

Augment Your ARES® Mission with FirstNet®

Randy Richmond, W7HMT

In March 2018, the Nationwide Public Safety Broadband Network known as First Responder Network Authority, in contract with AT&T, was launched as FirstNet®, the first nationwide 4G LTE communications platform dedicated for public safety's wireless broadband needs. The 2012 Spectrum Act, which funded FirstNet, allows the dedicated band on the 700 MHz spectrum to be shared with second responders (extended primary status), such as people in health-care, utilities, transportation, and supporting volunteer groups, including the Amateur Radio Emergency Service (ARES®). Here's how ARES members can apply for a subscription to FirstNet and use this tool for public service applications.

FirstNet vs. Commercial Cellular

FirstNet differs from commercial cellular carriers in the US because it offers the following:

- 20 MHz of dedicated 700 MHz spectrum, known as Band 14. Band 14 is a nationwide, high-quality spectrum provided by FirstNet to extend the coverage and capacity available to public safety users on its communication platform.
- Access to AT&T's existing commercial spectrum where Band 14 has not yet been deployed, or for additional coverage and capacity.
- Traffic priority for FirstNet first responder subscribers over commercial and consumer traffic on all of the above spectrum, without having to invoke Wireless Priority Service (WPS) codes. A subscriber vetting process helps ensure the pool of qualified users doesn't overly dilute priority access.
- A planned dedicated multicast IP network separate from AT&T's commercial unicast IP network, which can efficiently support group communications.
- Dedicated sales and support teams.
- Access to FirstNet Ready® devices and FirstNet-approved applications that include Band 14 capabilities and meet FirstNet's rigorous security, relevancy, and data privacy standards.

How to include this communications platform in your public service toolbox.

Advantages for ARES

ARES Cellular Use

ARES members know that in disasters, both cellular and public safety land mobile radio (LMR) networks can go down. One of the benefits of the Amateur Radio Service is that network-independent, ad-hoc stations can quickly be set up and get on the air to communicate inside and outside the impacted region. Although ARES is capable of operating with no functional cellular network, there are times when cellular capabilities, if available, are useful.



ARES training (such as EC-001: Introduction to Emergency Communication) notes specific instances where cellular service can aid the ARES mission, such as passing private information or large amounts of data (except for limited availability on HamWAN — 4G LTE exceeds the data rate of all other amateur radio modes).

Another example is the ability to communicate directly with served agencies. Phone calls between designated served agency management and ARES team members have always been desirable, particularly as a primary activation method. But ARES members seldom have the ability to participate in group two-way communications with their served agency, because they don't usually get permission to use an agency's Part 90 LMR system. FirstNet offers several certified broadband push-to-talk (PTT) apps that can be used to bridge served agency personnel and ARES team members on a common platform.

Common situational awareness and field reporting applications (such as *WebEOC*) between ARES teams and served agencies can also be integrated. Such situational awareness can include sending photos and real-time video.

Improving Cellular Resiliency

In many recent natural disasters, cellular service has been severely impacted. In light of FirstNet's mission, public safety departments have access to a nationwide dedicated fleet of 76 FirstNet deployable assets, such as Flying Cell on Wings (COWs) and Satellite Cell on Light Trucks (SatCOLTs), that can quickly be deployed during disasters.

Additionally, public safety agencies will be able to tap into the AT&T fleet of 300+ assets when available. The FirstNet platform is being built to help provide first responders with a solution that's more available and reliable than existing commercial networks. In addition to Band 14, AT&T continually assesses opportunities to harden critical sites important to public safety. These include sites in regions vulnerable to natural hazards like hurricanes, floods, and extreme temperatures.

Solving Cellular Congestion

Although cellular networks may go down during major natural disasters, there are many other ARES deployment scenarios in which cellular coverage is fully or

partially maintained (for example, large special events and less severe disasters). Often



Randy Richmond's, W7HMT, Sonim XP8 FirstNet-ready device.

the problem with cellular networks in these types of scenarios is that they're congested with traffic, which makes them an unreliable resource, except for special users who have access to a Wireless Priority Service (WPS). ARES members with FirstNet extended primary service receive priority network access and data prioritization, giving them continuous data priority across voice and data. When needed, first responders can "uplift" extended primary users, giving them even higher priority levels and preemption capabilities. This priority works on both AT&T's commercial bands as well as the dedicated Band 14. This priority applies to both voice and data (valuable for Broadband PTT, situational awareness, and field reporting apps).

The Future of FirstNet

FirstNet is not the only national public safety broadband network (NPSBN) in development. A number of other nations are actively pursuing it as well, including the UK, Canada, Australia, South Korea, France, Belgium, Germany, and Norway. Because of the global demand for mission-critical broadband, the global cellular standards body known as the 3rd Generation Partnership Project (www.3gpp.org), has been developing a series of open standards called Mission Critical PTT, Mission Critical Video, and Mission Critical Data (abbreviated as MCX). These capabilities can be added to both 4G and future 5G networks. Virtually every NPSBN globally has plans to adopt this suite of standards (and many commercial carriers plan to adopt it as well to retain their public safety customers). FirstNet just recently launched a service based on MCX, called FirstNet-PTT.

Another standard emerging from 3GPP is for a Mission Critical Interworking Function (IWF), which enables LMR networks to be integrated with MCX to enable interoperability between PTT users on both LMR and NPSBNs. FirstNet has plans to introduce this in the near future.

Hybrid radios that can operate both LMR and FirstNet and are upgradable to MCX are already available from several Part 90 LMR manufacturers, offering public safety users a single device that can make the best use of both networks.

As the MCX ecosystem expands, this promises to become a valuable tool to maximize real-time communications, situational awareness, and field reporting for all first, second, and volunteer responders.

Communicating Directly with Served Agencies

One of the valuable apps accessible to all subscribers through the FirstNet App Catalog is FirstNet Assist. ARES FirstNet subscribers using this app can view all mutual aid events within their proximity and request elevated priority access to FirstNet for the duration of the incident. FirstNet Push-to-Talk was launched in March 2020 (see the sidebar, “The Future of FirstNet”), and many public safety agencies have plans to use it to interoperate with and augment their LMR systems, further enabling them to communicate with their served agencies.

Subscribing to FirstNet

Given these advantages, I found it useful as an ARES member to have a FirstNet subscription, and the price was comparable to my existing AT&T consumer service. Although I don't work for a first or second responder agency, I recently obtained a FirstNet subscription based on my ARES membership. My process for subscribing may not be the same for all ARES members. If you're interested in subscribing, have your agency contact an AT&T FirstNet solutions consultant at FirstNet.com, through the “Contact Us” page.

After contacting FirstNet support, I went to the lead of our ARES team's served agency, who wrote a letter requesting that I be allowed to obtain a FirstNet subscription to aid with emergency communications for the agency. With this, FirstNet provided me with an online account profile and authorization code. I then went to my local AT&T store to obtain a subscriber-paid FirstNet subscription. I brought my FirstNet-ready smartphone. Because Band 14 is relatively new, not all handsets support it (visit www.firstnet.com/devices

for a selection of compatible devices and accessories). In less than an hour, I left the store with a FirstNet subscription (see Figure 1).

Subsequently, I installed the FirstNet Assist app, which simplifies obtaining support and enables me to see first responder mutual-aid incidents within my proximity. I also now have access to the FirstNet App Catalog, which shows an extensive list of FirstNet Reviewed and Certified situational awareness and broadband PTT apps, some of which my served agency may use in the future.

Conclusion

Given the fact that FirstNet, like existing cellular networks, is subject to impairment during disasters, there remains a need for a resiliency that only amateur radio can provide. Nonetheless, FirstNet can be another valuable resource in the ARES toolkit, to help provide communications in times of disaster.



The L3Harris XL-200 hybrid LMR/LTE radio.

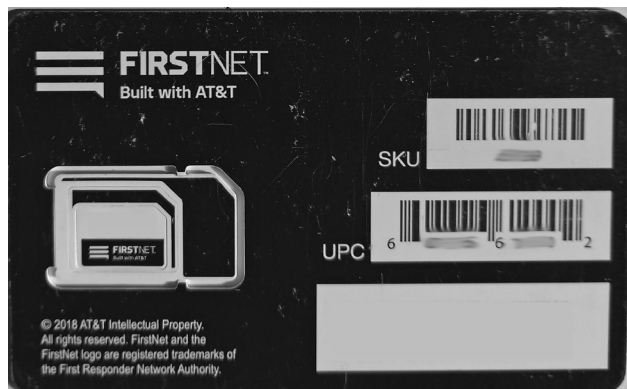


Figure 1 — FirstNet subscribers receive a black FirstNet SIM card from AT&T.

All photos by the author.

Randy Richmond, W7HMT, is the Planning Coordinator for the North Bend, Washington, ARES Team (NBAT). He's also the Standards and Regulatory Specialist at Zetron, Inc., a company that manufactures consoles for public safety dispatch centers. Randy can be reached at w7hmt@arrl.net.

For updates to this article, see the QST Feedback page at www.arrl.org/feedback.

