of electrical power in a specific electrical circuit, affecting customers or areas served by that circuit.
City-Wide Tactical Alert	Agency-wide notification used to alert all personnel of an emergent condition requiring immediate activation or specific state of readiness of resources.
Combustible Materials	Substances that can ignite and burn when under appropriate conditions; includes wood, vegetation, fuels, and other flammable matter.
Community Conflagration	A destructive fire involving numerous structures or developed areas. A community conflagration may begin as a wildland fire but continue spreading through structures, ornamental vegetation, vehicles, fences, and other fuels within the built environment.
Community Risk Reduction	A coordinated process for identifying local risks and implementing strategies to prevent or reduce their consequences. Wildfire-related measures may include public education, home hardening, defensible space, preparedness, and community-scale mitigation.
Community-Scale Mitigation	Coordinated risk-reduction actions implemented across multiple properties, neighborhoods, public lands, infrastructure systems, or jurisdictional boundaries, rather than solely on individual parcels.
Community Wildfire Protection Plan	A community-based plan that identifies wildfire hazards, prioritizes fuel-reduction and preparedness activities, and supports coordination among residents, government agencies, fire departments, and land managers.
Computer-Aided Dispatch (CAD)	Software system that supports handling emergency calls, manages incident information, and dispatches appropriate personnel and resources.
Connective Fuels	Combustible materials that form pathways between structures through which fire can spread. Examples include vegetation, fences, vehicles, accessory structures, outdoor garbage/recycling receptacles and accumulated debris.
Contraflow	A traffic management system that involves directing traffic in one or more lanes to travel in the opposite direction to normal flow
Damage Inspection Classifications	A standardized system used to categorize and rate the extent of damage to buildings and structures following a disaster.

Term	Definition
Department Operations Center (DOC)	Location used by a fire, police, utility or other department as a coordination point for agency resources and facilities during major incidents and planned events
“Dark Units”	A unit may be considered "dark" when it has been dispatched to an incident but its current location is unknown or not being actively tracked by dispatch.
Defensible Space	The area around a structure in which vegetation, debris, and other combustible materials are managed to reduce fire exposure and provide safer conditions for firefighting. Defensible space requirements vary according to jurisdiction and hazard designation.
Direct Flame Contact	Exposure occurring when flames physically reach a structure or other combustible material.
Division	An incident management organizational level responsible for operations within a defined geographic area. Divisions report to a Branch Director or, when branches are not established, directly to the Operations Section Chief.
Egress	Path of travel or means of exiting
Ember	A burning or glowing piece of combustible material that can be carried by wind. Embers may ignite vegetation, accumulated debris, building components, or other materials near or within materials within a structure. The terms “ember” and “firebrand” are often used interchangeably, though “ember” is used in this report.
Emergency Operations Center (EOC)	A facility where agency representatives cooperatively help with maintaining situational awareness, resource ordering, information sharing, and decision making in support of the incident management team on the ground executing the strategic and tactical operations.
Evacuation Order	A direction from an authorized public official indicating that people should leave an area because of an immediate threat to life.
Evacuation Warning	A public notification that a threat may require evacuation. People who need additional time, including individuals with access and functional needs, may be advised to leave during the warning period.
Evacuation Advisory	Typically the first public notification sent to instruct the public to a potential hazard and encourage them to remain aware of conditions and follow recommendations from emergency officials.
Exposure Pathway	A route by which heat, flames, or embers can reach and ignite a structure or other combustible material. Pathways may involve vegetation, adjacent structures, fences, vehicles, or accumulated debris.
Extreme Fire Behavior	Fire behavior that substantially exceeds ordinary suppression expectations and may include rapid rates of spread, long-range spotting, intense heat release, fire whirls, or other conditions that limit effective firefighting.
Field Observers	Personnel stationed at strategic locations to monitor fire behavior, spread, and conditions, reporting real-time information to incident command.
Fire-Adapted Community	A community in which residents, agencies, infrastructure providers, and other organizations work collectively to prepare for, respond to, and recover from wildfire while reducing potential loss of life and property.
Fire Danger	An assessment of the potential for a fire to ignite, spread, and resist suppression based on weather, fuels, topography, and related conditions.
Fire Hazard Severity Zone	A geographic area classified by California according to the severity of expected wildfire hazard. Classification considers factors including fuels, weather, topography, and anticipated fire behavior, but does not represent the wildfire risk of a specific property.
Fire Perimeter	The boundary or outer edge of a wildfire, representing the furthest extent of fire activity at a given point in time.
Fire Weather Watch	A National Weather Service notice indicating that critical fire-weather conditions are possible, generally within the following several days.
Firewise USA®	A national recognition program that provides a framework for residents and community partners to organize and implement local wildfire risk-reduction activities.
FIRIS perimeter	Fire Incident Response and Information System (FIRIS) boundary or outer edge of a fire's extent based on aircraft-mounted infrared sensors that detect heat signatures and human operators .
Fixed-Wing Aircraft	Non-rotary aircraft (airplanes) used in emergency operations for aerial reconnaissance, water/retardant drops, and personnel transport.

Term	Definition
Formal Briefings	Where all agency representatives gather during regular intervals to report priority information regarding the incident
Fuel Continuity	The degree to which combustible materials are connected horizontally or vertically, allowing fire to spread across a landscape, between parcels, or through developed areas.
Fuels	Living or dead combustible materials capable of burning. In the wildland-urban interface, fuels may include natural vegetation, ornamental plants, structures, vehicles, fences, debris, and other human-made materials.
Geographic Information System (GIS)	Computer technology that captures, analyzes, and visualizes geographic and spatial data for mapping and planning.
Hand line	A firefighting hose that is operated and maneuvered by firefighters (usually 2 ½ inches or less)
Hazard	A physical condition with the potential to cause harm. Wildfire hazard is influenced by the likelihood and potential intensity of fire based on factors such as vegetation, weather, topography, and anticipated fire behavior.
Hazard Map	A visual representation identifying areas prone to specific hazards (floods, wildfires, earthquakes, etc.) based on historical data and risk assessment
Holdover Fire	A fire that remains dormant for a considerable time and later reemerges from residual heat in vegetation, roots, duff, or other fuels when environmental conditions support renewed fire growth.
Home Hardening	Building design, construction, retrofit, and maintenance measures intended to reduce a structure's vulnerability to embers, radiant heat, and direct flame contact.
Incident Action Plan	A written or verbal plan that communicates incident objectives, operational assignments, organizational structure, safety information, and supporting information for a specified operational period.
Incident Command Post	Central location where incident commanders and leadership coordinate response operations, resource allocation, and strategic decisions.
Incident Command System	A standardized organizational framework used to manage emergency incidents. It establishes common terminology, defined responsibilities, manageable spans of control, resource accountability, and scalable command functions.
Incident Management Team	A designated group of personnel organized to perform command and general staff functions during an incident. Teams may manage operations, planning, logistics, finance, safety, public information, and interagency coordination.
Initial Attack	The actions taken by the first resources assigned to a wildfire to protect life and property and contain or control the fire.
Interagency Resource Ordering Capability (IROC)	A standardized system and process that enables emergency management agencies, fire departments, and other public safety organizations to request, coordinate, and mobilize resources across jurisdictional and organizational boundaries during emergencies and disasters.
Interoperability	The ability of personnel, organizations, communications systems, equipment, data, and procedures to operate together effectively during an incident.
Leaders' Intent	Expressed by a leader, and typically includes information on task, purpose and end state of a directive.
Light Force	Smaller, mobile firefighting unit typically consisting of a single engine and a ladder truck,t, used for initial attack or support operations in wildfire suppression.
Live Fuel Moisture	The amount of water contained in living vegetation relative to its dry weight. Lower live fuel moisture generally indicates that vegetation is more receptive to ignition and sustained burning.
Local Responsibility Area	Land where local government generally has primary responsibility for wildland fire protection. California wildfire hazard mitigation requirements within these areas may depend on the applicable Fire Hazard Severity Zone and locally adopted regulations.
Mountain Wave	Atmospheric phenomenon where air flows over mountains creating waves of rising and sinking air, affecting weather and fire behavior.
Mobile Field Force (MFF)	Deployable personnel and equipment units that can be rapidly mobilized to respond to incidents at various locations within a jurisdiction.
Mop-Up	Actions taken after initial fire control to identify and extinguish, or remove remaining burning and/or heat, smoldering material, and other potential sources of re-ignition to ensure the fire remains controlled.

Term	Definition
Mutual Aid	Assistance provided across jurisdictional or organizational boundaries under established agreements. Assistance may include personnel, apparatus, aircraft, equipment, communications, or specialized capabilities.
Mutual Threat Zone (MTZ)	A geographic area or operational zone where multiple agencies, jurisdictions, or responding units face the same hazards, threats, or dangers simultaneously.
Operational Period	A defined period during which a particular set of incident objectives and assignments is in effect.
Particularly Dangerous Situation (PDS) Red Flag Warning	An enhanced Red Flag Warning used to emphasize an unusually severe combination of critical fire weather and fuel conditions that create an elevated potential for rapid fire growth, property damage, and loss of life.
Pressure Regulating Stations	Facilities with valves and equipment that control and maintain appropriate water pressure throughout the distribution system to prevent damage and ensure service quality.
Pressure Zone	A defined portion of a water-distribution system in which pressure is maintained within an established range. Pressure zones may use pumps, regulating valves, storage tanks, reservoirs, and elevation differences to provide water service and firefighting flow.
Pump Station	Facility containing pumps and equipment that moves water through the distribution system, increasing pressure and flow to reach storage tanks and/or consumers.
Qualified Division/Group Supervisor	Fire department personnel certified and positioned to manage and supervise a division or group of firefighting units during incidents.
Radiant Heat	Thermal energy transmitted from a fire through electromagnetic wafers. Sufficient radiant heat can damage or ignite exposed materials and limit how close firefighters can operate in the vicinity of a fire.
Red Flag Warning	A National Weather Service warning that critical fire-weather conditions are occurring or imminent, typically involving strong winds, low relative humidity, and dry fuels.
Repeater	Electronic device that receives, amplifies, and retransmits radio signals to extend communication range and coverage.
Reservoir	Large natural or artificial body of water, used for water supply, flood control, and recreation.
Resilient Landscape	A landscape capable of withstanding, adapting to, and recovering from wildfire and other disturbances in a manner consistent with management objectives.
Response Time	Measurement of the time elapsed from when an emergency call is received to when responders arrive at the incident location.
Risk	The potential for adverse consequences resulting from the interaction of a hazard with exposed people, property, infrastructure, or other valued resources.
Santa Ana Winds	Dry, downslope winds that move from the interior toward coastal Southern California. These winds can strengthen as air descends through and over mountainous terrain, producing low humidity, damaging gusts, and conditions favorable for rapid wildfire spread.
Situational Awareness	The continuous understanding of incident conditions, resource locations, hazards, fire behavior, weather, evacuation activity, and other information needed to support operational decisions.
Span of Control	The number of personnel or units that one supervisor or commander manages, directs, and supervises during an incident or routine operations. Maintaining appropriate span of control ensures that leaders maintain adequate oversight, communication, and accountability without becoming overwhelmed.
Spot Fire	A fire ignited outside the main fire perimeter by windborne embers or other burning material.
“Squirrel Channel”	Informal or secondary communication channel, often used in emergency operations; likely refers to an unofficial or backup dispatch frequency.
State Responsibility Area	Land where the State of California has primary responsibility for preventing and suppressing wildland fires. State defensible-space and related wildfire requirements generally apply within these areas.
Strike Team	Group of emergency personnel organized and trained to work together as a tactical unit, often in wildfire suppression.
Structure Defense	Firefighting actions intended to protect structures and their occupants from an advancing fire while maintaining responder safety.

Term	Definition
Structure-to-Structure Fire Spread	Fire transmission from one building to another through embers, radiant heat, direct flame contact, or burning connective fuels.
Systems Approach	A holistic and interdisciplinary method for understanding and solving complex problems
Task Force	Flexible grouping of different types of emergency response units combined to accomplish a specific operational objective.
TIER (Take Initiative, Engage, and Report)	Emergency response framework emphasizing individual empowerment to act, participate, and communicate during incidents.
Unified Command	An Incident Command System structure through which agencies or jurisdictions with shared authority jointly establish incident objectives and strategies while retaining their individual legal responsibilities.
Upstaff	Increase staffing in anticipation of increased call volumes
Warning Fatigue	Instance where repeated warnings about hazards or emergencies cause people to become desensitized and less likely to respond appropriately or evacuate.
Water Distribution System	Network of pipes, pumps, and infrastructure that transports treated water from treatment plants to residential, commercial, and industrial consumers.
Water District	Government or public agency responsible for managing, maintaining, and distributing water supply to a specific geographic region or service area.
Water Storage Capacity	Maximum volume of water that can be held in storage tanks or reservoirs, typically measured in units of million gallons (MG) or acre-feet.
Water Storage Tank	Structure (ground-level, elevated, or buried) that holds water in reserve for distribution to consumers and emergency use.
Water Supply Zone	Geographic area served by a water district that receives water from a specific source or treatment plant.
Wildfire Models	Computer simulations and mathematical tools that predict fire behavior, spread, intensity, and impacts based on a range of inputs that can include weather, fuel, and terrain data.
Wildfire Resilience	The capacity of people, communities, infrastructure, landscapes, and response organizations to prepare for, withstand, adapt to, recover from, and reduce future losses from wildfire.
Wildland-Urban Interface	An area where structures and other human development meet or intermingle with undeveloped wildland vegetation and fuels.
Wireless Emergency Alert (WEA)	Text-based message system that delivers emergency information directly to mobile devices by authorized government entities without requiring opt-in.
Zone 0	The area extending approximately five feet from a structure where ignition-resistant conditions are emphasized to reduce the likelihood that embers or nearby combustible materials will ignite the building.

8. ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
A-Reps	Agency Representatives
A&W	Alert & Warnings
AA	Agency Administrator
AAR	After Action Report
AC	Air Conditioning
AC	Assistant Chief
AFN	Access and Functional Needs
AI	Artificial Intelligence
ALD	Altadena Station (LASD)
ANF	Angeles National Forest Fire & Aviation Management
ANSI	American National Standards Institute
API	Application Programming Interface
AR	Auto-Recloser
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
AVL	Automatic Vehicle Location
BC	Battalion Chief
BOF	California Board of Forestry and Fire Protection
BWC	Body Worn Camera
CAD	Computer Aided Dispatch
CAL FIRE and CDF	California Department of Forestry and Fire Protection
Cal OES	California Governor's Office of Emergency Services
CalFiDE	California Fire Dynamics Experiment
CalWARN	California Water/Wastewater Agency Response Network
CAP	Common Alerting Protocol
CDF and CAL FIRE	California Department of Forestry and Fire Protection
CEOC	County Emergency Operations Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERT	Community Emergency Response Teams
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHP	California Highway Patrol
CICCS	California Incident Command Certification System
Copter	Helicopter
CPUC	California Public Utilities Code
CPUC	California Public Utilities Commission

Acronym	Meaning
CRA	Colorado River Aqueduct
CRR	Community Risk Reduction
CSR	Customer Service Representatives
cu. ft.	cubic feet
CVP	Central Valley Project
CVS	Crescenta Valley Station (LASD)
CWCG	California Wildland Fire Coordinating Group
CWPP	Community Wildfire Protection Plan
CWUIC	California Wildland-Urban Interface Code
DAT	Damage Assessment Team
DC	Deputy Chief
DEOC	Department Emergency Operations Center
DINS	Damage Inspection
DIVS	Division/Group Supervisor
DOC	Department Operations Center
DOI	Department of the Interior
DS	Distribution Station
DSS	NWS' Decision Support Services
DWR	California Department of Water Resources
E	Engine
EAS	Emergency Alert System
EIT	Emergency Incident Technician
ELMFIRE	Eulerian Level set Model of FIRE spread
EM	Emergency Medical Services Captain
EMAC	Emergency Management Assistance Compacts
EMD	Emergency Management Department (Los Angeles City)
EMS	Emergency Medical Services
EO	Executive Order
EOB	Emergency Operations Bureau (LASD)
EOC	Emergency Operations Center
EOO	Emergency Operations Organization (Los Angeles City)
EPA	Environmental Protection Agency
ESCAPE	Evacuation and Sheltering Considerations: Assessment, Planning, and Execution
ESIAP	Electrical Services Incident Action Plan
ET	Electrical transmission

Acronym	Meaning
FARSITE	Fire Area Simulator
FEMA	Federal Emergency Management Agency
FFP	Firefighter Paramedic
FHSZ	Fire Hazard Severity Zone
FIRESCOPE	FIrefighting RESources of California Organized for Potential Emergencies
FIRIS	Fire Integrated Real-Time Intelligence System
FMWD	Foothill Municipal Water District
FOAC	Fire Operational Area Coordinator
FOBS	Field Observer
FRA	Federal Responsibility Areas
FS	Fire Station
ft	Foot, Feet
FWW	Fire Weather Watch
GIS	Geographic Information System
GOES	Geostationary Operational Environmental Satellites
GOES-R	Geostationary Operational Environmental Satellites—R Series
GPM	Gallons Per Minute
GPS	Global Positioning System
HAZMAT	Hazardous Materials
HLCO	Helicopter Command
HOA	Homeowners Association
HR	Human Resources
HVAC	Heating, Ventilation, and Air Conditioning
HWL	High Water Level
IAFC	International Association of Fire Chiefs
IAP	Incident Action Plan
IAZ	Initial Action Zone
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IMT	Incident Management Team
IPAWS	Integrated Public Alert & Warning System
IQR	Inter-Quartile Range
IROC	Interagency Resource Ordering Capability
IRWIN	Integrated Reporting of Wildland-Fire Information

Acronym	Meaning
IRPG	Incident Response Pocket Guide
ISO	International Standards Organization
IT	Information Technology
JPL	Jet Propulsion Laboratory
KID	Kinneloa Irrigation District
L-TAC	Local Tactical
LA FCCF	Fire Command and Control Facility (LACoFD)
LA Metro	Metropolitan Fire Communications (LAFD)
LA-RICS	Los Angeles Regional Interoperable Communications System
LAA	Los Angeles Aqueduct
LAAFCA	Los Angeles Area Fire Chiefs Association
LAC and LACoFD	Los Angeles County Fire Department
LACDPW	Los Angeles County Department of Public Works
LACoFD and LAC	Los Angeles County Fire Department
LACWWD-29	Los Angeles County Waterworks District 29
LADOT	Los Angeles Department of Transportation
LADWP	Los Angeles Department of Water and Power
LAFD and LFD	Los Angeles Fire Department
LAPD	Los Angeles Police Department
LARIAC	Los Angeles Region Imagery Acquisition Consortium
LASD	Los Angeles County Sheriff's Department
LAWC	Lincoln Avenue Water Company
LAX	Los Angeles International Airport
LF	Light Force
LFD and LAFD	Los Angeles Fire Department
LFM	Live Fuel Moisture
LFO	Live Field Observation
LFWC	Las Flores Water Company
LHS	Lost Hills Station (LASD)
LOFR	Liaison Officer
Low-E	Low-Emissivity
LRA	Local Responsibility Area
LVMWD	Las Virgenes Municipal Water District
LWIR	Long-Wave Infrared
m	meter

Acronym	Meaning
mb	millibars
MDC	Mobile Data Computer
Metropolitan	Metropolitan Water District of Southern California
MFF	Mobile Field Force
MG	Million Gallons
MGD	Million Gallons per Day
MHz	Megahertz
MODIS	Moderate Resolution Imaging Spectroradiometer
mph	miles per hour
MRCA	Mountains Recreation and Conservation Authority
MTZ	Mutual Threat Zone
MW	megawatts
MWD	Municipal Water District
MWIR	Mid-Wave Infrared
NASA	National Aeronautics and Space Administration
NDVI	Normalized Difference Vegetation Index
NERIS	National Emergency Response Information System
NFPA	National Fire Protection Association
NGFS	Next Generation Fire System
NIFC	National Interagency Fire Center
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NIR	Near-Infrared
NIROPS	National Infrared Operations
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPDWR	National Primary Drinking Water Regulations
NWCG	National Wildfire Coordinating Group
NWS	National Weather Service
OEM	Office of Emergency Management (Los Angeles County)
ORC	Orange County Fire Authority
OSB	Oriented-Strand Board
OSC	Operations Section Chief
OSHA	Occupational Safety and Health Administration
PA	Public Address

Acronym	Meaning
PAS and PFD	Pasadena Fire Department
PBS WARN	Public Broadcasting Service Warning, Alert, and Response Network
PCH	Pacific Coast Highway
PCS	Pressure Control Structure
PDOC	Power Distribution Operations Support
PDS	Particularly Dangerous Situation
PFAS	Per- and Polyfluoroalkyl Substances
PFD and PAS	Pasadena Fire Department
PIO	Public Information Officer
PNNL	Pacific Northwest National Laboratory
POST	Peace Officer Standards and Training
POTUS	President of the United States
PPD	Pasadena Police Department
PPE	Personal Protective Equipment
PRC	Public Resources Code
PRV	Pressure Reducing Valve
PS	Pump Station
psi	pounds per square inch
PSPS	Public Safety Power Shutoff
PST	Pacific Standard Time
PVC	Polyvinyl Chloride
PWAG	Public Water Agencies Group
PWP	Pasadena Water and Power
RA	Rescue Ambulance
RAWS	Remote Automatic Weather Station
RCLWA	Rubio Cañon Land and Water Association
REST	representational state transfer
RFW	Red Flag Warning
RMAC	Regional Mutual Aid Coordinator
ROE	Right of Entry
RTG	Regional Training Group
RVC	Riverside County Fire Department
SCADA	Supervisory Control and Data Acquisition
SCAG	Southern California Association of Governments
SCBA	Self-Contained Breathing Apparatus

Acronym	Meaning
SCC	Sheriff's Communications Center
SCE	Southern California Edison
SDG	Structure Defense Group
SDWA	Safe Drinking Water Act
SMA and SMFD	Santa Monica Fire Department
SME	Subject Matter Expert
SMMC	Santa Monica Mountains Conservancy
SMPD	Santa Monica Police Department
SMS	Short message service
SOFR	Safety Officer
SOP	Standard Operating Procedure
SRA	State Responsibility Area
ST	Strike Team
STAM	Staging Area Manager
State Parks	California State Parks
STEN	Strike Team Leader Engine
STEN-T	Strike Team Leader Engine Trainee
SWIR	Short-Wave Infrared
SWP	State Water Project
SYPS	Santa Ynez Pump Station
SYR	Santa Ynez Reservoir
T	Truck
TA	Tactical Alert
TC	Tablet Command
TCEP	Topanga Coalition for Emergency Preparedness
TCP	Traffic Control Point
TD	Technical Discussion
TF	Task Force
TFL	Task Force Leader
TFRA	Temporary Fire Refuge Area
TIER	Take Initiative, Engage, Report
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle
UC	Unified Command
UHF	Ultra High Frequency

Acronym	Meaning
UL	Underwriters Laboratories
ULRI	UL Research Institutes
USAR	Urban Search and Rescue
USFS	United States Department of Agriculture Forest Service
UOP	Unified Ordering Point
VHF	Very High Frequency
VHFHSZ	Very High Fire Hazard Severity Zone
VIIRS	Visible Infrared Imaging Radiometer Suite
VIS	Visible
VNC	Ventura County Fire Department
VoIP	Voice Over IP
WEA	Wireless Emergency Alert
WECC	Western Electricity Coordinating Council
WFDS	Wildland-urban interface Fire Dynamics Simulator
WFLC	Wildland Fire Leadership Council
WMP	Wildfire Mitigation Plan
WTP	Water treatment plant
WUI	Wildland-Urban interface

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