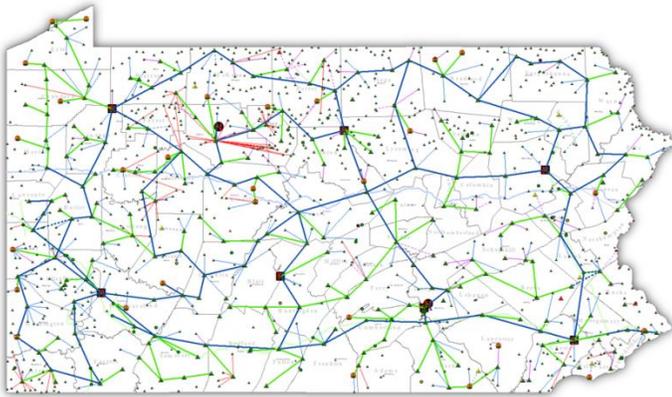


# Pennsylvania Statewide Radio Network Overview and Fact Sheet

Public Safety Radio for Pennsylvanians:



- Infrastructure:** 253 high-profile towers, 759 low-profile microcells.
- Coverage:** Mobile radio coverage of 96.9% statewide overall; 61 of 67 counties exceed the target of 95% coverage by county; all 67 counties at 92% or better.
- Traffic:** 25,756 subscriber devices are authorized for system use, logging an average of 141,640 calls (push-to-talks) daily.
- Adoption:** 22 commonwealth agencies, both houses of the legislature, county and municipal agencies, and many others.
- Interoperable:** Gateways support data and voice communications among user groups, from state agencies to local first-responder dispatch centers, including all county 911 centers.

**Technical highlights** include the following:

- Voice and data traffic** freely mix in a robust Internet Protocol (IP) network throughout the state.
- System network backbone** links sites through a statewide high-availability microwave network using Multi-Protocol Label Switching (MPLS), with secure network access both at a primary gateway and at a remotely-located alternative gateway.
- 800 megahertz (MHz) trunked digital technology** uses radio frequencies highly optimized by interweaving multiple voice and data streams over a single channel through sophisticated computer control.
- Radio “personalities”** define how radios communicate with each other, downloaded dynamically from a central database rather than stored in each radio, to allow central management and real-time changes that are secure and reliable.
- Over-the-air update of subscriber device software and configuration** relieves the need for physical access to radios for changes.
- Vehicular Tactical Networking (V-TAC)** with a mobile radio used as a repeater to extend system coverage or to serve as a mobile base station for Scene of Incident mode—for example, in support of operations at an emergency scene.
- Cell on Wheels (COW)**, a full-featured mobile microcell and communication tower for use at the scene of an emergency or some other event requiring additional local short-term system coverage.
- Interoperability technology**, including external radio system gateways, internetworking, frequency band overlays, and wireless broadband for intercommunication with the OpenSky® system.

**PA-STARNet infrastructure** comprises the following:

- High-profile radio communication sites** across the state, with smaller microcell stations for supplementary coverage.
- Seven Regional Operations Centers** and a **Network Operations Center (NOC)** monitor and administer network operations and control voice and data communications; also included is a remotely-located backup NOC for recovery and continuity.

**Currently used** by 22 commonwealth agencies, both houses of the legislature, business partners and other external organizations, as well as organizations under agency sponsorship such as Regional Task Forces (RTFs) and county and municipal agencies, serving primarily dispatch and mobile voice and data communications for public safety and emergency response.

**Examples of system use** by commonwealth agencies:

- Pennsylvania State Police (PSP)**—Data communications using computers in trooper vehicles support more than 27 million law enforcement database queries (CLEAN/NCIC) per year, as well as the use of Mobile Office applications such as messaging, alerts, and e-mail; also, all 89 PSP-dispatched stations use PA-STARNet for voice communication.
- Department of Health**—133 fixed-location radios in hospitals and other facilities statewide provide redundancy for the Health Alert Network, part of Pennsylvania’s Health Emergency Preparedness and Response Program.
- Pennsylvania Emergency Management Agency (PEMA)**—More than 600 mobile, V-TAC, hand-held, and fixed-location radios are used to coordinate with all county 911 centers as well as multiple state agencies.
- Department of Transportation**—Approximately 7,000 mobile, hand-held, and fixed-location radios support routine operations such as highway maintenance and snow removal, for which they rely on PA-STARNet exclusively in more than half the state.
- Department of Conservation and Natural Resources**—Remote locations are served by a hybrid system that uses a VHF overlay with PA-STARNet and supports 2,160 mobile, hand-held, and fixed-location radios.

**Participation by county and municipal government agencies** includes the following:

- ❏ **Cumberland County**—Countywide use of OpenSky® technology through an independent contract with Harris Corporation, incorporating intersystem communication with PA-STARNet.
- ❏ **Regional Task Forces**—More than 1,775 subscriber units configured for use with PA-STARNet in support of emergency response.
- ❏ **Huntingdon County Sheriff's Office**—Use of 33 subscriber units with PA-STARNet for dispatching and voice communication, including intercommunication with PEMA and with other county and municipal public safety agencies.

**PA-STARNet business partners**, who use PA-STARNet in consideration of access to sites and facilities, data communication bandwidth, 800 MHz frequency rights, or some combination of these, include the following:

- ❏ **FirstEnergy Corporation**—Approximately 2,070 subscriber radios support field technicians in utility maintenance operations.
- ❏ **Area Transportation Authority of North Central Pennsylvania**—189 mobile radios in rural transportation vehicles support public safety services such as emergency evacuation and medical transport.

**Responsibility for operation and development** of PA-STARNet includes the following:

- ❏ **Statewide Radio Network Division**—Bureau of Communications and Information Services in the PSP, provides management, and administration for the design, development, and operation of PA-STARNet, including support for agency adoption, use, and fleet management. See Management Directive 245.15.
- ❏ **Public Safety Communications Council**—Executives from using agencies and agencies responsible for system management and administration provide direction and policy for development and operation.
- ❏ **Public Safety Communications Operations Committee**—Consisting primarily of operational-level representatives from using agencies, provides a forum to discuss PA-STARNet status, development, policy, interoperability, and other key issues, resulting in guidance for PA-STARNet management and administration as well as information sharing among system users.

## History

**Initiated by Pennsylvania Legislative Act 148 (1996)**, providing funding for a “communication and information infrastructure, including approximately 200 sites located throughout this Commonwealth for transmission of voice and data communication connected by a digital microwave system to form a statewide mobile radio network”.

**Objectives** of system development included the following:

- ❏ **Replace multiple incompatible, aging, mobile radio systems** in use by the commonwealth with a single, highly-flexible, centrally-managed statewide system using the most full-featured, reliable, and effective wireless communications technology available.
- ❏ **Implement a statewide wireless transport** for mobile, hand-held, and fixed-position radios that supports data applications in addition to voice communication.
- ❏ **Provide system coverage of at least 95%** by county throughout Pennsylvania for mobile radio communication.
- ❏ **Create a framework for interoperable communication** among any state agencies, RTFs, and county 911 centers.
- ❏ **Make spare system capacity available** to county and municipal agencies and, eventually, commercial organizations.

**Funded by Legislative Act 148 (1996)** at \$179 million and by additional appropriations of \$189 million.

**Milestones achieved** included the following:

- ❏ In October 2003, completed factory acceptance testing for radio hardware and controller software.
- ❏ In November 2010, completed acceptance testing for system performance, 30-day endurance, and 67-county coverage.

**Original principal contractors for system development**, selected through competitive procurement, were the following:

- ❏ **M/A-COM**—Headquartered in Lowell, Massachusetts (acquired by AMP, then Tyco Electronics, and then Harris Corporation's RF Communications division, which dropped the use of the “M/A-COM” name). Provider of the OpenSky® radio communications technology used by PA-STARNet, including software and equipment for network infrastructure and subscriber devices, as well as site and equipment maintenance services.
- ❏ **Rohn Industries**—Headquartered in Peoria, Illinois, the original site development contractor responsible for site design, engineering, construction, and as-built documentation. After the company declared bankruptcy in 2003, these services were provided by PA-STARNet Division staff and by contractors engaged as needed through a competitive award process.
- ❏ **Alcatel**—Headquartered in Dallas, Texas, responsible for installation of the microwave backbone network that provides data communication among sites and across regions.
- ❏ **RCC Consultants**—Headquartered in Woodbridge, New Jersey, the principal supporting consultant in PA-STARNet design, development, and operation.

## Future

PA-STARNet's extensive experience with interoperable public safety communications makes it ideally suited to coordinate Pennsylvania's response to the federal FirstNet program and its mission to improve radio communications for first responders.