

Icom America Systems



Pike County, Illinois

Reliable Countywide Coverage Connects 12 Agencies Using Icom America Systems



A case study prepared by Icom America Inc.
Manufacturers of high-performance, award-winning radios for over 55 years.

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The Pike County Sheriff's, EMS and Fire departments needed a reliable communications system that would expand coverage across the county's difficult terrain and enable first responders to communicate interdepartmentally. The new system designed by Icom America Systems (IAS) connects 12 local agencies and provides reliable coverage countywide, allowing Pike County agencies to quickly and efficiently respond during emergencies and natural disasters.



B-K Electric is who 911 calls for help. They specialize in the volunteer public safety market from individual radios to complete systems.

Featured Products:

- Icom America Systems
- Icom FR3000 Repeaters
- Various Icom Portables & Mobiles

Unreliable System Poses Major Risk to Public Safety

Located in west central Illinois, Pike County is bounded on the east by the Illinois River and on the west by the Mississippi River. Steep bluffs rise up from each river to a highlands region typified by rolling hills, wooded areas and bountiful farmland. Primarily an agricultural area, the 849 square miles that comprise Pike County teem with natural resources and wildlife.

Like most public safety agencies, the Pike County Sheriff's, EMS and Fire departments use two-way radio for dispatch and everyday communication, as well as to communicate with other local, state and federal agencies during large interagency efforts. In the case of natural disasters like the recent Midwest flooding and search and rescue missions for missing hikers and hunters, the reliability of the agencies' radio communications is essential to a quick and efficient response.

The problem was that the Pike County Sheriff's, EMS and Fire departments were using a collection of disparate radio systems that couldn't talk to one another. The assortment of different systems prohibited communication between responders from different agencies, seriously complicating large response efforts.

"Icom was willing to come in and hear what we wanted in a system, and they offer great bang for the buck."

– Chief Larry Bradshaw, Griggsville (Ill.) Fire Department

Additionally, countless coverage holes dotted the county, especially in the bluffs along the rivers and the hilly terrain in the highlands. The lack of coverage caused problems for all county agencies, but it was particularly problematic for deputies patrolling the interstate freeways along the Illinois and Mississippi rivers.



“The old system was antiquated and there was no continuity between county agencies,” explains Chief Larry Bradshaw of the Griggsville (Ill.) Fire Department. “The county’s topography is very diverse with numerous bluffs and valleys. There were dead spots everywhere. In a lot of areas throughout our district the fire department was not able to communicate.”

Bradshaw recalls a hazmat incident that occurred in 2003 near the Illinois River. Federal, state and local agencies responded to the event, but radio coverage in the bluff area was so poor that responding agencies were unable to communicate with other agencies, let alone their own personnel. “We were located only four miles from the base station, but we couldn’t reach the base station to call out. We had to use cell phones to coordinate the response. It was very frustrating,” Bradshaw says.

Poor radio coverage complicated incident response for other county agencies, too. In one case, a sightseer became lost in the Twin Culvert Cave Nature Preserve. With radio coverage essentially nonexistent in the area, the lack of communications slowed response time and prevented rescuers from launching a timely search effort. Luckily for the tourist, he found his way to safety several hours later.

To correct its ongoing communication problems, Pike County required a cost-effective solution that would unite the Sheriff’s, Fire and EMS departments in a single interoperable system, enabling county agencies to respond quickly and efficiently during emergencies. The county also needed a system that would provide reliable coverage across the region’s rough terrain. Finally, the system needed to support multiple channels and meet NFPA compliance, which requires a dedicated paging channel and command and control channel for mutual aid.

Merging a Collection of Antiquated Systems

Pike County worked with Griggsville-based B-K Electric to develop a new county-wide radio system that would merge the agencies’ legacy systems and provide reliable coverage across the area’s rough terrain. After considering several options, it was clear that an Icom system from Icom America Systems (IAS) was the best solution for Pike County.

IAS built a new VHF conventional analog system that integrated up to 300 existing portable and mobile end-user radios — some up to 20 years old — into the new system. By not having to replace its existing radios, the county achieved significant cost savings. To supplement its collection of reprogrammed radios, the county also purchased an additional 60 to 75 radios, including the Icom F121 and F1821 mobiles, and the F3161, F50 and F50V portables.

“We had a 95 percent success rate in reprogramming the old radios,” says Jim Eatock of B-K Electric, who adds that by staying with a VHF conventional analog system Pike County kept costs down without compromising the efficiency or functionality of the new system. Eatock also says that since the system is “plain vanilla repeated VHF analog,” mutual aid agencies from nine surrounding counties and two states are able to easily add Pike County frequencies into their own radios.

Sixteen IC-FR3000 series repeaters at four sites provide reliable coverage across more than 95 percent of the county’s geographically challenged terrain. At any time, a radio user is covered by two or more sites. The three Raytheon/JPS SNV-12 voting chassis supplied and customized by IAS provides dependable communications by automatically selecting the transmitter closest to the mobile.

The four-channel system provides a common paging channel, a law enforcement channel and two fire/EMS interoperable command channels (Alpha and Bravo) to a total of 12 local agencies. A UHF repeater positioned at the prime site allows for full-time cross-band connection with local government users operating on UHF frequencies, including local schools, transportation and public housing.

Microwave backhaul keeps critical public safety airwaves open. Additionally, all pages are recorded, stored and automatically repeated after 15 seconds for maximum redundancy.

Although the system currently uses a mix of 12.5 kHz and 25 kHz equipment, the county will soon transition its remaining wideband channels to 12.5 kHz in order to meet FCC narrowband guidelines — a simple matter of radio reprogramming.

Natural Disasters Test System Resiliency

A major test of the resiliency of the new system came shortly after the system was installed in 2008. Flooding of the Mississippi River brought the Sny levee system of Pike County to within 6 inches of an all-time high. On the first day of the flood, the county’s Bravo channel handled approximately 3,700 transmissions during the first five hours, a traffic level the county’s prior equipment could not handle.

“The system was a month old, barely burnt in, and traffic jumped from three transmissions an hour to over 300. The repeaters were transmitting continuously for five or six hours at a time,” Eatock says.



Since 2008, B-K Electric has added several additional features and updates to the system, including three additional receive-only sites to fill in remaining coverage holes and for redundancy and back-end compatibility.



According to Sandy Schacht, coordinator of Pike County Sheriff's Department and E911, the new system has successfully satisfied the county's main goals of implementing a reliable system with less downtime and extending coverage countywide to make sure everyone is heard.

"We learned about Icom's solution from B-K Electric. We liked the solution and thought it would work well for us. Installation went well and end-user feedback is good," Schacht says.

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Chief Bradshaw, who wrote the initial FEMA grant funding part of the purchase of the new system.

Along the way, IAS provided prompt, helpful custom engineering service. For example, the paging system needed to be designed and built so that it automatically repeated all pages after a 15 second delay from different geographical regions, and IAS wasted no time in building their own solution. In a matter of hours IAS designed and built a circuit that worked perfectly.

This ongoing level of service, combined with great value and quality solutions, makes IAS an excellent partner, Eatock says. "IAS did a magic job" designing the new Pike County system, he says. "Icom and IAS provide very high quality, economic choices."



IAS Minimizes Costs, Maximizes Service and Value

Icom America Systems (IAS) assembled, tuned, aligned and tested the Pike County system at its Bellevue, WA headquarters prior to shipping the system to Griggsville for installation and final optimization.

In addition to providing a streamlined design and testing process, IAS helped keep costs down for Pike County by integrating legacy equipment into the new system and ensuring the system could be easily expanded and updated in the future to meet growing needs. This method also made installation and final optimization quicker and easier for B-K Electric.

IAS offers turnkey communication solutions for private mobile radio users across North America and the Caribbean. Whether you need an off-the-shelf repeater or a full, custom-built system setup, IAS can provide the level of service and ingenuity required to get the job done right the first time.



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