

Black Swan Events: Interoperable Telephone Communications – FirstNet

By Michael Prasad, CEM

In my article that appeared in the June 2020 *IAEM Bulletin*, I mentioned that our reliance on cellular networks for COOP/COG continues to be a critical issue – not only for the crumbling infrastructure issues of day-to-day usage, but also in the interoperability needed between disparate levels of government/non-governmental groups and jurisdictions **during a large-scale complex incident**. In many jurisdictions, robust radio/telecom capability is declining as much from *over-use/too much demand* as it is from obsolescence and inconsistent upgrades needed to complete interoperability (between organizations and even device usage). The reality of true interoperability – especially beyond simplex voice communications – is still not yet here for everyone.

In this article, I wanted to go further into detail on that telecommunications infrastructure – and what the U.S. federal government has done to help build/rebuild that capability now and for the future.

[FirstNet from AT&T](#) was built from that original premise. The [FirstNet Authority](#) was born of a need for interoperable radio communications from the World Trade Center attack on Sept. 11, 2001, in New York City. The 9/11 Commission (and subsequently public safety organizations and associations) required the country to establish an interoperable nationwide telecommunications system. They anticipated not only the continual vexing problem of one agency unable to communicate with another – locally at an incident scene, especially across different

responder types – but the potential for not only (1) multiple incidents to be simultaneously occurring across the country, while the public itself is overloading the communications infrastructure networks needed by first responders, but also (2) the possibility that all of these incidents are really one coordinated complex attack requiring national-level support and oversight.

Does this sound familiar to what we are all experiencing now?

National Telecommunications Infrastructure Critical

Our national telecommunications infrastructure is as important as our national interstate highway infrastructure. This was created in the 1950s by President Eisenhower, by the way, with the ability to move not only cars, buses and trucks, but also [large military vehicles](#) across the country. Our national telecommunications infrastructure not only moves voice and text – but also lots of data – across the country and beyond.

FirstNet: Meeting the Challenge

Today, in my opinion, FirstNet is meeting the challenges of this demand – by targeting the governmental first responder agencies (agency-paid subscribers), while also supporting the non-affiliated “customers” – those who get their devices on their own rather than via a large departmental order/central office (subscriber-paid).

When AT&T won the national public safety broadband network contract from the FirstNet Authority, they utilized two of their existing platforms – their existing 4G LTE

network (expanding over time to 5G on their own schedule, and not exclusively for FirstNet use) of cellular antennas (adding a Band 14 channel and traffic prioritization logic software – more on that in a moment) and their existing customer service/sales network of chain storefronts and online service support capability. If you are a volunteer firefighter whose department cannot afford FirstNet phones/radios for everyone, you can purchase one on your own. That smartphone will have a significantly higher call connect capability, especially when localized cellular traffic is high/excessive.

The same is true for emergency managers affiliated with government entities. This was not the case originally, but the FirstNet Authority later qualified and added OEM staff, hospital essential workers, National Guard members and others to the original list, which at first was just EMS, fire and police. For the subscriber-paid customers, just like the highway system, you drive your own car or truck on it rather than operating a fleet vehicle.

One of the benefits (and challenges) of this self-service model is obtaining and maintaining the “vehicle” – the cellular telephone itself, with the FirstNet sim card. There are two options for an individual (here’s where the traffic prioritization software comes into play): the highest priority access (black sim) or next highest priority (orange sim). Generally speaking, first responders (police, fire, EMS) get cell phones with the black sim installed, and the others get the

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orange one. If there is excessive traffic on the *overall* AT&T network (i.e. the towers and connections serving the location where the customer is located), the black sim customers get higher priority for calls, texts and data over the orange sim customers, who have higher priority over AT&T's commercial and residential customers. It's as if the lower priority vehicles get moved to different lanes when there is congestion in the priority lanes.

There are also a number of devices to select from – giving the customer options such as degrees of ruggedness (such as the Sonos military-grade unit) and/or end-user familiarity (like the iPhones or Samsung Galaxy units). Costs vary, but there are payment plans – and the cost per month for the nationwide cellular service which includes unlimited data (not counting the phone cost) is reasonable and somewhat regulated by the FirstNet Authority and/or the contracted levels for FirstNet corporate customers within your state.

A really big plus is that the cost per unit is significantly less than your standard 700-800mhz “police” type radio. If you are going to be a subscriber-paid customer, I strongly recommend you first review the FirstNet.com website thoroughly before signing up *and also* talk to your department or other first responder communications leaders who have already implemented FirstNet, for best practices/what will work in your area. Different devices have different types of antennas, different geographies have varying levels of coverage by AT&T (building construction can have an impact as

well), and your own “use case” is important as well. What will you be using a FirstNet device (or devices) to do now and in the future?

My personal experience with FirstNet has been somewhat unique, but I believe has a number of elements common to other independent subscriber-paid customers (those who are not obtaining a FirstNet phone from their department as part of a bulk commercial-type purchase and contract). I am familiar with the commercial radios, including the 700mhz units (and the trunking network) our state uses and is in the process of converting/restructuring to a FirstNet network, department by department. I had the opportunity to qualify as an individual subscriber and obtain a black sim FirstNet phone on my own (at my own cost). Call quality was good, and there was no learning curve on the user-interface and no data throttling I could notice – all the features you would expect in a cellular telephone. I did not get the opportunity to test any interoperability capabilities. There is a push-to-talk feature that effectively makes the FirstNet phone a responder radio, including dynamic group creation, a feature not normally found on your standard responder radio without the P25 upgrade. For me, it was a smartphone with a built-in Wi-Fi hotspot to boot. It was a nice backup to my personal smartphone and pushed my GETS/WPS card down a rung on my COOP communications plan. I was just starting to explore the idea of which smartphone applications would be best for interoperability compatibility and coordination with other departments and agencies.

Then COVID-19 Hit the Country

I needed my FirstNet smartphone as my primary way to

access the internet. I am doing emergency management work from home remotely, doing all the things I would have done at the office or EOC (calls, e-mails, writing plans, updating reports, etc.) plus lots of video conferencing. On many of those calls, when there is more than one person sharing their screens or video – especially if it is me talking or presenting – others cannot hear me clearly. **What I did not know** is there are limits to the smartphones themselves (hardware/software) that limits their *upload speed* as compared to their download speed (even as networks move to 5G, the emphasis is on streaming download speed).

My smartphone was not purely designed to be a hotspot router device. While this is my vehicle to “stay on the highway,” a smartphone is not designed to tow the “giant trailer” of video conferencing. I was “running out of gas a lot.” It turns out I was driving the wrong vehicle, if towing a trailer was what I needed to do. I ended up getting a 4G hotspot device (a JetPack from Verizon. I'm also exploring the Netgear Nighthawk Mobile Hotspot from FirstNet, as it also has an ethernet connection which may provide more capabilities for my other computers. This could cover my data-transfer hungry devices (mostly my laptop for now).

My lesson learned is that not every single device covers all possible needs (and future needs). We all need to understand that what we need for capabilities now [and in the future](#) is critical *before* making the commitment to purchase/subscribe. This is no different from the laptop hard drive size purchase decision or which EOC Common Operating Position system your organization selects – it comes down to cost vs. capability.

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“Black Swan Events” Versus “Gray Rhinos” – Accountability Makes All the Difference

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lack of collaboration was a glaring contributor to the recent dam collapse in Michigan. Involving unique and varied resources and skillsets, including the private sector, is absolutely mandatory for future crises. It is vital to have such agreements in place *before* a crisis emerges.

■ **Structured logistics and distribution.** Perhaps the most important lesson from the coronavirus outbreak is that logistics are everything. The systemic lack of planning and structure that led to a chaotic and counterproductive bidding war among state/local governments and medical providers for critical supplies serves as a perfect example of how *not* to manage a supply chain. Long-term CIKR project management must heavily factor an efficient, area command model for crucial logistical elements.

■ **Reliable funding channels.** At the federal level, a proper budget for infrastructure maintenance and repair will not occur until the executive and legislative branches

are forced to act. This will require a broad and sustained coalition of stakeholders applying appropriate pressure – including emergency managers from multiple regions and sectors.

■ **Identify the other rhinos.** Just because you’ve tamed one beast doesn’t mean there are not others roaming around. We cannot afford tunnel vision. For example, hurricane and wildfire seasons are now underway in the United States, and climate change has created sea levels and extreme weather patterns we simply have not encountered before now. We must be proactive in planning and preparing for predictable large-scale hazards in the future.

Now Is the Time

In essence, now is the time and place for unified, decisive and innovative leadership across all sectors of critical infrastructure. A vital portion of that responsibility lies in performing an honest after-action review of our preparedness and mitigation for recent infrastructure-related incidents, and rapidly applying the lessons learned to the next crisis. And there is always a next crisis. ▲

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What’s Your Experience?

My story – and the overall infrastructure buildout of FirstNet – is not over yet. I am interested in learning if my experience with FirstNet (so far) is unique or it is similar to the experiences of other emergency managers. Are you driving on the highway now (and maybe like me, without checking the tow load, or even reading a map ahead of time), or are you still figuring out which vehicle to take (or whether you should get on this superhighway at all)?

Take My Survey

I built a short (five indicative, five demographic questions) survey, and I would greatly appreciate your participation if you are new to using FirstNet. I hope to share the results in a future issue of the IAEM Bulletin. You can access the survey [online](#). ▲

FEMA Webinar Series Will Provide Information Regarding Notices of Opportunity for BRIC and FMA Grants

The Federal Emergency Management Agency (FEMA) is offering a series of 90-minute informational webinars regarding Notice of Funding Opportunities (NOFO) for the Building Resilient Infrastructure and Communities (BRIC) and the Flood Mitigation Assistance (FMA) grant applicants.

■ **NOFO Webinars #1-#3** (same content for each) will be held three times at 2:00 p.m. EDT on **Aug. 18, Aug. 20, and Aug. 25.**

■ **NOFO Webinar #4 for tribal applicants** will be held at 2:00 p.m. EDT on **Aug. 27.**

All of the first four webinars will provide an overview of the grant programs and details about the agency’s funding priorities and review process.

■ **NOFO Webinars #5-#6** (same content for each) on avoiding application pitfalls for grants will be held at 2:00 p.m. EDT on **Sept. 1 and Sept. 2.**

Registration for all six of the webinars can be found [online](#).

Additional webinars will be scheduled soon about FEMA Grants Outcome (FEMA GO), which is now the management system for Hazard Mitigation Assistance Grant (HMA) Grant programs. The development of FEMA GO is a multi-year effort to modernize and transform the way FEMA conducts grants management. ▲