

DHS Science and Technology Directorate Broadband Demonstration Network—Developing Tools to Measure and Assess In-Building Coverage

Enhancing Public Safety Communications

In many buildings across the country, first responders face significant obstacles to radio communications when responding to fires or other emergencies. While traditional radios work very well outdoors, their effectiveness is reduced when used indoors. This growing need to share data and video has made it essential for first responders to identify gaps in existing coverage and develop plans for expanded coverage in the future. To overcome this impairment, public safety officials need some form of in-building support for broadband wireless communications to use as an alternative to radio. First, they need to be able to collect data on a large number of buildings within their jurisdictions to document this difficult problem and to mitigate in-building coverage problems.

The Department of Homeland Security Science and Technology Directorate's First Responders Group (FRG) is partnering with the Department of Commerce Public Safety Communications Research Program (PSCR) to develop applications that can be used on a smart phone to assess broadband coverage in buildings to ensure they will work with existing networks first responders use. This work advances the research PSCR engineers performed over the last several years that simplifies and expands access to both in-building measurements and the quality of in-building coverage.

Improved LTE Coverage through Measurement and Testing

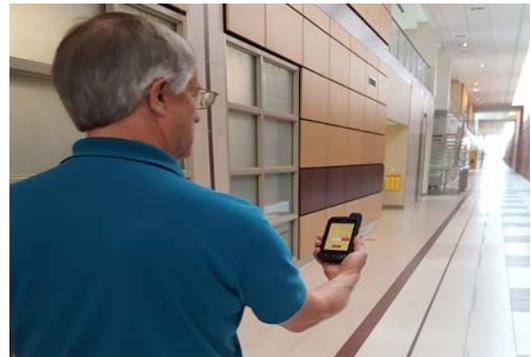
The First Responders Network Authority (FirstNet) is committed to addressing important hurdles in standing up the Nationwide Public Safety Broadband Network, a Band-14 dedicated public safety LTE network. To that end, it is essential that communication systems perform reliably indoors—providing adequate coverage to achieve optimum performance.

Many first-responder scenarios will require effective in-building cellular communications to allow people both inside and outside of buildings to transmit critically important data to each other during emergencies. In-Building Coverage Quality Measurement tools offer potential solutions to addressing this need.

Nationwide Accessibility with an Easy-to-Use App

PSCR is tackling this problem, developing apps that turn a selected Android device (phone or tablet) into an in-building measurement and coverage assessment tool. This capability will place in-building measurements and coverage quality assessments directly in the hands of public safety community without the need for highly specialized and expensive test equipment, or extensive operator training and skills. In addition, this tool will enable public safety officials to collect valuable in-building data on a national scale, with major benefits to both first responders and the public.

This project will demonstrate that the public safety community can use Band-14 devices to collect and analyze in-building data and identify areas where critical coverage problems occur. The data obtained may be used by FirstNet or other network operators, in turn, to facilitate mitigation of areas in and around buildings where signal coverage is inadequate.



Dr. Bob Johnk of NTIA/ITS performing in-building coverage testing using a PSCR-developed experimental app and a Band-14 Public Safety Android device.

Demonstration of Proof of Concept

This project complements other public safety broadband development efforts, including the Chicago LTE pilot program that integrates video technology on the Public Safety Broadband Network. PSCR has carried out extensive in-building measurements in Harris County, Texas as well as event centers in the Denver, Colorado area. PSCR demonstrated this technology at the PSCR Stakeholders meeting in June 2017, and at the 2017 Association of Public Safety Communications Officials Conference in August 2017. FRG and PSCR are working together to identify ways to make the application more widely available.



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To learn more about the Broadband Demonstration Network, contact SandTFRG@hq.dhs.gov.