



NEBRASKA IS AT THE FOREFRONT OF MODERN COMMUNICATIONS WITH ITS STATEWIDE INTEROPERABLE TRUNKING NETWORK

Two of Nebraska's key public service agencies joined forces to bridge communication gaps and improve safety, service and savings.



SITUATION

Nebraska, situated in the middle of the country, is a state of vast, often rugged territory ranging from sand hills in the west to farmland and highly populated urban areas on the eastern edge of the state. It is a state subject to extreme weather conditions year-round. When all this is combined with aging radio system infrastructure and equipment, there are more than a handful of issues.

With this shared challenge, the Nebraska State Patrol and Nebraska Public Power District—each responsible for connecting across a state that ranks 15th in size of the 50 states—were wrestling with mutual concerns. Unpredictable radio coverage not only placed employees at risk in the field, but also constituted a threat to public safety and hindered the ability of either organization to carry out its essential services. “It’s hard to cover a state with 77,000 square miles, and the previous systems didn’t do that great of a job with it,” explained Mike Jeffres, Public Safety Systems Manager in the state’s Office of the Chief Information Officer.

SOLUTION

Nebraska officials first identified the need for an upgrade in communications as early as the late 1990s but a variety of factors prevented action. Then in 2004, the state organized a multi-agency task force and launched a formal initiative to implement a statewide wireless radio network for first responders, which they refer to as the Statewide Radio System (SRS).

Brenda Decker, Chief Information Officer for the state of Nebraska said, “The state of Nebraska had taken a strong stance on collaboration and aggregation of services we provide to citizens. Whether it was web services or connection to departments in other areas of the state, we had to look at a network that would be supportive of all.” Leveraging federal Homeland Security funds, Nebraska started the process of preparing its communications infrastructure by first upgrading regional radio towers.

CUSTOMER PROFILE

Organizations

- State of Nebraska
- Nebraska Public Power District

Locations

- Lincoln, Nebraska
- Columbus, Nebraska

Industry

- Government
- Public Utility

Nebraska Statewide Trunking System

- Covers 93 counties and 77,000 square miles
- Currently serves seven state agencies and all Nebraska Public Power District (NPPD) field operations
- Expandable to local public safety agencies, civil service and local utility companies
- 51 tower sites

Motorola Solution

- Statewide VHF ASTRO® 25 trunking network
- Dynamic System Resilience (DSR) redundant core backup
- Multiband APX™ portable radios
- 700 MHz Digital Vehicular Repeaters (DVR)

Key Features and Benefits

- Multi-agency interoperability
- Improved voice clarity and reliability
- Improved voice and data communication
- Expanded radio coverage
- Improved employee safety
- Scalable network

CASE STUDY

NEBRASKA STATEWIDE VHF
PROJECT 25 TRUNKING SYSTEM



As the state's official dispatching resource for public safety agencies, it was clear that the Nebraska State Patrol would be the pillar of an effective network for emergency services. On a roughly parallel path, Nebraska Public Power District—a political subdivision that is the state's principal wholesaler of electricity—was pricing its own communication system upgrade and came up with a much more costly \$20 million estimate.

With the Office of the CIO leading the effort, the Nebraska State Patrol (NSP) and Nebraska Public Power District (NPPD) were brought together as primary partners for a statewide network. "When we made the decision to proceed, instead of bringing in only the technical people, we brought in all agencies that would be affected, including local government," stated Decker. "A committee of people from varying agencies worked together to create the proposal and evaluation criteria as well as sitting in the oral presentations and evaluations. The investment in time resulted in support from the users and the public. The committee picked the technology that fit their needs." After this committee established a performance punch list for a new solution—including a goal of 95 percent coverage—the vetting process led to the selection of a Motorola VHF ASTRO® 25 statewide trunking system, which was activated across the state in January 2011.

RESULT

With the new system in place, the state of Nebraska is realizing compatibility, clarity and cost savings. "By moving to the Motorola-based digital radio system, first off, we're making leaps-and-bounds advances in technology," said State Patrol Lt. Col. Thomas Schwarten, who represented the NSP on the state task force. And it's paying immediate dividends.

The statewide infrastructure network was funded through a partnership between the state of Nebraska and the Nebraska Public Power District, each funding half the cost of the infrastructure network. By pooling funding, the state and NPPD have saved approximately \$20 million. The system has the potential to render economic benefits for years to come as Nebraska gradually expands the Statewide Radio System to local public safety and utility companies.

In performance terms, the new Motorola solution has eliminated many radio dead spots. Network interoperability is opening up channels of cooperation across agencies that were never before possible for regular operations, special events, as well as life-threatening emergency situations. With channels of cooperation open, various agencies can work together for a variety of reasons and not just emergencies. "Now we have the ability to communicate to public safety directly at the local level, which is efficiency we did not have before," said Matt Schnell, the NPPD Telecommunications Supervisor.

With the clarity of Motorola's APX and XTL™/XTS® radios, both State Troopers and NPPD line workers have gained new safety efficiencies from mobile communications because they now have key features they didn't have before such as push-to-talk user identification, emergency notification and expanded coverage. Under its previous system, NPPD line workers often decided to shut off radios that were subject to "skip" and background noise, resorting to cell phones. Describing the reaction of his field workers to the new system, Schnell said, "The first thing they'll tell you is, 'Wow! I can't believe how clear the voice is when I'm talking and listening.'"

PARTNER AGENCIES

In addition to the Nebraska Office of the CIO, Nebraska State Patrol and Nebraska Public Power District, other agencies enlisted as current or future partners in Nebraska's statewide trunking network include:

- Nebraska State Fire Marshal
- Nebraska Game and Parks Commission
- Nebraska Emergency Management Agency
- Nebraska Department of Agriculture
- Nebraska Department of Motor Vehicles
- Nebraska Department of Roads
- Nebraska Department of Correctional Services
- Nebraska Department of Health and Human Services



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INTEROPERABILITY SHEDS OLD SHACKLES—AND NEW LIGHT ON SERVICE

Previously, both the NSP and NPPD were each reliant upon a loosely stitched network of towers that could sidetrack radio service. For instance, as NPPD users traveled from one service area to another, they required the tower call sign of the new service area to continue radio communications. Similarly, State Troopers needed to check in as they traveled across the state so dispatchers in one troop area could “hand them off” to another dispatcher in another troop area. Trunking, with the ability to program in talk groups, has now made it easy for teams to stay in touch and coordinate communications regardless of where the user is located within the state.

Over his long career with the Nebraska State Patrol, Lt. Col. Schwarten has felt the frustration of seeing an officer from another public safety agency—local police, county sheriff, or ambulance—“flying by” on an emergency call, but not being able to connect directly to offer assistance. Now using the new statewide trunking system, Schwarten and his fellow troopers can switch over to a mutual aid frequency or check in with a dispatcher who can steer them to an appropriate talk group to help other public safety agencies in need. “This is key to public safety,” Schwarten said.

Interoperability is also enhancing the ability of NPPD to respond to power outages and meet the expectations of a public that’s increasingly intolerant of downtime. With the ability to communicate directly with other agencies, NPPD can now work more efficiently and safely in cases where a downed power line requires police to close a road, or if a local power district requires support. “We understand how crucial it is for the State Patrol to have really good communications and the fact that they understand what part we play has been a big benefit,” said NPPD’s Schnell.

ALL SYSTEMS GO

Just one month after activating the Statewide ASTRO 25 VHF trunking system, Nebraska put the network’s Dynamic System Resilience (DSR) to the test. Because the state was upgrading the uninterrupted power supply (UPS) technology in its Lincoln data center, the system administration team didn’t want to risk an outage to take down the master site in Lincoln. So, using the DSR feature, the state and NPPD rolled service over to the other master site 140 miles away in Kearney. “It went off without a hiccup,” said Mike Jeffres. “When the UPS upgrade was over, we just rolled it right back over here.”

COOPERATION BECOMES A FOUNDATION FOR EXPANSION—AND SAVINGS

Considering the depleted condition of government budgets, it’s imperative to spread the shallow pool of public funding as far as possible. Nebraska has created a model for optimal value, which includes leveraging Motorola’s existing service network throughout the state. These resources are available to the state for supporting its network investment over the system’s life cycle.

“The Governor and the Legislature gave a one-time authority to spend dollars to put in the infrastructure and they also gave the instruction to find a way to sustain it,” said Brenda Decker. “We don’t create something we can’t sustain, so we put together a methodology for the agencies to budget over the years. We look to the departments for a sustainability plan.”

In addition to the initial savings that come from aligning the NSP and NPPD, the state has already enlisted seven other statewide agencies as partners in the network. But it’s just the start of leveraging the investment in a state-of-the-art system.

The network has been constructed to allow integration of local government agencies and local public power utilities across the state to join on an elective basis. And as each local agency joins the network, infrastructure assets—such as towers—can be added to reinforce the reach of radio communications.

“We’ve set the stage for accommodating public safety and public power districts across the state,” Jeffres said. “We’ve set up the structure very functionally so it’s adaptable as we learn and evolve with how we use the system.” Progress has already been made toward adding a local county and a local utility company on the system.

Decker believes the support from Governor Dave Heineman has been key to their success and to utilizing Homeland Security funds. “Other states have wondered how, in this economy, our project was funded and how to sustain it,” she said. “It’s not just about the technology—it’s also about the partnership.”

“The basic benefit is that people can communicate more clearly over a larger area and with more people than they ever could before.”

Mike Jeffres, Public Safety Systems Manager, Nebraska Office of the Chief Information Officer



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“The overall factors for selecting Motorola were cost, overall design, and the way Motorola designed the Dynamic System Resilience (DSR) function.”

Matt Schnell,
Telecommunications
Supervisor, Nebraska
Public Power District

HOW MOTOROLA MEASURED UP TO NEBRASKA'S NEEDS

As Nebraska drew up its wish list for the statewide radio system, certain features were non-negotiable—starting with Dynamic System Resilience or DSR. “Other essentials included a standards-based Project 25 VHF network and an IP-based network to connect to other IP systems,” Jeffres said.

“The overall factors for selecting Motorola were cost, overall design, and the way Motorola designed the DSR function,” said the NPPD’s Schnell. With DSR, the Motorola system has two master controllers that provide system redundancy in case of an outage or failure. “We were looking for a DSR function where we could have separate sites ... and the design Motorola came up with was the best of the ones we saw.”

Similarly, Motorola’s Digital Vehicular Repeater (DVR) technology, which puts a repeater in the car to extend portable coverage, has changed the expectations of portable radios. “It’s given employees a greater safety window of being away from their vehicles and still being able to communicate with people on the system,” Schnell said.

Motorola’s wide range of product offerings met Nebraska’s expectations for proven technology, experience with large network systems and innovation that could place the state at the forefront of modern radio communications. Nebraska is the first ASTRO 25 system to have Dynamic System Resilience (DSR)—which enables a second master site to take over the entire functions of the system if the first master site goes down for any reason.

Lt. Col. Schwarten was eager to get the newly released, groundbreaking Motorola multiband APX portable radios, with a color LCD display on one side and talk functions on the other. “We wanted the best,” Schwarten said. “Yes, it’s new technology, but it’s technology from a corporation that’s tried and true in public safety in the U.S. and across the world.”

NOT JUST PRODUCT SUPPORT, A “PARTNERSHIP”

“Vendor support is an important issue for us,” said Jeffres. He described the relationship between the Office of the CIO, Nebraska State Patrol, Nebraska Public Power District and Motorola as the “core partnership” during the early stages of the Nebraska Statewide Radio Network. “We’ve been very proactive with Motorola and they’ve been very responsive.”

During the entire four-phase system rollout, the final activation, and the ensuing months of operations, Motorola has walked in step with Nebraska officials. “From the project manager to the staging team to engineers and technicians—it’s been a very open process,” Jeffres said. “And even with some of the more difficult issues, Motorola has been very responsive.”

Jeffres also praised Motorola’s secure extranet site, a project support site for its customers and teams to communicate key details about the progress of the network installation. “It’s been very useful and adaptable. This site allowed us to keep certain information confidential and share certain information that could be made available to everybody.”

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