



# Case Study

## Gibson County 911 Services Tennessee, USA

### Challenge

Establish a reliable and cost-effective network for transporting 4-wire audio traffic between the county's 911 Command Center and the police, fire, and emergency service operatives in the field.

### Solution

RAD's IPmux-1E pseudowire gateway accepts 4-wire audio from radio receivers and packetizes it for transport over an Ethernet uplink. The IPmux-1E then hands off the Ethernet traffic to RAD's broadband radio, the Airmux-200. Operating in multiple point-to-point configurations, the Airmux-200 wirelessly transports the packetized 4-wire audio traffic over the license-free 5.8 GHz band between the remote sites and the central 911 Command Center.

### Features/Benefits

- Pseudowire technology enables the effective operational merger of legacy 4-wire audio with next-generation wireless Ethernet transport
- License-free broadband wireless provides reliable and affordable transport for packetized 4-wire audio traffic
- Remote management capability via a Windows-based application or SNMP platform drastically reduces need for field services
- Easy installation and maintenance maximize system up-time

## County 911 Command Center Relies on RAD Solution to Transport 4-Wire Audio over Wireless Ethernet

### Crowded UHF Airwaves Renders County's Original System Unreliable

For the past 30 years Gibson County relied on a UHF-based radio voting system for transmitting 911 Emergency Services radio traffic. In recent years, however, as two-way radio traffic increased throughout the county, the 911 radio system began to experience a significant increase in transmission interference.

Bob Moore, Gibson County's Operations Manager for 911 Services, recalls that, "It was getting to the point where the UHF radio voting system wasn't reliable. You can't have that in 911 services." In need of a solution, he reached out to Ray Roberts of Area Wide Communications. "Ray has capably tended to the health of Gibson County's communications systems for many years," states Mr. Moore.

Mr. Roberts had recently completed an IP-based, hub-and-spoke radio voting system deployment for the Emergency Management Services of nearby Fayette County, TN. Using a Kenwood Receiver and a Doug Hall voting system, along with RAD Data Communications' Airmux-200 broadband IP/Ethernet pseudowire gateway, Ray devised an architecture for a 4-wire audio voting system that relied on the wireless packet network instead of UHF radio bands. This provides much greater reliability and flexibility, along with being highly cost-effective.

"We started deploying this system more than 6 months ago and, I must say, it has performed exceptionally well. We can't figure out how we got along without it!"

Bob Moore, Operations Manager for 911 Services  
Gibson County, TN



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With the Fayette County deployment in mind, Moore and Roberts worked together to determine the sites around the county that would best serve as the spokes to the hub located in Gibson County's north central town of Dyer. With distances ranging from 8 to 12 miles between towers, they settled on sites in five towns that would provide reliable coverage for Gibson County's 604 square miles of territory and beyond.

At each of five remote sites they installed a Kenwood receiver to receive the field transmissions. The Kenwood receiver then ties into a RAD IPmux-1E, which employs pseudowire emulation technology to packetize the 4-wire audio for transmission over an IP/Ethernet uplink. From there, the packets are forwarded to the Airmux-200 broadband radio operating in the unlicensed 5.8 GHz band.

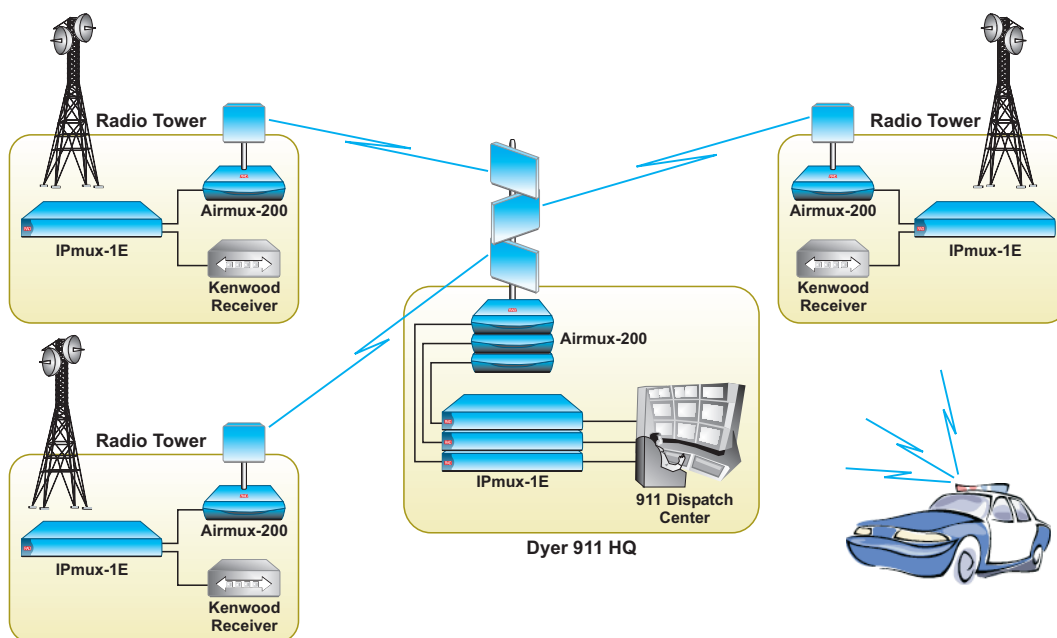
Though they could have used the licensed 4.9 GHz Public Safety spectrum for this application, Ray Roberts recommended otherwise. Citing his concern over the state's ability to override, without notice, the county's use of the reserved spectrum he noted, "That's not an uncertainty you can accept in a Public Safety application."

Each element in the system is configured in a multipoint-to-point topology with the central site housing a bookend unit opposite each unit deployed at the remote sites. The Doug Hall voting system sits at the central site constantly monitoring the remote sites so that any voice traffic is transmitted to the tower with the strongest signal.

The original deployment was just for the Sheriff's Office but when Bob Moore and company saw how reliably the system worked they quickly added the EMS and Fire Department into the system. Mr. Moore summarizes his experience, saying, "We started deploying this system more than 6 months ago and I must say that it has performed exceptionally well. We can't figure out how we got along without it!"

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Bob Moore, Operations Manager for 911 Services, Gibson County, TN



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