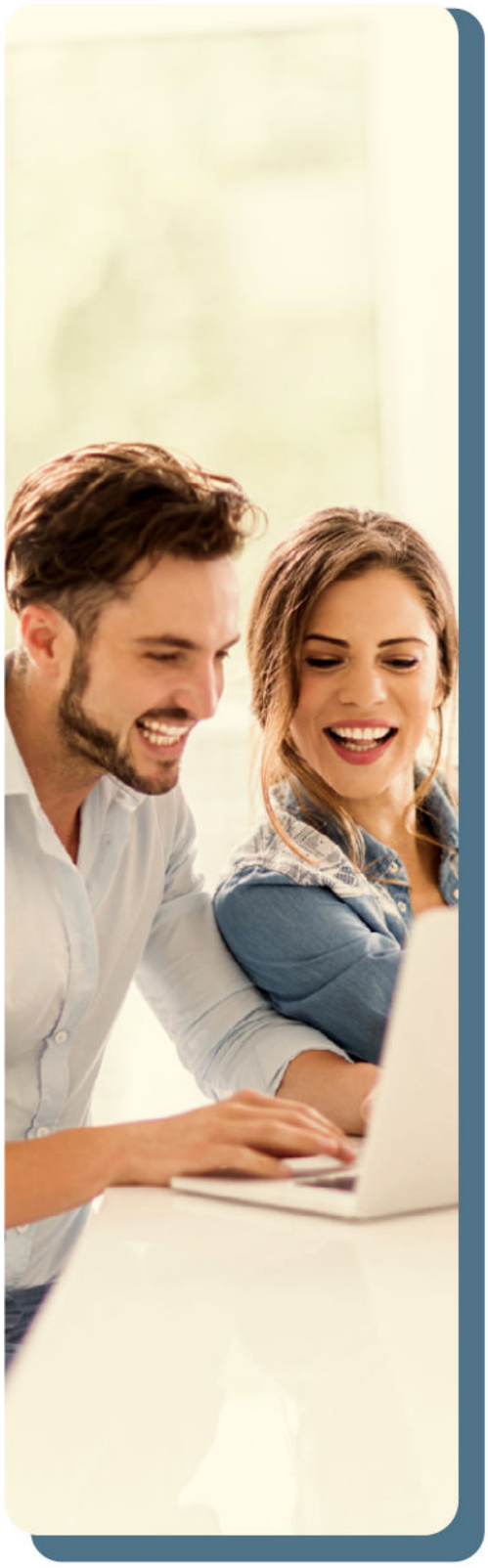

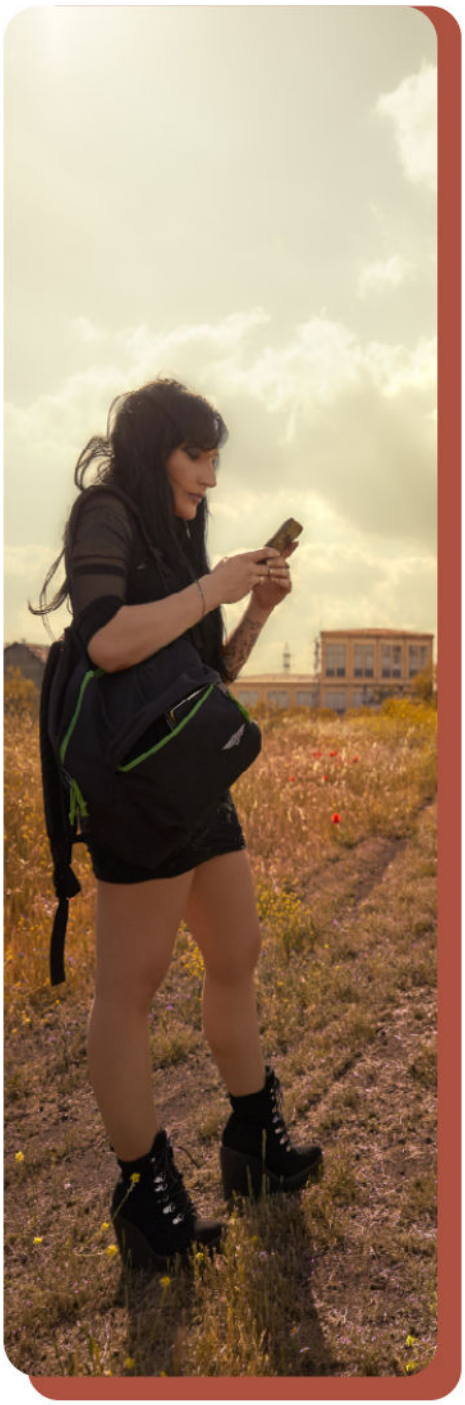

Texas Rural Funders

May 2022

Get Connected Y'all:

A Guide for Texas Communities on Securing Broadband

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Texas Rural Funders

Texas Rural Funders is a coalition of funding organizations that believe the future of Texas depends on strong, successful rural communities. TRF's diverse network of funders brings attention and resources to rural Texas, leverages local assets for success, and addresses systemic challenges for impact no single organization could achieve alone. The organization is dedicated to working with rural communities to amplify opportunities and rural voices. TRF funds Connected Nation Texas to create broadband access maps, has profiled communities that have come together to secure broadband, and serves as a convener for broadband stakeholders across Texas.

Executive Summary

Broadband is no longer a luxury. It is the Farm to Market road of the 21st century. Access to high-speed internet has become a cornerstone of economic development, public health, education, and civic engagement across the globe and here in Texas. Although support for universal broadband access is stronger than ever before, more work is needed to ensure every community and address is connected, especially in rural regions of the state.

Rural Texans have long been dissatisfied with the limited reach of private internet service providers. Even when broadband access has been extended to the main streets and anchor institutions of small-town Texas, residents, businesses, state parks, and other attractions in more remote locations have been excluded because providers face challenges in providing service at a profit in harder-to-reach areas. In some cases, even public investments designed to bring the last mile of service to rural addresses have been diverted to areas with a greater concentration of subscribers. In short, the free market alone will not meet the needs of rural broadband consumers.

The COVID-19 pandemic elevated the need to connect the most remote users. K-12 students struggled to learn from home without reliable broadband. College campuses closed, and students returned to their homes in rural Texas and had to camp outside McDonald's or the library to stay connected to school and friends. Working from home simply wasn't a possibility for some residents of rural addresses.

Both the federal and state governments have committed significant resources to tackle this challenge. The federal Infrastructure Investment and Jobs Act (IIJA) of 2021 dedicated $42.5 billion to the Broadband Equity, Access, and Deployment (BEAD) program. At the state level. House Bill 5, passed in 2021 by the 87th Legislature, established the Texas Broadband Office, authorized the creation of a statewide plan, and funded a development program to award grants and other financial incentives to eligible areas seeking to build out their broadband infrastructure.

These unprecedented public resources are essential, but there is no substitute for vision, collaboration, and persistence in bringing high-speed internet access to every last address. This guide shares lessons learned from rural Texas visionaries who have built coalitions and sustainable infrastructure to connect all Texans.

How to use this guide:

This guide shares a step-by-step approach to create and achieve your vision for securing fast, reliable, affordable broadband internet service in your community. It is informed by the experiences of real rural Texas communities, from Lufkin to Monahans and Muenster to McAllen.

How To Guide shares a process that has worked in other Texas communities to secure broadband. Stories and examples from other communities are embedded throughout the guide.

Glossary clarifies terms that may be unfamiliar.

How Much Do You Need explains how much bandwidth our computers, smart home appliances, home security equipment, and entertainment devices require.

Gather your broadband crew

1

Designing and implementing a plan to expand broadband access in your community will require extensive collaboration, so identify and engage a diverse team of partners early on. Bring together those in positional power, like judges and school superintendents, as well as those who are local influencers, like faith leaders and small business owners. Reach out to those who are not typically represented in the power structures that exist within your community, too.

For example, people who have recently moved to Texas and local youth have important perspectives and experiences that should be included in the conversation. Get to know these groups to understand and document their current challenges with internet availability, as well as their needs and preferences in using broadband.

Develop a vision for your community

2

In every community across Texas, the services available today were once a vision. You may be thinking, "I don't even know what to ask for." Documenting what you want to be able to do with broadband across your entire community is a great place to start. Why doesn't your community deserve the best there is? What if every address in your community had access to 100GB broadband - the fastest internet speed currently available in the United States - and could afford to pay for it?

Since 2016, the Federal Communications Commission (FCC) has defined broadband as an always-on connection that provides 25 Mbps upload speeds and 3 Mbps download speeds. This is a minimum threshold; see How much broadband do you need? to learn what speeds are required for everyday uses of the internet.

With fast, affordable, reliable service, how many businesses could launch or expand, adding local jobs in the process? How many prospective customers could find your business or access your community's resources? How many families could fully participate in education and the workforce? How many older people would be healthier and safer with virtual doctor visits powered by secure, stable connections? How many people could connect more closely with loved ones?

Vision in Action: Planning in Deep East Texas

The Deep East Texas Council of Governments (DETCOG) region encompasses 11 counties with an area of 9,414 square miles and a population of 340,000 residents. DETCOG convenes counties, cities, independent school districts, the Alabama-Coushatta Tribe of Texas, private industry, and other members to accomplish more than any individual member could accomplish on its own.

Eight of their eleven counties have lost population since 2010.

Nine of the counties have unemployment rates significantly higher than the rest of Texas.

Household income in all counties is significantly lower than the rest of the state and nation.

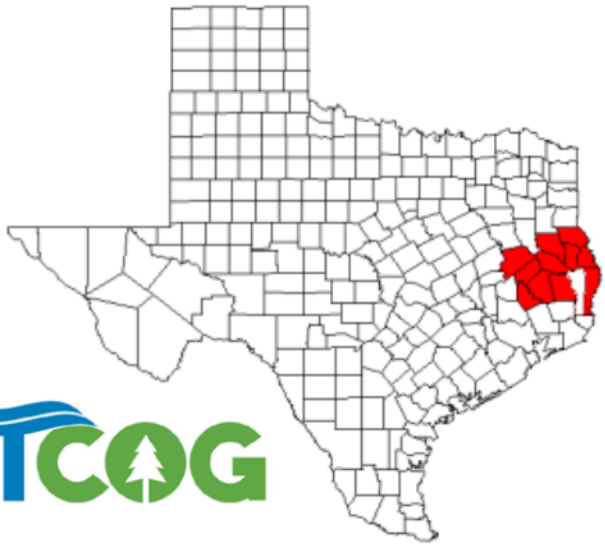
The counties rank near the bottom of Texas Health Rankings, with a severe shortage of physicians.

As a result, broadband is one of DETCOG's most important focus areas. They recognize that broadband is no longer a convenience or luxury. A modern infrastructure with broadband service - accessible and affordable for all - is a critical component of a competitive and modern regional ecosystem for enterprise and residential stakeholders.

According to a study commissioned by DETCOG, the economic impact of broadband over a 10-year period in East Texas will yield 10,300 new jobs and $1.4 billion in economic growth.

The only way to provide service for everyone in a region like theirs is to leverage the population and resources of the entire region. When everyone in the region has access, the entire region will benefit.

Source: Deep East Texas Council of Governments and Economic Development: The Case for Broadband in Deep East Texas



DETCOG

Enlist help from experts

3

Local leaders can navigate the complex, time-intensive process of securing broadband by building relationships with statewide organizations offering resources and expertise on this subject. There are many organizations working in and around Texas and here are just a few.

Texas Broadband Development Office - The Broadband Development Office (BDO), operated by the Texas Comptroller of Public Accounts, published a statewide broadband plan and awards grants and other financial incentives to internet service providers to expand access to broadband service in unserved and underserved areas. The BDO also provides a variety of tools and resources supporting the expansion of access across Texas.

Connected Nation Texas - Connected Nation is a national non-profit with an office in Texas working to support all Texans in leveraging broadband. This organization connects communities with technical supports, helps them navigate available funding streams for buildout, and finds resources for community stakeholders to understand the benefits of securing broadband.

Digital Texas - Digital Texas is a statewide coalition seeking to ensure that all Texans have equitable access to reliable and affordable digital connectivity. The organization advocates for state-level policy by working with legislators, private industry, nonprofits, and state agencies, and shares resources about partners and funding opportunities.

Councils of Governments - Councils of Governments (COGs) are organized by regions across the state and are voluntary associations of local governments formed under Texas law. These 24 associations work across city and county lines to secure funding and pursue economic development initiatives for the benefit of the entire region served. COGs are a great resource for understanding existing internet availability, convening broadband stakeholders, and navigating the federal and state funding earmarked for broadband.

Chambers of Commerce - There are 510 chambers of commerce in Texas, all working to support economic and workforce development initiatives in their communities. Chamber members and staff are key resources for understanding the current state of broadband availability and pricing, and can be instrumental in building public-private partnerships to expand access.

A Champion in Action in Monahans, Texas

Teresa Burnett is the Executive Director for the Monahans Chamber of Commerce in West Texas. She convened community stakeholders to form the Monahans Broadband Committee. The county judge, city manager, school superintendent, and head librarian joined Teresa and the Connected Nation team to form a "coalition of hte willing." This group gained momentum in persuading other community groups of the economic benefits of expanding access. When faced with pushback, she explained how broadband would open the door to new businesses beyond the region's cornerstone industry of oil and gas and attract families to the area.

Teresa also recognizes the importance of working upstream and puts her elected officials to work. She regularly talks about broadband with her state representative and congressperson, and has proactively spoken with both candidates for her district's upcoming congressional seat.

> *"[The candidates] know whichever one of them is elected, I'll be hounding them about broadband!"*
>
> **- Teresa Burnett, Executive Director**
> **Monahans Chamber of Commerce**

There is no doubt in Teresa's mind about whom her elected officials serve. As a result of her engagement, she was invited by former U.S. Representative Will Hurd to present on the need for broadband as part of a virtual town hall in 2021 that had more than 4,000 tune in.

Teresa and the Ward County coalition continue to pursue high-speed broadband, armed with a vision, team, and tools to connect the businesses, schools, and homes in Monahans and beyond.

Verify the current conditions

4

Once you have an idea of your community's wants and needs, take inventory of the internet services currently available in your community. Twice each year, the Federal Communications Commission (FCC) produces maps that show the availability of 25/3 Mbps broadband service. The maps overstate accessibility of high-speed internet across census tracts, neighborhoods, or developments, and the latest maps available on the FCC site tend to be outdated by two years or more.

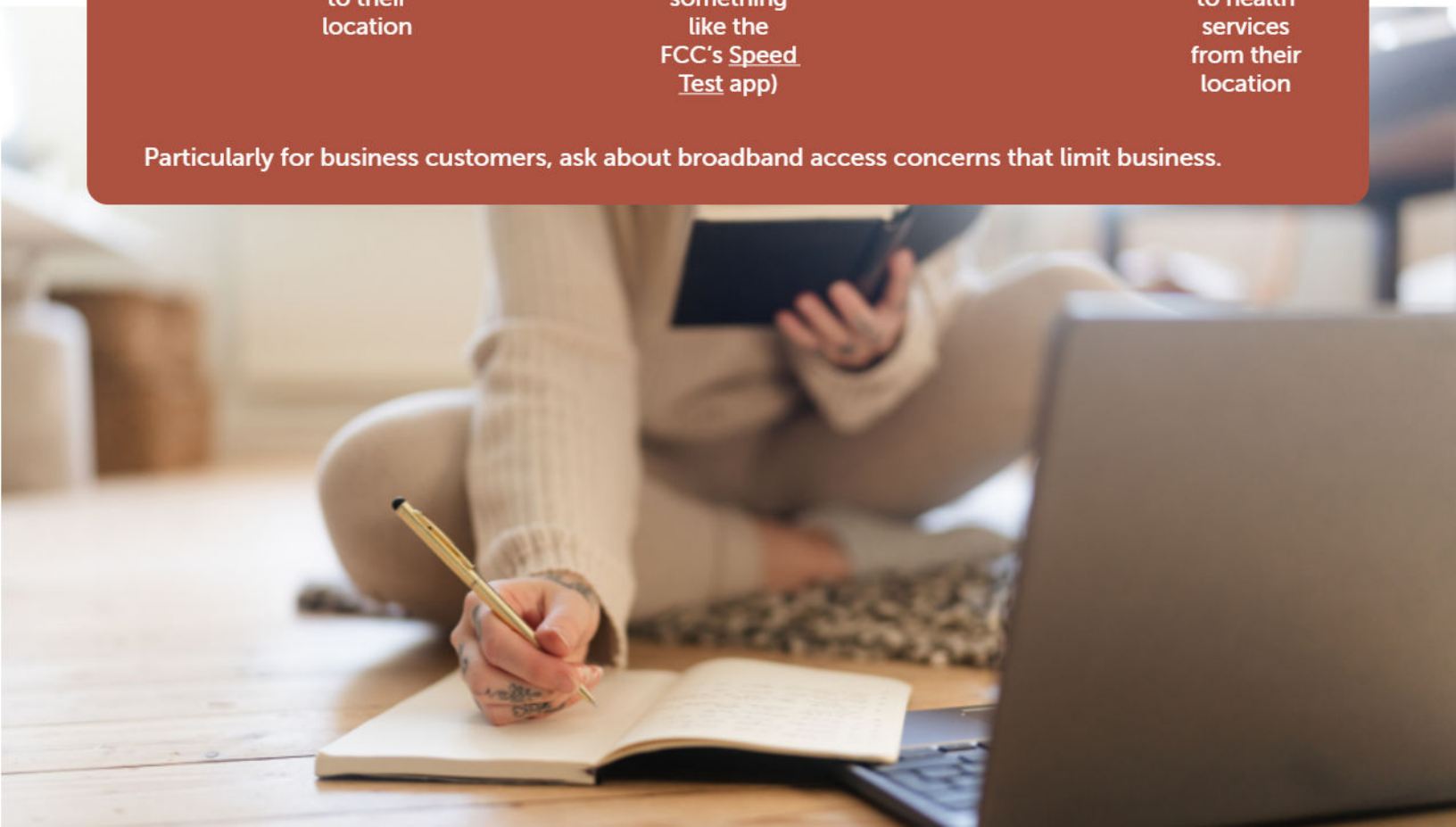
Challenging these maps can be a key opportunity for communities to qualify for federal and state support for broadband.

Do Your Own Broadband Research

Start by identifying a cross-section of users, including anchor institutions like schools, libraries, and hospitals, along with houses and businesses inside and outside of town. Ask them about their experience using the internet, including:

- the provider(s) they use
- the providers that will come to their location
- the speed they are promised
- the speed they can document (using something like the FCC's Speed Test app)
- their monthly costs
- their satisfaction with service
- reliability of service for work, study, or access to health services from their location

Particularly for business customers, ask about broadband access concerns that limit business.



There are a number of organizations that help communities validate current conditions. For example, Connected Nation Texas helps communities validate and add nuance to these maps of broadband access by engaging would-be internet users to share their experiences (and their inevitable workarounds) in getting sufficient internet. The broadband team in Anderson County worked with Connected Nation to administer a survey that showed the county is well-positioned to leverage available funding to build broadband resources and engage new users. As seen in these maps, survey results reveal patterns in met and unmet demand for broadband. With this information, coalitions can work with providers and funders to accurately project needs.

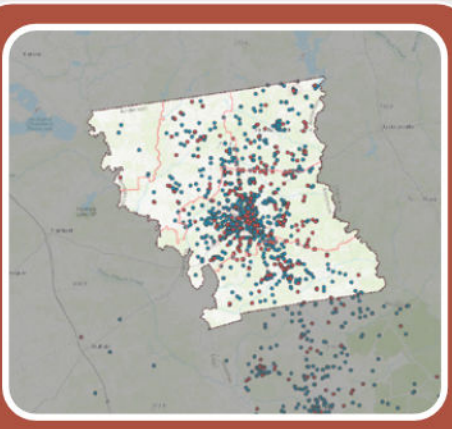


Exhibit A: Those who have (Blue) and desire (Red) a home broadband connection.

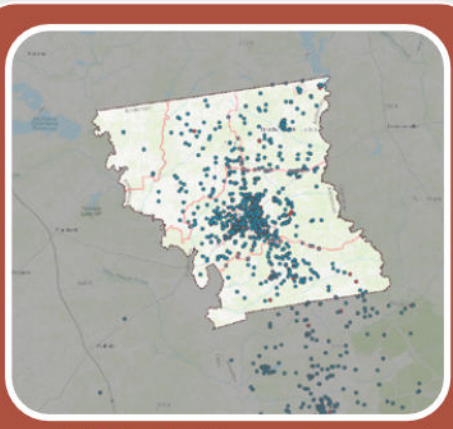


Exhibit B: Those who are interested (Blue) and not (Red) in additional internet choices

Exhibit C: Those whose internet needs are met (Blue) and those whose needs are not met (Red)

Exhibit D: Anchor institutions

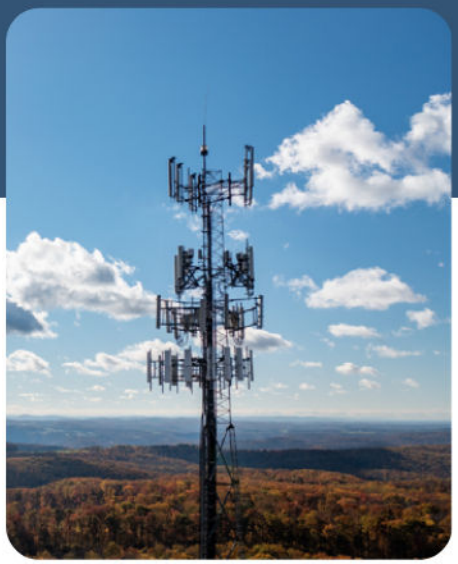
Develop a technology plan

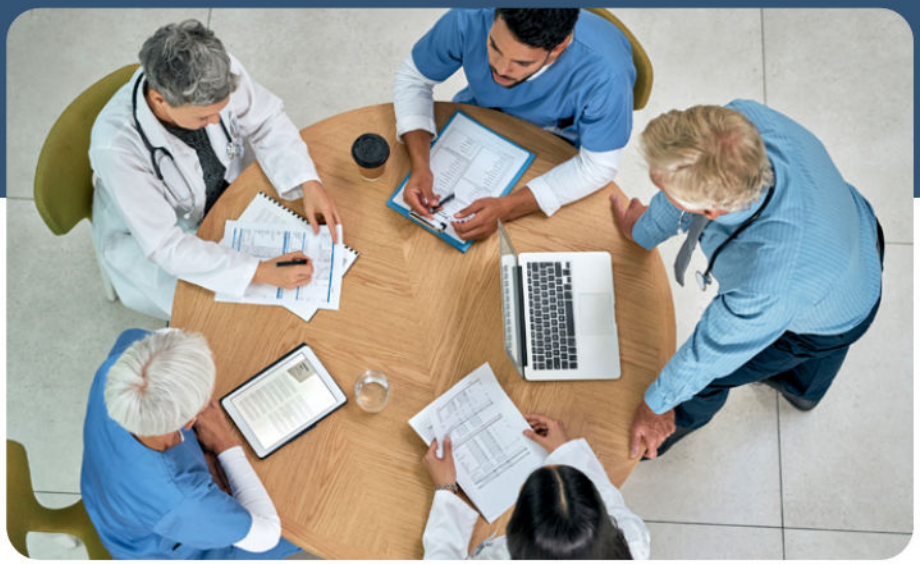
5

Technical expertise is required to map existing needs, create blueprints for broadband development, and meet those needs. There are many options for connecting all citizens, but they require commitment and creativity. Designing a forward-thinking connectivity plan that is efficient and inclusive requires engineering horsepower and knowledge of the physical terrain. The Piney Woods of East Texas provide very different landscape challenges than the rocky soils of the Permian Basin, but either way, accounting for the natural environment is essential.

For twenty-five years, leaders of the three incorporated cities in Bastrop County have been collaborating to provide health care services. That focus has turned to broadband over the last decade. An October 2013 report produced by Connected Nation Texas documented the internet capacity in Bastrop County at that time, when the county was a model of connectivity. Given the increase in bandwidth needs and internet speeds, its most recent survey revealed a different story. Connected Nation Texas helped Bastrop County conduct a survey of more than 3600 residents and business owners in late 2020. The resulting summary and full survey report revealed that many Bastrop County residents were not able to secure internet at their homes, available internet speeds barely met definitions of broadband, connections were unreliable, and prices exceeded national averages.

County coverage maps validated in January 2022 showed that service was not as available and speeds not as fast as reported. Aligned with Connected Nation Texas recommendations, Bastrop County leaders have created a technical plan for broadband expansion and released a Request for Proposals to identify providers in April 2022. They are expecting technical buildout to start and provision of high-speed service to more Bastrop residents before the end of 2022.





Activate Partnerships

6

Activating partnerships is the single most effective strategy communities can use to help themselves.

For the next five years, there are billions of dollars available through the Texas Broadband Development Office and the Infrastructure Investment and Jobs Act, along with additional incentives at the state level, to connect rural communities that have been underserved by legacy providers. Taking advantage of these unprecedented resources will require intentional, strategic collaboration. Pursuing your broadband vision with the funds you have and with the providers in your region will yield positive outcomes in competitive grant processes, as well.

Rural communities need to convene individuals, businesses and local anchor institutions to make a business case for bringing broadband to everyone. This may or may not engage a national or local internet service provider to expand service. Either way, rural communities should explore all options and get creative with local partners to pursue connecting every address.

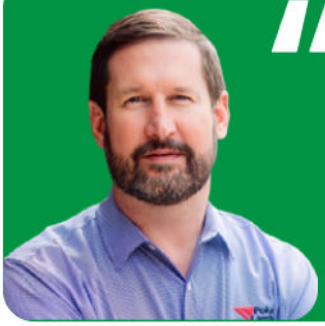
Some of the best partners for this work may already be offering other kinds of services in the community. Specifically, small telephone companies and cooperative associations that serve area communities may be more dedicated, responsive, and inclusive in addressing local needs.

This can look like creatively crafting proposals or contracts to enable local providers to bid for what they can handle. It can look like getting regional providers in a room with a whiteboard to **figure out how and when to provide service to rural communities rather than why and if**. It can look like engaging community members to commit to purchasing broadband service from new partners, or working with trusted partners in new ways to connect communities.

Old Partners, New Solutions

Telephone cooperatives and small, family-owned cable businesses sprang up across Texas in the 1950s and 1960s, and many continue to serve their communities. These locally-owned organizations are deeply committed to serving and developing broadband in partnership with their communities.

Patrick Sherrill is the general manager of Poka Lambro Telecommunications in Tahoka. What differentiates his company is its approach to service, he says.



> ***Service is what drives us from the board of directors down to the employees to the communities they serve. We want our neighbors to succeed. We've got guys who are out at midnight trying to restore somebody's service. It's not about what we do for a living – it's about somebody counting on us to do this job.***
>
> **- Patrick Sherrill, General Manager**
> **Poka Lambro Telecommunications**

Small providers like Poka Lambro value schools, hospitals, and libraries as anchor institutions that can serve as the pivot point for an entire community's service. As Sherrill says, "The anchor institutions are the largest institutions in the town. The revenue from that is important to us, but we have a symbiotic relationship. A community needs its school to be a strong and attractive community. That translates into what we seek in ROI. As a cooperative, you're not there to return money to shareholders; you're there to provide service. If there's enough of a return to cover our risk, we don't need to worry about that return premium on top of that. We can invest aggressively in some areas where you wouldn't invest otherwise if you were looking at a more traditional ROI."

With broadband's importance in education, telehealth, public safety, and commerce growing exponentially during the COVID-19 pandemic, local providers closed the access gap for many customers. These local businesses and co-ops are used to having skin in the game.

Poka Lambro Telecommunications partnered with the City of Tahoka to finance broadband expansion in their community. The city provided funding to connect its government offices, and Poka Lambro matched the investment by extending fiber to downtown businesses; this yielded a ten-fold return on the city's initial investment.

Patrick sums it up:

> ***"Our companies have a lot of resources, a lot of knowledge, and a huge amount of local commitment. When you're looking to solve a broadband problem, there are great resources in rural areas. There's a lot of experience bound up in these co-ops."***

Develop a work plan and budget

7

After documenting your community's technical needs, figure out a timeline and price tag.

- What investments do you need? When and where are they needed?
- What grants and other public or private financial support are available? Is the funding local, regional, state, or federal? What are the steps you need to take to access or make the most of the funding?
- How can you help more people become broadband users?
- How can we ensure that all households and areas are equitably served?
- As with any collaborative project: Who's going to do each part of the work?

These are the questions that community leaders need to discuss and decide. While there will inevitably be challenges, missteps, and delays, the steady efforts of engaged coalitions with a vision for equitable community transformation and clear metrics are essential to achieving the goal.

As Lonnie Hunt, Executive Director of the Deep East Texas Council of Governments, shares,

> ***There are 150,000 households in Deep East Texas, and I can verify that 50,000 have no service. It would not work to say "Let's go target those households." The reason those 50,000 houses don't have service is because companies can't earn a profit serving those houses. If there was enough grant money to build out service to just those who didn't have service, the structure would eventually collapse because those folks wouldn't be profitable to service. But if we include the anchor institutions and we include everyone and they subscribe, we can make it work.***
>
> **- Lonnie Hunt, Executive Director**
> **Deep East Texas Council of Governments**

"We can't allow cherry-picking to happen. We are the people who get left out of the cherry picking. You can ensure everybody gets service if you include everybody."

- Lonnie Hunt, DETCOG

Promote broadband benefits

8

Education and community engagement are vital as your broadband expansion project nears completion. It takes far less effort to convince people about the value of broadband now compared to before the COVID-19 pandemic. However, those who are not currently accessing the internet at all (or who are doing so at slow speeds) may find it hard to understand why they should join a community broadband effort. Limited uptake by residents who are unaware of the benefits of broadband can pose a barrier to the success of the initiative, since **the cost per user of delivering high-speed internet decreases as the number of subscribers increases.**

Securing broadband takes time, and it's critical to grow subscription rates high enough to make an initial case for broadband and to sustain operations. **Community leaders can accelerate the process by demonstrating the value of broadband to residents and teaching them how to access the services themselves.**

Broadband Uses and Their Appeals to Residents:

Accessing telehealth services to avoid commutes to doctor's offices or to connect with specialists

Viewing church services online

Watching a YouTube video to learn a DIY skill

Comparison shopping to find the lowest cost and fastest delivery for a product

Cutting the cord to cable and moving to a streaming service for entertainment

Accessing job postings for local and newly remote opportunities

Video chatting with family and friends

Taking online courses

It may be helpful to reassure those who feel hesitant or skeptical that the in-person connections that make rural life meaningful don't end when broadband access comes to every home. Broadband is simply a tool that can enhance each community member's quality of life.

Building knowledge to help broadband users stay safe is smart, at any internet speed. Rural advocates in Minnesota have created this resource to help address common concerns. Engaged community leaders can call on schools, churches, nonprofits, and other partners in your network to educate newer internet users about broadband so they are willing and able to take advantage of this critical service when it reaches them.

Busting Broadband Myths

Increasing broadband access and use require not only explaining the advantages of high-speed internet access, but also addressing misconceptions. Here are a few you may encounter in your community:

"Internet service is too expensive and I don't even know what I'd use it for."

"I'll just use my phone where I can get a good signal to get the internet."

"I am concerned about privacy and my online security."

"We don't need to spend millions to enable people to play video games or shop online."

"If I get broadband internet, I'll have to upgrade my TV."

Celebrate small victories

9

Securing broadband for rural communities is a long, complicated process, full of technical, financial, and coordination challenges. Find ways to share the excitement of intermediate steps with your stakeholders so they can see and celebrate progress.

For example:

- ☐ **Did you engage and excite a core group who is committed to moving the broadband project forward together?**
- ☐ Have you identified technical assistance providers who are ready to work with your rural community?
- ☐ **Did an unlikely ally emerge when you were doing outreach? Perhaps a local electrical coop is inspired to bid on a technical component? Maybe the local student council commits to go door-to-door to survey possible users?**
- ☐ Did you find a way to connect every single address in your region in a creative way?
- ☐ **Did you secure a new grant or funding partner. or do you qualify for part of the federal investment in broadband?**

As with any complicated change, you may find yourself dancing the Progress Cha-Cha: two steps forward and one step back. Celebrating the small victories builds momentum so you can achieve the big victories of lit fiber and fully engaged community members.

Conclusion

Broadband is just the beginning. Getting broadband to every address in a community is a resource-intensive undertaking. It takes vision. coordination. creativity, persistence, and time - not to mention significant funding.

Is universal broadband access worth it?
The answer is yes - because it's about more than broadband.

Broadband enables us to connect with community members to develop resources that previously were inaccessible. It gives us a chance to include those who have long been denied voice, access, and opportunity. If you can do that for broadband, you can do it for a lot of other things, too. The next challenge you tackle could be developing affordable housing or growing more locally-grown food, building high-quality child care options in your region, or providing support for elderly neighbors to age in place. There is no end to the goals communities can achieve with the vision, relationships, and tenacity they develop by working together.

> ***At the end of the day, broadband is not about policy, politics, technology, or money; it is about people. The mere existence of broadband in a rural community does not eliminate inequity - but when deployed democratically and harnessed inclusively, everything can be better with broadband, from homework to work to voting to health to talking with Grandma. Better broadband is a call to end digital divides in the United States.***
>
> **- Dr. Christopher Ali. adapted from Farm Fresh Broadband: The Politics of Rural Connectivity**

Definitions

5G: 5th Generation Internet (usually written as 5G) is mobile broadband that delivers the bandwidth necessary to handle the Internet of Things (see below). 5G can be 10-100 times as fast as 4G. Because the bandwidth needed to fuel 5G is so large, signals cannot travel far compared with 4G (800-1500 feet for 5G vs. tens of miles for 4G).

Anchor Institutions: Schools, libraries, medical and health care providers, public safety entities, institutions of higher education, major employers, and other local players. These institutions may provide outreach, access, equipment, and support services to facilitate greater use of broadband service.

Bandwidth: The measure of a telecommunications network's capacity to transmit data and signals. It is generally expressed in gigabits per second (Gbps) or megabits per second (Mbps).

Broadband: Reliable high-speed internet access that is always on, currently defined by the Federal Communications Commission in 2015 as providing download speeds of at least 25 megabits per second (Mbps) and upload speeds of at least 3 Mbps. Texas has adopted the same definition as the FCC. There are efforts to redefine minimum speeds of at least 100 Mbps for downloads and 10 Mbps for uploads.

Copper: Copper wire is the foundation of telephone lines. While copper wire has historically gone to every address and is used for dial-up internet service, the technology is not sufficient to provide broadband.

Cooperative Association: Known as co-ops, these are autonomous associations of persons, united voluntarily, to meet common needs through a jointly-owned and democratically-controlled enterprise. Cooperatives are governed by a board of directors, and profits return to the owners of the cooperative. Co-ops form for a variety of purposes, including to provide a community with access to a utility like electricity or broadband, and to generate buying power for agricultural goods.

Digital Divide: The gap between individuals in a population who have access to the internet and other communication technologies and those who have limited to no access.

Digital Equity and Inclusion: An ideal state in which all community members have the access and skills needed to fully participate in a digital society and economy, regardless of their location, age, income, or race/ethnicity. The concept of digital equity and inclusion highlights that a lack of access or skills can isolate individuals and communities from a broad range of opportunities.

Digital Subscriber Line (DSL): A technology that transmits digital data over telephone lines. DSL service is typically 5-10 Mbps, far below the threshold for broadband.

Fiber: Fiber internet is a broadband connection that uses fiber-optic cable, which can send data as fast as 70% of the speed of light. Fiber-optic cables are not as susceptible to severe weather conditions as other connections, which means outages are minimized. Fiber enables users to connect several devices to the internet at once.

Fixed Wireless Internet: An alternative to wired methods of accessing the internet that connects two fixed locations wirelessly via radio waves. Fixed wireless internet offers options to users with limited speed or challenging line-of-sight issues.

Internet of Things (IoT) – The interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data.

What do we mean by the Internet of Things?

Residential applications: Ring doorbells, Nest thermostat, Apple watches, Amazon Echo, Google Home, programmable small and large appliances from coffee makers to washing machines.

Commercial applications: autonomous farming equipment, wireless inventory trackers, bar code readers, smart factory automation, smart traffic signals.

Internet Service Provider (ISP): A company that provides individuals and organizations with a connection to the internet. ISPs can include telephone and cable companies, wireless companies, electric cooperatives, and mobile wireless providers. They use different technologies to deliver internet service to their customers, including fiber, cable, DSL, and fixed wireless.

Last-Mile Service: The final stage of network development, when an internet service provider connects their infrastructure to homes and small business customers.

Mobile Internet: The internet as accessed by means of a smartphone, tablet, or other mobile device.

Public-Private Partnership: Any formal partnership between public and private entities to achieve a common goal. For example, in the case of broadband development: A county or municipality might take responsibility for building community support, conducting a needs assessment, and providing resources to a private internet service provider to make deployment more financially attractive and sustainable. In return, the provider would contribute technical expertise, innovation, equipment, and capital investment to bring broadband to under- or unserved areas. Both partners share the risks and costs of broadband deployment.

Rights of Way: Legal rights to pass through property owned by another. Frequently used to secure access to land for digging trenches, laying fiber, constructing towers, and deploying equipment on existing towers and utility poles.

Service Area: The entire area within which a service provider offers or intends to offer broadband service.

Speed: The rate at which a device can send (upload) or receive (download) data. Speeds are conveyed in megabits per second.

What is the difference between speed and bandwidth?

Bandwidth and speed are closely related, and it's easy to get the two terms confused. If the text, images, and other data we access on the internet were cars, the network would be the freeway they traveled on. Bandwidth would be the width of the freeway, and speed would be how quickly the cars could travel. The greater the bandwidth, the greater the speed at which we can upload and download data.

Take Rate: The percentage of customers within an ISP's service area who subscribe to, or "take," the service.

Unserved Area: Zip code areas that lack physical access to broadband service as defined by the state.

Underserved Area: Zip code areas that have internet service at speeds higher than those defined as unserved, but lower than those that have broadband service, as defined by the state.

How much broadband do you need?

The current definition for broadband, 25 MB download and 3 MB upload, was established by the FCC in 2015. Technology and its uses have evolved dramatically in the seven years since that definition was published. Many users now regularly depend on at least four times that speed for work, school, health care, and recreation. Gaming, video calls, and streaming in particular require high-speed connections. If you're looking to expand broadband access in your community, plan to exceed the FCC's minimum speed thresholds.

It's also worth noting that the wide gap in download and upload speeds under the FCC's definition of broadband doesn't align with current usage patterns. Any task that involves sharing files, from posting video content to backing up security camera footage to storing documents in the cloud, requires substantial upload speeds. Planning for symmetrical bandwidth, where upload and download speeds match each other, will ensure your community's network meets a wide range of needs.

Internet speed	Works for
 0-5 Mbps	• Checking email • Streaming music on one device • Searching on Google
 5-40 Mbps	• Streaming video on one device • Video calling with Skype or FaceTime • Single-player online gaming
 40-100 Mbps	• Streaming HD video on a few devices • Multi player online gaming • Downloading large files
 100-500 Mbps	• Streaming video in Ultra High Definition on multiple screens • Downloading files quickly
 500-1,000 Mbps	• Gaming or streaming content on multiple devices

Internet Use	Minimum Speed	Recommended Speed
 Email	1 Mbps	1 Mbps
 Web browsing	3 Mbps	5 Mbps
 Social media	3 Mbps	10 Mbps
 Streaming SD video	3 Mbps	5 Mbps
 Streaming HD video	5 Mbps	10 Mbps
 Streaming 4K video	25 Mbps	35 Mbps
 Online gaming	3-6 Mbps	25 Mbps
 Streaming music	1 Mbps	1 Mbps
 On-on-one video calls	1 Mbps	5 Mbps
 Video conference calls	2 Mbps	10 Mbps

https://www.highspeedinternet.com/how-much-internet-speed-do-i-need