VIPER - Project 25 Standards
NC State Highway Patrol

Project 25 (P25) is a set of standards produced through the joint efforts of the Association of Public Safety Communications Officials International (APCO), the National Association of State Telecommunications Directors (NASTD), selected federal agencies and the National Communications System (NCS), and standardized under the Telecommunications Industry Association (TIA). The P25 suite of standards involves digital Land Mobile Radio (LMR) services for local, state/provincial and national (federal) public safety organizations and agencies.

P25 is applicable to LMR equipment authorized or licensed, in the U.S., under the NTIA or FCC rules and regulations.

Although developed primarily for North American public safety services, P25 technology and products are not limited to public safety alone and have also been selected and deployed in other private system application, worldwide.

The P25 technology will replace the current APCO Project 16 compliant radio system that supports analog and digital communications. The current technology consists of a trunked land mobile radio system connected together utilizing circuits that are transported over microwave to central controllers. This network operates within the 800 MHz public safety spectrum and supports both analog and digital communications over a 3600 baud control channel to each user device (radio) on the network.

Once we migrate to P25, there are several significant changes:

- All connections between the central controllers and sites shifts to the Internet Protocol (IP) addressing scheme, thus allowing for more connections over the existing microwave network.
- All communications will now be digital, since the P25 standard is in itself a digital only protocol.
- We will continue to operate in the 800 MHz public safety portion of the spectrum, however we will now be able to integrate 700 MHz channels into the system since the Federal Communications Commission (FCC) required that systems be operating as P25 networks to be able to use the 700 MHz spectrum. This vastly improves the amount of available spectrum and helps VIPER add capacity and coverage where needed to support local communications.
- Communications with end user devices (radios) over the control channel shifts to a 9600 baud rate. This allows for the transfer of additional information between the system and radios within an allotted time period. This could include GPS location data and simple text messaging if so desired.

The P25 technology will replace our current APCO Project 16 compliant radio system that supports analog and digital communications. The P25 national standard is an open standard and once we complete the system migration it provides us three (3) significant improvements:

1. The current APCO 16 Compliant Motorola SmartZone OmniLink system is limited to 65,535 User devices (radios), however the P25 technology will provide an immediate increase to 128,000 user devices and 256,000 user devices in future software and firmware releases.

2. Currently the SmartZone OmniLink system affords end users the ability to choose from only two radio manufacturers since the APCO 16 technology was vendor specific and somewhat proprietary in nature. Currently Motorola and EF Johnson are the only two manufacturers supported, however once the P25 migration is complete a significantly larger number of vendors are capable of supplying end user equipment for use on VIPER.

3. With the current technology, a maximum of 240 sites could be supported statewide. With the move to P25, the number of sites supported could reach 300-400 if the need for additional coverage is required.

It should be noted that the P25 standard remains the national standard for Land Mobile Radio systems, especially for mission critical, public safety and military applications. Not only are there an increasing number of states working to implement or as is the case with VIPER, migrate to P25, but the P25 standard is also being used nationally by the US Military to upgrade all of the its Base Radio Systems (BRS) at critical installations. Fort Bragg, Seymour Johnson and Cherry Point are in the process of upgrading to P25 or have completed their upgrade to P25.

There is some confusion about P25's future as it relates to LTE and FirstNet. To begin with, LTE (Long Term Evolution) is primarily a Broadband Data Network that has only begun to consider mission critical voice applications. Whereas LTE may in the future support voice capabilities over a cellular type handset, there are currently no offerings that emulate a public safety voice grade radio handset. FirstNet is envisioned to provide a nationwide/statewide/regional LTE format communications network, however it is not even close to being a near to mid-term voice solution for public safety.