



P25 Standards Update & JLMRLTE (LMR-LTE) Interworking Update.

John Lambrou

**Distinguished Member of the Technical Staff at Motorola Solutions
Chair of the TIA TR-8 Mobile and Personal Private Radio
Engineering Committee**

P25/TIA TR-8 Introduction.



- To date, TIA TR-8 (Mobile and Private Radio Engineering Committee) has created and maintains all documents included in the P25 Suite of Standards (80+ documents).
 - **Air Interfaces** - Frequency Division (FDMA) for trunking/conventional voice and packet data services and Time Division (TDMA) for trunking voice and control channel;
 - **Wireline Interfaces** - Inter Sub System Interface (ISSI), Console Sub System Interface (CSSI) and Fixed Station Interface (FSI);
 - **Security services**; Over the Air Rekeying (OTAR), Subscriber Authentication, AES256 Voice and Data Encryption;
 - **Location services**; Tier 1 (conventional) and Tier 2 (trunking or conventional)
- Standards enable interoperability between equipment of different manufacturers.

Latest Updates from the Nashville face-to-face TIA meetings.



- TIA hosted TR8 meetings on February 23-24, 2026.
- On the 23rd:
 - Six TR8 subcommittees met;
 - Two APCO Project 25 Interface Committee (APCO) Task Groups;
 - P25 CAP Updates.
- On the 24th:
 - Open User/Industry session;
 - Public Safety User Needs Working Group (PSUNWG);
 - Project 25 Steering Committee.

Summary of Improvements and Ongoing Work: P25 Air Interface Standards.



- New Silent Emergency Activation signaling for Trunking and Conventional.
 - Silent Emergency ensures that the emergency state of the radio is not detectable by anyone around the radio. When the radio enters emergency alarm mode, the emergency alarm request is transmitted but there is no audio/visual indication of that emergency on that particular radio. Use cases include undercover agents in surveillance activity so as not to warn the suspects. This feature informs other users of this situation.
 - Draft addendum distributed and in review.

Additional standardized Emergency indications:

- Man Down
- Vehicle Sensed Emergency
- Accessory Sensed Emergency
- Remotely Activated Emergency



Summary of Improvements and Ongoing Work: P25 Air Interface Standards. (2)



- New Revision to FDMA Common Air Interface – Support for Link Layer Encryption.
 - This feature protects air interface signaling.
 - Draft proposal currently in committee review.
- Improving documentation for modeling noise and interference and for coverage modeling and verification.

WG1

- **Published:** TSB-88.3-H covering performance verification and identification of interference sources;
- **Drafting:** TSB-88.6 dealing with in-building propagation topics.

WG2

- **Published:** TSB-88.0 providing a general overview and history of the TSB-88 series, including a dedication to Bernie Olson for his contributions over the years;
- **Drafting:** TSB-88.2-H dealing with propagation and fading profiles.

Summary of Improvements and Ongoing Work: P25 Security Standards.



- New standard capabilities for P25 Key Fill Devices.
 - Standardized Interoperability of the Key Fill interface for End-to-End and Authentication key material provisioning between KMFs/Authentication Facilities, KFDs, and portables/mobiles.
 - Published Q4 2025.
- Improved Interoperability for Link Layer Authentication.
 - **New Project, work in progress:** Security enhancements and clarifications for increased interoperability.
 - Review of subscriber authentication and mutual authentication procedures with a focus on multi-system and roaming scenarios.

Summary of Improvements and Ongoing Work: P25 Security Standards. (2)



- New P25 Link Layer Encryption service protecting all air interface signaling.
 - **Drafting:** Users and manufacturers are collaborating in the APCO Project 25 Interface Committee's Encryption Task Group to define the service.
 - This service will selectively encrypt air interface signaling and be interoperable with legacy air interface signaling.
 - This new system level service will affect nearly all published Air Interface standards in addition to published Security and Wireline Interface standards.

Summary of Improvements and Ongoing Work for: P25 Wireline Interface Standards.



- Control of “Group Regrouping” across the Inter Sub System Interface (ISSI) and the Console Sub System Interface (CSSI).
 - **Drafting:** Group Regrouping maximizes efficient use of RF resources when talkgroups are patched together. This new work will enable control of the Air Interface signaling when systems are connected with an ISSI or have dispatch equipment connected with a CSSI.
[Currently in committee review](#)
- New Interoperability and Conformance tests for ISSI and CSSI.
 - **Planned Work:** New Trunking Interoperability and Conformance tests include tests for vocoder mode combinations and Supplementary Data Services such as Call Alert and Emergency Group Call Cancel.

Summary of Improvements and Ongoing Work for: P25 Wireline Interface Standards. (2)



- Modifications to the Inter Sub System Interface (ISSI), the Console Sub System Interface (CSSI), and the Digital Fixed Station Interface (DFSI) to enable future Interworking with Broadband Cellular Public Safety Systems.
 - **Published:** ISSI/CSSI addendums defining use of the ISSI/CSSI for connecting Trunking systems to a 3GPP Inter Working Function (IWF).
 - **Drafting:** DFSI addendum defining use of the DFSI for connecting Conventional or Analog FM base stations to a 3GPP IWF. **Currently in committee review**
 - **Planned New Work:** Addendum to the P25 Conventional ISSI/CSSI standard for connecting P25 Conventional or Analog FM base stations to a 3GPP IWF.
- **New feature for Remotely Activated Emergency Alarm.**
 - **Planned New Work:** Considers control signaling across an Inter Sub System Interface (ISSI) and Console Sub System Interface (CSSI) to activate a radio's emergency alarm.

ATIS/TIA JLMRLTE Working Group.

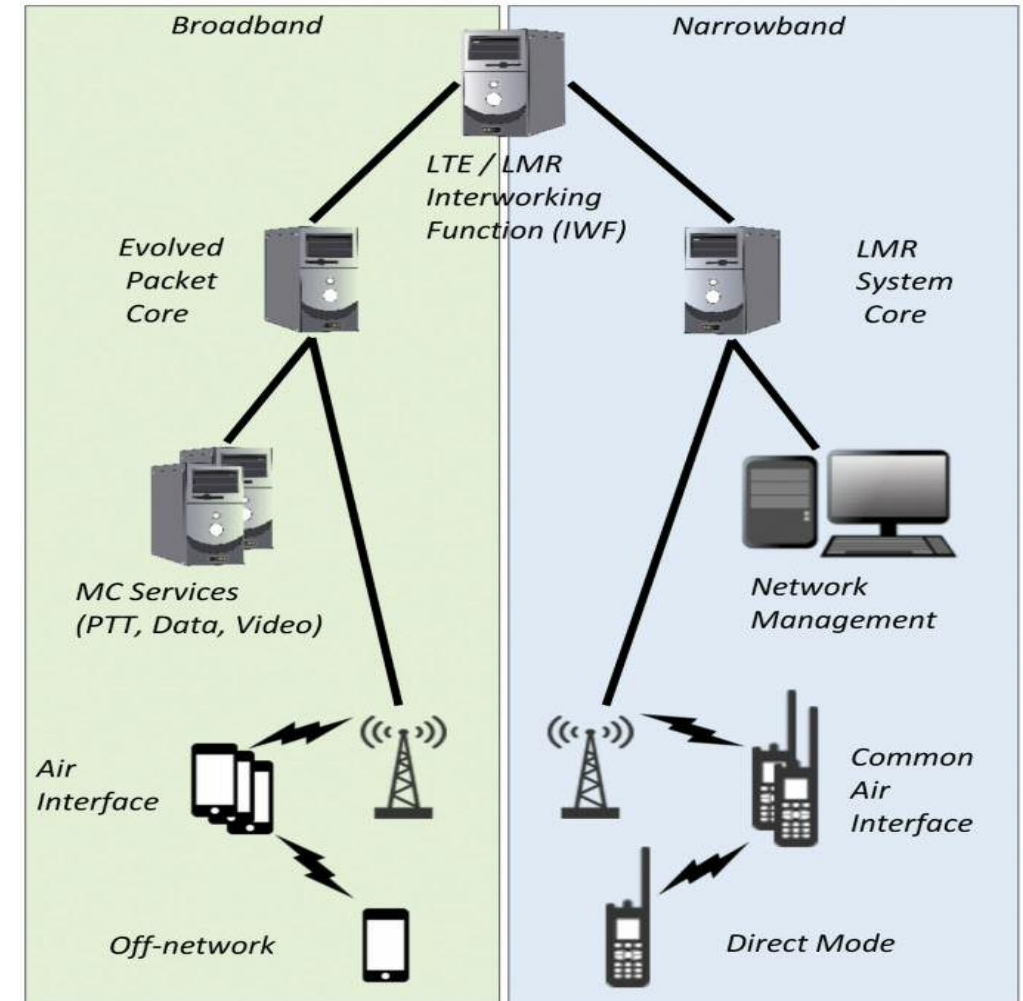


- **Current work item:** “Study of Interworking between P25 LMR and 3GPP (MCPTT) Mission Critical Services”.
 - Scenarios and considerations for using an Inter Working Function (IWF) to enable interoperability of standardized voice and data services between a 3GPP Mission Critical system and a TIA-based LMR system.
 - The TIA-based LMR systems included:
 - P25/TIA-102 Trunking;
 - P25/TIA-102 Conventional;
 - TIA-603 Analog Conventional FM.
- The P25 Inter Sub System Interface (ISSI) and Digital Fixed Station Interface (DFSI) have been chosen as LMR interfaces to the IWF.
- The first edition (J-STD-200) was published by ATIS/TIA March, 2025.
- “Phase 8” (J-STD-200 revision 1) additions completed; liaison to TIA reporting this progress.

LMR/Broadband Inter Working Function (IWF)



- From the Broadband side, the IWF acts as another 3GPP mission-critical system;
- From the LMR side, the IWF acts as another LMR system.
- The IWF is the functional entity responsible for conversion of media, identities and control signaling between 3GPP mission critical and LMR technologies to enable interoperable services.
- Interworking between LMR systems and 3GPP mission critical systems uses standard TIA LMR interfaces and the standard 3GPP IWF interfaces.
- LMR: TIA has chosen the P25 Inter-RF Subsystem Interface (ISSI/CSSI) and Digital Fixed Station Interface (DFSI).
- End to End encryption is supported.



LMR-LTE Interworking Document

Published by ATIS/TIA



“Study of Interworking between P25 LMR and 3GPP (MCPTT) Mission Critical Services”.
The First Edition was published by ATIS/TIA March, 2025.

To Get a copy of the document:

Copies of the Document are free to Government Agencies in the United States. Follow this link for an application form <https://tiaonline.org/wp-content/uploads/2020/11/20240730-P25-Request-Form.pdf>

For government agencies outside of the United States, please contact Victoria Mitchell at TIA using the link vmitchell@tiaonline.org

Documents for Commercial Entities can be ordered at: <https://store accuristech.com/tia>

P25 LMR & Broadband: Better Together.



P25 LMR and Cellular broadband (FirstNet) are different Technologies;

You do not need to choose one or the other.

P25 LMR and Broadband are Better Together!

- The rollout of 3GPP broadband services is expected to continue to progress.
- For the foreseeable future, both technologies (LMR and Broadband) are strongly anchored into the public safety ecosystem and markets.
 - This coexistence creates a need for Interworking of these technologies.
- The joint ATIS/TIA working group will continue to expand the Study document to enable interworking of the technologies.
- Work will continue in TIA to maintain and update P25 standard services.
- Work will continue in 3GPP to maintain and update 3GPP mission critical standard services.



Next TIA TR-8 Face-to-Face Meetings

June 16-17, 2026 – San Antonio, TX

TIA TR-8: Fall meeting TBD (possibly October)



THANK YOU!



MOTOROLA
SOLUTIONS

John Lambrou

Distinguished Member of the Technical Staff at Motorola Solutions

Chair of the TIA TR-8 Mobile and Personal Private Radio Engineering Committee

John.Lambrou@motorolasolutions.com

User Needs Working Group (UNWG)

Working Projects and Priorities

Scott Wright

Sr. Telecommunications Engineer II

State of Connecticut Deputy SWIC, UNWG Co-Chair

User Needs Working Group (UNWG)



Purpose: Provide a forum for education, discussion, and input from a broad range of public safety users and subject matter experts on issues directly or indirectly related to public safety communications, including the Project 25 Suite of Standards.

- Membership – open to members *around the globe*
 - UNWG membership is open to employees of public safety or government agencies with a role in public safety communications
 - For more information or to join the UNWG, please contact NCSWICgovernance@cisa.dhs.gov or scott.wright@ct.gov

UNWG Updates and Priorities

On Going Projects:

- Continued collaboration with APIC regarding LLE
- SPUN Updates
- LMR Encryption document revision
- Further identifying other user needs:
 - GPS use (wildland firefighting, etc)
 - Paging / Vehicle Repeaters
 - Development of a white paper regarding LMR/Cloud use

UNWG Updates and Priorities

On Going Projects: P25 TDMA Conventional

Currently, conventional P25 is only FDMA – you can have only one voice conversation per 12.5khz channel. While this may work for some, others don't need/want a trunked radio system but do need have a need for two simultaneous conversations.

There has been a request to develop a conventional P25 TDMA standard so that two voice conversations can occur within a 12.5khz channel. We are conducting a survey ascertain if this is a true user need and if so that this technology needs to be developed.

<https://forms.office.com/g/1R8DHciDhZ>



UNWG Updates and Priorities

On Going Projects: Trunked Fixed Station Interface (TFSI)

Unlike the commercial wireless world, P25 trunked systems can only be controlled by the manufacturer of the trunked system.

Conventional systems have an interface called DFSI (Digital Fixed Station Interface). That interface is vendor agnostic. There has been a request to develop a similar standard for trunked systems. We are conducting a survey to help judge the level of interest.

<https://forms.office.com/g/JsBzSvuLV6>



UNWG Updates and Priorities

Some prior priorities making progress!:

- Emergency Alarm Call/Cancel
- Group Regrouping
- Mutual Authentication
- Inter KMF Interface
- BDA/DAS/ERCES measurement guidance

ALL are with their respective TIA working groups and making tremendous progress toward resolution

User Needs Working Group (UNWG)



Publications:

[Link Layer Authentication \(LLA\) and Link Layer Encryption \(LLE\): Are You Really Secure?](#)

[GPS For Public Safety Location Services Other P25 related documents](#)

[Other P25 related documents](#)

Public Safety User Needs Working Group (PSUNWG)



Videos:

[What is the UNWG?](#)

[What is Link Layer Authentication \(LLA\)](#)

[What is the difference between LLA, LLE, and Voice Traffic Encryption](#)

THANK YOU!

Scott Wright

scott.wright@ct.gov

