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## Rural Broadband: A Texas Tour

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Provided by  
Connected Nation

# Rural Broadband: A Texas Tour

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2018 Listening Tour and  
Focus Groups

October 15, 2018

**CONNECTED  
NATION<sup>SM</sup>**  
Everyone Belongs.<sup>TM</sup>



# THANK YOU

Thank you to the organizations that participated in this project and for their passion for rural Texas. A special note of appreciation is also due to the Still Water Foundation for funding this project and for their commitment to serving rural Texas communities.

Alamo Area Council of Governments  
Amarillo Wireless  
Association of Rural Communities in  
Texas (ARCIT)  
AT&T First Net  
Atlas Sand  
Bastrop County  
Big Bend Telephone  
Big Bend Telephone  
Brazos Valley Council of  
Governments  
Burnet County  
Capitol Area Council of Governments  
Carson County  
Castroville Area Economic  
Development Council  
Central Texas Library System  
City of Clarendon  
City of Dripping Springs  
City of Invanhoe  
City of Lufkin  
City of Llano  
City of Niederwald  
City of San Marcos  
Culberson County Sheriff  
Deep East Texas Council of  
Governments  
Dripping Springs Independent School  
District  
Education Service Center Region 18  
Elgin Independent School District  
Elliott Electric Supply  
Faulkner Consulting  
Hays County  
HC Wireless  
Houston-Galveston Area Council  
Jasper County Judge

Jasper Economic Development Corporation  
Kendig Keast  
La Vernia Municipal Development District  
Lee College  
Liberty Hill Public Library  
Llano County  
Llano Independent School District  
McMullen Company  
Michael & Susan Dell Foundation  
Monahans Chamber of Commerce  
Monahans Economic Development  
Office of the Governor, Economic  
Development & Tourism  
Nacogdoches Economic Development Corp  
Newton County Judge  
Panhandle Regional Planning Commission  
Permian Basin Regional Planning  
Commission  
Presidio County Emergency Management  
Rebuild Texas Fund  
Resound Networks  
Rio Grande Council of Governments  
San Antonio County  
Sierra Blanca Independent School District  
Texas Department of Agriculture  
Texas Education Agency  
Texas Forest Country Partnership  
Texas State Library and Archives  
Commission  
Texas Workforce Commission  
T.L.L. Temple Foundation  
Tocker Foundation  
Town of Thompson  
Trinity County  
USDA Rural Development  
West Texas A&M University

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## I. Executive Summary

Broadband strengthens rural communities and sustains rural values and quality of life. Access to reliable, affordable broadband, also referred to as high-speed internet, can connect rural Texas communities with world-class educational resources, well-paying jobs, economic opportunities in a global marketplace, leading-edge healthcare services, social networks and more. At a time when many rural communities are struggling to retain and attract new residents and businesses, broadband can offer access to the jobs, healthcare, education, government services and other modern conveniences experienced in Texas cities. Rural communities have the added advantage of a quality of life that has been cherished for generations.

The following provides a snapshot of the broadband and technology challenges facing rural Texas communities:

- One out of every four rural Texans (1.25 million) lacks access to broadband infrastructure (compared to only 2% of urban residents).
- More than 2.7 million Texas households do not have a fixed broadband connection at home.
- Just over \$5.1 billion in potential economic benefit is left unrealized among disconnected households.
- One-third of households that do not subscribe to the internet say the cost of service is too expensive.
- Nearly one-quarter of Texas households have only one choice for broadband service.<sup>1</sup>

The need for new technologies, broadband-enabled healthcare and digital jobs skills is increasingly vital to the state. Research shows that Texas will need approximately 4.5 to 7.8 million new jobs to keep up with population growth in the next 18 years.<sup>2</sup> Moreover, these opportunities must be made available to all Texans equally.

Recognizing this digital divide and its deleterious impact on rural communities, the Still Water Foundation, the Texas Department of Agriculture, and other foundations and stakeholders partnered with Connected Nation (CN) to host a series of Listening Tours and Focus Group meetings across the state. The primary objectives for these meetings were to:

- Develop and document insights as to why communities are undersubscribing/under-applying for funds and resources that can be used for broadband technology projects;
- Develop and share a state resource guide that can be used to identify funding and resources for broadband technology projects; and
- Gather insights on broadband-related issues and possible solutions from local community leaders.

<sup>1</sup> <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report>

<sup>2</sup> <https://texas2036.org>



From June to September 2018, CN coordinated 12 Listening Tours with 10 Councils of Government or Planning Regions across the state of Texas. In total, CN heard from over 150 community leaders who are concerned about their connectivity capabilities and the implications that lack of broadband access has for their residents and businesses.

Throughout the Listening Tours, community leaders also shared personal experiences reflecting how the lack of broadband is impacting rural life. For example, one participant shared how his sick mother was prescribed a monitoring device for her heart condition, but because she didn't have sufficient broadband, the device could not communicate her clinical status to the physician as intended. Additionally, several participants shared that many children cannot complete their homework because internet services are not available where they live; they have to drive to the library or a local hotspot for access.

In addition to the Listening Tours, CN also moderated two small Focus Group meetings with public and private groups who currently offer funding or resources that could be used to support broadband projects in local communities. The groups explored how better to communicate available resources and engage community leaders. Focus Group feedback is also shared in this report.

## Issues Summary

As a result, Listening Tour attendees identified a number of key concerns or needs in their communities. The following topics represent the most prevalent issues communicated in the majority of the Listening Tours:

**School Connectivity and the Homework Gap** – Rural leaders are concerned about the existence of a homework gap in Texas and how this gap has serious life-long implications not only for students, but also for communities. Many rural and low-income students are unable to access the digital tools necessary to succeed in and outside of the classroom.

**Telemedicine** – Many leaders indicated that the loss of several rural hospitals and health clinics impedes residents' access to needed healthcare services. Telemedicine can serve as a lifeline for rural residents living significant distances from hospitals. In Texas, the median hospital cost savings through the use of telemedicine is estimated to be \$86,747 per year per facility, more than four times the national average.

**Fiber Infrastructure and Broadband Access** – Fiber infrastructure is often lacking in rural communities. Without incentives or effective planning, many rural leaders have no recourse to stimulate the infrastructure investment needed to bring broadband to their community.

**Availability of Grant Funding Information** – There are a number of grants offered through federal and state entities or private foundations and companies that could be used to support broadband-related programs and infrastructure;

however, communities often find it difficult to discover these opportunities and complete cumbersome applications when they do. As a result, despite communities having a dire need for improved broadband, thousands of dollars in resources are being left on the table.

**State Leadership** – While there is a strong interest and willingness to tackle the broadband issues by both regional and local leaders, there is a general consensus that the state of Texas needs to take an active role in coordinating key broadband activities and policies.

**Emergency Services** – Network reliability is a primary concern for a number of local leaders looking to maintain and improve the safety of their communities. In the aftermath of Hurricane Harvey, many leaders recognize reliable access to broadband is vital for public safety personnel to respond to emergencies. With high-speed internet and corresponding technologies, emergency services personnel can respond faster and more accurately to citizens before, during and after emergencies.

**Broadband Mapping** – Effective planning begins with complete and accurate data. With conflicting information on whether or not there is sufficient infrastructure ready to support vibrant broadband connections in communities, many leaders struggle to plan, pursue solutions and engage in productive discussions with service providers. Many leaders therefore identified that they would like to have accurate maps of broadband availability, speeds and infrastructure.

**Broadband Planning and Community Technology Action Plans** – Community leaders identified a need for not only broadband availability and infrastructure mapping, but also the development of plans and specific actions that seek to address the unique community challenges hindering the expansion of broadband. Many leaders recognize that local, multisector planning efforts can prepare a community for broadband improvements and plan for future technology needs.

## Recommendations

While identifying issues, community leaders also developed meaningful recommended actions for solving the broadband technology challenges facing rural Texas:

- Establish a Texas Broadband Office or entity that would serve as a key point of contact for all things broadband in the state, including broadband mapping, federal policy, local opportunities for broadband grants and more.
- Develop a centralized resource to build awareness for and easily identify funding and resources for potential broadband projects.



- Collect and validate statewide broadband data on an annual basis for the production and publication of a Texas map of broadband assets.
- Facilitate community broadband planning to assess broadband access, adoption, and use, and to develop a clear set of recommendations, specific to the community, for advancing technology readiness.
- Leverage state matches and provide application assistance in order for Texas schools and libraries take full advantage of the federal funding available to them for technology.
- Establish broadband partnerships to help address some of the access challenges facing Texas.
- Develop a broadband adoption campaign that would offer training classes through entities such as libraries and nonprofits on how to use technology while also providing information on low-cost broadband options.
- Develop partnerships to identify, prioritize and offer cybersecurity training and resources for both residents and businesses.
- Coordinate with FirstNet and the Texas Department of Public Safety to identify opportunities to expedite deployment and communicate critical gaps as the network is being built.
- Identify areas and facilities with insufficient connectivity to support telemedicine applications and develop education and training programs on the benefits and use of telemedicine applications.

**In summary, increasing the access and use of broadband is vital to maintaining and strengthening rural Texas communities. Evident through these Listening Tour and Focus Group meetings, Texas' dedicated community leaders recognize the opportunities that technology can bring to its citizens, but more needs to be done. This report further examines the issues identified and prioritizes recommendations to empower rural Texas to thrive in an increasingly digital world.**



01

# PROJECT OVERVIEW

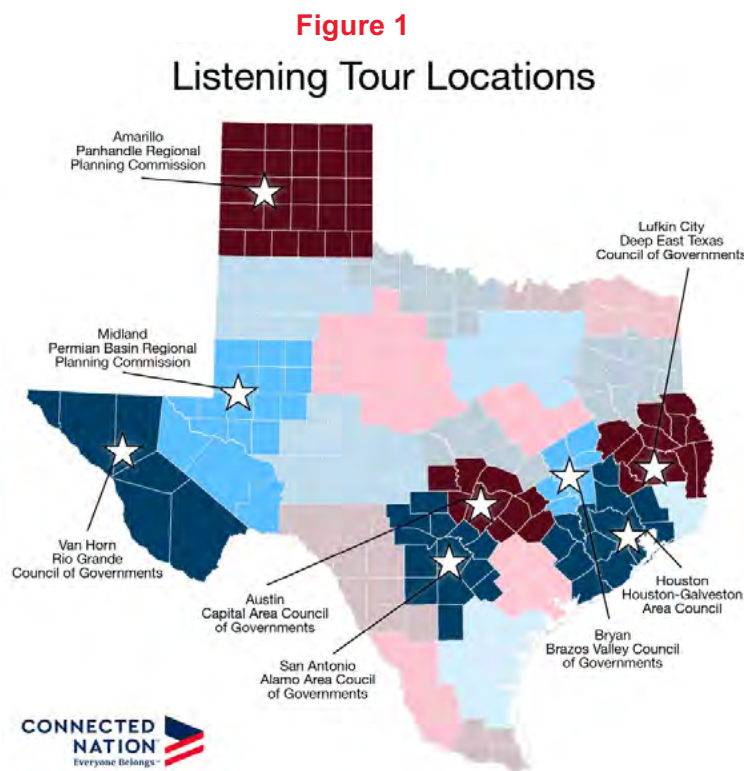
## II. Project Overview

### Listening Tour and Focus Groups

With funding from the Still Water Foundation and in collaboration with the Texas Department of Agriculture, the Texas State Library and Archives Commission, and other foundations and stakeholders, Connected Nation (CN) hosted a series of Listening Tours and Focus Group meetings throughout the state from June to September 2018. The groups each met with three objectives in mind:

- Develop and document insights as to why communities are undersubscribing/under-applying for funds and resources that can be used for broadband technology projects.
- Develop and share a state resource guide that can be used to identify funding and resources for broadband technology projects.
- Gather insights on broadband-related issues and possible solutions from local community leaders.

Over the four-month period, CN coordinated 12 Listening Tours with 10 Councils of Government or Planning Regions across the State of Texas.



# PROJECT OVERVIEW



The Listening Tours were intended to welcome feedback from multi-sector stakeholders throughout each region. The list below includes the participating entities with one or more attendees at Listening Tour events:

Alamo Area Council of Governments	Jasper County Judge
Amarillo Wireless	Jasper Economic Development Corporation
Association of Rural Communities in Texas (ARCIT)	Kendig Keast
AT&T First Net	La Vernia Municipal Development District
Atlas Sand	Lee College
Bastrop County	Liberty Hill Public Library
Big Bend Telephone	Llano County
Big Bend Telephone	Llano Independent School District
Brazos Valley Council of Governments	McMullen Company
Burnet County	Monahans Chamber of Commerce
Capitol Area Council of Governments	Monahans Economic Development
Carson County	Nacogdoches Economic Development Corp
Castroville Area Economic Development Council	Newton County Judge
Central Texas Library System	Panhandle Regional Planning Commission
Central Texas Library System	Permian Basin Regional Planning Commission
City of Clarendon	Presidio County Emergency Management
City of Dripping Springs	Rebuild Texas Fund
City of Invanhoe	Resound Networks
City of Lufkin	Rio Grande Council of Governments
City of Llano	San Antonio County
City of Niederwald	Sierra Blanca Independent School District
City of San Marcos	T.L.L. Temple Foundation
Culberson County Sheriff	Texas Department of Agriculture
Deep East Texas Council of Governments	Texas Forest Country Partnership
Dripping Springs Independent School District	Town of Thompson
Education Service Center Region 18	Trinity County
Elgin Independent School District	USDA Rural Development
Elliott Electric Supply	West Texas A&M University
Faulkner Consulting	
Hays County	
HC Wireless	
Houston-Galveston Area Council	

In addition to the Listening Tours, CN conducted two small Focus Group meetings with public and private entities that offer funding or resources that could be used to support potential

broadband projects. One or more individuals from each of the entities listed below participated in the Focus Group meetings:

Texas Department of Agriculture  
Texas State Library and Archives Commission  
Central Texas Library System, Inc.  
Still Water Foundation  
Tocker Foundation  
USDA – Federal Office  
USDA – State Office  
Michael & Susan Dell Foundation  
Office of the Governor, Economic Development & Tourism  
Texas Workforce Commission  
Texas Education Agency

Together, these Listening Tour and Focus Group meetings identified a variety of issues and potential solutions to help close the digital divide in Texas and open up economic and quality-of-life opportunities for its rural communities.

## Background

Connected Nation (CN) is a national 501(c)(3) organization with a core mission to improve lives through the expansion of technology. In 2009, CN was selected by 12 states and 1 territory as the designated entity to lead all broadband mapping and planning efforts under the NTIA's State Broadband Initiative (SBI). At that time, Connected Texas was formed and commissioned to collect data from over 200 national and local Texas broadband providers and almost 18,000 Texas Community Anchor Institutions over the next 5 years. Connected Texas also engaged over 4,000 state and local stakeholders in facilitating community level technology planning.

During the period between 2009 through 2015, CN received 680 "broadband inquiries" coming from residents, business owners, and other stakeholders. The inquiries were all commonly related to broadband issues and in most cases coming from rural communities. Since that active project period, CN continues to receive inquiries with increasing regularity. Inquiries range in scope and interest, but the desperate need for broadband technology in unserved areas of the state is consistent throughout. Below are just a few examples of such inquiries received by Connected Nation:

"I'm on SSI and I need Internet service...as you know at least 90% has to be done by Internet so it is difficult to do anything or even research information....Please if at all possible HELP ME or direct me how to get help with Internet services with phone number."

"I am a farmer, rancher and medical professional and the lack of internet in my area is astounding. I will be forced to go to satellite I am sure since wireless plans are outrageous. I would like to try and help the people in



my area gain access to the internet via repeaters or any means possible. I am one mile from the interstate 20 and no one services our area. Any suggestions on getting started? The nearest town is 7 miles away (Baird) Texas.”

“Hello I'm not sure if you're able to help me. My wife and I are college students raising a family and I'm looking for Internet service. I have contacted every major Internet service provider I know of and not one company can provide me with Internet. Do you have any contacts that might provide me with service or advice/recommendations? Thank you for your time.”

“I will be retiring in about a year and will be moving to some rural land I own in Cherokee County. I noticed by your map that there is a broadband ‘vacuum’ in much of that county. It is a very poor and rural area, no major cities, little economic development. What can I do to bring broadband to the entire county as a precursor to stimulating development?”

“I am a wireless network engineer, and I grew up in Walker County - where broadband data is sparse. I am interested in which areas in Texas may be best served with a solid terrestrial wireless broadband service... I may be interested in building one... or more. Thanks.”

Rural areas, in particular, are in need of an intervention. The FCC’s 2018 Broadband Deployment Report indicates that only 72.3% of Texans in rural areas have access to high-speed internet at 25 Mbps download and 3 Mbps upload while 97.6% of Texans in urban areas have access to those speeds. The project outlined in this report served to better understand barriers to deployment of high-speed internet and help communities overcome those challenges to ubiquitous broadband.





02

# Bringing Broadband to Rural Texas

## III. Bringing Broadband to Rural Texas

### What is Broadband?

Broadband access (or availability) commonly refers to high-speed internet access that is “always on.” Broadband includes several high-speed transmission technologies, such as fiber, wireless, satellite, digital subscriber line and cable. There are two primary types of broadband service: fixed and mobile. Fixed broadband is designed for permanent, stationary use at a home, business, or institution, while mobile broadband is designed for use “on the go.” Broadband is an essential infrastructure that impacts nearly every facet of a region or community.

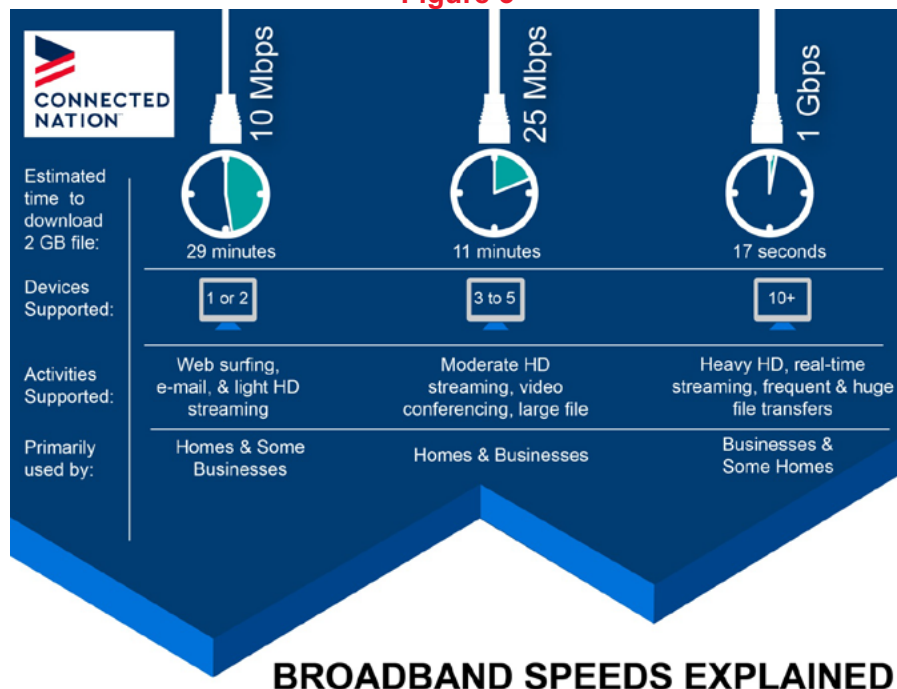
Figure 2



# BRINGING BROADBAND TO RURAL TEXAS

Broadband adoption is different than broadband access and is defined as subscribing to internet service. A household is defined as adopting broadband if its residents have such a connection, while an individual is considered a home broadband adopter if she/he lives in a household that is connected to such a broadband service (even if that individual does not, personally, use that broadband service).

Figure 3



## Why Does Broadband Matter?

Today, the success of a state has become dependent on how well that state is connected to the global economy. Deploying broadband infrastructure, services, and applications, as well as supporting the universal adoption and meaningful use of broadband, are challenging but required to advance technologically empowered communities. Every sector of a community requires the power of broadband and related applications to function at its highest capacity.

- Rural counties with at least two broadband technologies available have experienced significant in-migration compared to rural counties without similar broadband access.<sup>3</sup>
- By adopting web-enabled technology, local government can become more responsive, transparent and cost-effective.<sup>4</sup>

<sup>3</sup> Mahasuweerachai, Whitacre, and Shideler. "Does Broadband Access Impact Migration in America? Examining Differences Between Rural and Urban Areas." *The Review of Regional Studies*. 2010, Vol 40, #1.

# BRINGING BROADBAND TO RURAL TEXAS



- In the first decade of the millennium, rural counties with home internet adoption rates lower than 40% lost more businesses and more jobs than counties with higher rates of adoption.<sup>5</sup>
- Between 2001 and 2010, income grew faster and unemployment grew slower in rural counties with home internet adoption rates higher than 60%.<sup>6</sup>
- Small businesses (fewer than 20 employees) that have websites have higher annual revenues and are more likely to have recently hired than businesses without websites.<sup>7</sup>
- One study found that 50% of K-12 students surveyed said they couldn't complete their homework due to the lack of an internet connection and 42% received a lower grade because of their disconnectedness.<sup>8</sup>
- Telemedicine applications are estimated to add \$522,000 to rural economies and reduce hospitalizations of nursing home patients and generate savings for Medicare.<sup>9</sup>
- Two-thirds of new jobs created between 2010 and 2016 required medium to high digital skills;<sup>10</sup> and 1.1 billion jobs, globally, are automatable today.<sup>11</sup>
- Small businesses using social media weekly are 3x more likely to have recently hired and hired for more positions than businesses that don't use social media.<sup>12</sup>
- Communities without access to real-time data experience 25% higher rates of lost lives, injuries, and crime.<sup>13</sup>
- Fiber broadband access can increase home values by an average of 3.1%.<sup>14</sup>
- In a study of manufacturers, 40% stated they were able to add new customers and 57% realized cost savings because of their broadband connections.<sup>15</sup>
- Farmers who gain access to broadband experience a 6% increase in farm revenue on average.<sup>16</sup>
- More than 28% of adults use a smartphone as part of a job search and 51% make purchases via their device.<sup>17</sup>
- Broadband provides benefits to households, businesses, and farms, creating an entire ecosystem of benefits for communities that are connected (Figure 4).<sup>18</sup>

<sup>4</sup> "Broadband's Impact: A Brief Literature Review," Gallardo, Whitacre, and Grant, *Purdue Center for Regional Development*, January 2018. <https://www.pcrd.purdue.edu/files/media/Broadbands-Impact-Final.pdf>

<sup>5</sup> "Broadband's contribution to economic growth in rural areas: Moving towards a causal relationship," Whitacre, Gallardo, and Strover, *Telecommunications Policy*, 38, 2014.

<sup>6</sup> Ibid.

<sup>7</sup> Michigan Consortium of Advanced Networks (MCAN) 2018 Broadband Roadmap.

[https://www.michigan.gov/documents/snyder/MCAN\\_final\\_report\\_629873\\_7.pdf](https://www.michigan.gov/documents/snyder/MCAN_final_report_629873_7.pdf)

<sup>8</sup> "The Homework Gap: The 'Cruellest Part of the Digital Divide'," McLaughlin, *National Education Association Today*, April 2016

<sup>9</sup> "Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare," Grabowski and O'Malley, *Health Affairs*, Vol. 33, 2, February 2014

<sup>10</sup> "Crunched by the Numbers: The Digital Skills Gap in the Workforce." Burning Glass Technologies, March 2015.

[http://www.burning-glass.com/wp-content/uploads/2015/06/Digital\\_Skills\\_Gap.pdf](http://www.burning-glass.com/wp-content/uploads/2015/06/Digital_Skills_Gap.pdf)

<sup>11</sup> "Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation." McKinsey Global Institute, December 2017.

<https://www.mckinsey.com/mgi/overview/2017-in-review/automation-and-the-future-of-work/jobs-lost-jobs-gained-workforce-transitions-in-a-time-of-automation>

<sup>12</sup> [http://connectmycommunity.org/wp-content/uploads/2016/11/Small\\_Business\\_Infographic-FINAL.pdf](http://connectmycommunity.org/wp-content/uploads/2016/11/Small_Business_Infographic-FINAL.pdf)

<sup>13</sup> "Why Does Broadband Matter," National Telecommunications and Information Administration, 2018.

<sup>14</sup> <https://www.fiberbroadband.org/blog/study-shows-home-values-up-3.1-with-access-to-fiber>

<sup>15</sup> Petrick and Prindible, "Broadband Technology in Manufacturing." Prepared for the Commonwealth of Pennsylvania and the National Telecommunications and Information Administration, May 2014.

<sup>16</sup> "The Benefits of Expanded Broadband for Missouri Farms and Agribusiness," Johnson, Gautam, Mishra, and Haithcoat, *University of Missouri*, October 2011.

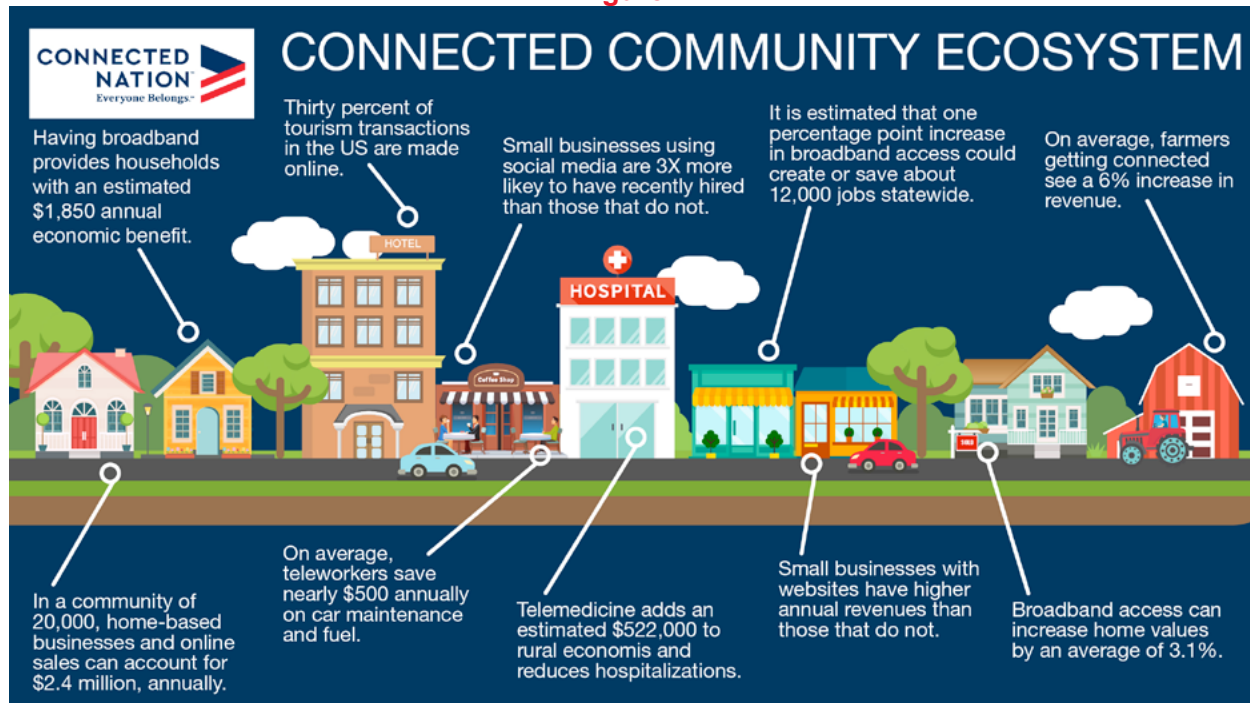
<sup>17</sup> "Ten Facts About Smartphones as the iPhone Turns 10," Rainie and Perrin, *Pew Research Center*, June 2017

<sup>18</sup> <https://connectednation.org/wp-content/uploads/2018/09/Connected-Community-Ecosystem-CN.jpg>



# BRINGING BROADBAND TO RURAL TEXAS

Figure 4



# BRINGING BROADBAND TO RURAL TEXAS



## Broadband in Texas

With broadband so vital to our everyday lives, business growth, and economic prosperity, an evaluation of the current status of broadband access and adoption in Texas is crucial.

### Broadband Access

Over the years, the definition of broadband has changed significantly, as applications require faster speeds and new methods of delivery have been developed. Currently, the Federal Communications Commission (FCC) sets the benchmark for broadband as internet service with advertised speeds of at least 25/3 Mbps. Of Texas' nearly 28 million residents, approximately 93% have access to broadband as defined by the FCC. This leaves approximately 1.8 million Texans lacking access to high-speed internet service.

The table below provides the estimated number of residents unserved by fixed, terrestrial broadband at the three speed tiers commonly used to measure broadband availability.

Table 1: Estimated Residential Broadband Service Available Via Fixed Terrestrial Platform in Texas <sup>19*</sup>		
Download/Upload Speed	Unserved Population	Percent Population Unserved
At Least 10 Mbps/1 Mbps	1,193,000	4.3%
At Least 25 Mbps/3 Mbps	2,304,000	8.3%
At Least 1 Gbps/100 Mbps	22,599,000	81.4%

\*Population availability percentages are cumulative of lower speed tiers.

The percentage of the population served at 25/3 Mbps varies greatly across the state. For example, relatively few citizens in Kinney, Sterling, Mitchell and Crane counties, among others, have access to broadband at this speed, while at least 90% of citizens in counties such as Fort Bend, Hutchinson and Bowie have access to this speed or faster. Areas without access are primarily those in rural areas and on the edges of small towns and suburban places.

The map on the following page shows areas of Texas that have access to broadband service of at least 25/3 Mbps. Areas shown in white are those unserved by broadband at those speeds.

<sup>19</sup> <https://broadbandmap.fcc.gov/#/area-comparison>

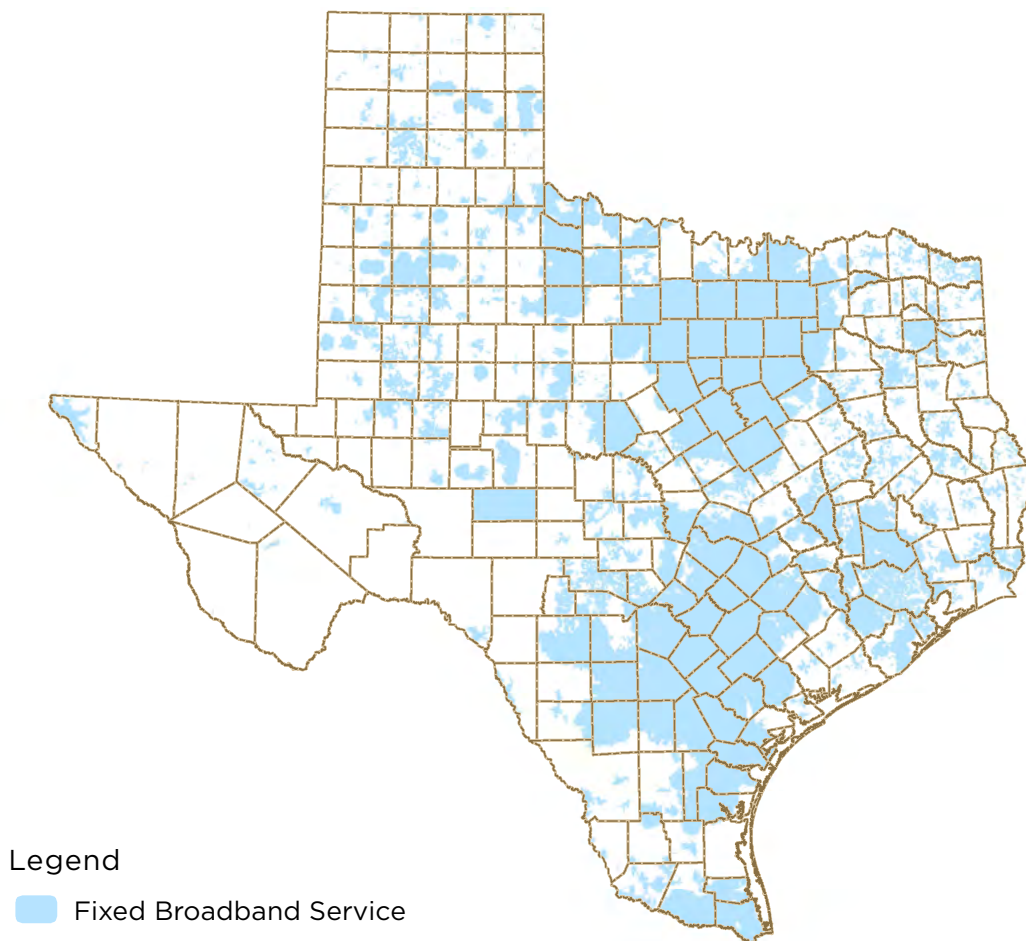


Figure 5



## Texas Broadband Service

Fixed Broadband at Least 25 Mbps Download/3 Mbps Upload



Published June 14, 2018

Data Source: FCC Form 477 Broadband Deployment  
Data as of December 31, 2016, released November 16, 2017.

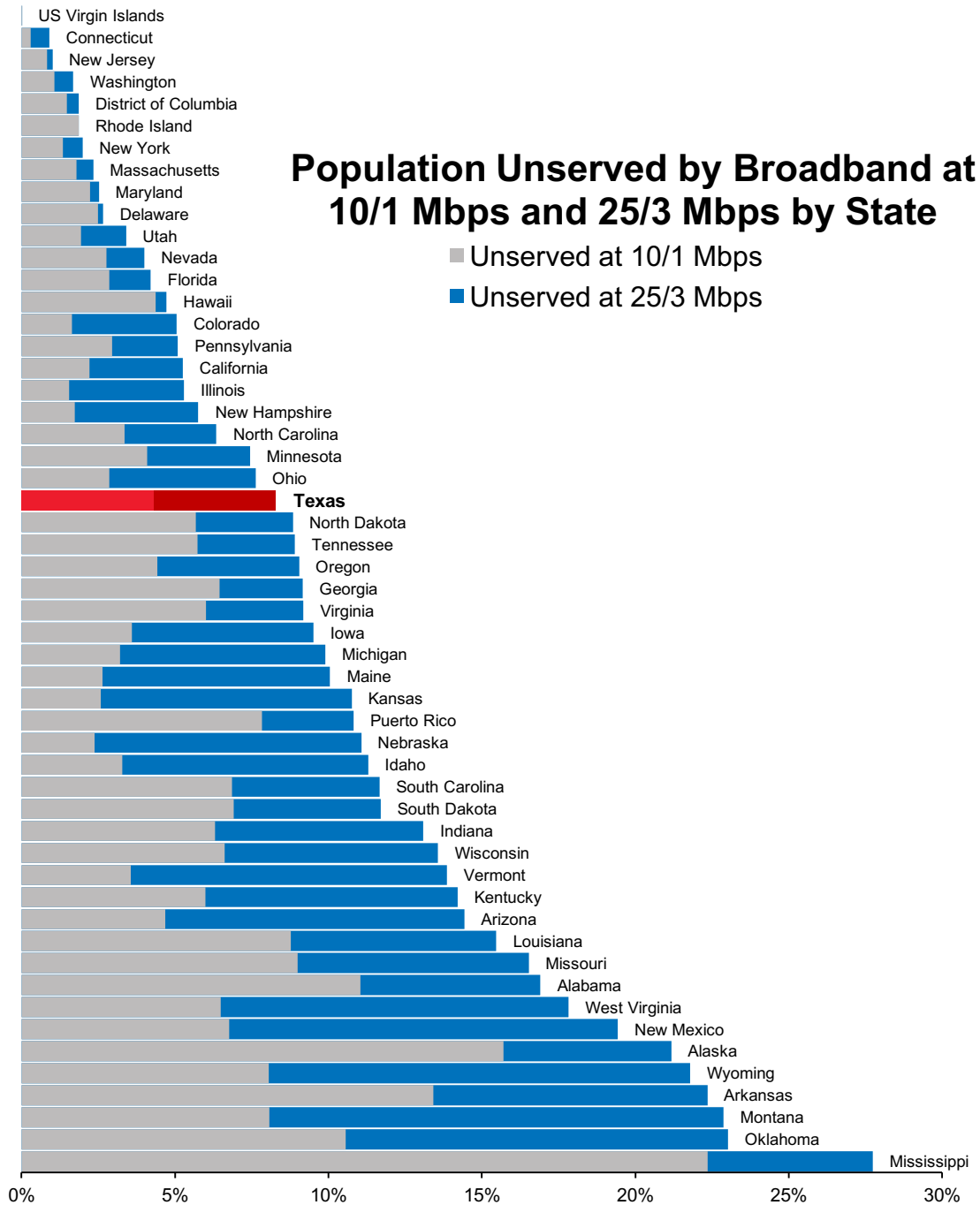
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# BRINGING BROADBAND TO RURAL TEXAS



To put Texas' broadband availability in perspective, the following chart shows the population availability of 10/1 Mbps and 25/3 Mbps broadband across the country. Texas ranks 23<sup>rd</sup> among other states and territories for broadband availability at 25/3 Mbps.

Figure 6



# BRINGING BROADBAND TO RURAL TEXAS

## Broadband Competition

Broadband service deployment, advancements, and upgrades typically respond to market forces. Internet connectivity can be delivered via several technology platforms, and ISPs offering service via these platforms often compete with each other in areas with high household density. This competition wanes, however, as household density decreases in rural areas due to a smaller, more dispersed market. Increased competition typically equates to more service options and greater affordability for consumers. The table provides the estimated number of residents that have access to only one fixed, terrestrial broadband provider at 10/1 Mbps and 25/3 Mbps. As shown, nearly one-quarter of Texas residents have access to only one broadband provider offering speeds of at least 25/3 Mbps (does not include those without service at the listed speed).

Table 2: Estimated Population in Texas with Access to Only One Fixed, Terrestrial Broadband Provider by Speed Tier		
Download/Upload Speed	Population with Only One Provider	Percent of Population with Only One Provider
At Least 10 Mbps/1 Mbps	4,470,000	16.1%
At Least 25 Mbps/3 Mbps	6,580,000	23.7%

ISPs offering cable internet do not typically compete directly with other cable companies to provide service. Similarly, DSL companies do not typically compete with one another; however, cable and DSL companies do compete for customers. Fiber and fixed wireless companies often compete with each other, as well as with cable and DSL, as they are not typically anchored or enclosed by political or other boundary types.

## Broadband Adoption

Broadband adoption is a different issue from broadband access. While access refers to one's physical connection to the internet, broadband adoption is the choice made by a resident, business, or institution to embrace and use broadband and its related technologies. Broadband adoption cannot occur without having access to high-speed infrastructure. However, even with access to the internet, broadband adoption may not follow. Several studies have shown that even with access to broadband, residents, businesses and institutions may not adopt.<sup>20</sup> Barriers to adoption can often include cost (of either a device used to connect or the cost of the connection itself), lack of relevance to the user, or lack of digital literacy (knowledge and skills associated with the use of digital hardware or software). Lack of broadband infrastructure availability is also cited as a barrier.

The broadband adoption gap (the difference between the number of entities with access to broadband and the number of those same entities that actually subscribe to it) can

<sup>20</sup> "Broadband Infrastructure Alone Does Not Bridge the Digital Divide," *National Digital Inclusion Alliance*, 2017. See also, "Home Broadband 2015," *Pew Research Center*, 2015. Also, "Broadband Adoption Rates and Gaps in US Metropolitan Areas," *Brookings Foundation*, 2015.

# BRINGING BROADBAND TO RURAL TEXAS



increase or decrease depending on the demographics of a community or region. For example, low-income populations tend to have lower adoption rates than those with higher incomes. This same disparity can be found between age cohorts, geographies, employment status, educational levels, etc. However, regardless of socioeconomic status, demographic composition or geographic location, every person should have the opportunity to participate in the digital economy.

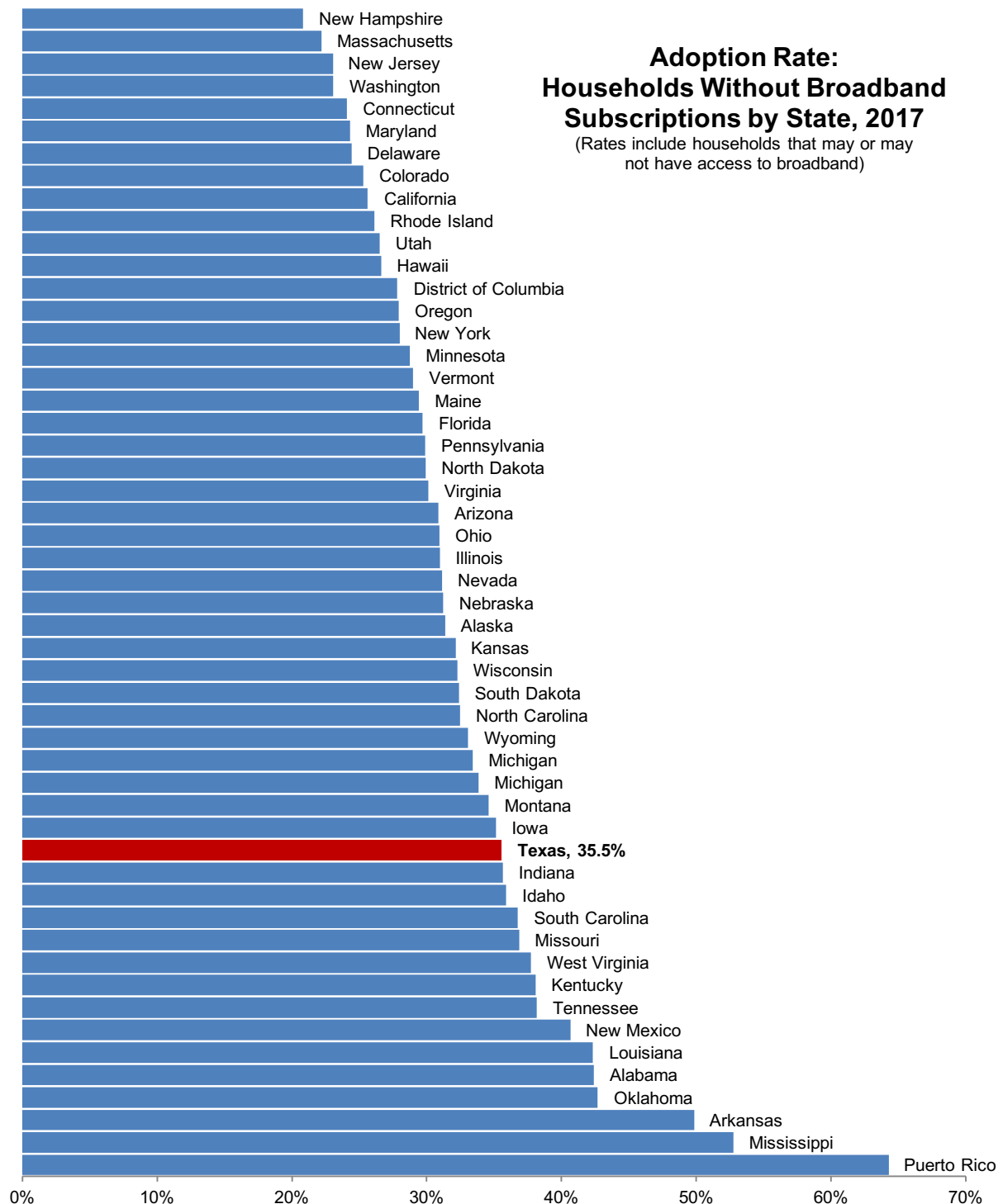
According to the 2017 United States American Community Survey from the U.S. Census Bureau, 35.5% of Texas households do not subscribe to fixed, terrestrial broadband service such as DSL, cable, fixed wireless or fiber.<sup>21</sup> This rate includes households that may or may not have access to broadband connectivity. This places Texas 38<sup>th</sup> in broadband adoption among other states and territories (compared in the following chart).

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<sup>21</sup> [https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17\\_1YR/S2801/0400000US48](https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_1YR/S2801/0400000US48)

# BRINGING BROADBAND TO RURAL TEXAS

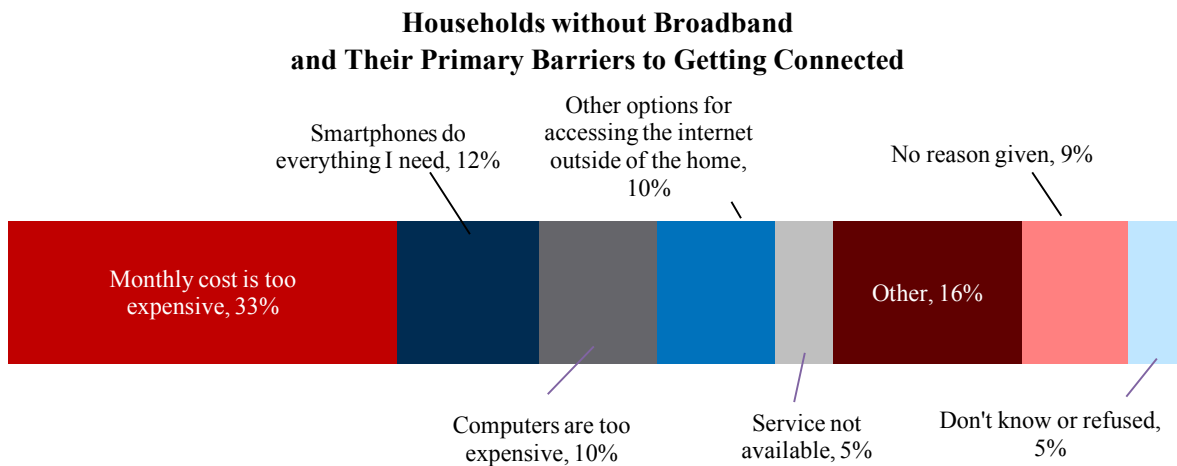
Figure 7



# BRINGING BROADBAND TO RURAL TEXAS

Non-adopting households cite several reasons for their lack of connectivity; however, households with lower annual income typically struggle the most to connect. The following chart provides information from a Pew Research Center<sup>22</sup> study designed to capture the barriers experienced by households that do not have a broadband connection.

**Figure 8**



The monthly cost of a broadband subscription is the primary barrier to adoption for one-third of currently disconnected households. Other non-adopters say the cost of a computer is prohibitive to obtaining service, while others feel that having a smartphone provides them with all the connectivity they need. The lack of a home internet connection disproportionately impacts low-income households across the state and country.

## Federal Investment in Texas

A number of federal programs have invested in broadband access in Texas over the last several years and are expected to continue funding efforts aimed at improving the state's broadband landscape. One such program is the FCC's Universal Service Fund (USF)<sup>23</sup>, which works to implement the principle that all Americans should have access to communications services, or "universal service." The FCC established four programs within the USF including: Connect America Fund, Lifeline, Schools and Libraries (E-rate), and Rural Health Care.

The Connect America Fund (CAF)<sup>24</sup> aims to connect unserved Americans by offering subsidies for broadband infrastructure buildout to communities without access to high-speed internet. The most recent Phase II of the CAF offered subsidies to five Texas broadband providers – AT&T,

<sup>22</sup> <http://www.pewinternet.org/2015/12/21/3-barriers-to-broadband-adoption-cost-is-now-a-substantial-challenge-for-many-non-users/>

<sup>23</sup> <https://www.fcc.gov/general/universal-service>

<sup>24</sup> <https://www.fcc.gov/general/connect-america-fund-caf>



# BRINGING BROADBAND TO RURAL TEXAS



CenturyLink, Consolidated Communications, Verizon and Windstream – to build out broadband at a minimum of 10 Mbps/1 Mbps to 212,492 households and businesses through the end of 2020. The total federal investment to connect these entities is \$93,131,882 in annual support.

Connect America Fund Phase II offered price cap carriers build-out subsidies in areas deemed eligible. In 2015, these carriers who accepted the offerings committed to complete network deployment to 60% of impacted homes and businesses by the end of 2018, with future benchmarks of 80% by the end of 2019, and 100% by the end of 2020.

Additionally, 14 of Texas' rate-of-return carriers accepted \$38.1 million annually to connect an additional 43,151 locations through the FCC's Alternative Connect America Cost Model (A-CAM).

In early 2018, the FCC announced the final census blocks and block groups eligible for the CAF Phase II Auction.<sup>25</sup> The auction was held in late July 2018, and in Texas, four winning bidders will receive \$82,420,436 to serve 35,933 currently disconnected locations. The national total for winning bids represents \$1.488 billion in broadband subsidies. Providers are required to build out to 40% of assigned homes and businesses within three years of becoming authorized to receive CAF II funding. Buildout must increase by 20% each year following and complete buildout is required by the end of the sixth year.

Accounting for current broadband coverage areas along with the subsidized areas committed for future buildout, the following map shows the state in the years to come. Even with significant investment, however, rural Texas needs more broadband.

**Figure 9**

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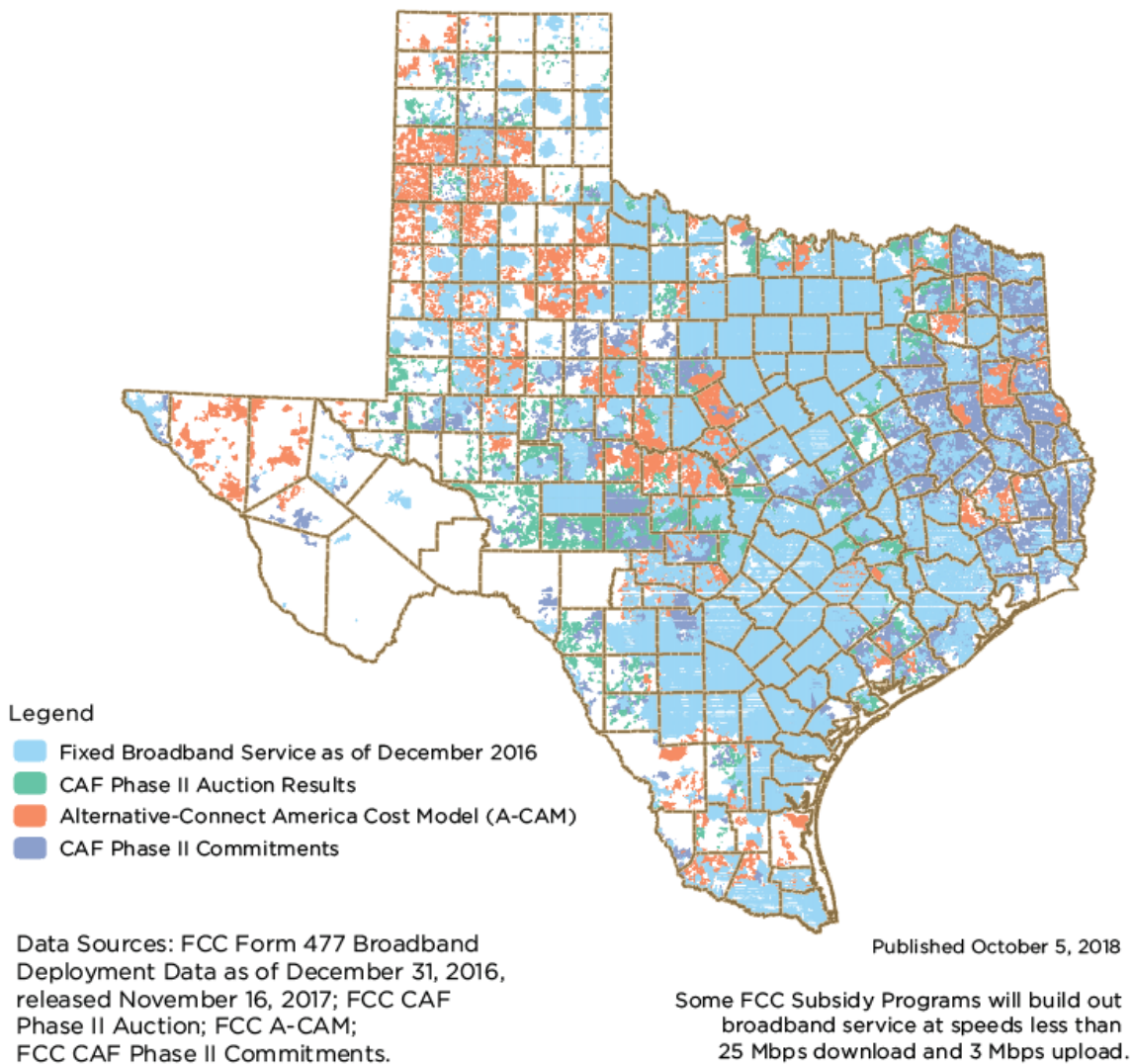
<sup>25</sup> <https://www.fcc.gov/auction/903>

# BRINGING BROADBAND TO RURAL TEXAS



## Texas Broadband Service

Fixed Broadband at Least 25 Mbps Download/3 Mbps Upload  
FCC Subsidy Program Areas



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## IV. Listening Tour Feedback and Recommendations

Rural Texas needs better broadband, and to begin to solve connectivity challenges, Connected Nation and various stakeholders met to examine and propose solutions to the broadband issues that plague local communities. In each meeting, CN presented a series of broadband project recommendations and then asked each group the following questions:

- Do these recommendation areas address your issues for broadband access and adoption in unserved and underserved areas? If not, what other areas should be addressed?
- From your perspective, what issues do you see with the current programs that offer grants and other financial instruments? What level of difficulty are you experiencing when researching this source? What level of difficulty are you experiencing while requesting these sources of funding?
- From your perspective, or that of your organization, what is your highest priority to improve broadband access and adoption?
- Locally, regionally or at a state/federal-level, what can others do to improve broadband access and adoption?
- What can you or your organization do to be an active partner in the solution to improve broadband access and adoption?

The following issues were identified by Listening Tour attendees as key concerns in their communities:

### Broadband Planning

Rural communities identified a number of issues aimed at broadband planning. Prioritizing such planning efforts, including data collection, mapping and state leadership, is vital to increasing internet access in the state. Local leaders cited the following planning needs:

#### State Leadership

While there is a strong interest and willingness to tackle the broadband issues by both the regional and local leaders, there is a general consensus that the state of Texas needs to create a central office to coordinate key broadband activities and policies. Such an office would act as a clearinghouse in disseminating information about federal, state and private broadband programs to communities.

Many local leaders, due to time and staffing constraints, are unable to stay abreast of the constantly moving pieces of federal policy around technology such as frequent FCC Notices and Orders, Congressional hearings, and White House reports. As an example, during all the Listening Tour meetings, the subject of the FCC's Connect America Fund was discussed and maps were presented showing the areas being funded for broadband expansion in unserved areas. In each meeting, numerous attendees were

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



unaware that this significant subsidy program existed and that the broadband buildout commitments had been launched in their area.

## *Recommendation*

**Establish a Texas Broadband Office or entity that would serve as a key point of contact for all things broadband in the state, including broadband mapping, federal policy, local opportunities for broadband grants, and more.** The central broadband office would serve as a neutral one-stop shop for state-specific broadband supply-and-demand information, correlating broadband data and research to federal and state policy opportunities, and create an environment to accelerate broadband initiatives across multiple private sectors and public functions. The office would proactively engage stakeholders and community leaders with regular broadband updates and insights to ensure that local and state initiatives incorporate impending policy changes and optimize state and federal resources to advance the communications infrastructure necessary to support the well-being of rural communities.

## **Availability of Grant Funding Information**

There are a number of grants offered through federal and state entities or private foundations and companies that could be used to support broadband-related programs and infrastructure; however, communities often find it difficult to research these opportunities and identify a contact person to answer questions. Rural communities also typically lack the capacity to complete a lengthy and cumbersome application process. As a result, despite communities having a dire need for improved broadband, thousands of dollars in resources are being left on the table.

To discuss the challenges of pursuing valuable grant resources, Connected Nation facilitated a funding discussion in each Listening Tour meeting as well as held two Focus Group meetings with public and private groups who offer funding or resources that could be used to support potential broadband projects.

Through these meetings, a number of possible solutions were determined:

- Provide expertise and on-the-ground, local support to help navigate grants, programs, fact-gathering, and application process information. Use the information to educate stakeholders on the opportunities and benefits as in workshops and other training formats.
- Establish a central communication point for public and private entities to get accurate information and register questions, opportunities and issues with state-level coordination of all broadband policies and projects across sectors to optimize results.
- Examine policies that help or hinder Texas broadband expansion.
- Develop a Texas-specific broadband funding guide.
- Identify local champions to help guide grant applications and pursue opportunities.
- Leverage existing communication channels and community partners to build awareness of programs and resources.
- Examine local interests or concerns that help Texas broadband expansion. For example, public safety may be a significant concern in a community and thus serve

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



- as a central motivation to pursue resilient and reliable telecommunication services that can be leveraged across sectors in the community.
- Ensure equitable distribution of program resources.
- Provide access to online training and resources.

## *Recommendation*

**Develop a centralized resource to build awareness for and easily identify funding and resources for potential broadband projects.** As a component of the Listening Tour project, CN has been incorporating all of the feedback and recommendations in order to create a comprehensive broadband funding guide. The funding guide will provide an overview of available grants, eligible locations, eligible entities, and links to applications and guidelines.

## **Broadband Mapping**

Effective planning begins with complete and accurate data. The current national process for collecting, processing and publishing broadband data does not allow for the level of granularity, timeliness or validation to serve as an effective and efficient resource for broadband planning activities. With conflicting information on whether or not there is sufficient infrastructure ready to support vibrant broadband connections in communities, many leaders struggle to plan, pursue solutions and engage in productive discussions with service providers. Many leaders therefore identified that they would like to have accurate maps of broadband availability, speeds and infrastructure. They would like maps of fiber-optic networks, vertical assets that could be used to support expansion, and areas with future build-out commitments. Accurate broadband mapping would allow local leaders to confidently identify areas that need greater service, competition and reliability of high-speed internet.

## *Recommendation*

**Collect and validate statewide broadband data on an annual basis for the production and publication of a Texas map of broadband assets.** The map would be more current, accurate and granular than any maps available under the existing national mapping process to better support rural areas in particular. The maps would include broadband services available by speed and technology type, density of broadband providers (competition), density of unserved households, federally subsidized expansion areas, FCC registered communications towers and more. The maps would be publicly available to all and community feedback on broadband coverage would be highly encouraged to support further data refinements. Having complete and accurate data would allow community leaders to plan more effectively and confidently and serve as a highly credible data source to substantiate need in funding and resource pursuits. The data, on a longer-term basis, may also serve to inform the efficacy of or need for federal and state policies designed to stimulate rural broadband expansion.



# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



## Broadband Planning and Community Technology Action Plans

Throughout the Listening Tour, a key theme that resonated in the meetings was the need for not only broadband availability and infrastructure mapping, but also for the development of plans and specific action items that seek to address those issues hindering the expansion of broadband in the community. Many leaders recognize that local, multisector planning efforts can prepare a community for broadband improvements and plan for future technology needs. An issue, however, is formalizing the process in a way that fully engages multisector stakeholders and results in a comprehensive plan.

Some local leaders have taken steps to assess their current state of technology readiness. For example, in September, the Upton County Broadband Committee completed a six-month study on their broadband and related technologies across the county. The study resulted in a Technology Action Plan that outlined their technology assets and recommendations for increased access, adoption and use of broadband.<sup>26</sup>

### *Recommendation*

**Facilitate community broadband planning to assess broadband access, adoption and use, and to develop a clear set of recommendations, specific to the community, for advancing technology readiness.** A program such as Connected Nation's Connected Community Engagement process would greatly benefit Texas communities looking to further plan for their technology future.<sup>27</sup> Through the process, communities would be able to gauge where they stand in relation to similar communities and national benchmarks and develop a succinct plan to close the gaps. Communities would be able to leverage the assessment and plan to develop public-private partnerships and pursue federal and state funding to effectuate their plan.

## E-rate and Lack of Dedicated Support for Applications

While Texas has 10.7% of the nation's K-12 students,<sup>28</sup> it is only realizing 8% of E-rate program distributions<sup>29</sup> — underperforming by at least 25 percentage points, and likely leaving more than \$37.7 million in funding on the table every year<sup>30</sup> and potentially millions more in one-time fiber special construction funding. To improve the use of available funds, communities indicated a need for dedicated support staff to ensure that E-rate applications are filed in a timely and accurate manner. Oftentimes, rural schools and libraries simply do not have the resources to go through the process to apply for funds. Support for developing quality E-rate applications would ensure that Texas is

<sup>26</sup> <http://connectmycommunity.org/project-view/upgrading-mccamey-texas-the-connected-plan-that-help-lead-to-positive-change/>

<sup>27</sup> <http://connectmycommunity.org/>

<sup>28</sup> <sup>1</sup> Source: NCES 2017 estimate of students in public K-12 schools.

<sup>29</sup> <sup>2</sup> [https://nces.ed.gov/programs/digest/d16/tables/dt16\\_203.20.asp?current=yes](https://nces.ed.gov/programs/digest/d16/tables/dt16_203.20.asp?current=yes)

<sup>30</sup> <sup>2</sup> Source: E-Rate Central 2018 (latest commitment wave): <https://tools.e-ratecentral.com/us/stateInformation.asp?state=TX>

<sup>30</sup> <sup>3</sup> 2.7% \* the total distribution commitment of \$1.397m committed to schools, school districts, and consortia (Source: USAC. <https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear/2018>)



# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



maximizing its opportunity to access the federal funding available for both fiber construction and internal networks and on-campus Wi-Fi connections.

E-rate funds are allocated based on a discount matrix that is predominantly commensurate with the percentage of students eligible for the National School Lunch Program. For example, a rural school district with 30% of students qualifying for free and reduced lunch would be eligible for a 60% discount whereas a district with 80% of students qualifying for free and reduced lunch would be eligible for a 90% discount. In some cases, the 10% cost of fiber connectivity remains too significant of a cost burden for schools or libraries to bear. In an effort to optimize the use of E-rate funds and overcome such cases, the state appropriated \$25,000,000 to school districts and charters for qualifying special construction school projects under the state match provision.<sup>31</sup> Under this provision, the FCC would provide an additional discount up to 10% of the broadband build, matching the state dollar for dollar. A similar appropriation was provided the Texas State Library and Archives Commission to distribute \$1,000,000 to leverage high-speed broadband to and within public libraries.<sup>32</sup> In summary, coordination of federal and state funding and resources can go a long way to incentivize local pursuit of broadband projects.

## *Recommendation*

**Leverage state match and provide application assistance in order for Texas schools and libraries to take full advantage of the federal funding available to them for technology.** To do so, community leaders may benefit from a state E-rate coordinator or consultant to assist with applications, information gathering, consolidated reporting and more.

## Broadband Access

### Fiber Infrastructure and Broadband Access

Fiber infrastructure is often lacking in rural communities where demand for high-speed internet is low due to lack of population density. Without incentives or effective planning, many rural leaders have no recourse to stimulate the infrastructure investment needed to bring broadband to their community.

Several community leaders in rural Texas shared the concern that the lack of broadband infrastructure is the number one deterrent to economic growth in the community. The Brazos Valley Council of Governments (BVCOG), for example, identified that the fiber optic network in the community was not capable of supplying the necessary backhaul to the region's broadband network. Under the direction of the BVCOG Board of Directors, COG officials planned and designed two fiber rings within the region to supply backhaul to anchor institutions. To date, the BVCOG has nearly completed the first fiber ring.

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<sup>31</sup> [https://tea.texas.gov/Academics/Learning\\_Support\\_and\\_Programs/Technology\\_Planning/Classroom\\_Connectivity/Texas\\_State\\_Match\\_Fund\\_FAQ](https://tea.texas.gov/Academics/Learning_Support_and_Programs/Technology_Planning/Classroom_Connectivity/Texas_State_Match_Fund_FAQ)

<sup>32</sup> <https://capitol.texas.gov/tlodocs/85R/billtext/pdf/SB00001F.pdf#navpanes=0>

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



## *Recommendation*

**Establish broadband partnerships to help address some of the access challenges facing Texas.** Partnerships can bridge the gap by bringing multiple assets together to successfully expand broadband access and adoption. A partnership between entities of all types – public, private and nonprofit – can address economic challenges by sharing capital costs and enhancing revenue potential. Through partnerships, communities can aggregate demand for broadband service among residents, businesses and community anchor institutions. The state may consider developing tools to aggregate this demand, which could include, but are not limited to, model survey instruments, educational materials, etc. Demand aggregation can help build a business case for expansion and improve return on investment. Community partnerships should also work to identify public and private assets that could be leveraged to decrease capital costs for deployment.

## **School Connectivity and the Homework Gap**

Rural leaders shared concerns regarding the existence of a homework gap in Texas and how this gap has serious life-long implications not only for students, but also for communities. Large percentages of rural and low-income students are unable to access the digital tools necessary to succeed in and outside of the classroom, resulting in an uneven playing field, further contributing to the digital divide.

As a result, closing the homework gap is a top priority for many of the leaders of rural Texas communities. In many of the areas examined, access to fixed broadband is either limited or nonexistent, leaving large segments of the student population relying on satellite or mobile internet service for homework. Worse, many students are forced to sit in the library parking lot after hours to complete homework on the library's Wi-Fi network, as was reported in Lufkin.

A number of the schools in rural Texas are implementing one-to-one initiatives, but the lack of access to broadband service, and in some cases the cost of broadband service, is inhibiting the implementation of digital teaching and learning platforms.

## *Recommendation*

**Conduct a parent survey study to analyze home broadband access as well as commercial LTE service availability from major providers across the community.** While E-rate dollars can help to alleviate some of the costs associated with connecting schools, currently, this funding can only be used to provide connectivity *to* and *within* schools. However, once a student leaves school grounds, their access to broadband is limited. With some schools across the country offering mobile devices for students to take home for homework use, understanding how students can currently access fixed and mobile broadband will help schools plan for one-to-one device deployments that benefit the most students possible.

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



## Vertical Asset Inventory

Many community leaders recognize that, within their communities, they have physical assets that can be used to facilitate broadband deployment. Such assets may include towers, water or agricultural siloes, and grain elevators that can be used for the placement of wireless communications equipment. The issue is that there is no comprehensive inventory of these vertical assets and their attributes such as height, ownership, access to power, etc. Several rural areas are therefore working with local fixed wireless providers to identify publicly and privately owned vertical structures for deployment of fixed wireless broadband networks. Fixed wireless broadband services are capable of reaching connection speeds defined by the FCC and tend to serve as a cost-effective option for providing internet service in rural, less densely populated areas.

## *Recommendation*

**Conduct an inventory of vertical assets to encourage placement of fixed wireless technology to connect unserved communities.** Following the inventory, an area map of the available structures and heights is recommended followed by outreach and planning meetings with potential fixed wireless providers.

## Broadband Adoption and Use

### Broadband Adoption

Broadband adoption refers to the rate at which citizens use the technology that is available in a community. Non-adopting households cite several reasons for their lack of connectivity. As previously stated, 33% of Americans who do not currently have broadband service at home cite high monthly broadband subscription costs as a barrier to adoption. Other reasons for a lack of adoption may be due to a lack of digital skills or high costs of a home computer. Overall, Texas ranks 38<sup>th</sup> in broadband adoption among other states and territories.

Local leaders expressed concern for low broadband adoption levels, particularly as it applies to certain population groups such as seniors, and identified that increasing such adoption was important for their community. Improving broadband adoption also supports additional infrastructure deployment as a boost in demand often requires an increase in supply. To help citizens participate in an increasingly digital economy, some communities are offering training programs through libraries, nonprofits and small-business centers. In Midland, for example, the Small Business Development Center trains local businesses on website development and social media marketing to increase meaningful use of technologies to improve the local economy.

## *Recommendation*

**Develop a broadband adoption campaign that would offer training classes through entities such as libraries and nonprofits on how to use technology while also providing information on low-cost broadband options.** By tackling digital literacy and internet cost issues, communities can assist citizens in being active

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



participants in a digital world, increasing their access to healthcare information, job prospects, education and more.

## **Cybersecurity**

Listening Tour attendees cited a need for cybersecurity training for their local residents and small businesses. There are a number of risks inherently associated with performing financial transactions, sharing information and interacting online. These risks, however, should not create a barrier to bringing the benefits of broadband to residents and business. Offering education on how to safely use the internet, facilitate financial transactions, and communicate with customers will encourage greater and more effective use of the technologies available.

## *Recommendation*

**Develop partnerships to identify, prioritize, and offer cybersecurity training and resources for both residents and businesses.** Communities and the state should encourage cybersecurity training for local residents and businesses by working with libraries and other entities to host and teach valuable online security skills.

## **Emergency Services**

Network reliability is a primary concern for a number of local leaders looking to maintain and improve the safety of their communities. In the aftermath of Hurricane Harvey, many leaders recognize reliable access to broadband is vital for Texas' fire, police, EMS and other public safety personnel to respond to emergencies. With high-speed internet and corresponding technologies, emergency services personnel can respond faster and more accurately to citizens before, during and after emergencies. In September 2017, Texas opted in to a nationwide, interoperable broadband network for public safety established under the First Responder Network Authority (FirstNet). FirstNet was established by the U.S. Congress in 2012 to address national public safety communications challenges such as those experienced during the 9/11 terrorist attacks. FirstNet, in partnership with AT&T, will ultimately build, operate and maintain a highly secure, resilient wireless broadband communications network for Texas' public safety community. Network buildout is underway with an expectation to complete network infrastructure by 2020.

## *Recommendation*

**Coordinate with FirstNet and the Texas Department of Public Safety to identify opportunities to expedite deployment and communicate critical gaps as the network is being built.** Other potential solutions proposed include applying for a U.S. Economic Development Administration (EDA) planning grant that develops a map of the existing fiber-optic network in the region in order to identify critical gaps. Knowing where the issues lie will help in ensuring a fiber-optic network with redundancy to avoid downtime for local emergency services.

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



## Telemedicine

Telemedicine is the use of telecommunication and information technology such as broadband to provide clinical healthcare from a distance. It has been used to overcome distance barriers and to improve access to medical services that would often not be consistently available in distant, rural communities. Due to the loss of several rural hospitals and health clinics, telemedicine is likely the biggest need in the Texas Panhandle, which represents 26,000 square miles. Residents often need to travel over 90 miles to see a doctor. Many minor health issues can be handled in a quick and inexpensive manner if a robust telemedicine network were available in the Panhandle region and other rural parts of the state. The NTCA Rural Broadband Association estimates that rural telehealth generates a median travel cost savings of \$18,914 annually per facility in Texas. The U.S. median savings is estimated to be \$5,718 per year per facility. Similarly, rural telehealth is estimated to generate a median hospital cost savings of \$20,841 annually per facility in the U.S. In Texas, the median hospital cost savings is estimated to be \$86,747 per year per facility.

Telemedicine could help reduce the costs of healthcare when treating prisoners as well. When a prisoner gets a minor ailment, for example, it requires at least two officers to transport that prisoner to a doctor (in some cases over great distances for some rural communities). This situation creates a large expense to the local government and removes two officers from their duties during that time period of transporting the prisoner, therefore reducing the community's police protection.

Due to this struggle with healthcare access in rural Texas, leaders are looking to telemedicine as an answer to a large problem plaguing communities. Rural leaders indicated a significant need for telemedicine. Solving the lack of reliable and affordable broadband in their communities could make telemedicine a reality.

## Recommendation

**Identify areas and facilities with insufficient connectivity to support telemedicine applications and develop education and training programs on the benefits and use of telemedicine applications.** Communities can work to leverage digital medical resources and ensure sick patients have the tools they need to seek care from even the most rural of homes.

## Teleworking Opportunities

Many rural Texas leaders indicated the need to improve job opportunities, keep youth in the communities, and attract new residents seeking a rural way of life. In order to do so, communities will need to offer sufficient connectivity and an environment that is friendly to teleworking. A study from the U.S. Bureau of Labor Statistics indicates that 40% of the workforce will be technology-based remote teleworkers and independent contractors by 2020. Moreover, 79% of job seekers report they used the internet to look for jobs in the prior 24 months, making it the top search option, even above networking through friends

# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



and family. One-third of those job seekers said that the internet was their most valuable resource in finding a job.<sup>33</sup> Without robust broadband connectivity, communities will have a difficult time improving job opportunities.

Teleworkers typically save between \$2,000 and \$7,000 in transportation and work-related costs and gain back the equivalent of 2-3 weeks' worth of free time that they would have otherwise spent commuting each year.<sup>34</sup> These time and cost savings coupled with the quality of rural life make a powerful combination in retaining and attracting an in-demand workforce. The city of Marfa, for example, has attracted teleworkers from urban areas looking to live in a more rural setting. A critical component of this process was developing a community technology action plan. Following the plan, Marfa leaders were able to work with Big Bend Telephone to build a fiber-to-the-home network in the city that invigorated local business and made available the connectivity to support telework.

## *Recommendation*

**Develop programs that support and train residents for remote, technology-based jobs and encourage employers to offer telework options.** For example, Connected Nation's Digital Works program connects residents with online training courses and companies that lack a physical presence in the community. The Digital Works program creates jobs in areas facing high unemployment by leveraging broadband technology for call centers and IT outsourcing. The program provides an avenue for communities to create a job incubator, retaining and upskilling workers in the area and attracting corporate jobs while providing a pathway for improving a worker's competitive advantage in the 21st-century workforce with specified coursework and training.

## **Smart Farming**

Local leaders reported they are looking to bolster the region's economy and create a more positive environment for advanced agriculture programs by promoting "smart farming" technologies. Smart farming allows farmers and ranchers to use precision agricultural to inform decisions impacting the amount of fertilizer a farmer needs, the amount of water required to sustain crops, and the amount and type of herbicides or pesticides the farmer may need to apply, among other things. Precision agriculture helps farmers use broadband connectivity to achieve optimal yield, lower environmental impact and maximize profits, according to the American Farm Bureau.<sup>35</sup>

Often on farmland, however, broadband access is lacking. The American Farm Bureau states that "farmers and ranchers depend on broadband (fixed and mobile) just as they rely on highways, railways and waterways to ship food, fuel and fiber across the country and around the world. Many of the latest yield maximizing farming techniques require broadband connections for data collection and analysis performed both on the farm and

<sup>33</sup> *Searching for Work in the Digital Era*, Pew Research Center, November 2015.

<sup>34</sup> Global Workplace Analytics 2017 State of Telecommuting in the U.S.

<sup>35</sup> <https://www.fb.org/issues/technology/broadband>



# LISTENING TOUR FEEDBACK AND RECOMMENDATIONS



in remote data centers.” For these reasons, enhanced broadband for farmers is vital for a number of the rural communities CN visited during the Listening Tour.<sup>36</sup>

## *Recommendation*

**Facilitate local discussion sessions to train and inform farmers on smart farming benefits and uses as well as identify local barriers to adopting smart farming technologies.** By working with the local agricultural sector to increase the use of precision agriculture and smart farming practices, communities can come together to maximize farm production and better understand the needs of the local farming community.

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<sup>36</sup> <https://www.regulations.gov/document?D=RUS-18-TELECOM-0004-0181>

A man and a woman are looking at a tablet together. The man is wearing a cap and a denim shirt, and the woman is wearing a plaid shirt. They are both smiling. The image has a blue tint and a red diagonal overlay in the bottom right corner.

04

# CONCLUSION

## V. Conclusion

Increasing broadband access, adoption and use is critical to Texas communities. By improving access to broadband, rural areas can increase economic activity, advance access to healthcare, provide educational opportunities, and allow for more efficient delivery of services. As stated above, broadband has the power to grow local economies. In one study, income grew faster and unemployment grew slower in rural counties with home internet adoption rates higher than 60%. Another study showed small businesses with websites had higher annual revenues and were more likely to have recently hired than businesses without a website. Students are able to complete their homework without sitting in a library parking lot for Wi-Fi access, as was shared at a Listening Tour in Lufkin, and farmers may experience significant increases in farm revenue with smart farming opportunities.

These benefits are well understood by Texas' communities, and during the Listening Tour and Focus Group meetings, local leaders were vocal, dedicated and passionate about making their regions more connected. Improving access to technology is complex and ever-changing due to the nature of the telecommunications industry and rapid advances in technology; however, through proper planning, education and partnerships, Texas can work to connect even its most rural of citizens.

## Appendix 1: About Connected Nation

Connected Nation is a leading technology organization committed to bringing affordable high-speed Internet and broadband-enabled resources to all Americans. Headquartered in Bowling Green, Kentucky, Connected Nation has operated programs in more than 30 states and was the largest single grantee under the United States Department of Commerce’s State Broadband Initiative (SBI) grant program—managing more than \$50 million in grant-funded broadband mapping and planning projects in 2009-2015.

From 2009–2015, Connected Nation operated the Connected Texas program as part of the SBI program. Through this program, Connected Nation was commissioned to collect data from over 200 national and local Texas broadband providers and almost 18,000 Texas Community Anchor Institutions. Connected Texas also engaged over 4,000 state and local stakeholders in facilitating community level technology planning. During this time period, CN also received 680 “broadband inquiries” coming from residents, business owners, and other stakeholders regarding their broadband issues in the state.

Today, Connected Nation’s mission continues to be focused on improving lives by providing innovative solutions that expand the access, adoption, and use of high-speed internet to all people. Through its projects, Connected Nation effectively raises the awareness of the value of broadband-related technologies by developing coalitions of influencers and enablers for improving technology access, adoption, and use. Connected Nation works with consumers, community leaders, states, technology providers, and foundations to develop and implement technology expansion programs with core competencies centered on a mission to improve digital inclusion for people and places previously underserved and overlooked.

Everyone belongs in a Connected Nation. For more information on Connected Nation, please visit [www.connectednation.org](http://www.connectednation.org).