Fiber Broadband in Rural America

A Roadmap to
High Performance Connectivity

THE BROADBAND GROUP®

Roanoke Electric Cooperative
Your Touchstone Energy® Cooperative

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Gaining Ground:
High-Quality Broadband in Rural America

In the modern connected economy, the critical need for affordable, reliable broadband in both rural and urban markets is widely acknowledged. Indeed, the road to our digitally connected future has been fraught with many doubts, disputes, and dilemmas. Even with the best of intentions, efforts from private industry and agencies dedicated to public interests have been unable to close the digital divide. The pandemic also made it painfully clear that the "good enough" approach deployed by some providers left millions of rural Americans with insufficient connectivity. While access to broadband is expanding, American households nationwide continue to face challenges around distance education, telehealth services, and hybrid/remote employment.

High-quality connectivity has never been more important and, fortunately, thanks to the leadership of electric cooperatives (co-ops), rural broadband has a realistic path forward. Instead of waiting for major national providers to deploy solutions, local stakeholders and co-ops can come together to address their own digital infrastructure requirements. While the potential for challenges cannot be overlooked, the need is too great for local leadership not to take an active role in serving the residents and businesses of their community.

When correctly anchored in best practices, locally-led initiatives can mobilize communities to take control of their connectivity future through direct investment, strategic partnerships, and/or state and federal grant opportunities. Co-ops can play a material role in deploying local network infrastructure to ensure rural access to high-quality internet and become key stakeholders in America's digital ecosystem.

Learning from the Past:
Electric Co-op Foundations

Fortunately, a brief look at history shows that rural American towns have a history of self-reliance when it comes to securing access to essential services.

Before 1935, access to power for homes and businesses was similarly lacking. It was only through the help of focused public policy that electricity could make its way to rural areas. Via executive order, the Rural Electrification Administration (REA) was created in 1935 to provide funds for rural farming communities to build out electric distribution lines needed to access the same light and power as their urban counterparts. Even though the REA provided funds to expand electricity into rural areas, it was not the big power companies that stepped up; it was community-led co-ops that took the initiative to build out service lines. Ultimately, it was the availability of dedicated funds, a properly organized citizenry, and collective determination that successfully produced over 900 co-ops that brought electricity to millions of Americans.
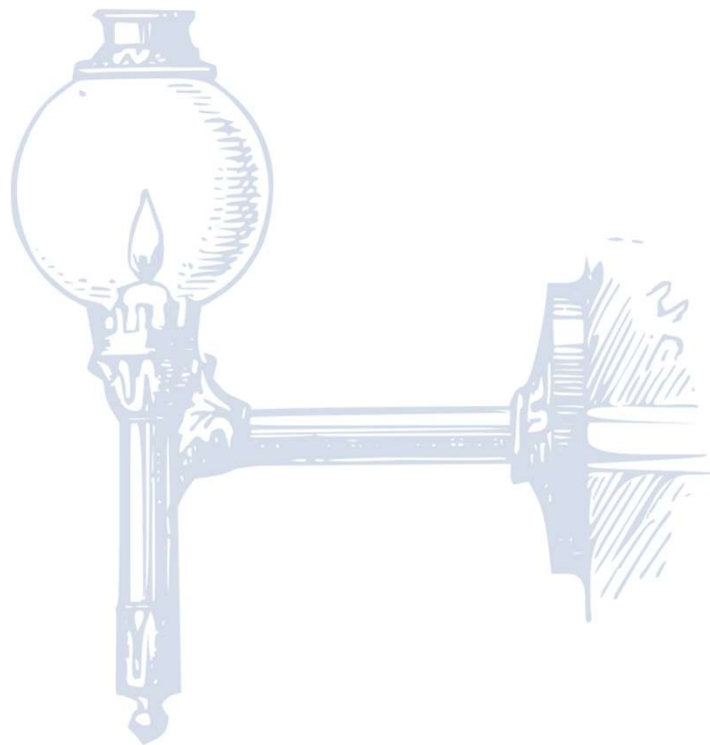
Learning from the Past:
Electric Co-op Foundations

42 million

U.S. citizens served by Electric Co-ops

250+

Electric Co-ops planning **to deploy broadband to their members**

Broadband is now acknowledged as a fundamental service, yet coverage and availability remain unevenly distributed. Thus, history repeats itself, and the acknowledgment of internet access as a necessity has spurred billions in federal grant programs to aid the deployment of high-performance broadband service in rural areas across the U.S.

While substandard expectations have defined rural broadband in the past, when done correctly with a structured and proven plan that respects the metrics of the broadband industry, co-ops can bring high-performance connectivity to their community; improving the quality of life for generations to come.

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Sparking New Ideas:
Roanoke Electric Cooperative

It is widely understood that broadband construction and operation in any market is an expensive, complex, and committed endeavor. Understandably, without enough examples of sustainable programs rich in lessons learned and best practices, many rural co-ops choose to remain on the sidelines. Acutely aware of this issue, we at The Broadband Group (TBG) are passionate about sharing our knowledge, experience, and appreciation for the myriad of challenges around broadband deployment. In doing so, we empower local communities, co-ops, and municipalities to make informed decisions about advancing access to the wired and wireless connectivity that residents and businesses need and expect.

Currently, our team at TBG and TBG Network Services is helping Roanoke Electric Cooperative meet the 21st-century needs of its community. Chartered in 1938, Roanoke Electric Cooperative (REC) has a member-owner (member) base of over 14,000 and serves as an engine of economic development for several counties in Eastern North Carolina. Over the decades, the co-op has won multiple awards for its exceptional leadership and community assistance services that have enhanced the quality of life for its members.

Expanding on their community promise, REC created Roanoke Connect Holdings, LLC in 2011, as a subsidiary to bring their members broadband internet and smart grid energy efficiencies. The first phase of this project was a 107-mile fiber network that linked the co-ops' 12 substations to its headquarters in Aulander, NC. The result was a major technological upgrade that improved system reliability, increased efficiency for demand response management, and lowered overall costs for its members.
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Sparking New Ideas:
Roanoke Electric Cooperative

"In the early days at Roanoke, our technicians had to physically visit individual meters to deal with billing questions," recalls REC CEO Marshall Cherry. "Then we started down the path of advanced metering, but we could only communicate data back to our office at 2 AM when there was no internet traffic because we were trying to move 14,000 meter reads across a 56kbps system on a daily basis."

"Once we deployed fiber connectivity, it gave us the ability to deal with service calls and billing questions in real-time without the need for a truck roll. So, from a system standpoint, broadband helped us to better understand our grid and improve engagement with our customers."

Two things happen when co-ops invest in smart grid energy infrastructure and then leverage their investment to deploy broadband. First, it provides wholesale energy savings, which helps members from a cost perspective. Secondly, it enables direct-to-consumer energy savings through efficient smart home devices for energy management. In other words, members get twice the savings, as well as the vital secondary service of broadband.

We've been fortunate to find individuals whose value system aligns with what we're trying to achieve. There are people out there who have had stellar careers working for cable who are ready for an opportunity to do something different, transform a region, and build a legacy.

Marshall Cherry, President & CEO
Roanoke Electric Co-op

Building Your Broadband Leadership Team

The first step is to assemble a team that will help create, lead, and monitor the deployment strategy. This division will need to consist of internal resources as well as qualified advisers with experience to navigate a successful path. Part of our services at TBG is to help co-ops identify staffing needs and provide guidance on what each role should look like to position the organization for success.

Over the last 80 years, REC has maintained the operational know-how to consistently achieve high service standards. However, regarding broadband, as Marshall puts it, "that's a completely different animal." For this reason, following their organizational assessment, step one for REC was to identify a qualified general manager with experience in the broadband space, which led them to hire their Vice President of Broadband Operations, Bo Coughlin. Bo worked with Time Warner Cable for over a decade and served as EVP/CTO at Knight Enterprises, a full-service OSP/Utility Construction and IT Services firm.

With Bo at the helm, combined with The Broadband Group's industry perspective and support, REC has the technical, operational, and financial proficiency to move forward with confidence.

Building Your Broadband Leadership Team

As Senior Vice President and CTO of The Broadband Group, Patrick Thibeault orchestrates the who, what, and how of TBG's broadband deployment strategy. He knows that rural broadband is a challenging business, but one that presents the opportunity for successful sustainability when structured and implemented correctly.

"It is crucial for co-ops attempting their first build independently or as a group to align with experienced organizations. While it is commendable and forward-thinking to be the first to accomplish community connectivity, inexperienced leadership will make predictable mistakes, which could prove terminal for an initiative." At TBG we leverage 26 years of perspective and lessons learned, so the value of working with us brings experienced counsel that helps avoid many of those initial pitfalls.

At TBG we recognize that a co-ops operational and financial interests will drive network architecture and design decisions. Defining long-term business priorities will ultimately guide the technical network design strategy.

Patrick Thibeault, Senior VP & CTO
The Broadband Group

Capital Requirements

Securing financing is one of the most crucial (and often challenging) aspects of any rural broadband network deployment. Broadband networks are highly capital intensive. Significant upfront investment around network design, engineering, make ready, field validation, and construction is necessary to deploy before any revenues are generated.

At TBG, we emphasize the importance of focusing on potential challenges instead of the potential revenues a client might achieve. Even with the best-laid plans, clients should expect timelines to take longer than a pro forma might project, and market share can be much slower to achieve than what conservative models might predict. We are often accused of being too negative, as we always warn that in many cases, network construction can take longer, cost more, and revenues can be much slower than anticipated.

One of the things that I like about working with TBG is they really spell it out. They put together a comprehensive model, not only financially, but we also have a full high-level system design. We have been asking for that for years, and once we started working with TBG, we had one in less than six months.

Cathy Davison, CFO
Roanoke Electric Co-op

Finding "The Magic Mile"

Broadband deployment projects require careful planning; there is no financial margin for error. Andrew Hurry, the Senior Financial Advisor at TBG, provides expertise on financial considerations of various strategies backed by dynamic investment grade models.

Much of Andrew's work depends on what he refers to as "the magic mile," the total cost for one mile of fiber network construction. It consists of several inputs including the number of network miles and whether the installation will be aerial or underground, which can translate to a material difference in overall costs. Equipment, labor, construction, and other associated design expenditures are all crucial considerations; getting those numbers right from the start is essential. "Garbage in, garbage out. The biggest drivers of the financial model are on the cost side, so any data we put in must be accurate and based on realism," says Andrew.

Financial models created by TBG are foundational to a successful fiber deployment strategy. This powerful decision-making tool allows co-ops to change assumptions, timelines, and designs to spin up new scenarios in real-time. Regarding operating profits, revenue models are balanced against inputs from all types of operating expenses to create a more accurate P&L, balance sheet, and cash flow statement which provides validity and credibility when presenting to potential funding partners.

Mapping the Terrain:
Aerial vs. Underground

An important consideration when forecasting costs is the physical environment and condition of assets, specifically utility poles. Co-ops must be honest about the condition of the poles, the potential need to utilize poles that are owned by other entities, and what upgrades might be needed to support broadband infrastructure.

Bearing that in mind, a thorough inventory of physical resources and potential network routes is imperative. For example, an oft-overlooked line item is make-ready, the cost associated with preparing and adapting utility poles to accept new wires. Even simple concepts like tree trimming and reinforcements against wildlife become costly at scale and require ongoing maintenance; in other cases, utility poles may not be salvageable and require a complete replacement. Therefore, simply estimating costs using data from previous or general budgets can cause utilities to underestimate development costs and timelines by significant margins.

For rural broadband to be successful, every aspect must be optimized, from ideation to network design, construction, operations, sales, marketing, and customer service. Every approach must be carefully planned, implemented, and executed.

Jeff Reiman, President
The Broadband Group

Lessons Learned:
FTTH vs. Fixed Wireless

In an attempt to limit capital costs, many co-ops often begin their broadband journey with fixed wireless as the solution before shifting to a complete Fiber to the Home (FTTH) solution. The pivot is due to the realization that anticipated cost savings rarely materialize with the operational challenges that fixed wireless can introduce. For instance, line-of-sight problems often emerge due to vegetation and inconsistent topography. Furthermore, the prevalence of trees can also create blockages, and wireless signals often cannot reach rooftops from the road, thus resulting in coverage that is less than expected.

Electric co-ops are a natural fit to provide FTTH service because they already offer wired electric connectivity to every home. Since they already have experience bringing electricity to the home, adding fiber-enabled broadband can be accomplished with incremental costs when appropriately implemented. Patrick's experience has also produced a similar conclusion, "I truly think that electric utilities and co-ops need to be part of the FTTH movement because it ultimately proves to be the lowest cost of construction and the best use of a dollar."

Starting second from left: **Brad Alabaster,** Director of Operations, **CJ Snead,** Sr. Inspector Supervisor, and **Jeff Reiman**, President of The Broadband Group.

Boots on the Ground
TBG Network Services

Protecting Long-Term Value

John McKinney, the Director of Engineering at The Broadband Group, helps translate client connectivity goals into a viable technical model. For rural networks that almost always have an extended financial payback period, he understands the importance of designing a network that will offer value over that timeframe. This process starts with ensuring the co-op is building the right network to meet the needs and challenges present in the community.

While technologies will evolve, John emphasizes that properly planned and deployed fiber infrastructure will last decades. For instance, while expensive electronics are available to serve 100+ gigabits over a passive optical network (PON) to every home and business that a co-op might serve, those speeds are beyond what consumers need today. However, if and when the market demands that level of connectivity, upgraded electronics can simply be installed on the fiber network that is in place.

One of the ways we future-proof the fiber network is to design it so that it will work with those electronics once they come down to a reasonable price and there's a market demand for it. We create a foundational fiber network that will be viable in 30 years without making major modifications to the network.

John McKinney, Dir. of Engineering
The Broadband Group

Working Together:
Cooperative Partnerships

Experienced in leading federal economic development districts, Roanoke CFO Cathy Davison speaks to the benefits of partnerships with other co-ops to provide services for a larger area. "The broadband industry is one of scale, so when we can share expenses, that's huge. Looking at the depth of our team, what we do, how we do it, and the available resources, we are small compared to other co-ops across the state."

Roanoke Electric's service territory encompasses one of the largest counties in the state of North Carolina. The lack of density in the region makes it an instructive rural example at six meters (members/customers) a mile with an average network construction cost of $40,000 per mile. REC leadership is aware six subscribers will not bankroll that mile of fiber's construction cost. However, strategic expansion outside their traditional service territory into denser towns that remain underserved, introduces a vision for sustainable profitability.

"Is our goal to serve every member? Absolutely. We can deploy broadband for our members and help get services out to other markets, which creates an additional revenue source helping to keep our rates low and competitive."

Lighting the Way for Utility Co-ops of the Future

For co-ops, fiber is a significant benefit that serves multiple purposes. It allows us to operate our grid more efficiently, lower energy costs for our members, and provide the vital broadband connectivity that is so needed in our region.

Robert "Bo" Coughlin, COO
Roanoke Connect
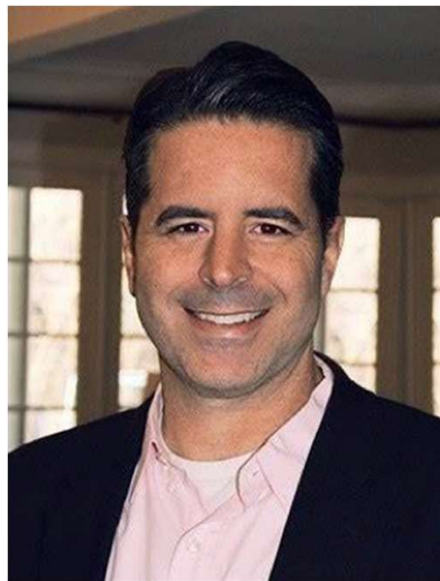
The power to leverage fiber investments across utility operations is a huge advantage, and Bo Coughlin, Chief Operating Officer at Roanoke Connect, is optimistic about the ability of co-ops to deliver broadband to rural America.

While many costs and complexities are associated with broadband development, Roanoke Electric Co-op knows that it is not a sunk cost but a strategic investment to provide its members with a modern, dependable, cost-effective, and efficiently managed grid.

Leading co-ops understand that deploying fiber is not only about supporting today's grid management requirements but also to serve as a foundation and plan for future technologies.

Lighting the Way for Utility Co-ops of the Future

Respecting the quality of life for people in smaller communities can help stabilize rural populations. With access to high performance connectivity, communities become more active and vibrant. Reliable and affordable broadband increases economic opportunities that ultimately attract new residents and businesses.

As a long-term strategist, Cathy Davison is fully aware of the benefits that fiber-enabled broadband will bring to the Roanoke region. Now more than ever, people are interested in life outside urban areas. "The pandemic was an eye-opener for those who realized there is life outside the closeness of city living, which puts us in a unique position. With the REC fiber network our members can stay connected and enjoy all the qualities our beautiful rural market has to offer. And oh, by the way, they have gigabit symmetrical internet service, allowing them to work, learn, and access healthcare as easily as they would from any urban center."

The importance of connectivity has never been clearer. For co-ops around the nation, it is critical to understand the principles necessary to successfully build a broadband enterprise that will benefit utility operations and the economic health of the region it serves. At The Broadband Group, our mission has always been to educate our clients on the opportunities and challenges of connectivity; leveraging industry wisdom that is anchored in proven strategies and best practices.

A Legacy of Industry-Defining Leadership

The Broadband Group's Founder, Tom Reiman, on Fox Business discusses successful fiber broadband deployment strategies.

https://www.broadbandgroup.com/tom-reiman-fox-business/

At The Broadband Group, connectivity extends beyond technology. It is about understanding how people live, how businesses work, and how communities thrive.

Tom Reiman, Founder
The Broadband Group

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