



P25 Updates

CITIG 2012

<http://www.pscr.gov>

Public Safety Communications Research Program
Department of Commerce – Boulder Labs

Public Safety Communications Research Program

Located at the
Department of Commerce
Boulder Labs in Colorado

The PSCR Program is a joint
effort between:

NIST's
Office of Law
Enforcement Standards
(OLES)
and
NTIA's
Institute for
Telecommunication
Sciences
(ITS)



PSCR Funding Sources



**Homeland
Security**

**Department of Homeland
Security**

**Office for Interoperability
and Compatibility**

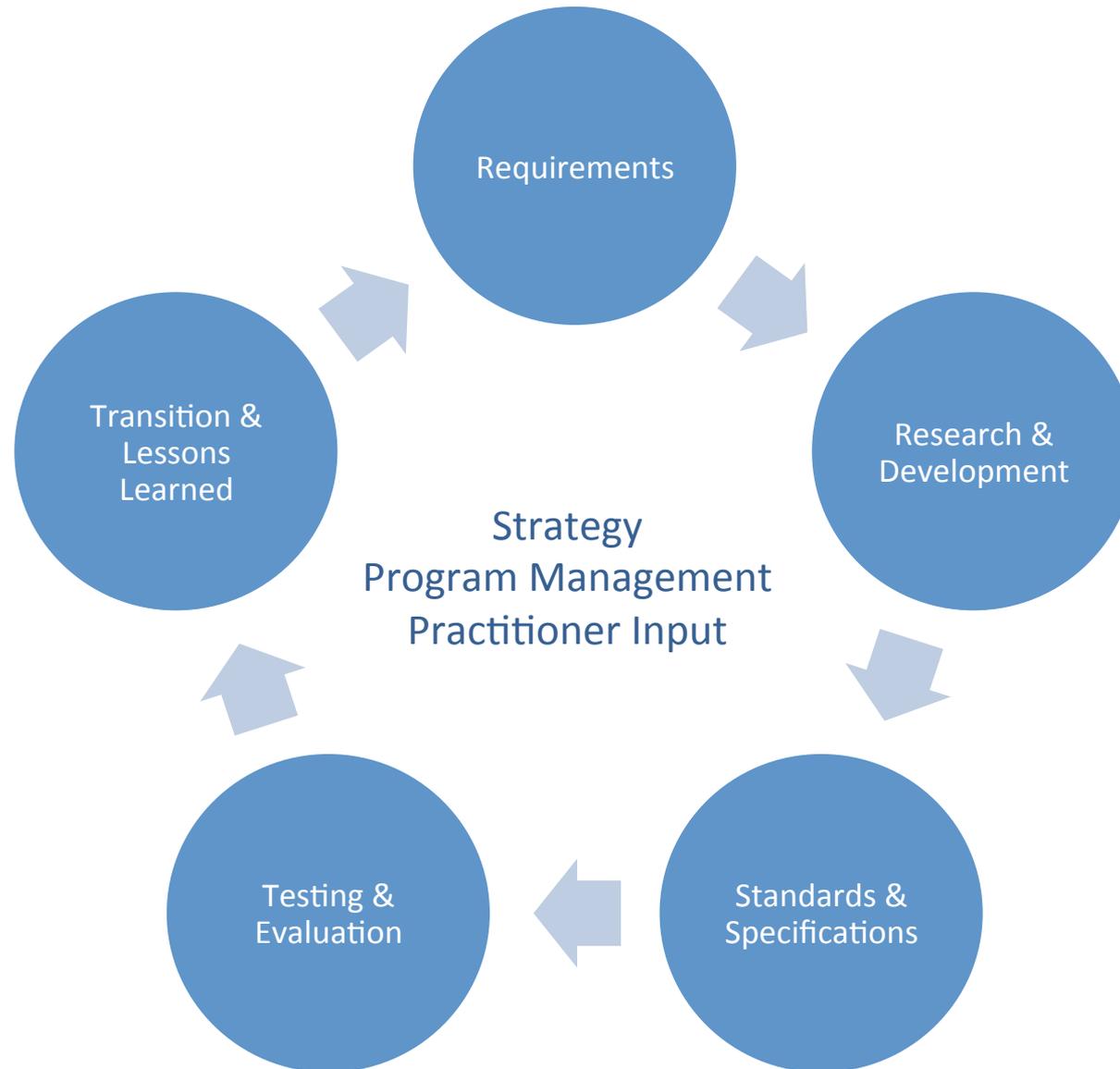
**Office of Emergency
Communications**



PSCR Portfolio

LMR Standards and Technologies	Broadband Standards and Technologies	Emerging Standards and Technologies
P25 Standards and CAP	Demonstration Network	Bridging LMR & LTE
P25 Test Tools and Simulation	Requirements and Standards	Video Quality
Public Safety VoIP	Mission Critical Voice	
Audio Quality	Modeling and Simulation	
RF Propagation Studies		

PSCR Approach & Capabilities



DISCLAIMER

The full description of the procedures used in the following PSCR presentations require the identification of certain agencies, localities, commercial products and their suppliers. The inclusion of such information should in no way be construed as indicating that such agencies, products or suppliers are endorsed by PSCR, or are recommended by PSCR, or that they are necessarily the best materials, instruments, software or suppliers for the purposes described.

Project 25

A suite of standards for public safety land mobile radio communications, known as Project 25, has been widely supported by local, state and federal public safety organizations, as well as by the private sector.



History

Project 25 was established October 1989 as a partnership of:

- Association of Public Safety Communications Officials (APCO)
- National Association of State Telecommunications Directors (NASTD)
- National Communication System (NCS)
- National Telecommunications and Information Administration (NTIA)
- National Security Agency (NSA)

A steering committee consisting of representatives from the above mentioned agencies along with other Federal agencies was established to decide the priorities and scope of technical development of P25

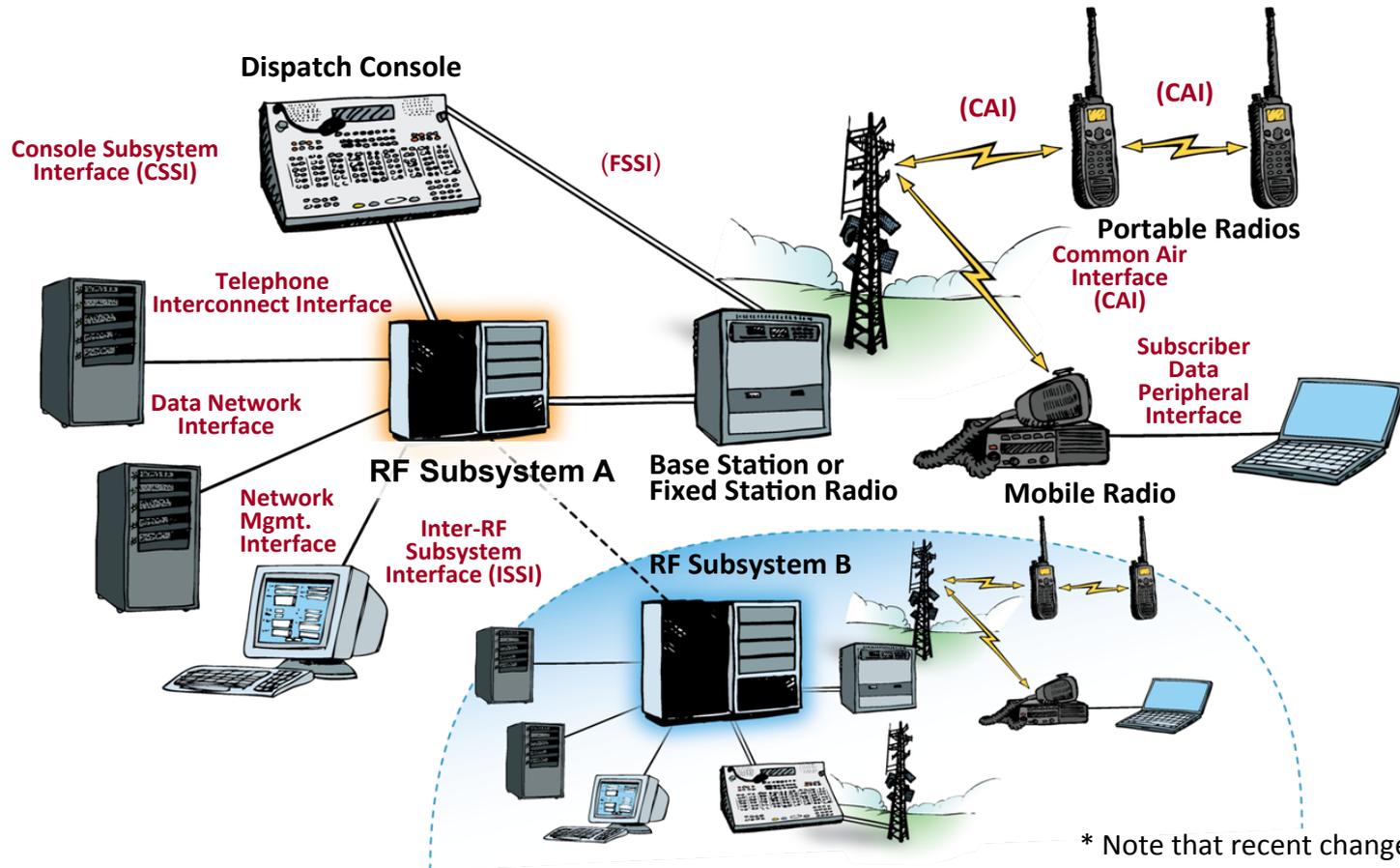
Project 25

Project 25 Standards are Focused on Achieving Goals that Benefit the Public Safety Community

<i>P25 Goals</i>	<i>Impact on Public Safety Community</i>
Graceful Migration	Allows an agency to move from a legacy system to a new system easily
Competition in System Life-Cycle Procurements	Users can select from multiple vendors that build innovative products to the same standards
Interoperability	Supports the sharing of information via voice and data signals on demand, in real time, when needed, and as authorized
Practitioner Driven Approach	Vendors develop public safety communications products that are driven by practitioner needs and requirements
User Friendly Equipment	Radio systems operate in consistent and familiar ways requiring the least mental and physical interaction by the operator
Spectrum Efficiency	Takes advantage of finite spectrum resources so more users can operate within limited bandwidths
Robust Compliance Assessment Program	A comprehensive P25 assessment program will ensure that vendor products are tested and can be trusted to be P25-compliant

Project 25

There are eight* P25 interfaces to be standardized



* Note that recent changes in P25 indicate more interfaces for items such as key management

P25 CAP Congressional Mandate

- The P25 Compliance Assessment Program was established on the basis of requests from the United States Congress:
 - Senate Report 109-088 – DEPARTMENTS OF COMMERCE AND JUSTICE, SCIENCE, AND RELATED AGENCIES APPROPRIATIONS BILL, 2006
 - House Report 109-241 – MAKING APPROPRIATIONS FOR THE DEPARTMENT OF HOMELAND SECURITY FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2006, AND FOR OTHER PURPOSES.

P25 CAP Vision

- The P25 CAP provides the more than 60,000 emergency response agencies in the United States in addition to International interest with a:
 - Consistent and tractable perspective of P25 product compliance.
 - Means of verifying that Federal grant dollars are invested in standardized solutions and equipment that promote interoperability.

Why P25 CAP

- Past research has indicated that some radios marketed as Project 25 (P25) compliant do not meet all parts of the standard
- Public safety has no independent way to verify compliance consistently across manufacturers
- Every other major wireless standard has some form of compliance program
- P25 Compliance Assessment Program (CAP) was created to fill this gap

Why is the P25 CAP Important

- Provides increased confidence:
 - To purchasers that their products meet standards
 - That federal grant dollars dedicated for communications are supporting interoperability and standards
- Low cost solution to provide public safety similar services as the commercial sector

Partnership

- The P25 CAP is a joint program between:
 - Department of Homeland Security's Office for Interoperability and Compatibility (DHS/OIC)
 - Department of Commerce's NIST Office of Law Enforcement Standards (NIST/OLES)
- The P25 CAP partners with industry and the public safety community

P25 CAP Goals

- P25 CAP:
 - Operates a recognition program that fulfills, as applicable, ISO/IEC 17011;
 - Promotes confidence in the technical competence of DHS/OIC recognized laboratories and the reliability of their results;
 - Communicates frequently with laboratories, public safety users, and other stakeholders to ensure the P25 CAP is meeting public safety needs and requirements; and
 - Meets the highest professional standards for integrity, impartiality, and ethical conduct.

Key P25 CAP Program Features

- Program will review 1st, 2nd, or 3rd party labs who will participate in the P25 CAP program
- Manufacturers must use approved laboratory to participate in the program
- Participating manufacturers must publish a Suppliers Declaration of Compliance (SDoC) and a Summary Test Report (STR)
 - SDOCs/STRs are housed on a common website (www.rkb.us), and DHS grantees are expected to purchase equipment with approved SDOCs/STRs
- Initial phase of the program is focused on the Common Air Interface (CAI) and the Inter-RF SubSystem Interface (ISSI)

Approved Laboratories

- There are currently 8 approved laboratories:
- Recognized labs include:
 - Compliance Testing LLC dba Flom Test Lab; Chandler, AZ
 - EF Johnson Technologies; Irving, TX
 - Motorola ASTRO System Integration & Test Laboratory; Schaumburg, IL
 - Motorola GP25 HEC-PITEC Schaumburg; Schaumburg, IL
 - Motorola P25 Performance CAI Subscriber Compliance Laboratory; Plantation, FL
 - Tait Electronics Ltd Teltest Laboratories; Christchurch, New Zealand
 - TIMCO Engineering, Inc.; Newberry, FL
 - Tyco Electronics – Wireless Systems; Lynchburg, VA

Documentation

- **Supplier's Declaration of Compliance**
 - A formal declaration of compliance created in accordance for a particular set of P25 compliance tests defined by the P25 CAP.
- **Summary Test Report**
 - A predefined format for manufacturers to present results to a subset of tests.



Suppliers Declaration of Compliance



Project 25 Compliance Assessment Program

SUPPLIER'S DECLARATION OF COMPLIANCE (SDoC)

Company Name
Company Department
Street Address
City, State Zip
Name of Authorized Representative
Phone: xxx-xxx-xxxx Fax: xxx-xxx-xxxx
E-mail: authorized_rep@company.com
URL: <http://www.companyname.com>

Product Name: {Name of product}
Installed options: {List of options}

{Company Name} hereby declares that the above referenced product complies with the following Project 25 standards:

RECEIVER TESTS, TIA-102, CAAB-B:

- §3.1.4 Reference Sensitivity under the following test conditions:
- §3.1.5 Faded Reference Sensitivity under standard test conditions
- §3.1.6 Signal Delay Spread Capability under standard test conditions
- §3.1.7 Adjacent Channel Rejection under the following test conditions:
- §3.1.8 Co-Channel Rejection under the following test conditions:
- §3.1.9 Spurious Response Rejection under the following test conditions:
- §3.1.10 Intermodulation Rejection under the following test conditions:
- §3.1.11 Signal Displacement Bandwidth under the following test conditions:
- §3.1.17 Late Entry Unqualch Delay under standard test conditions
- §3.1.18 Receiver Throughput Delay under standard test conditions

TRANSMITTER TESTS, TIA-102, CAAB-A:

- §3.2.8 Unwanted Emissions: Adjacent Channel Power Ratio under standard test conditions
- §3.2.12 Transmitter Power and Encoder Attack Time under standard test conditions
- §3.2.14 Transmitter Throughput Delay under standard test conditions
- §3.2.15 Frequency Deviation for C4FM under standard test conditions
- §3.2.16 Modulation Fidelity under standard test conditions
- §3.2.18 Transient Frequency Behavior under standard test conditions

2007-09-28

Issue date

Laboratory's Authorized Representative

Summary Test Report



Project 25 Compliance Assessment

Interoperability Test Report

Common Air Interface

Trunked Mode Operation



Motorola A STRO 25		Radio #1	Radio #2	Radio #3	Radio #4	Radio #5	Radio #6	Radio #7	Radio #8	Radio #9
Test Case	Description	Verdict								
3.1	Basic Group Call Tests									
3.1.1	Basic Group Call Test – One RF Site (Test 1.1)	P	P	P	P	P	P	P	P	P
3.1.2	Talk Group Privacy Test – One RF Site (Test 1.2)	P	P	P	P	P	P	P	P	P
3.1.3	Group Call Late Entry Subscriber Test – Subscriber Initially Set for a Different Talk Group – One RF Site (Test 1.3)	P	P	P	P	P	P	P	P	P
3.1.4	Group Call Late Entry Subscriber Test – Subscriber Initially Involved in a Unit to Unit Call – One RF Site (Test 1.4)	P	P	P	P	P	P	P	P	P
3.1.8	Group Call Late Entry Subscriber Test – Subscriber Initially Involved in a Unit to Unit Call – Two RF Sites (Test 1.8)	P	P	P	P	P	P	P	P	P
3.2	Queued or Denied Group Call Tests									
3.2.1	Busy, Queuing and Call Back Test for Group Call – One RF Site (Test 2.1)	P	P	P	P	P	P	P	P	P
3.2.3	Call Originator Subscriber Unit Not Valid Test – One RF Site (Test 2.3)	P	P	P	P	P	P	P	P	P
3.2.4	Target Talk Group Not Valid Test – One RF Site (Test 2.4)	P	P	N/A	P	P	P	P	P	P
3.3	Announcement Group Call Tests									
3.3.1	Basic Announcement Group Call Test – One RF Site (Test 3.1)	P	P	N/A	P	P	P	P	P	P
3.4	Protected Traffic Channel Tests									
3.4.1	Group Call Protected Traffic Channel Test – One RF Site (Test 4.1)	P	P	N/A	P	P	P	P	N/A	P

P25 CAP Status

- P25 has 8 (now potentially more) interfaces
- 4 were called out in Congressional language
 - The Common Air Interface (CAI)
 - The Inter-subsystem Interface (ISSI)
 - The Console Subsystem Interface (CSSI)
 - The Fixed Station Subsystem Interface (FSSI)
- Currently P25 CAP for:
 - CAI is operational with 92%+ of the manufacturers (14) represented¹
 - ISSI is ready and waiting for laboratory and manufacturer participation
 - CSSI and FSSI will increase intra-system competition and will be added to the P25 CAP as appropriate test standards are completed

Participating Manufacturers



MOTOROLA SOLUTIONS



KENWOOD

Raytheon

THALES



P25 CAP Status

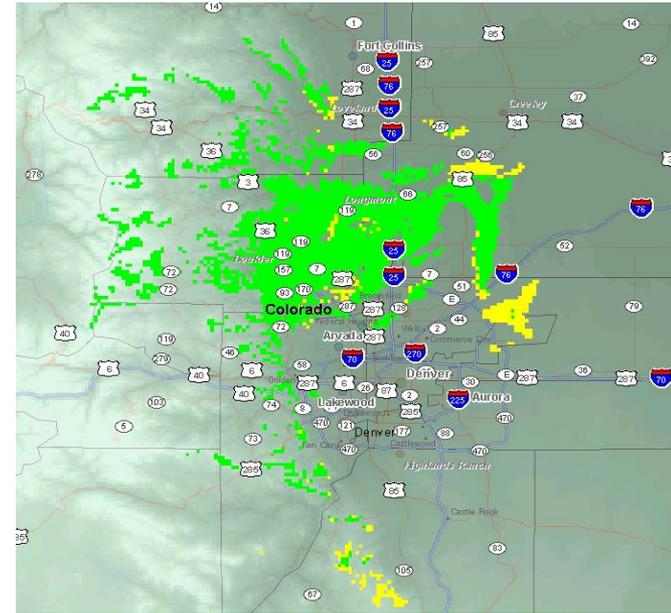
- PSCR has begun development of P25 CAI Conventional Conformance tests
 - NIST began the process of developing conformance tests outside of P25/TIA through the Federal Register Notice (FRN) process to ensure open environment and stakeholder participation
 - Several tests published along with test development criteria to allow stakeholders to develop and submit tests into the process
- DHS OIC has begun an investigation into transitioning assessment and recognition of P25 CAP laboratories to ISO/IEC 17011/17025 process
 - ISO/IEC 17011 accreditation bodies in the United States are A2LA and NVLAP and IANZ in New Zealand
 - NIST/OLES would no longer perform assessment
 - DHS OIC would no longer recognize laboratories
 - DHS OIC would continue to develop testing policy through Compliance Assessment Bulletins

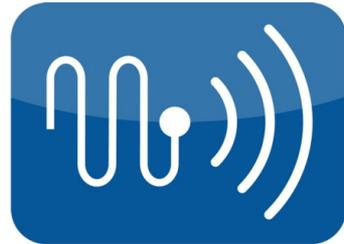
P25 CAP Status Cont'd

- DHS OIC & NIST have met with laboratories regarding assessment/accreditation transition
 - Laboratories to examine their quality management systems for ISO/IEC 17025 compliance
 - DHS OIC & NIST to meet with Accreditation Bodies to determine policy and timing guidance
- Next Steps
 - DHS OIC & NIST develop transition plan
 - Meeting with Accreditation Bodies
 - Develop Transition Plan documentation
 - Consolidate NIST Handbook 153 technical requirements into P25 Compliance Assessment Bulletin
 - DHS OIC & NIST to determine addition of test scope to program prior to transition
 - CAI Conventional Interoperability tests
 - Phase 2 Trunked Interoperability tests

LMR – LTE Interference and Interconnection

- PSCR has recently collaborated with the City and County of Boulder and the State of Colorado to co-locate a 700 MHz Demonstration Network cell site with an existing State of Colorado narrowband LMR site to test for any potential interference issues
 - Technical memo detailing results in development
- Additionally, research plans will be developed to analyze potential LMR to LTE interconnection capabilities using PSCR's two P25 LMR systems and the 700MHz Demonstration Network broadband systems
 - Potentially examining both the BSI and ISSI interfaces as options





PSCR

Thank You!

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For Additional Information:

<http://www.pscr.gov>