

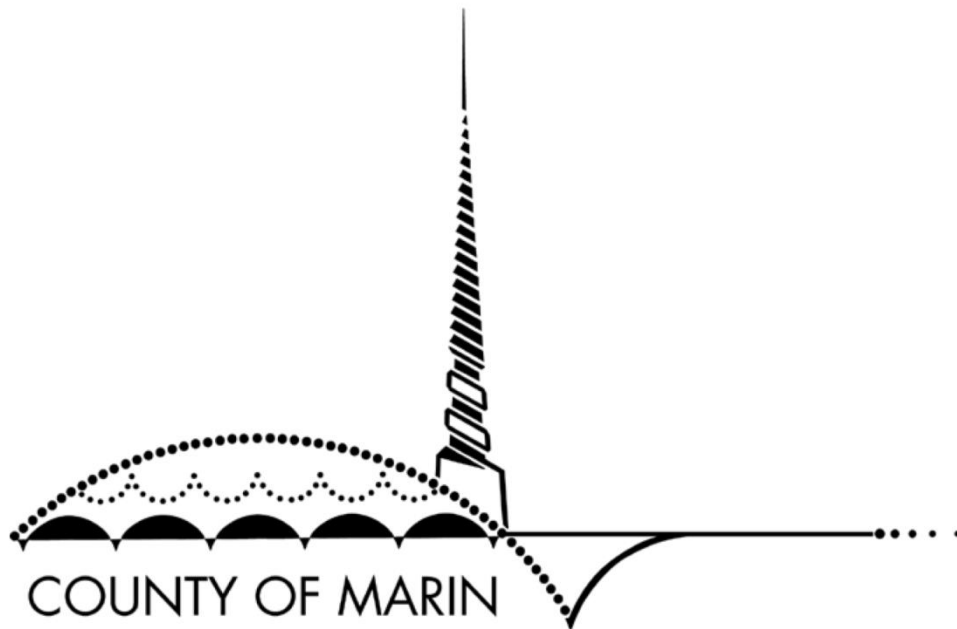
2018–2019 MARIN COUNTY CIVIL GRAND JURY

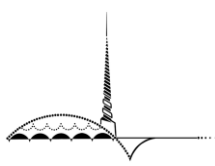
Wildfire Preparedness

A New Approach

Report Date: April 18, 2019

Public Release Date: April 25, 2019





Wildfire Preparedness: A New Approach

SUMMARY

Marin faces unprecedented danger to life and property from wildfire. The Grand Jury reviewed the conditions that make us vulnerable to wildfire, assessed the plans currently in place to correct them, and recommends a new approach to meeting these challenges. Four areas of vulnerability stand out:

Vegetation Management: Fuel conditions make Marin extremely vulnerable to wildfires. Through a combination of aggressive fire suppression and environmental policies, overgrown vegetation has created hazardous fuel loads throughout the county. The policies and procedures intended to manage and reduce vegetation are inadequate. Too few inspectors are available to determine compliance, and enforcement is too slow.

Educating the Public: The public's ignorance of how to prepare for and respond to wildfires makes Marin vulnerable. 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 the county's residents have not signed up to receive emergency alerts. Programs to educate the public for wildfire are not well known and are offered infrequently. The county's only organization assigned to educate the public about wildfires is understaffed.

Alerts: The two crucial emergency alert systems in the county have a flaw that restricts their reach. Both Alert Marin and Nixle, as opt-in systems, warn only those who have registered.

Evacuations: Evacuation planning is also a grave concern. Marin's topography creates great danger for those who live far from the main evacuation routes. Most connecting roads are narrow and overgrown. Some are constricted by traffic calming obstacles such as concrete medians, and bump outs which impede traffic in emergency evacuations. Plans to ease emergency traffic flow such as traffic-light sequencing and the conversion of two-way roads to one-way flow corridors are years away from implementation. Marin's roads lack the capacity for a mass evacuation in personal vehicles. Public transit is a neglected piece of evacuation preparedness and is underused. Inertia and complacency have prevented a proactive and nimble response to wildfire dangers.

The Grand Jury Proposes: The creation of a joint powers authority to coordinate a comprehensive, consistent approach to pre-ignition planning funded by a ¼ cent sales tax. This new approach will remedy the gaps in our preparedness and demonstrate our political will to improve wildfire safety in Marin.

INTRODUCTION

The conditions that made wildfire a distant and unlikely risk have now changed. Through a combination of new weather patterns, aggressive suppression of natural wildfires, and pro-vegetation environmental policy, Marin has become extremely vulnerable to devastation from wildfires.

We are living in a powder keg.

Marin's first responders are highly trained and dedicated specialists who excel in fighting fires. Mutual aid among fire agencies and disaster coordinators operates seamlessly, and countywide agencies meet regularly to discuss pre-ignition (before a fire) and pre-suppression (before a fire is extinguished) preparation. However, there are significant disparities among fire districts in the policies applicable to vegetation management, education of the public, evacuations and use of sirens.

Considering Marin's current state of preparedness, citizens should not assume that first responders will be able to save them from the horrors of a wildfire like those experienced during Butte County's Camp Fire. The deadly threat of fire creates an urgent need for new policies for wildfire preparedness which must be implemented without delay. These policies and practices must be made a top priority to ensure the public's safety.

Marin County has been warned repeatedly that it stands one spark away from a major conflagration, but many of the county's governments continue to conduct business as usual. Uncoordinated pre-ignition planning, jurisdictional rivalries, and a glacial pace for implementation of improvements has left the public in grave danger.

This report argues for a change in civic culture and suggests a mechanism to address many of the inadequacies in wildfire preparedness. The Grand Jury recommends the creation of a countywide umbrella agency to fund, coordinate and lead pre-ignition and pre-suppression planning.

METHODOLOGY

To prepare this report, the Grand Jury:

- Interviewed county officials and fire chiefs.
- Interviewed individuals in law enforcement, arboriculture, emergency planning, wildfire education, public advocacy, transportation, and public transit.
- Surveyed current fire preparedness procedures and practices.
- Reviewed newspaper articles.
- Examined websites.
- Studied wildfire and firefighting blogs.
- Reviewed emergency alert platforms.
- Researched emergency transportation studies.
- Considered previous Grand Jury wildfire reports.
- Visited 2017 and 2018 wildfire sites in Sonoma and Butte Counties.

DISCUSSION

Vegetation Management

The danger of a catastrophic wildfire in Marin exists in part due to vegetation management policies. Approximately 60,000 acres fall within the wildland urban interface (WUI), where residences are intermixed with open space and wildland vegetation. The Marin County Fire Department estimates there are upwards of 69,000 living units valued at \$59 billion within this area, which borders virtually every city and town in Marin. While vegetation management is critical throughout the county, its importance is elevated in areas where homes and residences are within the WUI.¹

Photographs of Marin County in the first half of the 20th Century reveal a landscape of open grassland with a smattering of trees and bushes. When the Golden Gate Bridge opened, many new homes were built, and more vegetation was planted. Marin now consists of homes, businesses, and shopping centers surrounded by densely overgrown vegetation. This overgrowth constitutes an enormous hazard that could fuel a firestorm and devastate our communities.

¹ Weber, Jason and Neill, Christie. "[2017 Marin County Unit Strategic Fire Plan & Community Wildfire Protection Plan \(CWPP\)](#)", Section 1.0. Accessed 12 Sept. 2018.



View from Mt. Tamalpais in days gone by (top) and today 2019. (Bottom photo: Eileen Alexander)

Overgrown vegetation also threatens Marin’s roads and evacuation routes. It narrows these escape routes, many of which will be impassable in a wildfire. As happened in Paradise, panicked Marin residents may try to flee only to find the roads impeded by burning vegetation, fallen trees, downed power lines, and stalled cars with melting engine blocks.²

² St. John, Page, Serna, Joseph, and Lin II, Rong-Gong. [“Here’s how Paradise ignored warnings and became a Deathtrap.”](#) *LA Times*. 30 Dec. 2018.



Burned Cars and Melted Aluminum from Engine Block Caused by Extreme Heat in Camp Fire, November 2018. (Jane Tyska/Bay Area News Group) *The Mercury News*. Published Nov. 13, 2018.

Overhanging trees, thick underbrush, and vegetation that have grown too close to structures also pose serious threats. First responders will bypass evacuated homes that are overgrown by vegetation. Instead, they will move on to homes that have defensible space rather than attempt to save a structure that has none.

Facts:

1. The federal government and the State of California own thousands of acres of ungroomed open space in the county.
2. The Marin Municipal Water District owns approximately 21,500 acres of wildland³ and has been clearing only 30 acres per year.⁴
3. Marin County Open Space District owns approximately 16,000 acres of wildland, but only about 10% are managed to reduce fire hazard annually.⁵
4. According to the Marin County Assessor's Office, approximately 4,400 vacant lots are in the county. They are usually not well maintained, or maintained at all, and as a result are dangerously overgrown, often with pyrophytic (fire prone) plants.
5. The vegetation management policies and practices by the county fire departments and districts are not uniform.

³ ["About MMWD,"](#) *Marin Municipal Water District*. Accessed on 14 Mar. 2018.

⁴ Spotswood, Dick. ["Challenge becomes clear in visit to MMWD watershed."](#) *Marin Independent Journal*. 25 Sept. 2018.

⁵ Korton, Max. ["2016-17 Annual Report."](#) *Marin County Parks and Open Space*. p. 3. Accessed 6 Mar. 2019.

6. The number of dedicated vegetation inspectors, who are also trained firefighters, varies significantly from one department to another. For example, the largest fire department, the County of Marin, has two chief officers, two captains, two part-time inspectors, and four to six seasonal defensible space inspectors. In contrast, many smaller departments cannot dedicate even a single firefighter to full-time inspection duties.
7. The number and frequency of vegetation/defensible space inspections vary significantly among jurisdictions.
8. Jurisdictions differ regarding the vegetation that is or should be banned. For example, San Rafael requires but fails to enforce the removal of juniper and bamboo as they are considered pyrophytic plants, but most cities and towns have no list of prohibited plants.
9. In residential communities, the lack of vegetation inspectors requires some departments to conduct only “windshield” inspections, where engine crews drive through neighborhoods looking for obvious violations that can be seen from the street, often missing hidden hazardous conditions.
10. Where hazardous conditions are observed and corrective notices are issued, jurisdictions rarely have the resources to follow-up and confirm the violations have been remedied.
11. The formal procedures to take action against code violators vary from one jurisdiction to another and none provide a streamlined process that will accomplish corrective actions in a timely manner.
12. Vegetation management is a repetitive task that needs to be performed at least annually; it requires clearing underbrush, mowing grass, limbing-up trees and disposing of dead matter.

Two charts summarizing current vegetation management practices in all of Marin’s fire jurisdictions are attached as Appendix A.

Educating the Public

Another essential issue is education of the public. To reach everyone in every neighborhood the number of Firewise Communities should be expanded through the efforts of Firewise USA™ and FIRESafe Marin. These two organizations support Marin County neighborhoods to reduce wildfire risks by educating and motivating citizens to mitigate hazards and prepare for a wildfire disaster.

Firewise Communities are neighborhood groups certified by Firewise USA, a national organization that teaches people about the risk of wildfire and encourages neighbors to take immediate action to protect their homes and improve their safety through neighborhood-wide collaboration. Communities develop plans that guide their risk reduction activities and develop collaborative efforts for neighbors to work toward building a safer place to live. Marin already has over 30 Firewise Communities.

FIRESafe Marin is a local non-profit information organization dedicated to wildfire risk prevention and increasing fire-safety awareness in Marin County. This organization provides education, resources, tools, and on-going support for neighborhoods to form Firewise Communities.

FIRESafe Marin also provides information and literature to the *Fire in Marin!* program that is held each wildfire season. Only a single volunteer delivers the *Fire in Marin!* program thereby limiting the number of sessions and attendees. In addition, there are a number of emergency preparedness programs offered, most of which cover all disasters, not exclusively wildfire. These are delivered by volunteers or fire departments. Most public education sessions have been notable for the predominance of older residents and the paucity of parents of young children.

Even if all local fire jurisdictions in Marin were to act together, more personnel would be needed to make sure everyone gets the message and gets prepared. This must be done at a grass roots level. Marin Firewise Communities have shown that they can generate much more neighborhood participation and preparation than public agencies are able to do. In order to involve all neighborhoods, FIRESafe Marin needs to expand its staff and activities from its one current part-time employee.

Education of the public is essential to enable Marin residents to reduce damages and destruction, to escape wildfire, and to survive. Educating and informing the public requires complete disclosure. This includes posting all possible evacuation routes and other exits including stairs, paths, fire roads and shortcuts. It also includes making all appropriate geographic information system maps easily understandable so residents can see and evaluate their own individual properties and situations regardless of possible commercial misuse by the insurance industry or others. By providing all information, emergency planners will enable people to make the best decisions for their own safety and survival because people cannot rely on being protected and rescued in a large emergency.

Wildfire is Coming: Are We Ready?

Ultimately, to be prepared for wildfire, everyone must take responsibility for their own property and join their neighbors to build strong, fire resistant communities. We must shake off apathy, get informed, and act.

Citizens have to ask themselves, “Am I ready and do I know what actions to take?”
For example, have I...

1. Created defensible space around my home?
2. Hardened my home against ember showers?
3. Discussed evacuation plans with my family?
4. Identified two exit routes from my neighborhood?
5. Stocked emergency supplies to last 72 hours?
6. Signed up for all emergency alerts?
7. Packed a go-bag?

If the answer to any of these questions is no, our safety authorities have failed to meet their obligation to educate and convince the public, or our citizens have failed to incorporate their message. Prompt action is needed while there still is time to prepare.

Facts:

1. Public education on wildfire preparedness is delivered inconsistently via websites, email, and in person in neighborhoods, homes, pop-up meetings, and classes.
2. County wildfire education policies are not consistent across towns/cities nor is the application of those policies.
3. Marin has 30 plus Firewise Communities which encourage neighbors to help neighbors to prepare for emergencies.
4. Only about 10% of Marin residents are signed up for Alert Marin.
5. Only a small percentage of Marin's citizens have attended a wildfire safety preparation meeting.
6. FIRESafe Marin has only one part-time employee to educate the entire county.
7. Emergency preparedness information is occasionally offered by CERT, Get Ready Novato, Neighborhood Response Groups, Fire in Marin!, FIRESafe Marin, FireWise Communities and fire departments.
8. There are no other countywide government sponsored programs that cover wildfire preparation.
9. Few residents take advantage of home visits provided by fire departments to assess their properties' vegetation and fire hazards.

Two charts summarizing current programs to educate the public in the county are attached as Appendix B.

Alerts

When a wildfire starts, emergency managers implement a number of alert systems to protect the public. It is critical that those in the path of a deadly wildfire receive accurate and timely information. The effectiveness of these warnings depends on the reliability of all alert system technologies and their rapid implementation through the emergency command structure.

Alert Technologies and their Weaknesses

Marin County has overlapping alert systems, which can be implemented for emergency events. Such redundancy is important as no single system will reach all residents at all times. Emergency managers use the Emergency Alert System, Wireless Emergency Alerts, Alert Marin, Nixle and, in some fire districts, sirens. In addition, emergency services use television and radio bulletins, and social media such as Facebook, Twitter, Nextdoor, and Instagram to inform the public. As a last resort, law enforcement personnel and fire fighters may go door to door or use loud speakers to deliver evacuation orders.

Emergency Alert System is used for catastrophic events. It is a national warning system, but state and local authorities can use it to deliver local emergency information. It reaches

the public via broadcast, cable, satellite, and wired communications pathways. However, if power is lost or the devices are switched off, the alert fails.

Wireless Emergency Alerts (WEA) is a system that employs “push notification” alerts. It reaches mobile devices by geographically targeting cell towers in a certain area. It sends text-like messages that warn of imminent threats to safety in the area. WEA does not require telephone subscribers to sign-up.

The disadvantage of the WEA system is that it is geographically imprecise. The message can “bleed over” to those who drive in and out of a cell tower’s range so it can reach more people than the intended recipients of the warning or evacuation order. Because of this, emergency officials hesitate to use it, as was the case in both the Tubbs Fire in 2017 and, again, in the Camp Fire in 2018. Recent history has shown that early use of WEA might be less dangerous, even if too many people are notified, than the risk of using it too late. Despite its over-reach, it offers at least a chance of escape to those in danger. If WEA is used too early and too many people receive an evacuation notice, at worst, it will provide a real-time, full scale evacuation drill for those involved even though it might strain evacuation routes.

Additionally, cell tower locations are proprietary information and therefore emergency officials cannot be sure when sending out a WEA that the information will be transmitted to exactly the right geographic location. Emergency planners discovered that in the East Bay, an emergency alert was issued to a specific location and after the event it was revealed that the alert had not gone through because no cell towers were in the targeted geographic area. Further, alerts only reach WEA compatible cell phones that are turned on, that are within range of an active cell tower, and whose wireless provider participates in WEA.

Significantly, in the context of wildfires, WEA are also vulnerable to failure because if cell towers and power lines are destroyed, phone contact will be lost, and alerts will fail.

Alert Marin is the most precise way to target those populations that need to be warned of danger. It is considered to be the first-tier emergency notification system for the county. It reaches land lines, and for those who register, cell phones, email, and VOIP (Voice Over Internet Protocol) connections. Alerts are sent to individuals who are registered to specific postal addresses and contain vital, but short, instructions such as *shelter in place*, *prepare to evacuate*, or *evacuate now*. These directives remain in effect until the situation changes. Alert Marin keeps leaving messages until the recipient responds.

Alert Marin is designed to provide messages to the public using pre-written templates, so its directives are terse, inflexible, and not explanatory. Consequently, after a recent fire event on Mt. Barnabe in Marin, fire officials were told that some recipients were

confused because the information conveyed was so brief or not updated as the situation unfolded.

Alert Marin is an opt-in service that only reaches those who have signed up. The fact that it is not opt-out is a significant weakness. The Marin Office of Emergency Services (OES) estimates that only about 10% of Marin residents are registered with Alert Marin.

In addition, like WEA, Alert Marin is vulnerable to cell tower damage and therefore its communications may fail to reach people in the path of danger.

Nixle sends out a text messages to smartphones. It reaches an entire zip code. Messages are sent from different safety authorities to inform the public of local conditions such as roadwork, accidents, weather, and other events. Emergency officials find Nixle a useful and flexible means of transmitting warnings and updates in dynamic situations. It is hard to track how many people subscribe to Nixle because it is a zip code-based registration system with multiple zip codes easily added by one phone subscriber. Emergency planners believe that a low percentage of Marin's residents are signed up for Nixle.

A disadvantage of the Nixle system is that people might develop "Nixle fatigue." They may stop reading their texts because Nixle is used by so many different agencies and alerts are sent so frequently, including situations that they don't consider dangerous or relevant.

Another disadvantage is that Nixle, as with Alert Marin, is an opt-in system and that it is vulnerable to failure when communications systems are overwhelmed or when cell towers go down.

Sirens do not depend on wireless technology and therefore they are less likely to fail at the same time than other alert systems. Their disadvantages are that sirens cannot be heard everywhere or by all people and they do not convey specific information unless they have a voice communication system attached such as a Long Range Acoustic Device (LRAD).

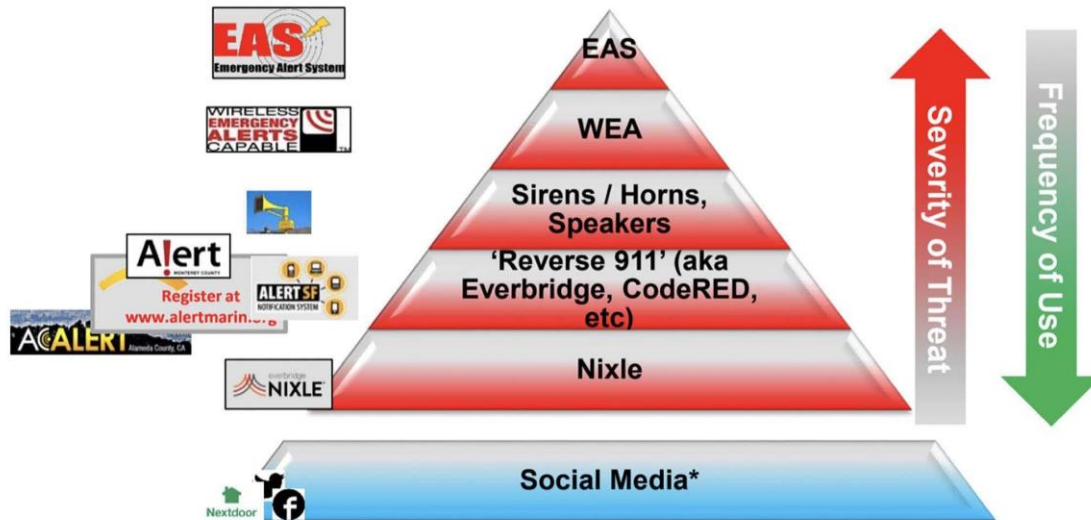
Social media are useful but also subject to cell tower failure. Also, social media cannot reach those who are not online.

Radio and TV bulletins are reliable because they are independent of cell towers and they operate on different frequencies in the wireless spectrum. Radio and TV, however, require power and access to equipment. To serve as a reliable alert system such devices must be on at all times.

Megaphones are used when all else fails. Police and firefighters drive through neighborhoods to warn residents with loud speakers and horns. They also may knock on

doors to announce an evacuation. While these methods are highly effective, they are time consuming, dangerous, waste skilled manpower and provide the least amount of advance notice.

Mass Notification Landscape



Woody Baker-Cohn, Emergency Services Coordinator, Marin County Sheriff's Office of Emergency Services

Having multiple alert systems is essential to reach the greatest number of residents who are in the path of fire danger. No single system is adequate because at some point, each is vulnerable to failure when put to the test. However, designing a warning system that requires the public to sign-up and then failing to advertise adequately its existence, fails to meet even minimum standards of emergency preparedness and common sense.

Evacuations

Having alerted the public to danger, the next step is to evacuate large groups away from an oncoming wildfire. Evacuations will be difficult; they have not been well planned or practiced. Evacuations in Marin will be chaotic, and could be deadly, during a wildfire.

Evacuation Dangers and Concerns

The geography of Marin County is varied and most of the county is open space, much of which has become dangerously overgrown. The majority of Marin's population is concentrated along the Highway 101 corridor. Access from residential neighborhoods to the freeway is usually crowded, through narrow corridors, and often deliberately constricted. Some smaller communities in West Marin are situated along Highway 1, Sir Francis Drake Boulevard, and Novato Boulevard, the county's main east/west routes. These roads, and Highway 37, would be main evacuation routes to or from Highway 101 to escape a wildfire. None of these arteries is designed to accommodate mass evacuations.

About 69,000 homes in Marin are in the WUI.⁶ Due to surrounding vegetation and proximity to wildlands these areas are considered to be at greater risk of wildfires. In the WUI, many residential communities are in steep, box canyons with only one entry or exit road. Houses built on hills are frequently connected to safety only by narrow, winding roads that lack shoulders and have a steep drop to one side. Roads in these areas also snake through hills covered by dense vegetation. The topography and overgrown vegetation of the county makes us vulnerable to catastrophic evacuation failures.

Indeed, all areas in Marin are vulnerable to wildfire and evacuation failure no matter whether they are situated inside or outside of the WUI. Those shown on the county's fire hazard severity zone maps to be located in low fire risk areas are also vulnerable.⁷ Ember showers and fire tornadoes are frightening characteristics of recent, devastating fires. In wind driven wildfires, embers travel miles ahead of the flame front, igniting new fires. For example, Coffey Park in Santa Rosa is not in the WUI; it abuts Highway 101 and was totally destroyed by the Tubbs Fire. In fact, fire authorities are beginning to consider hazard projection maps misleading because people rely on them mistakenly believing that they are safe.⁸ No neighborhood can consider itself immune to the ravages of wildfire and difficulties in evacuating.

Evacuations in the Camp Fire proved deadly. Poor vegetation management on both sides of the evacuation routes created fuel loads that sent temperatures to over 1500 degrees. This intense heat melted tires and wheel rims, and many newer cars simply ceased to operate when their air intake temperature sensors detected extreme heat. Roads were blocked with abandoned cars, fallen trees and downed power lines, which led to panic -- creating a lethally dangerous situation for those attempting to escape the fire. A number of people died in their cars while attempting to evacuate.⁹

⁶ ["Updated Wildfire Protection Plan OK'd by Board."](#) *County of Marin*. Accessed on 22 Feb. 2019.

⁷ ["Wildland Hazard & Building Codes: Fire Hazard Severity Zones Maps."](#) *Cal Fire*. Accessed on 13 Mar. 2019.

⁸ Pera, Matthew. ["Marin firefighters uneasy about state's risk maps."](#) *Marin Independent Journal*. 6 Jan. 2019.

⁹ Krieger, Lisa and Debolt, David. ["Camp Fire: Paradise residents say they received no mass cellphone alerts to evacuate, or to warn of fires - Residents learned late of the danger --then faced gridlock."](#) *The Mercury News*. Nov.18, 2018.



Burned Cars and Downed Power Lines Block Pearson Road in Paradise, California, on Saturday, Nov. 10, 2018. (Jane Tyska/Bay Area News Group) *San Jose Mercury News*, November 17, 2018.

The Grand Jury visited Paradise in January 2019 to view the disaster. See Appendix F to this report, which compares Paradise’s wildfire preparedness before the Camp Fire with Marin’s current state of preparedness.

Marin County has failed to manage its vegetation adequately and its evacuation routes are narrow and overgrown. The public is not sufficiently prepared or drilled in evacuation procedures and first responders cannot handle evacuation events with the speed and scale required by the new, routinely occurring megafires. Even when drills are practiced, they occur on a small scale, using unblocked roads, with clear information and no panic (See Appendix E). The mass movement of populations in an unpredictable, dynamic emergency needs meticulous planning. Fire departments work with law enforcement to manage evacuations and neither may be able to muster sufficient personnel to handle it.

The staffing of emergency personnel in Marin is a matter of concern. According to the Grand Jury report in 2011, only 20-30% of first responders live in the county.¹⁰ That number is likely to be even lower now. Considering how fast a wildfire travels and how few police and firefighters would be on duty to handle a sudden threat, the county’s reliance on a prompt response from non-resident, reserve and off-duty personnel is unrealistic. They could be delayed for hours because of road damage or congestion, if they even arrive at all.

¹⁰ [“Disaster Preparedness in Marin: Are You Ready?”](#) *Marin County Civil Grand Jury*. 21 June 2011, p.1.

Marin's narrow roads cannot all be rebuilt, but existing, wider roads and those that are major evacuation routes should not be narrowed or impeded. Some roads now have obstacles such as concrete medians, sidewalk bump-outs, lane reductions, speed bumps and other "traffic calming" techniques, which will significantly hinder evacuations. The lethal danger these obstacles create outweighs the benefit a community achieves by reducing the "expressway feeling" that busy roads give to a pleasant town. The possibility of a mass evacuation now rises to a significant daily risk in the fire season; constricting already inadequate roads seems reckless.

Plans to ease the flow of traffic along existing evacuation routes are far from ready. The use of traffic-light sequencing which could be used to improve the speed and flow of traffic along evacuation routes such as Sir Francis Drake Boulevard are being discussed, but implementation is years away. Other roads that might be suitable for this life-saving innovation have not yet been considered.

Additionally, contraflow arrangements, making two-way roads into one-way thoroughfares, is essential to move people more swiftly. Contraflow can increase the directional capacity of a roadway without the time or cost required to construct additional lanes. However, contraflow procedures have not yet been developed or tested for the county's main evacuation routes.

No traffic studies have been performed to determine how long a mass evacuation would take for an entire community. Consequently, comparing the time a mass evacuation on available exit roads would take with the duration of an evacuation on contraflow routes and routes with sequenced traffic lights, has not been considered in evacuation planning. These omissions put the public at grave risk. They will make mass evacuations along Marin's inadequate roads a predictably terrifying, if not deadly, event.

Use of Transit in Evacuations

Finding that plans for residents to evacuate in their own vehicles down Marin's narrow roads has not been adequately addressed, the Grand Jury examined the county's plans to use public transit to ease congestion along routes that cannot or will not be improved, straightened or enlarged.

A vital part of evacuation planning in Marin County should involve the participation of public transit. In the Tubbs fire, a memory care facility was evacuated by bus drivers who, on their own initiative, drove to the facility and rescued the residents.¹¹

Public transit is an underused resource for evacuations. It must be included in emergency planning because buses can carry numerous passengers who otherwise might be trapped. Marin residents who do not have cars cannot simply drive away from a wildfire, yet planners have not identified how many non-drivers would need rescue.

¹¹ McCallum, Kevin. "[Santa Rosa bus video shows harrowing Tubbs fire rescue.](#)" *Santa Rosa Press Democrat*. 5 Jun. 2018.

A major national report by the Transportation Research Board of the National Academies found that transit should be involved in both planning and implementation procedures of an emergency evacuation. It specified that “transit agencies should be part of preparedness plans and represented in the emergency command structure. They can also play a vital role during the response phase, in both helping to evacuate those without access to a private vehicle and bringing emergency responders and equipment to the incident site.”¹²

Additionally, other emergency transportation preparedness studies reviewed by the Grand Jury make it clear that for an orderly evacuation, large populations cannot be moved without transit being fully represented in the chain of command in an emergency operations center (EOC).^{13 14} In Marin’s EOC, transit is only represented by Marin Transit. Golden Gate Transit emergency managers, SMART representatives, Whistlestop, Marin Airporter and ferry operators do not have a seat in the room. The current arrangement is that Marin Transit will keep Golden Gate Transit and the other transit agencies informed and on standby. This places most transit agencies too far from the emergency command structure in the operations center and will lead to unnecessary delays as information has to be relayed to and from these other agencies before any assets can be deployed.

These emergency transportation studies indicate that an evacuation using public transit requires real-time communication between transit operators and emergency managers prior to and during emergency evacuations. This entails integration of communications within a transit system, among different transit agencies and between transit and other governmental safety partners. Currently, Marin’s transit communications fail to meet these standards.

Transit communications are not properly integrated into the Marin Emergency Radio Authority (MERA), a multi-agency communications system. In 2014, a special parcel tax was passed to fund MERA’s Next Generation radio equipment, a system that was intended to improve its interoperability and integrate emergency communications services into a unified system. Despite this, units in the field of both Golden Gate Transit and Marin Transit still cannot communicate directly with each other, with other transit agencies or with other mutual aid safety partners and first responders to coordinate emergency activities because the new equipment has not yet been installed. It is expected that the new system will be up and running by 2023. This failure impedes the county’s ability to deploy transit services and help evacuate large populations in an emergency.

Judged on both criteria of integration with the command structure and fully integrated communications, transit is an underused resource of evacuation preparedness in Marin.

¹² [The Role of Transit in Emergency Evacuation, Transportation Research Board of the National Academies Special Report 294, Transportation Research Board 2008, p.3.](#)

¹³ Schwarz, Michael A. and Litman, Todd A. “[Evacuation Station: The use of Public Transportation in Emergency Management Planning.](#)” *ITE Journal on the Web*. Jan. 2008.

¹⁴ Scanlon, J. “[Transportation In Emergencies: An Often Neglected Story.](#)” *Disaster Prevention and Management*. Vol. 12, No. 5 2003.

Impediments to Progress

Much could be done to greatly improve Marin's wildfire preparedness in all the areas mentioned above were it not for public and private inertia, governmental distrust of the public, and instances of bureaucratic complacency. In the face of wildfires' unprecedented threat, our political culture must change. We must prioritize public safety now. We need to adopt a new wildfire safety ethic.

In the last twenty years, the Marin County Civil Grand Jury has issued five reports on the dangers of wildfire and the importance of being prepared; the most recent was released in 2013. County elected officials overseeing multiple departments and agencies have been required to read and respond to the reports' recommendations. Although summaries have been published in the *Marin Independent Journal* and other publications, not enough has been done publicly or privately to improve countywide preparedness.

In some cases, local government does not trust the public. It "spins" information to avoid an adverse public response. Government officials and first responders would like the public to believe that all evacuation routes have been cleared of roadside vegetation, all designated access and egress roads are accessible and passable, and that traffic congestion can be handled by police officers who will be in place at critical intersections. The public would be mistaken to believe this.

Emergency planners in many jurisdictions do not publicize all possible evacuation routes and other exits including stairs, paths, fire roads and shortcuts because they think that wildfires are too dynamic and unpredictable. They fear that residents will focus on a predetermined route even though changing conditions might make that route unfeasible. Withholding information prevents people from planning ahead for their own evacuation or improvising as circumstances change. It is precisely the unpredictability of wildfire that makes it essential that all possible escape routes be known well in advance. Only if they understand all the options can residents make well-reasoned decisions in unforeseen circumstances. The public needs to be protected from wildfire, not from knowledge.

Studies have shown that to build public trust, those in authority positions must be open.¹⁵ Trust affects evacuation behavior in emergency situations and is vital to avoid panic. To gain the public's trust, emergency planners must trust the public, keep them fully informed and explain the limits of their ability to help the public in an emergency. Governments must make it clear that alerts might fail and evacuations, if possible at all, will be dangerous, unpredictable and slow. If the public understands that nothing is being hidden, they will make preparations for themselves, trust that the information provided to them is both accurate and as complete as possible and respond to an emergency order without delay or panic.

¹⁵ Drury, John and Cocking, Chris "[The Mass Psychology of Disasters and Emergency Evacuations: A Research Report and Implications for Practice](#)" *Department of Psychology. University of Sussex.* March 2007.

The Transportation Authority of Marin (TAM) is an example of bureaucratic complacency and evasion of responsibility. TAM's job is to oversee the use of its 2004 sales tax money with a "single goal: [i]mprove mobility and reduce local congestion for everyone who lives or works in Marin County by providing a variety of high quality transportation options designed to meet local needs." Also, improving Marin's roads and preventing evacuation congestion fits squarely with the provisions of TAM's new 2018 Expenditure Plan which requires it to spend Measure AA dollars to, among other things, "[m]aintain, improve, and manage Marin County's local transportation infrastructure, including roads ... to create a well-maintained and resilient transportation system" and to "[m]aintain and expand local transit services."¹⁶ Despite this, TAM has not involved itself in planning for mass evacuations, or to improve the county's roads, evacuation routes, and other emergency infrastructure for large scale emergencies. The Grand Jury was unable to determine why this is so since TAM's authorizing legislation allows it to perform these functions.^{17 18}

Further, citing concerns about liability, TAM has been resistant to even convening a discussion to address evacuation congestion planning. Although it administers a "Safe Routes to School" program to reduce congestion, TAM claims that making routes safe from fire is not within its power or responsibility. Would not addressing evacuation planning and procedures "improve mobility and reduce congestion" for Marin residents and workers escaping wildfire? Bureaucratic inertia and the shirking of responsibility are dangerous to everyone.

Another instance of potentially devastating complacency concerns the fact that both Alert Marin and Nixle are opt-in. Having estimated that only about 10% of Marin residents are registered with Alert Marin, and most likely the same with Nixle, the OES and other county officials should not be content with this dismal number. To date, little effort has gone into increasing registration with a public information campaign: no media blitz, bus advertisements, billboards, mailers or public service announcements. The fact that the vast majority of the county cannot be reached by its two most important warning systems should be of urgent concern.

However, the Grand Jury considers that a public information campaign, even if implemented, would still be inadequate for public safety. The OES should facilitate the inclusion of all Marin citizens into Alert Marin and Nixle to make them opt-out systems. Both should have a database containing residents' contact information. This information can be obtained from a variety of sources. Let those with privacy concerns opt-out. This is a matter of life or death for the ninety percent of Marin residents who are not registered.

County and local governments cannot afford to manage vegetation. Property owners must be responsible for doing much of the work. Despite this, county and local officials have made little effort to impress upon property owners that their safety depends on individual action. Few

¹⁶ "[Transportation Authority of Marin 2018 Final Expenditure Plan](#)." Accessed on 15 Mar. 2019.

¹⁷ "[California Public Utilities Code](#)", Division 19, Chapters.1-6, Sections 180000-180264.

¹⁸ Resolution No. 2004-21. *Marin County Board of Supervisors*. 2 Mar. 2004.

programs or subsidies are offered. Our local politicians reliance on public participation without adequate public outreach and education is a poor response to mitigating a significant hazard.

This slipshod approach to public safety seems to rely more upon the hope for good luck than it does on rigorous planning. Appendix E to this report lists what a former Federal Emergency Management Agency Administrator describes as the seven deadly sins of emergency management - each one can be found in Marin's plans. Why do we have inconsistent vegetation management, inefficient fire code enforcement procedures, and spotty public education? Where are our best thinkers and planners? What is every government agency doing to protect the public from the catastrophic dangers we now confront? Our priorities and attention are elsewhere.

Despite the laudable efforts of Marin's fire chiefs to create a bold new approach to pre-ignition and pre-suppression issues, other entities such as city councils, transportation agencies, environmental groups, regional/urban planners, and land-use activists are not addressing the wildfire risks that climate change has brought to our daily lives. Environmental activists discourage vegetation removal and controlled burns, elected officials allow development in the WUI and choke evacuation routes with obstacles.

These policies reflect an old reality and old thinking. The environment, housing, and traffic calming efforts are important, but the consequences of these policies are not being reviewed or modified to address the new hazards created by wildfire. Wildfires ravage the environment; they create massive air quality issues, toxic waste, mass destruction, and most importantly, they cause death. Whether through lethargy, indifference or inflexible thinking, many policy makers, emergency planners, and government agencies do not prioritize wildfire safety, nor do they seem willing or able to act nimbly to forestall an impending disaster.

Two charts summarizing current countywide evacuation and alerts issues are attached as Appendix C.

CAMP FIRE

Worst air on Earth

State urged to take steps to protect public



Air Quality During the Camp Fire. Marin Independent Journal dated November 17, 2018.
(Risberg, Eric. Associated Press)

CONCLUSION

Proposed Umbrella Entity

In response to its pre-ignition and pre-suppression planning concerns, the Grand Jury proposes the creation of a countywide entity whose purpose would be to coordinate fire preparedness throughout the county regardless of the political jurisdiction. This proposed umbrella entity (the “Entity”) would not propose to interfere with actual fire-fighting issues nor would it attempt a countywide consolidation of fire departments or districts. Its mission would be to focus on pre-ignition and pre-suppression issues only.

Proposed Powers

The countywide Entity would have authority to investigate, create, propose, and carry out programs and processes in the following areas:

1. **Vegetation management:** Create a countywide group of at least 30 plus full-time vegetation management inspectors with authority granted by each constituent jurisdiction to inspect property throughout the county regardless of the city/town or county where the property is located. The inspectors would be authorized to issue citations to enforce countywide protocols established by best practices for safe vegetation management. The Entity would create uniform enforcement of vegetation management citations as well as develop an expedited legal process akin to the process currently used in civil courts for evictions. This would ensure prompt compliance with citations. If the creation of this accelerated enforcement procedure requires state legislative action, the Entity should lobby the California legislature for these changes.
2. **Fuel Reduction Crews:** Create sufficient fire/fuels crews whose sole responsibilities would be to work on reducing the fuel load starting with the highest fire risk areas.
3. **Education:** Engage in public outreach and education either through dedicated staff or by subcontracting with FIREsafe Marin.
4. **Alerts and Evacuations:** Develop countywide best practice policies for alert notification systems and evacuation route planning, including the possible use of new technology, such as the LRAD system, as well as working with public transit agencies to develop emergency response protocols, evacuations, drills and alerts.
5. **Public Participation:** Create programs to encourage fuel reduction work by citizens on their own properties as well as develop funding programs either by the Entity or through grants from other sources to help the elderly, those with access and functional needs, and low-income residents.

Suggested Structure

The Grand Jury proposes that the Entity be a Joint Powers Authority (JPA). It should include every special fire district, every city and town, Marin County Fire Department, Marin Municipal Water District (MMWD) and Parks and Open Space. See Appendix D for a list of those that should be members of the Entity.

Although the fire chiefs and city/town managers in the county have come together to formulate a joint community-wide response to all the major wildfire issues, their working group is an informal structure. This group will not be able to fully implement and enforce all of the programs and protocols necessary to make Marin firesafe and prevent individual jurisdictions from adopting their own practices. As fire knows no jurisdictional boundaries, a countywide JPA must be formed to unify wildfire preparation.

Funding

Funding for pre-ignition and pre-suppression projects is the main obstacle cited by all government agencies and fire districts. Not only do government entities claim that there are no excess funds in their budgets, individual fire departments and special fire districts also claim that they do not have enough money to undertake the types of pre-ignition and pre-suppression proposals cited in this report. It is imperative to solve this critical issue.

Two practical methods for funding the Entity are (1) a countywide parcel tax or (2) a countywide sales tax:

1. **Parcel Tax:** According to the Assessor's office there are approximately 90,000 taxable parcels in Marin County not counting the extensive holdings under control of the Golden Gate National Recreation Area, MMWD or Marin County Parks. Thus, any parcel tax paid would have to be high enough to fund projects on these tax-exempt lands. In order to be effective, each jurisdiction would have to pass exactly the same parcel tax measure for the same amount at the same time. Besides the difficulty of having 11 cities and towns as well as the county coordinate such a process, there are a number of special fire districts in the county that would also have to be involved in the drafting and implementation of this process. If just one jurisdiction fails to cooperate with this proposal, the benefit of having a countywide plan to deal with wildfire preparedness would fail. Based on these very real political issues, the Grand Jury does not recommend a parcel tax as the best method to fund the Entity.
2. **Sales Tax:** The best way to fund the Entity is to authorize a countywide quarter cent sales tax. Under state law, the sales tax is 6% plus an additional mandatory 1.25% for local jurisdictions for a total of 7.25%. State law allows local jurisdictions to assess up to an additional 2% sales tax with voter approval. The 7.25% coupled with the 2% maximum means that the maximum sales tax could be 9.25%. However, the state legislature routinely allows local entities to exceed the 2% cap by simply passing a statute to that effect. For example, all of Los Angeles County, including its 16 cities, plus an additional seven cities in Northern California have requested and been granted the right to exceed the 2% limit.

Because of the 2% cap, a number of local officials have resisted putting this final ¼ cent tax before the voters. However, only four jurisdictions currently have actual combined sales tax rates at the 9% level. The remaining eight jurisdictions could easily add this ¼ cent and still not hit the 2% ceiling. Each jurisdiction's current sales tax is attached as Appendix G. As for the four jurisdictions that would hit the 9.25% maximum, they would be likely to get a state exemption should the need arise in the future.

Finally, the most important reason for recommending a ¼ cent sales tax as a funding mechanism is that there need be only one enabling statute which can be placed directly on the ballot by the Marin County Board of Supervisors with the agreement of all the political jurisdictions. Marin voters used this process in November 2018 to continue a ½ cent sales tax for transportation improvements.

The time has come to use the final ¼ cent sales tax for our most pressing countywide issue, wildfire. If not now, when? If not for this, then for what? What could be more important than saving lives? If the citizens of Marin are given a chance to make their county as safe as possible from wildfires, passing this sales tax measure should not be a problem. It will provide a steady source of revenue so that the local governments and special fire districts will not have to tap into their budgets. As part of this ballot measure, a citizen oversight committee should be created to make sure that the funds collected are used solely for the mission of the Entity.

Local Interests Must Be Subsumed Into A Countywide Organization

This proposal is revolutionary for Marin. It will require every government entity and every special fire district to become a member. The only way to make Marin safer is for the entire county to work together and not allow local politics to torpedo this innovative proposal.

A number of critical issues prevent Marin from being fire safe. Current vegetation management policies, alert systems and evacuation planning, as well as current public education efforts are insufficient to make Marin pre-ignition and pre-suppression fire safe. The most crucial issue is the political will to create this countywide agency with such broad authority.

The citizens of Marin must choose between safety and vegetation aesthetics.

The creation of this Entity allows for necessary actions to be developed and implemented for all pre-ignition and pre-suppression matters. The Entity will ensure that the tax funds are used solely for wildfire preparedness and not for other environmental priorities. It also does not impinge on local sovereignty except where necessary to create countywide best practices. Without the Entity, local jurisdictions have neither the will nor the money to undertake such sweeping measures.

Wildfires do not respect jurisdictional boundaries. Marin is known for providing mutual aid and cooperation among its professional firefighting agencies. What is missing are countywide, coordinated, science-based, pre-ignition and pre-suppression policies and procedures. This recommendation solves that issue.

FINDINGS — Vegetation

- F1. Existing vegetation management codes are both inconsistent and inconsistently enforced.
- F2. There are not enough trained vegetation inspectors or fuel reduction crews.
- F3. Current vegetation enforcement procedures are slow, difficult and expensive.
- F4. Government agencies and safety authorities cannot currently manage vegetation on public lands.
- F5. All property owners are responsible for vegetation management on their property, yet they are not sufficiently educated about vegetation management and many do not have the physical and financial resources to create defensible space.

FINDINGS — Education of the Public

- F6. Wildfire preparedness education is inconsistent and fails to reach most citizens, especially parents of young children.
- F7. The most effective method of education is person to person in neighborhoods.
- F8. Although Marin has 30 plus Firewise neighborhoods, the most in California, they only cover a small percentage of population and land.
- F9. Sufficient public funds have not been provided to sustain comprehensive wildfire preparedness education.
- F10. Educating the public requires a different set of skills than firefighters usually have.

FINDINGS — Alerts

- F11. Any hesitation to use the WEA system can be deadly even if its alerts might reach people outside of its intended target zone.
- F12. Alert Marin sends the most accurately targeted warnings to endangered populations, but it reaches too few residents because it is not well publicized. Both Alert Marin and Nixle require opt-in registration, a serious design flaw.
- F13. Sirens could be a useful and reliable warning system if their numbers and locations were increased to broaden their reach and if they were enhanced with a customized message through LRAD.

FINDINGS — Evacuations

- F14. In the WUI and in many town centers, infrastructure and roads are inadequate for mass evacuations.
- F15. Evacuation routes are dangerously overgrown with vegetation and many evacuation routes are too narrow to allow safe passage in an emergency.
- F16. Emergency planners often do not publicize evacuation routes due to their mistrust of the public.
- F17. Town councils, planners, and public works officials have not addressed traffic choke points and, in some instances, they have created obstacles to traffic flow by the installation of concrete medians, bumpouts, curbs, speed bumps, and lane reductions.
- F18. No studies have been performed to determine how long it would take to evacuate entire communities via existing evacuation corridors.
- F19. The implementation of traffic-light sequencing and coordination to allow mass egress, and the conversion of two-way roads into one-way evacuation routes to ease traffic congestion, are dangerously delayed and years away from being implemented.
- F20. Public transit is a neglected asset of emergency response preparedness: all operators except one transit agency are left out of the command structure and none is integrated into the emergency radio communication system MERA.
- F21. A bureaucratic culture of complacency and inertia exists in Marin. Government often fails to act quickly to repair known gaps in emergency preparedness, to think flexibly, and to prioritize safety in its planning and policies.

FINDINGS — Umbrella

- F22. No countywide comprehensive, coordinated policies have been made and no funds have been allocated to prepare for wildfires.

RECOMMENDATIONS — Vegetation

- R1. Create a comprehensive, countywide vegetation management plan that includes vegetation along evacuation routes, a campaign to mobilize public participation, and low-income subsidies.
- R2. Hire at least 30 new civilian vegetation inspectors and at least eight fire/fuels crews focused on fuel reduction in the high risk areas of the county, including federal, state and local public lands.
- R3. Develop and implement a fast, streamlined procedure to enforce vegetation citations.

RECOMMENDATIONS — Education

- R4. Adopt and deliver a comprehensive education program focused on action for all residents of Marin on a regular schedule by a team of expert trainers.
- R5. Promote the creation of Firewise Communities in every neighborhood by all local jurisdictions.
- R6. Employ individuals with skills in public speaking, teaching, curriculum design, graphics, web design, advertising, community organization, community relations, and diplomacy to educate the public.

RECOMMENDATIONS — Alerts

- R7. Collect Marin residents' information and add it to Alert Marin and Nixle databases to make them opt-out systems.
- R8. Expand the use of sirens with LRADs.

RECOMMENDATIONS — Evacuations

- R9. Research, develop, and publish plans for the mass movement of populations along designated evacuation routes.
- R10. Give the highest priority to mitigating known choke points and to maximizing the capacity of existing evacuation routes.
- R11. Incorporate and prioritize plans for mass evacuations in all pending and future traffic/road projects along major escape routes.
- R12. Educate, prepare, and drill for evacuations in all communities.
- R13. Fully integrate public transit into the MERA communications system without further delay.
- R14. The Transportation Authority of Marin must convene all stakeholders no later than December 31, 2019, to address congestion on escape routes in an evacuation.

RECOMMENDATIONS — Umbrella Entity

- R15. Establish in the form of a Joint Powers Authority an umbrella organization for wildfire planning and preparedness (vegetation management, public education, alerts, and evacuation), funded by a ¼ cent sales tax.

REQUEST FOR RESPONSES

Pursuant to Penal code section 933.05, the Grand Jury requests responses as follows:

From the following governing bodies:

- County of Marin Board of Supervisors (R1-13, R15)
- Belvedere City Council (R1, R3-13, R15)
- Corte Madera Town Council (R1, R3-13, R15)
- Fairfax Town Council (R1, R3-13, R15)
- Larkspur City Council (R1, R3-13, R15)
- Mill Valley City Council (R1, R3-13, R15)
- Novato City Council (R1, R3-13, R15)
- Ross Town Council (R1, R3-13, R15)
- San Anselmo Town Council (R1, R3-13, R15)
- San Rafael City Council (R1, R3-13, R15)
- Sausalito City Council (R1, R3-13, R15)
- Tiburon Town Council (R1, R3-13, R15)

- Bolinas Fire Protection District Board of Directors (R1, R3-13, R15)
- Central Marin Fire Authority Council (R1, R3-13, R15)
- Inverness Public Utility District Board (R1, R3-13, R15)
- Kentfield Fire Protection District Board (R1, R3-13, R15)
- Marinwood Community Services District Board (R1, R3-13, R15)
- Novato Fire District Board of Directors (R1, R3-13, R15)
- Ross Valley Fire Department Board of Directors (R1, R3-13, R15)
- Sleepy Hollow Fire Protection District Board of Directors (R1, R3-13, R15)
- Southern Marin Fire Protection District Board of Directors (R1, R3-13, R15)
- Stinson Beach Fire Protection District Board (R1, R3-13, R15)
- Tiburon Fire Protection District Board of Directors (R1, R3-13, R15)

- Marin Municipal Water District Board of Directors (R1, R2, R15)
- Transportation Authority of Marin Board of Commissioners (R9-11, R14)

The governing bodies indicated above should be aware that the comment or response of the governing body must be conducted in accordance with Penal Code section 933 (c) and subject to the notice, agenda and open meeting requirements of the Brown Act.

From the following individuals:

- Marin County Sheriff (R7, R11)

The Grand Jury also invites responses from the following individuals:

- FIRESafe Marin Council Coordinator

Note: At the time this report was prepared information was available at the websites listed.

Reports issued by the Civil Grand Jury do not identify individuals interviewed. Penal Code Section 929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Civil Grand Jury. The California State Legislature has stated that it intends the provisions of Penal Code Section 929 prohibiting disclosure of witness identities to encourage full candor in testimony in Grand Jury investigations by protecting the privacy and confidentiality of those who participate in any Civil Grand Jury investigation.

APPENDIX A: Vegetation Management

VEGETATION MANAGEMENT	FIRE DEPARTMENTS/DISTRICTS	V/M STAFF	TYPE OF INSPECTION	ANNUAL PARCEL INSPECTIONS
	Bolinas Fire Protection District	None noted	Complaints & requests for inspection; neighborhoods and roads are inspected annually.	Goal: individual property inspections every year: currently, every 2-3-years.
	Central Marin Fire Authority (Larkspur & Corte Madera)	None noted	Yearly windshield inspections. 30 day Wildfire Hazard Notices issued to those not in compliance	No specific goals
	Inverness Volunteer Fire Department	None noted	Complaints & requests for inspection	Inspect and note problem areas; no specific goals; MCFD has records of inspection frequency
	Kentfield Fire Protection District	Fire Inspector & Community Risk Reduction Specialist	Inspectors visit properties located in WUI in May. Violators asked to create defensible space by 6/15.	Required by law to inspect every SRA parcel each year. Goal: inspect 200 additional parcels/yr
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	2 chief officers, 2 captains, 2 part-time inspectors, 4-6 seasonal defensible space inspectors	Defensible Space Event in June: on duty staff conduct inspections in their response area. Seasonal firefighter inspectors perform 4K+ defensible space inspections/yr.	For the county, goal: inspect 4500K parcels annually.
	Mill Valley Fire Department	None noted	Proactive & maturing compliance program requires active agency management	Annually
	Novato Fire District	None noted	Engine crews drive WUI, leave door hangers where needed. Inspect reported properties, referred for review, or requested for voluntary evaluation. New construction & major remodels in WUI must submit VM plan. Properties for sale require inspection. Assessment in May to determine which properties must provide defensible space	Door hangers/windshield inspections in the WUI followed by notices. Homes remain on watch list for 3 yrs.
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	VM program includes on-duty engine company, full-time inspector, and 2 part-time employees 26 hrs/week	New construction & major remodels in WUI must submit VM plan. Properties for sale require inspection. Engine companies assess in May to determine which properties must provide defensible space	Currently, no goal, but if RVFD Board approves dedicated inspector program, will inspect 3-4K parcels annually.
	San Rafael Fire Department and Marinwood	2 dedicated VM fire inspectors	Proactive inspections. Assist rangers & remove homeless encampments. Residents notified yearly to keep defensible space. Inspections conducted by request	Inspect all of the approx. 8K parcels in the WUI in a 3 year cycle
	Southern Marin Fire Protect. District (includes Tam-Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	None noted	None noted	Annually inspects all parcels
Stinson Beach Fire Protection District	None noted	Some areas covered under Marin County VM. Citizens perform voluntary compliance	None	
Tiburon Fire Protection District (Tiburon and Belvedere)	None noted	Some areas covered under Marin County VM. Citizens perform voluntary compliance	Goal: to inspect 100% of high fire severity zone parcels annually	

APPENDIX A: Vegetation Management (cont'd)

VEGETATION MANAGEMENT	FIRE DEPARTMENTS/DISTRICTS	PROHIBITED PLANTS	FINANCIAL ASSISTANCE WITH V/M REMOVAL	WIDE CLEARANCE ON EVAC ROUTES
	Bolinas Fire Protection District	None noted	Matching grant opportunities for vegetation clearance on non-county-maintained roads	Collaborate with local utility district to reduce vegetation
	Central Marin Fire Authority (Larkspur & Corte Madera)	3K+ parcels are in WUI. Major reconstruction plans must be evaluated by Fire Prevention Bureau to ensure pyrophytic plant removed/not replanted	Free chipper program	Yes
	Inverness Volunteer Fire Department	None noted	Part of cost of chipper days underwritten	Fire Dept. partners with MCFD & Fire Safe Marin for clearing along the local major evacuation routes
	Kentfield Fire Protection District	None noted	Not currently	Roadside clearance is Marin DPW responsibility. Standards in place to ensure private driveways are maintained to current standards.
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	New construction & substantial remodels in WUI prohibit pyrophytic plants w/in 100' of structures. Otherwise, prohibition not feasible (unless in close proximity to residential structures)	\$15K CA Fire Foundation grant matched plus \$15K from BOS, North Bay Lessons Learned Committee. Coordinating with HHS Senior Protective Service to identify persons in need	No. There is no code that requires extra wide vegetation clearances
	Mill Valley Fire Department	Changing code to prohibit bamboo, juniper, cypress, acacia and bays within 30' of structures	Considering a program similar to Novato Fire's grant program	Yes, clear vegetation but it is not specified to be extra wide
	Novato Fire District	None noted	Matching grant to owners, 1x/yr. \$500 for chipper/fuel removal. HOAs in WUI offered annual matching grant to \$1500 for same	Major evacuation routes maintained by CalTrans.
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	New construction & substantial remodels in WUI prohibit pyrophytic plants and require a Veg. Mgmt Plan be submitted.	\$15K CA Fire Foundation grant matched plus \$15K from BOS, North Bay Lessons Learned Committee. Coordinating with HHS Senior Protective Service to identify persons in need	No. There is no code that requires extra wide vegetation clearances
	San Rafael Fire Department and Marinwood	Mandatory removal of juniper and bamboo	Free chipper service for juniper and bamboo	Requires a 10' clearance from roadway on each side: considering additional distances in WUI
	Southern Marin Fire Protect. District (incl Tam Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	Code prohibits bamboo, juniper, cypress, acacia and bays within 30' of structures	Regularly partner with Tam Valley Community Services District to manage grants used for chipper days and other vegetation management programs	Enforce access/defensible space requirements/ vegetation clearances; Roadways to maintain flammable vegetation clearance from roadway 10 feet onto properties. Inspect roadways annually
Stinson Beach Fire Protection District	None noted	Chipper days	Yes	
Tiburon Fire Protection District (Tiburon and Belvedere)	None noted	No	Yes	

APPENDIX B: Education

EDUCATION	FIRE DEPARTMENTS/ DISTRICTS	EDUCATION STAFF	PROGRAMS/EVENTS
	Bolinas Fire Protection District	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Annual community forums held with moderate attendance
	Central Marin Fire Authority (Larkspur & Corte Madera)	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	32 Neighborhood Response Groups with coordinator; partners with FD to provide fire safety education
	Inverness Volunteer Fire Department	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Inverness Disaster Council, West Marin Disaster Council
	Kentfield Fire Protection District	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Kentfield Fire District employees. Fire Inspector and Community Risk Reduction Specialist, educating the community and school children within the community.
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Supported by Marin BOS, CALFIRE, FIRESafe Marin, CERTs and disaster councils
	Mill Valley Fire Department	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Rotary Club organizes and sponsors events; Emergency Preparedness Commission sponsors programs
	Novato Fire District	No staff fully dedicated to education but firefighters implement door hanger program targeting WUI neighborhoods annually	Ready, Set, Go: Get Ready Novato; FireWise Communities; Cal Fires, Prevent Wildfire California, Ready for Wildfire, One Less Spark
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Materials provided by FSM, Marin County Fire Chiefs Assoc.
	San Rafael Fire Department and Marinwood	Firefighters assist Prevention and OES staff with presentations, inspections and public outreach	San Rafael Fire Commission and San Rafael Fire Foundation fund wildfire education along with FireSafe Marin and Firewise USA
	Southern Marin Fire Protect. District (includes Tam-Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	Partners with Tam Valley Community Services District and Marin County FD to prepare and educate public
Stinson Beach Fire Protection District	No staff fully dedicated to education. Firefighters are trained to teach preparedness to the public	None	
Tiburon Fire Protection District (Tiburon and Belvedere)	Deputy Fire Marshal performs public education for emergency preparation; all firefighters can teach defensible space practices.	Belvedere-Tiburon Joint Disaster Council promotes wildfire and Get Ready awareness programs.	

APPENDIX B: Education (cont'd)

E D U C A T I O N	FIRE DEPARTMENTS/ DISTRICTS	EDUCATIONAL READINESS & PREPAREDNESS GOALS	SUCCESES
	Bolinas Fire Protection District	Not ready for next fire season. Property owners not engaged/active in preparedness. Neighbors encouraged to know each other	Over 200 residents did evacuation drill and discussion of fire hazard mitigation
	Central Marin Fire Authority (Larkspur & Corte Madera)	Participation in NRGs increases each year. Community forums, presentations	Several neighborhoods pursuing FireWise recognition
	Inverness Volunteer Fire Department	Residents are prepared as neighbors helping neighbors	Designated local neighborhood disaster groups since 1982; fire safety covered at group meetings
	Kentfield Fire Protection District	Kentfield Fire District conducting inspections to prep for next fire season; secured grant to create a defensible space between District and large landowner partners.	Kent Woodlands community is Firewise certified
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	Referenced in Marin County Performance Measures and Lessons Learned	FireWise participation, evacuation exercises and community meetings
	Mill Valley Fire Department	Working towards entire community becoming FireWise certified	2-minute videos on website; 8 community meetings; numerous FireWise communities
	Novato Fire District	Neighbors helping neighbors: three FireWise communities are ready for next fire season	4 FireWise Communities: Pacheco Valley, MVMCC, Black Point/Green Point, Indian Valley; HOAs - Wildhorse Valley and Bahia
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	Hosting community meetings; and referenced in Marin County Performance Measures and Lessons Learned	Cascade Canyon and Sleepy Hollow FireWise Communities
	San Rafael Fire Department and Marinwood	San Rafael Wildfire Protection Plan has 37 recommendations to make SR fire safe.	4 Firewise communities, 20+ HOA wildfire safety/preparedness presentations in 2018, 2 Wildfire Preparedness Symposia at Dominican in 2018
	Southern Marin Fire Protect. District (includes Tam-Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	No goals set yet; anticipate more with the passage of Measure U	3 Get Ready programs which have low participation
	Stinson Beach Fire Protection District	Work in progress; hiring fire prevention officer	Meetings with Marin County FD and GGNRA
Tiburon Fire Protection District (Tiburon and Belvedere)	2-3 additional FireWise Communities in 2019	First FireWise Community of Harbor Hill	

APPENDIX C: Evacuations & Alerts

EVACUATIONS & ALERTS	FIRE DEPARTMENTS/ DISTRICTS	SPECIAL NEEDS/ ELDERLY LISTS	EVACUATION CHOKE POINTS	HIGH-RISK COMMUNITIES	TRANSIT DEPENDENT COMMUNITIES
	Bolinas Fire Protection District	Disaster council, fire department keep list of at-risk residents	Elm Road, Evergreen Rd, Mesa Rd, Olema-Bolinas Rd	Yes. All communities on gridded Mesa are high risk	No
	Central Marin Fire Authority (Larkspur & Corte Madera)	32 NRGs maintain lists	Madrone & Magnolia Aves. Redwood & Corte Madera Aves. <u>Corte Madera</u> : Christmas Tree Hill, Sausalito Ave. (aka Hidden Valley). <u>Larkspur</u> : Baltimore Canyon, Marina Vista Area	Madrone & Magnolia Aves. Redwood & Corte Madera Aves. <u>Corte Madera</u> : Christmas Tree Hill, Sausalito Ave. (aka Hidden Valley). <u>Larkspur</u> : Baltimore Canyon, Marina Vista Area	No official accounting
	Inverness Volunteer Fire Department	Yes	Sir Francis Drake is the only road in and out	Seahaven	No
	Kentfield Fire Protection District	No	Sir Francis Drake at Hwy 101	Most residential communities at risk	None
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	Residents with special needs, or elderly must make MCFD aware of their status	Yes, most non-county maintained roads in West Marin	Yes, refer to 2016 CWPP pages 43-56	Unknown
	Mill Valley Fire Department	Maintain a list of those with additional needs, though this changes often and is unreliable	All non-county maintained roads in West Marin are choke points. SFDB, Miller Ave, Blithedale leading to Hwy 101 and on ramps to Hwy 101	75% of MV is in the WUI and therefore at risk	The Redwoods
	Novato Fire District	No	Atherton on-ramp NB on 101; North of San Rafael SB 101; on HWY 37 (Sonoma County) past raceway, Novato Blvd and Diablo Ave.	Wildhorse Valley, Atherton, Marin Valley, Little Mountain, San Marin, Blackpoint, Cherry Hill, Indian Valley, Ignacio Valley, Pacheco Valley, Anderson Rowe, Loma Verde, President's (IVC), Wilson West Novato North, Hilltop	EOC has information on agencies to contact
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	Residents with special needs or elderly must make RVFD aware of their status	Most of RVFD's response area consists of single lane roads leading to single artery roadway	Yes, refer to 2016 CWPP pages 43-56	Unknown
	San Rafael Fire Department and Marinwood	Promote neighborhood awareness through GetReady and CERT	None identified	All neighborhoods in the WUI	Residential, assisting living facilities, Kaiser patients
	Southern Marin Fire Protect. District (includes Tam-Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	List of residents of Sausalito only.	Every intersection is a choke point. Control of intersections is by PD and DPW	Districts near the WUI and areas within canyons	Public transit is available in flatter topographic areas
Stinson Beach Fire Protection District	Yes	No	No	No	
Tiburon Fire Protection District (Tiburon and Belvedere)	PD departments maintain lists	Currently creating "Red Zones"	Neighborhoods adjacent to open space at ridgeline	Neds Way /downtown rely on public transit	

APPENDIX C: Evacuations & Alerts (cont'd)

EVACUATIONS & ALERTS	FIRE DEPARTMENTS/ DISTRICTS	EVACUATION ROUTES PUBLICIZED	SIRENS	COMMUNITY DRILLS	CITE & TOW ON EVACUATION ROUTES
	Bolinas Fire Protection District	Policy decision not to publicize routes	No sirens currently; researching LRAD	1 drill held in 2017; Planning annual drills	No
	Central Marin Fire Authority (Larkspur & Corte Madera)	Evacuation routes are not publicized. Planning is key element of the NRGs	1 siren and 1 diaphon system in Corte Madera not yet operational. Considering LRAD	Drill in 2018 had 18% participation. Plan to conduct one exercise/year	CMFD has no authority to cite vehicles
	Inverness Volunteer Fire Department	No. Dependent on specifics of the emergency	Sirens determined to be ineffective	Monthly radio drills with CERT, daily radio checks	No parking within 6' of center of road. Violators cited.
	Kentfield Fire Protection District	Possible evacuation routes are available to the public through marinfire.org. No signage used.	Kentfield Fire District has one Siren. Test of LRAD did not meet expectations	Evacuation drills held in Kent Woodlands; Full campus drill held at COM 2018. Yearly drills held with all schools	Parking enforcement issues are referred to the Sheriff's office
	Marin County Fire Department (Marin Open Space; provides fire services to the GGNRA)	No. Dependent on specifics of the emergency	One siren on Throckmorton Ridge	As needed	MCFD has no authority to enforce vehicle code
	Mill Valley Fire Department	Steps, Lanes and Paths are marked evacuation routes	5 sirens located throughout the City. LRAD system on order	1 drill performed each year	Yes. Cite and tow
	Novato Fire District	Evacuation points for Blackpoint/ Greenpoint & Marin Valley Mobile Country Club	No	Coordinates drills, targeting WUI areas every 3-5 years	Yes. Cites vehicles. Works with NPD and CHP
	Ross Valley Fire Department (Fairfax, San Anselmo, Ross, & the Sleepy Hollow FPD)	No. Dependent on specifics of the emergency	Sirens in Fairfax, San Anselmo and Ross. Recommend a battery backup weather radio activated by the Emergency Alert System	As needed	RVFD has no authority to enforce vehicle code
	San Rafael Fire Department and Marinwood	Encourage residents to know an alternate to standard routes	No sirens. Rely upon NIXLE, WEA. Evaluating other systems	On a small scale in various neighborhoods	No parking within 6' of center of road. Violators cited. Working to designate parking in WUI zones & towing under red flag conditions
	Southern Marin Fire Protect. District (includes Tam-Valley, Almonte, Homestead Valley, Alto, Strawberry, Sausalito, Fort Baker, Marin Headlands, part of Tiburon)	No. There is a potential conflict with actual emergency evacuation needs	No fixed sirens. Coordinating with OES. LRAD can be linked to Alert Marin and Everbridge	One or two every year	Yes. Cite and tow
Stinson Beach Fire Protection District	No	Yes	No, but working on plans	No	
Tiburon Fire Protection District (Tiburon and Belvedere)	No, but working on plans	6 sirens currently in use. Considering LRAD	Not presently	All vehicle violations are referred to the PD	

APPENDIX D: Recommended Structure and Membership for Entity

The Grand Jury recommends the following entities be members of the Entity. Listed in alphabetical order, with the fire districts first, the entities are:

1. Bolinas Fire Protection District
2. Central Marin Fire Authority – serves the City of Larkspur and Town of Corte Madera
3. Inverness Volunteer Fire Dept. – run by the Inverness Public Utility
4. Kentfield Fire Protection District
5. Marin County Fire Department – serves unincorporated Marin County not within a Fire District and contracts to provide wildland fire protection with CAL Fire for all State Responsibility areas and with Golden Gate National Recreation Area (GGNRA) and Point Reyes National Seashore (PRNSS) for Federal Responsibility Area FRA within the County.
6. Marin Municipal Water District
7. Marinwood Community Services District – Fire Department
8. Novato Fire Protection District
9. Ross Valley Fire Department – serves the Towns of San Anselmo, Fairfax, Ross and the Sleepy Hollow Fire Protection District
10. Sleepy Hollow Fire Protection District – provides only pre-ignition and pre-suppression services to Sleepy Hollow
11. Southern Marin Fire Protection District – serves the communities of Tamalpais Valley, Almonte, Homestead Valley, Alto, Strawberry, approximately 1/4 of the Town of Tiburon, the City of Sausalito, Fort Baker and the Marin Headlands.
12. Stinson Beach Fire Protection District
13. Tiburon Fire Protection District – serves the Town of Tiburon and City of Belvedere and surrounding areas.
14. County of Marin
15. City of Belvedere
16. Town of Corte Madera
17. City of Fairfax
18. City of Larkspur
19. City of Mill Valley
20. City of Novato
21. Town of Ross
22. Town of San Anselmo
23. City of San Rafael
24. City of Sausalito
25. Town of Tiburon

Since having 25 members would make the Entity difficult to manage, the Grand Jury recommends that the Entity hire an executive director. This should be a person with considerable knowledge and experience with the key pre-ignition and pre-suppression issues such as community education, vegetation management, alert notices, and evacuation policies. This person would be employed to create processes and programs, emphasizing “best practices,” for all pre-ignition and pre-suppression matters. To do this, the executive director would be authorized to hire staff necessary to carry out the Entity’s mandate.

To help guide the executive director and staff with policy development, the Grand Jury recommends that the Entity as a whole, select a group of individuals from its membership to act as a Board of Directors. Finally, the Grand Jury recommends that the County Counsel's office be authorized to draft the legal documents to create the Entity as well as the ballot measure for the ¼ cent sales tax.

APPENDIX E: The 7 Deadly Sins of Emergency Management

At a conference in Stockholm, Sweden on November 28, 2017, Craig Fugate, former Administrator of FEMA under President Obama, discussed what he considers to be

The 7 Deadly Sins of Emergency Management.¹⁹

1. We plan for what we are capable of responding to.
2. We plan for our communities by placing our vulnerable populations aside.
3. We do drills and exercises that we know will be successful.
4. We think our emergency response system can scale up from small emergencies to large disasters.
5. We build our emergency management team around government, leaving out volunteer organizations, the private sector and the public.
6. We treat the public as a liability.
7. We price risk too low to change behavior; as a result, risk grows.

Marin's emergency management plans replicate these errors.

¹⁹ Fugate, Craig. "[The 7 Deadly Sins of Emergency Management.](#)" *YouTube video*. Viewed Jan.10, 2019.

APPENDIX F: A Case in Point: Paradise and Marin

The Grand Jury visited Paradise, California in January 2019. Here are some of the major contrasts and comparisons between Paradise's wildfire preparedness and Marin's current preparedness:

- Paradise has three well-paved good roads out of town.
 - Marin has many communities located in canyons with only one exit on narrow, poorly maintained roads.
 - All of Marin's main east west evacuation routes have choke points where they narrow to one lane in each direction.
-

- At the time of the Camp Fire, most of Paradise's fire and police officers lived in town and were on the job quickly.
 - Marin's fire and police officers often live in other counties which will severely delay response time. It may take hours for emergency personnel to get here.
-

- Paradise had comprehensive evacuation plans that were tested in previous fires and had conducted practice evacuation drills. Even so, it took around 5 hours to evacuate the town.
 - Marin's OES has given itself 36 months to update its evacuation plans.
 - Marin has no comprehensive evacuation plans that have been shared with the public, and only a few neighborhoods have had an evacuation drill.
-

- Paradise had failed to manage vegetation, particularly along evacuation routes.
 - Marin has failed to manage vegetation adequately in its residential communities, open space and along evacuation routes.
-

- The fire in Paradise did not come from the usual direction but came from the opposite direction from what was expected.
 - Fire in Marin could come from any direction depending on the prevailing wind.
-

- The Butte County Grand Jury report on Paradise in 2008 criticized the lack of an adequate number of evacuation routes and the deliberate narrowing of the main evacuation routes.
- Many jurisdictions in Marin deliberately constrict the flow of traffic along already narrow evacuation routes with lane reductions and road impediments..

APPENDIX G: Sales Tax

With the local sales cap at 2%, the final quarter cent only applies to jurisdictions that are currently at 9%. The following are the breakdown of Marin jurisdictions and what the local rates are:²⁰

Jurisdiction	Current Sales Tax	Local Sales Rate
Corte Madera	9.00%	0.75%
Fairfax	9.00%	0.75%
Larkspur	9.00%	0.75%
San Rafael	9.00%	0.75%
San Anselmo	8.75%	0.50%
Sausalito	8.75%	0.50%
Novato	8.50%	0.25%
Tiburon	8.25%	0%
Belvedere	8.25%	0%
County of Marin	8.25%	0.25%
Mill Valley	8.25%	0%
Ross	8.25%	0%

From this, it can be seen that only four out of the 12 taxing authorities in Marin are at the limit. There are 16 cities, all in LA County, that each have their combined sales tax rate over 10% as well as seven cities in the Bay Area that are over the 9.25% cap.

²⁰ ["California Department of Tax and Fee Administration."](#) *CA.Gov*. Accessed on 25 Mar. 2019

APPENDIX H: Prior Marin County Civil Grand Jury Reports on Wildfire (Since 2000)

[Marin Civil Grand Jury, “Wildfires — Partners in Prevention”, 2002-03](#)

[Marin Civil Grand Jury, “The Next Disaster: Are Marin Citizens Prepared?”, 2005-06](#)

[Marin Civil Grand Jury, “Marin on Fire! Not if, but when, 2007-08](#)

[Marin Civil Grand Jury, “Disaster Preparedness in Marin: Are You Ready?”, 2010-11](#)

[Marin Civil Grand Jury, “Marin on Fire Redux”, 2012-13](#)