

BROADBAND IN TEXAS

A Briefing Prepared for the
Governor's Broadband
Development Council

April 2020



**CONNECTED
NATIONSM**

Texas



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01

OVERVIEW & INTRODUCTION

01 Overview and Introduction

Purpose

Today, the success of a state has become dependent on how well it is connected to the global economy and how those connections are leveraged to improve the quality of life for its residents, the sustainability and growth of its businesses, the delivery of services from its many and varied institutions, and the overall economic development of its communities. As noted in the National Broadband Plan, broadband internet is “a foundation for economic growth, job creation, global competitiveness, and a better way of life.”

It has been noted that it is becoming increasingly difficult in the growing e-commerce economy to conduct various forms of business transactions without internet connectivity. Concerns have been raised that a lack of proper broadband connectivity in rural areas of Texas has left many residents at a disadvantage compared to other areas of the state, leaving rural Texans at risk of being left behind. With the establishment of the Governor’s Broadband Development Council (Council) through HB 1960 86(R), Governor Abbott and the legislature have taken a bold step toward a more connected Texas.

The purpose of this document is to provide the Council members with a comprehensive briefing on the current state of broadband in Texas, federal initiatives impacting the state and the industry, and a summary of related activity in other states around the country. This briefing is intended to offer readers a basic understanding of the broadband industry in the state and of the many federal and state efforts to expand broadband. This information will provide a foundation to allow Council members to fulfill its statutory requirements.

The briefing is divided into three primary sections:

1. The state of broadband in Texas
2. Federal broadband initiatives and programs
3. Broadband efforts in other states

The data and information in this briefing are presented with minimal exposition and analysis to provide readers with facts and a reference guide to better inform the decision-making process of developing the Council’s annual report and recommendations.

About Connected Nation and Connected Nation Texas

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). CN, through its Connected Nation Texas (CN Texas) efforts, has been working to address broadband and technology challenges in Texas since 2009. CN Texas partnered with the Texas Department of Agriculture and was commissioned to collect data from over 200 national and local Texas broadband providers and almost 18,000 Texas community anchor institutions over the subsequent five years. CN Texas also engaged over 4,000 state and local stakeholders in facilitating community level technology planning.

During the period between 2009 through 2015, CN Texas received 680 “broadband inquiries” coming from residents, business owners, and other stakeholders. The inquiries were all commonly related to

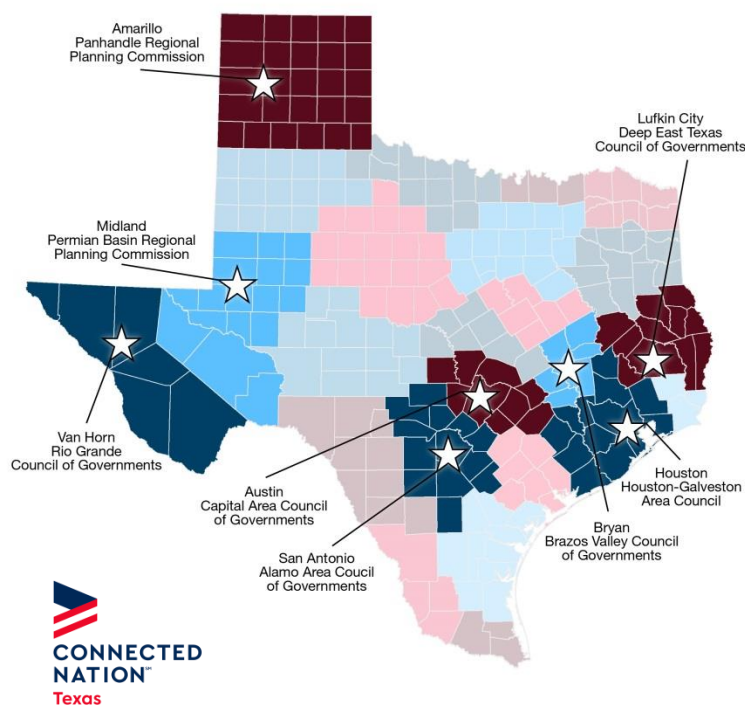
broadband issues, with most inquiries coming from rural communities. Since that active project period, CN continued to receive inquiries with increasing regularity. Inquiries ranged in scope and interest, but the desperate need for broadband technology in unserved areas of the state was consistent throughout.

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, CN Texas 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 and under-applying for funds and resources that can be used for broadband technology projects
- Develop and share a state resource guide that could 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 Texas coordinated 12 Listening Tours with 10 councils of government or planning regions across the state of Texas.

Listening Tour Locations



The Listening Tours were intended to welcome feedback from stakeholders representing multiple sectors throughout each region. In addition to the Listening Tours, CN Texas 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. 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. Read more about these issues and solutions in [Rural Broadband: A Texas Tour](#).

CN Texas is supported by its parent nonprofit organization, Connected Nation. Connected Nation (CN) has over 19 years of experience providing strategic consulting and advisory services at the federal, state, and local community levels in order to accelerate and expand broadband access. CN's strategic consulting and advisory services provide a multi-discipline view of the broadband landscape by providing broadband and telecommunications research, policy insights, mapping, engineering, and federal, state, and local strategic planning services.

CN has experience and a process to inform and develop a comprehensive plan with measurable outcomes that is representative of stakeholders from multiple sectors. Evidence of state-level engagement and comprehensive plan development includes the production of the [Nevada State Broadband Action Plan](#) and [Puerto Rico's Gigabit Island Plan](#). In every planning process, CN works with state stakeholders to develop a holistic view of the broadband landscape that extends beyond broadband infrastructure and deployment to include the present and planned adoption and use of broadband among residents and businesses.

CN enjoys a well-informed policy staff that fully understands the telecommunications industry, drawing on years of experience working with states on broadband issues and having experience in Washington, both with the FCC and with our nation's legislators. This experience allows for robust development of policy and programs that can help pave a mutually-agreeable path toward greater availability and expansion of broadband services.

More information on Connected Nation can be found at: www.connectednation.org and Connected Nation Texas' website can be found at: www.connectednation.org/texas.

Access, Adoption, and Use

It is recognized that in order to fully participate in a digital economy, states and communities need to address not only the access/availability of broadband (supply), but also the ways in which it is adopted and used (demand) to create a truly digitally inclusive place. Wires and wireless signals are useless if they are not leveraged to improve civic engagement, accelerate community and economic development, retain families and youth, improve leadership, and develop human capital. CN Texas takes a comprehensive approach to broadband and technology development by addressing the access, adoption, and use of technology in a broad and deep manner.

Access

Broadband access refers to the infrastructure that enables a high-speed internet connection. Broadband is delivered to a user via several technology platforms including cable, digital subscriber line (DSL — through a phone line), fiber optics, fixed wireless, mobile wireless, and satellite. While these are currently the primary methods of delivery, new innovations and technologies are being developed that continue to improve the efficiency and speed of connectivity.

Broadband availability is essential infrastructure for 21st century communities. Broadband empowers a community to access applications ranging from health care and education to business and government services. Unfortunately, many places suffer from inequities of access on several fronts: between income levels; between urban and rural areas; between traditional business areas and non-traditional ones; and in differing levels of service due to geography or infrastructure limitations.

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. Barriers to adoption often include cost (of either a device used to connect or the cost of the connection itself), lack of relevance to the user, or a lack of digital literacy (knowledge and skills associated with the use of digital hardware or software).

The broadband adoption gap (the difference between the number of entities with access to broadband and the number of those same entities that subscribe to it) can increase or decrease depending on the demographics of a community. 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, physical locations, employment status, educational levels, etc. However, regardless of socioeconomic status, demographic composition, or geographic location, everyone should have the opportunity to participate in the digital economy.

Use

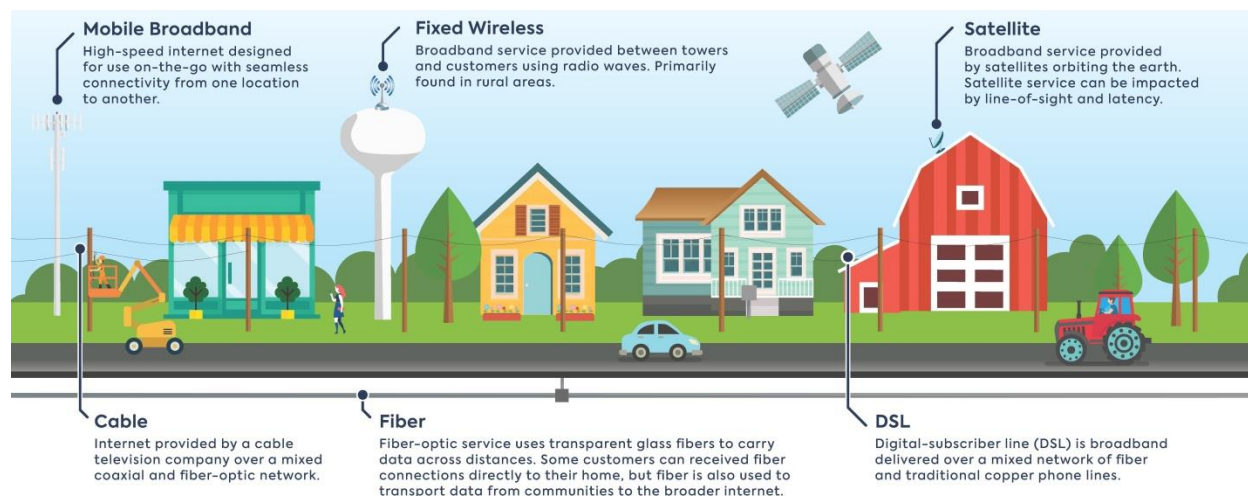
The access and adoption of internet technologies leads to the use of that connection and applications to improve the quality of life for residents, businesses, and communities. Technology impacts every sector of the economy and opportunities abound for residents, businesses, and institutions to leverage technology to make improvements in their day-to-day lives and operations.

The wellbeing of a community involves the complex interaction of several sectors including health care, K-12 and higher education, public safety, government, libraries, residents, private-sector businesses, and others. These distinct, yet entwined, sectors (and their many individual parts and entities) contribute to a state's place in the digital economy. As broadband and related technology have developed over time, applications pertinent to each of these sectors have been developed that allow them to function, provide services, generate revenue, and generally operate more efficiently, which impacts their contribution to the wellbeing of their community and state. The use of technology is critical to the impact these sectors have on the overall quality of life in a community.

While access, adoption, and use form a spectrum of sorts (i.e., one cannot adopt broadband without having access to it, and one cannot use broadband without adopting it), all three components are equally important for everyone to fully realize a digitally inclusive and digitally connected state.

Basic Definitions

Below are several definitions and explanations of broadband terms and concepts that are used frequently in the remainder of this document. A more extensive glossary is located in Appendix B.



Broadband: The term broadband commonly refers to high-speed internet access that is always on and faster than traditional dial-up access. Broadband includes several high-speed transmission technologies, such as fiber, wireless, satellite, digital subscriber line (DSL), and cable.

Fixed Broadband: High-speed data transmission to homes and businesses using technologies such as T1, cable, DSL, fiber, and fixed wireless. This category excludes mobile broadband and non-terrestrial services.

Mobile Broadband: A type of internet connection designed for “on-the-go” use, with seamless connectivity from one geographic location to the next. Examples of mobile broadband providers in Texas include, but are not limited to, AT&T, Verizon, T-Mobile, and Sprint, among others.

Cable Modem System: Cable television companies have offered internet access via their cable system for more than a decade. The network architecture uses a loop that connects each subscriber in a given neighborhood, meaning they all share one big connection to the internet. Examples of cable broadband providers in Texas include, but are not limited to, Charter, Comcast, Grande, Sparklight (formerly Cable One), and Suddenlink, among others.

DSL (Digital Subscriber Line): A form of technology that utilizes a two-wire copper telephone line to allow users to simultaneously connect to and operate the internet and the telephone network without disrupting either connection. Examples of DSL providers in Texas include, but are not limited to AT&T, CenturyLink, Earthlink, Frontier, and Windstream, among others.

FTTH or FTTP (Fiber to the Home or Fiber to the Premise): The delivery and connection of fiber optics directly to a home or building. Examples of fiber to the home broadband providers in Texas include, but are not limited to, AT&T Fiber, Frontier, and Google Fiber, among others.

OVERVIEW & INTRODUCTION



Fixed Wireless Broadband Access: The use of wireless devices or systems in connecting two fixed locations, such as offices or homes. Fixed wireless broadband providers in Texas include, but are not limited to, NextLink, Rise Broadband, VTX Communications, and TWN Communications, among others.



02

TEXAS'
BROADBAND
LANDSCAPE

02 Texas' Broadband Landscape

Introduction

The first step in addressing gaps in broadband access and adoption is to understand where broadband is available, who is using it, and what prevents others from subscribing to or using broadband service. To this end, CN Texas has mapped broadband access to residences, releasing statewide and county-level maps in January 2020. In addition, CN Texas has datasets from local surveys conducted as part of its Connected Communities program, as well as other publicly available data that show how Texas compares to its neighbors and the rest of the nation in terms of broadband adoption and usage.

A Note on Broadband Availability Data

Broadband providers are required to file with the FCC a list of census blocks covered by their services twice annually. Under this current census block methodology, if even one household in a given block is served, the entire block is marked as having service. In rural areas, these blocks can be extremely large, increasing the likelihood of overstatement of service in the very areas that need help the most. For example, nationally, there are more than 3,200 census blocks that are larger than the entire District of Columbia (68 square miles in area) and five blocks that are larger than the entire state of Connecticut (5,567 square miles in area). Secondly, broadband providers that do not have GIS (geographic information system) capabilities are not able to visualize the spreadsheet-based file of census block IDs being filed through the FCC's Form 477 process to ensure accuracy, resulting in overstated and/or understated coverage reporting. Thirdly, some providers are simply missing from the Form 477 dataset entirely. Lastly, fixed wireless coverage is also reported as full census blocks, instead of service areas developed from propagation modeling, as was produced during NTIA's State Broadband Initiative program (2010-2014). The FCC continues the problematic use of census blocks as the unit of measure for reporting, and thus accepts the well-established and inherent overstatement and understatement that such reporting yields.

CN Texas works to mitigate the census block issue in Texas by working directly with broadband providers to help refine their coverage areas and offer them an opportunity to provide more detailed information on the infrastructure availability. CN Texas employs a confidence methodology to identify areas that are likely to be overstated and attempt to work with providers in those areas to refine their coverage areas. However, there is no requirement for broadband providers to offer more granular data. Some broadband providers in Texas are more willing than others to offer more granular data or refine their coverage areas. Finally, CN Texas also conducts on-the-ground field validation of broadband coverage and wireless availability when possible. Drive testing and field validation offer an opportunity to reduce overstatement and create a more accurate map; however, this process is time and resource intensive. Data displayed in map form and as tabular data is developed from a combination of direct provider outreach and data collection, FCC Form 477 filings, and independent research conducted by CN Texas. As such, broadband availability at an exact address location cannot be guaranteed, and the aggregate household availability statistics are estimates made using the most up-to-date and accurate information available.

Texas Broadband Definitions

Broadband is defined by Utilities Code Sec. 181.048 as internet service with the capability of providing: (A) a download speed of 25 megabits per second or faster; and (B) an upload speed of three megabits

per second or faster. Broadband is also defined in Government Code Chapter 490H as a service that provides advanced telecommunications capability and internet access.

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 sets the benchmark for broadband as internet service with advertised speeds of at least 25 Mbps downstream and 3 Mbps upstream. By this definition, over half-a-million households in Texas currently lack access to broadband service.

Texas Statewide Broadband Availability Estimates by Speed Tier			
Among Fixed Technologies: Cable, DSL, Fiber, Fixed Wireless			
Speeds	Unserved Households	Served Households	Percent of Households Served
10 Mbps Download x 1 Mbps Upload	206,745	8,716,188	97.68%
25 Mbps Download x 3 Mbps Upload	516,060	8,406,873	94.22%
50 Mbps Download x 5 Mbps Upload	889,984	8,032,949	90.03%
100 Mbps Download x 10 Mbps Upload	1,314,967	7,607,966	85.26%

Please note these are preliminary estimates to be updated in July 2020.

The current FCC definition of broadband is a minimum speed of 25 Mbps download and 3 Mbps upload.

Help improve the maps: <https://connectednation.org/texas/feedback>

Source: Connected Nation Texas, January 2020.

Over 440,000 of the half-a-million households statewide that lack access to broadband service, or 86% of Texas households that lack broadband access, are rural.

RURAL Texas Statewide Broadband Availability Estimates by Speed Tier			
Among Fixed Technologies: Cable, DSL, Fiber, Fixed Wireless			
Speeds	Unserved Rural Households	Served Rural Households	Percent of Rural Households Served
10 Mbps Download x 1 Mbps Upload	146,960	2,759,663	94.94%
25 Mbps Download x 3 Mbps Upload	443,468	2,463,155	84.74%
50 Mbps Download x 5 Mbps Upload	756,157	2,150,466	73.99%
100 Mbps Download x 10 Mbps Upload	1,148,203	1,758,420	60.50%

Please note these are preliminary estimates to be updated in July 2020.

The current FCC definition of broadband is a minimum speed of 25 Mbps download and 3 Mbps upload.

Help improve the maps: <https://connectednation.org/texas/feedback>

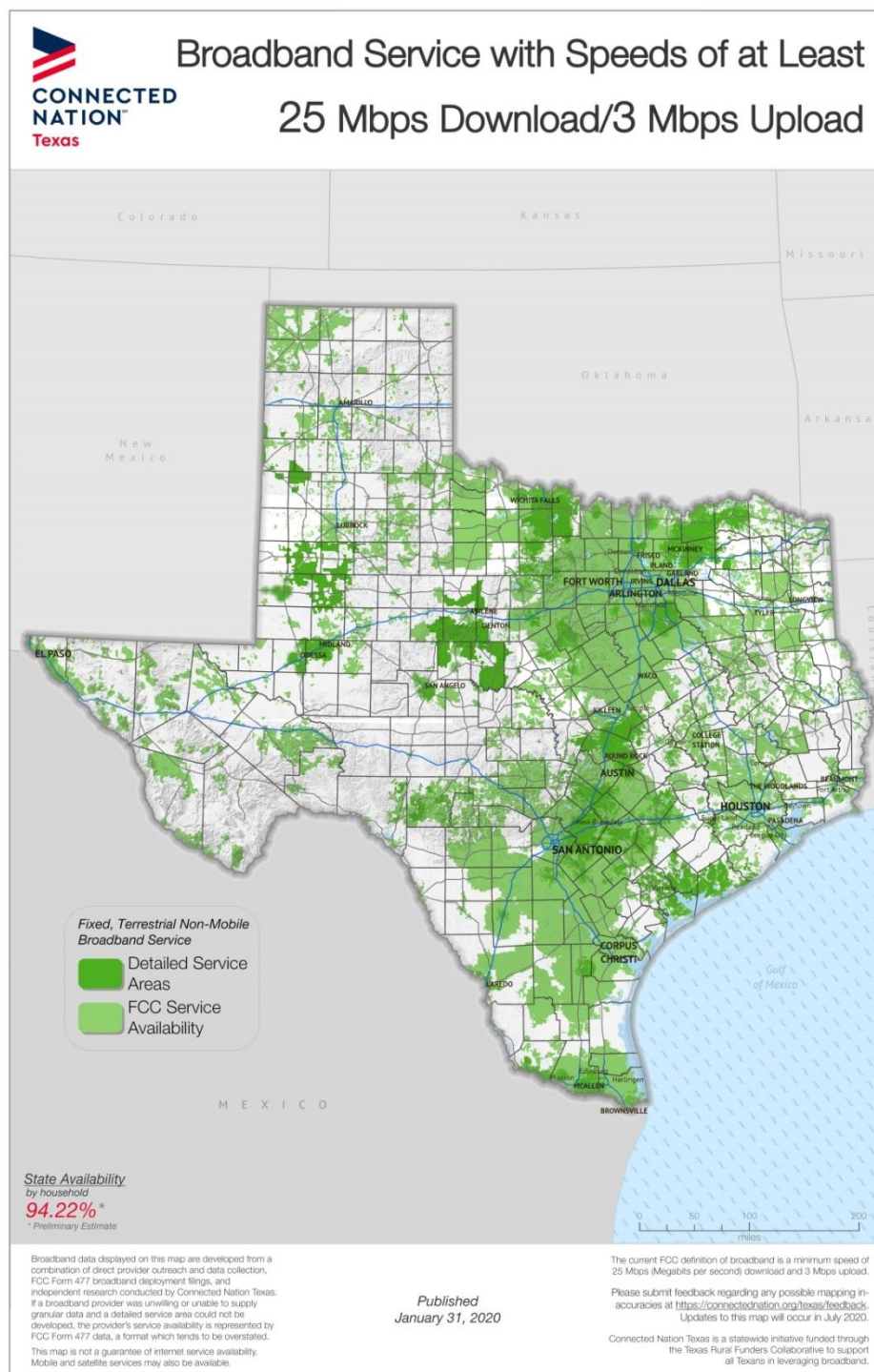
Source: Connected Nation Texas, January 2020.

Maps in this section provide information on Texas' broadband availability at the 25 Mbps downstream and 3 Mbps upstream speed tier, as well as the 10/1, 50/5, 100/50 Mbps speed tiers. Broadband data displayed on this map are developed from a combination of direct provider outreach and data collection, FCC Form 477 broadband deployment filings, and independent research conducted by Connected Nation Texas. If a broadband provider was unwilling or unable to supply granular data and a detailed service area could not be developed, the provider's service availability is represented by FCC Form 477 data, a format which tends to be overstated. This map is not a guarantee of internet service availability.

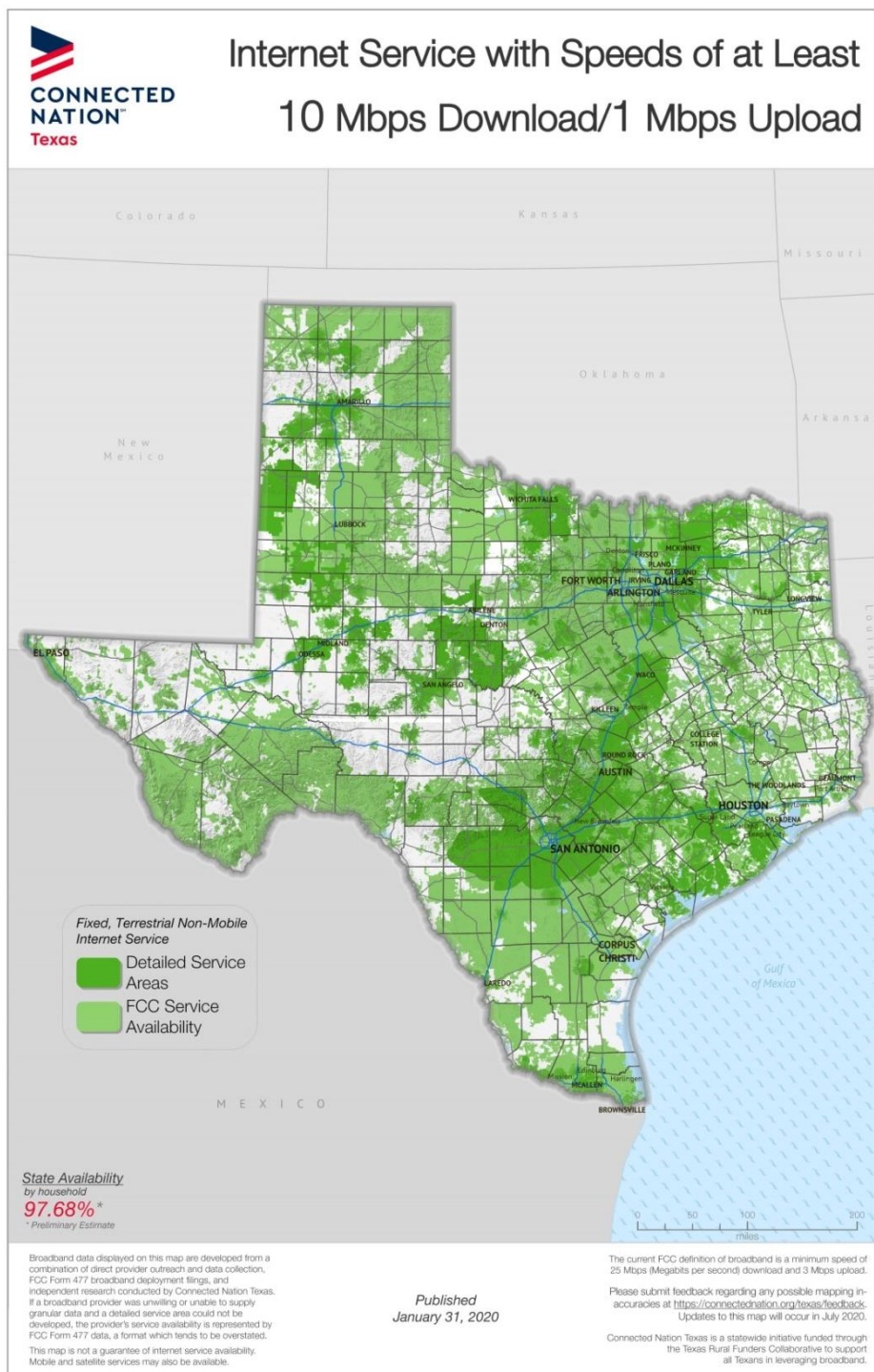
TEXAS' BROADBAND LANDSCAPE



Mobile and satellite services may also be available. Additionally, an interactive map of Texas' broadband availability is available online at: <http://map.connectednation.org/?map=tx>.

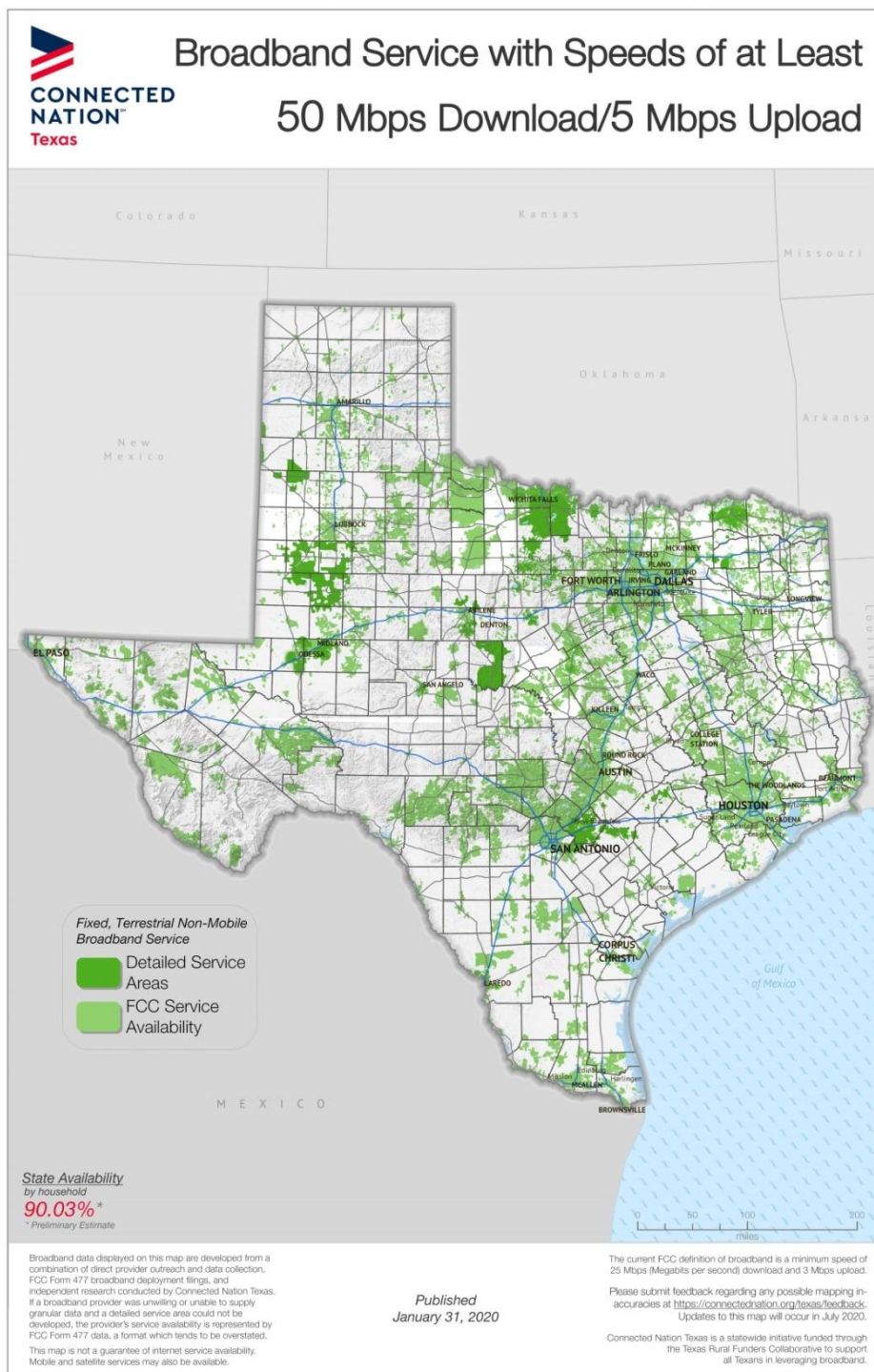


TEXAS' BROADBAND LANDSCAPE



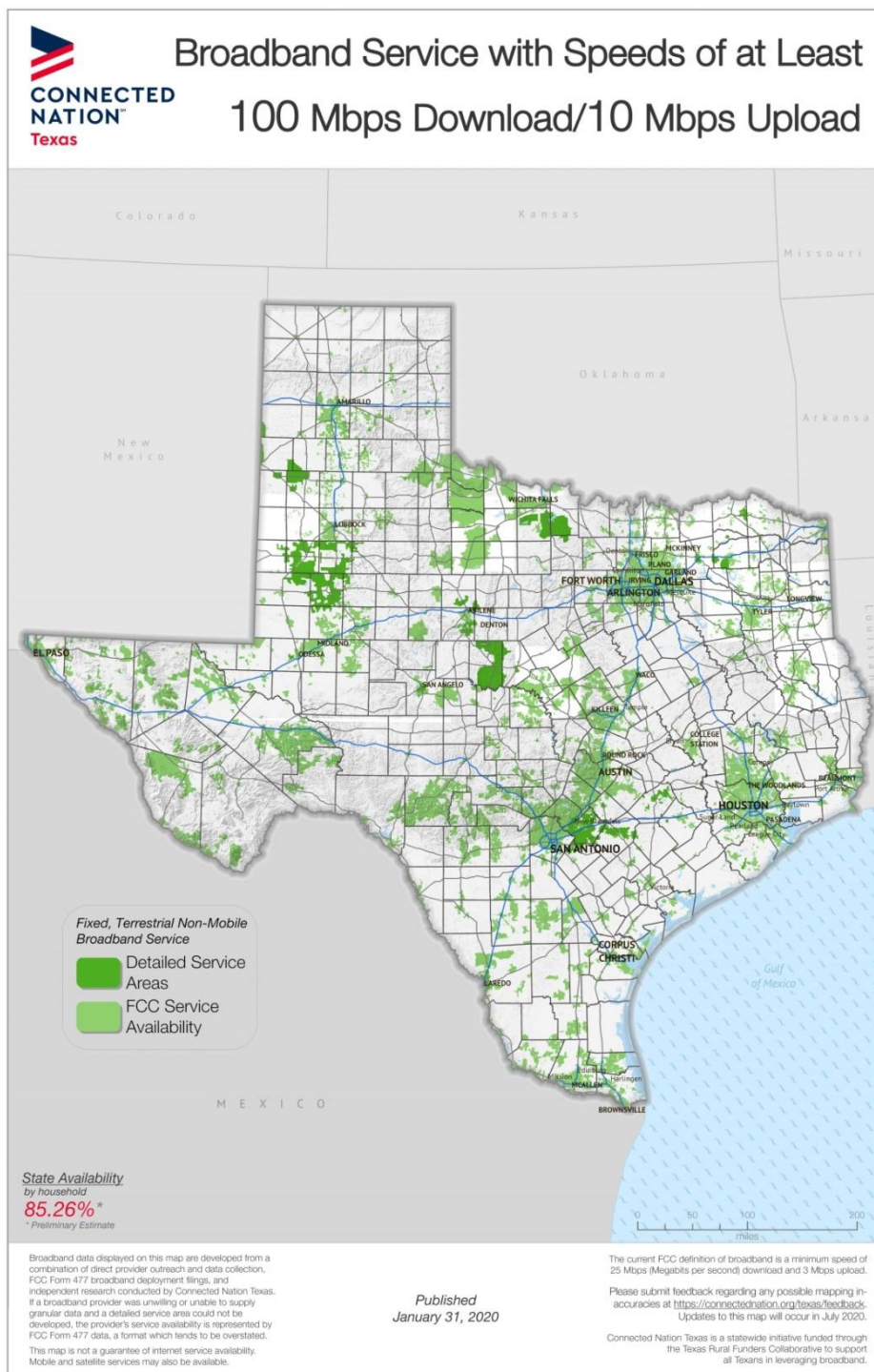
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TEXAS' BROADBAND LANDSCAPE



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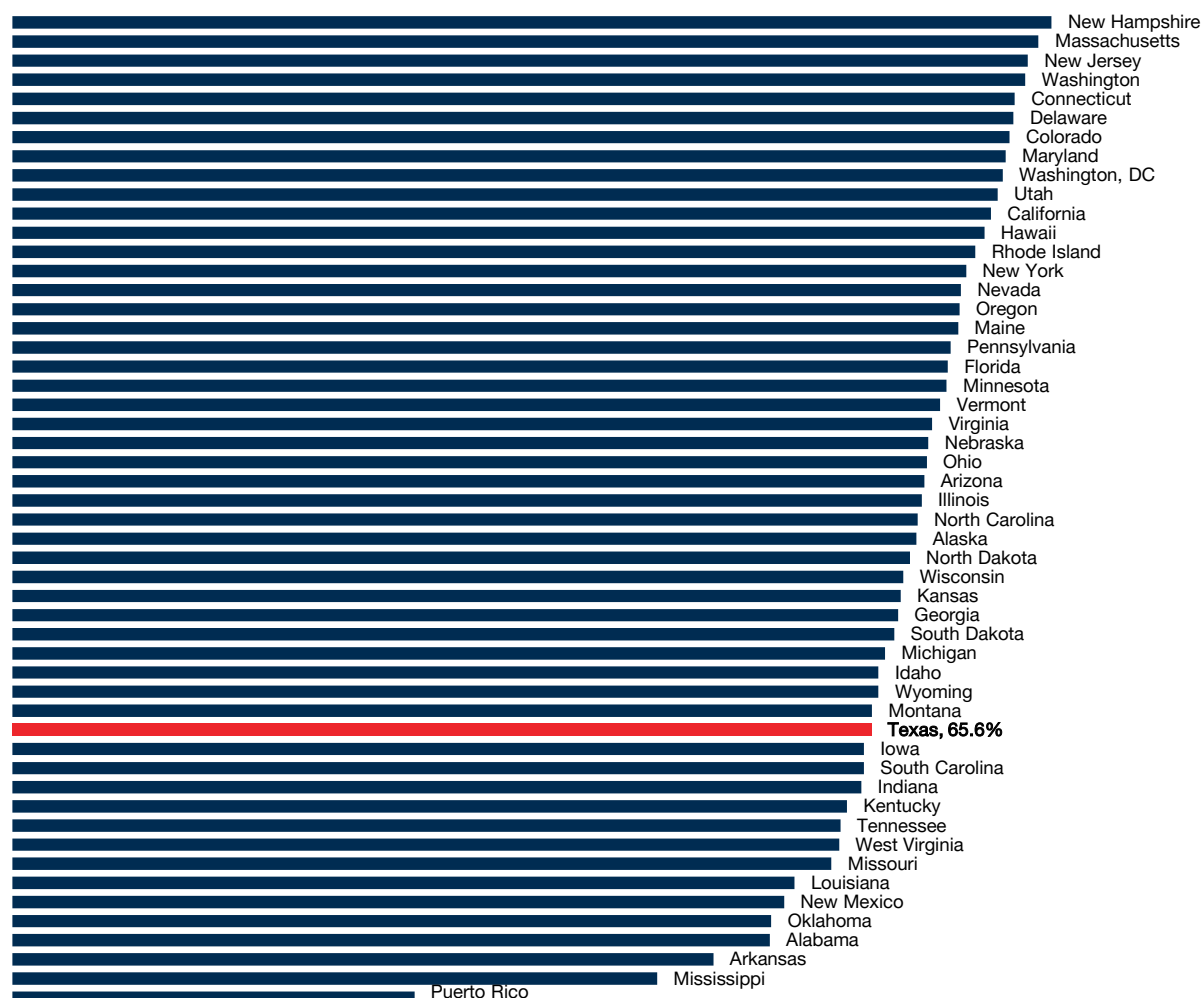
Internet Service Providers in Texas

Across the state, Texas households are served by an estimated 333 platform options offered by an estimated 228 different providers statewide, many of which offer services under a variety of business names or different platforms in different parts of the state (Appendix A). While many residents along the I-35 corridor and in urban areas across the state have access to a number of terrestrial internet service providers, the remainder of households often rely on fixed wireless, mobile hotspots, or satellite service.

Broadband Adoption and Usage

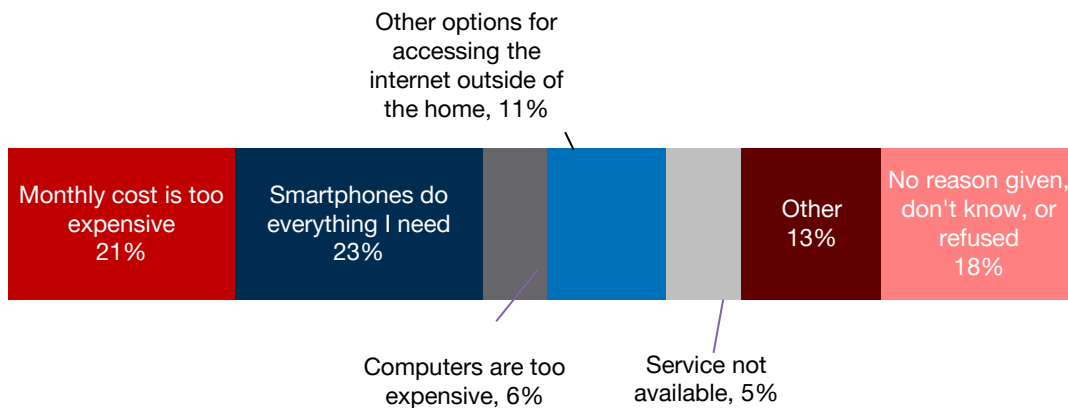
While more than nine out of 10 Texas households have access to broadband service, not all choose to subscribe. According to the 2018 American Community Survey from the United States Census Bureau, only 65.6% of Texas households subscribe to fixed broadband service such as DSL, cable, or fiber at home; this places Texas below the national average of 69.6% of households and at 38th in adoption behind California, New York, Florida, and 34 other states. Texas does, however, have a larger share of fixed broadband subscribers than any of its neighboring states.

Adoption Rate:
Households with Broadband Subscriptions by State, 2018
 (Rates include households that may or may not have access to broadband)

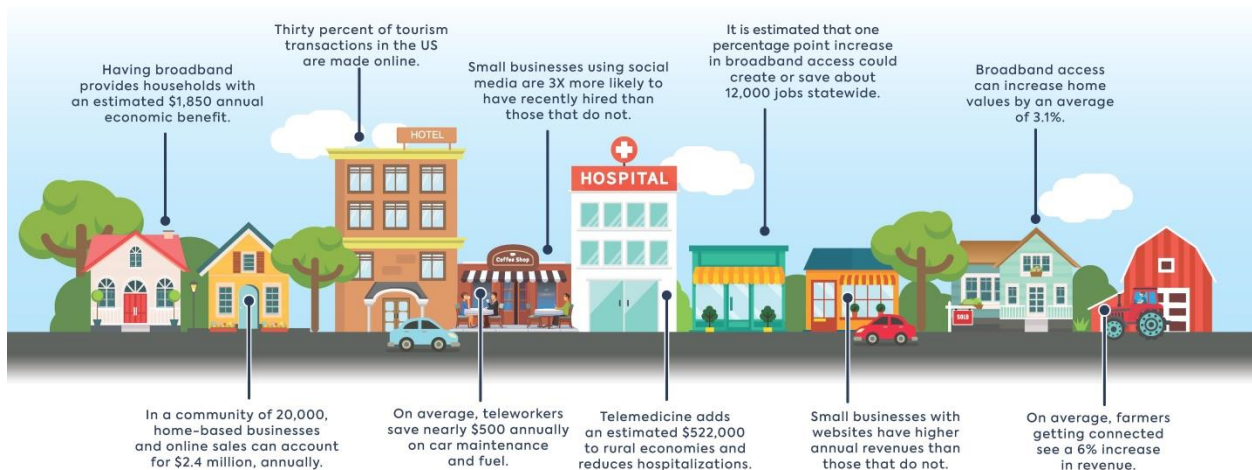


Non-adopting households cite several reasons for their lack of connectivity; however, households with lower annual income typically struggle the most to connect. The following chart provides information from a national Pew Research Center¹ study designed to capture the barriers experienced by households that do not have a broadband connection.

Households without Broadband and Their Primary Barriers to Getting Connected



The need for new technologies, broadband-enabled health care 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.² Moreover, these opportunities must be made available to all Texans equally.



¹ <https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/>

² <https://texas2036.org>

03

FEDERAL INITIATIVES & PROGRAMS



03 Federal Initiatives & Programs

Introduction

Connected Nation maintains a robust watchtower on broadband policy issues at the federal level. From regular policy briefs³ on key topics affecting stakeholders to general tracking and research on opportunities for rural development, the follow pages outline some of these issues that impact Texas.

United States Department of Agriculture

Rural eConnectivity Pilot Program (ReConnect)

[ReConnect](#) offers three types of funding options for broadband infrastructure to connect rural families, businesses, farms, ranches, schools, libraries, and public safety facilities to modern, high-speed internet. A rural area is eligible if it currently does not have sufficient access to broadband.

Grants, grant and loan combinations, and low-interest loans can be used for the following:

- Construction or improvement of buildings, land, and other facilities that are required to provide broadband service
- Reasonable pre-application expenses
- Acquisition and improvement of an existing system that is currently providing insufficient broadband service (eligible for 100 percent loan requests only)
- Terrestrial-based facilities that support the provision of satellite broadband service

Eligible applicants include most state and local governments, federally recognized tribes, commercial/internet service providers, nonprofits, small businesses, rural recipients, electric utilities and co-ops, and financial institutions.

\$550,000,000 is available in FY2020 and award amounts are limited as follows:

- 100 Percent Grant
 - Up to \$200,000,000 is available for grants. The maximum amount that can be requested in an application is \$25,000,000.
- 50 Percent Loan/50 Percent Grant
 - Up to \$200,000,000 is available for loan/grant combinations. The maximum amount that can be requested in an application is \$25,000,000 for the loan and \$25,000,000 for the grant. Loan and grant amounts will always be equal.
- 100 Percent Loan
 - Up to \$200,000,000 is available for loans. The maximum amount that can be requested in an application is \$50,000,000.

Community Connect Grants

The USDA's [Community Connect Grants](#) helps fund broadband deployment into rural communities where it is not yet economically viable for private-sector providers to deliver service. Rural areas that lack any existing broadband speed of at least 10 Mbps downstream and 1 Mbps upstream are eligible.

³ <https://connectednation.org/policy-research/>

The funds may be used for the following:

- The construction, acquisition, or leasing of facilities, spectrum, land or buildings used to deploy broadband service for:
 - all residential and business customers located within the Proposed Funded Service Area (PFSA)
 - all participating critical community facilities (such as public schools, fire stations, and public libraries)
- The cost of providing broadband service free of charge to the critical community facilities for two years
- Less than 10% of the grant amount or up to \$150,000 may be used for the improvement, expansion, construction or acquisition of a community center that provides online access to the public

Eligible applicants include most state and local governments, federally recognized tribes, nonprofits, and for-profit corporations, and matching funds of at least 15% from non-federal sources are required and can be used for operating costs.

Distance Learning & Telemedicine Grants

The USDA's [Distance Learning and Telemedicine Grants](#) (DLT) help rural communities use the unique capabilities of telecommunications to connect to each other and to the world, overcoming the effects of remoteness and low population density. The program can link teachers and medical service providers in one area to students and patients in another.

Grant funds may be used for:

- Acquisition of eligible capital assets, such as:
 - Broadband transmission facilities
 - Audio, video and interactive video equipment
 - Terminal and data terminal equipment
 - Computer hardware, network components and software
 - Inside wiring and similar infrastructure that further DLT services
- Acquisition of instructional programming that is a capital asset
- Acquisition of technical assistance and instruction for using eligible equipment

Eligible applicants include most entities that provide education or health care through telecommunications, including: most state and local governmental entities, federally recognized tribes, nonprofits, for-profit businesses, or consortia of eligible entities. Applications are accepted through a competitive process, and applicants are required to provide a minimum 15% match. Awards can range from \$50,000 to \$1,000,000.

Farm Bill Broadband Loans & Loan Guarantees

The [Rural Broadband Access Loan and Loan Guarantee Program \(Broadband Program\)](#) furnishes loans and loan guarantees to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide service at the broadband lending speed in eligible rural areas.

Broadband loans provide funding on a technology-neutral basis for financing:

- The construction, improvement, and acquisition of facilities required to provide service at the broadband lending speed, including facilities required for providing other services through the same facilities;
- The cost of leasing facilities required to provide service at the broadband lending speed if such lease qualifies as a capital lease under Generally Accepted Accounting Principles (GAAP); and
- An acquisition, under certain circumstances and with restrictions.

To be eligible for a broadband loan, an applicant may be either a nonprofit or for-profit organization and must take one of the following forms: corporation LLC, cooperative or mutual organization, a state or local government, or Indian tribe or tribal organization.

Eligible area stipulations include:

- Proposed funded service areas must be completely contained within a rural area or composed of multiple rural areas.
- At least 15% of the households in the proposed funded service area are unserved.
- No part of the proposed funded service area has three or more “incumbent service providers.”
- No part of the proposed funded service area overlaps with the service area of current Rural Utilities Service (RUS) borrowers or the service areas of grantees that were funded by RUS.
- Communities where USDA RUS has previously provided funding for construction of broadband infrastructure may not be eligible.

Telecommunications Infrastructure Loans and Guarantees

The [Telecommunications Infrastructure Loans and Loan Guarantees program](#) provides financing for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas.

Eligible applicants include most entities that provide telecommunications in qualified rural areas including state and local governmental entities; federally recognized tribes; nonprofits, including cooperatives and limited dividend or mutual associations; and for-profit businesses (must be a corporation or limited liability company).

Eligible areas include:

- Rural areas and towns with a population of 5,000 or less
- Areas without telecommunications facilities or areas where the applicant is the recognized telecommunications provider are eligible

Funds may be used to finance broadband capable telecommunications service improvements, expansions, construction, acquisitions (in certain cases), and refinancing (in certain cases).

The types of loans available include:

- Cost-of-Money Loans are direct loans from USDA Rural Utilities Service;
- Loan Guarantees of up to 80% allow private lenders, including the Federal Financing Bank (FFB), to extend credit to qualified borrowers in rural areas; and
- Hardship Loans may be used, at the sole discretion of USDA Rural Utilities Service, to assist applicants in meeting financial feasibility requirements for applications to serve underserved areas.

Universal Service Fund

The Federal Communications Commission's (FCC) [Universal Service Fund \(USF\)](#) 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.

Connect America Fund

The [Connect America Fund \(CAF\)](#) (also known as the High-Cost Program) is designed to ensure that consumers in rural, insular, and high-cost areas have access to modern communications networks capable of providing voice and broadband service, both fixed and mobile, at rates that are reasonably comparable to those in urban areas. The program fulfills this universal service goal by allowing eligible carriers who serve these areas to recover some of their costs from the federal Universal Service Fund.

The Connect America Phase II auction ([Auction 903](#)) employed competitive bidding to allocate up to \$1.98 billion of support over 10 years. Auction 903 was the first commission auction to award ongoing high-cost universal service support through competitive bidding. The commission made eligible for Auction 903 high-cost census blocks in states where the price cap carriers declined an earlier offer of model-based support and other unserved areas nationwide (excluding NY, AK, PR, VI) that are not served by an unsubsidized service provider. Texas was awarded \$8,242,043.62 which was split between AMG Technology Investment Group LLC, Echo Wireless Broadband, Inc., Hilliary Communications Consortium, and Plains Internet, LLC to connect 35,933 locations.

Program	Total Support	Locations Served
CAF II Auction ⁴⁵	\$82,420,430/10 years	35,933
A-CAM II ⁶	\$305,458,060/10 years	23,424
A-CAM I ⁷	\$306,710,440/10 years	32,943
CAF II ⁸	\$558,791,292/6 years	212,492
Total Support	\$1,253,380,222	304,792

Lifeline

The [Lifeline program](#) provides a discount on phone and internet service for qualifying low-income consumers to ensure that all Americans have the opportunities and security that phone service brings. The Lifeline program is available to eligible low-income consumers in every state, territory, commonwealth, and on tribal lands.

On March 31, 2016, the commission adopted a comprehensive reform and modernization of the Lifeline program. In the 2016 Lifeline Modernization Order, the commission included broadband as an eligible

⁴ https://auctiondata.fcc.gov/public/projects/auction903/reports/total_assigned_by_state

⁵ <https://www.fcc.gov/reports-research/maps/caf-ii-auction-results-april-2019/>

⁶ <https://docs.fcc.gov/public/attachments/DOC-359224A1.pdf>

⁷ https://apps.fcc.gov/edocs_public/attachmatch/DA-17-99A1.pdf

⁸ https://apps.fcc.gov/edocs_public/attachmatch/DOC-335269A5.pdf

service. The FCC also set minimum service standards and established a National Eligibility Verifier to make independent subscriber eligibility determinations.

Lifeline provides a \$5.25 monthly discount on certain voice services and a \$9.25 monthly discount on certain broadband services. To participate in Lifeline, households must be at or below 135% of the federal poverty guidelines or participate in certain programs like SNAP and Medicaid.

Schools and Libraries (E-Rate)

The schools and libraries universal service support program, or the [E-rate program](#), helps schools and libraries to obtain affordable broadband.

According to the FCC, “Eligible schools, school districts and libraries may apply individually or as part of a consortium. Funding may be requested under two categories of service: category one services to a school or library (telecommunications, telecommunications services and internet access), and category two services that deliver internet access within schools and libraries (internal connections, basic maintenance of internal connections, and managed internal broadband services). Discounts for support depend on the level of poverty and whether the school or library is located in an urban or rural area. The discounts range from 20% to 90% of the costs of eligible services.”

The E-rate program has an annual cap of \$4.15 billion but is based on demand.

The 2014 E-rate Modernization Order set out “to maximize options for schools and libraries seeking to purchase high-speed broadband” and raised the spending cap. Other changes in 2014 included:

- Suspending the requirement that applicants seek funding for large upfront construction costs over several years, and allowing applicants to pay their share of one-time, up-front construction costs over multiple years.
- Equalizing the treatment of schools and libraries seeking support for dark fiber with those seeking support for lit fiber. Dark fiber leases allow the purchase of capacity without the service of transmitting data—lighting the fiber. Dark fiber can be an especially cost-effective option for smaller, rural districts.
- Allowing schools and libraries to build high-speed broadband facilities themselves when that is the most cost-effective option, subject to a number of safeguards.
- Providing an incentive for state support of last-mile broadband facilities through a match from E-rate of up to 10% of the cost of construction, with special consideration for tribal schools.
- Requiring carriers that receive subsidies from the universal service program for rural areas—called the High Cost program—to offer high-speed broadband to schools and libraries located in the subsidy area at rates reasonably comparable to similar services in urban areas.
- Increasing the certainty and predictability of funding for Wi-Fi by expanding the five-year budget approach to providing more equitable support for internal connections—known as category two—through funding year 2019.

Rural Health Care

The [Rural Health Care Program](#) provides funding to eligible health care providers (HCPs) for telecommunications and broadband services necessary for the provision of health care. The Program aims to “improve the quality of health care available to patients in rural communities by ensuring that eligible HCPs have access to telecommunications and broadband services.”

The Rural Health Care Program has an annual cap of \$571 million and is made up of two programs: the Healthcare Connect Fund and the Telecommunications Program.

Rural Digital Opportunity Fund

On August 1, 2019, the FCC adopted a Notice of Proposed Rulemaking (NPRM) proposing to establish the \$20.4 billion Rural Digital Opportunity Fund (RDOF) to bring high-speed fixed broadband service to rural homes and small businesses that lack it. On January 30, 2020, the commission adopted the [Rural Digital Opportunity Fund Report and Order](#), which establishes the framework for the RDOF, building on the success of the CAF Phase II auction by using reverse auctions in two phases.

The Phase I auction, which is scheduled to begin on October 22, 2020, will target over 6 million homes and businesses in census blocks that are entirely unserved by voice and broadband with download speeds of at least 25 Mbps. Phase II will cover locations in census blocks that are partially served, as well as locations not funded in Phase I. Up to \$16 billion will be made available for Phase I of the RDOF auction, and the remaining Phase I budget, along with \$4.4 billion, will be awarded for Phase II of the auction.

Eligible areas include:

- Census blocks where no provider is offering, or has committed to offering, either via the CAF II auction, the USDA ReConnect program, or state-specific programs, service of at least 25/3 Mbps

Other Federal Activity

FirstNet

The Middle Class Tax Relief and Job Creation Act of 2012 created the First Responder Network Authority, or FirstNet, which is tasked with ensuring the establishment of a nationwide interoperable public safety broadband network. According to the FCC, “the governor of each state may choose to have FirstNet build, operate, maintain, and improve the network within the state (opt-in) or it may choose to build, operate, maintain, and improve its own radio access network (RAN) within the state (opt-out), so long as the network is interoperable with FirstNet’s nationwide network and meets the criteria prescribed in the Act.”

In September 2017, FirstNet delivered buildout plans triggering a 90-day period for states and territories to decide whether to opt in or opt out. As of the December 28, 2017 deadline, no states or territories had chosen to opt-out, indicating that all 50 states and the District of Columbia will participate in the network.

AT&T won the 25-year contract to build and run FirstNet, and in February 2018, AT&T prioritized rural America, stating that rural areas are a key priority during every stage of the buildout and beyond. The buildout will take five years and there are rural coverage requirements throughout the process.

More information on Texas’ participation in FirstNet and related efforts can be found online here: [Texas Public Safety Broadband Program](#).

White House Infrastructure Plan

In February 2018, the White House released the much-anticipated \$1.5 trillion [Infrastructure Plan](#), which includes \$200 billion in federal funding over 10 years. The release of the plan ended months of speculation on what would be included, what funding levels the administration would call for, and what percentage of that funding would be federal. The 55-page document outlined a “roadmap for the Congress to draft and pass the most comprehensive infrastructure bill in our Nation’s history,” according to the White House release, and includes a series of grants and loans to improve America’s aging infrastructure.

The plan is comprised of several key areas, as follows:

- **Infrastructure Incentives Program** “would encourage increased state, local, and private investment in infrastructure. This program would provide for targeted federal investments, encourage innovation, streamline project delivery, and help transform the way infrastructure is designed, built, and maintained.”

Federal funding for this Program is cited as \$100 billion in the form of grants for “surface transportation and airports, passenger rail, ports and waterways, flood control, water supply, hydropower, water resources, drinking water facilities, wastewater facilities, stormwater facilities, and Brownfield and Superfund sites.”

- **Rural Infrastructure Program** “would provide for significant investment in rural infrastructure to address long-unmet needs. This investment is needed to spur prosperous rural economies, facilitate freight movement, improve access to reliable and affordable transportation options, and enhance health and safety for residents and businesses. Under this program, states would be incentivized to partner with local and private investments for completion and operation of rural infrastructure projects.”

The Rural Infrastructure Program is allotted \$50 billion in federal dollars, 80% of which would go to governors’ offices and 20% would be reserved for rural performance block grants. Eligible projects would include:

- Transportation: roads, bridges, public transit, rail, airports, and maritime and inland waterway ports.
- Broadband (and other high-speed data and communication conduits).
- Water and Waste: drinking water, wastewater, stormwater, land revitalization, and Brownfields.
- Power and Electric: governmental generation, transmission, and distribution facilities.
- Water Resources: flood risk management, water supply, and waterways.

In respect to distribution of funds, the plan calls for the creation of a “rural formula” calculation based on rural lane miles and rural population adjusted to reflect policy objectives.

- **Transformative Projects Program** “would provide federal funding and technical assistance for bold, innovative, and transformative infrastructure projects that could dramatically improve infrastructure. Funding under this program would be awarded on a competitive basis to projects that are likely to be commercially viable, but that possess unique technical and risk characteristics that otherwise deter private sector investment.” The plan states that applicants would aim to include “ambitious, exploratory, and ground-breaking project ideas that have significantly more risk than standard infrastructure projects but offer a much larger reward

profile.” The infrastructure sectors covered by this program could include transportation, clean water, drinking water, energy, commercial space, broadband sectors, and others.

Federal funding for the Transformative Projects Program would be set at \$20 billion.

- **Infrastructure Financing Programs** “would dedicate \$20 billion of the overall amount to advance major, complex infrastructure projects by increasing the capacity of existing federal credit programs to fund investments and by broadening the use of Private Activity Bonds (PABs).” Funding for these programs include \$14 billion for increasing the capacity of existing federal lending programs and \$6 billion for the expansion of PABs.
- **Other Details of the Plan:** The plan allows for the remaining \$10 billion in federal investment to go toward a Federal Capital Revolving Fund, which would serve to finance purchases of federally owned civilian real property. Additionally, the plan seeks to reduce permitting burdens by creating greater efficiencies and eliminating redundancies in a number of current processes. Lastly, the plan places a focus on workforce development by expanding access to education and workforce development programs (such as Pell grant eligibility), reforming career and technical education, strengthening ties to the workforce for college students (specifically through reforms to the Federal Work Study program), and reforming licensing requirements for individuals seeking a job on an infrastructure project.

Net Neutrality

In late 2017, the FCC approved a [Declaratory Ruling, Report and Order, and Order](#) to repeal Net Neutrality at the commission’s December Open Meeting.

Obama-era Net Neutrality rules, which went into effect on June 12, 2015, aimed to ensure consumers and businesses would have access to a fast, fair, and open internet. The two main components of these previous rules were:

1. ISPs would fall under the category of telecommunications services (as opposed to information services), so they would be bound by the regulations of Title II of the Telecommunications Act of 1934, which provides the FCC the authority to regulate them as a public utility.
2. The inclusion of the “Bright Line Rules” that state:
 - No Blocking: Broadband providers may not block access to legal content, applications, services, or non-harmful devices.
 - No Throttling: Broadband providers may not impair or degrade lawful internet traffic on the basis of content, applications, services, or non-harmful devices.
 - No Paid Prioritization: Broadband providers may not favor some lawful internet traffic over other lawful traffic in exchange for consideration of any kind—in other words, no “fast lanes.” This rule also bans ISPs from prioritizing content and services of their affiliates.

On June 11, 2018, the [Restoring Internet Freedom Order](#) took effect and provides a framework for protecting an open internet while paving the way for better, faster and cheaper internet access for consumers.

Broadband DATA Act

On March 10, 2020, Congress passed [the Broadband Deployment Accuracy and Technological Availability \(DATA\) Act](#), which set the stage for a sweeping reform on how broadband data is collected,

verified, and mapped by the Federal Communications Commission and builds upon the Digital Opportunity Data Collection (DODC) report and order that the FCC adopted in August 2019.

The legislation states that within 180 days of being signed into law, the FCC must issue rules to set up a framework for collecting broadband availability data for fixed terrestrial, fixed wireless, satellite, and mobile broadband services. The rules will set up a twice-yearly collection and dissemination of granular broadband data from providers, create maps of service availability, establish processes for verification of the data's accuracy, and establish processes for the protection of competitively sensitive or non-public data. Furthermore, the FCC is required to develop processes for collecting other data from sources such as entities that map and track broadband coverage for a state, local, or tribal government; third parties whom the FCC thinks could aid in map development or verification; and other federal agencies. Further, the FCC is called upon to evolve the data collection and mapping process by revisiting their initial rules on an as-needed basis to account for changes in technology, so as to ensure the accuracy of wireless propagation modeling and to increase the usefulness of the coverage maps.

In total, there are seven key areas in which Congress provides direct instruction or guidance to the FCC as it prepares to implement the new broadband data and mapping program, which are summarized in greater detail in CN's [policy brief](#):

- 1) Creation of a location “fabric” to identify serviceable structures
- 2) Handling of provider-submitted data
- 3) Data accuracy and the creation of a challenge process
- 4) Reform of the current Form 477 data collection process
- 5) Launch of a new National Broadband Map to display the data
- 6) Three technical assistance programs to support the challenge process, small provider data submission, and tribal governments
- 7) Costs associated with these new mandates

The Broadband DATA Act clears a path for more accurate and reliable broadband access data on a location-by-location basis—a significant improvement over the FCC’s current data collection at the census block level of detail. However, several questions still remain—including how funding issues above will be resolved.

What is clear is that the FCC will have to roll out a revised report and order to adapt the DODC program adopted last year to the bill’s requirements, and formally call for the creation of a Broadband Serviceable Location Fabric, establish the details of a challenge process, and determine a timeline by which service providers must submit the first round of granular service availability data. The FCC will have 180 days from enactment (when the president signs the bill into law) to accomplish these tasks.

States that are engaged in (or planning) their own broadband mapping initiatives should think about how the Broadband DATA Act’s passage will impact them. Certainly, this means that service availability data will be available from the FCC for state consumption—data that is much more accurate and granular than anything the FCC has collected in the past. States will need to develop a process to respond to the FCC’s call for challenges to the data, as valid challenges will certainly impact the flow of money to unserved areas. States that are prepared to submit robust challenges will likely be in a better position to steer more federal money their way. States may also choose to augment the new federal data in ways that serve their own needs—such as supporting their own state grant programs for broadband development, assessing “middle mile” fiber infrastructure needs, or analyzing the cost of services.



04

OTHER STATES

04 Other States

Best Practices

Most state broadband programs implement five identified best practices in some form or another. These best practices include:

1. **Stakeholder outreach and engagement.** States are actively engaging stakeholders in their broadband efforts to gain broad support and ensure that policy, planning, and funding are designed to serve all communities' needs. These entities bring different perspectives on broadband challenges and resources to solve them. And they interact in multiple ways. States address this best practice by:

Working with a broad range of entities. Recognizing that broadband underlies many aspects of modern life, state broadband programs are building relationships with a range of stakeholders at the state and local levels, including state agencies, county and municipal leagues, provider associations, rural advocacy groups, broadband coalitions, local government officials, local and regional economic development and planning organizations, business owners, health care organizations, and local broadband champions.

Collaborating with state-level partners. State task forces and councils advise and evaluate efforts and may make policy recommendations. States also use interagency working groups and formal partnerships to implement programs.

Engaging local stakeholders. Because state broadband programs are aimed at the local level, they engage with local stakeholders. This engagement educates local elected officials on why broadband investment is needed, builds awareness of state resources to support broadband and how to access them, supports local broadband planning committees, facilitates conversations between communities and ISPs, and celebrates local projects.

2. **Policy framework.** State policy creates the framework for broadband deployment by setting goals, defining who is responsible for broadband and what those responsibilities are, and addressing how broadband intersects with other policy areas. States address this best practice by:

Defining a clear policy direction. States are establishing specific goals for broadband access, setting timelines for achieving them, and creating broadband programs. These measures, often set in statute, create a framework for broadband expansion efforts, providing clarity to providers and communities as they make decisions about investing in broadband infrastructure.

Addressing identified policy barriers. States are identifying and addressing potential barriers to connectivity to facilitate investment in broadband infrastructure. This includes clarifying which entities can provide broadband and access the infrastructure or rights of way needed to deploy broadband infrastructure.

Connecting broadband to other policy priorities. Connecting broadband to other policy issues—including economic development, transportation, and agriculture—underscores its importance and can help build partnerships to improve connectivity. It can also allow states to use funds that are not specifically directed to broadband expansion.

3. **Planning and capacity building.** State broadband plans define goals and objectives, identify steps to achieve them, help guide state investments, provide a baseline against which to measure progress, and provide a framework for local planning efforts. Local plans, in turn, help educate community leaders and residents, putting them in a better position to carry out infrastructure projects—and apply for state grant funds when available. At both levels, planning processes ensure a systematic approach and depend on stakeholder outreach and engagement to develop robust goals and recommendations that may inform policy and program decisions. Planning processes do more than chart a path; they help educate stakeholders and build the consensus, buy-in, and relationships that are necessary to achieving goals. States address this best practice by:

Adopting state broadband plans. Broadband plans may focus exclusively on broadband availability, or they may address broadband adoption and include other policy areas such as economic development, education, public safety, health care, and agriculture. Some states have statutory requirements to develop a state broadband plan.

Supporting local and regional planning efforts. Planning helps communities define broadband goals and needs and identify projects for funding. Conversely, funding also can help give communities the capacity necessary to undertake a focused broadband planning effort. Some state grants require or incentivize planning.

4. **Funding and operations.** States often support broadband deployment through grants and loans to ISPs, nonprofit utility cooperatives, and local governments to help make projects economically viable. These programs and their requirements are defined in state statutes, which may outline eligible grant recipients, scoring criteria, and challenge procedures to help ensure accountability. Stakeholder engagement and planning processes help inform which grants are funded. States address this best practice by:

Provide state funding to support broadband deployment in unserved and underserved areas. States are providing support, primarily through grants, to facilitate broadband deployment in unserved and underserved areas.

Address accountability for investments. States put grant reporting, data collection, and other accountability measures in place to ensure that funded projects deliver the promised service and provide data necessary for the state to evaluate progress toward its goals.

5. **Program evaluation and evolution.** States are evaluating the performance of their broadband programs against stated or legislated goals, such as the number of new locations connected. These evaluations can inform next steps, such as addressing broadband adoption and digital literacy, or expanding the focus of a broadband program to applications (for example, precision agriculture, the use of technology, such as GPS guidance on tractors and soil monitors, to better calibrate production; distance learning; and telemedicine). Lessons learned can prompt changes to a state's broadband policy and activities, including how and which stakeholders it engages, the types of planning and technical assistance it offers, and the design and administration of grants. States address this best practice by:

Evaluating program performance. States conduct formal and informal evaluations of their programs. For grant programs, an annual report to the Legislature is a common requirement. States also informally evaluate their programs, using success stories, customer testimonials, and other anecdotal evidence that demonstrate the impacts of their investments. The level of

evaluation differs across states, with more highly funded programs often having more requirements.

Updating program goals and activities. As state programs mature, they are seeking to ensure that residents can take full advantage of the benefits of broadband, such as telecommuting, precision agriculture, and distance learning.

A successful state broadband office should incorporate most if not all of the aforementioned best practices with dedicated staff/expert consultants; strong support from state leadership; be visible to a wide array of stakeholders and responsive to their needs; serve as a connector, facilitator, and clearinghouse for all things broadband in the state.

State Broadband Offices

Several states have dedicated broadband offices including California, Colorado, Indiana, Ohio, Maine, Minnesota, North Carolina, Tennessee, Virginia, West Virginia, and Wisconsin, among others. While the functions of these offices vary by state, there are several common elements between them:

Common Elements

Leadership. Successful programs have strong leadership from governors, legislators, and agency heads. If the governor's office is focused on broadband, it will bring more attention to the issue. It can also help make broadband a priority within state agencies, ensuring that it is incorporated into state programs.

Dedicated broadband staff. Having staff dedicated to broadband is important to avoid having work on the issue become "other duties as assigned." Staff who are focused on broadband can develop expertise. Assigning them to the issue creates accountability and responsibility, and provides stakeholders with a point of contact.

Visibility and responsiveness. Having visible broadband directors and staff who attend meetings and events around the state, not just near the capital, is essential. These can include informational sessions about the state's grant program, broadband committee meetings, and ribbon cuttings or check presentations for grant projects. They are also responsive to questions from grantees and constituents.

Connectors. Successful broadband programs build strong relationships with multiple stakeholder groups and are viewed by them as a trusted partner. They provide a neutral voice when educating policymakers and community leaders and become a reliable resource for information on broadband. As a result, they often play a central role in facilitating coordination and building partnerships to advance broadband projects and policy.

05 Appendix

A. Texas Internet Service Providers and Technology

Provider Name	Technology
281 Communications, Inc.	Fixed Wireless
3 Rooms Communications LLC	Fixed Wireless
325 Internet, LLC	Fixed Wireless
432 Internet, LLC	Fixed Wireless
903 Broadband	Fixed Wireless
Access Media Holdings, LLC	Cable, DSL, Fiber
ADT Systems, Inc.	Fixed Wireless
Air Net, LLC	Fixed Wireless
AirLink, Inc.	Fixed Wireless
Airplexus, Inc.	Fixed Wireless
Alamo Broadband, Inc.	Fiber, Fixed Wireless
Aledo Broadband	Fixed Wireless
Alenco Communications, Inc.	DSL, Fiber, Fixed Wireless
AMA Communications, L.L.C.	DSL, Fiber, Fixed Wireless
AMG Technology Investment Group	Fiber, Fixed Wireless
Ansteorra Inc.	Fixed Wireless
ANTS-Technology, Inc.	Fixed Wireless
Anvil Communications	Fixed Wireless
Argon Technologies	Fixed Wireless
AT&T	Cable, DSL, Fixed Wireless
Autophone of Laredo	Fixed Wireless
AW Broadband	Fiber, Fixed Wireless
AwesomeNet, Inc.	Fixed Wireless
Balatize Broadband Services	Fixed Wireless
Bandera Electric Cooperative, Inc.	Fiber
Basin 2 Way Radio, Inc.	Fixed Wireless
Basin Broadband, Inc.	Fixed Wireless
Bee Creek Communications	Fixed Wireless
Big Bend Telephone	DSL, Fiber, Fixed Wireless
Blossom Telephone Company, Inc.	DSL, Fiber
Brazoria Telephone Company	Cable, DSL, Fiber
Brazos Telephone Cooperative, Inc.	DSL, Fiber
Brazos Wifi	Fiber, Fixed Wireless

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Broadwaves Communications	Fixed Wireless
Burcham Solutions, LLC	Fixed Wireless
CableOne	Cable
Cajtex Communications, LLC	Fixed Wireless
Callis Communications, Inc.	Fiber
Cameron Telephone Company, LLC	DSL, Fiber
Campus Communications Group, Inc.	Fiber
Cap Rock Telephone Cooperative	DSL
Cap Rock Telephone Cooperative	Fiber
Cascom Internet Service	Fixed Wireless
Celltex Networks, LLC	Fixed Wireless
Centex Web Access	Fixed Wireless
Central Texas Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
CenturyLink	DSL, Fiber
CG Communications, Inc.	Fixed Wireless
Chaparral CableVision Inc.	Fixed Wireless
Charter Communications	Cable, Fiber
Coba Systems	Fixed Wireless
Cobridge Communications, LLC	Cable, Fiber
Coleman County Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Colorado Valley Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Comcast Cable Communications, LLC	Cable, Fiber
Communications Etc.	Fiber, Fixed Wireless
Community Telephone Company, Inc.	Fiber, Fixed Wireless
CommZoom, LLC	Cable, Fiber
Computers, Electronics, Office Etc	Fiber, Fixed Wireless
Consolidated Communications Holdings, Inc.	DSL, Fiber
Cumby Telephone Cooperative, Inc.	DSL, Fiber
Dell Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Denton Commercial Internet Inc.	Fixed Wireless
DigiComm Enterprises, LLC	Fixed Wireless
Digital Passage, Inc.	Fiber
Digitex.com	Fixed Wireless
East Texas Broadband	Fixed Wireless
East Texas DSL	DSL
Eastex Telephone Cooperative, Inc.	DSL, Fiber
Eastland Internet Inc	Fixed Wireless
EBTX Wireless, LLC	Fixed Wireless

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Echo Wireless Broadband, Inc.	Fixed Wireless
ECTISP, Inc.	Fixed Wireless
ENMR Telephone Cooperative, Inc.	DSL, Fiber
ETEX Communications, LP	DSL, Fiber, Fixed Wireless
Etex Rural Broadband	Fixed Wireless
ETS Cablevision Co., Inc.	Cable, Fiber
Falcon Internet	Fixed Wireless
Farm to Market Broadband LP	Fixed Wireless
Fiber Wave, LLC	Fixed Wireless
Five Area Telephone Cooperative, Inc.	DSL, Fiber
Frog Holdings, LLC	Fiber
Frontier Communications Corporation	DSL, Fiber
Ganado Telephone Company, Inc.	DSL, Fiber
GCEC Telecom	DSL, Fiber, Fixed Wireless
Gecko Inter.Net, Inc.	Fixed Wireless
GEUS Cable & Internet	Cable
GHz Wireless	Fixed Wireless
Gigabit Communications, LLC	Fixed Wireless
GigaMonster	Fiber
GOCO Wireless, Inc.	Fixed Wireless
Google Fiber	Fiber
Grande Communications Networks LLC	Cable, DSL, Fiber
Gtek Communications	Fixed Wireless
Guadalupe Valley Communications Systems L.P.	Cable, DSL, Fiber
Gulf Coast WiFi	Fixed Wireless
GVEC.net	Fiber, Fixed Wireless
Hallettsville Communications	Fixed Wireless
Harris Broadband LLP	Fiber
Helmsco, Inc.	Fixed Wireless
Hill Country Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Hill Country Wireless & Technology	Fixed Wireless
Hillcountry Networks	Fixed Wireless
Hilliary Communications, LLC	Cable, DSL, Fiber
Homesmart Satellite Station Fire & Security	Fixed Wireless
Hometown Computing	Fixed Wireless
Honeyberry Hill Consulting	Fixed Wireless
Hotwire Communications, Ltd.	Fiber, Fixed Wireless
IGN-LPG Enterprises LLC	Fixed Wireless

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Imperio Networks	Fixed Wireless
Indian Creek Internet Services, Inc.	Fixed Wireless
Industry Telephone Company	DSL, Fiber, Fixed Wireless
Inova Data Solutions	Fixed Wireless
Internet Management Services	Fixed Wireless
Jackson Electric Cooperative Inc	Fiber, Fixed Wireless
KLW Communications	Fixed Wireless
La Ward Telephone Exchange, Inc.	DSL, Fiber
Lake Livingston Telephone Company, Inc.	DSL, Fiber
Leaco Wireless, LLC	Fixed Wireless
Legacy ISP, LLC	Fixed Wireless
Lipan Telephone Company, Inc.	DSL, Fiber
Livingston Telephone Company, Inc.	Cable, DSL, Fiber
LVWifi.com	Fixed Wireless
Mexus Communications	Fixed Wireless
Mid-Plains Rural Telephone Cooperative, Inc.	DSL, Fiber
Millennium Telcom, LLC	Cable, DSL, Fiber, Fixed Wireless
Mission Valley Communications	Fixed Wireless
NDemand, Inc.	Fixed Wireless
Neal Silvers d.b.a Backroads Broadband	Fixed Wireless
Net3 ISP	Fixed Wireless
NetWest Online, Inc.	Fixed Wireless
Neu Ventures, Inc.	Cable, Fixed Wireless
New Source Broadband II	Fixed Wireless
Nextwave Wireless, LLC	Fixed Wireless
Nortex Communications	Cable, DSL, Fiber, Fixed Wireless
North Texas Telephone Company	DSL, Fiber
NTS Communications	Fiber
Orbit Broadband, LLC	Fixed Wireless
Oz Oil & Gas, Inc.	Fixed Wireless
Panhandle Telephone Cooperative, Inc.	Cable, DSL, Fiber, Fixed Wireless
Pathwayz Communications, Inc.	DSL, Fiber, Fixed Wireless
Peoples Communication, Inc.	DSL, Fiber, Fixed Wireless
Phoenix Broadband, LLC	Fixed Wireless
Phonoscope Enterprises Group, LLC	Fiber
Plains Internet, LLC	Fixed Wireless
Poka Lambro Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Promptwireless, LLP	Fixed Wireless

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Rarity Solutions	Fixed Wireless
RB3, LLC	Cable, Fixed Wireless
Resound Networks	Fixed Wireless
RGC Wireless Internet	Fixed Wireless
Rise Broadband	Fixed Wireless
Riviera Telephone Company, Inc.	DSL, Fiber, Fixed Wireless
rNetworks, LLC	Fixed Wireless
Rock Solid Internet & Telephone	Fixed Wireless
RodZoo Wireless	Fixed Wireless
Roll Call Security & Communications, LLC	Fixed Wireless
Rural Telecommunications of America	Fiber, Fixed Wireless
Santa Rosa Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
SCT Broadband	Fixed Wireless
Shout Broadband, LLC	Fixed Wireless
Sinlar Broadband	Fixed Wireless
Skynet Communications	Fixed Wireless
Skynet Country, LLC	Fixed Wireless
Skywave Broadband Internet, LLC	Fixed Wireless
SmartBurst, LLC	Fixed Wireless
SmartCom Telephone, LLC	DSL, Fiber, Fixed Wireless
Smith Internet Solutions	Fixed Wireless
SOS Communications LLC	Fixed Wireless
South Plains Telephone Cooperative, Inc.	DSL, Fiber
South Texas Internet	Fixed Wireless
Southwest Arkansas Telephone Cooperative, Inc.	Fiber
Southwest Oklahoma Telephone Company	Fixed Wireless
Southwest Texas Telephone Company	DSL, Fiber, Fixed Wireless
Southwestern Wireless, Inc.	Fixed Wireless
Speed of Light Broadband, Inc.	Fixed Wireless
SpeedNet, LLC	Fixed Wireless
Spry Wireless Inc.	Fixed Wireless
SRIInternet, LLC	Fixed Wireless
Suddenlink Communications	Cable, Fiber
SurfsideTX.Net	Fixed Wireless
Tachus Communications	Fiber
Taylor Electric Cooperative Inc.	Fiber
Taylor Telephone Cooperative, Inc.	DSL, Fiber
TDS Telecommunications Corporation	Cable

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Tejas Wireless	Fixed Wireless
Terral Telephone Company	Fixed Wireless
Texas CellNet, Inc.	Fixed Wireless
Texas Wireless Internet	Fixed Wireless
Texhoma Wireless, L.L.C.	Fixed Wireless
Texoma Communications, LLC	Fixed Wireless
TGM Pinnacle Network Solutions, LLC	Fixed Wireless
TierOne Converged Networks, Inc.	Fixed Wireless
TISD, Inc.	Fixed Wireless
Totalcom Communications, LLC	DSL, Fiber, Fixed Wireless
TransWorld Network Corporation	Fixed Wireless
Unified Communications, Inc.	Cable, Fiber, Fixed Wireless
Valley Telephone Cooperative, Inc.	DSL, Fiber, Fixed Wireless
Verizon Communications	DSL, Fiber
Verona Networks LLC	Fixed Wireless
VGI Technology	Fixed Wireless
Victoria Electric	Fixed Wireless
Vivint Wireless, Inc	Fixed Wireless
VRFuturenet	Fixed Wireless
Vyve Broadband	Cable
Webatron Internet Solutions, Inc.	Fixed Wireless
WEHCo Video, Inc.	Cable
West Texas Rural Telephone Cooperative, Inc.	DSL, Fiber
Western Broadband	Fixed Wireless
Westex Connect	Fixed Wireless
Wes-Tex Telecommunications, Ltd.	Fiber, Fixed Wireless
Wharton County Electric Cooperative, Inc.	Fixed Wireless
WIFIRUS	Fixed Wireless
Windstream Communications	DSL, Fiber
Wireless Internet Corp	Fixed Wireless
WLANJV Inc.	Fixed Wireless
XIT Telecommunication & Technology, Ltd.	DSL, Fiber, Fixed Wireless
XO Communications, LLC	DSL
Zeecon Wireless Internet, LLC	Fixed Wireless
Zion Broadband	Fixed Wireless
Zito Midwest, LLC	Cable
Zoom Broadband, LLC	Fixed Wireless
Zulu Internet, Inc.	DSL, Fixed Wireless

B. Broadband Glossary and Table of Units

Reproduced from a resource provided by the National Telecommunications and Information Administration

Numbers

3G: The term for the 3rd generation wireless telecommunications standards usually with network speeds of less than 1 Mbps.

4G: The term for 4th generation wireless telecommunications standards usually with network speeds greater than 1 Mbps.

5G: The term for emerging 5th generation wireless telecommunications standards usually associated with network speeds of up to 1 Gbps or more.

A

ADSL (Asymmetrical Digital Subscriber Line): A form of internet service communications technology that delivers constantly accessible data transmissions over copper telephone lines. ADSL is a common version of DSL and has download speeds between 2 and 6 Mbps and upload speeds reaching 512 Kbps.

Asymmetrical Bandwidth: A connection in which the maximum transfer rate is different for download and upload speeds.

ATM (Asynchronous Transfer Mode): A transmission method where information is re-structured into packets. It is asynchronous due to the fact that the recurrence of packets from an individual user is not necessarily periodic.

B

Backbone: A major high-speed transmission line that strategically links smaller high-speed internet networks across the globe.

Backhaul: The portion of a broadband network in which the local access or end user point is linked to the main internet network.

Bandwidth: The capability of telecommunications and internet networks to transmit data and signals.

Bit: The base unit of information in computing. For our purposes, also the base unit of measuring network speeds. A single piece of information is equal to 1 bit. Network speeds tend to be measured by bits per second—using kilo (1,000), mega (1,000,000), and giga (1,000,000,000). A bit is a part of byte; they are not synonyms. Bit is generally abbreviated with a lower case b.

Broadband: The term broadband commonly refers to high-speed internet access that is always on and faster than traditional dial-up access. Broadband includes several high-speed transmission technologies, such as fiber, wireless, satellite, digital subscriber line, and cable. For the Federal Communications Commission (FCC), broadband capability requires consumers to have access to actual download speeds of at least 25 Mbps and actual upload speeds of at least 3 Mbps.

Broadband Adoption: The use of broadband in places where it is available, measured as the percentage of households that use broadband in such areas.

BTOP: Broadband Technology Opportunities Program, established by the 2009 stimulus legislation, a program to disburse \$4.7 billion to improve broadband access and literacy throughout the country.

Burstable: Authorizes a connection to exceed its specified speed, normally up to a set maximum capacity for a period of time.

Burst Speed: A method which momentarily allots additional bandwidth to consumer's services for short periods of time.

C

Cable Modem System: Cable television companies have offered internet access via their cable system for more than a decade. The network architecture uses a loop that connects each subscriber in a given neighborhood, meaning they all share one big connection to the internet.

Central Office: A telecommunication company's building where consumers' phone lines are attached to equipment that connects a consumer to other consumers in that central office or other central offices across the globe.

Community Anchor Institutions: Schools, libraries, medical and health care providers, public safety entities, institutes of higher education and other community support organizations that provide outreach, access, equipment, and support services to facilitate greater use of broadband service by the entire population and local governments.

Conduit: A reinforced tube through which cabling runs. Conduit is useful both to protect fiber-optic cables in the ground and because one can place the conduit underground when convenient and later "pull" the fiber cabling through the conduit.

D

Dark Fiber: Fiber that is in place but not being used for broadband services. ("non-lit" fiber, also see "Lit Fiber").

Digital Divide: The gap between those of a populace that have access to the internet and other communications technologies and those that have limited or no access.

Digital Equity: Recognizes that digital access and skills are now required for full participation in many aspects of society and the economy. Digital Equity links Digital Inclusion to social justice and highlights that a lack of access and/or skills can further isolate individuals and communities from a broad range of opportunities.

Digital Inclusion: Implies that individuals and communities have access to robust broadband connections; internet-enabled devices that meet their needs; and the skills to explore, create, and collaborate in the digital world.

Digital Literacy: The ability to leverage current technologies, such as smartphones and laptops, and internet access to perform research, create content, and interact with the world.

Digital Skills: Any skills related to operating digital devices or taking advantage of digital resources.

DOCSIS (Data Over Cable System Interface Specification): The international telecommunications standard for cable signaling data and spectrum sharing. DOCSIS standards evolve over time. DOCSIS Standard 3.1 is the most recent version.

DSL (Digital Subscriber Line): A form of technology that utilizes a two-wire copper telephone line to allow users to simultaneously connect to and operate the internet and the telephone network without disrupting either connection.

E

EDGE: Enhanced Data Rates for GSM Evolution: An upgraded 2G mobile standard offering faster data transfer speeds. Connections may fall back on this if 3G or 4G aren't available—on smartphones it will usually be indicated by an 'E' next to the signal meter.

E-Government Services: The government's use of web-based and information technology resources to connect with citizens and provide online services and resources.

F

Fiber (Also referred to as Fiber Strand): A flexible hair-thin glass or plastic strand that is capable of transmitting large amounts of data at high transfer rates as pulses or waves of light.

FTTH or FTTP (Fiber to the Home or Fiber to the Premise): The delivery and connection of fiber optics directly to a home or building.

Fixed Broadband: High-speed data transmission to homes and businesses using technologies such as T1, cable, DSL, fiber, and fixed wireless. Excludes mobile broadband and non-terrestrial services.

Fixed Wireless Broadband Access: The use of wireless devices/systems in connecting two fixed locations, such as offices or homes. The connections occur through the air, rather than through fiber, resulting in a less expensive alternative to a fiber connection.

I

Internet Service Provider (ISP): A company that provides users (individuals or businesses) with access (a connection) to the internet and related services.

Interconnection: The linking of numerous telecommunications networks to exchange user traffic.

L

Last Mile: The technology and process of connecting the end customer's home or business to the local network provider.

Lit Fiber: An active fiber optic cable capable of transmitting data.

LMDS (Local Multipoint Distribution Service): A wireless broadband service that uses microwave signals to render communications service—voice, data, internet—to customers within the last mile.

Loan: The giving of money or property in exchange for payment of the principal amount plus interest.

Local Area Network (LAN): A group of connected network devices that are on a high-speed connection and typically within the same building or location.

LTE (Long Term Evolution): A 4G wireless broadband technology that provides speeds up to 100 Mbps download and 30 Mbps upload.

M

Middle Mile: The connection between a local network, also called a “last mile” connection, and the backbone internet network.

Mobile broadband: A type of internet connection designed for use “on-the-go” with seamless connectivity from one geographic location to the next.

N

Network Infrastructure: The hardware and software components of a network that provide network connectivity and allow the network to function.

O

Open Access Network: Networks that offer wholesale access to network infrastructure or services provided on fair and reasonable terms with some degree of transparency and nondiscrimination.

P

Point of Presence: The particular place or facility where local internet service providers connect to other networks. Distance from the Point of Presence can affect service availability and pricing.

Public Computer Center (PCC): A facility that is open to the public and provides broadband access, education, support, and training relevant to community needs. PCC locations include, but are not limited to, community colleges, libraries, schools, youth centers, employment service centers, and centers in public housing developments, among many others, that provide broadband access to the general public or specific vulnerable populations, such as low-income, unemployed, older adults, children, minorities and people with disabilities.

R

Rights-of-Way (ROW): ROW are legal rights to pass through property owned by another. ROW are frequently used to secure access to land for digging trenches, deploying fiber, constructing towers and deploying equipment on existing towers and utility poles.

S

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

SDSL (Symmetrical DSL): A technology that permits the symmetrical transfer of data over copper telephone lines. The transmission bandwidth for uploads and downloads is equal.

SONET (Synchronous Optical Network): An American National Standards Institute standard for the simultaneous transmission of data over optical fiber.

Spectrum: A conceptual tool used to organize and map the physical phenomena of electromagnetic waves. These waves propagate through space at different radio frequencies, and the set of all possible frequencies is called the electromagnetic spectrum.

T

Tier 1 Internet Network: A network of internet providers that form a superhighway that allows users access to every other network on the internet.

Tier 2 Internet Network: A network of smaller internet providers that allow users to reach some portion of the internet but that still purchase IP transit.

Telecommunication Services or Services: Includes regulated and unregulated services offered to customers for the transmission of 2-way interactive communication and associated usage. A telecommunication service is not a public utility service (from the Michigan Telecommunications Act).

Telemedicine: The use of high-speed, high-capacity internet to support long-distance health care services, patient and provider education, and enhanced health care administration.

V

VoIP (Voice over Internet Protocol): A technology that allows users to send and receive voice calls using an internet connection instead of a phone line.

W

Wi-Fi (Wireless Fidelity): A technology that uses radio transmissions to enable electronic devices to connect to a wireless local area network (LAN).

WiMAX: A wireless technology through which wireless internet access is provided with a significantly larger range than regular Wi-Fi. WiMAX can provide broadband service up to 30 miles.

WISP: An ISP that provides service through a wireless network.

Table of Units

Units Associated With Broadband	
Bit	Smallest unit of digital information
Byte	Equal to 8 bits
Bps	Bits per second
Kbps	Kilobits per second (1000 bits per second)
Mbps	Megabits per second (1 million bits per second)
Gbps	Gigabits per second (1 billion bits per second)
Tbps	Terabits per second (1 trillion bits per second)

C. Relevant Texas Broadband Statutes

<i>Program Activity</i>	<i>Relevant Statute or Executive Order</i>
Broadband Office	
None	n/a
State Agency that Oversees Broadband	
None	n/a
Broadband Task Force	
Governor's Broadband Development Council	Tex. Government Code 490H
Broadband Goal	
None	n/a
Broadband Plan	
None	n/a
Broadband Mapping	
None	n/a
Broadband Fund	
None	n/a

Other Relevant Statute or Administrative Code	
Definitions	<p>Tex. Utilities Code 181.048: Definition – Broadband</p> <ul style="list-style-type: none"> (1) "Broadband service" means Internet service with the capability of providing: (A) a download speed of 25 megabits per second or faster; and (B) an upload speed of three megabits per second or faster. <p>Tex. Government Code 490H</p> <ul style="list-style-type: none"> "Broadband" means a service that provides advanced telecommunications capability and Internet access.
Funding and Financing	Tex. Tax Code § 151.3186 – Property Used in Cable Television, Internet Access, or Telecommunications Services
Legislative Intent	Tex. Utilities Code § 58.251 – Intent and Goal of Subchapter
Municipal Broadband	Tex. Utilities Code § 54.201-2025 – Subchapter E. Municipalities
Rights-of-Way	<p>Tex. Utilities Code § 186.054-58 – Construction and Maintenance of Utility, Common Carrier, Cable Operator, and Energy Transporter Facilities.</p> <p>Tex. Utilities Code § 181.048 – Electric Cooperative Broadband Facility</p> <p>Tex. Transportation Code § 201.672 – Coordination</p>

APPENDIX C



Service Provision	Tex. Utilities Code § 43. – Use of Electric Delivery System for Access to Broadband and Other Enhanced Services, Including Communication
Small Cell	Tex. Local Gov. Code § 284 – Deployment of Network Nodes in Public Right-of-Way
Schools and Libraries	2018-2019 General Appropriations Act, rider 69 – E-Rate Classroom Connectivity
Cooperatives	Tex. Utilities Code § 181.048 – Electric Cooperative Broadband Facility
Other	Tex. Utilities Code § 58.203 – Infrastructure Goals Of All Electing Companies