



Public Safety Communications Research

U.S. Department of Commerce - Boulder Laboratories

www.pscr.gov

Our Public Safety Communications Research (PSCR) laboratories provide research, development, testing, and evaluation to foster nationwide communications interoperability. The PSCR program provides insight to wireline and wireless standards committees developing standards for voice, data, image, and video communications.

Housed within the Department of Commerce Labs in Boulder, Colorado, the PSCR program is a joint effort between the National Institute of Standards and Technology's Office of Law Enforcement Standards and the National Telecommunications and Information Administration's Institute for Telecommunication Sciences. The very successful research performance of the joint effort has earned two Department of Commerce Gold Medal awards, the highest honor granted by the Department.

The PSCR program performs research on behalf of its sponsors at the Department of Homeland Security (DHS) Office for Interoperability and Compatibility (OIC) and the Department of Justice Community Oriented Policing Services to advance public safety communications interoperability.

Practitioner-Driven Approach to Projects

The PSCR program involves public safety practitioners – fire, police, and emergency medical services – directly in its research and development activities for public safety specific requirements.



Public Safety 700-MHz Broadband

Public safety has long struggled with effective cross-agency/jurisdiction communications in the land mobile radio (LMR) environment, due to stove-piped proprietary systems and non-contiguous spectrum assignments. Congressional legislation has made broadband spectrum cleared by the Digital Television transition available to public safety.

New public safety broadband communications will allow for a unified system to foster nationwide roaming and interoperability. The PSCR program is deeply involved in the rapidly progressing 700-MHz broadband activities. To help move forward broadband technology for public safety communications, PSCR is building a national public safety broadband demonstration network and providing technical advocacy for the public safety community through requirements gathering and standards development.



Radio Over Wireless Broadband

The Radio Over Wireless Broadband (ROW-B) project successfully integrated radios operating on the District of Columbia's existing LMR system with a broadband network, allowing for broadband devices such as computers and cell phones to communicate with radios on the LMR network. This technology enables public sector personnel to have seamless interoperation between broadband and LMR, and have location awareness of users. Not only can emergency responders use this service but it also can be extended to other personnel – such as bus drivers and crossing guards – so that critical information can be easily communicated during an incident.



Project 25 Compliance Assessment Program

The PSCR program built a coalition of Project 25 (P25) users and P25 LMR manufacturers to create the independent P25 Compliance Assessment Program (CAP). The P25 CAP will ensure equipment is tested in DHS-recognized laboratories. The P25 CAP is a voluntary system that provides a mechanism for manufacturers to formally demonstrate their products' compliance with a key subset of testing requirements within the P25 standards.

The P25 CAP informs the more than 60,000 emergency response agencies nationwide regarding P25 compliance of the communications equipment they purchase. The P25 CAP generates manufacturer competition resulting in more affordable technologies for emergency responders, and verifies that Federal grant dollars are invested in standardized interoperable equipment.





Project 25 Standards Development

The open standards developed in Telecommunications Industry Association TR-8/P25 define how LMR equipment and systems should operate, and more importantly, how key system interface standards that, when implemented, would allow radios and infrastructure from different manufacturers to interoperate. The catalog of competitively offered P25 equipment continues to grow, with broad adoption by public safety organizations in the U.S. and by public safety organizations in over 54 countries. The PSCR program actively participates in the development of these standards in support of practitioner requirements for their use of digital land mobile radios.



Voice over Internet Protocol

Public safety agencies are investing millions of dollars in devices that allow agencies to patch non-interoperable radio systems together. These are commonly referred to as bridging systems, and many of these systems use Voice over Internet Protocol (VoIP) technology. While IP itself is a formal standard that allows for interoperability, the VoIP technology built on top of that standard is often proprietary and prevents interoperability.

The PSCR program, on behalf of DHS/OIC, is leading a coalition of public safety officials and VoIP vendors in an effort to bypass lengthy and traditional standards processes to ensure that disparate radio systems can interoperate using today's VoIP technologies.



Public Safety Audio Quality

The PSCR program has worked with practitioners to test how digital radios operate in the presence of loud background noise. The PSCR program is studying technology improvements to overcome background noise issues and is working with practitioners to test mitigation techniques for the problems.

Partnering with practitioners from various agencies to conduct numerous tests, the PSCR program identified immediate behavioral, procedural, and technical steps agencies can take to avoid or minimize emergency response background noise. The PSCR program's work helps drive public safety's audio requirements so that manufacturers can redesign systems to remedy audio quality problems.



Public Safety Video Quality

A clear picture could mean the difference between life and death for public safety practitioners using video from the scene of an incident. The PSCR program is developing task-specific video quality requirements for public safety applications since traditional methods for evaluating perceived broadcast video quality are not appropriate for public safety video.

The PSCR program conducted subjective viewing experiments to define performance parameters that ensure manufacturer video implementations meet the operational needs of public safety. The PSCR program's task-based testing methodology has been incorporated into International Telecommunication Union (ITU) standards.



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