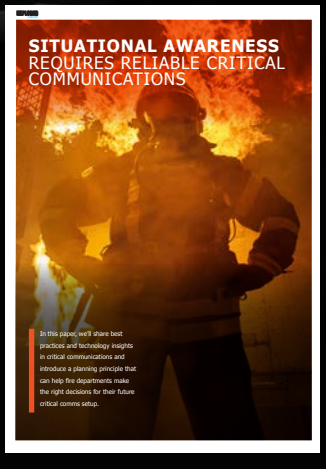
THE IMPORTANCE OF **COVERAGE** FOR RELIABLE CRITICAL COMMUNICATIONS

Situational awareness supported by wireless communication is critical to the success and safety of emergency response operations. As the number, ferocity, and unpredictability of mass emergencies grow, so does the need for planning critical communication solutions able to provide uninterrupted voice and data connectivity.

This paper is an excerpt from an extensive publication on critical communications supporting situational awareness. To download the full report, please click here:



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COMMUNICATIONS SUPPORTING SITUATIONAL AWARENESS STARTS AND ENDS WITH COVERAGE

In firefighting, safe, effective operations depend on situational awareness: knowing what is happening, where, and when. Control, coordination, decision-making, and orders are vastly improved by effective, reliable, wireless communication – regardless of where your teams are and the conditions they're facing. This requires your communication approaches to always perform, anywhere. Between personnel on the ground. And from the front line to the command center. If technology fails and coverage is lost, firefighters are left with a much harder job. The risk increases. Their voice communication could be hampered, making it harder to communicate what they see and hear, and more sophisticated devices such as drones and wireless-connected thermal cameras would be rendered useless.

> Control, coordination, decision-making, and orders all depend on effective, reliable communication.

Firefighting agencies face several challenges when it comes to providing dependable coverage. If the operational area they cover is large, sparsely populated areas may be outside of coverage – but still populated by taxpayers expecting the same firefighting excellence provided in the cities. Improving your fire department's coverage can be achieved in different ways, but careful consideration must be paid to each method's feasibility as well as its vulnerabilities in an emergency. From flooding to wildfires and hurricanes, every scenario needs to be carefully thought through.

LAND MOBILE RADIO

Land mobile radio, LMR, is still the mainstay of most fire departments' critical comms setup. And with good reason. It has been purpose-built for reliability and resilience and has been around for years. People know and trust their two-way radios. Using their PTT radios, frontline firefighters can stay connected to each other and to incident command and exchange the information required for improved situational awareness. But even LMR has its limitations and can fail, too, which is why the best practice and learnings from other sectors is to have more communication approaches available. LMR networks rely on repeaters installed in buildings with an antenna on the roof or on a tower or mast to extend coverage. But radio towers can be vulnerable in mass emergency situations like high wind events or wildfires. This means you'll risk losing coverage when you really need it the most. Losing coverage, you'll risk degraded command and control, as well as a reduction in the information flow that is valuable to situational awareness. In our opinion, there is no need to scrap existing LMR setups. But forward-looking decision makers need to ensure that alternative communication approaches are made available.

DON'T MAKE FIREFIGHTERS WAIT FOR COMPLETE SIGNAL LOSS BEFORE A SYSTEM SWITCH.

OPINION

The quality of wireless coverage changes as you change position, moving through an area. Just think of how radio reception or mobile phone coverage can change as you drive. But different signals tend to change at different times. The quality of your LTE coverage goes up and down independently of the quality of LMR coverage, as many different factors affect different signals. Ideally, your critical comms solution should be able to automatically switch between different signals, always providing users with the best possible signal quality. Firefighters on the scene of a mass emergency shouldn't have to wait for complete loss of one signal before the system switches to another. The switch should take place automatically, always opting for the best quality signal – without users even noticing.

LMR OUTAGE LEAVES DETROIT FIRST RESPONDERS CUT OFF

CASE

In August 2013, Detroit lost LMR coverage, leaving all police officers, firefighters, and EMS crews out on the streets without a central way to communicate. Some police officers resorted to using their private cell phones to stay connected while serving the city's 600.000+ residents. * One can only wonder how well any city's emergency response agencies would be able to handle a mass emergency, if first responders had to rely on their personal cell phones for communication. For one thing, firefighter gloves are not compatible with touch screens. We do not believe adding additional handsets to critical comms solutions and having to manually switch between communication approaches is desirable. What is your department's plan for handling the sudden loss of LMR coverage?

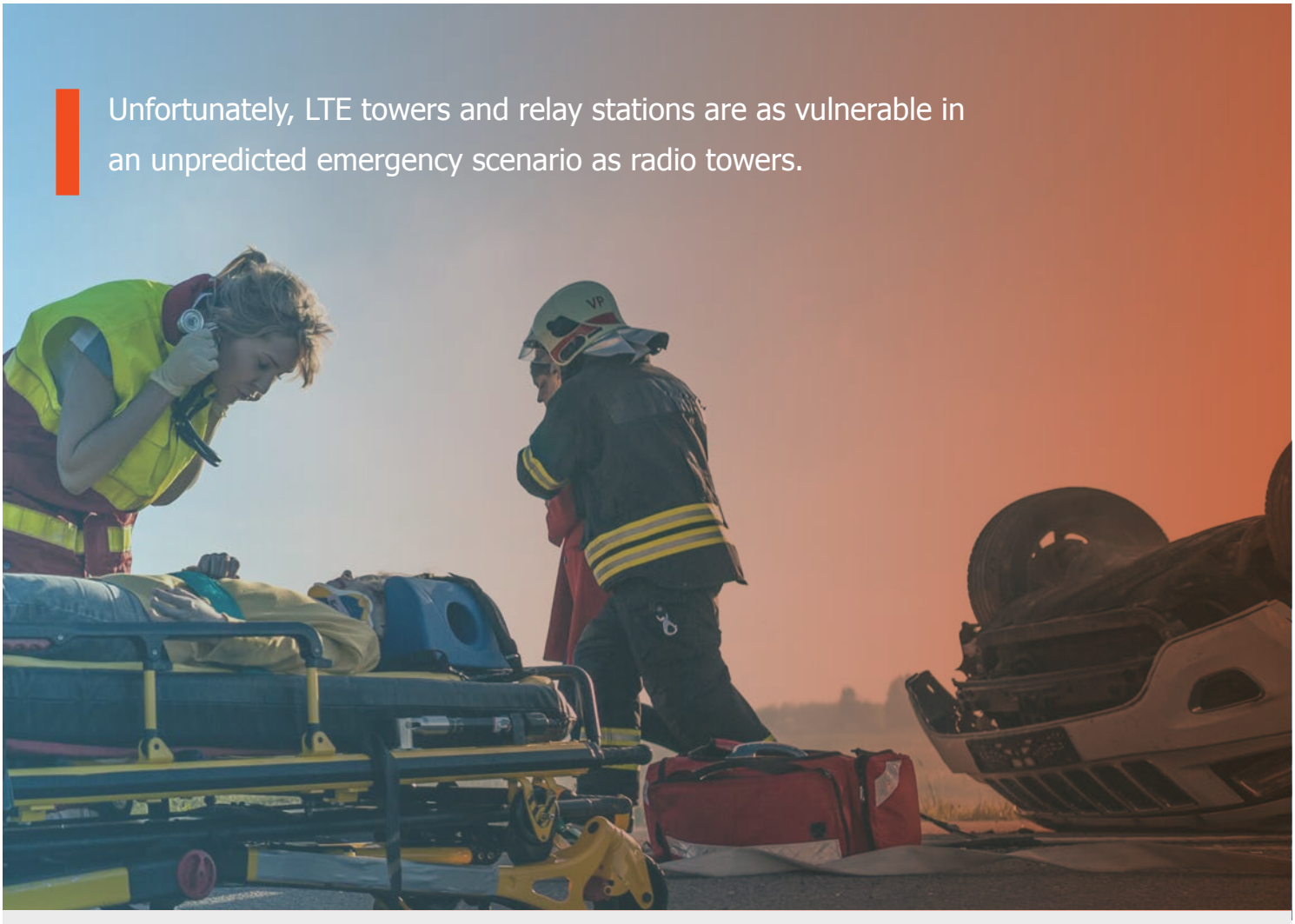
[1] https://detroit.cbslocal.com/2013/08/20/detroit-police-emergency-radio-system-goes-offline-again/

[1] https://detroit.cbslocal.com/2013/07/05/detroit-police-emergency-radio-system-down/

PRIVATE AND PUBLIC LTE

Having your firefighting communications carried via commercial LTE networks supporting Quality-of-Service, Priority, and Preemption (QPP) makes a lot of sense. After all, commercial mobile phone networks already cover most of the globe with reliable 4G and 5G connectivity. So why insist on building the necessary infrastructure and taking care of maintenance yourself, when others already do it better and will let you use theirs for a modest fee? Adding mission-critical LTE to their critical comms setup could see fire departments increase their coverage without breaking the bank. And when it comes to situational awareness, LTE opens the door to new digital tools like dash mounted cameras, drones, and incident log-keeping.

To avoid the risk of getting cut off by network congestion during a mass emergency, some countries have set up private LTE networks reserved for emergency response agencies. Unfortunately, LTE towers and relay stations are as vulnerable in an unpredicted emergency scenario as radio towers. In fact, in a large-scale natural disaster or other mass emergency, traditional radio and mobile phone infrastructure is often the first to go, leaving firefighters and other emergency services in the blind if LTE is all they have.



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MESH

Whether operating far from headquarters or deep inside a burning building, MESH networks are a clever way of extending coverage and keeping firefighting teams in touch with dispatch and each other. MESH is also a good way of carrying IP to the fire ground, enabling the use of digital tools by firefighters even in sparsely populated areas. By dropping relay nodes along the way, fire crews deployed in remote locations can establish a data connection back to dispatch. This will allow them to use IP-based tools and hardware away from their fire apparatus. However, resilience is a worry, as is the time necessary to set up the network. If digital backhaul to dispatch is lost, your firefighters could be cut off and only able to communicate with each other.

SATELLITE

Satellites can provide a wireless connection safely out of reach of hurricanes, wildfires, and other manmade or natural disasters. Adding satellite connectivity to their critical comms setup, firefighting agencies can achieve close to 100 percent coverage of their operational area without having to wait for – or pay for – building new radio towers. Satellite solutions come with little to no maintenance costs or initial investments, and only using satellite as a last resort will help keep monthly bills down. Choosing a service provider with a sensible concept for signal compression and access to flat rate subscription fees will also help to keep your department from running up unpleasant tabs.

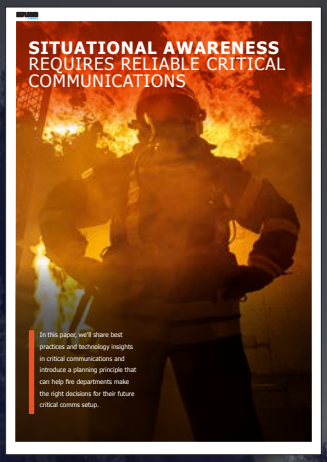
Traditional radio and mobile phone infrastructure is often the first to go, leaving firefighters and other emergency services in the blind if LTE is all they have.

PLANNING FOR FAILURE IS KEY TO **UPHOLDING CONNECTIVITY**

Shared situational awareness based on communication supports the success and safety of emergency response operations. Wireless digital voice and data connectivity enables inter-agency communication and the use of new, digital tools that further support situational awareness and firefighters' ability to protect people and property. But without coverage, communication is hampered, and situational awareness diminished.

GET THE FULL STORY – AND VALUABLE INSIGHTS FOR PLANNING RELIABLE CRITICAL COMMS

To download the full report, including an introduction to PACE planning, a valuable planning principle for critical comms that ensures reliable connectivity for first responders, please click here:



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