NATIONAL LAW ENFORCEMENT AND CORRECTIONS TECHNOLOGY CENTER
*A program of the National Institute of Justice*

From Fall 2008 *TechBeat*

TECH b•e•a•t

Dedicated to Reporting Developments in Technology for Law Enforcement, Corrections, and Forensic Sciences

# Talking in Texas With TIP

*When a tornado hit the area around Eagle Pass, Texas, in the spring of 2007, local police were able to readily communicate with other Texas emergency responders who offered assistance, thanks to a regional communications improvement project known as TIP.*

TIP, the Technology Improvement Project for the Middle Rio Grande Region of Texas, is a Project 25 (P25)-compliant, spectrum-efficient, VHF-trunked infrastructure system that is shared with local, State, Federal, and tribal users. The area served by the system covers roughly 15,000 square miles in 9 counties, with a population of 155,000. P25 is a suite of standards intended to help produce equipment that is interoperable and compatible regardless of manufacturer.

"People came in [from the other counties] and we were able to communicate," says Sgt. Alejandro Guedea of the Eagle Pass Police Department. "You could pick up a radio, switch to the frequency, and could all communicate together, as opposed to contacting your dispatcher, who would have to communicate with another dispatcher."

Although no 700/800 MHz users are currently assigned to the region, the system design includes the capability to communicate with users in those bands who might be called on to assist during an emergency.

"The system gets everybody on the same page," says W. Spade Condry, telecommunications coordinator for the Middle Rio Grande Development Council (MRGDC), which is directing the project. "Using trunking allows us to take advantage of the towers, to fill in some of the [communication] gaps and holes in radio coverage we had previously encountered. We set up radio common programming templates when we first started, and set up zones that are named consistently across the entire region. The equipment is also backward compatible and will operate on legacy systems as well as new ones."

The multiagency project covers nine counties in the Southwest border region of Texas—Dimmit, Edwards, Kinney, LaSalle, Maverick, Real, Uvalde, Val Verde, and Zavala. Val Verde and Maverick counties, which are along the Rio Grande River border with Mexico, were the first to become part of the system in 2005. Other counties followed. Real and Edwards counties will probably be the last to become fully operational. All nine counties are anticipated to have some trunk system capability operational by the fall of 2008, with full functionality for all counties expected in early 2009, according to Forrest Anderson, MRGDC homeland security director. Other agencies in Texas have also expressed interest in the system, and planners anticipate adding jurisdictions beyond the original nine counties.

MRGDC is a regional government organization providing multiple services to the area. MRGDC plans and delivers economic development efforts, helping to get Federal funds to support local projects. Its varied services also include management of the region's 911 emergency response system, funding for the Regional Law Enforcement Training Academy to train local peace officers, basic education and skills training services for the unemployed, and a network of service centers for the elderly.

The Border Research and Technology Center (BRTC) in Austin, Texas, operated by the Sheriffs' Association of Texas, has been providing technology assistance for TIP. BRTC is part of the National Law Enforcement and Corrections Technology Center System, a program of the Office of Justice Programs' National Institute of Justice (NIJ). Federal funding for TIP has been channeled through NIJ.

TIP replaces communications systems purchased with law enforcement assistance grant funds 30 years ago. Coverage in many cases is poor in some areas and at best unreliable in others with the old single-county, single-agency radio systems.

"Under the old system, each county had a radio tower in the county exclusive to that county," explains Joe Peters, BRTC director. "If users went outside the range of that tower they couldn't talk to anyone. With the new trunk system, the towers complement each other; users never know which tower they are talking on."

The system provides individual talk groups for each user agency and talk groups dedicated to local and regionwide interoperability.

"Another useful feature is they can roam across the entire region," Peters adds. "If a deputy sheriff in Val Verde had to go to La Salle County, he can still keep up with what is going on in Val Verde. All the radios are programmed alike. If during a mutual aid incident a responder picks up a radio in another county, the radio will work exactly as his does. The nomenclature is the same throughout the region. There are interoperability channels throughout the region, and private talk groups so that a sheriff does not have to listen to the fire department if he doesn't want to, but he has the capability to do so."

"It takes a lot of the effort out of using the equipment during a stressful incident," Condry says. "You just dial in to a talk group and can talk to them. You can also tie into other systems, so for interoperability it works very nicely."

The best radio for interoperability is the radio that the public safety providers use every day.

"Life for the first responder community in the region served by the TIP project would be like a step back in time without it," Peters says. "Users of the new system now enjoy a heightened sense of security and comfort in knowing that when they 'push to talk' on the new system, someone, somewhere, is likely to hear them from almost anywhere across the almost 15,000 square miles served by the system. They now enjoy being able to utilize the latest in technology to enable much improved coverage and seamless interoperability between the local, tribal, State, and Federal users of the system with the radios they are most familiar with, the radios they use in their everyday operations."

A number of the agencies served by the system are small and rural. Using the VHF band allows more radio coverage in a rural area. With VHF, Anderson explains, they can cover 15,000 square miles using 15 VHF trunked radio repeater sites. An 800 MHz system could require roughly double the number of sites at considerably greater expense for the same amount of coverage across the region.

"It's cost efficient and spectrum efficient," Anderson says.

Estimated cost for the project upon completion is about $8 million. Initial funding was used to improve infrastructure—the equipment at the towers, which had to be in place first. Other dollars are used for purchase of mobile and portable radios and a regional records management system to facilitate data sharing among the law enforcement agencies across the entire region. Jurisdictions are also using grants from the U.S. Department of Homeland Security to equip their fleets with subscriber radios.

The Eagle Pass Police Department has been buying new subscriber equipment as it receives grants, and expects to have all officers and vehicles outfitted with the updated radio equipment by fall 2008. "Our officers are looking forward to it as a safety issue," Guedea says.

The TIP project required extensive frequency and propagation studies to determine the best locations to install communications equipment. Legacy tower sites were chosen to maximize radio coverage and keep costs down. State and Federal agencies with tower assets across the region are currently or have promised to share those assets with the MRGDC regional system as may be beneficial.

"A challenging part of the project is securing the VHF frequencies we need to be compatible and not cause or experience interference," says Peters. "We started along the border first and performed spectrum analysis at several critical sites adjacent to the Mexican border to determine which frequencies we could use."

The radios operate on narrowband digital channels, and trunking technology allows for maximum utilization of all available channels.

"The project came along at an opportune time because of the mandate from the FCC [Federal Communications Commission] to use spectrum efficient technology," Condry says. "So it was timely to integrate the technology. We are moving from wideband to narrowband radio channels. The fact that it's trunked together compounds the efficiency of the system. It couldn't have come along at a better time because we had to improve to spectrum efficiency anyway."

Another component of the project is development of a regionwide records management system (RMS) for sharing data, and providing wireless data access, explains Condry. Agencies have been using different records management systems, at least one of which was in a shoe box. The RMS will allow users across the region to easily share information such as criminal background checks. Laptop computers using wireless data are being dispersed across the MRGDC region. Law enforcement officers use the wireless laptops to run the Texas Law Enforcement Telecommunications System from their patrol cars. The plan is for them to also have wireless access to the RMS and computer-aided dispatch.

Users in the field are adjusting to the TIP system. "We like to say around here we've gone from the Flintstones to Star Wars," says Anderson. "It's been quite a change for a lot of our people."

***For more information about the Technology Improvement Project, contact Joe Peters of the Border Research and Technology Center, at 514–445–5888, Joe@txsheriffs.org; Spade Condry of the Middle Rio Grande Development Council, at 830–278–4491, ext. 2036, spade@911planning.com; or Forrest Anderson, also with the Council, at 830–876–3533, ext. 1264, forrest.anderson@mrgdc.org.***



This article was reprinted from the Fall 2008 edition of *TechBeat,* the award-winning quarterly newsmagazine of the National Law Enforcement and Corrections Technology Center System, a program of the National Institute of Justice under Cooperative Agreement #2005–MU–CX–K077, awarded by the U.S. Department of Justice.