Report on the 2014 Public Safety Communications Research Stakeholder's Conference June 3-5, 2014 Westminster, Colorado

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Report Prepared by:
Carl R. Fortner III
FloridaNet Advisory Board Member
FL RDSTF-1 I/O Communications Co-Chair
Communications Manager, Bay County Sheriff's Office

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Last week, several members of the FloridaNet team and I participated in the Public Safety Communications Research (PSCR) Stakeholder's Conference held at the Westin Hotel in Westminster, Colorado. We joined approximately 545 other Public Safety professionals for a highly technical conference on the future Nationwide Public Safety Broadband Network. This report should serve to brief the Public Safety response community —in the 10-county region of Northwest Florida— on progress that's been made to date, future challenges, and future opportunities related to FirstNet and the FloridaNet.

The first day of the conference started with a meeting of the FirstNet Board. Copies of the FirstNet Board Meeting Minutes will be available at http://firstnet.gov as soon as they become available.

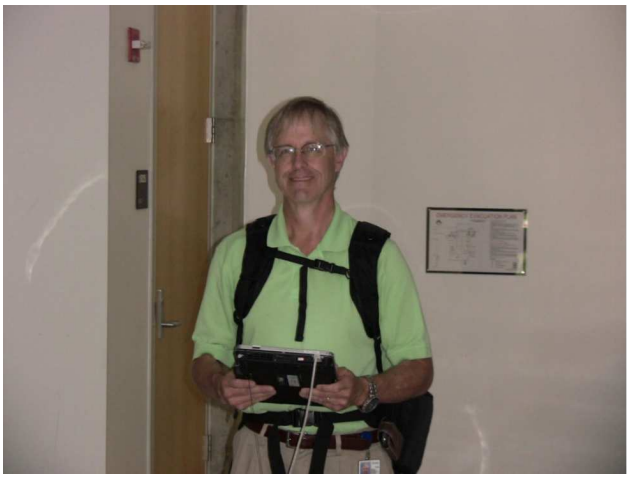
FirstNet Board in Westminster, CO, June 3, 2014

This meeting was followed by a Keynote Address by Sue Swenson, FirstNet Chairwoman. Welcome and introductory messages were then delivered by Dereck Orr, Program Manager and Andrew Thiessen, Operations Manager at PSCR. Follow-on high-level presentations were made on: (1) Research and Development Roadmapping; (2) FirstNet Leadership Updates; and (3) Modeling and Simulations that have been —or are being— conducted for the future Public Safety Broadband Network.

Nada Golmie and Richard Rouil (PSCR) reported that previous modeling and simulation work has focused on the day-to-day needs of public safety. Now, however, they're able to shift their research focus to large-scale incidents and potential network failures. Once their data collection is complete, PSCR will be able to set standards for network resiliency and identify future site location needs.

On Conference Day 2, stakeholders listened to Keynote Addresses by Daniel Cotter, Director of the DHS Office for Interoperability and Compatibility, and Admiral (Ret.) Ronald Hewitt, Director of the DHS Office of Emergency Communications. Presentations then followed on: (1) FirstNet Planning, Consultation, and Outreach Updates; (2) Priority, Pre-Emption, and Quality of Service; (3) Indoor/In-Building Testing; (4) Extended Range Testing; (5) Mobile Applications Security for Public Safety; and (6) Video Quality Research.

The session on Indoor/In-Building Testing focused on the comparison methods used for analyzing and improving in-building coverage. As emergency responders, we're all very familiar with the limitations of signal reception inside steel and concrete buildings with Low-E glass. To capture exact amounts of signal strength loss in commercial buildings, Dr. Bob Johnk (PSCR) used a backpack with scanner/LTE modem, a USB hub, and Waypoint Indoor Navigation System to measure radio signal levels and quality, as well as data throughput and quality.



DR. BOB JOHNK TESTING IN-BUILDING SIGNAL STRENGTH AT THE DISCOVERY LEARNING CENTER ON THE CAMPUS OF THE UNIVERSITY OF COLORADO.

TESTING EQUIPMENT USED AT THE DISCOVERY LEARNING CENTER
& THE COORS EVENTS CENTER AT THE UNIVERSITY OF COLORADO

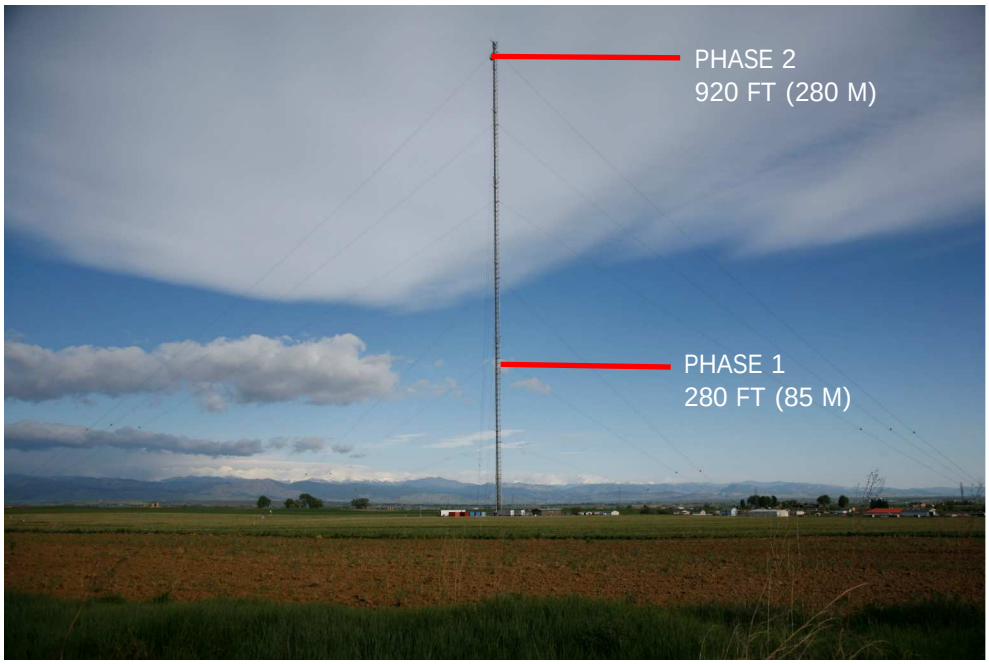
(a) (b)

Ultimately Dr. Johnk and his research team found that in-building coverage should be supplemented by Commercial Off The Shelf (COTS) small cells and Cells On Wheels (COWs) with microwave backhaul to the larger broadband network —like the one pictured on the left— in future deployments, especially at large-scale and planned events at indoor stadiums, etc.

So the future Public Safety Broadband Network will rely on small scale devices, portable deployable hardware, and small and large towers, and satellites to deliver LTE and LMR signals.

Small call technology. Typical installation with antenna, backhaul, eNodeB, and power supply (not shown).

In the Extended Range Cell Testing presentation, Christopher Redding and Camillo Gentile (PSCR) described the Phase 1 (FY-14) Testing that has been performed to date. Leveraging a 985-ft tower at the Boulder Atmospheric Observatory (BAO.) PSCR teams were able to obtain a 48 mile cell radius by deploying an eNodeB antenna on a tower at 280 feet Above Ground Level (AGL).



In Phase 2 (FY-15) Testing, PSCR plans to leverage the same 985-ft BAO tower and to deploy another eNodeB antenna at 920 feet AGL. The expectation is that they'll be able to achieve a cell radius of 62 miles with 40-watts transmit power. There are going to be significant improvements in cell signal range —for public safety— when you consider that the average range on most cell towers is currently 2 to 3 miles. In fact these higher height, increased power, cell towers will be what PSCR and FirstNet deploys to cover the 68 percent of the United States —and its territories— that is rural. The 27 percent of the US that is considered wilderness will most likely be covered by satellites. The remaining 5 percent (urban areas) will be covered by lower towers and small cell sites.

Conference Day 3's Keynote Address was delivered by Dr. Patrick Gallagher, Deputy Secretary of the U.S. Department of Commerce. Follow-on presentations were made on: (1) Customs and Border Protection (Merging LMR & LTE Devices); (2) Audio Quality; (3) Small Cell Technology; (4) Next

Generation Network Wireless Priority Services Testing & Evaluation; (5) Requirements Gathering & Standards Development; and (6) Local Control.

One of the most interesting things that came out of the presentations on Conference Day 3 was a discussion on the convergence of Land Mobile Radio (LMR) and Long Term Evolution (LTE) technologies for Mission Critical Voice. Until now, the Public Safety Communications community has been trying to manage expectations by saying that we are at least 10 years away from Mission Critical Voice via the Public Safety Broadband Network. That is no longer the case. Now, we're looking at US deployment in 4 to 6 years. This is so because the United Kingdom has decided to migrate away from the current technology they use to provide Mission Critical Voice —within 2 years— and to replace it with the technology being developed in the US. That project will, in effect, become the pilot for follow-on US deployment. The UK has but approximately 300,000 public safety users, whereas the US has several million.

One company, MaXphone, has developed a prototype device (pictured below) that will give you an idea of where the technology is headed. This new device will be capable of both LMR and LTE capability and will hopefully sell for less than $1,000 per unit. In effect, a local user would access one application (app) to get to their LMR network and select another app if (s)he wanted to use the LTE feature set.

Example of LMR & LTE device under development. The device will ultimately be the size of a modern-day cell phone, if only slightly larger.

Again, more detailed information is available on the PSCR website should you be interested in learning more on this topic.

The presentation on Local Control —Conference Day 3— was of significant importance to those of us who'll be local users of the future Public Safety Broadband Network. FirstNet recognizes that flexibility must be built into the network so as to meet local needs while responding to local emergencies. Primarily, Local Control will mean User and Device Management. Local Control will also mean: Subscriber Provisioning; Charging & Billing Views; Security Monitoring; User Experience Monitoring; Disaster Recovery; and Dispatch View of coverage and faults. Finally, Local Control may also mean: User Priority Provisioning; CAD Interface for Priority Control; Quality of Service Proxy for Agency Applications; and Quality of Service Proxy for Agency VPN.

In this brief, I have merely tried to highlight some of the key issues that are being worked by FirstNet in Reston, VA and by PSCR at NIST in Boulder, CO. If you'd like more information on all the presentations made at the conference, you can review the material at http://www.pscr.gov. My goal has been just to show you what's under development as we move forward —in a layered approach— to deployment of a Nationwide Public Safety Broadband Network.

Internet Resource List:
US Department of Commerce - Boulder Labs http://www.pscr.gov
First Responder Network Authority http://firstnet.gov
FloridaNet http://www.floridanet.gov

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