

Case study

Bringing high-speed broadband to rural communities

Newport Utilities overcomes terrain obstacles with fixed wireless access



ERICSSON



Living at a slower pace without sacrificing access to high-speed broadband

Case study:
Newport Utilities

Industry:
Utilities

Executive summary

A municipal utility serving the people of Cocke County, Tennessee, Newport Utilities began rolling out fiber-based high-speed broadband in 2017. However, the company ran into two major roadblocks: the prohibitive cost of reaching more remote customers in the mountainous terrain of this rural area, and a lockdown brought on by the COVID-19 pandemic. With thousands of people forced to work and learn from home, yet still lacking access to broadband, the

company worked with Ericsson to design and deploy an alternate solution to reach more people through a fixed wireless access network built on Ericsson Massive MIMO technology. The fixed wireless access solution proved easier and more cost effective to deploy than fiber, and today is a vital driver of economic development, providing broadband access to more than 8,000 homes and businesses at speeds never before possible.

The challenge of modern life in rural communities

In eastern Tennessee, the Great Smoky Mountains provide an idyllic backdrop to the small towns and homesteads tucked into hollows and nestled along nearby lakes. It's a place that calls to people near and far seeking peace and beauty, a chance to get closer to nature and enjoy a simpler lifestyle. One of those people is Chris Calhoun, a 30-year veteran of the U.S. Coast Guard, who left the seas behind to enjoy life in the mountains.

Currently Vice President of Operations and Technology for Newport Utilities, a municipal utility serving the people of Cocke County, Tennessee, Chris understands the region's

allure. "After I retired from the military and living on the coast for close to 50 years, this is where I chose to land. It's just gorgeous."

He also understands the challenges. "Many people move here to get away from the pace of urban and suburban life. But they still need to connect to the modern world to run businesses and communicate with friends and family. Today, that means having access to high-speed broadband. It has very much become an essential service."

The challenge for many rural communities, however, is lack of access to high-speed broadband.

At-a-glance

Goal:

Bring high-speed broadband access to underserved rural populations in and around Cocke County, Tennessee.

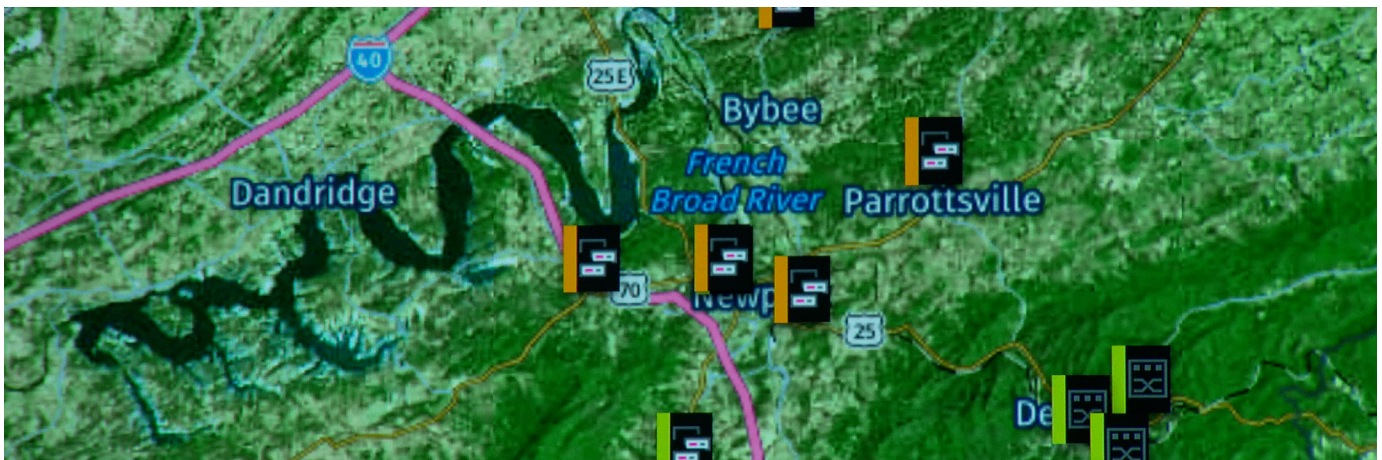
Approach:

- Deploy fixed wireless access network built on Ericsson Massive MIMO 64T64R technology
- Erect 11 macro sites that leverage the 3.5 Ghz Citizens Broadband Radio Service (CBRS) spectrum
- Add 12 small cell sites to reach areas deep in mountain hollows and rugged terrain

Results:

- Accelerated deployment of broadband access to underserved communities
- Extended reach of high-speed broadband access to more than 8,000 homes and businesses
- Achieved wireless broadband speeds of up to 200 Mbps
- Provided essential access to internet services for work, school, and telemedicine
- Bolstered broadband infrastructure to support rural economic development





Recognizing broadband as an essential utility service

The fact is most major commercial providers cannot justify the cost of building out broadband infrastructure in sparsely populated rural areas for the modest return in revenue they'll realize. But as a community-focused local government agency, Newport Utilities saw things differently. The company recognized broadband as an essential utility service and launched a major initiative to bring high-speed broadband access to underserved areas of rural Cocke County via fiber-optic cable.

However, shortly after starting the fiber deployment, the project hit two major roadblocks. First, getting fiber into the more mountainous areas of the county ultimately proved cost-prohibitive. Then, the COVID-19 pandemic struck, completely shutting down the deployment.

"We view high-speed broadband as a major pillar for economic development and quality of life," Chris points out. "While the pandemic forced us to halt our fiber deployment, it also revealed the urgency for us to come up with another approach for getting broadband out to people."

Practically overnight, employers required people to work remotely from home. Telemedicine was no longer a novel convenience but a life-critical digital service. Children had to learn through a computer screen. In fact, 60 percent of school-age children in the communities served by Newport Utilities lacked access to high-speed internet at home. With so many people's lives and livelihoods at stake, the company redoubled its resolve to reach them.

Trusted partner Ericsson offers the optimal solution

During the pandemic, it was unsafe for installers to enter people's homes to complete the fiber deployment. Instead, Newport Utilities reasoned that fixed wireless technology was a way to augment its fiber infrastructure and reach more people with high-speed broadband. So, the company defined an initial set of requirements for the fixed wireless infrastructure and invited several leading vendors, including Ericsson, to respond with their proposed solutions.

Jennie Bratten, the Director of Utility Sales for Ericsson who now works with Newport Utilities, explains that the approach Ericsson took when responding to the RFP entailed not only offering a solution based on the specifications in the formal request for proposal, but also looking deeper at the company's needs and proposing an alternative solution. "Our job is to be the technology experts and offer up the right solution for the problem our customer is trying to solve. In some cases, it may be a solution the customer didn't originally envision, but it is the best fit to their needs."

In this case, Newport Utilities had originally specified a traditional antenna solution with two transmit paths per tower across 60 sites. However, Ericsson proposed an advanced, higher-speed antenna solution based on its Massive MIMO technology with 64 transmit paths. The Massive MIMO solution could not only reach farther out into the company's remote communities, but do it more efficiently and with fewer sites.

"The fact is we don't have a lot of wireless expertise in-house," Chris explains, "so we rely on trusted partners. Ericsson listened to

what we were trying to accomplish and didn't limit their thinking to only what we knew.

They went the extra mile and actually recommended an approach we hadn't considered. In the end we got a much better solution, which really helped establish that trusted partner relationship."

Brings community broadband speeds never before seen

Today, Newport Utilities has a fixed wireless access solution with enough capacity to deliver vital high-speed broadband to more than 8,000 homes and businesses across rural Cocke County who previously lacked access. The solution is built on Ericsson Massive MIMO technology with 64 transmit and 64 receive antennas that use the 3.5 GHz Citizens Broadband Radio Service to connect customers to the network. Instead of requiring 60 sites, the Ericsson solution enables Newport Utilities to reach most of its target customers with just 11 "macro" towers and another 12 small cell sites to fill in areas that are shadowed in the hollows between the surrounding mountains.

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— Chris Calhoun, Vice President of Operations and Technology, Newport Utilities

Jennie remarks, “The cool thing about this solution is that it enables Newport’s rural communities to have access to the same kind of high-speed broadband you’d find in any major city. It is 100 percent about bringing people the utility services they need to support their livelihoods and for children to do their schoolwork without having to sit in the parking lot of a fast food restaurant to get on their Wi-Fi.”

In some areas, residents and businesses now get broadband speeds of up to 200 Mbps through the fixed wireless access network, and speeds of 80–90 Mbps are commonplace across the service area.

Chris points out, “With a clear line of site to our towers, people will see connection speeds they’ve never experienced before. When we got our broadband service up to the more remote part of our service area, people were just ecstatic.”

One of those people is Randy Jones, owner of Incredible Tiny Homes, who has built a community of 166 tiny homes in the Newport area now serviced by the new fixed wireless broadband network. “People come here initially with a lot of fears about being able to get essential services like electricity, water, sewer, and today that also means broadband. They need Wi-Fi access to work from home, connect with family, and just to live in the modern world. Now, with the fixed wireless solution, our customers can download things, stream videos, and work from home with a great signal—just like they’d get in a big city. We haven’t had anybody call about a problem with their reception, running out of bandwidth, losing the signal, or anything like that,” says Randy.

Randy explains that on the side of each tiny home is a small, unobtrusive wireless transponder that connects to the nearest Newport Utilities tower. “What I love about this Ericsson wireless solution is I can develop my entire 160 acres, which could mean 2,000 to 3,000 people living here, and it’s going to cost us less money to put in the infrastructure. So, it’s really helped ease my pain of developing more property.”

Relying on outside wireless experts to manage the network

In addition to designing and installing the fixed wireless access network for Newport Utilities, Ericsson Managed Services also run the day-to-day network operations and provide technical support when needed. With just over 100 employees to serve a 600 square mile county, Chris says bringing in outside expertise was the most practical way to go.

“We do not have a deep bench,” he acknowledges. “With such a complex system, it’s a force multiplier to have the experts at Ericsson managing our fixed wireless access network. I’d have to hire a small team—if I could even find people with the right skill sets—so why not let Ericsson do what they do best. They have the skills, the equipment, and they can monitor everything 24/7. It’s a very big part of what makes our system reliable for our customers.”

When it comes to technical support, Ericsson is also at hand around the clock to troubleshoot and resolve issues on the fixed wireless access network. In fact, there are times when the Ericsson team will proactively identify an issue and resolve it without Newport Utilities—or its customers—ever knowing there was a problem.

Chris says, “Having Ericsson taking care of our system eliminates a lot of worry for us. It’s part of that trusted partnership we have.”

Simplifies future network expansion

Despite being far-removed from the pace of big cities, the communities across Cocke County continue to grow. That means Newport Utilities will need to continually scale up its broadband services to meet increasing demand. Understanding that growth is inevitable, Ericsson worked with Newport Utilities to design the fixed wireless access network to scale and enable the utility to add new services using the existing infrastructure.

For example, Newport Utilities currently offers 4G wireless services, but in the future it could easily choose to add 5G. Chris notes, “One of the value-added capabilities that Ericsson brought to us is that our current fixed wireless system is 5G-ready. All we need is a software upgrade; there’s no need to change out equipment at the sites. That helps us avoid a big capital expense down the road.”

> 8,000

More homes and businesses reached via fixed wireless access with up to 200 Mbps



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With the success of its current fixed wireless access solution, Newport Utilities is also able to take a fresh look at how to expand the broadband network. Originally envisioned to augment fiber in difficult-to-reach areas, fixed wireless has proved easier to deploy while delivering plenty of performance for most home and business needs.

“I don’t think any of us expected the performance we’ve seen from the fixed wireless network,” Chris says. “It’s caused us to take a step back and consider that maybe we don’t need fiber everywhere. Having that flexibility is huge because it can help us reach people more efficiently and at less cost.”

Reflecting on his experience working with Ericsson to build out a fixed wireless access network in rural Tennessee, Chris offers this advice: “If you’re a small utility, don’t try to do it yourself. With a complex system like this, it pays to bring in outside experts to help design, build, and manage the network—somebody who has the skill set to stand with your team and be accountable. That means it has to be a partner you trust.”

Chris concludes, “Ericsson has been by our side since the beginning. It’s their technology that enables Newport Utilities to close the gaps in terms of internet access for our underserved communities. I’m very happy that Newport Utilities decided to partner with Ericsson. They provided us with a solution that works, it’s reliable, and enables us to get essential high-speed broadband out to a lot more people—faster and more efficiently.”

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Solution highlights

Taking broadband farther, more efficiently

Overcoming rugged mountainous terrain, Newport Utilities is bringing essential high-speed broadband services to more rural customers than ever before with the utility industry’s first fixed wireless access network in Tennessee.

Transformational Solution

- Fixed wireless access network leveraging the 3.5 Ghz Citizens Broadband Radio Service (CBRS)

Ericsson Hardware

- Ericsson Radio System – 64T64R Massive MIMO - AIR 6488
- MINI-LINK
- Network Management and Automation Integrated Site Solutions

Ericsson Software

- Ericsson Radio System Software
- Ericsson Network Manager (ENM)
- BSS

Ericsson Services

- Ericsson Managed Services
- Systems Integration (OSS, Cloud Infrastructure, Packet Core)

Solution Advantages

- Lower total cost of ownership
- Faster return on investment
- Higher capacity and coverage
- Lower latency
- Reduced interference
- Lower cost per megabit

About Newport Utilities

Newport Utilities first started providing electric service in 1940 when the City of Newport purchased the electrical system from the Tennessee Valley Authority. Since then, Newport Utilities has expanded to provide water delivery, wastewater treatment, internet, television, and phone services. As the local utilities provider to Cocke County and the surrounding communities, Newport Utilities' 100-plus employees—from engineers and electrical line workers to office staff and administrative personnel—live in the area and are committed to meeting the needs of their neighbors with prompt, professional service.

About Ericsson

Ericsson enables communications service providers to capture the full value of connectivity. The company's portfolio spans Networks, Digital Services, Managed Services, and Emerging Business and is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's investments in innovation have delivered the benefits of telephony and mobile broadband to billions of people around the world. The Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York. www.ericsson.com

