Bridging the digital divide

OhioTT brings affordable high-speed wireless broadband access to the underserved

ERICSSON

Winncom Technologies

OhioTT
OHIO TRANSPARENT TELECOM

Changing lives and livelihoods across Ohio

Executive summary

Recognizing that thousands of people across rural Ohio lack affordable access to broadband, OhioTT created a grassroots, community-supported effort to reach households unserved or underserved by traditional internet providers. The company engaged Winncom Technologies, which designed and delivered a complete fixed wireless access solution based on Ericsson antenna-integrated radio technology. The flexible solution is being deployed on existing community assets, such as water towers, as well as new full-height transmission towers built by OhioTT. By leveraging Ericsson Massive MIMO technology, the solution overcomes many traditional line-of-sight and signal propagation issues, making it possible to deliver broadband service in areas that previously had no other viable connectivity options. Working with community leaders, Winncom and Ericsson, OhioTT is bringing life-changing communication services to people and businesses, driving economic development, precision agriculture, and improving quality of life for households across Ohio.

At-a-glance

Goal:
Deliver reliable, affordable broadband access to communities unserved or underserved by traditional digital providers

Approach:
- Partner with Winncom Technologies and local community leaders to plan and fund a fixed wireless access solution
- Engage Winncom to design, engineer, and provide ongoing support of a complete wireless broadband network
- Leverage Ericsson radio technology for reliable, high-performance wireless connectivity with no line-of-sight restrictions

Results:
- Connected first customers in less than 30 days from the time community leaders approved the project
- Enabled affordable high-speed broadband access to residents, farmers, and small businesses in communities with limited connectivity options
- Delivered life-changing communication capabilities impacting potentially tens of thousands of people
- Exceeded wireless performance expectations, attaining 100 Mbps across miles and through trees
- Provided the foundation for new community programs and business opportunities

Coping in an internet desert

On an average day two years ago, people were crowding several of the local fast-food restaurants in downtown Zanesville, Ohio. Driving through town, Megan Kvamme observed the gatherings—puzzled; then enlightened. "I knew there was a problem getting broadband in my home state," she says, "but it was at that moment I realized how pervasive the problem really was."

Folks were clustered at the restaurants and coffee shops to get on the internet—to work, do homework, check in with elderly relatives. At the time, it was their only option to access broadband service.

Megan resolved to change all that. Born and raised in central Ohio, she felt a calling to help her fellow Ohioans by making broadband more accessible. This was the genesis of Ohio Transparent Telecom, or OhioTT.

Resolving digital inequity for the people of central Ohio

The counties surrounding Zanesville are largely rural—the Appalachian region of Ohio—offering scenic beauty and peaceful lifestyles, but often neglected by modern digital service providers due to their sparse populations. The problem is that running fiber-optic cable in rural communities where miles separate each home is generally not economically feasible, and consequently, the main providers decline to make an investment. Megan, who is now the executive chairwoman of OhioTT, was determined to bring digital equity to the region.

Megan had years of experience working with state and local governments on economic development. And she knew people with the right technical expertise to find an alternative to fiber. But most important, she understood the needs of the people.

"The fact is 'access' for some isn't necessarily access for others," Megan explains. "For a person trying to work their way out of poverty and needing access to online continuing education, spending $99 a month is not financially feasible. So we knew we had to make our service affordable, as well as bring it to areas where even expensive options didn't exist."

Kyle Yoder, who heads up the technical team at OhioTT, was aware of a new breed of fixed wireless technology through his contacts with Winncom Technologies, a global provider of networking solutions headquartered in Ohio. That technology—Ericsson Massive MIMO—is a portfolio of antenna-integrated radios that maximize wireless performance and capacity, even where there is no direct line of sight.

"With traditional fixed wireless products, there were so many limitations with capacity and the way signals propagated; there were lots of line-of-sight issues," Kyle says. I was amazed how Ericsson overcame those old issues with Massive MIMO. It offered a major leap in wireless broadband capability, which was exactly what we needed."

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> — Kyle Yoder, Head of Technology, Ohio Transparent Telecom

Bringing a viable fixed wireless solution to market

To explore in depth how OhioTT could use Ericsson's next-generation fixed wireless access technology, the team engaged Winncom Technologies as a key partner to help with radio frequency (RF) planning, solution design, and engineering support.

Kyle notes, "As a small start-up, we needed a partner that had an established relationship with Ericsson and could help us with all the deployment complexities."

Mike Cook, Vice President of Business Development at Winncom Technologies, says, "Ericsson technology is top notch—you'd be hard pressed to find anything else on the market that compares. It is engineered to provide great performance for the variable and challenging clutter and terrain of rural America. Partnering with Ericsson we are able to simplify the complexity for OhioTT's home broadband network. Winncom's advanced technical capabilities together with Ericsson's hardware and software enable OhioTT to leverage the best equipment available and meet the market need."

Winncom brought together the Ericsson Massive MIMO technology and all the other ancillary components necessary to deliver a complete fixed wireless broadband solution. Additionally, Winncom included its network management services to monitor health and performance, as well as troubleshoot any issues on the wireless network.

Kyle says, "Working with Winncom as an extension to our own technical resources enabled OhioTT to bring a viable solution to market with an attractive cost that made good business sense for us."

Megan adds, "When it comes to economic development, working with local people was very important to me. Everyone on the Winncom team demonstrated a passion for

what we're trying to achieve—this wasn't just transactional for them."

Also important was having a solution that could continue to support OhioTT's evolving needs into the future. Mike points out, "Ericsson radio technology is a key component that allows us to future-proof the solution out of the gate. That means, while today we're delivering 4G LTE technology, we can easily move to 5G with just a software update. That ability to build a future-proof wireless network was part of the thinking at OhioTT from the beginning, and Ericsson's Massive MIMO enabled us to deliver."

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>20,000
Previously unserved/under-served households able to access affordable broadband

Turning vision into reality in less than 30 days

Confident in Ericsson's fixed wireless access technology and their partnership with Winncom, Megan and the OhioTT team began working with local communities to turn their vision into reality. Megan points out, "The thing about working with local governments is you don't just come in and tell them about all the great things you can do—you have to show them."

As a first step, the OhioTT team met with the mayor of Somerset, a village in Perry County. They discussed how installing this new radio technology on existing water towers could quickly and cost-effectively provide people access to broadband service. The mayor recognized the potential, and just 29 days after getting the village's approval, OhioTT was connecting local residents to the internet— many for the very first time.

"When we got those folks connected, it was so exciting to see," Megan recalls. "People could now work from home, their children could study and do online assignments. It was like turning on the lights. We were meeting a palpable need that touched people very deeply."

Kyle shares his impressions from a technical perspective: "After we installed the radios on that water tower in Somerset, I did a speed test from a mile away and got over 100 Mbps right through the trees. My mind was blown. There was a lot of work that went into that first deployment, but when I saw those results, I realized we have the technology and the talent to make this an operational success."

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>
> **— Megan Kvamme, Executive Chairwoman, Ohio Transparent Telecom**

Connecting cows on a high-tech farm

As OhioTT continues to roll out new sites, the company is focusing primarily on the 32 Appalachian counties, of the 88 total

counties, in Ohio where broadband access is most limited. As with its first deployment in Somerset, the OhioTT team is taking an economic development approach, going community to community working with local leaders to find solutions that help them help their citizens.

In many instances, the impact of enabling wireless broadband access has been profound. Case in point: Daugherty Farms, a sixth-generation family farm in Coshocton County, Ohio. The bucolic farm is set in the heart of Appalachian Ohio—scenic but far from modern digital services. Yet, the forward-thinking Daugherty family has updated the operation with robotic milkers and automated environmental systems to optimize cow comfort and milk production. To enable communication for these digital farming systems, the Daughertys initially relied on a Wi-Fi hot spot. However, the hot spot provided only limited capacity despite costing hundreds of dollars per month, and speeds often slowed to a crawl as capacity dwindled toward the end of each month, rendering the service essentially useless.

Bill Daugherty recalls, "We're always on our phone out here checking cow data and our crop system. We carry an iPad on most of the tractors as we're planting. It used to be sometimes you had internet, sometimes you didn't. My wife pays all the bills and cashes checks with her phone and she used to have to stand by the window to have things go through. Since we've gone to OhioTT, internet service is much faster and more efficient. It's a very workable solution for our farm and our whole family."

Back in Somerset, the mayor and a local university are working on developing new programs for seniors, leveraging the wireless broadband service to create socialization and wellness programs. These include digital communications to help seniors stay connected with friends and family, as well as wearables that measure health conditions and detect falls.

Megan notes, "Those of us blessed enough to be connected make so many assumptions that we can't imagine what it's like to not have broadband anywhere, anytime we want. If you think about how many times in a day you text a friend or look up something online, it's astonishing how much connectivity matters in our daily lives. Now we're working to make it matter for more people in Ohio."

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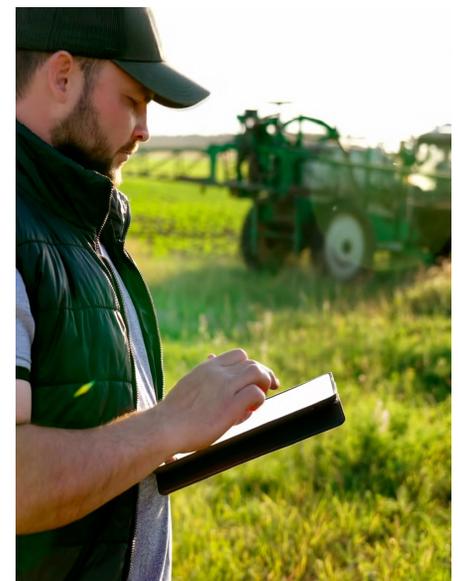>
> **— Bill Daugherty, Daugherty Farms**

Continuing expansion to serve those most in need

Today, OhioTT has eight fixed wireless access sites in production with 14 more sites slated to come online soon and additional sites being planned as the rollout continues across the state. Ultimately, the potential is to impact thousands of households.

Matt Armstead, OhioTT's Chief Growth Officer, says, "In Coshocton County, nearly half of its 33,000 residents have no access to high-speed broadband services. When this project is completed, we'll be able to serve over 9,000 households and around 15,000 residents in Coshocton County alone. The uptake in interest for wireless broadband across Coshocton and other counties has been astounding. People can't wait to finally get internet."

As OhioTT expands across Ohio, other providers may come into play, but Megan does not see that as a competitive threat; instead, she welcomes the opportunity for partnership. "Our mission remains focused on meeting the needs of unserved and underserved people in our state. When it comes to access, affordability and speed to market matter. By working with Winncom and Ericsson, we're able to deliver broadband services in a thoughtful way that respects the specific needs of each community we serve."

Matt adds, "The combination of technology and partnerships is a big differentiator for OhioTT. Through our economic development model, we set up a connectivity fund when we go into a community to ensure the broadband service is used in the most appropriate ways to benefit that community—education, digital preservation of historical items, the arts, telehealth, etc."

Megan concludes, "So often in life you don't get to participate in things that make you smile, that leave the world better than you found it. At OhioTT, I feel we have the opportunity to do our part by using technology to make a lasting, positive impact on people's lives every day."

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> "Ericsson is proud to play a small part in delivering mid-band connectivity to unserved parts of rural Ohio, and we look forward to a long-term partnership with both OhioTT and Winncom. Through collaboration, we see a future where fixed-wireless access provides the fabric on which precision agriculture can be delivered to farm headquarters and greenhouses as well as the crop, livestock head, and soil environment. Ultimately, this will help ensure food security, traceability of domestically grown food across the entire supply chain, higher quality product, and more sustainable local economies."
>
> — Steven T. Strickland, PMP, Director of Partnerships and Channels, Ericsson

Solution Highlights

Bringing affordable high-speed broadband access to the unserved and under-served
OhioTT is on a mission to bring reliable, affordable high-speed broadband to rural communities across Ohio, leveraging partnerships with local government leaders and technology providers to overcome geographical limitations and accelerate speed to market with state-of-the-art fixed wireless access.

Transformational solution
• Enables broadband access in rural communities that have no other connectivity options utilizing 3.5 Ghz Citizens Broadband Radio Service (CBRS) shared spectrum, Band 48

Ericsson solutions
• Ericsson Antenna Integrated Radio — Massive MIMO (24 layers) AIR 6488
• Ericsson Baseband Unit — Model 6630
• 3 sector, 60 MHz per sector solution
• GPS configuration
• Ericsson Radio System Software (LTE TDD)
• Ericsson Network Management Software
• Ericsson Customer Support Plan

Winncom Technologies Solutions
• Site installation materials, DC power system with battery backup
• Switching and routing equipment
• Site kitting and pre-configuration
• Remote Integration of Baseband to ENM/OSS
• ENM SAS integration
• LTE Network Support - Design, Configuration, Optimization
• Remote and On-Site Installation Support

Solution advantages
• Reliable and predictable performance with rapid deployment
• High capacity, broad coverage with no line-of-sight issues
• Future-proof, 5G-ready fixed wireless solution
• Lower total cost of ownership with lower cost per megabit
• Faster return on investment with long-term value protection

About Ohio Transparent Telecom

OhioTT is on a mission to bring reliable, high-speed internet to places that have long been under-served. An Ohio-based company, OhioTT understands the needs of local communities and provides truly affordable, high-speed broadband service in partnership with the communities it serves. OhioTT also led the creation of county-by-county Connectivity Funds that will reduce the digital divide in the markets it serves by way of a partnership with Foundation for Appalachian Ohio. These funds will be accessible to local nonprofits and assist with digital literacy, social isolation, telehealth options, and more.

About Winncom Technologies

Winncom Technologies is a worldwide distributor and provider of wireless and wired networking solutions. Its unmatched expertise in broadband wireless networking products and full range of network infrastructure and access products from the leading industry manufacturers allows the company to deliver complete solutions for various markets and applications. Headquartered in Cleveland, Ohio, Winncom Technologies serves all major geographical regions, from North and South America to Europe, Africa and Central Asia, with highly trained sales and technical professionals.

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 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