

## Case Study

**Organization:** RiverCom 911  
**Featured Solution:** MT-4E Series,  
Zetron Extended Service Plan

**Location:** Wenatchee, Washington  
**Market:** Public Safety



# Modernizing Emergency Service Connections in the Pacific Northwest

RiverCom 911 replaces obsolete Land Mobile Radio (LMR) network with the MT Series to ensure reliable communications for public safety

## Challenge

RiverCom 911 is a dedicated multi-jurisdictional Public Safety Answering Point (PSAP) that provides communications for the state of Washington's Chelan and Douglas counties. In 2012, the agency installed a 911 Land Mobile Radio (LMR) network to support its 23 different law enforcement, fire and emergency medical agencies. Less than 10 years later, RiverCom learned that the LMR products they had come to rely on would reach their end-of-life in 2018.

## Solution

RiverCom turned to the MT-4E flagship series to upgrade its pre-existing LMR network. The MT products are tough, reliable, and provide problem-free operation in any conditions, from scorching hot temperatures, to below freezing conditions. Stretching across 14 sites, the modular P25 system covers Stevens Pass to Blewett Pass, and from the Grand Coulee Dam to Crescent Bar, providing dependable analog and digital communications for public safety

professionals. The same system architecture also supports simulcast voice and paging. Zetron provides 24/7 technical support to RiverCom as part of its extended maintenance program.

## Result

In the summer of 2018, the process of replacing the outdated LMR sites began. The team took extraordinary measures to ensure continuous operation throughout the cutover. The RiverCom LMR network is now state-of-the-art and provides robust communications to first responders throughout the coverage area. Drawing on the RiverCom team's vast experience, they designed a system that addressed the region's challenging RF environment and delivers superior coverage and voice quality with the optimum number of sites. After full cutover, the highly redundant network is performing far beyond expectations.



## An Unspoiled Frontier

Located on the eastern slope of the Cascade Mountains, Chelan and Douglas counties straddle the Columbia River in North Central Washington state. The counties are mostly rural and sparsely populated. The diverse landscape includes mountains, flatlands and lakes with elevations that range from 564 feet (172 meters) in Chelan County to 4,803 feet (1,464 meters) in Douglas County. Both counties boast over 300 days of sunshine with annual snowfall levels that far exceed the national average – 51 inches in Douglas County and 100 inches in Chelan County – making the region a haven for residents and tourists alike.

## Mission Critical Responsibility

RiverCom's service area covers approximately 4,843 square miles, serving a population of approximately 115,000 residents and processing over 50,000 emergency 911 calls per year.\*

The agency is charged with:

- Providing emergency dispatch for law enforcement agencies, fire districts and public/private ambulance services.
- Facilitating the delivery of Information from the Washington State Patrol Law Enforcement Data Communications System to law enforcement agencies.
- Assisting agencies in answering, monitoring and dispatching resources to public safety emergencies and other calls for assistance.

\* 911 calls do not include non-emergency calls for service

## No One Likes Surprises

RiverCom wasn't planning on replacing their analog 911 radio system. Still, when the manufacturer informed them that the network products would be end-of-life in 2018, the agency faced a critical decision: Replace the existing LMR network with the manufacturer's newest products, explore solutions from other providers, or maintain an obsolete product that could potentially risk the lives of public safety professionals and the communities they serve.

Joshua Humphrey, radio systems technical manager for RiverCom 911, knew they had to make a change. "The choice was clear, RiverCom could not continue with an unsupported system where software upgrades, spares and repair services were no longer

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*Joshua Humphrey*

Radio Systems Technical Manager for RiverCom 911

available," says Humphrey. "When you need to talk to public safety personnel in an emergency, there's no real slack for not being able to get parts for a radio or make timely repairs."

So the agency began its search for an experienced LMR provider whose products had the level of quality and reliability necessary for the rugged operating environment and would be fully supported for at least the next 10 years.

## A Flexible Platform

RiverCom liked the simulcast VHF system they had and didn't particularly think about upgrading until the manufacturer ended their support. That gave RiverCom the opportunity to look at enhancing it. "We wanted to get something that the manufacturer would stand behind and support for 10 years," states Humphrey. "We weren't looking for any new bells and whistles; what we needed was something that had manufacturing support behind it."

Zetron's cornerstone LMR platform proved to be the right solution. RiverCom was already using the MT series at its solar sites, so they knew it was reliable. The Zetron base stations enable RiverCom to support a variety of applications, including VHF simulcast. From remote mountaintop base stations and repeaters, the MT series

provides seamless and problem-free operation. Backhaul is provided via an Internet Service Provider (ISP), fiber, licensed and unlicensed microwave.

## Overcoming Challenging RF Conditions

There is no argument, Chelan and Douglas counties are undoubtedly beautiful. Along with the area's rustic beauty, however, comes a harsh RF environment.

"In Chelan County, there are multiple streams, rivers and lakes, and each one presents a unique RF challenge," reports Humphrey. "Water causes RF signals to reflect, which can distort communication transmissions and degrade audio quality."

"Another common problem is something I call TMD (too much dirt)," explains Humphrey. "The valley is populated by numerous mountains that impede the propagation of RF signals. That's why the placement of radio sites and repeaters is so critical to ensuring that our responders have coverage wherever it is required."

**"It's nice to have Zetron behind me to help me when I need it."**

*Joshua Humphrey*

Radio Systems Technical Manager for RiverCom 911

## Optimizing Coverage with Analog and Digital Radios

RiverCom's previous system only provided an analog signal, but it served the agency well. When upgrading to a new system, however, the agency saw it as an opportunity to explore adding digital capabilities to its network.

"We service an area on both the east and west side of the Columbia River that's a mix of mountainous terrain with wide-open flatland," remarks Humphrey. "While a digital signal works well in the flatlands, the mountain range tends to work best with analog."

When using radios in mountainous terrains, such as Chelan County, there's an effect that can occur called multipath, where the radio signals bounce off of rocky cliffs and sheer faces. With an analog signal, it can create some static, but a digital signal can actually be worse in this environment. With the addition of Zetron's P25 system, RiverCom can now offer both analog and digital – something their previous solution didn't support.

## A Seamless Transition

After months of preparation, deployment went smoothly. Zetron developed a comprehensive system design to ensure the precise and economical deployment of resources. Predictive models were created and validated in field tests where factors including signal intensity, signal quality and interference were measured and analyzed. Based

on this real world analysis, minor adjustments were made to ensure the network achieved the levels of coverage, capacity and quality required to serve RiverCom's first responders effectively.

Once installed, switching over the channels only took approximately 10 minutes. The process was straightforward and only required a minute or two of input from first responders when they were asked to change their radio channel for testing purposes. They never went without coverage.

"If you change someone's channel and you haven't checked it, you're potentially cutting someone's lifeline. You want to make sure," warns Humphrey, "that their lifeline is attached and that it has been moved, and it's still there."

Zetron also installed two geo-diverse redundant controllers, something RiverCom didn't have with the previous system. In the unlikely event that one unit goes down, the other server takes over. "Downtime is simply unacceptable when handling public safety. Knock on wood, it hasn't occurred yet, but regardless of whatever chaos my responders have to respond to, we want to ensure that they can call for help," asserts Humphrey.

As for the staff in the RiverCom call center, they didn't even notice a change in the system. They continued to field calls as they would on any other day. "When the staff who uses the system doesn't notice any difference, then you're doing something right," notes Humphrey.

## Remote Monitoring

RiverCom's radio site locations are as varied as the calls the 911 center receives. One site sits atop the county jail, while other radios/repeaters are nestled in rocky mountain terrain. If an issue occurs at the top of a mountain on a snowy day, crews take snowmobiles to the location and repair the system with the tools and spare parts stored at the site.

That's one reason remote monitoring of the network is so important. The MT platform supports live site data and logging capabilities for predictive trending and alarm/trigger notification. Armed with this information, crews have more in-depth information on system status, health and availability and can better address problems in real time.

## Planning for the Future

In the coming years, RiverCom plans to add sites and expand its coverage for user agencies, something they can easily do with Zetron's technology. "It's nice to have Zetron behind me to help me when I need it," concludes Humphrey.

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