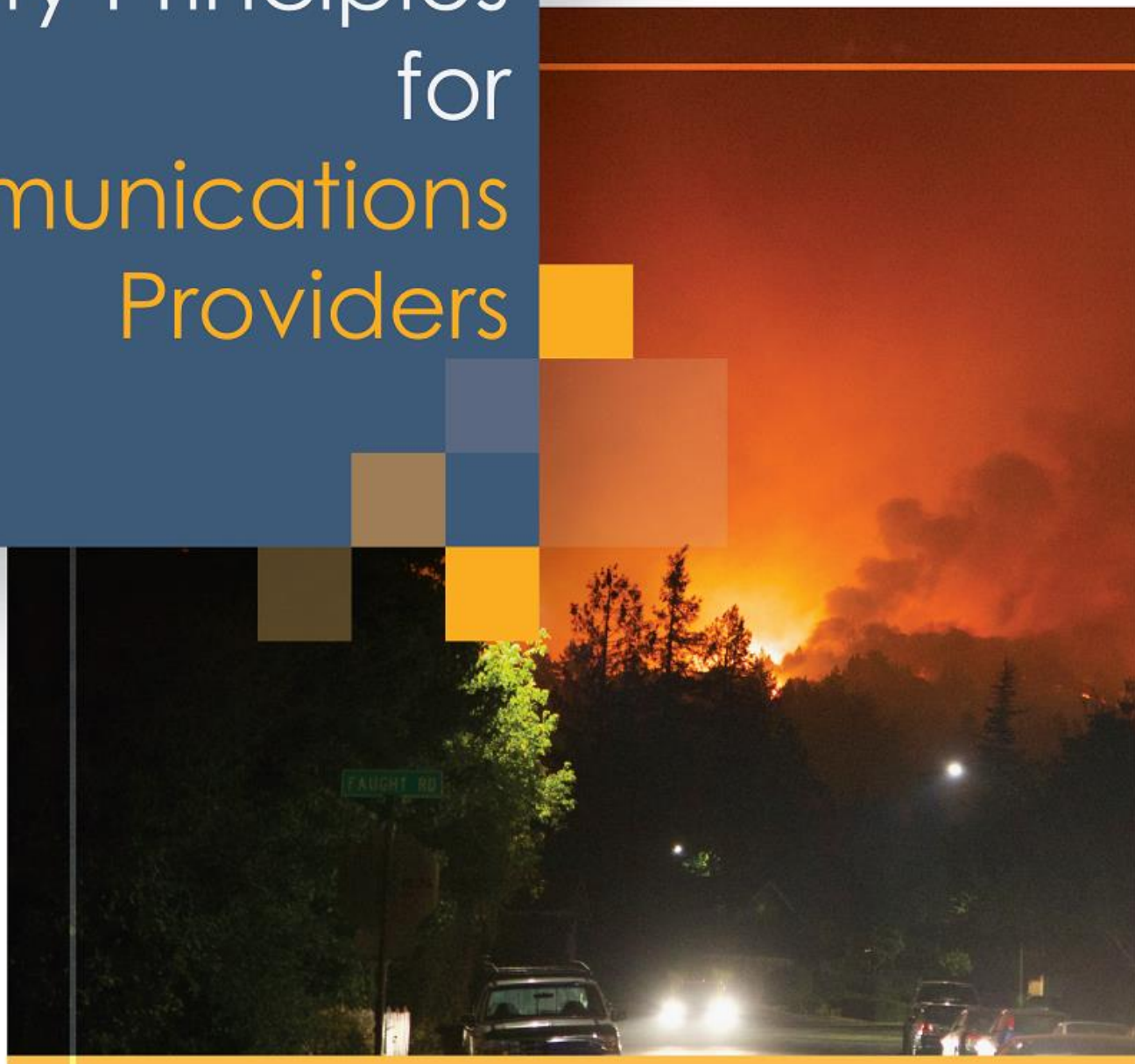
Safety Principles for Communications Providers



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"When you are responding into an emergency, communications are your lifeline. When people are rushing out of a threatened area or having to communicate with 9-1-1 centers, that link, that communication link, is critical for life-saving operations."

– Cal OES Director Mark Ghilarducci at CPUC Workshop on Emergency Disaster Relief, Nov. 1, 2018

"The public's expectations have grown significantly along with technological advancements in recent years. Residents expect to know within minutes, if not seconds, about threats that could affect them, and they anticipate the government will provide extensive details about how and where the threat is evolving and what immediate actions they should take in response to that threat."

- Sonoma County After Action Report, Sept. 2018

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i. Synopsis

With the increased threat from deadly wildfires and other disasters facing California, including earthquakes and floods, having a resilient and dependable communications grid that aids first responders and communicates with the public in a timely manner is a matter of life and death, especially for our most vulnerable residents. We lack such a system today and creating one must be a top priority. California's communications system is our most essential component for public safety, yet it is our weakest link. As recent events have shown, communication failures during such calamities are common, with lives being lost as a result. This paper identifies regulatory and statutory gaps in communications that, if addressed, would significantly enhance public safety.

ii. Introduction

Few crises in California have risen to the level of urgency as the growing threat from catastrophic wildfires. Over the past few years, California has experienced increasingly destructive and fast-moving infernos as climate change, prolonged drought and rapid development in the wildland-urban interface exact an ever-greater toll on our state. California wildfires burned an average of 60,000 acres a year from the 1960s to the 1990s, but this decade they have been consuming an average of more than 250,000 acres annually. Five of California's largest wildfires have occurred since 2012, and the state's fire season is no longer restricted to a few months a year. It has also become common for previous wildfire records regarding fatalities and damages to quickly be eclipsed by new fires doing ever-greater damage.

Two recent fires—the Wine Country fires in Sonoma and Napa Counties in 2017, and the 2018 Camp Fire in Paradise—together claimed more than 130 lives, destroyed nearly 30,000 homes and other structures, and left behind billions of dollars in property damage. Those fires cost hundreds of millions of dollars to fight and contain, to say nothing of the billions of dollars required to rebuild damaged communities. The fires have also led the state's largest utility, Pacific Gas & Electric Co., to seek bankruptcy protection, and resulted in downgrades to the credit worthiness of Southern California Edison and San Diego Gas & Electric.

Top 5 Largest California Wildfires			Top 5 Most Destructive California Wildfires			Top 5 Deadliest California Wildfires		
Name	Date	Acres	Name	Date	Structures	Name	Date	Deaths
Mendocino Complex	2018	459,123	Camp	2018	18,804	Camp	2018	85
Thomas	2017	281,893	Tubbs	2017	5,636	Griffith Park	1933	29
Cedar	2003	273,246	Tunnel	1991	2,900	Tunnel	1991	25
Rush	2012	271,911	Cedar	2003	2,820	Tubbs	2017	22
Rim	2013	257,314	Valley	2015	1,955	Cedar	2003	15

These disasters have understandably alarmed the public and commanded the focus and resources of state and local governments. And time and again, we learned of failures within California's communications grid in news reports with headlines such as these:

- ***As desperate calls poured in, an emergency alert system failed many*** – *Los Angeles Times* Oct. 11, 2017
- ***Blame falls on loss of cellular, fiber connection*** – *KEYT TV* Oct. 13, 2018
- ***Alarming failures left many in path of California wildfires vulnerable and without warning*** – *Los Angeles Times*, Dec. 29, 2017
- ***California Wildfires Reveal Alert System Shortcomings*** – *Government Technology* 8/7/18
- ***A Frantic Call, A neighbor's knock, but few official alerts as wildfires closed in . . . Only a fraction of residents received emergency alerts or evacuation orders from local authorities*** - *New York Times* - 11/21/18
- ***Verizon, under fire for throttling firefighters' data speed, lifts caps for first responders*** – *San Francisco Chronicle*, Aug. 24, 2018
- ***Camp Fire created a black hole of communication/In disasters, our high-tech communities are reduced to 1940s-era responses*** – *The Mercury News*, Dec. 16, 2018

iii. Preparing for Disasters

California's communications grid, of course, can be disabled in ways that have nothing to do with wildfires, jeopardizing public safety and disrupting vital services, including 9-1-1 calls, phone service, internet access, credit card processing and ATM machines. Phone and internet services for thousands of customers were disrupted in April 2009, for instance, when vandals cut fiber-optic cables in multiple locations around Santa Clara, Santa Cruz and San Benito Counties. A similar act of vandalism occurred in 2015 along California's North Coast, affecting large parts of Mendocino, Humboldt, Sonoma and Lake Counties, when a fiber optic cable in Hopland was cut. And internet and phone service were disrupted in Long Beach in July of 2018 when a delivery truck caught and severed a core fiber-optic cable.

This problem is most acute in rural California, where, as state Sen. Mike McGuire has noted, life-threatening emergencies cannot be responded to effectively if the communications grid is unreliable, as is often the case during a major wildfire or other disaster.

"Public health and safety [are] at risk when a simple fiber cut can lead to rural residents not being able to access an ambulance, the fire department or law enforcement," Senator McGuire has said. "As it stands now, telecom companies don't let emergency officials know when the local 9-1-1 system is not operating, which puts lives in danger. To adequately provide rural residents the public safety they deserve, emergency responders have to be kept in the loop. There is a basic level of communication that must occur between the utility company, the customer base and the local government."

In addition to wildfires and acts of vandalism that can cripple a communications grid, California is prone to other disasters, including earthquakes, mudslides and floods. A recent article in the *Los Angeles Times* focused on the devastation that could occur in Southern California from a "mega-storm" that dumps rain on the region for days on end; experts say such an occurrence could cause three times as much damage as a major earthquake on the San Andreas Fault. In other words, there are many reasons that California needs a resilient, reliable and effective system of communicating with first responders, local and state governments and the public when disasters strike. And the truth is, we do not have that system today.

At a November 2018 CPUC workshop on emergency disaster relief, Mark Ghilarducci, Director of the Governor's Office of Emergency Services (Cal OES), focused on the challenges confronting first responders on the front lines of a disaster.

"We've moved from what we call secure communications, secure landline, secure land mobile radio systems to an internet-based, cellular-based system," Ghilarducci testified, "and as our public safety are moving over to that system, we've moved from a system where government had much more control. We knew that the systems were secure. We could build redundancy and resiliency into those systems because we knew that they were the lifeline, the backbone, the absolute critical aspects of communications that were needed.

"I will tell you," he went on, "coming out as a first responder and starting at local government and working through all the way to the federal government, when you're responding into an emergency, communications are your lifeline. When people are rushing out of a threatened area or having to communicate with 9-1-1 centers, that link, that communication link, is critical for life-saving operations."

In the deadly wildfires of October 2018, Ghilarducci noted, Cal OES reported that 341 cell sites went off line; 72,000 people had difficulty reaching 9-1-1, some due to the inability of the 9-1-1 system to "move the signal." His conclusion: "Our wireless network is just not built to survive the disasters and many of the cell sites do not have that resiliency, whether it's power backup or they're built to a standard at which they can withstand these kinds of events."

Another perspective comes from Jeffrey Reeb, director of the Los Angeles County Office of Emergency Management, who has drawn attention to the questionable resiliency of the communications grid as one of his top safety concerns. He has also observed that cellular providers are not as integrated or immersed into the emergency management community as other utility providers, which is a hindrance to information sharing and relationship building, two critical facets for successful emergency response and recovery. Some of the information that's important for first responders to have includes:

- Demonstrated proof of multiple levels of resiliency;
- Detailed information about how communication providers manage outages when their equipment is damaged and what emergency responders and the public can expect when outages occur;
- What temporary restoration equipment providers have and how they deploy it;
- How decisions are made to "open up roaming" for all phones to use any network;

- Why cellular providers oppose moves to improve the accuracy of Wireless Emergency Alerts;

Recognizing such concerns, the Federal Communications Commission (FCC) has mandated that telecom operators be capable of supporting Wireless Emergency Alerts (WEA), which are used for Amber Alerts, presidential alerts and alerts involving imminent threats to safety or life, but it is unclear how and when those updates will be completed. There is currently a lack of transparency, however, around communication infrastructure that is vital for first responders to understand, including: cell tower location, what carriers are on what tower, whether towers have battery backup and resilient communications backhaul, how WEA messages are distributed, how rapidly alert messages can be promulgated, and information pertaining to whether alert messages were distributed. There are also various issues with consistent access to communication services in situations where there is a loss of power, particularly in rural areas with limited cell coverage.

A drier, denser California—one more prone to catastrophic wildfires—is the state's new normal. In this California, the questions addressed here are a matter of life and death, especially for people living in high-risk areas, the elderly and other vulnerable populations. Because emergency responders have the same concerns during earthquakes, flooding and other disasters, these shortcomings affect virtually everyone in the state.

Public Safety Power Shutoffs, or pre-emptive de-energization actions increasingly employed by the state's electric utilities to help prevent wildfires, are another growing concern. Californians will undoubtedly experience de-energization of the electric grid more frequently and for longer durations. This is another compelling reason why the state needs a more resilient, reliable and predictable communications grid, which may require more than the voluntary efforts and goodwill of communications providers. De-energizing electric power lines affects communications networks, necessitating creation of multiple layers of backup power for cell towers and IP services that otherwise could be inoperable for multiple days. This will likely require the adoption of standards, protocols and best practices for power companies and communications providers to ensure proper notification between utilities and to mitigate the impact on affected populations through back-up power requirements.

Public safety is paramount, and when a 9-1-1 call is made, it must go through, no matter the time, place, or technology used. Historically, traditional copper telephone lines are reliable, even in blackouts, because they are powered by an independent electrical source. When the power goes out—they still work. The resiliency of VoIP service is more precarious; it is generally provided over copper, fiber, or cable facilities that do not have their own power. The FCC requires providers to offer their customers the option to purchase 8 or 24 hours of battery backup power, but that may not be enough for Californians who are experiencing and will continue to experience multi-day deenergization events. For wireless consumers, their mobile phones operate on battery power, but they may or may not have service in a power outage, depending on the backup power installed at cell sites. For all of these services, backup power for consumers is only part of the equation. The actual networks need power to operate—whether wired or wireless—and backup power requirements on the network-side are minimal, if they exist at all. Having a reliable and resilient system is crucial in trying to mitigate the impact of power shutoffs on vulnerable populations.

Also, of crucial importance is real-time reporting to California's first responders and entities such as Cal OES on where outages occur, something that communications companies now say they provide voluntarily. Emergency responders need this information quickly if they are to respond effectively. Budge Currier, 9-1-1 Branch Manager at Cal OES, addressed this issue at the CPUC workshop last November.

"When we set up an evacuation center or a disaster recovery center or we are determining the ingress and egress routes from a disaster, knowing the status of the communication in that area is critical, because if I know there's a fairground here on this road where the cellular infrastructure is damaged, but three miles down the road the cellular infrastructure is intact, we will choose the other one," he said. "If we don't have that type of information in real time, we can't make those decisions. So, then the ripple-down effect of that is, I establish a disaster recovery center at a fairground with no (communications) and now you're having to bring in portable cellular to provide communications there, which we all know doesn't have the capacity to truly support everybody that would be in that area. It creates an undue burden . . . So that's why this real-time data is important. And it needs to be accurate."

iv. Technological Changes and Policy Barriers

The State of California has clear requirements for electric, natural gas, and water utilities to ensure access to safe, reliable and affordable services. But because of significant legal obstacles and technological changes, this is no longer true for communications utilities. The state's oversight of communications providers cannot ensure safe, reliable, and affordable service, nor does the state require communications providers to take steps that can protect the public during an emergency.

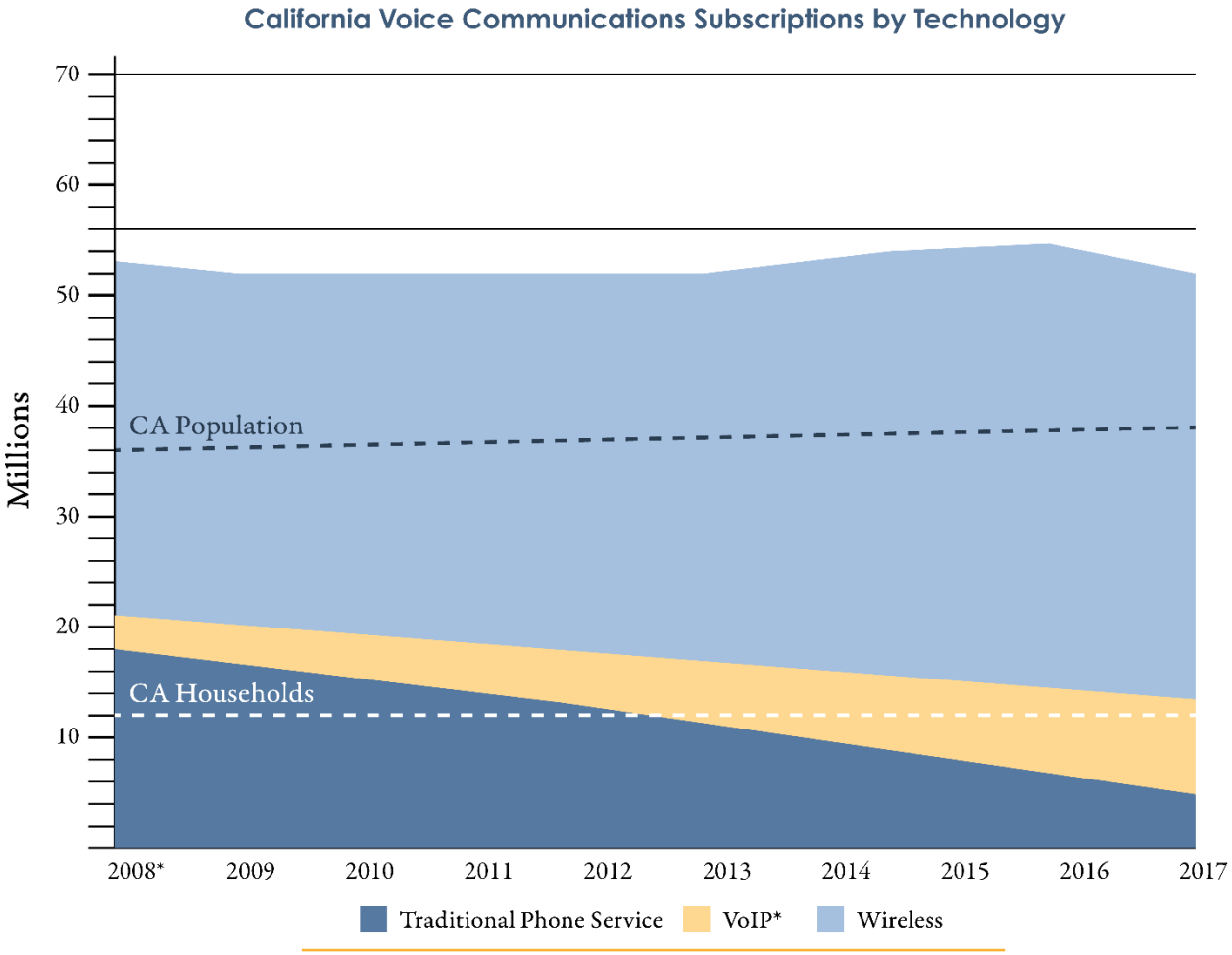
Arguably the greatest obstacle toward a more reliable communications grid has been Section 710 of the California Public Utilities Code. In part, the law says: "The Commission shall not exercise regulatory jurisdiction or control over Voice over Internet Protocol and Internet Protocol enabled services except as required or expressly delegated by federal law or expressly directed to do so by statute or as set forth in subdivision (c)."

It was not that long ago, when most people had landlines and mobile phones were less prevalent, that if someone dialed 9-1-1 for help, he or she got through and the person answering the call knew its origination point. Help could be dispatched to a precise location, or emergency preparedness or response information dispensed, without wasting precious time trying to pin down the caller's whereabouts. Now, mobile phones are ubiquitous, with 80 percent of 9-1-1 calls made from a wireless device. Many traditional phone lines remain in use in California, but these devices are rapidly being replaced by VoIP phones or Voice over Internet Protocol, a technology that allows a user to make voice calls using a broadband internet connection instead of a regular, or analog, phone line. Yet, Wireless and VoIP 9-1-1 calls may not automatically transmit the user's phone number and/or location information.

2018 9-1-1 Call Statistics	
Total 9-1-1 Calls	27,018,953
Wireless	81%

Wireline	12%
Voice over IP	4%
Other	3%
Text Messages	28,014

According to FCC data, as of December 2017, California had 5.8 million traditional phone lines and 8.2 million VoIP lines. The state also had 41.8 million wireless subscriptions. The chart below illustrates the trendlines toward VoIP in California's changing communications landscape.



*Both interconnected VoIP and mobile broadband subscribers were required to report as of December 2008.
Source: FCC Form 477 filings

v. Deficiencies in Emergency Alert Distribution

The state's inability to communicate effectively in a disaster was underscored yet again—this time under tightly controlled circumstances—when the Sonoma County Fire and Emergency Services

Department conducted an alert and warning test over two days in September 2018. They released their findings in the *Sonoma County Operational Area Alert and Warning Functional Exercise After Action Report / Improvement Plan*.

In Phase One, county personnel attempted to contact people associated with the nearly 300,000 phone numbers in the SoCo Alert database. Officials reported a 51 percent success rate in delivering messages to a person or answering machine. Similar problems were reported in the Camp Fire. The Sonoma program is mandatory, as SoCoAlert twice a year purchases customer data and phone numbers from AT&T and Frontier Communications. SoCoAlert also encourages people to go to the program website and register on their own so first responders can notify residents and businesses by mobile phone, text message, email and social media with time-sensitive, geographically specific emergency notifications.

There are many reasons for the dismal success rate, but it's apparent that an emergency alert system that misses about half its targeted audience is critically inadequate.

In Phase Two of the Sonoma County test, county officials targeted five geographical areas for a Wireless Emergency Alert (WEA) and Emergency Alert System (EAS) notification. The WEAs are sent to participating wireless carriers in a targeted area through FEMA's Integrated Public Alert Warning System and then pushed to WEA-enabled mobile devices in the affected areas. Because the accuracy of geographic targeting of alerts has been a serious issue in the past, in January 2018 the FCC approved new rules scheduled to take effect in November of this year that will require participating wireless providers to deliver emergency alerts in "a more geographically precise manner" so that alerts are sent to no greater than a tenth of a mile outside the targeted area.

The Sonoma County Report also found inconsistent policies and practices in how providers issued alerts. The report noted that these inconsistencies reduce the confidence that emergency management officials have in being able to manage successful emergency responses.

"The exercise findings indicate that significant challenges remain regarding the effective use of the federal warning systems, including WEA and EAS," the report concludes. "These challenges include incomplete and inconsistent alerting across communication providers, significant bleed-over when targeting specific geographic locations, and the performance of the technology across various wireless devices. These shortcomings significantly conflict with the public's expectations for service. Local government emergency managers will have to continue to consider these shortcomings in developing and conducting alert and warning efforts. It is critical that local governments, Cal OES, FEMA, and the FCC engage communications providers to continue to improve the reliability and effectiveness of these systems. . . With current policies of mobile carriers, it is almost impossible to target any area with any confidence."

For any emergency alert system to be effective, wireless communications providers must make available certain information such as cell tower location, but these companies have grown accustomed to not cooperating with state and local government officials or regulators. The following paragraph from the Sonoma County report is representative of the communications providers' posture when it comes to dealing with state regulators:

> "Requests were made to the communication providers AT&T and Verizon to provide information and participate in the exercise. Both companies eventually

responded but did not provide the data requested or participate in the exercise. Both company representatives said their respective WEA teams would be in contact with County staff but never followed through."

vi. Post-Disaster Consumer Protections

In an active CPUC Rulemaking regarding post-disaster consumer protections, communications providers represented by the VoIP Coalition that includes AT&T, Frontier, Charter, Comcast and other providers actively oppose the CPUC's effort to impose post-disaster requirements on them, filing in Sept. 2018 for a rehearing of the Commission's Decision (18-08-004). The protections called for in the Decision include such measures as waiving for one year deposit requirements for residential customers seeking to reestablish service, stopping estimated usage billing for the time period when a residence is unoccupied as result of the emergency, discontinuing billing for the same reasons, implementing payment plan options for residential customers, suspending disconnection for non-payment and associated fees and waiving deposits and late-fee requirements for residential customers and similar steps.

Communications providers generally argue that they are already doing on a voluntary basis most of what the order would require. They also maintain that any mandatory disaster relief measures exceed the Commission's jurisdiction under § 710 and are contrary to federal law. Instead, the application makes the following offer: "We look forward to working with the Commission to identify ways in which we can best document our ongoing commitment to providing meaningful relief to consumers on a voluntary basis." Given California's recent experience with deadly fires and the persistent communications challenges they pose, first responders have made clear that voluntary measures are not enough.

vii. Fixing the Problems and Saving Lives

In light of these issues and experiences, the Legislature must determine what responsibilities communications companies have before, during and after a disaster. Setting clear policies that enhance public safety and emergency preparedness and the restoration of vital communications services after a disaster are essential. Deregulated Internet Protocol services and a lack of any clear policies and standards inhibits local and state public safety agencies from ensuring a safe and reliable communications grid for warnings, evacuations, and response.

First responders have made clear that voluntary best efforts are not enough. Given the communications companies' track record of resisting any regulation, their statements of support for what the emergency responders and the CPUC wish to achieve—as long as they can do it on their own schedule and voluntarily, if at all—do not ensure that communications providers will remedy the problems cited here on their own.

Legislative action in the following four areas will help realize a reliable and resilient communications grid that works effectively before, during and after a disaster strikes:

- Ensuring distribution of emergency alerts to the public as quickly and reliably as possible.
- Requiring communications services be provided during emergency response operations.
- Requiring the resiliency of the communications grid, ensuring its ability to function when there is loss of power.
- Financial obligations for enhanced emergency response.

Legislative support and guidance are needed for the CPUC, Cal OES and local emergency services departments to ensure the public's access to 9-1-1, the timely delivery of emergency alerts, and to take the steps needed to protect the public without industry obstruction.

Here is a summary of the state's current authority over the three classifications of voice services:

- **Traditional Telephone Services Landlines:** The State Legislature and the CPUC retain extensive authority over traditional phone service companies. While clearly still an important technology, traditional telephone subscriptions have dramatically declined as consumers switch to wireless and VoIP services. The state can no longer ensure a reliable and resilient communications grid by limiting its authority to this service alone.

- **Wireless Carriers:** Federal law precludes states from regulating entry into wireless markets and the rates of wireless carriers, but states retain explicit authority to regulate ***terms and conditions of service***. Still, wireless providers are likely to challenge any effort to impose safety regulations, including requiring the provision of temporary facilities in areas where permanent facilities have been damaged or destroyed. The companies may argue that these requirements constitute indirect rate regulation, or 'entry' regulation, or both. However, resiliency of wireless voice networks is a service quality issue that seems to fall under the preserved state authority over the 'terms and conditions of service' and would cover requiring warnings to customers, providing communications services during emergency response operations and ensuring resiliency of their networks and the ability to function where there is loss of power.

  Resiliency of wireless voice networks would appear to be a service quality issue linked to the preserved state authority over "terms and conditions," and would cover requiring warnings to customers, providing communications services during emergency response operations and ensuring resiliency of their networks and the ability to function where there is loss of power. To improve wireless resiliency, it would be highly beneficial for the state to consider requiring mandatory back-up power and defensible space for all cell sites and disclosures by wireless providers to customers as to how emergency alerts work, including any steps that customers would need to take to make sure they receive the alerts.

  The state could exercise the limited regulatory authority it has under "terms and conditions" for wireless communications when it comes to ensuring the public's safety, despite industry opposition to such efforts. Legislation should be enacted before the next disaster to ensure the state takes meaningful steps to protect the public and save lives.

- **VoIP Carriers:** Public Utilities Code Section 710 prohibits the CPUC, Cal OES and local governments from exercising regulatory authority over IP-enabled services, including voice. The law sunsets on January 1, 2020. When § 710 was passed in 2012, arguments for the bill included the notion that VoIP was in its nascent form and needed free reign to innovate and grow. Seven years later, with the law set to expire and the industry seeking its extension it may be time for a change. The industry is no longer nascent; VoIP has surpassed traditional telephone service as the dominant wireline service in California. It is clear, given the threat of wildfires, mega-storms, and other disasters, and the strains those disasters put on the communications grid, that there are compelling public policy and safety reasons for why § 710 should sunset. All voice providers that offer the public the vital link to 9-1-1 must once again be required to provide reliable service and consumer protections.