



Ready? Aim? Fire!

Santa Cruz County on the Hot Seat

Summary

As the specter of climate change increases, so does the fear and likelihood of more wildfires in populated areas. As evidenced by the 1991 Tunnel Fire in the Oakland Hills and more recent fires (Mendocino Complex, Carr, Camp), Santa Cruz County faces increasing risk to life and property from a wildfire. The Grand Jury recognizes it is important to do everything possible to prevent emergencies from occurring. This can best be accomplished by creating an environment that reduces risk and adopts best practices.

The Santa Cruz County fire organization is extremely complex, making it challenging to properly gauge the level of risk mitigation, effectively measure emergency response, or determine citizens' readiness to evacuate in an emergency. In addition, residents must be educated on the importance of being prepared, and on their role in reducing the likelihood of a wildfire.

The Grand Jury determined Santa Cruz County residents would benefit from greater efficiency and transparency from the multitude of fire agencies in the county, with the goal of improving preparedness and response. The Grand Jury recommends improvements be made in assessing risk, establishing performance targets, and communicating progress toward those targets. Further, progress and performance reporting must be easily accessible to the public and communicated in concise, understandable terms. Lastly, in order to provide the level of protection residents need and deserve, governing bodies must make data-driven decisions and hold leaders accountable for their results.

<p>While this Grand Jury investigated and reported on the complexities and difficulties of the organization of multiple fire agencies in Santa Cruz County, the Grand Jury respectfully recognizes and commends the dedication of our firefighters as they attend to the safety and well-being of the community.</p>
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Background

Although Santa Cruz County has experienced large fires such as the Lockheed Fire in recent years, it has not suffered a fire of the magnitude of the Camp Fire or the Oakland Hills Fire, which directly and drastically impacted large urban populations. The Lockheed Fire was remote from any town center, and although fierce and raging, forced evacuation of a comparatively small number of residents. That lack of experience however, adds to the challenge of emphasizing prevention.

Santa Cruz County, with its unique and diverse geography and microclimates suitable for vegetation to flourish, plus urban areas adjacent to, or integrated into this dense vegetation, has a population where over 50% live in what is classified as a Wildland Urban Interface zone (WUI).^[01] This zone is considered the highest risk area of wildfire due to the abundance of both fuel and ignition sources.^{[02] [03]}

According to the United States Forest Service Santa Cruz County has the largest percentage of WUI of all the counties in the state of California.^[04] Over 167,000 people reside in close to 72,000 homes in this high risk fire zone shown in Figure 1 below and in detail in [Appendix A](#).

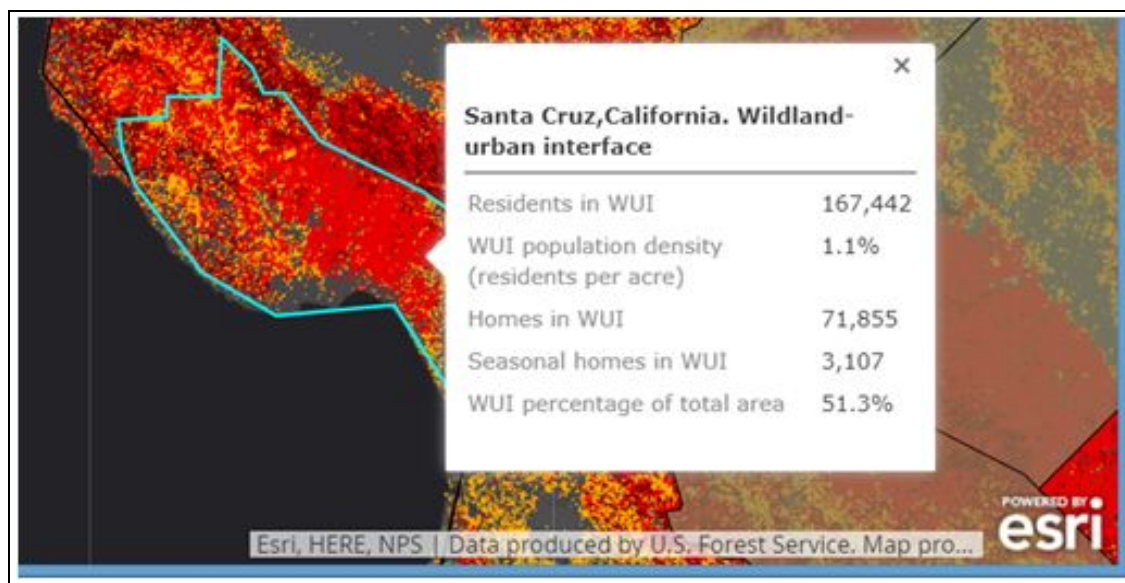


Figure 1. **Santa Cruz County Wildland Urban Interface Statistics**^[05]

The Santa Cruz County Local Hazard Mitigation Plan (LHMP)^[06] emphasizes the magnitude of the risk faced by current residents by describing earlier local fires and the conditions that fueled them:

The potential magnitude or severity of future fires could be predicted from experience gained from the recent fires of 2008 (Summit Fire) and 2009 (Lockheed Fire). In those fires, spotting exceeding 1 mile, torching of conifers, flame lengths exceeding 100', area ignition and sheeting were all observed. In 2008, over 75 structures were destroyed in 3 fires alone.

Similar fuels (Manzanita/Knobcone, Eucalyptus, chaparral, and mixed conifer forestland), topography and weather conditions are expected to be encountered in future fires creating a repeat of extreme fire behavior exhibited in recent large local fires.

While normal weather conditions in the Santa Cruz Mountains can be categorized as cold and damp with extensive marine influence (fog), several times each year conditions are created where fuel moisture levels have been measured below 5% with temperatures above 90°, and north winds greater than 45 mph.^[07] (emphasis added)

The Oakland Hills Fire of 1991 is a good model of the speed and devastation of a wildfire out of control. Oakland has similar terrain and vegetation, coastal fog conditions, and an abundance of older structures built to codes much like those in Santa Cruz County today. These similar traits may foretell similar wildfire speed and devastation in our county. Figure 2, graphics and images of the Oakland Hills Fire remind us that even fires that bring quick response can spread rapidly and destructively.^[08]

Since 1991, there have been improvements in weather forecasting, building codes and materials, communications, alerts systems, command and control systems, fire retardants, and apparatus. Yet, because of other factors (e.g. climate change), the threat is as strong, or possibly stronger than ever before.

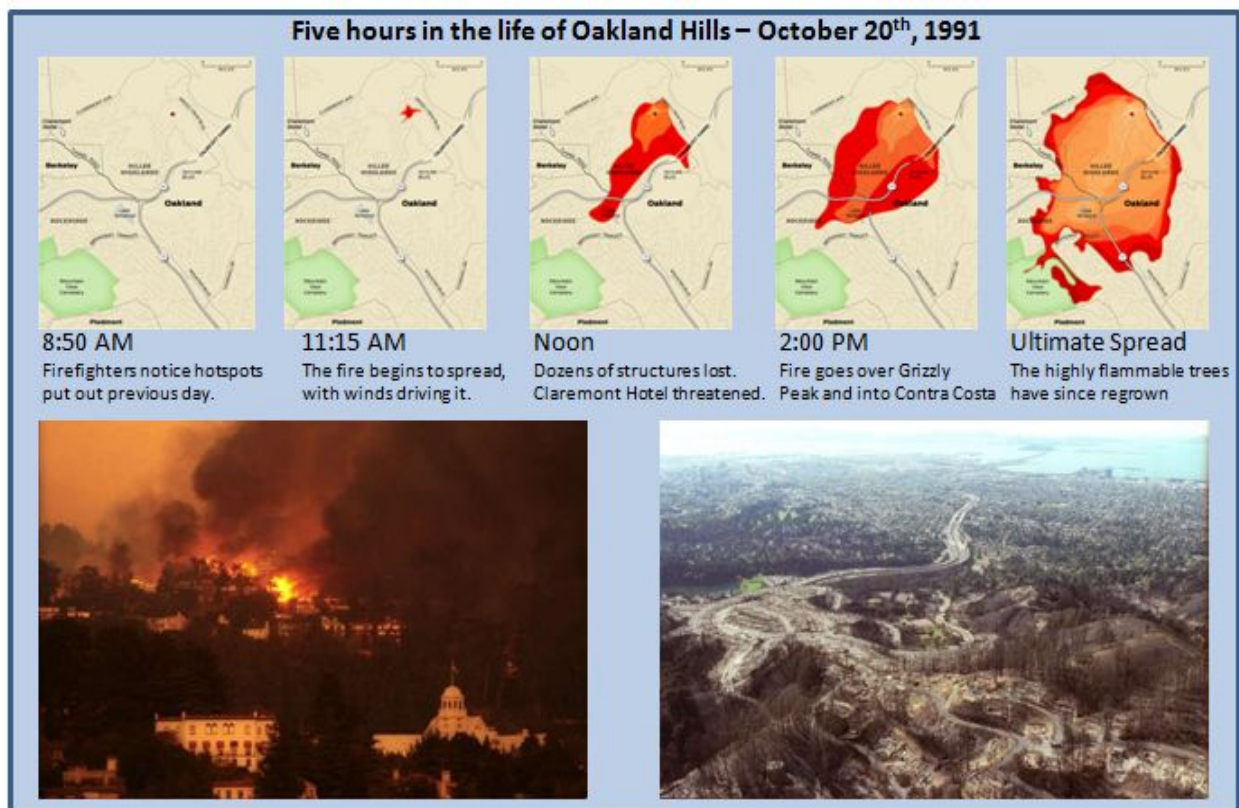


Figure 2. **Oakland Hills Fire October 20th, 1991**^[09]

It is now abundantly clear that climate change has had, and will continue to have, a powerful impact on large scale fire risk in California. Climate change has resulted in increased focus at the national level such as new surveillance systems, and at the state level with new fire code legislation, vegetation abatement, and audits. Private sector electric companies are pouring millions of dollars into infrastructure upgrades, vegetation management and alert systems in addition to mitigating their own risk by way of scheduled power outages.^[10] A significant portion of this investigation will assess how our local government and our community are addressing this growing risk.

In Santa Cruz County, fire protection is composed of fire protection districts (fire districts), city fire departments, the Santa Cruz County Fire Department (County Fire), and the California Department of Forestry and Fire Protection popularly known as CAL FIRE. These agencies do not have overlapping geographical boundaries of jurisdiction as seen in Figure 3.

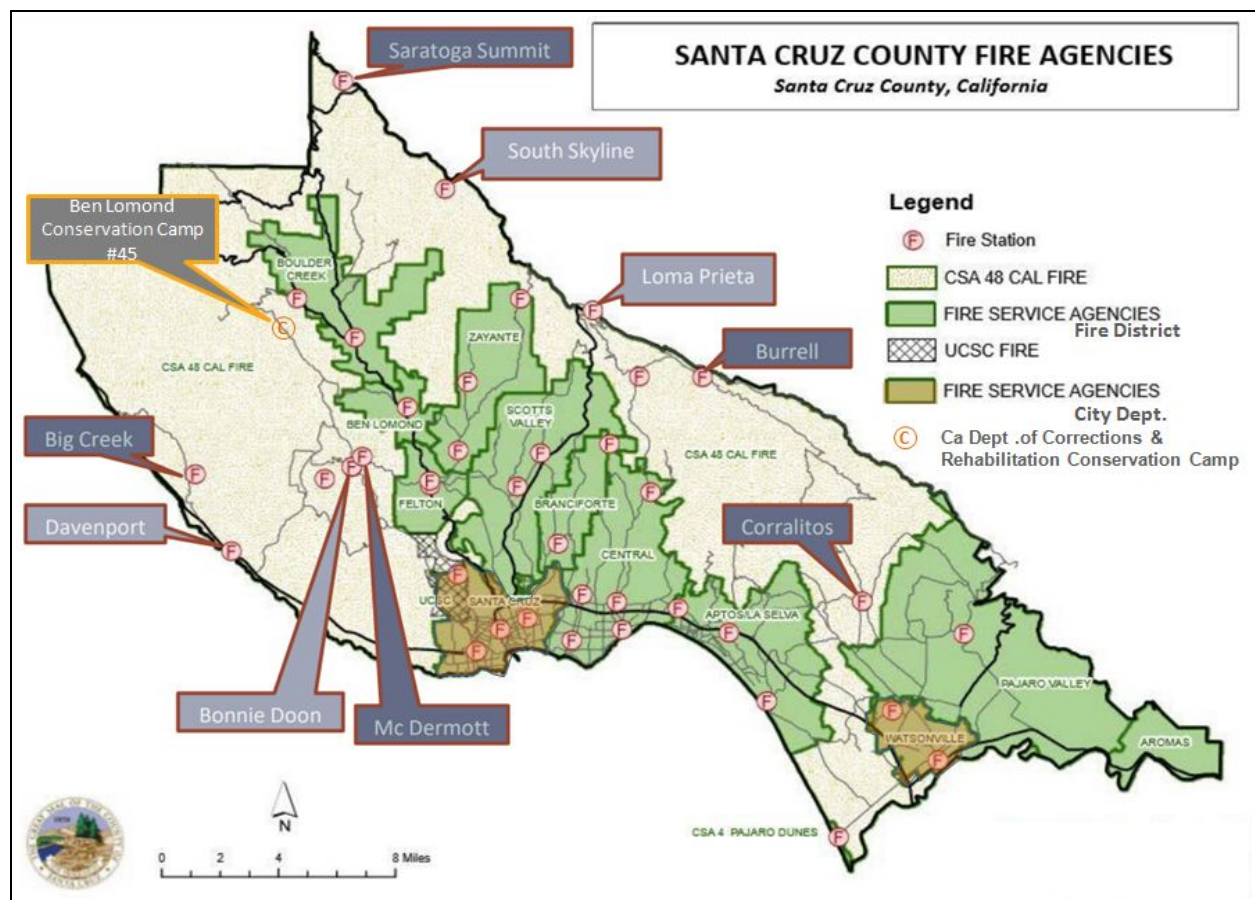


Figure 3. **Santa Cruz County Fire Agencies**^[11]

However, fire agencies have mutual aid agreements which enable them to help one another across jurisdictional boundaries when emergencies exceed local resources. Mutual aid is usually requested on an as needed basis by the local incident commander. Mutual aid is typically voluntary, and may not occur if the requested agencies are dealing with incidents of their own and/or do not have enough equipment or firefighters

to share at the time. This complex organizational structure and the management of mutual aid agreements are also considered in this report. Finally, in January 2019, the Governor of California issued executive order 1.8.19-EO-N-05-19 that asserted:

...the people of the State of California expect that their government will take all possible actions to protect life, property, and forests from deadly megafires, and will do so with an urgency that matches the scope of the threat."^[12]

This order called for increased attention on policy, methods, urgency, funding, and education associated with wildfire.

It is with that philosophy of urgency and expectation that this Grand Jury also investigated our local government's processes, practices, and priorities.

Scope and Methodology

The scope of this investigation was comprehensive in nature. It explored many aspects of fire agency services, including risk mitigation, response, alerts, evacuation, and education. For these service areas, the Grand Jury evaluated planning, execution, measurement, and governance. Not all agencies (county, city, district) were investigated to the same extent, but were examined closely enough to make both generalized and specific recommendations.

The usual methods of investigation were employed including: interviews with leaders, agency staff and residents; attendance at outreach events and visits to numerous sites associated with fire/disaster response; document request and analysis for critical data measurements of performance.

To help identify key issues for our county, the Grand Jury also reviewed many reports including other California Grand Jury reports, Local Agency Formation Commission (LAFCO) reports, State Auditor reports, consultant studies, and journalistic investigations. The Grand Jury did not constrain our reviews of reports to those just from Santa Cruz County; we felt that many counties in California have similar challenges with regard to fire risk, from which we may extract relevant topics of investigation. This is evidenced by the sample in Table 1 below:

Table 1. **California Grand Jury Fire Service Related Reports**

County	Civil Grand Jury Report
Marin	2019: Wildfire Preparedness: A New Approach ^[13] “Fire code inspections, policies and procedures intended to manage and reduce vegetation, and evacuation planning are inadequate”
Contra Costa	2019: Fire Inspection Records and Reporting ^[14] “...confirmed that the Fire District had fallen behind on completing all the state-mandated fire inspections for schools and multifamily residences”
Butte	2019: Camp Fire Lessons Learned ^[15] “...chances of survival can be greatly enhanced by increasing...safe places for evacuating residents to gather when evacuation becomes impossible.” 2009: Wildfire and Safety Considerations ^[16] “...recent evacuations, traffic reduced to a crawl once fleeing vehicles encountered traffic controls in adjoining cities.”
Sonoma	2018: Fire Emergency Response ^[17] “Sonoma County has 43 individual fire districts that are functionally independent.... The California Fire Chiefs Association recommends that counties and the state develop a proactive system rather than a reactive system.”
Santa Cruz	2015: Fire District...Response Times, Mutual Aid, and Consolidation^[18] “...districts would benefit from increased shared services or consolidation.” 2008: What is County Fire^[19] “Volunteer fire companies are key to the fire protection of rural areas of the county. “...call reports provided by Cal Fire to the Board of Supervisors are incomplete” To offset rising costs of County Fire, the Board of Supervisors chose to reduce costs by cutting staffing.”
San Diego	2015: Back-County Fire Protection - Where We Are Today ^[20] “improve and expand mutual aid agreements...”
Alameda	2014: Oakland Fire Department - Commercial and Vegetation Inspections ^[21] “The Grand Jury concluded there were lax ... collection practices in both the commercial inspection program and the city’s vegetation management program.”
Santa Clara	2011: Fighting Fire or Fighting Change ^[22] “Public safety consumes 50%-70% of city budgets Fire departments should rethink their response protocols—which are based on an historically fire-oriented model that does not match today’s medical-based demand for emergency services.” 2007: Record Keeping In Disarray at San Jose Bureau of Fire Prevention ^[23]
Santa Barbara	2011: Improving Our Emergency Alert System in the 21st Century ^[24] 2001: Regional Approach to Providing Better Fire Protection and Emergency Medical Services ^[25]

Sources noted with each report.

Investigation

Our investigation sought to answer these important questions:

- How well does the organization of the fire departments across the County maximize their effectiveness and efficiency?
- Are the risks of wildfire occurrence and containment accounted for and mitigated?
- Does emergency response meet the criteria for safety and security of life and property?
- In the event of a wildfire event, can the public be alerted, evacuated, and sheltered in time?
- Is the public sufficiently educated about fire risk and prepared to mitigate personal property and community risk?
- How well do the fire agencies and the governing bodies in counties and cities make data-driven decisions and hold responsible leaders accountable for their results?

Organization

One unexpected yet necessary aspect of this investigation was understanding the structure of the Santa Cruz County fire organization. Many California counties are served by a single fire protection district (fire district), a highly structured, well balanced organization with a single set of policies, procedures, and priorities. Santa Cruz County's organization consists of ten fire districts, two city fire departments, one large California university, and CAL FIRE, which is supported by five independent community volunteer battalions. The Aromas Tri-County Fire Protection District serves three counties, including a small fragment of Santa Cruz County. The City of Capitola contracts its beach services to the City of Santa Cruz. The CAL FIRE regional unit that provides fire protection to the County of Santa Cruz also provides fire protection services to San Mateo County and the Pajaro Fire District. Unlike the fire districts, where the fire chief and organization report directly to a governing body (i.e the fire district's board of directors), city fire departments report to the city manager. The CAL FIRE contact is administered by the office of the County Administrative Office (CAO)/General Services Director/Office of Emergency Services(OES).^{[26] [27] [28] [29] [30] [31]}

All fire organizations have mutual aid agreements with the other fire organizations that enable sharing aid and reimbursement of costs. In some cases sharing is on a reciprocal basis. It can get complicated when aid is sent out of the County.

Due to the dizzying nature of Santa Cruz County's fire organization, the Grand Jury mapped out the relationships in order to understand its complexity, which resulted in the development of the chart in Figure 4 below.

When Santa Cruz County is compared to Contra Costa County, a mid-size Bay Area county, and Los Angeles County, a very large Southern California county, the differences in complexity are clear. The issues and challenges arising from this complexity will be discussed throughout this report.

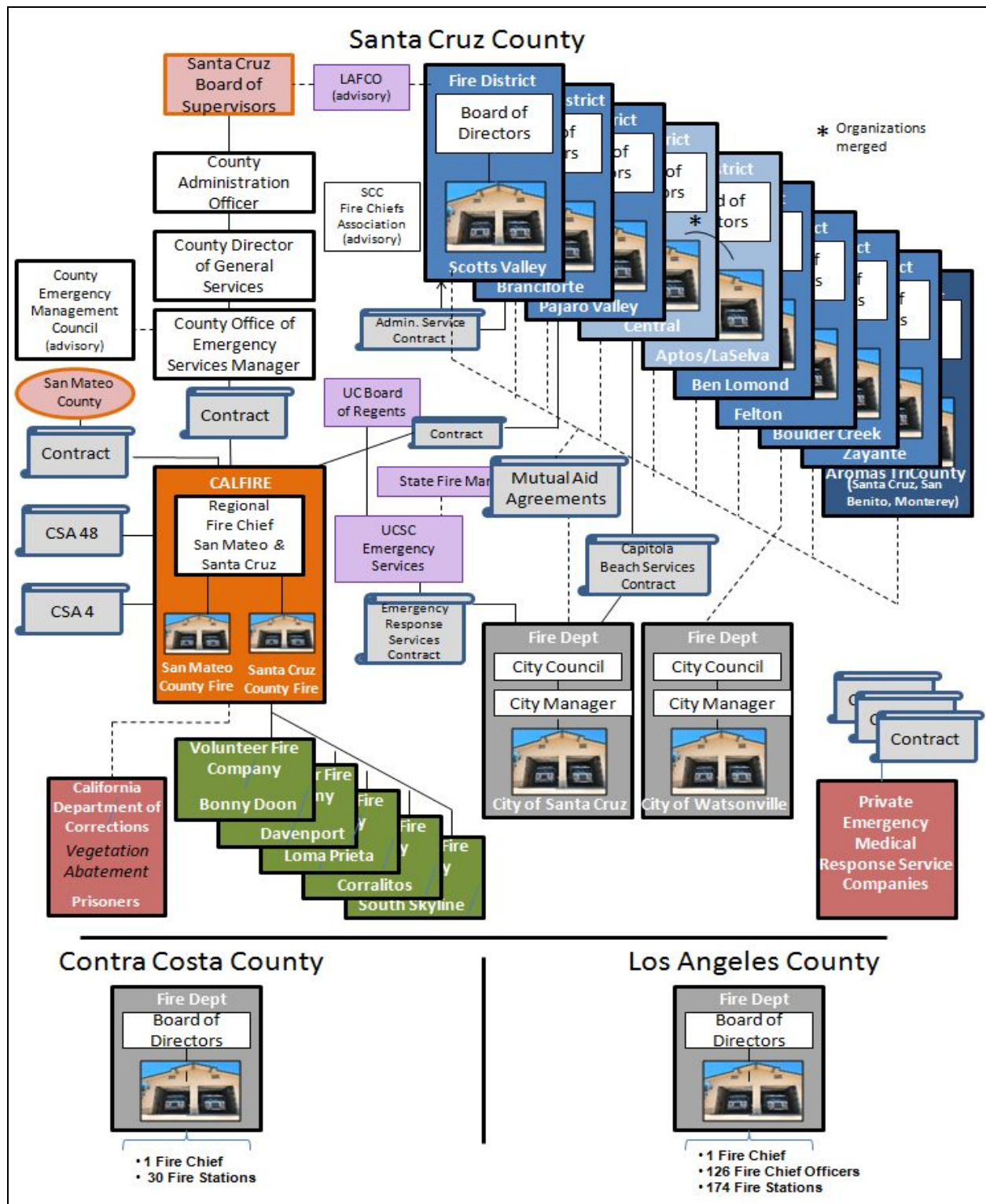


Figure 4. A Comparison of Fire Organization Structures for three Counties [32] [33] [34] [35] [36] [37] [38] [39]

Fire Districts and City Fire Departments

Fire districts are local government agencies that provide essential and specific fire related services, and are governed by the local residents of the district.^[40] Like all special districts of California, they must follow state laws pertaining to public meetings, record keeping, and elections. The major funding source for fire districts is property tax revenue.^[41] Each local government agency shares a portion of this revenue based on an established percentage or allocation factor.^[42] There are ten fire districts in Santa Cruz County.

The districts use the dispatch services provided by Santa Cruz Regional 911 Center (Netcom). CAL FIRE/County Fire calls for service are dispatched separately, utilizing CAL FIRE's Felton Emergency Command Center (ECC).

County Fire

In unincorporated areas, fire protection is provided by the County. Because counties often consist of large and diverse geographical areas, providing a consistent and adequate service level across all areas can be difficult. The County Service Area Law (California Government Code §25210.1 et seq.) was created in the 1950's to provide a means of providing expanded service levels in areas where residents are willing to pay for the extra service.^[43]

In Santa Cruz County, the unincorporated areas not covered by a special district are covered by the County. There are two County Service Areas (CSAs), CSA 4 and CSA 48. CSA 4 is a small 1/4 square mile area known as Pajaro Dunes, CSA 48 covers the balance. Services differ for these two CSAs due to the differences in the tax assessments approved by the voting residents of the CSA.^[44]

Volunteer firefighters make up the bulk of County Fire Department staffing, with supplemental staffing from CAL FIRE. The County and CAL FIRE have a contract for services managed by the County Office of Emergency Services (OES). These services include:^[45]

- Emergency Fire Protection, Medical and Rescue Response
- Basic Life Support Services
- Dispatch Services
- Fire Code Inspection, Prevention and Enforcement Services
- Land Use/Pre-Fire Planning Services
- Disaster Planning Services
- Staffing Coverage
- Extended Fire Protection Service Availability (Amador Plan)

Volunteer Companies

County Fire depends on the participation of organized volunteer fire companies. "The volunteer companies allow for a level of staffing and distribution of fire stations and equipment that could not otherwise be accomplished."^[46] Volunteers are professionally

trained firefighters but are non-salaried. The County funds a CAL FIRE officer year-round to manage the training of volunteers. Volunteer companies rely on community donations to support the purchase or upgrade of equipment and to assist in the upkeep of fire stations not otherwise supported by County funds. There are five volunteer companies located in CSA 48. All but one of these volunteer companies operates out of its own fire station. The company that does not is co-located at a CAL FIRE facility.^[47]

According to Santa Cruz County Fire documentation of Frequently Asked Questions in support of the recent Proposition 218 ballot measure,^[48] “Santa Cruz County Fire has 25% fewer paid firefighters on staff today than we did 10 years ago and a 45% reduction of volunteer firefighters (down from 110 to 60)”. This reduction in volunteers appears significant.

California Department of Corrections & Rehabilitation Assistance

Santa Cruz County has one of four State “conservation camps”, the Ben Lomond Conservation Camp #45, located on Empire Grade.^[49] This camp is actually a low security State prison, housing, training and employing low risk inmates to work on fire fighting, brush clearing and other labor intensive tasks. They form the front line of firefighters, working with chainsaws and hand tools to clear the lines, forming fire breaks, lighting backfires, hauling hoses, doing whatever they are asked by their commanders. The system allows for a small number of qualified inmates from the Santa Cruz County Jail to be assigned to the Ben Lomond Conservation Camp, giving eligible County Jail inmates the opportunity to move from the Jail to the Camp and serve as firefighters.^[50]

With the reduction of the numbers of non-violent prisoners being incarcerated, diminishing numbers of prisoners available for fire fighting pose a manpower issue for available fire fighting crews. These crews are very valuable because of their low pay rate, earning a dollar an hour extra pay for dangerous service on the fire lines, working alongside firefighters earning an “annual mean wage of \$74,000 with benefits.”^[51] Further demonstrating the inequities of the prison emergency labor system in California, there are women prisoners being housed in a firehouse outside of their Chowchilla California prison, serving as EMTs, riding in their trucks, entrusted with giving emergency medical care to members out in the community, earning \$.53 per hour, women are prisoners and will not be allowed to hold EMT jobs in civilian life, because of their criminal histories, despite their training and proven abilities.^[52]

Risk and Mitigation

California Governor executive order N-05-19 directed California state agencies to identify policy changes, funding changes, and priority changes to augment and improve the value received from the one billion dollars of forest management funding already allocated to address fire mitigation.^[53] This section addresses what the government at the local level is doing and not doing to protect life, property and forests from a potentially deadly megafire.

Most at risk for wildfire are those areas where high density populations intersect with areas abundant with fuel for fire, the Wildfire Urban Interface zone (WUI).^[54] This area is typically considered a high risk area because the urban presence provides sources of ignition, and in major fires like the Camp Fire, the houses themselves become the major fuel source.^[55] As stated earlier, Santa Cruz County has the largest number of people living in a designated WUI of any county in the state (see Figure 1 above).

In Santa Cruz County, the high risk areas are not limited to the WUI, but also include areas of high vegetation in proximity with an ignition source and far from a fire station. These typically are areas with rural homes and businesses or high voltage electrical devices. Within the urban area itself, there are groves of highly flammable Blue Gum Eucalyptus trees growing in close proximity to ignition sources such as recreational warming fires (hereafter warming fire), outdoor burning, and sparks from gas powered engines and motors.

Strategies for mitigating these risks and minimizing impacts include limiting potential fuel, preventing ignition, limiting the spread of fire by early detection, quick and effective response, and in the worst case scenario, either quick and effective evacuation, or providing shelter-in-place tactics in the event no evacuation routes are available. This section focuses on fuel management, ignition prevention, and early detection.

Quantified Risk Assessment - ISO

One approach for determining the risk level of homes in your community is the use of one of the risk metrics developed by experts in risk assessment, the insurance industry. A company called the ISO (Insurance Services Office) creates ratings for fire departments and their surrounding communities.^[56] These ratings calculate how well-equipped fire departments are to put out fires in that community. The ISO provides this score, often called the "ISO fire score," to homeowners' insurance companies. The insurers then use it to help set homeowners insurance rates. The more well-equipped your fire department is to put out a fire, the less likely your house is to burn down. And that makes your home less risky, and therefore less expensive to insure.

An ISO fire insurance rating, also referred to as a fire score or Public Protection Classification (PPC), is a score from 1 to 10 that indicates how well-protected your community is by the fire department.^[57] In the ISO rating scale, a lower number is better: 1 is the best possible rating, while a 10 means the fire department did not meet the ISO's minimum requirements. Scores are developed based on 1) the assessed quality of your local fire department, including staffing levels, training, and proximity of the firehouse, 2) availability of water supply including prevalence of hydrants and water available for firefighting, 3) quality of the communications systems, and 4) community outreach including fire prevention and safety courses.^[58]

The ISO provides the information for free to any fire department it inspects but does not provide the information directly to homeowners. Homeowners are advised that if your department has a poor score, it is a good idea to take extra steps in fireproofing your home. However the Grand Jury found no evidence that any of the fire agencies in the County broadly publish their ISO scores. It is evident that many of these agencies know

what the scores are from references in minutes, announcements, and newspaper articles. The 2007 and the 2016 LAFCO Municipal Service Reviews for Stanislaus County published the ISO scores for nearly every fire agency reviewed. Santa Cruz County LAFCO has not.^[59] ^[60]

All County residents would benefit if their fire agency not only published their current ISO score but previous scores. This would not only help them understand the cost of their homeowners insurance relative to others in the County, but it would help them decide the amount of energy to apply to help offset that risk. In addition it would allow residents to monitor the efforts applied by their fire agency to improve service, and reduce the impact of fire.

As a frame of reference, the Grand Jury discovered on a scale of 1 (exemplary) to 10, (unsatisfactory) the Scotts Valley Fire District was assessed as a “2” in 2018.^[61] In 2013, County Fire was assessed as a “5”, (assessed as a “6” the year before), for properties within 1,000 feet of a hydrant and properties beyond 1,000 feet of a hydrant, but within 5 miles of a station.^[62] The Grand Jury was unable to determine with readily available information if County Fire is still scored as an ISO 5 for the above referenced categories.

Risk Management and Coordination

Addressing risk mitigation categories (fuel management, ignition prevention, and early detection) requires coordination between multiple departments and agencies. In all cases, a thorough assessment of the risk’s probability of occurrence and impact is required to effectively prioritize, fund, and manage the mitigation activities. Management of the risk includes timely periodic reassessment.

It should be noted that Santa Cruz County lacks a comprehensive risk management function. Per the County Personnel Department website, risk management is limited to risks to liability and property, worker’s compensation, unemployment insurance, risk administration, and health benefits.^[63] Operational and financial risks are not covered. Risks to public health and safety are not covered.^[64]

In order to better understand how fire related activities can overlap multiple stakeholders, the Grand Jury created Table 2. The table shows the breadth of the cross functional nature of risk mitigation across a single institution such as a city or county. What it does not reflect is the relationship between all the departments associated with all the jurisdictions (county, cities, university, commission, fire districts, or school districts.)

The Grand Jury found little evidence that essential information and data required to effectively manage fire risk in the County was available to operational managers who have the responsibility to minimize the impact of wildfire.

Table 2. Wildfire Risk Mitigation Activities Across Santa Cruz County

	Educate	Plan & Mitigate	Respond	Evacuate	Govern • Provide Vision • Assess Risk • Hold Accountable • Establish Policy • Fund Appropriately
Boards	• Community outreach				
Mgmt/ Leadership	• Community outreach	• Assess Risk • Hold Accountable • Fund Appropriately • Partner with Institutions	• Assess Risk • Hold Accountable • Fund Appropriately	• Communicate	• Assess Risk • Hold Accountable • Establish Policy • Fund Appropriately • Compliance
Fire Dept.	• Community outreach	• Inspect (identify code violations) • Clear Vegetation	• Extinguish, Assist & Protect	• Protect during Evacuation	
OES	• Community outreach • Educate leadership • Publish	Develop: • Hazard Mit. Plan • Emergency Ops Plan • Evacuation Plan • Provide Surveillance	• Manage 911 and Reverse 911 Alert systems	• Command & Control of Evacuation	
Planning Dept. /GIS		• Prepare/Update/Status /Report Hazard Mit. Plan • Develop Maps,			
Bldg. Dept.		• Issue & Enforce Code Violations			
Public Works & IT Depts.		• Repair Hazardous Facilities and Infra. • Sustain /Improve IT/COMMS & Support Sys		• Support & Protect Infra • Manage IT	
Parks & Rec.		• Clear Vegetation			
Law Enforcement		• Enforce Illegal Burns • Supervise Vegetation Abatement	• Assist & Protect	• Execute Evacuation	
Dept. of Corrections		• Clear Vegetation			
Institutions (e.g. PG&E)		• Clear Vegetation • Remove Hazards • Monitor Hazards			
School Districts	• Educate students • Drills	• Develop safety plans • Maintain to code			
Community Organizations	• Community outreach • Educate leadership • Publish	• Clear Vegetation • Monitor Hazards			
Residents	• Educate Friends & Family			• Understand Evacuation Plans	

Source: Grand Jury Developed from multiple sources^[65]

Risk Plans

Key to any consideration of managing risk is a plan to mitigate the risk. This investigation was able to locate a number of independent plans associated with various jurisdictions within the County, but was unable to locate any plan that was centralized or integrated with any other. County plans are not integrated with city plans nor with fire district plans. Plans are not kept up to date. Plans seldom cross departmental boundaries. No evidence was found to show progress made on any of the plans.

By most accounts plans were not plans at all, because they did not propose specific actions with schedules to complete, but rather were composed of strategies. Plans examined included General Plans, Hazard Mitigation Plans, Emergency Operations Plans, and Inspection Plans, and a single jurisdiction's Vegetation Management plan for a single area.^[66] Of note, the only Evacuation Plan the Grand Jury could locate on the internet was on the City of Santa Cruz's website, where the plan was easy to locate.^[67] These plans are summarized below.

Table 3. Agency Emergency Response, Hazard Risk Mitigation Plans

Jurisdiction	Local Hazard Mitigation Plan (last update)	Emergency Operations/ Management Plan (last update)	Community Wildfire Protection Plan (last update)	Fire Inspection Plan status	Vegetation Management /Fuel Abatement Plan
Santa Cruz County	2015 ^[68]	2015 (Draft) ^[69]	2018 ^[70]	deficient ^[71]	deficient ^[72]
City of Santa Cruz	2018 ^[73]	2018 ^[74]	none	deficient ^[75]	unpublished
City of Scotts Valley	none	2015 ^[76]	none	district compliance asserted ^[77]	unknown
City of Watsonville	in development	none	none	deficient ^[78]	unknown
City of Capitola	2013 ^[79]	none	none	unknown	unknown
Fire Districts	NA	NA	none	Felton, Aptos, Central ^[80]	unknown

Sources: Embedded in Table

In Santa Cruz County, the primary plan in place for mitigating wildfire risk is the Hazard Mitigation Plan.^[81] Its purpose is to identify and characterize hazards, and to identify and prioritize the mitigation activities. The threats of wildfire change frequently due to increases in population and development. The updating of plans to mitigate damage from wildfire is surprisingly infrequent. The Hazard Mitigation Plan for Santa Cruz County has not been updated since September 2015.

On the mitigation side of the equation, there are frequent changes in methods, new technologies, changes in response capabilities, and improvements in knowledge and understanding of the problems. Lessons can be learned from many communities such as Butte County and Sonoma County. Technologies improve constantly in areas such as collaboration and communication between responsible agencies, imaging, and artificial intelligence. Building materials improve. Response staff levels change. Funding opportunities and sources change. Priorities change.

The Grand Jury asks, “Why does a county that has the largest population in the state living in high risk wildfire areas only update its hazard plan once every five years?” Our conclusion is that the timing is driven by the U.S. Federal Emergency Management Agency (FEMA) requirement to update plans at least every five years to qualify for mitigation planning grants. This requirement does not prohibit plans from being updated more frequently when necessary and appropriate. County residents, especially those living in high risk areas, would benefit if the County updated the wildfire section of its Hazard Mitigation Plan, or created lower level, detailed and actionable plans yearly to account for the constant changing conditions referenced above.

The Hazard Mitigation Plan is not being used in managing wildfire risk, and some witnesses interviewed by the Grand Jury were not even familiar with its contents.^[82] During the course of the investigation, it became clear this important plan is not being used as a management tool, nor is it being used to support active mitigation of one of the County’s greatest potential hazards to residents. The mitigation plans, which follow FEMA guidelines, have been structured to enable frequent and cost effective updating.^[83] The City of Capitola’s Hazard Mitigation Plan asserts that characteristic, but even so, the City has not updated the plan since 2013. Yet the plan itself states that it was designed to facilitate its update when new data is available. Data changes frequently.^[84]

Institution of a process that explicitly correlates department budgets and activity plans to the Hazard Mitigation Plan could reduce the County and City hazard risk level and could also encourage accountability and intra-departmental collaboration. Jurisdictions not having any Risk Mitigation Plans, such as Watsonville and Scotts Valley, should immediately correct this critical omission. See Table 3 above.

Hazard Mitigation Plans often lack adequate detail regarding identified risks and recommended mitigation activities. These activities are necessary to provide effective and specific guidelines for action. Further, the plans do not appear to have followed the FEMA guide for hazard mitigation planning.^[85]

For instance, the FEMA guide recommends consideration of location when quantifying impact and provides the example:

Community B has a high population density in the north and a very low population density in the south... Community D is located in a mountainous region with its population spread between the suburban areas in the foothills and the rural mountain communities, ...^[86]

This level of detail is not provided in the plans of the County and cities.

A primary source of ignition for recent large scale wildfires in the state has been power company owned electrical equipment.^[87] Pacific Gas and Electric Company, currently in bankruptcy court, a situation driven by liabilities from wildfire related lawsuits, has stepped up its efforts to locate its high risk equipment. One of the reasons the equipment is dangerous is its age, condition, and its proximity to vegetation, much of which is on private or government property. The Grand Jury was unable to identify evidence that County authorities are aware of where high risk equipment is located, and therefore are unable to conduct inspections, supervise or assist with vegetation removal, or even to notify residents of the location, nature, and level of the risk.

The County of Santa Cruz Local Hazard Mitigation Plan (2015-2020) follows Federal Emergency Management Agency (FEMA) guidelines for risk management.^[88] In the Plan, Wildfire Hazard Risk strategy B-4 states: "Maintain adequate Fire Suppression and Prevention staffing levels to meet the needs of the County residents and development trends."^[89] Nowhere in the plan does it specify what these needs are or the basis of assessing these needs. Nor does it specify who is responsible for developing a detailed plan for suppression and prevention regarding the type of vegetation, or thinning requirements. Furthermore, nowhere in the County's contract with CAL FIRE does it provide a basis of needs.^[90] Nowhere in County Fire's annual presentation to the County Board of Supervisors are the *needs* of the County or "basis" of proposed resource level specified, either for fire suppression or prevention.^[91] The Grand Jury thinks that if these needs are not specifically delineated, the risk of understaffing and inadequate planning can neither be measured nor addressed. It was concluded that the risk to County residents is extremely high, because leadership does not know what they need to be doing to address staffing and planning needs in order to be "adequately" safe.

In order to develop useful and current data required to estimate staffing needs, creation of an accurate database is necessary. Fuel abatement must be coordinated between jurisdictions and/or departments. Surveys of needs are necessary. Abatement status needs to be understood. Building inspection plans need to be complete.^[92] Abatement on County property is predominantly performed by State prisoners under the supervision of CAL FIRE and as such, is not always an available labor resource. A robust assessment and analysis of the work needed should be completed promptly. This work should be based on the current status and include informed projections for the future.

Accurate staff levels required for fuel abatement could thereby be determined. The difference between current staffing and actual required staff levels needs to be determined and communicated to the County Board of Supervisors and the public so everyone understands the level of risk, and what it will take to reduce those levels of risk. Update plans to address what can be addressed. Come to understand what risks cannot be mitigated so that residents can adjust their plans and behavior in appropriate ways. With respect to fire prevention, it is just as important to know what is not getting done, as it is to know what is getting done.

The Community Wildfire Protection Plan

In 2008, shortly after the Summit Fire, which burned 4,000 acres, CAL FIRE, in association with the Santa Cruz County and San Mateo Resource Conservation District, met with community and agency stakeholders in San Mateo and Santa Cruz Counties regarding their wildfire concerns.^[93] Through this process, the community-identified hazards, assets at risk, and information on high priority areas in need of fuel reduction were solicited. Projects were defined and prioritized to address the needs. These were all documented in the Santa Cruz County - San Mateo Community Wildfire Protection Plan (CWPP).^[94] The plan is referred to as “a living document that will adapt to a changing landscape with changing priorities.”^[95] It also states, “A plan becomes outdated the moment it is published, unless there is an established updating process.”^[96] Ten years after conception, eight years after publication, and six months after four of the most destructive fires in California history, the CWPP was finally updated in 2018.^[97]

This regional CWPP provides a strategic view of the risk areas, and identifies the organizations that have submitted proposals in alignment with project goals. The CWPP notes that since there are “numerous jurisdictions in the county, with differing interests,” it is to be used as a “flexible planning tool.”^[98] It also states, “A CWPP must be developed collaboratively, must prioritize fuel reduction areas, and must provide recommendations to reduce the ignitability of structures.... It allows the community to conduct wildfire prevention planning across the landscape by recommending projects that benefit the community as a whole.”^[99] And most importantly the **“CWPP should be utilized as the foundation for additional, detailed, site-specific CWPPs to be prepared for communities throughout the region.”**^[100]

The Grand Jury believes that the CWPP is strategic and directionally sound. However, to be truly effective, a closed loop level of accountability is required where priorities for improvement actions are delineated, project status is assessed, new projects proposed and detailed community-specific plans are developed.

Santa Cruz County would greatly benefit if steps were taken to implement the CAL FIRE, San Mateo - Santa Cruz Unit 2018 recommendation of developing detailed, site specific Community Wildfire Protection Plans for communities throughout the County.

There is a CAL FIRE 2019 Strategic Plan which includes more project detail than the CWPP.^[101] The project list shows many projects which are incomplete, and the data and images used are as much as 10 years old.

The Grand Jury is also concerned with the accuracy of the level of risk reported to County residents. As an example, the updated 2018 plan states that 20,858 Santa Cruz County homes are located in the WUI. This is in significant contrast to the 71,855 Santa Cruz County homes, that according to the United States Department of Forestry, are located within the designated WUI.^[102]

Vegetation Management

Vegetation management is a key element in reducing the risk of fire, and enabling access in an emergency. The Grand Jury heard testimony that other than during construction phases, only residences and power lines have regulations requiring ongoing maintenance for vegetation management. There is no rule or program that mandates that all roads, even critical evacuation routes, must be kept cleared to meet defensible space requirements. Public roads have to be maintained for sight line clearing, but not fire prevention. Therefore, existing policies addressing vegetation management should be updated to ensure clearance for evacuation and access for emergency vehicles.^[103]

County Wildfire Hazard Risk B-4 identifies the need to “reduce fire risk in the Wildland Urban Interface (WUI) by advocating the use of improved building materials and appropriate code enforcement, including defensible space and fuel reduction programs.” The Local Hazard Mitigation Plan (LHMP)^[104] does not quantify an actual risk due to fuel. It does not specify what needs to be reduced or how to reduce it, nor does it reference other plans that could contain this needed information.

The Grand Jury finds that the County’s LHMP lacks sufficient detail to quantify or prioritize the risks, or the means to measure progress at mitigating the risks, or effectiveness of the steps performed in mitigating the risks.

The City of Santa Cruz has identified similar risk in its LHMP,^[105] and has made significant progress in its work to acquire a grant to address vegetation at DeLaveaga Park and Pogonip. Of additional concern is the fuel abatement within the domain of fire districts. The majority of fire districts have significant WUI zones. The WUI zones within these districts are frequently outside of the City of Santa Cruz’ (or other cities’) responsibility area. They are also outside of the responsibility of County Fire. Local Hazard Mitigation Plans are not in place nor are there specific plans to address vegetation/fuel. Scotts Valley Fire District, for instance, addresses what it calls “weed abatement,”^[106] and simply provides recommendations to residents on how to manage their weeds.

Home Hardening

Home Hardening is a key factor in mitigating damage in the Wildfire Urban Interface. “Extreme wildfire conditions are inevitable.”^[107] There is extensive and convincing evidence of the effectiveness of hardening houses. Recognizing the importance of improving a home’s resistance to fire, in 2019 the California Legislature enacted California Government Code Section 8654.2 (see [Appendix B](#)). This statute provides financial assistance for home retrofitting to communities and populations particularly vulnerable to the threat of wildfire.

Ways to mitigate fire danger to structures include installation of modern vent screens that conform to the County’s WUI codes, properly designing and managing landscapes, performance of annual fire code inspections, and increased surveillance. Hardening a

home or other structure against wildfire also includes employing fire resistant materials and construction methods for protection against flying burning embers generated by a wind driven wildfire. Effectively hardening a single home is where it begins, and experience has shown that hardening communities is more effective than firebreaks, such as freeways, which can be breached by wind driven fires. Coffey Park in Santa Rosa was swept by fire primarily driven by gale force winds that jumped across Highway 101, a multi-lane freeway.^[108]

Firewise USA® (Firewise) is a voluntary program that provides a framework to help neighbors get organized, find direction, and take action to increase the ignition resistance of their homes and community, and will be discussed later in this report.^[109] Firewise provides many recommendations on making houses safer such as installing fine screening of vents to prevent wind-blown embers from entering the structure, as mentioned above. application of fire retardant coating to wood surfaces, general maintenance such as cleaning rain gutters, and use of fire resistant plants for landscaping. The Witch firestorm in San Diego County in 2007 left five fire-hardened developments unburned while surrounding houses burned. Effective treatment of the houses and surrounding yards and landscaping minimized their vulnerability to the wildfire when it came.^[110]

Early Warning Systems: ALERTWildfire

The explosion of fire detection technology in recent years has resulted in new early warning capabilities. One of those systems is the ALERTWildfire Surveillance System. The system, developed by a small consortium of West Coast universities using relatively low cost ultra high definition imaging cameras, was tested successfully in Lake Tahoe from 2014-2016 and has been embraced by most of California's power companies, including PG&E since.^[111] The cameras, characterized as "near infrared" and sensitive to the radiation emitted by fire, provide constant real-time fire surveillance of areas in their field of view. Video is distributed over a microwave network and streamed real time on the ALERTwildfire.org website, and made available to the world.^{[112] [113] [114]}

The ALERTWildfire website asserts the system can: (1) discover/locate/confirm fire ignition, (2) quickly scale fire resources up or down appropriately, (3) monitor fire behavior through containment, (4) during firestorms, help evacuations through enhanced situational awareness, and (5) ensure contained fires are monitored appropriately until thoroughly extinguished.^[115]

As the system matures, the capability to automate wildfire identification will improve. The ALERTWildfire is working on integrating artificial intelligence algorithms into the notification system to filter out fire and smoke detection not associated with a wildfire. Figure 5 shows images captured from a Ventura County camera that reduced the impact and magnitude of the Maria Fire of Ventura County fire in October 2019.^[116] Until automation becomes practical, monitoring of video by an actual person is still required. Some communities, keenly concerned with their safety, have organized themselves to keep a careful watch on the video.

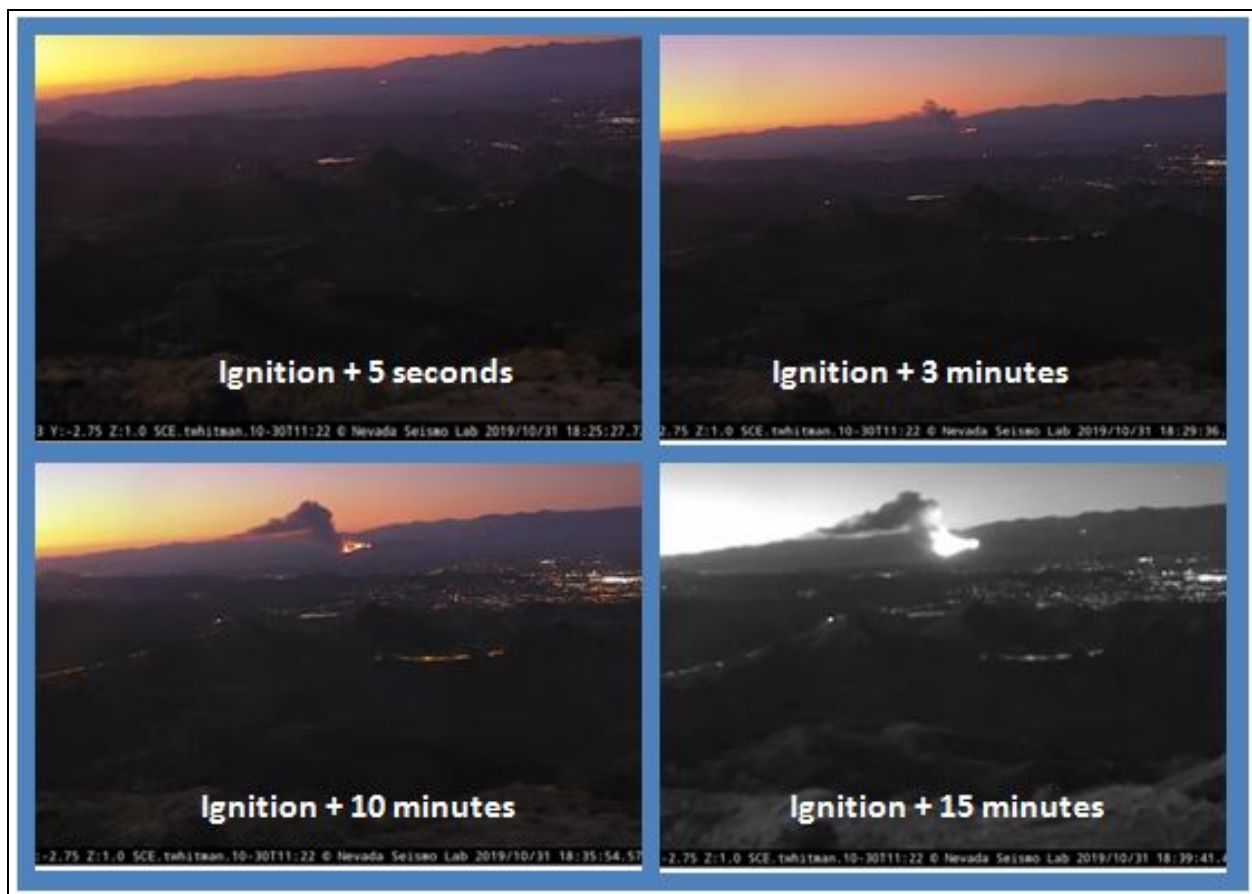


Figure 5. Image Captures of ALERTWildfire Video Surveillance Maria Fire of Ventura County Oct 31, 2019^[117]

Any organization, not just electric power companies, can participate, becoming sponsors and installing observational video systems. A camera installation costs \$20,000 and includes site survey, installation, and configuration.^[118]

This relatively low cost technology offers new opportunities for constant, real time surveillance. Santa Cruz County, with the highest number of residents living in a WUI in the state, has limited coverage from a single camera at Bonny Doon. This camera points towards San Mateo and is not configured to rotate for an expanded view of Santa Cruz County, although has that capability.^[119] San Mateo County to the north has complete coverage, as does Santa Clara County to the north.^[120] The WUIs in Monterey County and San Benito County to the southeast have nearly complete coverage. By contrast, Santa Cruz County, as stated above, has virtually no coverage. According to ALERTWildfire, as of this report, camera coverage for Santa Cruz County is not in any near term plan.^[121]

All ALERTWildfire cameras have rotational capabilities. The camera in Santa Clara County on Mt. Chaul at an elevation of 3500+ feet, shown in Figure 6 (right) below, has a potentially extensive view into Santa Cruz County, but has not been configured to cover all potential directions. Cameras in Monterey County that once rotated toward

Santa Cruz County, but were too low and too distant to be practical, are now stationary and only monitor Monterey and San Benito counties.^[122]

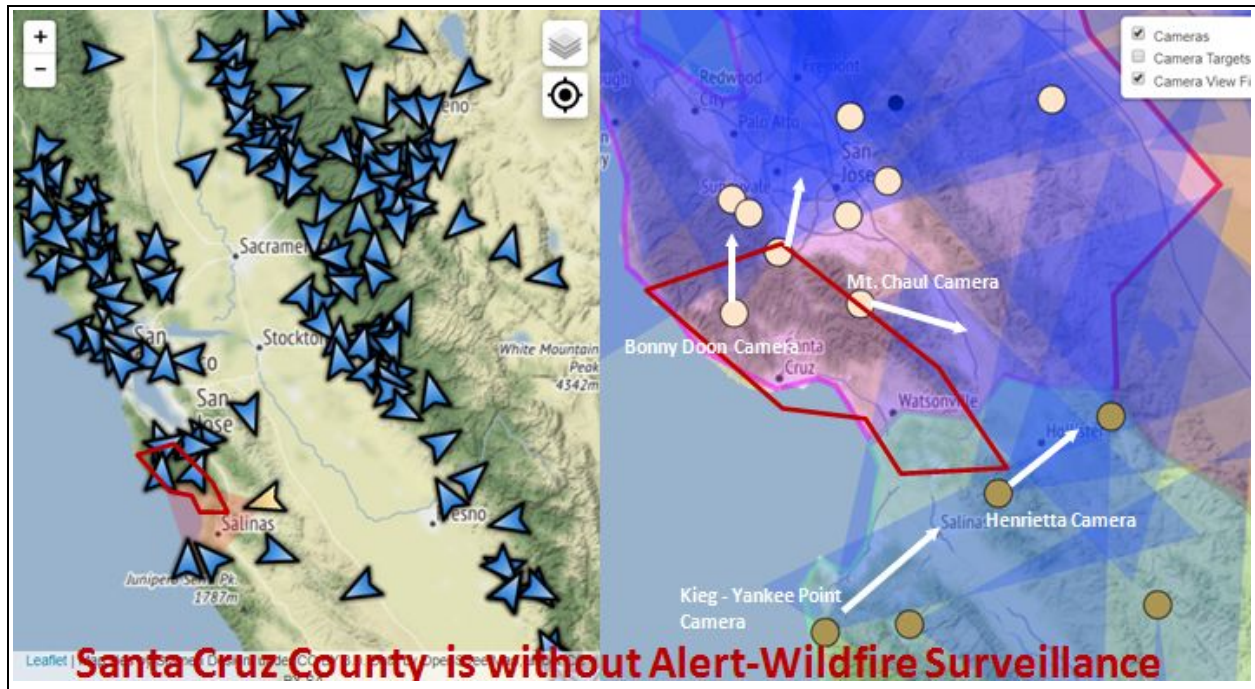


Figure 6. ALERTWildfire Coverage Oct 2019 - April 2020^[123]

Figure 6 (left) shows the locations of cameras and the directions they point. The camera at Mt. Chaul, as shown in Figure 6 (right) and Figure 7, clearly has a direct line of sight into a large vegetated area of Santa Cruz County. If PG&E is not interested in configuring the camera to rotate toward Santa Cruz County, the County should immediately evaluate a procurement of a camera that monitors the County from this location.



Figure 7. Mt. Chaul - ALERTWildfire Camera Location and real time Image^[124]

The camera at the summit in Bonny Doon, shown in Figure 8, has not been configured to rotate and survey Santa Cruz County to the south, east, or west. It only covers a small portion of Santa Cruz County to the north plus a large part of San Mateo and Santa Clara Counties. Like the camera at Mt. Chaul, it could be rotated to assist in monitoring an already identified fire, but is not so configured. As you can see from the image in Figure 7, when it was rotated to potentially observe the wildfire that occurred the morning of June 10, 2020 in Henry Cowell State Park, a large portion of the view was obscured by trees. Nonetheless Santa Cruz County residents would benefit if the camera was configured to rotate to those areas that are not obscured.

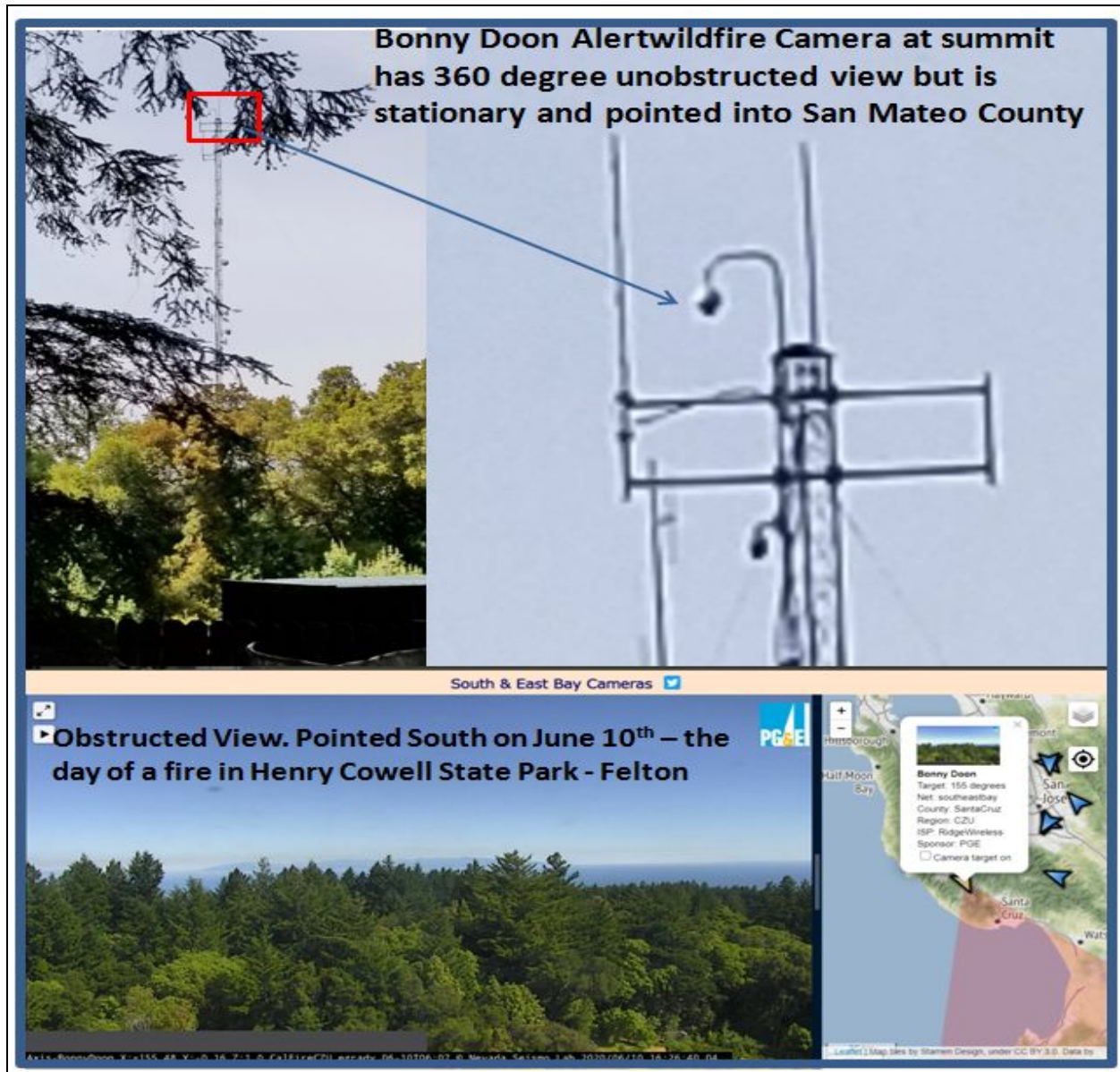


Figure 8. Bonny Doon ALERTWildfire Camera^[125]

A Special Risk: The Eucalyptus Groves of Santa Cruz

One of the fire risks in the City of Santa Cruz shared with the Oakland Hills is the presence of Blue Gum Eucalyptus groves. The bark that sheds from these trees contains highly flammable oils, and in the presence of ignition sources such as warming fires the bark becomes a threat worthy of special attention. Warming fires are tolerated within the City as long as they conform to regulated size, and are not within twenty five feet of flammable material.^[126] The Grand Jury learned through our investigation that the policy of law enforcement is not to ticket violators. With this risk in mind, the Grand Jury wanted to better understand the size and location of these groves and their proximity to fire stations and learn what the City is doing to manage the risk.

Figure 10 (next page) identifies the sizable groves, their location relative to fire stations, an example of proximity to multi-family residences, and a line of sight perspective from the County's emergency communications platform located in the midst of one of the more substantial eucalyptus groves in DeLaveaga Park. At least one and sometimes two fire stations are within 1 mile of these groves. Figure 10 also provides a conceptual surveillance perspective, should the County or City consider the installation of an ALERTWildfire Camera on the County's existing communications platform located inside DeLaveaga Park. Figure 9 below provides an example of the surveillance image of the Santa Clara Valley using a camera with a good perspective view.

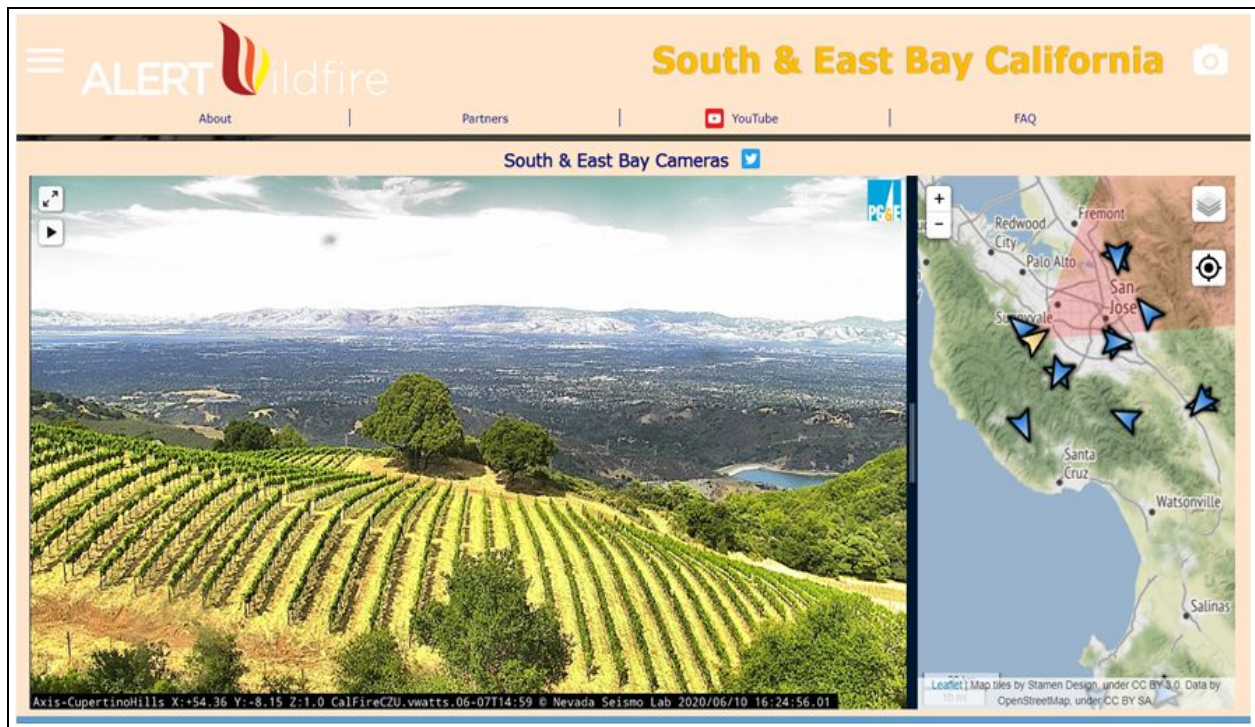


Figure 9. ALERTWildfire Surveillance Image of Santa Clara Valley - June 10, 2020^[127]



Figure 10. **Conceptual City of Santa Cruz High Risk Fire Zone Surveillance**^[128]

In 2018 the City of Santa Cruz applied for a grant to help fund fuel abatement in DeLaveaga Park. It received that grant, and with the help of CAL FIRE, performed significant fuel abatement.^[129] According to the Santa Cruz City Parks and Recreation Department and administration at the City Fire Department, recent abatement activities have also taken place in other groves, such as those located in Arroyo Seco (pictured above) and Pogonip. In addition, native trees have also been planted as noted by the sign at the 911 center (located between the 17th green and the 18th tee of the DeLaveaga Golf Course)referencing the Urban Tree Inventory and Planting Project funded by the California Department of Forestry and Fire Protection.^[130] The Grand Jury saw evidence of that work at DeLaveaga Park.

Emergency Response

Emergency response includes any systematic response to an unexpected or dangerous occurrence. The goal of an emergency response procedure is to mitigate the impact of the event on people and the environment. ^[131]

Emergency Response Calls

We tend to think of fire departments as primarily responding to fires. However, fire departments are called upon for a variety of reasons, including fire, medical, traffic, and hazard emergencies, not to mention false alarms. In the past 40 years, the composition of emergency responses has changed significantly. Figure 11 below depicts these changes nationwide. ^[132]

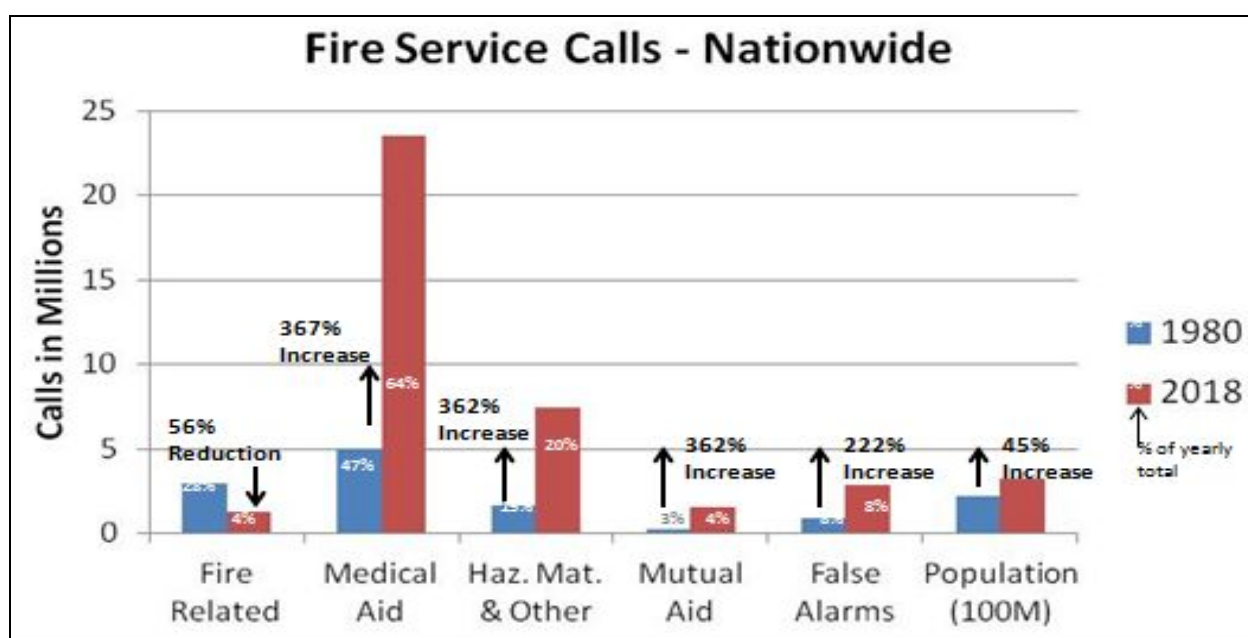


Figure 11. **The Change in Emergency Response for the Nation's Fire Depts** ^[133]

As shown in Figure 11, between 1980 and 2018, fire related calls have been reduced 56% even as the population increased over 45%. Improved technology, building materials, and building codes clearly have had a favorable impact. This same period also saw explosive growth in wireless communication, which may have contributed to the 367% increase in medical aid calls. As a result, fire related and medical related calls that were once relatively similar at 28% and 47% of all calls respectively, diverged enormously and are now 4% and 64%. In other words, medical calls that once outnumbered fire calls close to 2 to 1 now outnumber fire calls 16 to 1, nationwide. Medical incidents are now by far the number one type of emergency service requested from today's fire departments.

Similar changes have occurred during this same period in Santa Cruz County. Figure 12 shows call types for County Fire serving the 24,000 residents of CSAs 48 and 4, a city

fire department (Santa Cruz, serving approximately 70,000 city residents and UCSC students), and a fire protection district (Central, serving 56,000 residents that includes Live Oak, Capitola, and Soquel). The distribution of call types can be seen in Figure 12.

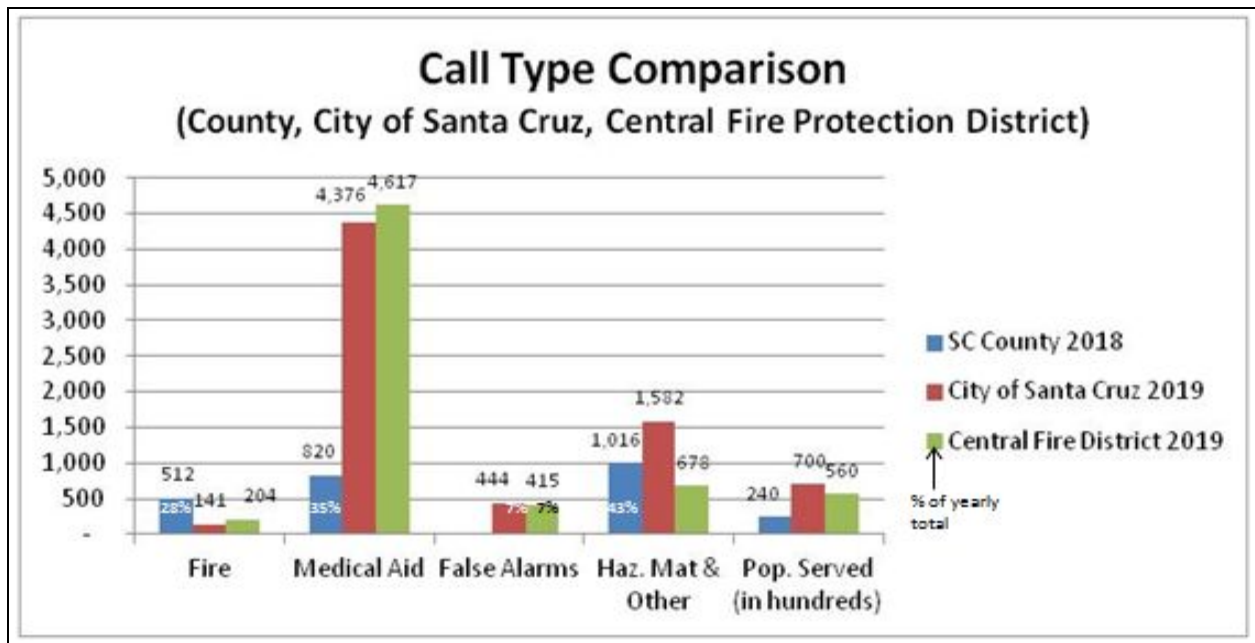


Figure 12. **Emergency Service Call Types - Santa Cruz County** ^[134] ^[135] ^[136]

The data in Figure 12 shows the relative ratio of fire calls to medical calls is very different between the rural responsibility area of County Fire (8 to 5) compared to the more urban areas of the City of Santa Cruz (31 to 1) and Central Fire (23 to 1). Also worth noting is that the false alarm calls of Santa Cruz and Central (7%) are very much in alignment with the false alarms nationwide (8%).

Emergency Medical Response Service

Given the high need for medical emergency response, it is clear fire departments must be concerned with possessing the required skills and capacity to meet the various emergency response requirements, especially that of medical in more urban communities.

That is the case with fire protection in the County. The fire departments and districts in the County provide either Advanced Life Support (ALS) or Basic Life Support (BLS). ^[137] ^[138]

The ALS vehicle has a paramedic on board, along with an Emergency Medical Technician (EMT). The vehicle is equipped with airway support equipment, cardiac life support, cardiac monitors as well as a glucose-testing device. The ALS vehicle also carries medications onboard. The patients in an ALS vehicle can receive a higher level of medical monitoring which may include a continuous IV drip, chronic ventilator, or cardiac monitoring. ^[139] ^[140]

The paramedics and EMTs who staff the ALS vehicle have a higher level of training than those who operate the BLS vehicles. Due to their advanced training, ALS personnel are allowed to start IVs, administer medications, and give injections to help stabilize the patient on the way to a nearby trauma center.^[141] ^[142]

Emergency Medical Technicians staff BLS vehicles which are designed for patients who have lower extremity fractures, patients transferred to sub-acute care facilities or who are discharged to home care, psychiatric patients, and other non-emergency medical transportation. EMTs that staff BLS vehicles are not allowed to perform any procedures that break the skin of patients, which includes giving injections, administering medications, starting an IV, or any necessary medical process, including cardiac monitoring.^[143] ^[144]

County Fire only provides BLS emergency medical services to the 24,000 residents of CSAs 4 and 48.^[145] ^[146] The other quarter million residents of the County, served by the fire districts or city fire departments, receive ALS emergency services. These agencies are able to provide ALS by ensuring that enough of their firefighters are trained as paramedics and have apparatus properly equipped for ALS services.

According to CAL FIRE, it is estimated that providing year round ALS support to the 24,000 residents currently receiving BLS support, would cost roughly \$10 to \$11 million per year, excluding operational costs.^[147] Given this amount is roughly equal to the size of the entire current County Fire budget,^[148] the County would have to double its fire budget in order for residents in CAL FIRE's jurisdiction to obtain the same level of emergency response services as residents in urban areas in the County. As a point of comparison, the Scotts Valley Fire District, with \$6.5 million^[149] in total expenditures during its 2016-2017 fiscal year, and with its 19 licensed and accredited paramedics, provided ALS medical service to its 20,000 residents residing within its 24 square miles of responsibility.^[150]

Two in and Two Out

The Grand Jury identified issues with regard to staffing capacity. The federal mandate regarding fire response is "two in, two out," meaning there must be two firefighters on the outside of a structure in case the two going into the structure are in need of rescuing.^[151] This requirement is met in CSAs 48 and 4 during the fire season by CAL FIRE and their stations. This requirement is not being met by Santa Cruz County Fire during the non-fire season.^[152]

In December 2019, the County presented Proposition 218 to the voters in CSA 48, recommending an increase in taxes to pay for additional firefighters.^[153] The proposition was passed by the voters in January 2020,^[154] and should result in reduced delay times for firefighters entering a structure. When these extra personnel are hired, the fire response best practices standard "two in, two out" should be satisfied. However, medical training at a BLS level may still be insufficient to save lives, especially in areas where transportation time is long.

Local Response Time Performance

Probably the most critical standard to measure effectiveness of fire emergency response is **response time**:

*Response time is an important aspect of emergency response. This refers to how long it takes emergency responders to arrive at the scene of an emergency after the emergency response system has been activated. A long response time can result in increased and permanent damage, a higher likelihood of fatalities, and greater distress to those involved. **As such, response time is often used as a proxy for the effectiveness of an emergency response program.***(emphasis added)^[155]

Response time goals are set by local authorities. The starting baseline is based upon the National Fire Protection Agency (NFPA) standards discussed later. Through studies or planning efforts the authority may adjust these actual goals based upon the specific needs and capabilities of the particular fire jurisdiction.

National best practices dictates the response time target should be six minutes 90% of the time for all emergency calls. “Brain death can occur in six minutes or less in cardiac arrest incidents, and a house fire can create untenable conditions in a home within the same timeframe.”^[156] Therefore, it is critically important to measure and minimize response times.

Response times are where the rubber meets the road. However, this critical data is very hard to find. Few fire agencies in the County publish response data either in current form or past where trends in performance can be reviewed. Nor do they publish their target response time.

The review and analysis of available response data resulted in more questions than answers. The Grand Jury found a large disparity in response times between County Fire and the more urban districts. There were differences between agencies and within agencies themselves based on year or location, with no explanation as to why. This prompted the question: what should the response time be? What are the standards? What are other counties performing to?

As an example, the response time for fire related calls for County Fire in 2017 and 2018 was a little over 37 minutes and 35 minutes respectively yet in 2015, 2016, and 2019 it was between 25 and 26 minutes.^[157] A ten minute difference in response to a fire can be significant. Average medical response time for County Fire is between 13 and 14 minutes which is 10 to 20 minutes faster than a fire response.^[158] Fire Districts’ average response times for structure fires in 2017 were between a low of five minutes for Branciforte to a high of nearly 13 minutes for Zayante.^[159] In the sections that follow, this report will address in detail what the Grand Jury learned with respect to standards and their relevance to local response time performance.

Figure 13 below from the 2017 Santa Cruz Regional 9-1-1 Annual Report^[160] depicts the average total response times for structure fire for the agencies they serve. For urban/suburban fire agencies (Aptos/La Selva, Central, Santa Cruz, Scotts Valley, and

Watsonville) only Aptos/La Selva and Scotts Valley are slightly outside of compliance. For rural agencies (Boulder Creek, Ben Lomond, Felton, Zayante, and Branciforte), only Zayante response times are outside of compliance. This data is not reported in the 2018 or 2019 9-1-1 annual reports. ^[161] ^[162]

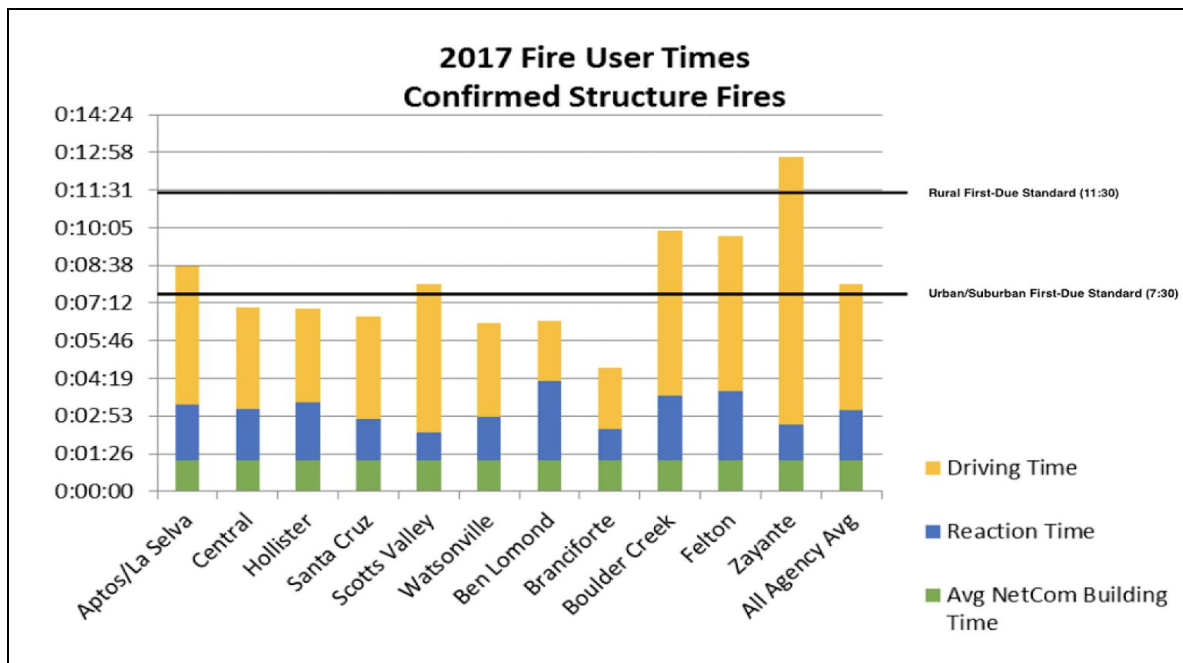


Figure 13. Fire Agency Response Times For Structure Fires ^[163]

With regard to Figure 13:

- The First-Due Total Response Time Standards for Urban/Suburban and Rural Localities were overlaid on top of the 9-1-1 Annual Report Figure. ^[164]
- The Grand Jury is unclear whether the reported times are “first-due” or an average for every responding unit. *First-Due Total Response Time* is the time it takes for the first units to arrive at a scene of an emergency.

“First-due” is a critically important performance indicator as first-due units can mitigate the extent of loss of life and property. In this case, even if the times in Figure 13 are the less stringent average of all responding units, as discussed in further detail below, it is clear the districts are better or close to compliance to the first-due standards recommended by Citygate. Citygate is a large company that specializes in providing Fire and Emergency Medical Service consulting, analysis, and studies to fire agencies across the Western United States. ^[165]

The Grand Jury received a report for all fire incident types in CSA 48 for 2015-2019, with total response times listed for each resource that was dispatched for the incident. To support comparison with the data above, the Grand Jury restricted incident types to exclude wildland fires, and events not associated with structural fires. Finally, only the fastest response time for each incident, assuming it aligned to “first-due” response was

used. For 2017, the average first-due, total response time in CSA 48 was 16:33.^[166] This exceeds the National Fire Protection Agency (NFPA) 1720 standard of 14:00 for rural areas.^[167]

Additional information from a “frequently asked questions” on CSA 48, written to support Proposition 218, stated the following, “The average 9-1-1 response time for Santa Cruz County Fire - CSA 48 area is approximately 10 minutes.”^[168] This response time does not align with the 2017 data reported above or the more current 2019 Computer Aided Dispatch (CAD) data discussed below.

In 2017, two efforts to set response times for Aptos/La Selva and Central Fire Districts produced the same goals for their responding units: “*first-due units should arrive within 7:30 minutes from 9-1-1 notification, and ERF resources should arrive within 11:30 minutes of 9-1-1 notification, all at 90 percent or better reliability.*”^[169] ^[170] Figure 14 reflects the latest first-due response times for the Aptos/LaSelva Fire District using the most recent data the Grand Jury could locate (2016). It shows that 2016 first-due response performance was slower than this goal by nearly three minutes (35%).

Incident Location	2016
District-Wide	10:27
Station 1	9:54
Station 2	10:27
Station 3	11:59

Source: Aptos/La Selva FPD incident records; SCR911 CAD records

Figure 14. **Aptos/LaSelva Fire District First-Due Response Times – 2016**^[171]

Based upon this performance, Citygate provided the following assessment for improvement:^[172]

Numerous factors influence the District’s first-due response performance, including large fire station first-due response areas, longer-than-expected dispatch center call processing and crew turnout time performance, and slower travel times due to the District’s topography, road network, and daily traffic congestion.

Citygate recommends the following to improve first-due response performance:

- *Collaborate with Santa Cruz Regional 9-1-1 to improve call processing performance more in alignment with industry-recognized best practice standards while maintaining dispatch accuracy.*

- *Work to improve 90th percentile turnout time performance to meet a recommended target of 2:00 minutes or less.*
- *As long-term funding permits, consider dynamic deployment of one or more “fast response” units during peak traffic congestion and/or peak service demand periods. This option should not be considered until long-term fiscal planning identifies ongoing stable revenues sufficient to support this cost in addition to the other fiscal recommendations identified above.*
- *As capital funding permits, consider relocation of Fire Station 3 closer to Highway 1 in the vicinity of San Andreas Road and Seascape Boulevard.*

Fast response units referenced above are defined as: smaller (1- to 1/2-ton or less) apparatus with Emergency Medical Services (EMS) and minimal firefighting service capabilities.^[173]

The Grand Jury did not attempt to verify progress with regard to Citygate’s recommendations.

For the Central Fire Protection District, the call to first arrival response performance **over the preceding three years** (2014-2016) is significantly slower than the Citygate 7:30 minute goal by 33% (2:31 minutes).^[174]

Zone	Response Time
District-Wide	10:01
Station 1	9:43
Station 2	9:58
Station 3	11:47
Station 4	9:40

Figure 15. **Central Fire Protection District First-Due Response Times – 2016**^[175]

In review of this data, Citygate provided the following recommendations^[176] to improve first-due response performance:

- *Collaborate with Santa Cruz Regional 9-1-1 to improve call processing performance to achieve better alignment with industry-recognized best practice standards while maintaining dispatch accuracy.*
- *Work to improve 90th percentile turnout time performance to meet a recommended goal of 2:00 minutes or less.*

- *As capital planning and funding permit, consider relocating Fire Stations 3 and 4 to sites outside of a designated flood zone that, to the extent possible, enhance first-due travel time coverage for their higher population and building density response areas.*

The Grand Jury finds that the most important measure of fire service effectiveness, first-due total response time, is not clearly and consistently documented for public review. According to NFPA standards, this should be documented annually through a standard reporting method. Although average response times are often available in annual reports, it is not clear how they are being calculated and against what standard of performance they are being assessed.

The response time data from Central Fire District is shown in Figure 16 below. There are two important questions that would help with critical examination of this data: 1) How do the results compare against specified targets or best performance standards; 2) Why is Soquel consistently slower than the other stations, and what is the relevance of these differences?. The source report provided no such explanation.

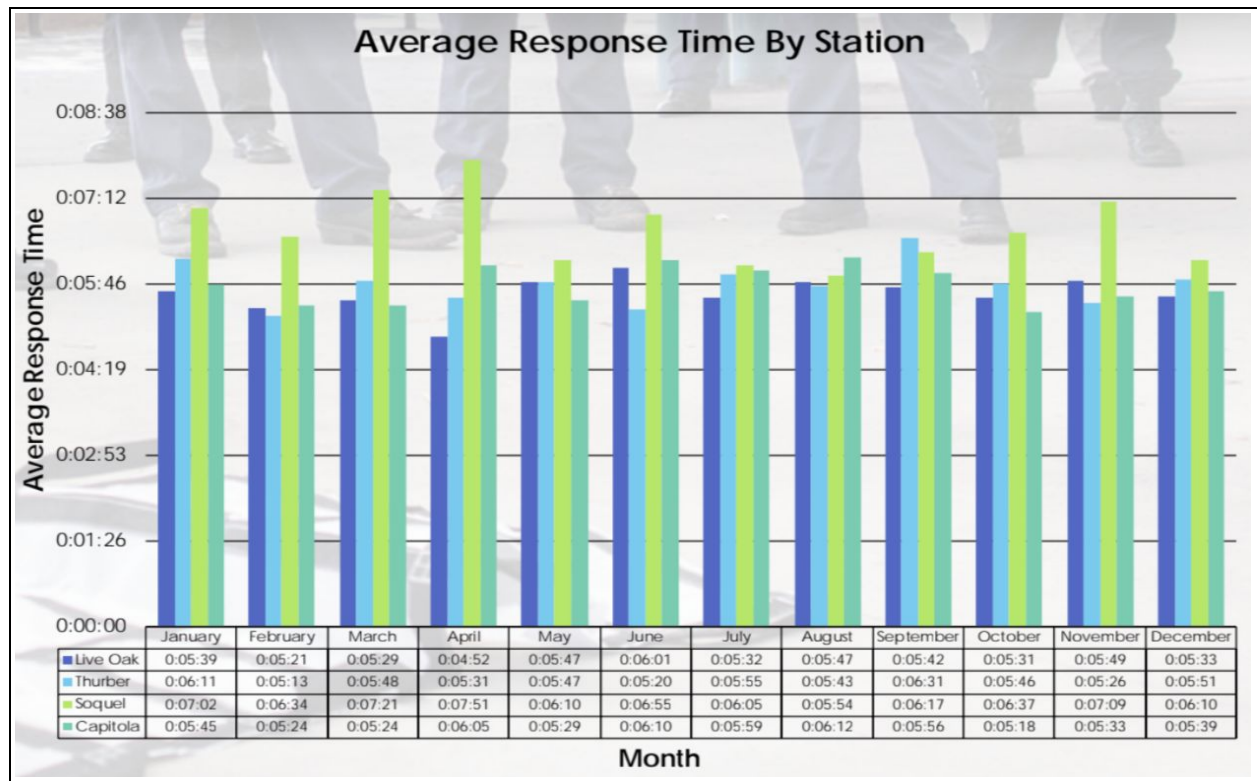


Figure 16. **Central Fire District Response Times, 2019**^[177]

To further illuminate the differences between rural and urban response times, the Grand Jury requested and received response time data from CAL FIRE, a distinctly more rural service area than that serviced by Central Fire. Table 4 provides CAL FIRE's response times in County rural areas for fire emergencies. Explanations of response time causal factors were not provided to the Grand Jury, nor could explanations be found in the public domain. As can be seen by comparing data in Figure 16 with Table 4, the

response times in the more urban areas, such as those covered by the more urban Central Fire, are within the target response time of less than 6 minutes 90% of the time, while rural areas are a challenge for the delivery of consistent response times.

Table 4. County Fire Average Response Times to Fire calls

Year	Number of Incidents	Average Response Time	Percent of Response Times under 5 Minutes	Percent of Response Times under 10 Minutes
2019	310	00:25:18	23.83%	41.45%
2018	332	00:35:39	23.94%	38.83%
2017	318	00:37:34	22.07%	38.50%
2016	321	00:26:03	20.57%	42.58%
2015	296	00:25:06	20.69%	43.35%

Source: Santa Cruz CAL FIRE^[178]

Countywide EMS Service is provided through a combination of fire agency first responders (with ALS Capability) and through a contract administered by the Santa Cruz County Health Services Agency with American Medical Response, West (AMRW).^[179]

To ensure contract response performance compliance, AMRW has partnered with the Emergency Medical Services Integration Authority (EMSIA), a Joint Powers Authority consisting of 11 Santa Cruz County fire agencies providing ALS first-responder services pursuant to a Prehospital Emergency Medical Services Agreement with AMRW. Under this agreement, the fire agencies provide certain ALS services within their respective service areas, thus enabling AMRW to provide emergency medical and transport services under the County contract with modified (longer) response time requirements, as shown in the table below.

Population Density¹	ALS First Responder	ALS Ambulance
Urban	8:00 minutes or less @ 90%	12:00 minutes or less @ 90%
Suburban	12:00 minutes or less @ 90%	18:00 minutes or less @ 90%
Rural	20:00 minutes or less @ 90%	30:00 minutes or less @ 90%

¹ Urban density: 101–500 per square mile; suburban density: 51–100 per square mile; rural density: 5–50 per square mile
Source: Santa Cruz County Emergency Ambulance Agreement

Figure 17. Santa Cruz Countywide EMS Response Standards^[180]

In reviewing available data and documentation for Santa Cruz County Fire (CSA 48), actual performance measures shown in Table 5 were uncovered for average total response time for EMS incidents. For instance, as shown in Table 5 below, CAD reports

reflect that over 629 EMS incidents in 2019 where CAL FIRE responded had an average response time of 13:44. This is significantly under the 20:00 standard for rural locations, but above the 12:00 for suburban locations shown above. The Grand Jury was not able to determine how to differentiate suburban incidents from rural incidents in the data provided.

Table 5. County Fire Average Response Time to Medical Calls

Year	Number of Incidents	Average Response Time	Percent of Response Times under 5 Minutes	Percent of Response Times under 10 Minutes
2019	629	00:13:44	21.25%	49.72%
2018	677	00:13:50	18.43%	49.55%
2017	689	00:14:06	21.40%	50.51%
2016	699	00:13:47	25.33%	50.83%
2015	657	00:13:38	27.67%	56.22%

Source: Santa Cruz County Fire^[181]

Response Time Best Practices

It is clear that the risks and associated level of service requirements for fire departments may vary over time and will definitely vary across jurisdictions. This raises the question of whether there are well-defined levels of service targets for emergency response for each of our fire agencies. In addition, if there are, are they being monitored for compliance? The Grand Jury was unable to locate any targets published by County fire agencies to help us make this assessment. We searched to find an authoritative framework of best practices, consensus or mandated standards of performance, and assessment processes and roles. The search led to the following:

- Codes and Standards: National Fire Protection Association (NFPA)^[182]
- Best Practices, Assessment Processes & Roles: Center for Public Safety Excellence (CPSE)^[183] and the Commission on Fire Accreditation International (CFAI)^[184]

NFPA standards represent the consensus of international fire officials for performance of fire agencies with regard to equipment, deployment tasks and staffing, and response times for various types of risk. These are not mandatory, but are used by the Authority Having Jurisdiction (AHJ) to establish performance statements for a fire agency. The AHJ is “an organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.”^[185] In fact, the Grand Jury discovered the following: there are no mandatory federal or state regulations directing the level of fire service staffing, response times, or outcomes. Thus, the level of fire protection services provided are a local policy decision:^[186]

The CPSE and CFAI provide a standard process to assess and potentially accredit fire agencies. The Grand Jury is not concerned with the issue of accreditation in this report, and therefore focused on the part of the process that produces **performance statements** for fire agency services, Assessment and Planning. These performance statements are important to inform the public and assure accountability to the respective governing boards.

Performance Statements are described by the CPSE below:^[187]

Performance statements are used to illustrate what your department is delivering with its existing resources. The performance statement brings together elements found in the Community Risk Assessment and their analysis, to tell your residents and policy-makers the type, depth and scope of services they receive. By showing the current performance (baseline) versus the target (benchmark) times, the reader can understand the difference or “GAP” between the two measures.

The establishment of the baseline and benchmark measures is a combination of the technical knowledge of the department staff and the political judgement of the AHJ. It is important that these measures, once established, be communicated in a transparent manner to the residents protected by the fire department. ... This analysis requires the department to set aside its current practices and carefully examine what is needed based on the identified level of risk associated with a particular incident or structure type.

The performance statement can be a powerful tool to easily communicate current performance to its external stakeholders. It also tracks a department’s efforts to narrow the GAP between what it is doing today vs the adopted performance target.

These performance statements are part of a specification referred to as Standard of Response Coverage (SORC), a.k.a. Standard of Coverage (SOC) that should be published in fire agency master plans and annual reports. A SORC or SOC is about **matching resources to risk** and is described by the NFPA as:^[188]

Following a community hazard/risk assessment, fire service leaders prepare a plan for timely and sufficient coverage of all hazards and the adverse risk events that occur. This plan is often referred to as a Standard of Response Coverage... those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization.

Establishing A Performance Baseline

[Appendix C](#) contains a sample of a baseline performance statement and its matching target performance statement for an imaginary fire agency. Each statement contains a

performance standard for initial response (a.k.a. first-due) capabilities and Emergency Response Force (ERF or First- Alarm) capabilities.

The Grand Jury believes it is critically important that performance statements are established, regularly measured and reviewed, and easily available to the general public. NFPA standards specify service performance be evaluated annually. Evaluation requirements can be found in [Appendix D](#).

Given the importance of this national standard, the Grand Jury searched for annual reports and master plans for available performance statements for each fire jurisdiction in Santa Cruz County, and found:

- County of Santa Cruz/CAL FIRE (Combined, Rural) - No formal performance statements found
- City of Santa Cruz (Career, Urban/Suburban) - No performance statements found
- City of Watsonville (Career, Urban/Suburban) - No performance statements found
- Scotts Valley (Career, Urban/Suburban/Rural) - Limited performance statements found in Standard Operating Procedures (SOPs)
- Branciforte (Volunteer) - No performance statements found
- Pajaro Valley (Career, Rural) - No performance statements found; emergency services provided by Watsonville Fire Department by contract
- Central (Career, Suburban/Rural) - Informal response time goals found, but no performance statements aligned to risk zones and services; Central Fire Protection District of Santa Cruz County Standards of Coverage and Management/Administrative Assessment^[189]
- Aptos/LaSelva (Career, Suburban/Rural) - Performance statements found; Aptos/La Selva Fire Protection District Emergency Services Master Plan^[190]
- Ben Lomond (Volunteer, Suburban/Rural) - No performance statements found
- Boulder Creek (Volunteer, Suburban/Rural) - No performance statements found
- Zayante (Volunteer, Suburban/Rural) - Provides performance goals in their fire policy manual

The Grand Jury finds that without formally specified baseline and target performance statements, it is difficult to align stakeholders around the level of fire services that is an optimal balance of what the community desires and what it can afford. These statements do not currently exist or are not externally communicated as required by best practice standards.

As stated above, probably the most critical measure to assess effectiveness of fire emergency response is **response time**. The way response time is measured and reported can vary across fire agencies. This can make it difficult to compare performance across reporting jurisdictions. However, establishing explicit performance statements that includes performance time gaps and clearly defines what part of the response time spectrum is being considered can address this issue. NFPA standards define a sequence of response time events that must be measured.^[191] (See [Appendix E](#).)

NFPA also defines standards of performance for each event in the sequence. There are different standards for career fire departments (NFPA 1710), typically in urban and suburban areas (see [Appendix F](#)), and volunteer fire departments (NFPA 1720), typically in rural settings.^{[192] [193]} These standards are set based upon technical understanding of the time based progression of fire and medical incidents and the potential damage that can be caused if the incident is not mitigated within that time frame.

For emergency medical services, the NFPA **travel time** standards are:^[194]

- 4 minutes or less for the arrival of a unit with a first responder and an Automatic External Defibrillator (AED). (NOTE: this is the same travel time requirement as for fire suppression incidents.)
- 8 minutes or less for the arrival of an Advanced Life Support (ALS) unit, where this service is offered by the fire department; assumes that the AED or Basic Life Support (BLS) units have already arrived in the 4 minute period.

NFPA does not provide response time standards for wildland fires except for the specification that the crew should be able to initiate direct attack operations within ten minutes of arrival.^[195] (NFPA 1720 extends these response time specifications for volunteer and cooperating fire agencies.^[196])

Based upon these NFPA standards, a starting point for the Authority Having Jurisdiction (AHJ) considerations for *total response time of career fire departments is*: first-due units should arrive within 6:39 minutes from 9-1-1 notification, and ERF resources should arrive within 10:39 minutes (low/medium hazard) of 9-1-1 notification, all at ninety percent or better reliability (for structural fires).^[197]

After reviewing additional documentation, the Grand Jury noted the following caveat with regard to response time standards:^[198]

*In Citygate's experience, very few fire agencies can meet this response performance standard, primarily due to existing resource distribution and the costs associated with re-locating those resources. Citygate therefore recommends that its **urban/suburban client agencies consider a first-due performance measure of 7:30 minutes or less from fire dispatch notification, 90 percent of the time, and a performance measure of 11:30 minutes or less for arrival of the last ERF resource. For rural agencies, Citygate recommends a first-due performance measure of 11:30 minutes or less and an ERF performance measure of 15:30 or less (emphasis added).***

Citygate also clarifies the importance of specification and measurement of a first-due response goal for fire suppression and EMS services with a reminder that crews should arrive before brain death occurs or a fire spreads beyond the room of origin, which means arriving within a seven to eight minutes total response time.^[199]

Restating, meaningful assessment of emergency response must be done using a *first-due total response time* goal, "...**that is within a range to give the situation hope for a positive outcome...**"^[200] Following the recommendations of Citygate, actual

first-due performance measures for both fire suppression and EMS incidents should be compared to the following standards:

- ***For urban/suburban client agencies, first-due performance measure of 7:30 minutes or less from fire dispatch notification, 90 percent of the time***
- ***For rural client agencies, first-due performance measure of 11:30 minutes or less***

As indicated earlier, the Grand Jury attempted to find and acquire the most current response time performance data from fire departments in the County; this proved to be difficult. Response time data is provided from a variety of sources, depending on the year and the reporting district: 911 Annual Reports, Fire Agency Annual Reports or Fire Service Studies, LAFCO Municipal Service Reviews, and Computer Aided Dispatch (CAD) Reports. Oftentimes, it was not possible to find the appropriate documents on agency websites.

Another challenge was the lack of clarity and/or consistency in the definition of the actual metric being reported. The range of metrics obtained included: average total response time across all incidents, average total response time by incident type, travel time, turnout time, and alarm time. Except in the case of the Santa Cruz County CSA 48 CAD reports^[201] where the Grand Jury could not find definitive sources for performance as measured by first-due total response time, the most important measure of effective response.

Alerts and Evacuation

It is no surprise to any Santa Cruz County resident that traffic choke points and bottlenecks exist along primary traffic corridors and in the roads and streets intersecting them. How does ease of access into and out of communities in our County compare with those in other areas? STREETLIGHT Data Corporation, a “big data” leader in transportation analytics analyzed 30,000 communities with a population under 40,000 and identified 800 of them with unusually high evacuation risk based on traffic characteristics.^[202] Lompico, the 1,137 resident community adjacent to Loch Lomond Reservoir, and shown on the map below, has an unusually high evacuation risk.

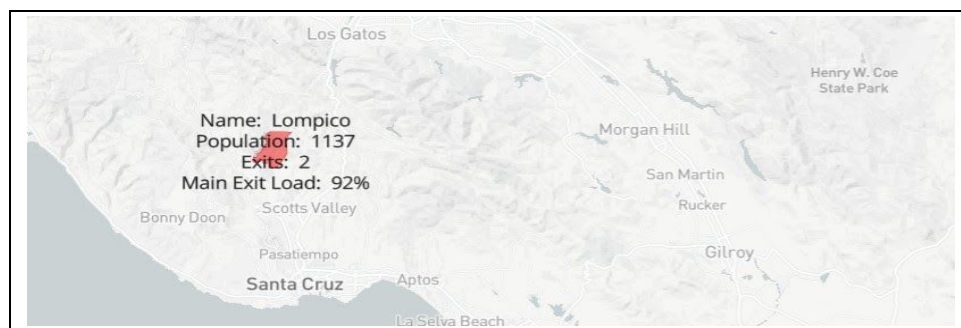


Figure 18. High Risk Evacuation Community Evacuation Map^[203]

In June 2009, the Butte County Civil Grand Jury published a report entitled "Wildfire and Safety Considerations." That report stated:

With 60,000 acres burned and 200 homes lost, the wildfires in the foothills of Butte County during the summer of 2008 were the most severe in recent history. Three of four major evacuation routes south from Paradise were closed due to heavy smoke and fire. The fourth evacuation route was jammed with single-lane traffic, making the (seven mile) trip from Paradise to Highway 70 nearly three hours long. ...It is imperative that safety considerations be adequately addressed in the referenced 2030 General Plan" (under development).^[204]

Ten years later, in June 2019, shortly after the most devastating California fire in the last century, the Butte County Civil Grand Jury wrote:

Several recommendations of the 2008-2009 Grand Jury were completed prior to the November 8th wildfire. These included the clearing of vegetation along the Skyway ...the paving of Forest Highway 171, and the drafting of detailed community emergency action plans. These changes saved lives. The main evacuation routes in High Fire Hazard Severity Zones within our county must also receive vegetation clearing. This will allow the best possible chance of safely evacuating residents during future fire events. Rapid evacuation of large populations can easily be halted by downed utility lines and poles, trees and debris, and disabled vehicles. Residents' chances of survival can be greatly enhanced by increasing the number of temporary safe places for evacuating residents to gather when further evacuation becomes impossible. The use of just a few of these areas saved the lives of hundreds of trapped Camp Fire evacuees. Emergency planning must be expanded ...to prepare for the major influx of traffic. During recent evacuations, traffic reduced to a crawl once fleeing vehicles encountered traffic controls in adjoining cities.^[205]

For residents of Santa Cruz, the excerpt from the Butte County Grand Jury report above is well worth reading again. It contains profound, wise, and timely observations and recommendations that we ignore at our peril.

These reports clearly contain lessons deserving attention to be learned regarding evacuation risk.

There has been increased attention at the state level, with state auditors assessing county readiness associated with experience gained following the fires of Butte, Sonoma, and Ventura Counties. In 2019, the California State Auditor published report 2019-103 entitled "California Is Not Adequately Prepared to Protect Its Most Vulnerable Residents From Natural Disasters."^[206] This report focused on an audit of the three counties that experienced large and destructive wildfires in 2017 and 2018 including Butte County, and concluded that best practices and those recommended by FEMA, had not been followed, and that all three counties were ill prepared. Focus was on the

county ability to protect their most vulnerable residents, but the findings could easily apply to those least vulnerable as well. No one is free from wildfire risk when it comes your way.

The State found that:

...despite having access to technology that could reach all cell phones in their evacuation zones, Butte and Sonoma did not send alerts using that technology. Instead, both counties sent messages through notification systems that reached landlines and reached a person's cell phone only if that person had pre-registered to receive emergency alerts from the county. ^[207]

There were no arrangements or plans in place for post emergency shelter such as transportation, equipment such as cots, amenities such as showers, and toilets for temporary shelters. Counties were without evacuation plans and could not issue effective alert and warning messages for all of their residents for whom they were responsible, not just those in locations difficult to access or those with disabilities who might require assistance. ^[208]

Alerts

In the Midwest, when tornadoes are a threat, neighborhood sirens wail. In the 1960s, 70s, and 80s, emergency audio notifications were received with handheld transistor radios. Today, in 2020,, one depends on a small screen, on a charged mobile phone, with a network connection, a provider providing, available capacity, and advance registration to an alert system. That is not necessarily progress. Like Butte and Sonoma Counties that were found to be inadequately prepared cell phone alert notifications by the State Auditor, Santa Cruz County also depends on a system of advance registration. Agencies responsible for public safety do a great job of publicizing and publishing website links to the emergency notification system CodeRED™, ^[209] however technology for comprehensive alert notification is not being aggressively pursued. According to the County Office of Emergency Service, there are only a little over 17,000 registered accounts for the CodeRED™ emergency alert system. ^[210] The County has over a quarter million residents, therefore a large percentage of residents are not subscribed. The County could not provide the Grand Jury with a number of households with at least one CodeRED™ subscribed phone number associated with the household.

Alert Lessons Learned

The Butte Grand Jury noted that:

With the fire's rapid progress, many communication cables and cell towers were burning and became unusable, disrupting the CodeRED™ evacuation orders. The situation was further complicated with no electricity for TV, radio, or internet in the affected areas. The only notification systems left were emergency vehicle sirens and bull horns...word-of-mouth with families and neighbors...and immediate action. ^[211]

Some cities in California have begun using hailing devices. Their device of preference is the Long Range Acoustic Device known as the LRAD, developed by the LRAD corporation (now re-branded as Genesys Inc.).^[212]



Figure 19. **LRAD Corporation's Long Range Acoustic Device**^[213]

LRADs have been effective tools in notifying residents of the need to evacuate. An LRAD can send auditory warning messages and warning tones over areas of up to 5.4 square miles.^[214] The Cities of Laguna Beach, Newport Beach, Mill Valley and Menlo Park have all adopted LRAD systems to assist in alerting residents during a fire emergency.^{[215] [216] [217]}

With the cost of an LRAD in the range of \$25,000, an LRAD system would be a high value tool in alerting residents in areas of Santa Cruz County.

Evacuation

FEMA advises that if an official government source advises you to evacuate, do so immediately.^[218] Only when there's a serious threat to public safety is a mandatory evacuation ordered. FEMA also advises you to obtain guidelines on how to evacuate your family and pets when time really matters. Residents must know what to do when a quick evacuation is necessary, and what to do if a little more time is available. Citizens need to learn and know possible evacuation routes. In some events, evacuating home, work, or school can lead to greater risk. In these situations, awareness of how and when to shelter-in-place should be well known and understood.^[219]

The County Office of Emergency Services (OES), within the County Office of General Services, is responsible not only for administering the County Fire contract, but also for managing the County responses to emergencies, including those that require evacuation. The manager of the OES is also responsible for directing operations during an event that requires evacuation. The County OES does not publish evacuation routes or safe shelter sites before they are needed. This is a concern and this Grand Jury is not alone in this concern. After the 2018 Camp Fire, the 2019 Butte County Grand Jury

found the information from the Butte County Emergency Alert System did not provide timely information on evacuation locations, and information about evacuation routes was not reaching the public for whom it was intended.^[220] The San Mateo County Grand Jury found that residents in only four communities, containing less than two percent of the San Mateo County population, received information about alternative emergency evacuation routes and shelter sites in advance of an actual emergency.^[221] The Santa Cruz County OES' position on publishing evacuations routes in advance, or shelter locations, is that it produces more harm than good, since routes could change depending on conditions.

In 2019, KLD Engineering, PC, conducted a Wildfire Evacuation Time Estimate Study for PG&E.^[222] The scope of the study was to model and analyze the evacuation of a cluster of seven communities in the San Lorenzo Valley between Santa Cruz and San Jose. The goal of the study was twofold: (1) to determine how long it would take to evacuate these communities (individually and as a whole); and (2) to provide a framework/methodology for other cities/communities in high fire risk areas to estimate how long it would take to evacuate.^[223] The Grand Jury was unable to find any evidence that this study has been shared with the County to support emergency management, nor shared with residents of the County.

Interested in assessing road conditions associated with a San Lorenzo Valley evacuation, the Grand Jury made a site visit to one of the San Lorenzo evacuation routes, Alba Road. Alba Road is a designated evacuation route in the event Highway 9 is blocked. It is about four miles long and is one of the few roads that connect Highway 9 to Empire Grade. Its entry point on Highway 9 is pictured in Figure 20 below.^[224]



Figure 20. San Lorenzo Valley Evacuation Route - Alba Road^[225]

In its current state, the Grand Jury concludes that Alba Road is not adequate to be used as an evacuation route. In some areas, it has a 10% grade.^[226] In others, it is reduced to only a single narrow lane and is extremely curvy. The intersection with Highway 9 is poorly signed, has severe pot holes, and is clearly not a County priority. See Figure 21.



Figure 21. **San Lorenzo Valley Evacuation Route - Alba Road conditions**^[227]

Evacuation Experience From Butte County

After the 2018 Camp Fire of Paradise, the 2019 Butte County Grand Jury wrote:

...fire was initially spreading at 4,600 acres an hour, eventually devouring 153,336 acres. The wind-driven embers ignited spot fires all over ...For many, survival meant finding immediate temporary shelter when evacuation became impossible. Examples included a church, gas station, market parking lot...

News reports have widely credited these temporary refuge areas as having saved many lives during the Camp Fire. This has prompted communities throughout Northern California to now demand that their local governments identify these possible areas within their own locales.

For those unable to leave, most deaths occurred in or near their residences. For many survivors, the frantic mass exodus was dangerous because of severe congestion and gridlock with so many cars, flames along the roadside, and not enough exit roads.

Before several of the latest fires, “Plan A” was always to evacuate. After much study by CAL FIRE experts and emergency personnel, Plan A is now “Be Prepared in Advance and Leave Early.”^[228]

Education

An informed and engaged public with an understanding of the risk of wildfire, its impact on life and property, knowing how to protect themselves and respond appropriately is of paramount importance. In conjunction with first responders, an educated and engaged public can result in minimizing the loss of life and property.

An important responsibility of all fire agencies is the education of the communities they serve by way of available means of publication and public engagements. As part of this investigation, the Grand Jury reviewed websites, monitored news announcements, attended community meetings and presentations, and reviewed reports assessing education and community involvement for Santa Cruz and other counties.

So how are we doing?

All agencies publish substantive educational material on their websites. Some are exemplary. Many, like the City of Santa Cruz, make education material available on their websites.^[229]

Community programs and presentations are predominantly made by local fire agencies, but also occasionally by the County such as the, “California On Fire”, lecture and discussion at the Rio Theater in 2019.^[230] That well promoted event attracted over two hundred attendees. California was literally on fire at the time. Social media is used effectively to provide information and to announce events, as well as the traditional news media in both print and broadcast forms.

The biggest concern of the Grand Jury, with respect to education of the public, is not the willingness and ability of the agencies to transmit information. The biggest concern is with the public, acknowledging and acting on the information provided. Effective communication requires engaged participants on both sides. The need to connect and engage with the community should be major concerns of our fire and emergency response leadership.

In spite of the big turnout at the Rio Theater event cited above, low turnout at some public outreach events indicates part of the underlying lack of awareness by some members of the public. Indications of lack of public engagement is evidenced by the high level of vegetation surrounding many structures on private property, and the level of participation in opt-in alert systems. The Grand Jury commends fire agencies for their perseverance in reaching out to engage the attention of residents, but more results of public awareness and action are needed.

The largest challenge in educating the community about wildfire seems to be public apathy, possibly due to lack of experience. Many residents in Santa Cruz County have the attitude that “it won’t happen here.” This may stem from the fact that Santa Cruz County is located in a coastal area.^[231] Fog, humidity levels, and the presence of redwood trees, which are somewhat fire resistant, lead residents to believe there is a reduced chance of wildfire damage. Nonetheless, not all of the local forests are composed of redwood trees, and historically significant fires have occurred in Santa Cruz County. Current residents have been fortunate that conditions of wind and

humidity prevailing during recent fires have been favorable enough to enable fire fighters to successfully contain and extinguish fires before they progressed from bad to horrific.

Given the long term nature of climate change and the increase of fire risk that comes with it, the education of our youth is as important as informing our adult population. Most fire agencies in the County have a variety of programs or initiatives to address this, such as school visits, ride alongs, children's lesson books, and teen fire service education. Some agencies are stronger than others. None show any evidence of measuring or reporting the effectiveness of their educational outreach. Most efforts are passive in nature. That is, parents need to look for the material, and schools must reach out to the fire agency.

Every County emergency service agency website publishes active links to alert system registration, yet the Grand Jury learned that only roughly 17,000 residents out of over 270,000 in the County have registered for emergency alerts.

County fire agency wildfire preparedness materials are well done and resident education is attempted, but fails to sufficiently reach and motivate residents to act.

Timing for encouraging engagement in preparedness is everything, and education could be most effective when residents have a heightened sense of awareness of wildfires, such as in the summer and fall months of drought. A great time for public outreach could be just prior to a PG&E Public Service Power Shutdown.

Lessons from Marin County

Marin County published their 2019 Grand Jury report on fire risk, from which numerous comparisons can be drawn to Santa Cruz County. ^[232] Marin stated they face unprecedented danger to life and property from wildfire. The Marin County Grand Jury reviewed the conditions that make their county vulnerable to wildfire, assessed plans currently in place in order to correct them, and recommended a new approach to meeting these challenges.

In analyzing the education of the public, the Marin County Grand Jury found the public's ignorance of how to prepare for and respond to wildfires makes Marin County vulnerable. Their findings included: ^[233]

- Most people do not know how to make their homes fire resistant or create defensible space by cutting back vegetation.
- Many have failed to collect emergency supplies or plan for evacuations.
- Nearly 90% of Marin County's residents had not signed up to receive emergency alerts.
- Programs to educate the public for wildfire are not well known and are offered infrequently. Marin County's only organization assigned to educate the public about wildfires is understaffed.
- Regarding alerts, the two crucial emergency alert systems in Marin County have a flaw that restricts their reach. Both Alert Marin and Nixle, are opt-in systems, warning only those who have registered.

Marin County posed a bond issue in the recent election, which was passed with 69% of the vote. Their stated objectives included:^[234]

- Improve emergency alert and fire warning systems.
- Improve evacuation routes and infrastructure for quicker and safer evacuations.
- Reduce hazardous vegetation and protect native species using environmentally-responsible practices.
- Expand defensible space and fire safety inspections.
- Protect roads, bridges, power and communication lines, schools, police and fire stations.
- Provide support for seniors, low-income homeowners and people with disabilities needing assistance keeping their homes fire resistant.
- Expand neighborhood wildfire safety and preparedness programs.

The Grand Jury asks: How can Santa Cruz County similarly fund fire risk mitigation and education? Would the citizens of Santa Cruz County also support a bond issue to fund objectives similar to those passed by the voters of Marin County?

FireWise

Firewise USA® is a voluntary program that provides a framework to help neighbors get organized, find direction, and take action to increase the ignition resistance of their homes and community.^[235]

The FireWise Institution provides helpful information; however, there are only eight registered FireWise communities in Santa Cruz County.^[236] Four are located in urban areas around Santa Cruz (Western Dr., Highland/Hillcrest Terrace, Prospect Heights and Paradise Park), while four are in the WUI near the Santa Clara County line (Las Cumbres, Sunset Ridge Rd., Marty Rd., and the Riva Ridge HOA). Comparatively, in Marin County, a county with a similar population, there are over 60 FireWise sites.^[237]

A significant amount of fire prevention and preparedness information is available, through [FireWise](#) and other local organizations and agencies. An information session was conducted by the City of Santa Cruz in August 2019 where the public was invited to learn about ways to prepare for a wildfire. The information presented, if acted on by residents, would have a substantial impact on risk mitigation. Less than 20 residents attended the event. Sending information via direct mail in utility bills and/or property tax statements should be considered as other ways of educating the public with the goal of reducing risk when fires occur.

FireWise.org provides a wealth of information on simple acts such as the blocking of structure vents with fine screening, applying fire retardant coating to wood surfaces, keeping flammable composting materials away from the house, and the planting of fire resistant plants. These efforts pay big dividends when wildfire strikes.^[238]

Governance

... the way in which a public authority exercises its power to fulfill its role as a service provider, maintaining the rule of law, to protect citizens and to ensure economic and social development of its people rights. ^[239]

The Grand Jury felt it important to assess how well the fire system as a whole in Santa Cruz County, consisting of several coordinating organizations, performs with regard to governance functions. To make a credible evaluation, the Grand Jury felt it was important to find and adopt a well-defined assessment framework for governance. The framework should provide clear evaluation criteria, be based upon solid research, and must have been applied in various contexts of governance. The Grand Jury found such a framework called the Local Governance Barometer (LGB). ^[240]

The Grand Jury considered the baseline LGB criteria to define a set of criteria relevant to the problem of fire services of the County. These main criteria are: 1) accountability, 2) effectiveness, 3) transparency, 4) participation, and 5) equity. The first three criteria will be addressed in this section. Participation was addressed in the Education section of this report. Equity will not be addressed.

The model includes these key elements: clear responsibility and authority to make decisions, leadership to hold responsible parties accountable, reporting of decisions and results, and consequences if commitments are not met.

Although the Grand Jury did not apply quantitative methods to these criteria, they were used as categories for assessing evidence of good governance. For the remainder of this section, evidence of these factors will be discussed.

Responsibility, Authority, and Leadership

As depicted in Figure 4, the tremendous complexity of the County's fire services organizational structure spreads accountability across several agencies. In some cases the performers of fire services are career personnel, and in other districts they are dominated by volunteers. For many services, effective execution requires coordination across boundaries which are controlled by numerous mutual aid agreements. A further complication: the citizenry plays a key role as well, especially in fire risk mitigation.

Leadership comes into play at three levels. Executive management (e.g. CAO, City Manager, Fire Chiefs) are responsible for implementing the policies and procedures. Second, a board is accountable for the formulation and oversight of the governance process (e.g. County Board of Supervisors, Special District Governance Boards, City Council). Finally, supporting these two governing levels can be advisory committees such as the County's Emergency Management Council (EMC). ^[241]

In this complex organization, it is very hard to mark clear lines of responsibility and authority. The phenomena of wildfire, which knows no boundaries, must currently be managed across a myriad of organizational boundaries. This requires a substantial amount of coordination and mutual support agreements in order to serve the needs of the County. Relationships must be strong, contracts understood and managed to, goals

established, integrated plans developed, and performance measured. Fire risk mitigation perhaps should be a County-wide concern and managed as such.

The independent fire organizations in the County lack a single governing body and thus should depend on a framework of standards, and codes at the federal, state and county levels to govern. An organization of fire chiefs called the Santa Cruz County Fire Chiefs Association does exist, but it is not a governing body and is closed to outside review and participation.^[242]

No one entity in the County is performing a leadership role in Fire Hazard Mitigation. Thus, the lines of authority from leadership to performers are not clearly defined, making accountability difficult.

Reporting and Consequences

There are different types of reporting requirements including: status, performance, compliance reporting, and audits. All are important to the goal of accountability. Regular status reports provide an ongoing narrative of activities, issues, and resolutions. Performance reports provide measures of progress against key measurable goals. Audits, and compliance reports allow stakeholders to assess compliance to applicable regulations or to terms of a contract. The following is what the Grand Jury discovered with regard to fire performance reporting in the County.

The organization responsible for reviewing special district performance is LAFCO, a State sponsored commission led by leaders of the County (two County supervisors, two special district directors, and one member of the community).^[243] The Grand Jury reviewed the last twenty years of LAFCO's review of the Santa Cruz County fire districts and spheres of influence which include CSA 4 and CSA 48. There were two reviews, one in 2007^[244] and one almost ten years later in 2016.^[245] The focus of the reviews were financial risk, and fire and emergency service response. The majority of the assessments were self-assessments in the form of a survey responded to by each district fire chief in addition to the County Fire Chief representing CSA's 48 and 4.

The Grand Jury also examined, through document requests, interviews, and review of Santa Cruz County Board of Supervisor meetings, the presence or absence of reporting and review.

With respect to reporting accountability, the Grand Jury discovered:

1. The County Board of Supervisors does not receive, in its annual report from CAL FIRE, data and analysis to reflect the gaps that exist between current performance and what the community needs, so that informed budget decisions can be made.
2. The County Board of Supervisors and the CAO do not fully hold CAL FIRE accountable for its contract with the County.
3. LAFCO reviews fire districts only once every ten years and does not adequately address fire prevention performance such as inspections and fuel abatement.

Furthermore, reporting statistics and formats utilized by fire agencies throughout the County are inconsistent and therefore difficult to evaluate and at times impossible to

compare. Mechanisms to properly set goals, measure progress and report to stakeholders for vegetation removal and inspection compliance are inadequate. Not a single performance metric was identified on any of the agency websites or annual reports regarding these important activities. A good example of annual reporting of performance across the County to all residents can be found in [Appendix G](#), which shows how Los Angeles County, on its website, presents performance data to its residents.

Effectiveness Through Planning, Capacity and Results

In this section, the Grand Jury is specifically looking at the effectiveness of the governance or management of the fire services system. It was important to look at the sum, the complete system, as opposed to the parts, i.e. the individual agencies.

Fire prevention is a County-wide concern. Wildfire ignition and spread does not recognize the city or special fire district boundaries that comprise Santa Cruz County's complex ecosystem of fire agencies. This presents a challenge to the efficient and effective alignment of resources to the accomplishment of a common goal. So, how effective is fire prevention management in Santa Cruz County at creating a unified effort toward minimizing the vulnerability of residents, property, and the environment to the ravages of wildfire?

There are no County-wide mutual aid agreements or plans that capture a common vision and approach.

Where could coordinated management be created? The Grand Jury believes the Santa Cruz County Emergency Management Council (EMC) could be the right place.^[246] The EMC was established to manage compliance with the legal requirements of the State and to assist the County Board of Supervisors and the Director of Emergency Services in the administration of Chapter 2.26 of the Santa Cruz County Code.^[247] The EMC is empowered to develop and recommend for adoption by the County Board of Supervisors, **emergency and mutual aid plans and agreements**, and such ordinances, resolutions, rules and regulations as may be necessary to implement such plans and agreements, and any necessary amendments thereto.^[248] Plans are needed to provide the most detailed specification of actions and resources to achieve well defined objectives. With so many disparate performers, acceptable control and coordination of fire risk mitigation activities requires a detailed plan. The Grand Jury found no evidence of an integrated plan to guide proactive and preventative action with regard to fire risk mitigation. Further, the Grand Jury observed that existing individual plans are not up to date, are not based upon current or accurate data, and do not provide a gap analysis against key goals. This reflects the lack of any clear goal setting process for County fire risk mitigation.^{[249] [250]}

This Grand Jury is not alone in concluding that effective governance requires current, up to date plans with broad spectrum input and consideration. Below is a 2019 finding of the Santa Cruz County Regional Transportation Committee (SCCRTC):

Santa Cruz County Office of Emergency Services (OES) should work with CHP, Santa Cruz County Fire Chiefs Association, Cal Fire "CZU" Felton Area, volunteer fire districts in the SLV, Santa Cruz City Fire Department, and the Santa Cruz County Sheriff's Department, and should regularly meet and update emergency management plans.^[251]

The Grand Jury has found evidence of broad hazard mitigation planning in individual jurisdictions.^{[252] [253] [254] [255] [256]} However, it is the Grand Jury's observation that daily operations focus primarily on the emergency response part of the plans. In addition, there is a robust planning framework for the creation of an integrated set of plans for dealing with wildfire prevention, the Community Wildfire Prevention Plan (CWPP). The CWPP concept was discussed in more detail in the Risk section of this report.^[257]

Resource Capacity and Results

A key element of effectiveness is the acquisition and allocation of resources to match capacity to need. In a difficult funding environment, competition for resources is intense. In order to build capacity to meet goals, a compelling case must be made by fire agency leadership. Yet, without goals, measurement, and gap analysis, no case can be made.

In June 2018, the Santa Cruz County Civil Grand Jury made the recommendation that:

The Board of Supervisors should direct the County Administration Officer to implement performance budgeting over the next two-year budget cycle.^[258]

The County Board of Supervisors responded with a commitment to implement and also noted an ongoing pilot program that would "feature public-facing dashboards that allow users to understand policy issues and assess department performance. These (Parks & Rec & Probation Dept.) pilots will be included in the two-year budget document for FY 2019-20 and FY 2020-21."^[259] Evidence of this commitment was found on the County's Operations website page, which provides even more transparency than the commitment itself.^[260] However, no evidence was found of public facing performance driven budgeting for County Fire services.

The Grand Jury discovered that data-driven budgeting is not being performed by the County for most fire related emergency services or other agencies for risk mitigation activities.

Budgets should not be developed based on the status quo. In order for data-driven budgeting to work effectively, clear benefits, requirements and associated costs must be provided to budget authorities.

Other reporting sources have reviewed issues of deficient funding and capacity for fire risk mitigation. Items that stand out are:

- The Boulder Creek Fire Protection District does not have sufficient reserves to pay for projected equipment costs, other capital needs, and a reserve for contingencies.^[261]
- The Branciforte Fire Protection District has a small revenue base, a low funding balance, an existing loan that was used to purchase an engine, and insufficient funds in its capital reserve to purchase a new engine.^[262]
- The Central Fire Protection District does not have sufficient revenue to maintain current staffing levels and pay for salaries, increasing pension costs, post-retirement health insurance liabilities, and other operating costs.^[263]
- Central Fire should relocate a station to the intersection of Soquel and Capitola by closing two in the flood plain and constructing a new one.^[264]
- Most agencies' financial obligations have increased faster than their revenues. Some agencies have structural deficits that threaten maintenance of the current service levels.^[265]
- Two City of Santa Cruz Fire stations have driveways in need of repair and have not received a high enough priority by the City to be funded, and so remain unfunded and unrepaired.^[266]
- Most Santa Cruz County fire districts and departments have been unable to comply with state mandated fire and safety building inspections.^[267]
- To provide an appropriate level of service and response, the City of Santa Cruz is in need of a Fire Station located near the Santa Cruz Beach Boardwalk and the Santa Cruz Wharf.^[268]

Good governance cannot be achieved without goals that are aligned with an organization's capacity.

Transparency - Actionable Data and Information for Stakeholders

Transparency is the essence of good governance. Without it, political trust is diminished, planning is uninformed, assessment and accountability are not possible, and broad participation is unlikely to be achieved. Relevance is another aspect of transparency. Directly responsible parties and other stakeholders must not be inundated with irrelevant data and information. So, what are the key elements of transparency for fire risk mitigation? Based upon the Grand Jury investigation, the following variables must have correlation of past, current, and future measures to adequately inform stakeholders:^[269]

- fuel management, which includes vegetation management of defensible space and areas in proximity of ignition sources,
- ignition prevention and early detection, which includes ignition source locations and type (equipment, recreational warming fires), surveillance location gaps,
- inspection backlog of fire related fuel management facilities and their risk severity,

- incident response time, which includes fire protection response time gaps, medical and rescue response time gaps,
- citizen education, because citizens must be educated enough to support community and personal mitigation efforts, and be prepared for a fire event.

The Grand Jury found little evidence of formal measurement or reporting mechanism to provide key planning and execution data and information on the variables above for key stakeholders: the County Board of Supervisors, CAO, City Managers, and the public.

A key element of transparency, especially for public stakeholders, is through online channels. Each of the fire administrations is responsible for its own website presence and data publication.

The Grand Jury observed that most fire agency websites provide clear and effective guidance on alerts and preparations. However, they lack consistency in reporting of response, prevention data and performance results.

One commendable example that this is possible is shown by the Central Fire District, which documents a strategic plan including inspection objectives and resources.^[270] Central Fire was recently recognized:

Central Fire District received the District Transparency Certificate of Excellence by the Special District Leadership Foundation (SDLF) in recognition of its outstanding efforts to promote transparency and good governance. Central Fire Protection District is the first fire district in Santa Cruz County to receive this award.^[271]

This recognition was created by the Special District Leadership Foundation (SDLF) in an effort to promote transparency in the operations and governance of special districts to the public, and to provide special districts with an opportunity to showcase their efforts in transparency.^[272]

Conclusion

Our investigation sought to answer important questions.

How well does the organization of the fire departments across the County maximize their effectiveness and efficiency? After substantial investigation and research, because of the lack of accessible historical data, lack of assessment or audit data, and differences in reporting between agencies, the Grand Jury was unable to quantitatively evaluate effectiveness and efficiency. The complex fire organization structure in the County demands significant attention.

Are the risks of wildfire initiation and containment accounted for and mitigated?

Seldom is an event as risky as wildfire completely mitigated. The Grand Jury was unable to find published information by fire departments in the County that quantitatively assessed mitigation efforts or any resulting risk levels. The best quantitative metric the Grand Jury was able to locate is the Insurance Service Office (ISO) rating. These standardized ratings are not published by the County fire agencies, so the public remains uninformed about these insurance ratings. The Grand Jury found that far more attention is paid to reaction than prevention and transparency.

Does emergency response meet the needs of the criteria for safety and security of life and property in the County? The Grand Jury found:

- Fire emergency responses account for a minority of all emergency calls, and medical calls have increased dramatically since 1980. Medical response targets should be measured and communicated.
- Other out of County agencies convey how they were performing against national standards and agency goals, but the Grand Jury found no such reports for Santa Cruz County.
- There is a degradation in the quality of reporting of 911 response time, a lack of data reported from some fire districts, and inconsistent reporting practices from those that do.
- LAFCO merely summarizes the self-assessment performed by the fire agencies in Santa Cruz County.
- There are significant inconsistencies in response time data across jurisdictions.

In the event of a wildfire, can the public be alerted, evacuated, or sheltered in time? The Grand Jury was unable to affirmatively answer this very important question, but found:

- Table top simulations are performed by the Office of Emergency Services (OES)
- No evidence of the publication to the public of the evacuation study performed for PG&E in 2019, by experts in the field.
- A lack of attention to road maintenance on designated evacuation routes.
- A population undersubscribed to the CodeRED™ Alert System used by the County.
- No evidence of designated, published shelter locations and little evidence of awareness of potential shelters on evacuation routes.
- Santa Cruz County's Emergency Management Plan is both out of date and updated infrequently.

Is the public sufficiently educated about fire risk and prepared to mitigate personal property and community risk? The answer to this question is unequivocally no. Perhaps more could be done with outreach. Perhaps more could be done leveraging the media and with increased attention to youth. The challenge though is getting the attention of those residents at risk, and getting them to act. The solution to this challenge clearly is with the community itself and its leaders.

How well do the fire agencies and the governing bodies in counties and cities make data-driven decisions and hold responsible leaders accountable for their results? At the County level, the Grand Jury believes there is much room for improvement in both quantitative budgeting, decision making, and holding those responsible accountable to their commitments. Commitments can be made either by contract, by state code, or as benchmark standards of service. Fire districts appear to pay the most attention to data. For cities, the Grand Jury is aware of the challenges fire departments face in competing for general funding. For this reason, governing bodies should pay increased attention to establishing appropriate priorities for addressing critical fire safety needs.

Findings

Risk and Mitigation

- F1.** Vegetation/fuel management and abatement are not receiving the attention nor funding needed from the County of Santa Cruz Board of Supervisors, and therefore are not adhering to California Government Executive Order 1.8.19-EO-N-05-19.
- F2.** Santa Cruz County residents are at increased risk of fire danger due to the lack of risk management for wildfire. Specific risks are not formally identified, tracked, assessed for impact, nor is progress reported by fire departments in the County. Therefore, leaders responsible for budgets and accountability are left unprepared to manage risk, impact, or performance.
- F3.** City and County officials have not collaborated with PG&E to identify the location of high risk PG&E electrical equipment, and so are left uninformed as to how to manage their responsibilities or how to instruct residents about potential danger due to proximity to this equipment.
- F4.** Most of Santa Cruz County in addition to the City of Santa Cruz with its large eucalyptus groves are not being monitored by the ALERTWildfire Imaging Surveillance system and would be well served by the installation of cameras capable of monitoring coastal areas occupied by eucalyptus groves in areas harboring potential sources of ignition.
- F5.** Santa Cruz County would greatly benefit if steps were taken to implement the CAL FIRE, San Mateo - Santa Cruz Unit 2018 recommendation of developing detailed, site specific Community Wildfire Protection Plans for communities throughout the County.

Emergency Response

- F6.** Response time data for fire departments in Santa Cruz County is challenging to obtain. Santa Cruz Regional 9-1-1 previously reported response time data in their annual reports, but did not do so in the 2018 or 2019 annual reports.
- F7.** Residents living in the CSA-48 receive a lower level of emergency medical support than those living in more urban areas where ALS is provided.
- F8.** Santa Cruz County Fire, through its contract with CAL FIRE, has not been meeting the “two in, two out” requirement, reducing their ability to respond effectively and quickly to individuals or structures needing attention in a fire emergency. Proposition 218 was proposed and passed to be able to satisfy the “two in, two out” requirement, without a clear commitment by County Fire that that standard will be consistently met in all CSA-48 locations. In addition, no analysis was presented to quantify the effect on response time.

- F9.** The number of County Fire volunteer firefighters has decreased from 110 to 60 since 2004. There has been no analysis done on the impact this reduction in staffing has had on the level of service provided to residents. Reductions in available numbers of prison firefighters likewise should be acknowledged.
- F10.** Roadside vegetation in rural areas of the County is not being cleared consistently which could potentially increase emergency response time, putting life and property in unnecessary danger. Furthermore, evacuations could be restricted as there is no rule or program that mandates that roads, even critical evacuation routes, be kept cleared meeting defensible space requirements.

Alerts & Evacuation

- F11.** There are only approximately 17,000 accounts for the Santa Cruz County opt-in CodeRED™ emergency system, which implies that a significant portion of the County may not receive emergency alert messages, which potentially reduces residents' opportunity to take action in a timely, life-saving manner.
- F12.** Long Range Acoustic Devices (LRADs), have been deployed in other areas of the state and have proven effective tools in alerting residents in urban and rural areas to a wildfire. However, Santa Cruz County has no such devices, increasing the risk to County residents.
- F13.** High risk communities in the County are left unnecessarily vulnerable due to the lack of easily accessible, published information of refuge/assembly areas and structures.
- F14.** Because the County does not publish a "shelter in place" plan, when a fire expands rapidly, residents cannot make informed decisions about whether to shelter in place or evacuate.
- F15.** Unlike the City of Santa Cruz, the County does not publish emergency evacuation routes, purportedly to avoid having old or untimely information being followed in an emergency. The County therefore withholds revealing evacuation routes until an emergency is in progress, likely creating unnecessary risk and potential for chaos.
- F16.** In the Wildland Urban Interface zone, and in many town centers, traffic choke points exist, and in some instances have roadway obstacles to traffic flow such as overgrown vegetation, concrete medians, curbs, and lane reductions resulting in roads that are inadequate for mass evacuations.
- F17.** Santa Cruz County residents, and especially those living in District 5, would benefit if the 2019 San Lorenzo Evacuation Study performed by KLD Engineering was made available on a County agency web site and publicized.

- F18.** Santa Cruz County has not sufficiently implemented lessons learned from Butte County's Paradise Fire on the importance of traffic management during an evacuation. It is imperative the County Office of Emergency Services ensures coordination between neighboring communities to manage traffic light sequencing and conversion of two-way roads into one-way evacuation routes, enabling mass evacuation during a wildfire.

Education

- F19.** Wildfire preparedness informational materials are well done and public education is attempted by fire departments in the County, but fails to sufficiently reach and motivate residents to act.
- F20.** The FireWise institution provides a valuable fire prevention program and, as of March 2020, there were eight FireWise communities registered in the County. Marin County, by contrast, with a similar population, has sixty registered communities, highlighting the need for more FireWise promotion and participation in Santa Cruz County.
- F21.** The County Office of Emergency Services and fire agencies in the County encourage residents to be prepared for an emergency, however the passive mechanisms such as web sites used to encourage preparedness are not proving to be sufficient.
- F22.** Property owners in the County are responsible for their own vegetation management, yet they are often not sufficiently educated about vegetation management practices, or do not have the capability, financial resources, or desire to create defensible space.

Governance & Transparency

- F23.** No single organization in the County is assuming a leadership role in Fire Hazard Mitigation. It is not clear whose responsibility it is to minimize this County wide risk.
- F24.** The annual report to the County Board of Supervisors and the County Administrative Office by County Fire/CAL FIRE does not provide data or analysis of resources, response times, code enforcement, inspection, or education. This information is necessary to show what gaps exist between current performance and community needs in order for informed budget decisions to be made. Without adequate background information, the Board of Supervisors is unable to hold CAL FIRE accountable for the specific responsibilities specified in their contract.
- F25.** The four fire protection districts in the San Lorenzo Valley would benefit by further aligning their policies and procedures in anticipation of future consolidation.

- F26.** Reporting data, statistics, and formats utilized by fire agencies throughout the County are highly inconsistent, uncoordinated, and therefore not readily evaluated and compared. The standard Insurance Services Office (ISO) rating system would be useful to adopt. Response time data are not well described or consistently reported by the jurisdictions, making accurate assessment difficult, especially by other agencies or by the public.
- F27.** The 2015 County of Santa Cruz Emergency Operations Management plan does not adequately address evacuation, and references data too outdated to be useful, such as a population density map from the 2000 census.
- F28.** The 2016 LAFCO Municipal Service Review of Fire Districts report and its 2006 predecessor do not adequately address district performance in the areas of Fire Risk Reduction (specifically: inspections, vegetation management, and education).
- F29.** The Grand Jury finds that formally specified baseline and target performance statements, in alignment with the Center for Public Safety Excellence Assessment Process, neither currently exist nor are they reported by fire departments in the County as required by best practice standards. There are no goals set or measures made of progress for review by the Board of Supervisors regarding County Fire/CAL FIRE performance. Other fire districts in the County are similarly remiss in reporting to their governing bodies. Appropriate goals would include progress on response times, vegetation management, and code inspection progress, all of which are necessary to properly quantify the budget and resources required for full-time, volunteer, and prison inmate workforces, in appropriate, affordable proportions.
- F30.** Due to the inconsistent reporting of response times provided by CAL FIRE in Proposition 218, conflict with information supplied by document request to the Grand Jury, and due to lack of performance standards for response times, voters may have been ill-informed when voting on the proposition.

Recommendations

- R1.** Santa Cruz County, under the auspices of the Emergency Management Council (EMC) with LAFCO support, should study a governing structure that would tie all fire agencies in the County together with common leadership, objectives, sharing of data, and maximized use of resources. (F23, F25)
- R2.** The Santa Cruz County Board of Supervisors should require CAL FIRE and County Fire to provide quarterly and annual reports to the County General Services Department with specified data and success metrics for each of the contract requirements, beginning with the current fiscal year. (F2, F24, F26, F29)
- R3.** The Santa Cruz County Board of Supervisors should require CAL FIRE, in conjunction with the General Services Department, to provide annual operations reviews with performance metrics and annual improvement objectives, beginning with the current fiscal year. (F2, F24, F26, F29)

- R4.** The fire districts of Santa Cruz County should establish a plan by January 2021, to develop actionable Community Wildfire Protection Plans (CWPP) that follow the framework established by the 2018 Santa Cruz County - San Mateo County CWPP. (F2, F5, F22)
- R5.** Santa Cruz Regional 9-1-1 should include response time data, for each fire department in their annual reports, starting with the 2020 annual report. (F6, F26)
- R6.** The County Board of Supervisors should request that the County Fire Chief submit an analysis and a recommended plan to assess whether to provide Advanced Life Support (ALS) year round to the County Fire service area by the 2021-2022 budget. (F7)
- R7.** County Fire should provide a plan to the County Board of Supervisors by September 30, 2020 identifying how and when the new CSA 48 tax revenue will result in the addition of six more firefighters to the response team, enabling the required “two in, two out” in a fire emergency. (F8)
- R8.** The County Board of Supervisors should set an objective for County Fire to increase the number of volunteer firefighters by July 1, 2022, as well as a plan for use of the prison workforce or an alternative. This needs to be done in concert with a comprehensive resource plan for County Fire. (F9)
- R9.** Each year, during the budget presentation, the County Board of Supervisors should require County Fire to provide a vegetation management plan, including a priority list of projects and a timeframe for their completion. (F1, F10, F16, F29)
- R10.** Santa Cruz County and Cities should create and/or update Hazard Mitigation Plans by July 1, 2021. Any new or existing plans should be updated a minimum of every three years. All plans should address wildfire risk, evacuation and shelter in place plans, emergency alerts, vegetation management, and confirm compliance with California SB 821. (F1, F2, F10, F11, F14–F16, F29)
- R11.** The CAL FIRE Ready for Wildfire website should be actively promoted and shared within the community via all available means, including printed descriptive materials inserted into utility and property tax bills, by December 31, 2020. (F19–F21)
- R12.** The Santa Cruz County Office of Emergency Services should create and publish shelter in place plans, with the cooperation of all county fire protection districts and cities, and should inform citizens of safe building locations, and on what to expect and what to do in case of wildfire, by March 31, 2021. (F14)
- R13.** LAFCO review of County fire districts should include the review of fire risk reduction plans and achievements, and LAFCO should perform this specific and focused review for all districts by June 2021. (F2, F28)
- R14.** LAFCO should increase its comprehensive review of County fire district services from once every 10 years to once every five years. (F23, F25)

- R15.** All fire districts in Santa Cruz County should coordinate with utility companies to provide information to residents, via information inserted in utility bill mailings, describing how to sign up for emergency notifications by December 31, 2020. (F19)
- R16.** Fire departments throughout the County should take an active role in encouraging communities and neighborhoods to sign up for FireWise, and be measured on their success by their respective governing boards on an annual basis. (F19–F22)
- R17.** The County Office of Emergency Services should evaluate, quantify, and report to the County Board of Supervisors on the specifics of the public state of preparedness for a large-scale emergency such as wildfire by June, 2021. (F11, F23)
- R18.** County Fire and the fire districts within the County should evaluate whether purchase of Long Range Acoustic Devices (LRADs) would be beneficial in helping notify residents to evacuate in an emergency by December 31, 2020. (F12, F15, F17, F18)
- R19.** The Board of Supervisors should require the CAO to appoint a county Risk Manager, by December 31, 2020. The Risk Manager should report to the CAO, who will be responsible for ongoing identification, analysis, quantification, and remediation planning of all fire risks across the County. This role should be considered as a service to all four cities in the County as well. (F2, F3, F24)
- R20.** The County Office of Emergency Services should inventory, designate, and publish locations by December 31, 2020 for assembly and refuge in high risk communities, designating shelter in place locations in case of threatening wildfire when evacuation from the area might not be possible. (F13–F15, F27)
- R21.** County emergency planners at all levels should provide notification of evacuation routes and/or shelter-in-place options by March 31, 2021. Notification plans should be provided for when power is out and dissemination of information by wireless or internet is difficult or impossible. (F11, F14, F15, F17, F18, F27)
- R22.** The Santa Cruz County Administrative Office should develop and sign a Memorandum of Understanding between the County and PG&E, to require that PG&E share and update quarterly the location of their aging and high risk equipment. This should include coverage of the four cities in the County and should be done by December 31, 2020. (F3)
- R23.** Santa Cruz County and Cities should invest in an ALERTWildfire Imaging Surveillance system. Cameras should be purchased, installed, and tested to achieve full coverage of the County by the beginning of the 2021 fire season. (F4)
- R24.** The County Board of Supervisors should update regulations to require evacuation routes be kept clear for fire prevention, not just for line of sight, but also for access by fire engines and other emergency equipment by the beginning of the 2021 fire season. (F15–F18, F27)

R25. The County Board of Supervisors should explain to the public why the Proposition 218 information on response times is inconsistent with the response time data available from County Fire by December 31, 2020. (F6, F8, F30)

Commendations

C1. The Aptos and Central Fire Districts are commended for the organizational merging of their fire districts.

Required Responses

<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Santa Cruz County Board of Supervisors	F1, F2, F4–F8, F10–F18, F20–F24, F26–F30	R1–R3, R6–R12, R15, R17, R19, R24, R25	90 Days October 1, 2020
Local Agency Formation Commission of Santa Cruz County	F23, F26, F28, F29	R1, R13, R14	90 Days October 1, 2020
Santa Cruz Regional 911 Board of Directors	F6, F11	R12	90 Days October 1, 2020
Aptos-La Selva Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Aromas Tri-County Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Ben Lomond Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F25– F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Branciforte Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Boulder Creek Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F25– F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Central Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020

Required Responses, continued			
<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Felton Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F25– F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Pajaro Valley Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Scotts Valley Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F26, F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Zayante Fire Protection District Board of Directors	F1–F3, F5, F6, F10–F16, F19–F24, F25– F27, F29	R1, R4, R10, R11, R15, R16, R18, R21, R23	90 Days October 1, 2020
Santa Cruz City Council	F2, F4, F11, F20, F22, F23, F27, F29	R10, R12, R15, R19	90 Days October 1, 2020
Scotts Valley City Council	F2, F11, F20, F22, F23, F27, F29	R10, R12, R15, R19	90 Days October 1, 2020
Watsonville City Council	F2, F11, F20, F22, F23, F27, F29	R10, R12, R15, R19	90 Days October 1, 2020

Requested Responses

<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Santa Cruz County Administrative Officer	F1–F4, F6–F8, F10–F17, F20–F24, F26–F30	R1–R3, R6, R7, R9–R12, R15, R17–R23	90 Days October 1, 2020
Santa Cruz County Director of General Services	F7, F8, F24, F26, F28, F29	R2, R6, R7	90 Days October 1, 2020
Santa Cruz County Emergency Services Manager	F4, F5, F11–F21, F23, F27	R10, R12, R17, R20, R21, R23	90 Days October 1, 2020
Santa Cruz County Fire Department	F1, F3–F12, F19–F24, F26–F30	R2–R4, R6–R9, R11, R16, R18, R23, R25	90 Days October 1, 2020
Santa Cruz City Fire Department	F3–F6, F11, F12, F19–F24, F26, F29	R4, R16, R18, R23	90 Days October 1, 2020

Requested Responses, continued			
<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Watsonville Fire Department	F3, F5, F6, F11, F12, F19–F24, F26, F29	R4, R16, R18, R23	90 Days October 1, 2020
Santa Cruz City Manager	F2–F4, F11, F13–F15, F21–F23, F27, F29	R10–R12, R15, R21–R23	90 Days October 1, 2020
Scotts Valley City Manager	F2, F3, F11, F13–F16, F21–F23, F27, F29	R10–R12, R21–R23	90 Days October 1, 2020
Watsonville City Manager	F2, F3, F11, F13–F15, F21–F23, F27, F29	R10–R12, R15, R21–R23	90 Days October 1, 2020

Definitions

- **ALS:** Advanced Life Support: Category of first responder treatment that goes beyond that of an Emergency Medical Technician. Requires paramedic equivalent training and certification by local governing agencies to implement. This differs from Basic Life Support which is administered by EMT's.
- **Amador Plan:** An agreement under which Santa Cruz County government pays CAL FIRE for fire and rescue services provided during winter/non-fire season.
- **Auto Aid:** Fire agencies providing coverage on fire or medical calls for neighboring districts/departments. The current Auto Aid system is assisted by the Computer Aided Dispatch System and based upon agreements between fire districts/departments as well as Emergency Medical Services Integration Authority and the County Fire Chiefs Association. Also known as Mutual Aid.
- **Ben Lomond Fire:** Ben Lomond Fire Protection District
- **BLS:** Basic Life Support. Generally identified with Emergency Medical Technician training (EMT).
- **Boulder Creek Fire:** Boulder Creek Fire Protection District
- **Branciforte Fire:** Branciforte Fire Protection District
- **CAD:** Computer Aided Dispatch Software system used to dispatch law enforcement, fire, and emergency medical services.
- **CAL FIRE:** California Department of Forestry and Fire Protection is dedicated to the fire protection and stewardship of local wild lands. The Department also provides emergency services. As of 2007, CAL FIRE is the new name for the State Fire Department, formerly known as CDF. CAL FIRE is a state organization funded by the state. During the fire season, typically five months (which has become longer in recent years), CAL FIRE, funded by the state, provides fire protection services in the Wildland Urban Interface of the County (CSAs 48 and 4).

- **Central Fire:** Central Fire Protection District
- **County Fire:** County Fire is a term commonly used to refer to the fire services provided by Santa Cruz County performed by CAL FIRE, under contract to the County, as well as volunteer services provided by the communities of CSA 48 and CSA 4.
- **CSA:** County Service Areas can be formed to provide residents in rural areas with services that are not generally provided by existing business or government agencies. The County Board of Supervisors serves as the governing body for County Service Areas.
- **ECC:** CAL FIRE Emergency Command Center is responsible for dispatching County Fire resources.
- **Emergency Management Council (EMC):** The County Emergency Management Council is empowered to develop and recommend for adoption to the Board of Supervisors, emergency and mutual aid plans and agreements, and such ordinances, resolutions, rules and regulations as may be necessary to implement such plans and agreements, and any necessary amendments thereto.
- **EMSIA:** Emergency Medical Services Integration Authority Joint Powers Authority formed in Santa Cruz County to oversee Emergency Medical Services and Advanced Life Support in Santa Cruz County.
- **EMT:** Emergency Medical Technician
- **Felton Fire:** Felton Fire Protection District
- **FEMA:** Federal Emergency Management Agency
- **LAFCO:** The Local Agency Formation Commission was created by state law in 1963 to regulate the boundaries of cities and special districts.
- **LHMP:** Local Hazard Mitigation Plan. Hazard mitigation planning is the process used by state, local and tribal leaders to understand risks from natural hazards and develop long-term strategies to reduce the impacts of disasters on people, property, and the environment.
- **LRA:** Local Responsibility Area Portion of land where the County is responsible to provide fire protection.
- **Mutual Aid:** Fire agencies providing coverage on fire or medical calls for neighboring districts/departments. The current Mutual Aid system is assisted by the Computer Aided Dispatch System and based upon agreements between fire districts/departments as well as Emergency Medical Services Integration Authority and the County Fire Chiefs Association. Also known as Auto Aid.

- **Mutual/Automatic Aid:** Contractual assistance between agencies. Mutual aid is assistance that is dispatched, upon request, by a responding agency. Automatic aid is assistance that is dispatched automatically. Proposition 172: Passed in 1993, this state proposition funds local public safety services. The County Board of Supervisors has the discretion to change the allocation of these funds.
- **NETCOM:** Santa Cruz County's Regional Dispatch Center, also referred to as SCR911.
- **NFPA:** National Fire Protection Association, an international nonprofit organization that advocates for fire fighting codes and standards as well as research, training, and education. [\[273\]](#)
- **NOAA:** National Oceanic and Atmospheric Administration, a 12,000 personnel agency of the U.S Department of Commerce whose mission is to understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources.
- **Pajaro Valley Fire: Pajaro Valley Fire Protection District PVFD:** Pajaro Valley Fire Protection District
- **Santa Cruz Fire: City of Santa Cruz Fire Department SCFD:** City of Santa Cruz Fire Department
- **Scotts Valley Fire:** Scotts Valley Fire Protection District
- **SCR911:** Santa Cruz Regional 91, a Santa Cruz County's Regional 911 Dispatch Center, also referred to as NETCOM.
- **SLV:** San Lorenzo Valley
- **SRA:** State Responsibility Area, a portion of land where the State of California is responsible to provide fire protection.
- **Turnout Time** - Cited by NFPA 1710 as being, "The time interval that begins when the emergency response facilities (ERFs) and emergency response units (ERUs) notification process begins by either an audible alarm or visual annunciation or both and ends at the beginning point of travel time."
- **Warming Fire** - Short for Warming Recreational Fire
- **Warming Recreational Fire** - A warming recreational fire is defined by the City of Santa Cruz Fire Department as an outdoor warming recreational fire, burning materials other than rubbish where the fuel being burned is not contained in an incinerator, outdoor fireplace, barbeque grill or barbeque pit and has a total fuel area of 3 feet (914 mm) or less in diameter and 2 feet (610 mm) or less in height for pleasure, religious, ceremonial, cooking, warmth or similar purposes. [\[274\]](#)
- **Watsonville Fire:** City of Watsonville Fire Department

- **Wildland Urban Interface (WUI):** The Federal definition of WUI are developed areas that have sparse or no wildland vegetation, but are within close proximity to a large patch of wildland or areas where houses and wildland vegetation directly intermingle.
- **Zayante Fire:** Zayante Fire Protection District ZFPD: Zayante Fire Protection District

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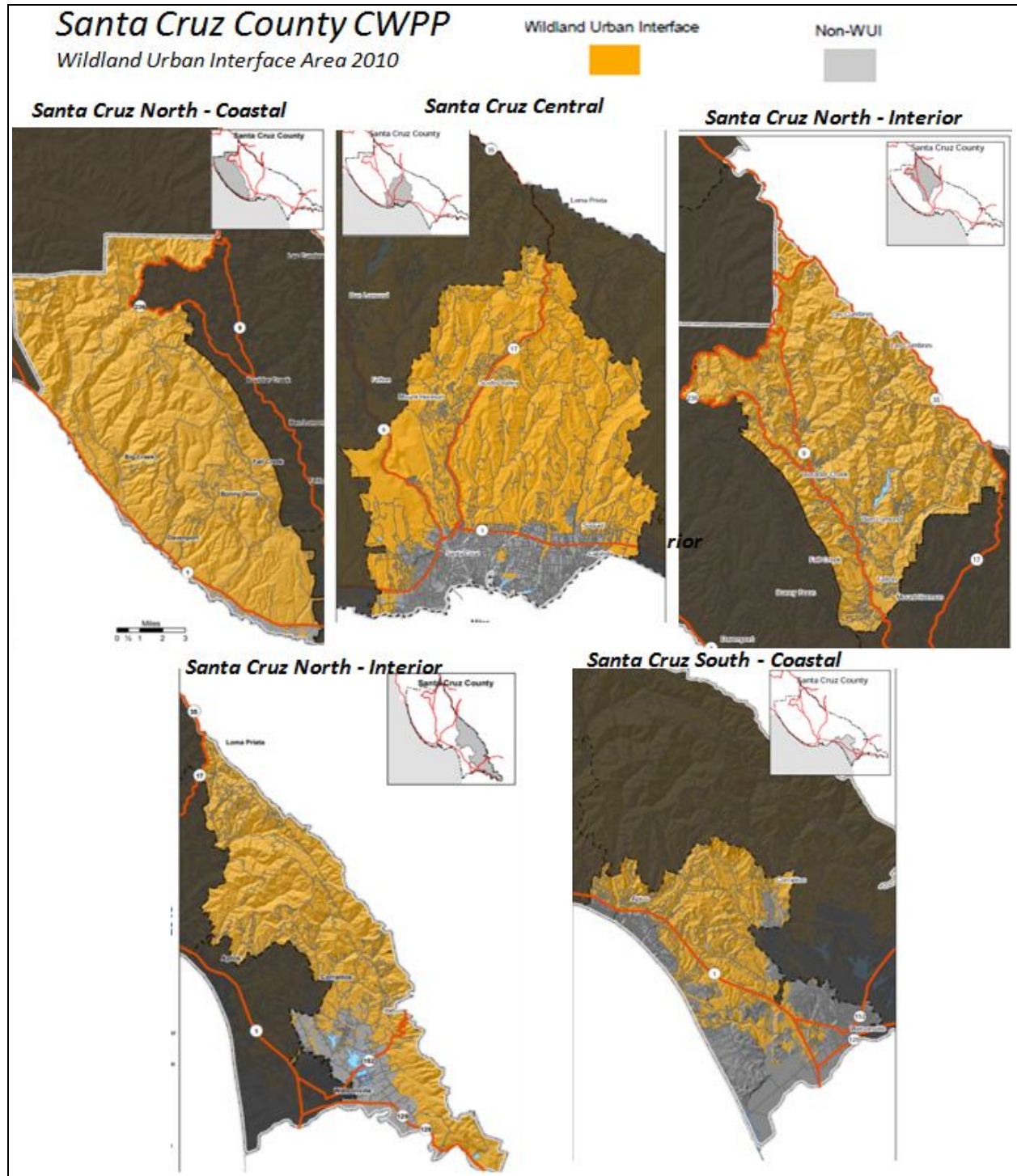
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City of Santa Cruz Delaveaga Park
Alba Road, Felton, CA

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Appendix A
Santa Cruz County Wildland Urban Interface Maps
from 2010 and 2018^[275]



Appendix B
Ca. Gov. Code Section 8654.2^[276]

Cal. Gov. Code § 8654.2

Section 8654.2 - Legislative findings and declaration

The Legislature finds and declares the following:

(a) Catastrophic threats exist to lives, property, and resources in California including wildfire. Climate change, an epidemic of dead and dying trees, and the proliferation of new homes in the wildland urban interface magnify this threat and place substantially more people and property at risk than in preceding decades. More than 25 million acres of California wildlands are classified as under very high or extreme fire threat, extending that risk to over one-half the state.

(b) Certain populations in our state are particularly vulnerable to wildfire threats. These Californians live in communities that face near-term public safety threats given their location. Some residents in these areas are made further vulnerable due to factors such as age and lack of mobility. The tragic loss of life and property in the Town of Paradise during the 2018 Camp Fire demonstrates such vulnerability.

(c) While California has stringent building standards for new construction and requirements for the maintenance of defensible space in wildfire hazard areas, California must develop statewide options to encourage cost-effective structure hardening to create fire resistant homes, businesses, and public buildings within wildfire hazard areas and with a focus on vulnerable communities.

(d) It is the intent of the Legislature to offer financial assistance through a statewide program to communities for all-hazards in support of a comprehensive mitigation strategy and reduce or eliminate potential risks and impacts of disasters in order to promote faster recovery after disasters and, overall, a more resilient state.

(e) It is further the intent of the Legislature to develop a comprehensive financial assistance program to help property owners, whole communities and local governments retrofit existing housing, commercial, and public properties in wildfire hazard areas to a cost-effective standard that provides comprehensive risk reduction to protect structures from fires spreading from adjacent structures or vegetation, and to prevent vegetation from spreading fires to adjacent structures.

Ca. Gov. Code § 8654.2

Added by Stats 2019 ch 391 (AB 38), s 4, eff. 1/1/2020.

Appendix C

Example Performance Statement^[277] ^[278]

Fire service deployment, simply stated, is about the speed and weight of the response. Speed refers to initial response (first-due) of all-risk intervention resources (engines, trucks, and/or rescue ambulances) strategically deployed across a jurisdiction for response to emergencies within a time interval to achieve desired outcomes. Weight refers to multiple-unit responses (Effective Response Force or ERF) for more serious emergencies such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents. In these situations, a sufficient number of firefighters must be assembled within a reasonable time interval to safely control the emergency and prevent it from escalating into a more serious event.

For 90 percent of all fire suppression incidents, the total response time for the arrival of the first due unit, staffed with 3 firefighters and 1 officer, is: 8 minutes and 20 seconds in urban areas; and 10 minutes and 55 seconds in rural areas. The first due unit is capable of: providing 500 gallons of water and 1,500 gpm pumping capacity; initiating command; requesting additional resources; establishing and advancing an attack line flowing a minimum of 150 gpm; establishing an uninterrupted water supply; containing the fire; rescuing at-risk victims; and performing salvage operations. These operations are done in accordance with departmental standard operating procedures while providing for the safety of responders and the general public.

For 90 percent of all fire suppression incidents, the total response time for the arrival of the ERF, staffed with 15 firefighters and officers, is: 12 minutes and 17 seconds in urban areas; and 20 minutes and 43 seconds in rural areas. The ERF is capable of: establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the OSHA requirements of two in and two out; completing forcible entry; searching and rescuing at-risk victims; ventilating the structure; controlling utilities; and performing salvage and overhaul. The ERF for high and special risk fires is also capable of placing elevated streams into service from aerial ladders. These operations are done in accordance with departmental standard operating procedures while providing for the safety of responders and the general public.

Appendix D

NFPA 1710 Performance Evaluation Standards^[279]

4.1.2.5 Evaluations.

4.1.2.5.1 The Fire department shall evaluate its level of service and deploy delivery and alarm handling time, turnout time, and travel time performance objectives on an annual basis.

4.1.2.5.2 The evaluations shall be based on emergency incident data relating to level of service, deployment, and the achievement of each travel time performance objective in each geographic area within the jurisdiction of the fire department.

4.1.2.6 The fire department shall provide the AHJ with a written report annually.

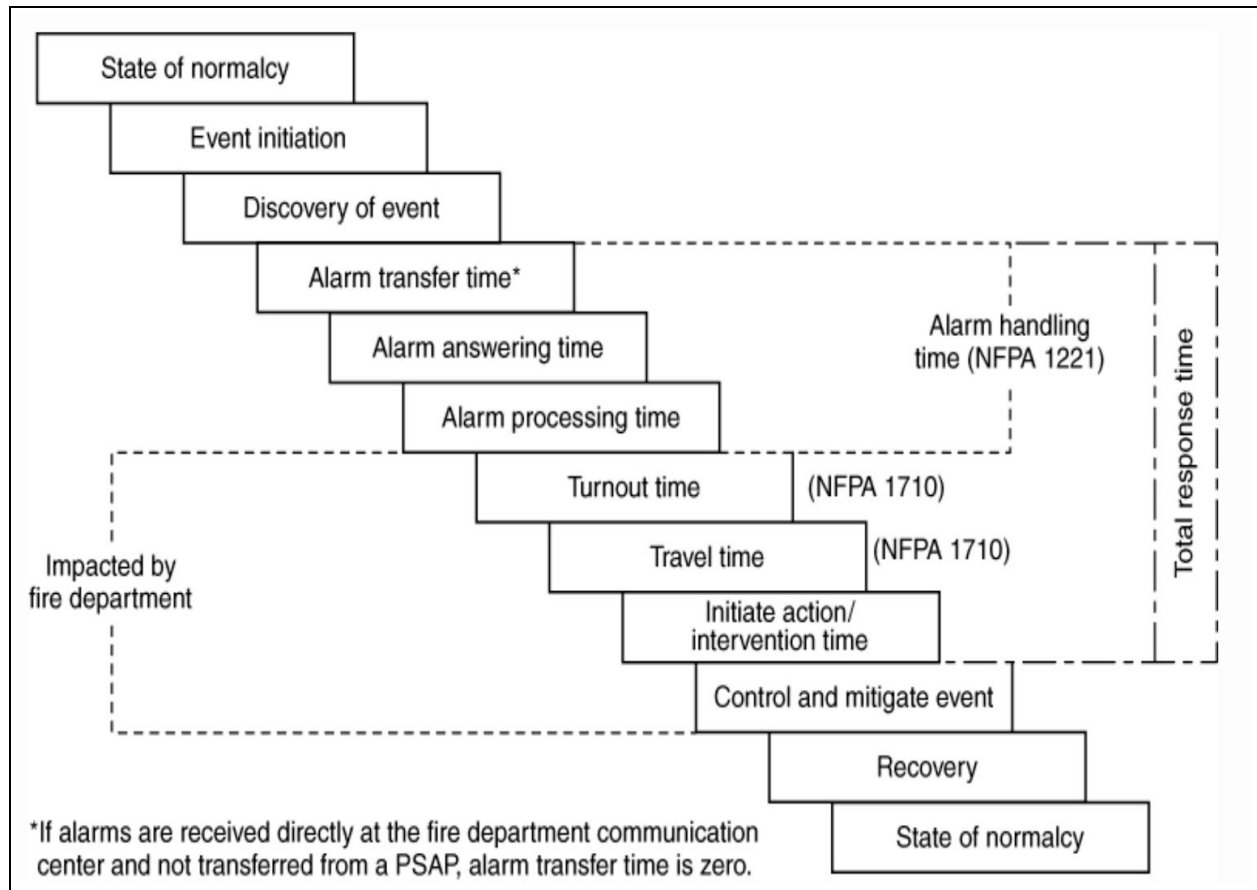
4.1.2.6.1 The annual report shall define the geographic areas and/or circumstances in which the requirements of this standard are not being met.

4.1.2.6.2 The annual report shall explain the predictable consequences of these deficiencies and address the steps that are necessary to achieve compliance.

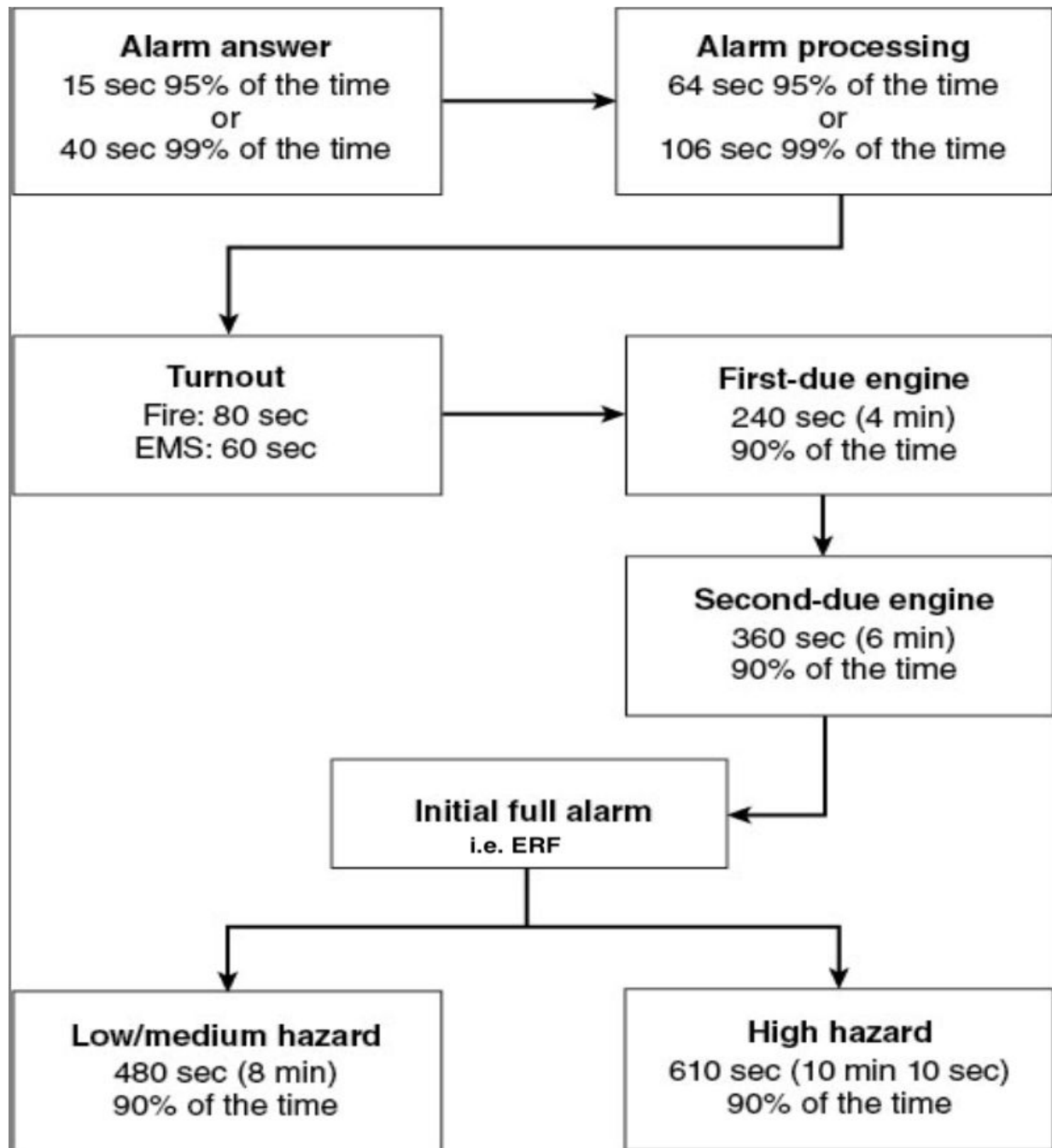
4.1.2.6.3 The annual report shall identify any deficiencies that are anticipated to develop in the next 3 years and address the steps necessary to continue to achieve compliance to this standard.

Appendix E

NFPA Standards End-to-End Response Time Events ^[280]




Appendix F
National Fire Protection Association 1710 Response Timeline^[281]



Appendix G

A Best Practice in Performance Tracking and Transparency: Los Angeles County Fire Department 2019 Statistical Summary^[282]

 <div> County of Los Angeles Fire Department <i>Fire Chief Daryl L. Osby</i> </div>			
2019 STATISTICAL SUMMARY			
FIRE DEPARTMENT — Three Year Data 2017-2019			
	2019	2018	2017
Acreage Burned	9,923	63,648	8,672
FIRE INCIDENTS			
Structures	1,937	2,304	1,912
Vehicles	1,611	1,716	1,821
Rubbish	2,679	2,659	2,705
Brush / Grass	780	759	724
Outside Storage	42	336	401
Misc. Property	60	800	752
TOTAL	7,109	8,574	8,315
EMERGENCY MEDICAL RESPONSES			
TOTAL	333,973	330,059	324,102
OTHER INCIDENTS			
False Alarms	26,954	23,887	23,370
Mutual Aid Provided	2,164	1,919	2,804
Haz-Mat	662	681	591
Misc. Incidents	28,119	27,752	35,403
TOTAL	57,899	54,239	62,168
TOTAL INCIDENTS	398,981	392,872	394,585
Fire Loss in Dollars 2017-2019			
	2019	2018	2017
Property or Structure	\$ 88,657,162	\$ 290,003,114	\$ 93,901,408
Vehicle Contents	\$ 20,319,296	\$ 22,270,615	\$ 18,675,078
Misc. Property	\$ 9,852,531	\$ 1,412,559	\$ 1,468,072
Total Dollar Loss	\$ 118,828,989	\$ 313,686,288	\$ 114,044,558
LIFEGUARD — Three Year Data 2017-2019			
	2019	2018	2017
Ocean Rescues	10,057	11,242	9,866
Medical Calls	14,849	15,646	16,687
Boat Rescues (Distress)	393	423	358
Missing Persons	758	1,046	1,170
O ₂ Therapy	110	155	241
Drownings	2	4	0
Beach Attendance	50,697,049	56,045,125	63,188,840

4,096,325 Residents
1,259,866 Housing Units
59 District Cities and all
Unincorporated Communities
~2300 Square Miles

DIVISION I
Battalions 7, 14 & 18 – 10 Cities
CARSON LOMITA
GARDENA PALOS VERDES ESTATES
HAWTHORNE RANCHO PALOS VERDES
HERMOSA BEACH ROLLING HILLS
LAWDALE ROLLING HILLS ESTATES

DIVISION II
Battalions 2 & 16 – 9 Cities
AZUSA DUARTE
BALDWIN PARK GLENDFORA
BRADBURY IRVINDALE
CLAREMONT SAN DIMAS
COVINA

DIVISION III
Battalions 4, 6 & 22 – 2 Cities
LA CAÑADA FLINTRIDGE SANTA CLARITA

DIVISION IV
Battalions 8, 9 & 21 – 12 Cities
ARTESIA LA MIRADA
BELLFLOWER NORWALK
CERRITOS PARAMOUNT
HAWAIIAN GARDENS PICO RIVERA
LA HABRA SIGNAL HILL
LAKEWOOD WHITTIER

DIVISION V
Battalions 11 & 17 – 2 Cities
LANCASTER PALMDALE

DIVISION VI
Battalions 13 & 20 – 6 Cities
CUDAHY LYNWOOD
HUNTINGTON PARK MAYWOOD
INGLEWOOD SOUTH GATE

DIVISION VII
Battalions 1 & 5 – 6 Cities
AGOURA HILLS MALIBU
CALABASAS WEST HOLLYWOOD
HIDDEN HILLS WESTLAKE VILLAGE

DIVISION VIII
Battalions 12, 15 & 19 – 5 Cities
DIAMOND BAR POMONA
INDUSTRY WALNUT
LA PUENTE

DIVISION IX
Battalions 3 & 10 – 7 Cities
BELL ROSEMEAD
BELL GARDENS SOUTH EL MONTE
COMMERCE TEMPLE CITY
EL MONTE