ALMR INSIDER

LMR/Broadband Convergence

The more public safety agencies join FirstNet (NPSBN), the more those following the progress as "outsiders" (not public safety personnel) are making noises about how FirstNet will "soon" become the only public safety network needed. It is not clear why some administrators, vendors, pundits and researchers are pushing this model. However, it is clear why elected officials in Congress, the states and local jurisdictions are promoting the one network approach - they want to stop funding existing land mobile radio (LMR) systems that are currently the nearest thing public safety has to mission-critical networks, which FirstNet is not now and may never be.

While public safety personnel recognize the many capabilities that FirstNet will provide, they do not view it as a total replacement for the current LMR systems in use by their agencies nationwide, at least in the foreseeable future. Many of them do see and anticipate a planned convergence of the two technologies over the coming years. The graphic included with this article is how one vendor envision the convergence of LMR and FirstNet over the next several years. Others may see slightly different time lines for availability and implementation, but it appears in general, vendors and public safety personnel see convergence of the two technologies, not replacement of LMR for quite some time, if ever. The convergence of FirstNet and LMR will make available the unique strengths and capabilities of each.

(Article by Mr. Del Smith, ALMR Operations Manager, with excerpts from Public Safety Advocate by Andrew Seybold. Graphic use authorized by Motorola Solutions®)
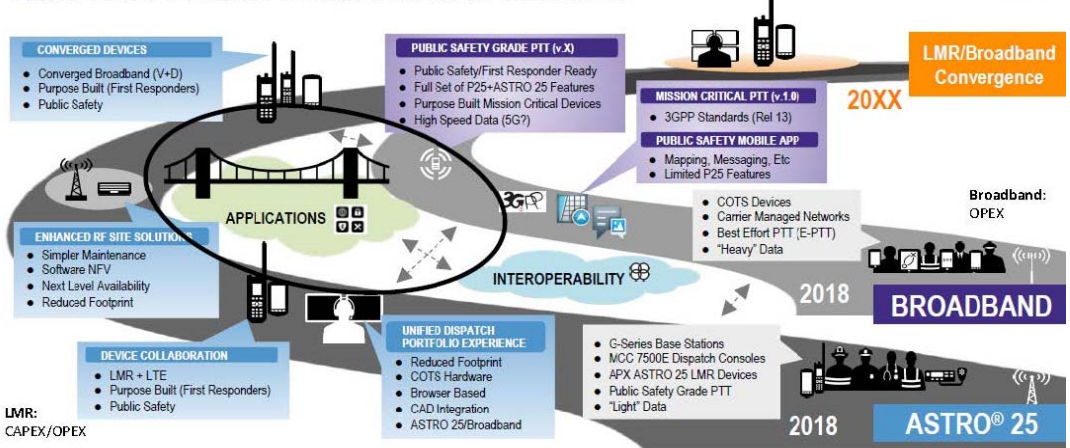
Public Safety Grade LTE: Myth or Reality?

Recently, there has been some debate on the meaning and definition of "public safety grade." The 2017 hurricanes underscored the need for clarity on what it means and what public safety needs with regard to reliable data. A National Public Safety Telecommunications Council (NPSTC) document published

in 2014 provided a definition that the overall system design enables system and service to achieve 99.999 percent (five nines) availability, which results in net outage of only five minutes per year. The First Responder Network Authority (FirstNet) is highlighting the importance of data in

Public Safety Grade LTE: Myth or Reality? (continued)

public safety operations, and as public safety wrestles with a 25-year commitment decision with the selected vendor, it becomes one of the cornerstones of the eventual solution that will last a generation.

If FirstNet and data communications are ever expected to become "mission critical," public safety must be able to rely on data communications as much as LMR, built to five nines availability, which is needed to achieve "public safety grade." Five nines, among many other requirements, is mandatory for broadband to replace LMR.

First, cell sites have been dramatically reduced in height. Carriers originally used 300-foot towers, but now they are 30 - 50 feet tall in urban areas and only cover so much area, no matter which way you point the antennas.

Second, the largest concern in urban areas from loss of a cell site is loss of capacity and in-building coverage. Steel and concrete construction, combined with LEED-compliant windows, result in signal degradation 1,000-fold by the time it reaches the interior. It's not feasible to have a distributed antenna system in every building, so the economical approach is substantial cell density.

Third, an outage is rarely only a single site. This occurs because a power outage often affects an entire region and more than one site in area and is precisely when a mission-critical network is needed.

The final flaw is that the system was designed to include the failed site and any missing site is likely to cause a substantial traffic load on neighboring sites, further increasing interference levels. While first responders will have priority on the network, if signal levels do not sufficiently exceed noise levels, performance will suffer.

LMR networks are not only more survivable and available, they have better backups. Because public safety radios come with simplex or talkaround capabilities, when the network fails, public safety can still communicate. In addition, LMR networks have failure modes that allow for a graceful degradation of service as multiple transceivers can be used as a control channel in a trunked radio network, or sites can be configured to operate in stand-alone mode, separate from the core network, if necessary. LTE sites have some backups, but will generally have one or more single points of failure that present a risk, on top of other hardening factors for the site itself.

Upgrades, modifications and preventive maintenance should be planned to least impact the system and cause minimal outages; other maintenance efforts need to be performed without affecting service availability. Public safety works 24/7 and needs a 24/7 network.

There are no easy answers and AT&T and FirstNet should seek out-of-the-box solutions. Sharing situational awareness information among first responders at an incident scene needs to be as pervasive in 5 - 10 years as PTT voice communication is today. Public-safety professionals put their lives on the line every day to serve the public; delivering rock-solid communications solutions is the least we can do for them.

(Excerpts from "Public Safety Grade LTE: Myth or Reality? " article by Joe Ross, Steve Sidore, Scott Edson and Ted Pao, Mission Critical Communications)

FirstNet Association Forms to Bridge Gap with Users, Vendors

Public safety leaders created the FirstNet Association, an organization dedicated to bridging the gap between end users of the nationwide public-safety broadband network (NPSBN) and those responsible for the system's buildout, evolution and maintenance.

Al Gillespie, past president of the International Association of Fire Chiefs (IAFC), will serve as president. Ray Flynn, retired assistant sheriff from the Las Vegas Metropolitan Police Department, and Richard Mirgon, past president of the Association of Public-Safety Communications Officials (APCO) International, will also lead the association.

"Public-safety professionals must have access to the women and men who touch every portion of the network, from individuals developing hardware and software platforms that will operate on the network, to those crafting policies and regulations that will shape how the network is used," said Gillespie. "Connecting end users with people responsible for the network's success will help ensure FirstNet evolves into the best possible version of itself."

First responders, academia, industry partners and other nonprofit associations will have a dedicated forum to trade ideas, share best practices and offer lessons learned from real-life experiences on the FirstNet network. This exchange of ideas will lead to more effective broadband deployments that will help drive innovation within public-safety departments across the country, a statement said.

"Our goal with this organization is to empower a new generation of first responders by providing them with the tools to participate in the advancement of their network," said Roger Wespe, executive director of FirstNet Association and national public-safety strategy and technology manager for Sonim Technologies. "FirstNet will succeed because first responders collectively choose to engage in this endeavor."

"The emergence of the FirstNet Association offers great promise for the FirstNet public safety user community and vendor community," said FirstNet Chair Sue Swenson. "We stand ready to encourage its success, so that FirstNet fully realizes its exclusive public safety mission."

(Article taken from Mission Critical Magazine/Radio Resource International, April 4, 2018)

NIST Releases List of Devices Approved for FirstNet Network

The National Institute of Standards and Technology (NIST) released a list of approved devices under the First Responder Network Authority (FirstNet) Device Approval Program.

In addition to the previously announced Samsung(R) Galaxy S9 and S9+ smartphones and Sonim Technologies XP5S and the XP8 rugged handhelds, the list includes seven Apple(R) iPhone smartphones and three additional Samsung(R) smartphones, the S8, S8+ and S8 Active.

The list also includes the Apple(R) iPad and iPad Pro tablets and the Netgear(R) MR1100-330 hot spot. The hot spot, Galaxy S9 and S9+, and Sonim handhelds all bear the "FirstNet Ready" logo on the firstnet.com website, although there are no specific designations for devices on the NIST list.

"Devices that have a FirstNet Ready badge are those that will work on the FirstNet EPC (evolved packet core) simply by installing a FirstNet SIM (subscriber identity module) card," the firstnet.com website said. "Note that some FirstNet Ready devices may also require a simple software update. The remaining devices displayed are those that will work on the FirstNet EPC upon updating the software, unlocking the device (if required) and installing a FirstNet SIM."

NIST is responsible for maintaining the device list under the legislation that established FirstNet.

The FirstNet Device Approval Program is built on AT&T's standards-based wireless device testing and certification program. FirstNet conducted audits and verification steps in this process, said Joe Martinet, FirstNet director of devices.

"For example, we audited and verified testing of public-safety-focused features and functions of wireless devices currently published on the NIST list," he said. "This includes band 14 functionality, FirstNet UICC (universal integrated circuit card) or SIM functionality, as well as functionality with the FirstNet core."

A process document[1] outlines three phases of approving a FirstNet device for sale. The first phase is regulatory testing and includes FCC certification. The second phase is industry certifications required to sell a product in the United States, including PCS Type Certification Review Board (PTCRB) certification. The final phase is mobile network operator (MNO) testing and is specific to AT&T. Martinet said the first FirstNet SIM cards were available in February, and more devices will be added to the list later this year. The NIST list will align with the firstnet.com website.

"As more devices progress through the FirstNet Device Approval Program, we will continue to work closely with NIST to ensure timely updates to the NIST list going forward," Martinet said. "This will ensure public safety is aware of the rich and diverse portfolio of devices available for use on the FirstNet network."

(Article taken from Mission Critical Magazine/Radio Resource International, by Sandra Wendelken, Editor, April 11, 2018) ([1]Process document located at: https://www.nist.gov/sites/default/files/documents/2018/05/10/process_document_for_the_nist_list_of_certified_devices_v1.50.pdf)

Bridging to the Future with Convergence Technologies

Traditional voice communications via Land Mobile Radio (LMR) will continue to be the bedrock mode of communications for first responders (fire, police, EMTs and utilities). Broadband technologies, however, are viewed as key elements of the future mission-critical communications portfolio, and that means starting the adoption process at some point in the near future.

LMR continues to enjoy popularity among first responders because, as private dedicated networks, the coverage and reliability of LMR meets the standards for mission critical communications. LMR's limitations are also its strengths: it is relegated to primarily voice communications with very limited (if any) integration of data or multimedia into the first responder workflow. And, it's what they're comfortable using and accustomed to relying on.

As first responders look toward Long-Term Evolution (LTE) broadband, converged devices can be the catalyst to accelerate the adoption of new data-centric capabilities, while ensuring that end users have reliable voice communications. First responders can benefit greatly from still images and video, as well as the ability to use purpose-built applications that can bring new levels of capability to end users with LTE. Because LMR cannot effectively transmit images or video transmissions, it is currently being supplemented for non-emergency communications by broadband technologies.

The buildout of nationwide commercial LTE networks for Public Safety is underway and multiple carriers have stepped up with plans to provide nationwide service built for mission-critical end users. This multi-year process is just beginning as LTE networks will need to be proven ready for the demands of the first responder community. In essence, first responders in the U.S. are amidst a major inflection point in mission-critical communications.

While some departments are already sprinting towards LTE, the shift from LMR to LTE will take many years and thus will require a carefully

Bridging the Future (cont)

planned migration, made easier by converged technologies that enable end users to leverage both LMR and LTE.

The best way to approach future communication procurements is to think in terms of converged networks, devices and applications. Convergence means that services are delivered to the user with the same presentation, and with the same features and operation, regardless of the transport network that delivers the services.

When considering such devices, one should think about how the user equipment will support a variety of services as users move through different network coverage areas.

Even agencies in urban areas with many broadband service providers should consider how these devices will support communications when catastrophic events result in a simultaneous surge in usage, as well as a reduction in capacity due to network outages. In these situations, multimode devices will fall back to secondary networks–whether LMR or LTE or enterprise WiFi®.

For the time being, communications network planners will continue to rely on and incorporate devices, applications and services that allow for converged communications across a variety of networks–including LMR and LTE/WiFi® broadband networks.

The steady pace of adoption of new converged products will continue, but until nationwide LTE public safety networks are fully proven to provide public-safety-grade reliability, first responders will seek solutions including LMR-LTE converged devices that enable them to have the best of both worlds.

(Excerpts taken from Bridging to the Future with Convergence Technologies, June 2018 Harris-Tait Communications, harris.com)

Did You Know?

Admin/OP/Statewide IC Zones and Regional IC Zones should be programmed into every radio operating on ALMR. If this is not an option due to limitations of the radio, the Statewide IC Zone and agency Regional IC Zone should be programmed, at a minimum. Regional IC Zones provide common use talkgroups for each of the seven Tactical Interoperable Communications Plan (TICP) regions.

(ALMR Concept of Operation)

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