Calix University

Broadband Academy:
How To Deliver and Sustain
the Broadband Experience
Your Community Deserves

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About the Author

As Director of Local Government and Utility Partnerships at Calix, Joanie Twersky supports the unserved and underserved parts of the country looking to bring broadband connectivity to their communities. Municipalities, electric cooperatives, and tribal communities are increasingly raising their hands to deliver fiber connectivity to rural areas and ensure equal access to jobs and education.

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INTRODUCTION: TAKE THE LEAD IN CONNECTING YOUR COMMUNITY

Broadband connectivity is essential to our everyday lives. In a 2021 survey, 76 percent of Americans said internet service is as important as electricity or water. We rely on broadband connectivity like never before, whether it's for working, learning, healthcare, entertainment, or keeping in touch with family and friends. It's also integral to our socio-economic future—the availability of broadband attracts new companies, enables new, and higher-paying jobs. Back in 2015, fiber connectivity to a home was already boosting real estate values by 3.1 percent; post-pandemic, fiber connectivity is now one of the deciding factors in home buying.

Demand for broadband continues to surge across the United States, but the Federal Communications Commission (FCC) estimates that approximately 14.5 million people still do not have access. Most live in unserved and underserved markets that traditional service providers have long ignored. Today, electric cooperatives, municipalities, and tribal governments have a once-in-a-generation opportunity to build broadband networks to connect and serve rural communities.

However, the path from utility provider, municipality, or tribal government to broadband service provider (BSP) is not always straightforward or easy. The need for education and training is growing as unprecedented amounts of money flow into underserved and unserved areas of the country.
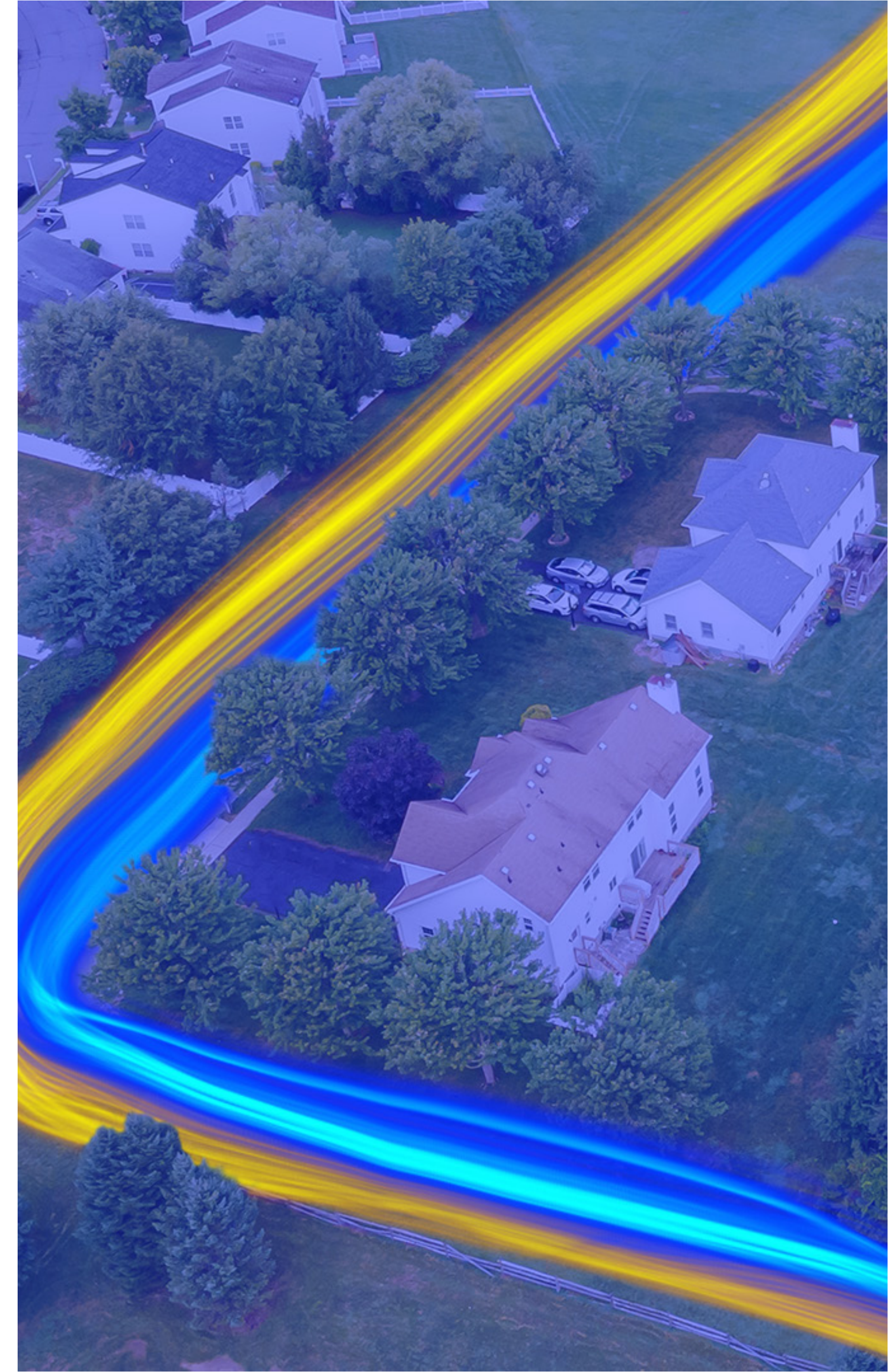
Introducing Broadband Academy

To fill the knowledge gap for new service providers, Calix created Broadband Academy. Broadband Academy is an online educational resource that provides the knowledge, training, guidance, and best practices that will help you make the transition to BSP. Unique in the industry, the Broadband Academy curriculum offers self-guided learning designed for leaders planning new broadband services. It addresses the specific requirements of nontraditional service providers such as electric utilities, municipalities, and tribal governments. It gives you the know-how—and the confidence—you need to launch and grow your broadband service and improve your community.

This eBook will outline the growing opportunity for new service providers to enter the broadband field. We will:

▸ Explore the five critical stages of launching and growing your broadband business, which are detailed in Broadband Academy—fund, design, build, operate, and market.

▸ Discuss technology options to consider as you embark on your broadband project.

▸ Highlight the success stories of untraditional service providers that have become digital leaders for their communities.

NAVIGATING THE COMPLEXITIES OF THE BROADBAND INDUSTRY

Building on several waves of funding, the federal government recently allocated $42.25 billion to expand high-speed internet access in unserved and underserved communities across the U.S. through the National Telecommunications and Information Administration's (NTIA) Broadband Equity, Access, and Deployment (BEAD) program. Separately, in 2022, the NTIA disbursed $1.7 billion in grants to over 200 Tribal entities, projected to connect more than 135,000 households, as part of the Tribal Broadband Connectivity Program (TBCP). And when you add in state and private funding opportunities, the pool for broadband infrastructure investment tops $120 billion.

New service providers have an extraordinary opportunity to build a foundation for future growth. And in doing so, they will ensure their communities' socio-economic wellbeing and vitality for generations to come.

> *For a broadband service provider to succeed, they must understand the fundamentals of running a fiber broadband business. I use Broadband Academy to educate and train our company across a variety of roles, from field operations technicians to customer service representatives, so we all understand the fundamentals of what it takes to be an excellent BSP. With this fresh and easy-to-follow tool, we are knowledgeable in current best practices and share a common language."*
>
> **John Rinehart,** Chief Customer Officer and Co-Founder at FastBridge Fiber

But getting into the broadband business presents new challenges for nontraditional service providers. Utility leaders, government officials, and tribal leaders must wear multiple hats. In addition to their primary roles, they're now responsible for everything from reviewing investor term sheets to approving network architectures to developing marketing plans for this completely new service. For most, this is unfamiliar territory. Delivering broadband is complex, with many variables shaping the subscriber's experience.

New BSPs must select the right technology and design to future proof their investments and ensure long-term service sustainability. From an operational standpoint, they need to have robust systems in place to ensure service availability and support while at the same time keeping operating costs (OPEX) low. And they will have to build a skilled workforce that will get communities connected. All of this can feel incredibly daunting to new service providers—are they adequately prepared to deliver value to their constituencies—or, worse, in attempting to connect their communities will they stretch themselves too thin and jeopardize the services they already provide?

Broadband Academy can help new BSPs overcome these hurdles to develop broadband networks that provide access to essential services like healthcare and education, create new economic development opportunities, and will benefit their communities for generations to come.

> *I recommend Broadband Academy to any electric cooperative seeking to bridge the digital divide in their community. It provides valuable guidance on how to successfully operate as a broadband service provider."*
>
> **Mark Freeman,** Manager of Network Operations, Cullman Electric Cooperative

> *Broadband Academy is a great learning resource to understand the telecom industry at a high level. Learning how to fund, design, build, operate, and market your network will help prepare you to apply for and execute grant awards. Broadband Academy is also a great training tool for new employees."*
>
> **Jason Hall,** *Broadband Grants and Projects, Mohawk Networks, LLC*

5 STEPS TO BECOMING A DIGITAL LEADER FOR YOUR COMMUNITY

Many new service providers are already stepping up to bridge the broadband gap, delivering high-speed internet services to unserved and underserved markets across the country. Calix is privileged to have worked with 86 percent of all U.S. electric cooperatives that offer broadband, 71 percent of municipally owned broadband networks, and 60 percent of tribally owned BSPs.

With Broadband Academy, we are sharing our knowledge and experience to help guide new service providers who want to expand into broadband. Broadband Academy gives new BSPs training, expert insights, and best practices in five areas key to building a successful broadband service: fund, design, build, operate, and market.

1 Fund

**Identify and secure funding to grow a thriving broadband business.**

Over $120 billion in unprecedented federal, state, and private funding is available to build new broadband networks in underserved and unserved communities. The Broadband Academy funding course is designed to help BSPs navigate the complicated process of identifying—and securing—the right type of funding to grow their business.

2 Design

Design a scalable, future-proof network that maximizes investment.

Designing a world-class broadband network is a complex undertaking. However, new networks provide critical connectivity and enhanced services to communities and create economic and social value that leaves a lasting multi-generational impact. The Broadband Academy design course teaches new BSP leaders to architect efficient, scalable end-to-end networks that deliver the latest services and capabilities.
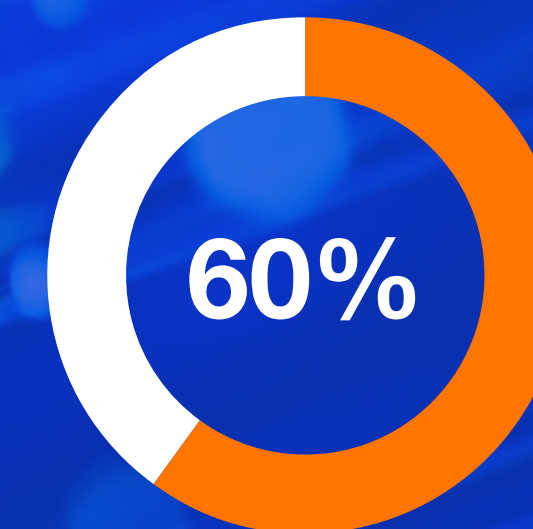
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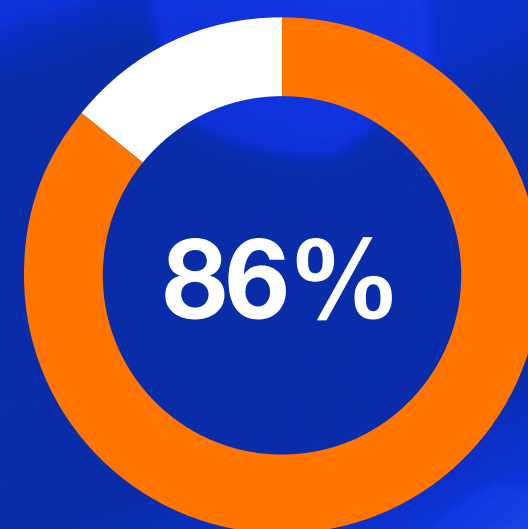
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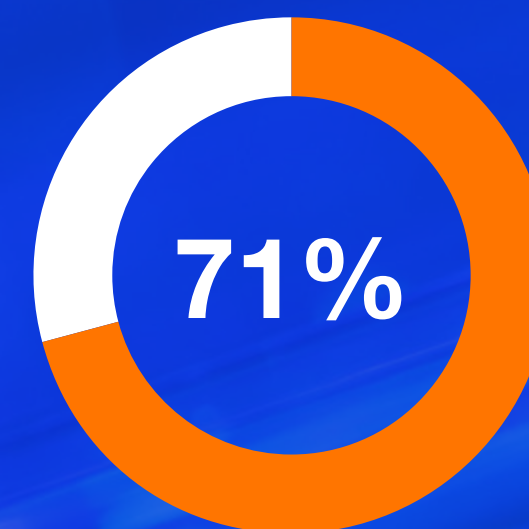
71% of municipally owned broadband networks

60% of tribally owned BSPs

③ Build

Plan for a smooth broadband buildout.

Rural electric utilities, cooperative or municipally owned, have unique advantages regarding fiber deployments. They utilize mostly aerial plant and already own their poles and rights-of-way, and have the necessary labor skills, equipment, and experience building outside plant infrastructure. The Broadband Academy build course is all about the physical components used outdoors and finding the right partners to start network construction.

④ Operate

Learn how to ensure highly efficient broadband operations.

Today's subscribers have high expectations for their broadband experience, and rural subscribers deserve the same level of experience as their urban counterparts. The Broadband Academy operations course offers insights and best practices to help BSPs optimize fiber network performance while ensuring subscribers enjoy the ultimate broadband experience.

⑤ Market

Develop critical marketing skills to excite subscribers and grow revenue.

Utility providers, municipalities, or tribal communities starting a broadband business may not have the marketing skills they need to provide an exceptional subscriber experience. Learners can take advantage of the extensive Calix Marketing Academy curriculum available within Broadband Academy. Lessons cover marketing strategies and tactics for digital, email, social media, mobile, and more—enabling marketing teams of all sizes to create impactful experiences.

Through Broadband Academy, we are partnering with new service providers to help them confidently enter the broadband industry and create community value for decades to come.

Strengthen Your Community

Providing critical broadband services ensures the socio-economic future of your community by:

Creating new, high-paying jobs

Access to broadband supports additional job opportunities. According to models from Deloitte, a 10 percent increase in broadband penetration in 2016 would have resulted in more than 806,000 additional jobs in 2019, or an average annual increase of 269,000 jobs.

Improving educational outcomes

Students that have access to high-speed internet at home can achieve higher grades. A report by the Quello Center at Michigan State University found that on average, students with fast home internet reported an overall grade point average (GPA) of 3.18, compared to 2.81 for students with no access and 2.75 for students who have only cell phone internet access.

Enabling a work-from-anywhere culture

The U.S. Census Bureau reports that the number of work-at-home employees grew to 27.6 million in 2021, up from 9 million in 2019. Broadband makes it possible for people to work from anywhere, expanding employment opportunities to those living in rural areas.

KEYS TO PLANNING YOUR BROADBAND SERVICE

The goal of utilities, municipalities, and tribal communities entering the broadband space is simple: create thriving communities by providing access to high-speed connectivity and essential services. But you need to make the right decisions up front to ensure your broadband network can evolve to meet the needs of residents for generations to come. Although the process can seem complex—and Broadband Academy will help demystify it—here are three steps to get you started in planning your broadband network.

❶ Get to know your potential subscribers.

One of the most critical aspects of developing your broadband network is understanding the subscribers you'll be serving. Is your community home to many families with school-aged children or are you located in an area that's a haven for retirees? Is your town focused on attracting new businesses or luring professionals who can work from anywhere? Understanding the demographics and lifestyles of your potential market is critical in helping you build a network that can accommodate subscribers' demands today and well into the future.

Beyond understanding the characteristics of your potential subscriber base, you'll want to estimate the number of subscribers you would be serving. In addition to the population of the community, you will need to determine the number of houses, farms, multi-dwelling units (MDUs) and commercial locations. You can then calculate your take rate, which for most new BSPs would be around 20 to 30 percent but could be higher if you are building in unserved or underserved locations. Building with the future in mind is essential. If your network was designed to only accommodate 20 to 30 percent of the market, increasing capacity (especially if fiber is limited) is not easy to do. Make sure you choose systems and software that are scalable and can sustain your operations over time, to change with your community.

❷ Explore your service area.

If you've done a feasibility study, it likely covers (at a high level) the geographic landscape, existing infrastructure, subscriber demographics, and local planning regulations applicable to your proposed service area. But in preparation for the actual network build, you'll need to create more detailed designs. For example, the location of rivers and railroads will influence the placement of your broadband cables. So will sewer and water infrastructure, and above-ground utilities. What types of and how many premises will you be serving—residential, business, or institutional? Understanding the unique requirements of your service area will help you design the right path for your network's physical infrastructure.

You'll also want to look into what local, state, and even federal approvals will be needed and if there are any prohibited practices. For example, some communities won't allow cables to be hung overhead, which is valuable information to know before getting too far into the detailed design of your network. Research planning permissions to ensure that your network design meets local codes, so you don't have to go back to the drawing board. Outside plant designers and network engineers will be familiar with this aspect of the build and can help you navigate your area's specific regulations and permitting processes.

❸ Evaluate your connectivity options.

Broadband is a general term for data transmission over a high-speed internet connection. It comes in many flavors: fiber-to-the-home (FTTH), DSL, coaxial cable, and wireless. Service providers entering the market today will typically select either underline fiber or wireless for their builds. Fiber is the core infrastructure that enables wireless technology. It's the technology of choice to support communities' current needs and the devices, applications, and services they'll need in the future as remote work, healthcare, and education trends continue to explode.

There are only two viable deployment options for new builds in rural areas—an all-fiber network or a hybrid fiber-wireless network. Fiber offers not only high bandwidth but high reliability. That's why fiber is essential to businesses and anchor institutions. However, to determine whether wireless should also be a component of your network, you need to consider the topology and density of the regions you serve and the connectivity requirements for the applications you want to support, now and in the future.

BRINGING LIFE-CHANGING SERVICES TO RURAL COMMUNITIES

Calix is already working with hundreds of underlined electric cooperatives, municipalities, and tribal communities to help them bring essential broadband connectivity and value-added services to unserved and underserved communities. New service providers have a life-changing impact on residents, businesses, and institutions. They make it possible for rural communities to take advantage of the same opportunities once available only to those in big cities.

Now citizens in even the smallest communities can work and learn remotely, access services like telemedicine or remote learning and enjoy the latest in entertainment. As a result, new businesses can take root and existing enterprises can flourish. With next-generation broadband services, new rural BSPs are improving people's quality of life and ensuring communities can thrive for generations to come.

See how these service providers are making a difference in their rural communities—and what you can learn from them.

Cumberland Connect

Since 1938, Cumberland Electric Membership Corporation (CEMC) has been delivering cutting-edge technology to its members. They made their biggest investment to date when they brought voice, internet, and streaming services to the residents and businesses in their five-county footprint in northern middle Tennessee through their wholly owned subsidiary Cumberland Connect. To deliver even greater value to members, Cumberland Connect provides fully managed Wi-Fi services, with enhanced home network security and parental controls standard in every package. The result? Unbelievably satisfied and loyal members.

Gibson Connect

Established in 2017, Gibson Connect is a not-for-profit, wholly owned subsidiary of Gibson Electric Membership Corporation (EMC), providing high-speed internet services to rural communities across West Kentucky and West Tennessee. Starting from scratch, Gibson Connect pledged to build 3,600 miles of fiber over five years with an investment of $80 million. Gibson Connect now serves about 14,000 members, and that figure continues to rise. Bringing affordable broadband to every home and business will be their legacy—fueling job growth, increasing access to education, telemedicine, and entertainment, and attracting professionals and businesses from nearby urban hubs such as Nashville and Memphis. Their commitment to their members will pay dividends for generations— boosting economic vitality and improving the quality of life for the communities they serve.

Medina Fiber

In February 2021, Lit Communities secured the initial capital investment to build their first community network in Medina County, Ohio. Lit formed a locally operated ISP, Medina Fiber, to partner with Medina County Fiber Network to bring FTTH to 45,000 homes and businesses across Medina County. They were able to plan, design, and build out the initial phase of the cutting-edge broadband network and turn up the first subscriber in a remarkable seven months. Medina Fiber offers residents a range of services, including high-speed internet up to 1 Gbps, premium managed Wi-Fi, video streaming, and voice to residential and business subscribers. The network also presents the opportunity to deliver municipal services such as telehealth, smart street lighting, smart water meters, smart waste management, and even public Wi-Fi in town parks.

Midwest Energy & Communications

Midwest Energy & Communications (MEC) was founded as a cooperative to introduce electricity to communities that would otherwise go completely unserved—and, later, other vital services such as heat and broadband. MEC is advancing this mission by delivering more than essential broadband connectivity. As part of their managed Wi-Fi services, the cooperative includes home network security and parental controls to ensure that every community member is protected. The strategy is paying off. In the first quarter of 2022, MEC blocked an average of 16,400 digital threats each month. And thanks to a simple, all-inclusive, two-tier pricing model, MEC increased its annual revenue by 13 percent and average revenue per user (ARPU) by 8 percent in the same period. MEC continues to look for new ways to bring value to their community; the cooperative is rolling out connected camera-based security to give members additional peace of mind.

At Midwest Energy & Communications, our vision is simple: Create vibrant, relevant, and sustainable rural communities. Over 85 years, we've made this a reality by delivering first-in-class innovations and solutions where others won't. Electrifying communities across southern Michigan. Launching our smart grid. Rolling out fiber internet to bring high-speed connectivity to rural areas. These vital services have transformed our customers' lives—and there's much more to come. Just seven years after rolling out our fiber network, we celebrated a major milestone: 20,000 subscribers. We're not resting on this achievement, though. We're building out an additional 3,000 miles of fiber that will reach more than 30,000 homes and businesses across southern Michigan."

Robert Hance, President and CEO, Midwest Energy & Communications

Mohawk Networks

The Saint Regis Mohawk Tribally owned enterprise, Mohawk Networks, LLC, launched in 2015 after the Tribe's completion of a $15 million broadband project that laid 68 miles of fiber and connected hundreds of Akwesasne residents, businesses, and anchor institutions to reliable, cost-effective broadband, voice, and video services. Today, Mohawk Networks is delivering high-speed internet to Akwesasne and surrounding communities, increasing access to education and healthcare and strengthening the regional economy.

Sterling Local Area Municipal Broadband

Sterling Municipal Light Department (SMLD) boasts a long record of innovation, going back to 1910 when it started as an electric utility in the small central Massachusetts community of Sterling. It has taken this to the next level with Sterling Local Area Municipal Broadband (LAMB)—the town-owned, town-managed internet service. Leveraging state and federal funding, Sterling LAMB deployed a state-of-the-art, all-fiber broadband network that delivers high-speed internet services up to 1 Gbps to residents and 2 Gbps for businesses. They started building out fiber in January 2021, turned up service in May, and have been adding new subscribers ever since. In addition to internet, Sterling LAMB provides managed Wi-Fi services in all residential packages, including home network security and parental controls, all managed by an intuitive, easy-to-use mobile app. This strategy is helping them compete—and win—against the consumer retail giants.

NextLight

NextLight was established in 2014 by Longmont Power & Communications to provide fiber-optic internet services to residents and businesses in Longmont, Colorado. Three years later—thanks to NextLight—Longmont was declared Colorado's first "Gig City." In 2018, NextLight was rated the fastest internet service provider in the United States by PCMag and consistently ranks among the nation's fastest networks since. NextLight has played a critical role in narrowing the digital divide in Longmont—making affordable high-speed connectivity available to the entire community. Citizens rely on NextLight for a wide range of activities, from distance learning, telemedicine, and remote work to gaming and streaming television. NextLight also supports Longmont's economic growth—providing essential connectivity to the city's enterprises, small businesses, and a rising number of entrepreneurs building home-based businesses.

In less than ten years, we've established NextLight as a leader, not only here in Colorado but nationwide. We've built one of the highest performing networks in the country, beating out some of the biggest service providers and consumer brands. But what's more important is the value we're bringing to our community. We're bridging the digital divide, helping our citizens to work, learn, play, and stay connected to the world. We're enabling businesses to flourish and enhance our city's economic vitality. None of this would be possible without our strong partnership with Calix, and we look forward to creating even greater success together"

Valerie Dodd, Executive Director of NextLight

SUMMARY

With the right planning, partners, and broadband network, utility providers, municipalities, and tribal communities can close the gap on the digital divide and build thriving communities that can remain economically viable long into the future. Broadband Academy can help you take the next step in building a broadband service that will provide the essential connectivity and services your communities need while enabling them to access opportunities for the future they deserve.

To learn more about how to build a successful broadband service, <u>enroll in Broadband Academy</u>.