



2018

In-Building Public Safety Communication Survey



First Responders Call In-Building Communications Capabilities Critical

More than half say they have experienced communication failure in the last 24 months

Firefighters, law enforcement, emergency medical services (EMS), and other first responders are trained to run into situations where other people flee; they risk their lives to bring order to chaos, protect us from danger and save us from injury and death.

In all of these scenarios, mobile communication is crucial. Firefighters battling a blaze need to be able to communicate with each other and with the commanders on site. Law enforcement needs to talk to each other while responding to an emergency. And EMS personnel need to communicate with each other and other first responders when treating patients. In most cases, the need for all agencies to be able to intercommunicate when addressing a situation or treating a patient is paramount.

Many of these first responders use a variety of mobile communication devices, including two-way radios. The trend toward mobility throughout the country is touching emergency responders, as well. All too often, the buildings they find themselves in during the course of their work have poor radio coverage and cellular connectivity. The connectivity gap greatly hampers their ability to communicate with each other and those outside of the building – a situation that can be life-threatening.

The danger is heightened by the fact that, while first responders know there are buildings with poor radio coverage, in most municipalities, there is no way of tracking those buildings.

To first responders, being able to communicate is critical during an emergency. In most jurisdictions, they're going into situations blind because there is no system in place that can tell them whether the building they're going into has adequate cellular coverage. While almost everyone at every level of every department recognizes that ongoing communication failures are a problem, finding solutions is taking time.

To get a better sense of what the situation on the ground is and what can be done to improve it, we asked the experts. Zinwave collaborated with the Safer Buildings Coalition (SBC) to develop a survey, and the SBC worked with their public safety member, the International Association of Fire Chiefs (IAFC) to survey first responders about their in-building connectivity experience.

The survey received over 600 responses from a range of first responder organizations – including law enforcement, fire and EMS – about communication problems they encountered while inside buildings as they are responding to emergencies. Respondents included Code Officials, Leadership/C-Level, senior management, and service professionals who respond to emergencies. We wanted to know how many experienced communication failures, and we wanted to identify key challenges to remedying the issues.

Here is what we found.



Mobile (Cellular) Technologies Are Now **Critical to Public Safety**

When you consider that a high percentage of 9-1-1 calls are placed using cell phones indoors, it becomes clearer that in-building cellular coverage is a public safety concern. Current fire codes focus on legacy first responder radio technology called Land Mobile Radio (LMR). The increased use of cellular technology by first responders and the public has created an imperative to improve in-building cellular coverage in addition to legacy LMR frequency bands.

Surprisingly, a large majority of first responders reported using their smartphones and other systems connected to cellular networks while on the job. According to our survey, more than three-quarters of respondents—77%—said it's common for people in their organizations to use smartphones to be alerted to or to respond to emergency incidents. Another 66% said they and others in their organizations—firefighters, law enforcement and EMS—use smartphones while performing their duties during emergency incidents.

A firefighter may not necessarily use a smartphone to communicate with someone else while in the middle of a fire, but command personnel working on an incident often does. Similarly, EMS personnel most likely will have

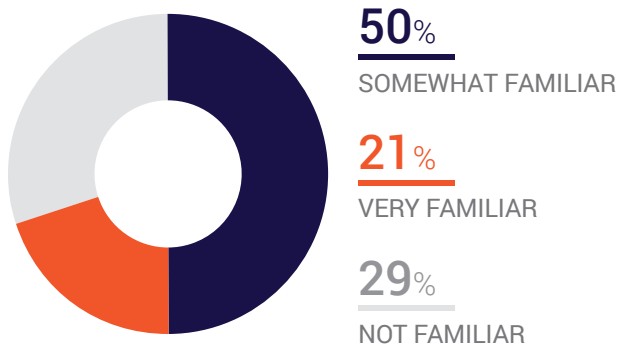
heart monitors hooked up to a mobile connection that's feeding data back to the hospital from an incident. Law enforcement officers have laptops in their cars that are used to send and receive information, and those systems are often tied to a cellular connection.

The growing use of smartphones and similarly connected devices by public safety responders further highlights the need for reliable connectivity, enabling them to send and receive crucial data while responding to emergencies.

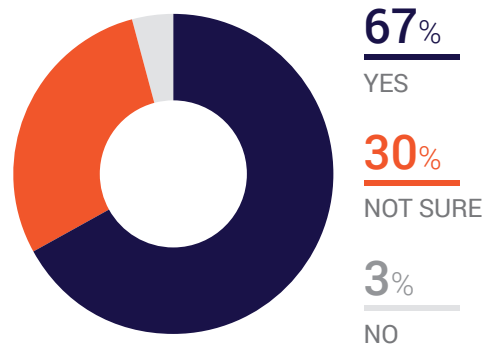
With the deployment of the Nationwide Public Safety Broadband Network (NPSBN) by FirstNet (which uses cellular technology), reliance on cellular coverage for in-building public safety will dramatically increase. While the FCC allocated LTE spectrum in the 700 band specifically for FirstNet, AT&T (who was selected to deploy and operate FirstNet) announced they will use all of their cellular bands to provide the service.

67% of respondents stated that it is important for FirstNet services to be available inside buildings. Only 3% thought it was not important. But FirstNet is very new. 79% stated they were either unfamiliar with or somewhat familiar with FirstNet.

How familiar are you with FirstNet services?



Do you think it's important for FirstNet services to be available inside buildings?



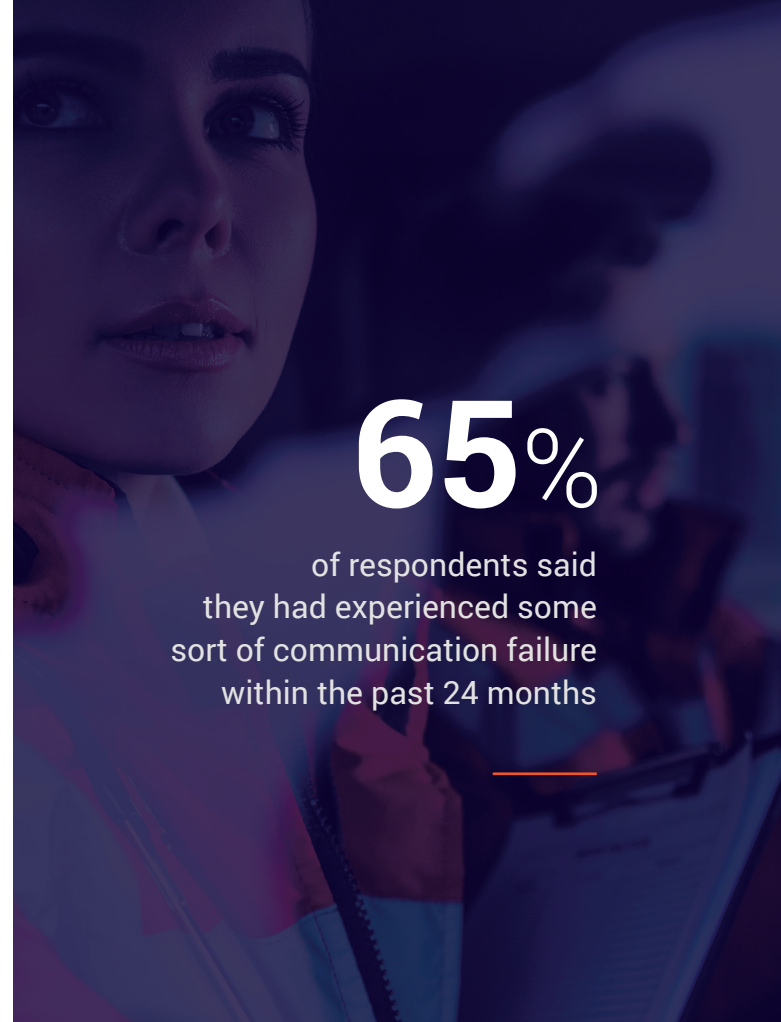
Communication Failure Is Not Uncommon

More than 65% of respondents said they had experienced some sort of communication failure within the past 24 months while inside a building or some other kind of structure while responding to an emergency. Many said they experienced a problem within the last year.

And it could take some time before the situation gets better. Municipalities are adopting certain local amendments and International Fire Codes (IFC) that require the owners of new buildings to prove they have reliable public safety coverage, but few jurisdictions require coverage in existing buildings that weren't subject to the code when the building was constructed. Groups like the Safer Buildings Coalition are helping to drive the industry in adopting fire codes that address the problem. But getting those codes adopted and enforced is a long-term effort. Until then, public safety responders will continue to face communication interruptions.

Most First Responders Experience Trouble with Radio Coverage in Buildings in Response Areas

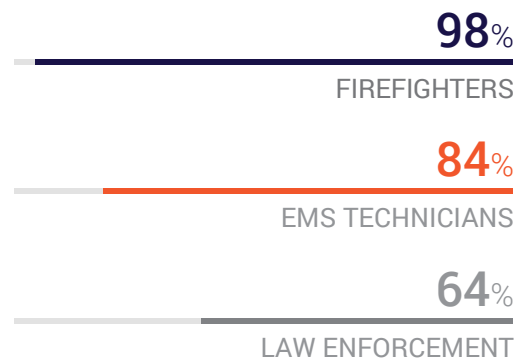
Most emergency responders have buildings within their response area where poor coverage impacts their ability to use public safety radios. The response was high among EMS technicians, with 84% saying they had run into the problem. Law enforcement officers—64%—also reported problems. But poor radio coverage was particularly acute among firefighters; 98% said they noticed in-building communication problems in their jurisdictions. The relatively wide range of responses may seem counterintuitive at first, but when you think of the difference in job functions, it makes sense. For firefighters, almost every emergency they respond to is indoors. They're almost always in a building trying to communicate with their fellow firefighters and with others outside of the immediate scene, making them acutely aware of coverage problems indoors.



65%

of respondents said they had experienced some sort of communication failure within the past 24 months

Most emergency responders report having been impacted by poor in-building radio coverage.



Enforcement of Fire Codes Requiring Booster Systems is Limited but Growing

As indicated by the survey results, poor radio coverage is a problem for firefighters, law enforcement officers and EMTs when responding to in-building emergencies, and improving signals indoors would help them immensely. However, finding solutions to the problem is not an easy matter.

There are challenges that boil down to what can realistically be done, at what cost and by whom. 42% of jurisdictions reported they are currently enforcing or plan to enforce fire codes published by the National Fire Protection Association (NFPA) and International Code Council (ICC) that include ensuring good cellular coverage in buildings. 32% of respondents said their jurisdictions are not currently enforcing these codes, and 26% were unsure of the current status of code enforcement in their jurisdiction [note: not all respondents were Fire Marshals or Code Enforcement officials].

However, putting codes in place and installing what's needed to comply with them becomes a resource issue of both time and money. It can take years to get codes adopted and implemented, and once in place, budgeting becomes an issue. Some agencies reported a lack of funding and training to support enforcement of codes they recognize as critical.

Currently, funding for in-building wireless systems are invested in by building owners and developers as they plan and construct new buildings or renovate older ones. As codes are put in place, developers will be mandated to abide by them. This includes deploying the necessary systems that ensure reliable indoor cellular connectivity for public safety officials. New business and financial models are emerging as the in-building wireless and commercial real estate industries gain a better understanding of the requirements and opportunities to innovate.



Are fire codes for emergency responder radio coverage (ERRCS) enforced in your jurisdiction for good cellular coverage?

42%

CURRENTLY ENFORCE OR PLAN TO ENFORCE

32%

DO NOT ENFORCE

26%

UNCERTAIN OF STATUS

Reliable In-Building Connectivity Is Critical

When firefighters go into burning buildings, when law enforcement officers respond to a crime scene and when EMS personnel must go indoors to answer an emergency call, they are armed with mobile devices. They need to be able to communicate with their fellow responders, with management outside the emergency area and with others at the 9-1-1 communications center or at the hospital. Unreliable coverage inside buildings can create life-and-death situations for both the responders and those they are trying to help.

First responders understand the need for in-building connectivity. A clear majority of the survey respondents –99%– said reliable in-building communication coverage of public safety frequencies is important to them when performing their jobs during emergencies. Of those, almost 81% said reliable coverage was critical, and another 14% said it was frequently important.



99%

of respondents said reliable in-building communication coverage is important to them when performing their jobs during emergencies

How important is reliable in-building communications coverage to performing your job during emergency incidents?

79%

CRITICALLY IMPORTANT

15%

FREQUENTLY IMPORTANT

6%

SOMETIMES IMPORTANT

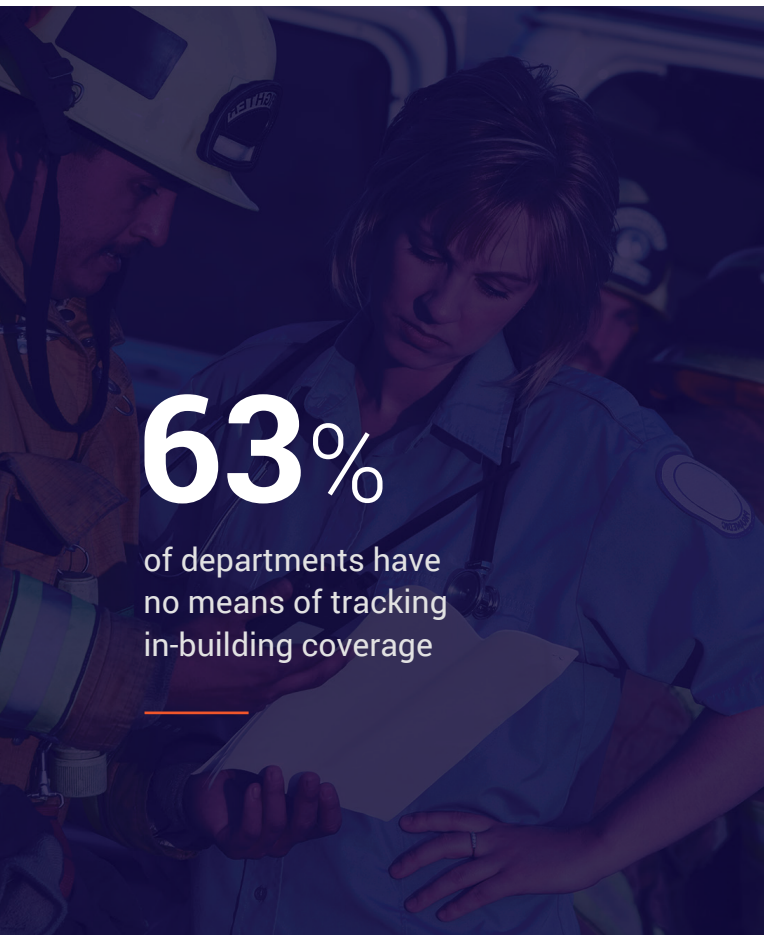
Keeping Track of Buildings with Poor Coverage Isn't Easy

While many first responders have communication issues, the survey identifies more than 63% of departments don't have any way of tracking building coverage, so that every first responder is aware of buildings without coverage. Those who do track coverage problems stated they utilize Computer Aided Dispatch (CAD) and Record Management Systems (RMS) for this purpose.

Knowing which buildings have and don't have reliable connectivity is becoming increasingly important for first responders; creating a formalized tracking system that shows which building does or does not have coverage is just now being explored by many jurisdictions. There are challenges, including the fact that first responders don't enter every building very often, so data collection about indoor coverage throughout a jurisdiction can be incomplete.

In many respects, in-building radio coverage wasn't really recognized by many as a problem until the first responders during the 9/11 attacks in New York were unable to communicate. Interest in the issue of ensuring communication during emergencies came to the forefront out of that tragedy, but change takes time.

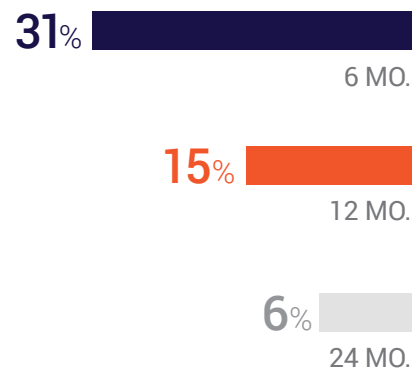
The process of developing fire codes that include ensuring proper in-building cellular coverage and getting communities to adopt such codes can be lengthy. Implementing the codes takes even more time. Therefore, while the ability to track buildings' coverage capabilities would be helpful to first responders, it won't happen overnight.



63%

of departments have no means of tracking in-building coverage

Over 30% of respondents stated they have experienced a communication failure within a building over the last six months.



Delivering Safety with In-Building Connectivity

Conclusion

The need for reliable in-building connectivity will only grow in the coming years. First responders will continue to rely on wireless mobile devices while performing their duties, whether it's entering a building that's on fire, responding to a call for law enforcement help or assisting a person in need of medical attention.

To ensure communications during emergencies, a system that can amplify the frequency bands that are most commonly used by public safety providers is necessary. That includes frequencies in the 400MHz, 700MHz and 800MHz bands, as well as lower-band VHF and other tactical frequencies. With the increased reliance on smartphones and cellular bands to make 9-1-1 calls and respond to them, the best solution will also provide for multi-carrier cellular coverage.

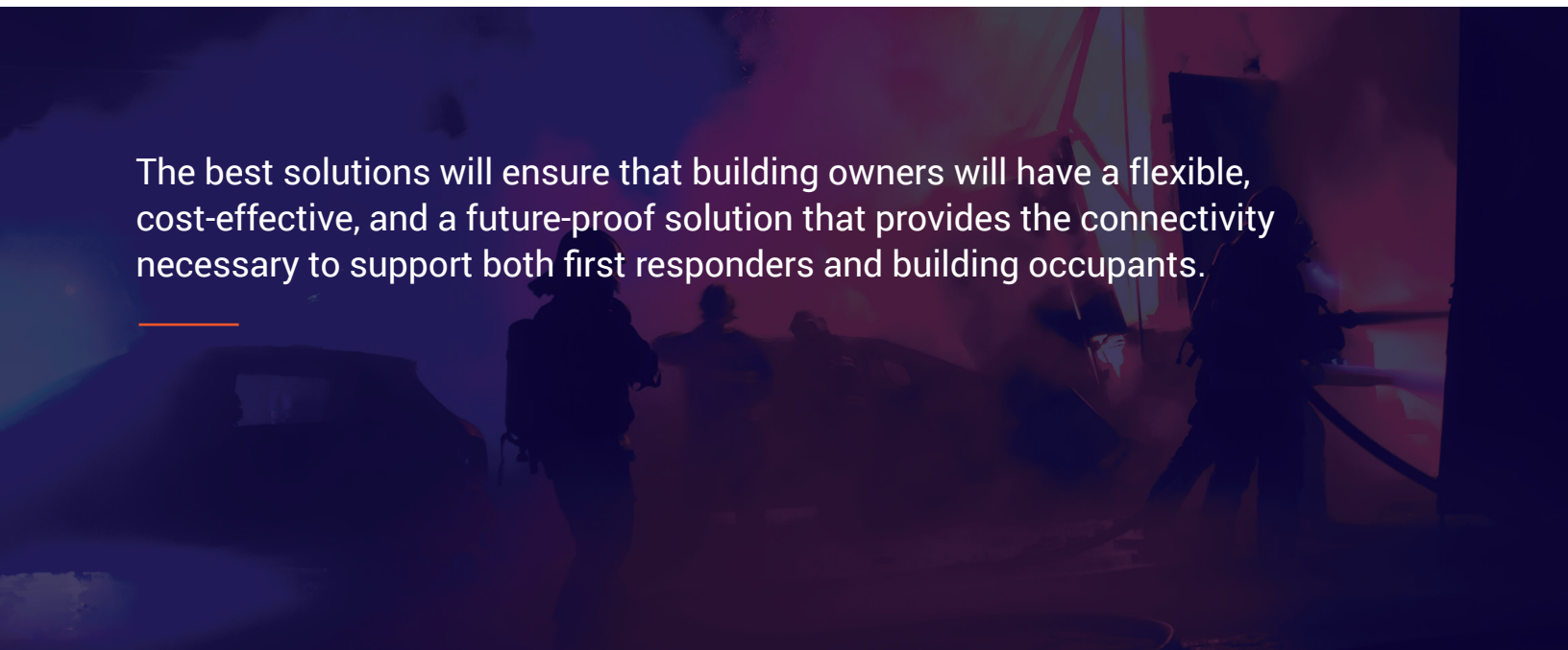
Currently, many jurisdictions require separate booster systems for LMR and cellular bands, but 19% reported they permit combined systems. 26% said they are not permitted, while 55% stated they were unsure. Therefore,

there is an opportunity for building owners to leverage some of the public safety booster system investment mandated by fire codes to improve cellular coverage for occupants.

As previously mentioned, the financial responsibility for bringing such solutions into buildings falls on the building owners and developers. Public safety booster system fire codes are being adopted and enforced in more and more jurisdictions, and some jurisdictions have implemented retroactive requirements for existing buildings.

A minimum public safety booster system solution should be code compliant, easy to deploy, and should ensure that first responders will be able to communicate reliably as they answer the call to emergencies.

The best solutions will ensure that building owners will have a flexible, cost-effective, and a future-proof solution that provides the connectivity necessary to support both first responders and building occupants.



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THE FUTURE OF IN-BUILDING CELLULAR
AND PUBLIC SAFETY CONNECTIVITY

About Zinwave

Zinwave provides indoor cellular and public safety coverage that businesses need in a four-component, fiber-based solution that's easy and affordable to install. And because it can support the full spectrum of common radio frequencies from day one, the Zinwave solution is future-ready without additional hardware needed to add capabilities, making for the lowest total cost of ownership. Zinwave has a global customer base.

For more information, please
visit www.zinwave.com



About SBC

From our inception in February 2012, the Safer Buildings Coalition has been at the forefront advancing the idea that wireless technology makes people inside large buildings safer.

The Safer Buildings Coalition is an independent, non-profit organization focused on advancing policies, ideas and technologies that ensure comprehensive in-building communications capabilities for Public Safety and the people they serve.

For more information, please
visit www.saferbuildings.org

