

Interoperability, Apps & Affordability

Leveraging Commercial Technology for Public Safety

BY T.J. KENNEDY

The mission of the First Responder Network Authority (FirstNet) is to establish a nationwide, interoperable broadband network for America's first responders and other public safety workers. It is an ambitious but necessary mission that implements one of the final recommendations of the 9/11 Commission—and will fundamentally change the way public safety communicates.

We are familiar with the obstacles that some first responders faced on 9/11 when they were not immediately able to speak to each other to effectively coordinate responses. A lot of work has been done at the state and local levels to enhance communications among agencies, disciplines and jurisdictions during emergencies. But firefighters, police officers, paramedics and others still have to contend with more than 10,000 separate and often proprietary land mobile radio (LMR) networks that are not inherently interoperable. This can make it difficult, and at times impossible, for emergency responders from different jurisdictions to communicate, especially during major emergencies.

In the almost 13 years since 9/11, communications networks and devices have made major advancements. Yet public safety communications systems are not fully leveraging these technologies. In fact, teenagers today often have smartphones that are more powerful communications devices than those used by public safety professionals. In many cases, emergency responders have to bring their own smartphones to work to access applications, make phone calls and share photos or videos.

First responders across the country have told us they need an interoperable communications system that they all can use, from a variety of jurisdictions, at the same time. They need leading

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edge mobile applications (apps) to better protect themselves and the public they serve.

NATIONWIDE & INTEROPERABLE

This is where FirstNet comes in. Our charge is to bring the benefits of a single, nationwide, interoperable network that is hardened, secure and built to open standards for public safety agencies

is that the network will operate on nationwide spectrum that's all similar. If you visit public safety agencies today, different jurisdictions operate on different spectrum. Some are still on VHF and others are on 800 MHz spectrum with digital trunked radio systems. Some are in 700 MHz narrowband spectrum. Being in different spectrum areas can make LMR systems incompatible with other systems.

The ability to coordinate spectrum used by first responders across the U.S. with one nationwide broadband system will solve one of the interoperability problems that exists today. FirstNet spectrum is 20-plus MHz in the 700 MHz D Block region of the spectrum. Because that spectrum is available in all states and territories across the country as part of our enabling legislation, if first responders were requested to help a neighboring county or state, they would be able to operate in the same spectrum. See the "700 MHz Band" chart detailing FirstNet's dedicated spectrum.

Our legislation calls for the use of long-term evolution (LTE) technology. LTE is optimized for voice, video and data capabilities. It is very much a high bandwidth data network that can do many things. The fact that you can do multiple things on the same network will help solve challenges involved with using disparate technologies.

With FirstNet, the entire public safety community will be able to communicate on the same technology



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across the U.S. and its territories. We will enable multiple jurisdictions to cost-effectively share access to applications and common databases such as motor vehicle and criminal background

"Our goal is to facilitate an app ecosystem for public safety"

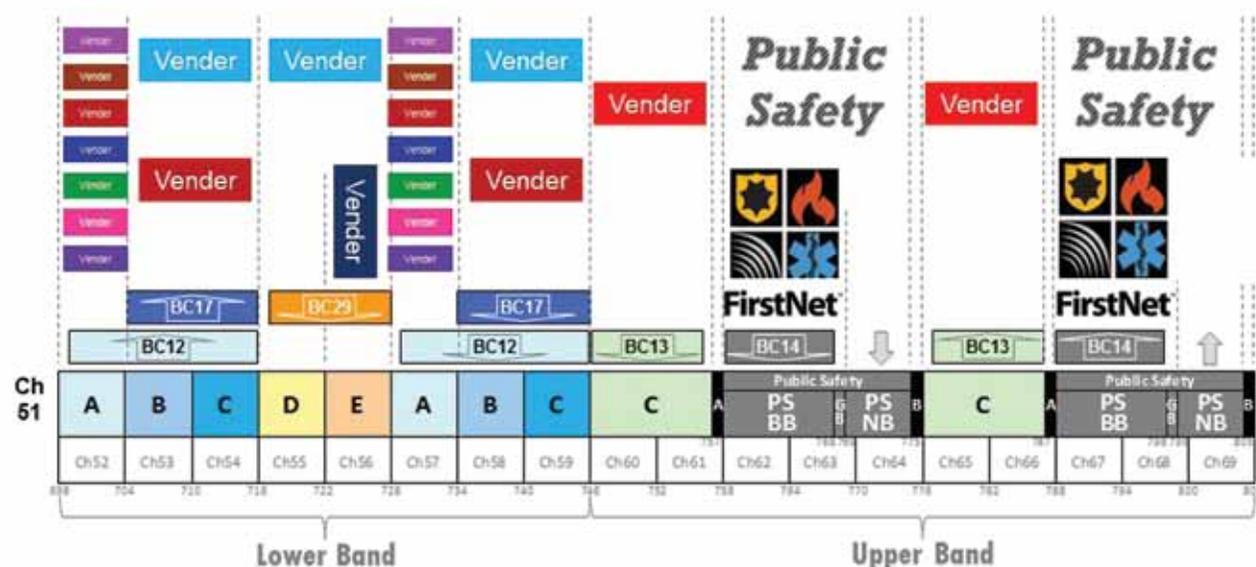
information. During incidents where multiple agencies converge in a small area, and calls from affected individuals often flood a typical cell network, first responders will have priority access on their own network.

One of the best things about FirstNet

across the U.S. and its territories. When you get on an airplane in Portland, Oregon and land in Atlanta, Georgia, your cellphone still works in Atlanta, right? The same principle will apply to public safety communications under FirstNet as on a nationwide cellphone network,



700 MHz Band



but one that is built specifically for public safety's needs. No matter where public safety is sent to help in a large emergency, first responders coming to help will have immediate access to the communications capabilities.

We at FirstNet believe that one nationwide network with interoperability built-in from day one will enhance public safety's ability to protect and serve. Incident commanders need the ability to quickly convey vital data to every first responder. This

is particularly true in the face of terrorist attacks or natural disasters. Different jurisdictions will be able to share new apps that better leverage common and/or event-driven information, images and video.

BROADBAND DATA UPON DEPLOYMENT

When FirstNet is initially deployed, it will provide mission-critical, high-speed data services that augment the voice capabilities of today's LMR networks. FirstNet users will be able to send and

receive data, video, images and text, as well as use voice applications. They will communicate over the network and benefit from the ability to share applications. FirstNet will also carry location information and eventually support streaming video and voice over LTE (VoLTE).

“We cannot make FirstNet work without organizations like APCO”

It will enable a faster, more informed and better coordinated response to incidents across city, county, tribal, state, regional and national emergency services personnel. This LTE network will be an end-to-end Internet Protocol-based network.

FirstNet will be bringing public safety into the trend of how Internet communications have been evolving over the last 10 years. The simpler LTE architecture also means cheaper components and usage shifts toward the services or applications side. Once we

get the network in place and everything running over the top of it, the ecosystem and dynamic for first responders will be similar to what we've seen with popular smartphones running on big commercial pipes.

Just as smartphones—smart mobile devices—and Internet-based networks have changed the way we communicate in our personal lives, FirstNet devices and applications will change the way our first responders operate for the better.

As first responders start using a data-driven network that's focused on them, we're going to ride that same wave everyday people have been riding with their smartphones for quite some time. First responders will get all of the data and application richness inherent in broadband solutions.

FIRSTNET USE CASES

When I was a paramedic we had a very physical, hands-on ways of working. We had radios. Today, a paramedic who is treating a critical patient not only has

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INTEROPERABILITY, APPS & AFFORDABILITY

to treat the patient and save them, he or she has to talk on a radio to describe the patient's condition while on the way to the hospital. They have to describe the patient's heart rate, blood pressure and heart rhythm to a receiving emergency room. Paramedics spend a good amount of time describing what they're seeing into words spoken into a radio.

Today, and even more so in the future with the broadband network, paramedics have the same kinds of modalities I used, but in hand-held applications that allow



them to attach and monitor a patient wirelessly. They can send real-time data from the patient to emergency rooms and trauma centers. What the future holds for triage apps and remote medicine is exciting. The same is true for apps focused on the law enforcement and firefighting communities.

In the case of emergency medical services, treating people will increasingly involve the transfer of bits and bytes of information for better, faster patient care and communication. In the FirstNet broadband network world, paramedics could send all that patient data electronically in real-time and on an ongoing basis. The paramedic would attach the cardiac monitor to the patient and a SpO2 monitor for pulse oximetry

and electronically send their vital signs to the hospital in real-time.

FirstNet is on the forefront of this technology wave and the wave that's coming is a big one. Our goal is to facilitate an app ecosystem for public safety so innovation comes from every single police officer, firefighter and paramedic who's thinking of great ideas. Some of these people will develop apps themselves and launch companies. Some will use developers who create the apps for them. We're already encouraging first responders to lean forward and create apps that will be robust and support real-world, real-time public safety needs.

KEEPING COSTS LOW

Our goal is to keep user fees as low as

possible so all of public safety—police, fire and EMS, big and small departments, metro and rural—can access the public safety broadband network. Given our ambitious task, we must be cost-effective in how we build and maintain the network.

With millions of public safety users, FirstNet can take advantage of increased vendor competition and economies of scale to drive down the final cost to public safety users and bring savings to local, state and federal budgets. In fact, there are smart devices—phones, tablets, PDAs and dongles—being tested in partner federal labs now that support our spectrum. We're also seeing some traditional public safety radio vendors developing Band Class 14 devices for their first responder market.

Finally, we recognize that we cannot make FirstNet work without the support and collaboration of public safety organizations like APCO. Naturally, we'll look to associations like APCO to help FirstNet and relay valuable input from the field. APCO members can help FirstNet become the resource it absolutely must be to support our first responders. **||PSC||**



T.J. KENNEDY is the acting general manager of the First Responder Network Authority (FirstNet).

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