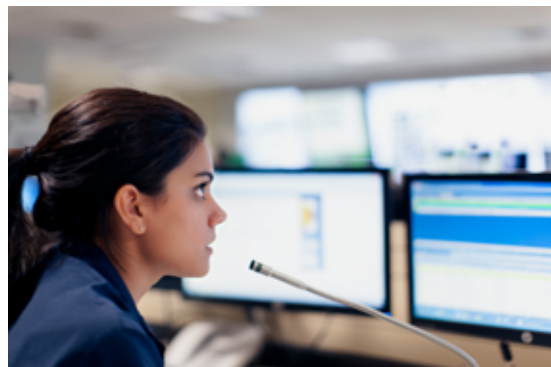# PROJECT 25 AND INTEROPERABILITY IN LAND MOBILE RADIO

- **The Project 25 standard is unique in that it is a USER driven standard.**
- **Multiple vendors support the P25 standard.**
- **Motorola Solutions equipment interoperates with other vendors equipment.**
- **Customers can and do have a mix of vendor's equipment.**
- **As technology and customer needs move forward, so too, does P25, which is an open and continually evolving standard.**

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P25: A UNIQUE USER DRIVEN STANDARD

Public safety agencies are challenged with keeping communities safe and protecting the lives of their officers, both in normal day-to-day operations as well as when a disaster strikes. Often, it requires agencies to work not only within their jurisdictions or agencies but also across multiple jurisdictions and agencies. Interoperable wireless communications is critical to coordinating joint and immediate response. The public safety community and mission critical land mobile communication providers have been working hand-in-hand for many years and have developed the Project 25 (P25) standards for interoperable mission critical communications.

WHAT IS THE PROJECT 25 STANDARD AND WHO MANAGES IT?

According to the Project 25 Interest Group (PTIG), "Project 25 is the standard for the design and manufacture of interoperable digital two-way wireless communications products. Developed in North America with state, local and federal representatives and Telecommunications Industry Association (TIA) governance, P25 has gained worldwide acceptance for public safety, security, public service, and commercial applications."

PTIG continues, "The published P25 standards suite is administered by the Telecommunications Industry Association (TIA Mobile and Personal Private Radio Standards Committee TR-8). Radio equipment that demonstrates compliance with P25 is able to meet a set of minimum requirements to fit the needs of public safety. The P25 standard was created by, and is intended for, public safety professionals."[1]

WHO ESTABLISHED THE STANDARD?

Project 25 was established in October 1989 when APCO (Association of Public Safety Communications Officials), NASTD (National Association of State Telecommunications Directors), NCS (National Communications System), and NTIA (National Telecommunications and Information Administration) agreed to the creation of the APCO-NASTD-FEDERAL Project 25. Since the beginning, the standard has been unique in that it was developed with the involvement of public safety agencies alongside industry leaders.

Developed by Public Safety Users, Project 25 systems have been available since the late 1990's. Today, Project 25 systems are deployed in 83 countries.[2]

[1] Project 25 Technology Interest Group website on Project 25, http://www.project25.org/
[2] Project 25 Technology Interest Group, "Project 25 Foundations: System Interface updates for 2014", IWCE 2014, Slide 38,
  http://www.project25.org/images/stories/ptig/IWCE_2014/IWCE_2014_P25_Foundations_PodiumFinal.pdf
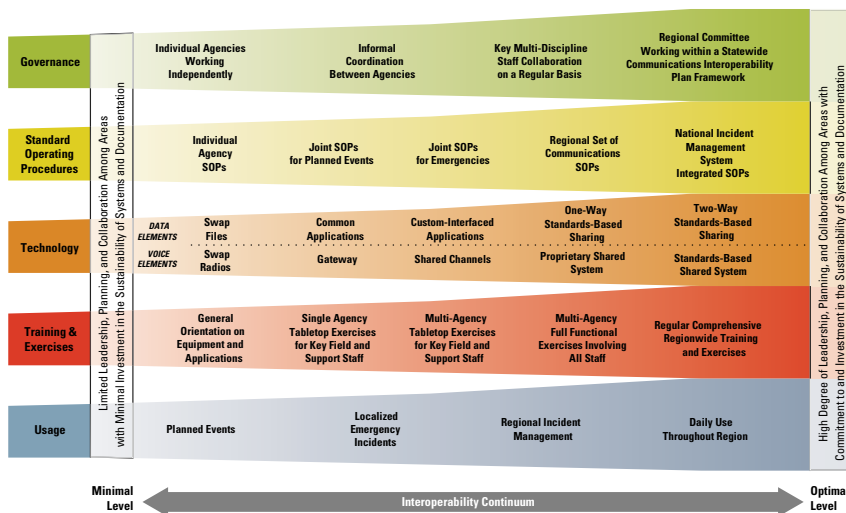
P25: BEYOND TECHNOLOGY…
THE "INTEROPERABILITY CONTINUUM"

Technology is only one out of five elements that are critical to successful interoperability. To help facilitate a common perspective on interoperability, SAFECOM (a communications program to improve interoperability under the U.S. Department of Homeland Security) produced the Interoperability Continuum, which "…is designed to assist emergency response agencies and policy makers to plan and implement interoperability solutions for data and voice communications. This tool identifies five critical success elements that must be addressed to achieve a sophisticated interoperability solution:"[4]

These elements include:

1. Governance
2. Standard Operation Procedures
3. Technology
4. Training and Exercises
5. Usage of Interoperable Communications

SAFECOM also noted "Interoperability is a multi-dimensional challenge. To gain a true picture of a region's interoperability, progress in each of the five interdependent elements must be considered."[4]

Source: SAFECOM Fact Sheet, October 2013[3]

GRANT FUNDING AND INTEROPERABILITY

In support of interoperability, SAFECOM produces grant funding guidelines for stakeholders and updates them annually. To ensure investments promote the goal of interoperability, the current guidelines state[4]:

- "To maximize opportunities to improve interoperability across investments, grantees should ensure that digital voice systems and equipment purchased with Federal grant funding are compliant with the P25 suite of standards…"

- "To ensure equipment purchased is P25-compliant, grantees using Federal funds to purchase equipment are strongly encouraged to obtain documented evidence from the manufacturer that the equipment has been tested and passed all the applicable, published, normative P25-compliance assessment test procedures for performance, conformance, and interoperability as defined in the latest P25 CAP Compliance Assessment Bulletins for testing requirements."

> **…To maximize opportunities to improve interoperability**
> **…grantees should ensure**
> **…compliance with P25 suite of standards.**

- "Grantees should be prepared to demonstrate how their procurements comply with these requirements. When purchasing P25 LMR equipment and systems, grantees should, at a minimum, ensure the vendor has participated in equipment testing consistent with the P25 CAP."

- "Equipment covered in the Project 25 Compliance Assessment Program Requirements document is tested in accordance with applicable standards and policies of the P25 CAP, and evidence of this testing is documented through Supplier's Declarations of Compliance and Summary Test Reports."

- If documentation is not available through the P25 CAP, agencies should obtain documented evidence from the manufacturer.

These excerpts clearly indicate that the Federal Government is willing to plan, prioritize and fund the build-out of interoperable Radio Systems and P25 standards are enablers of that interoperability.

3 SAFECOM Fact Sheet, (10/2013), http://www.safecomprogram.gov/highlights/safecom_fact_sheet_final_10242013.pdf
4 SAFECOM, "Interoperability Continuum Brochure," http://www.safecomprogram.gov/oec/interoperability_continuum_brochure_2.pdf

Q: WHAT IS MOTOROLA SOLUTIONS POSITION ON PROJECT 25 (P25) AND OTHER STANDARDS?

A: MOTOROLA SOLUTIONS SUPPORTS THE P25 STANDARD AS WELL AS OTHERS IN THE LMR INDUSTRY

- With the advent of digital Land Mobile Radio (LMR), the need was recognized for a comprehensive suite of standards that enable interoperability within multi-vendor systems.
  - This led to the creation of the TIA 102 series standard adopted by Project 25.
  - The TIA 102 series standard continues to evolve due to advances in technology and user needs.
- Motorola Solutions has implemented standards in LMR for over 40 years.
- In 1989, Motorola Solutions was one of the founding members of P25 and commercialized the first P25, TIA 102-compliant offering in 1996.
- To ensure continued progression of the P25 standard, Motorola Solutions supports continued standards development with participation in all 24 active committees.

> **"The TIA 102 series standard continues to evolve due to advances in technology and user needs."**

Q: WHAT EXAMPLES ARE THERE TO DEMONSTRATE SUPPORT OF THE P25 STANDARD?

A: MOTOROLA SOLUTIONS INFRASTRUCTURE HAS BEEN SUCCESSFULLY TESTED WITH COMPETITIVE RADIO DEVICES AND MOTOROLA SOLUTIONS SUBSCRIBERS HAS BEEN SUCCESSFULLY TESTED WITH COMPETITIVE INFRASTRUCTURES

- Motorola Solutions System Equipment has successfully Compliance Assessment Program (CAP) tested interoperability with subscribers from the following vendors: Motorola Solutions, EF Johnson, Harris, Icom, Kenwood, PowerTrunk, Relm, TAIT, Technisonic and Thales.
- Motorola Solutions Subscriber Equipment has successfully CAP tested interoperability with trunked radio systems from the following vendors: Motorola Solutions, Harris, TAIT, TAIT/EADS, Cassidian, PowerTrunk and EF Johnson.
- Motorola Solutions has also successfully CAP performance tested 56 radio models.
- Today, there are many customer systems that have a mix of vendor's equipment.

> **Motorola Solutions has successfully tested P25 equipment for interoperability with 9 competitive radio vendors.**

Q: WHAT IS MOTOROLA SOLUTIONS DOING TODAY TO SUPPORT INTEROPERABILITY?

A: MOTOROLA SOLUTIONS HAS MADE SIGNIFICANT INVESTMENTS AND CONTINUES TO INVEST IN LMR INTEROPERABILITY

- **Hosting multi-vendor interoperability testing**
  - Motorola Solutions hosted the first multi-vendor interoperability testing in 2006 with 5 industry participants. This demonstrated successful multi-vendor interoperability prior to the creation of the DHS CAP program.

A: MOTOROLA SOLUTIONS HAS MADE SIGNIFICANT INVESTMENTS AND CONTINUES TO INVEST IN LMR INTEROPERABILITY (CONT.)

- **CAP testing**
  - Motorola Solutions hosted the first Dept. of Homeland Security (DHS) CAP event in 2010, and was among the first to post the Suppliers Declaration of Compliance (SDoC) for its base stations, subscribers, and trunked infrastructure.
  - In support of CAP testing, Motorola Solutions currently maintains 3 DHS recognized labs:
    - Plantation, FL Subscriber Performance Testing lab
    - Schaumburg, IL Station Performance Testing lab
    - Schaumburg, IL Trunking interoperability Testing lab

> **"Motorola Solutions currently maintains 3 DHS recognized performance testing labs to ensure interoperability."**

  - To further assure the validity of the interoperability results, Motorola Solutions utilizes an independently recognized testing firm (Timco Engineering) for CAP trunking interoperability testing.
    - Timco Engineering personnel are independently recognized by DHS for this type of testing.
    - Timco Engineering has used the MSI lab since January 2011 to test other P25 radio vendors on a Motorola Solutions infrastructure.
    - This approach ensures that other P25 radio vendors have complete flexibility in scheduling test sessions and are not impacted by Motorola resource availability.
    - Timco Engineering provides this same service for other Infrastructure manufacturers. In those cases, Motorola Solutions provides P25 radios for testing on other manufacturer's infrastructures.
- **Non CAP testing (Testing of functionality not covered by the CAP program)**
  - Formal – Motorola Solutions provides test reports when customers ask for areas not covered by CAP.
  - Informal – There are times when Motorola Solutions has a mutual customer with another manufacturer. To ensure customer interoperability, Motorola Solutions works with those vendors while developing standards based products.

> **"Motorola Solutions provides test reports when customers ask for areas not covered by CAP."**

- **Motorola Solutions continues to invest in Inter-Sub System Interface (ISSI) Testing**
  - Recognizing the need for system interoperability, P25 developed the ISSI standard in 2006. The ISSI establishes the multi-vendor interconnectivity that allows P25 users to roam between neighboring systems. As with other standards, the ISSI continues to evolve and add features.
  - Motorola Solutions regularly hosts ISSI interoperability testing in lieu of a certified DHS CAP ISSI lab.
  - Motorola Solution's ISSI accomplishments:
    - 1st successful multi-vendor demo in 2007 (APCO 2007 / EADS, EFJ, Tyco & MSI)
    - 1st customer implementation in 2010 (MSI/City of Dallas & Harris/DFW Airport)
    - Continue to successfully test with vendors as the standards and products evolve.

> **"Motorola Solutions regularly hosts ISSI interoperability testing in lieu of a certified DHS CAP ISSI lab."**

- **Motorola Solutions has invested in similar informal testing with several other vendors for standard interfaces and services not covered by CAP. This includes Data, OTAR and TDMA.**

MOTOROLA SOLUTIONS COMMITMENT

Motorola Solutions is proud to be part of the Project 25/TIA-102 standardization process and, along with other manufacturers, provide extensive technical resources in the development and maintenance of the standard.

Since the 1990's Motorola Solutions has invested in Project 25, developing the ASTRO® 25 portfolio of networks, devices, applications and services. We are committed to the standard and support thousands of public safety agencies as they meet their interoperability requirements.

As the standard evolves in the future, Motorola Solutions looks forward to a continued relationship with the standard body and public safety users to enhance interoperability for first responders.

PROJECT 25 INFORMATION SOURCES

• Project 25 Technology Interest Group (PTIG) www.project25.org
• TIA (Telecommunication Industry Association) www.tiaonline.org/standards/
• Suppliers Declaration of Compliance (SDoC) www.llis.dhs.gov/knowledgebase/certifications-declarations-list
• Motorola Solutions, Inc. www.motorolasolutions.com/project25

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