

From the Field:

The 700MHz Broadband Public Safety Demonstration Network

By Dereck Orr, Program Manager, Public Safety Communications Research Program

The evolution of wireless broadband communications for the public safety community is in overdrive. In the last few years, several Federal Communications Commission (FCC) and congressional rulings, coupled with the digital television

The Public Safety Communications Research program hosted the inaugural stakeholder meeting for the 700-MHz Public Safety Broadband Demonstration Network on April 20 and 21, 2010 at the Department of Commerce Boulder Laboratories. The meeting brought together interested parties for the first time to shape future implementation of the Demonstration Network. More information about the meeting, including PowerPoint presentations, can be found at: http://pscr.gov/about_pscr/highlights/700mhz_demo_net_inaug/inaugural_meeting.php.

transition, have allocated spectrum to public safety in the 700 MHz band. Following this allocation, the National Public Safety Telecommunications Council ([NPSTC](#)) stood up the 700 MHz Broadband Task Force and released a report of public safety broadband requirements. Prior to that, the Public Safety Spectrum Trust ([PSST](#)) was named the nationwide Public Safety Broadband Licensee by the FCC. Additionally, this March, the FCC released the National Broadband Plan, which states, "To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network."

There are as many as 15 million public safety stakeholders in the Nation, and this new 700 MHz broadband network has the potential to provide affordable broadband capabilities for all public safety organizations—Federal, State, local, and tribal. This broadband network will greatly improve data communications among public safety agencies, providing real-time access to mobile streaming video, criminal databases, remote security monitoring, GPS and mapping applications, and other advanced technologies.

It is important to note that though a nationwide broadband network will bring public safety these important capabilities, mission-critical land mobile radio voice systems aren't going anywhere. Right now, we are working with public safety to determine the requirements for broadband, mission-critical voice, and other public safety broadband applications to then create the necessary specifications to enable this on a 700MHz broadband system. Though my organization, the

Public Safety Communications Research ([PSCR](#)) program, is also working with the 3rd Generation Partnership (3GPP) standards development organization to advocate the adoption of public-safety requirements, it may be years before 3GPP's Long-Term Evolution (LTE) standard allows for features such as mission-critical voice communications.

Public safety has been licensed to use the 700 MHz spectrum, but there are currently no government or independent facilities in the Nation capable of testing or demonstrating the public-safety-specific LTE implementation requirements. PSCR is addressing this gap by launching a 700 MHz Broadband Public Safety Demonstration Network, which will provide a com-

mon demonstration site for manufacturers, carriers, and public safety agencies to test and evaluate advanced broadband communications equipment and applications. The Department of Homeland Security's Office of Emergency Communications ([OEC](#)) is supporting this Demonstration Network by ensuring that public safety stakeholders are involved from the start. Therefore, stakeholders have been heavily involved in defining what requirements the Network will analyze; this stakeholder feedback will ensure that the Network tests for capabilities that are needed in public safety environments.

It is clear that we have only scratched the surface of LTE and 700 MHz broadband for public safety. The efforts of OEC, the PSST, NPSTC, the PSCR, and others will be invaluable as we deploy this nationwide, interoperable broadband networks. For more information, please e-mail 700MHz@its.bldrdoc.gov.

The Public Safety Communications Research (PSCR) program is a partnership of the National Institute of Standards and Technology's (NIST) Office of Law Enforcement Standards, National Telecommunications Information Administration's Institute for Telecommunications Sciences, and various other NIST laboratories. PSCR provides objective technical support—research, development, testing, and evaluation—to foster nationwide communications interoperability. Drawing on existing standards as well as critical requirements provided by public safety practitioners, the program provides insight and direction to information technology and wireless standards committees that are developing standards for voice, data, image, and video communications.

Fairfax County COMLs Respond to Haiti Earthquake

A 7.0 magnitude earthquake hit the Caribbean nation of Haiti on January 12, 2010. Within a few hours, the Fairfax County, Virginia, Urban Search and Rescue team was notified that their assistance would be needed. Two teams, consisting of rescuers, doctors, structural engineers, canine handlers, and communications professionals were sent to help rescue efforts. The teams took with them concrete and steel cutting tools, generators, and medical supplies. But perhaps most essential to fulfilling the mission, the team took radios so they could communicate amongst themselves and with those leading the response efforts.

Multiple Urban Search and Rescue teams were deployed to Haiti by the [United States Agency for International Development \(USAID\)](#). Fairfax County is one of two Urban Search and Rescue teams in the United States that are trained to respond to international disasters. The Fairfax County teams included three trained Communications Unit Leaders (COMLs), including Lieutenant Wes Rogers of Fairfax County Fire and Rescue. For the past year, Lt. Rogers has been detailed to work at the Office of Emergency Communications (OEC), supporting the COML training program and providing OEC with the voice of public safety in the field, while continuing his duties with Fairfax County.

Getting to Work in Haiti

Once they arrived in Haiti, both Fairfax teams set up on the grounds of the U.S. embassy in Port au Prince, the most secure location at the time. Despite the destruction around them, the first order of business was to establish their communications and command posts. Lt. Rogers explains how the COMLs immediately directed their fellow rescue workers to unpack radio equipment and set up antennas. To do their jobs effectively, the COMLs leaned on their training to maintain strong communications through a combination of modern technology and old-fashioned face-to-face contact. "Everybody has to get set up," says Lt. Rogers. "We have to get communications set up; we have to get command set up. Because no one's going out until we get that."

Communications Challenges

Communications presented some challenges, but the teams were able to come up with solutions in adverse conditions. The local public safety system had gone down and security concerns were such that placing equipment was difficult. "Normally you put the repeater in the center of the area you're working in," says Rogers, "but because

of security we had to put the repeater at the embassy." The first Fairfax County team to arrive did not even put up repeaters, but placed an antenna on top of the site where they were working and used a talk around. At other times, they placed an antenna on top of a vehicle and issued satellite phones and cell phones to team leaders. They also used their limited number of mobile radios for teams that were working farther away from the embassy. Rogers says the other key to successful communications was a nightly meeting among the communications leaders from the various rescue teams. He said they were able to troubleshoot equipment problems, exchange contact numbers, coordinate channel use to avoid interference, and help one another meet their needs by exchanging and loaning equipment.

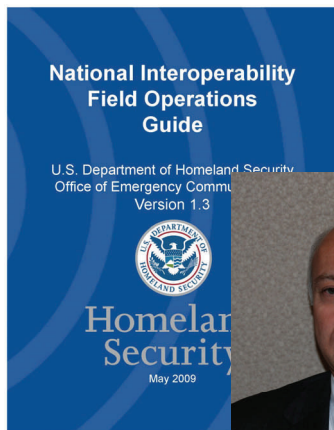
"Everybody has to get set up. We have to get communications set up; we have to get command set up. Because no one's going out until we get that."
-Lt. Wes Rogers

The Virginia Urban Search and Rescue team ran into some difficulties with the radios among their own team members. The first team to deploy took some of the County's older equipment with them. When the second team was deployed, they brought radios from the Virginia State communications cache. Several days into the operation, the two Fairfax teams merged and found their radios were not interoperable. A Mobile Emergency Response Support team from Frederick, Maryland, was able to loan the Fairfax team 50 extra radios, and Rogers programmed them so the entire Fairfax team could communicate. He says it was one of the many times during the deployment to Haiti that the team relied on its specialized training. "I had to sit there and write up a code plug on these radios. If we hadn't been able to do that, the radios would have been there but they wouldn't have been any good to anybody."

As the operation entered its second week, the team learned that by walking the streets and talking to residents they received additional information about people who were trapped. There were no hard line communications for phones, and cell phone service was unreliable, so it was difficult for residents to request help from authorities. When the technology failed, the team found that the most basic forms of communications still served them well. Rogers says the biggest lesson the team learned from Haiti was the importance of face-to-face communications with the residents, and more importantly among the communications leaders and task force leaders of the rescue teams.

For more information, contact Rogers at Wes.Rogers@dhs.gov

Expanding Office of Emergency Communications Technical Assistance Tools



Ross Merlin

Over the past 3 years, the National Interoperability Field Operations Guide (NIFOG) has become the authoritative guide on national mutual aid and interoperability frequencies for public safety use in the field. Intended to support first responders at all levels of government, the NIFOG was designed as a portable, easily referenced guide that would fit in pockets and hold up to rough wear and tear in the field.

One of the NIFOG's primary authors is Ross Merlin, who today serves as a senior telecommunications specialist at the U.S. Department of Homeland Security's (DHS) Office of Emergency Communications (OEC). Previously, as a manager in the DHS Spectrum Management Office, Merlin researched operational, regulatory, and technical issues to help develop the first edition of the NIFOG. Continuing the project with OEC, Merlin has worked to keep the NIFOG up to date, and has been a driving force in the distributing approximately 14,000 copies nationwide. The current version (version 1.3) was published in 2009 and contains sections on:

- Regulations and guidelines for national interoperability
- Tables of nationwide interoperability channels

- Mutual aid and other common public safety references
- Tables of commonly used frequencies
- Dialing instructions for Government Emergency Telecommunications Service and satellite phones

Since its publication, the NIFOG has been a component of the OEC-sponsored Communications Unit Leader training course.

OEC has built on the NIFOG concept by creating locally-focused Field Operations Guides (FOG) which utilize operational information from a region's Tactical Interoperability Communications Planning in a FOG format. This Tactical Interoperability Communications Field Operations Guide support is available through the OEC Technical Assistance program. For further information, email oecc@dhs.gov.

A NIFOG TALE

At a recent event observation in the field, US Marshals were invited by the host city to participate as Federal partners. When the Marshals arrived in their communications van for a planning meeting, one of the local participants asked about how to establish interoperable communications with them. A Marshal said, "You have the NIFOG – that's your interoperable communications plan."

The NIFOG is available as a downloadable PDF document at: <http://www.npstc.org/psdocs.jsp#nifog> or in hard copy by contacting OEC

About the *Emergency Communications Forum*

The *Emergency Communications Forum* (ECF), published by the Department of Homeland Security's Office of Emergency Communications (OEC) is intended to engage and inform the emergency response community, policy makers, and Federal, State, local, and tribal officials about issues and events that directly affect everyday nationwide emergency communications. We would love to feature your story or article in the next edition of the ECF. Please send any articles or content ideas to oecc@dhs.gov.