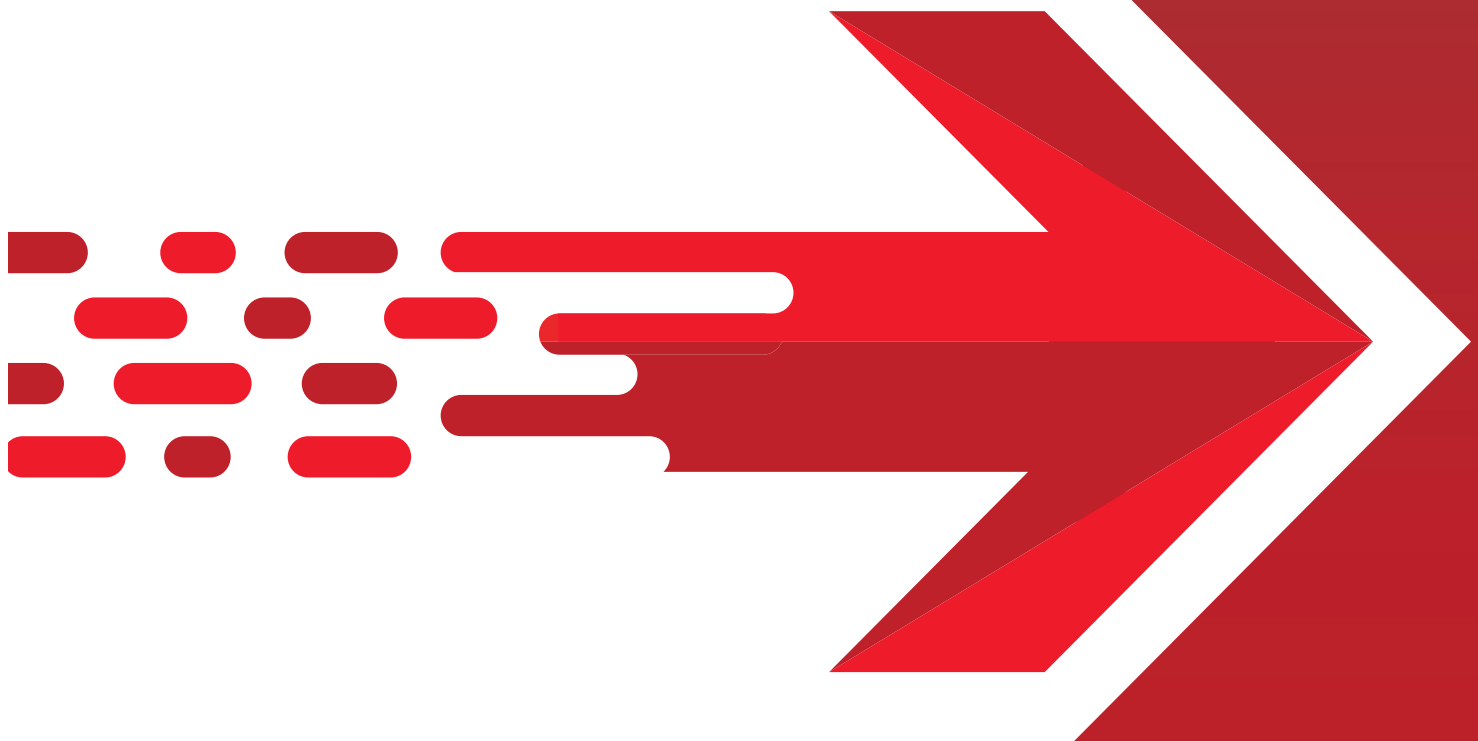


# *Understanding Broadband*

..... *and* .....

# *How to Get It*



December 2023



# What You'll Find in this Community Toolkit

This toolkit has information for Texas residents who don't currently have access to broadband internet.



Learn more about the various technologies available for your home, and the pros and cons of each option.



Learn key terms you may need to know.



Learn how to identify the options available for your area and the steps that may be required to install broadband internet at your residence.



Check out resources on what to do if there aren't any good options for broadband currently available to you.



Read more about the digital divide, and why we are working to ensure all Texans have access to broadband.

## Broadband Access: A Primer

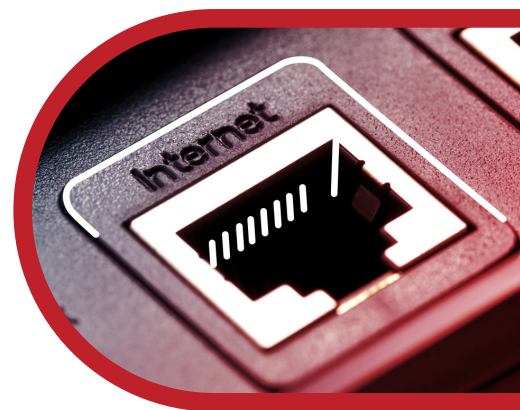
When choosing a broadband service, it is important to consider both the performance (how well the internet connection will work) and the cost. It is also important to consider how broadband will be accessed in your home once all necessary equipment has been installed.

### How to think about broadband performance

Performance can be measured in two different ways:

1. **Bandwidth** and **speed** refer to the amount of information that can be uploaded/downloaded at a time. They are measured in Megabits per second (Mbps). The information (or data) can be in the form of text, images, video, etc. Activities that consume a lot of bandwidth include:
  - streaming video (e.g., watching Netflix, Hulu, or YouTube)
  - gaming (e.g., playing a video game on a personal computer, Xbox, or Playstation)
  - downloading large uncompressed files (e.g., installing an app on a smartphone or computer)

**Bandwidth** refers to the maximum possible flow of data that can go through a connection, while **speed** refers to the amount of data that is actually being processed at a given moment in time. Depending on the technology, even a high bandwidth connection may seem slow at peak times when many users are sharing the connection.



The Federal Communications Commission (FCC) defines broadband as a minimum of **25 Mbps** bandwidth for downloads and **3 Mbps** for uploads. This type of connection would allow a single device to stream a movie or make a video call. The Texas Broadband Development Office considers communities underserved if maximum available speeds are less than **100 Mbps** for downloads and less than **20 Mbps** for uploads. At 100 Mbps, multiple devices can stream video at the same time, and large files can be downloaded relatively quickly.

2. **Latency** refers to the amount of time data takes to travel from the home device to internet servers and back. Latency is measured in milliseconds (ms). The shorter the time, the better. Latency can become an issue when the physical distance to travel is very great, such as when a satellite is involved and data must travel into space and back. The Texas Legislature mandates that a broadband connection latency be less than 100 ms 95% of the time or more.

## How to evaluate cost

When considering the **cost** of a particular broadband service, it is important to ask several questions:

1. What is the **initial investment** (or up-front cost) required to install broadband at a residence?
  - Is it necessary to purchase electronics for the home, such as a modem, router, tablet or computer?
  - Are there additional installation costs that must be paid, such as laying down cable or fiber to reach the residence, or installing a roof antenna?
2. What is the **monthly cost** for service, and how long is that rate guaranteed? Will the monthly cost rise considerably after a discounted introductory period?
3. Is there a **contract** for service that is difficult or expensive to break, which could lock someone into that particular service for months or years?



## About providers

Various companies, both large and small, provide broadband. Later on in this toolkit, we provide a website where you can search by your Zip code, from your phone or at your local library. We do not endorse any specific company, but some names include Verizon, Spectrum, Google Fiber, AT&T, T-Mobile, and so on.

## Understanding the installation

Once you have signed up with a provider, broadband is installed in your house through a **modem**: a small piece of equipment that is in your home. This device translates the digital information coming from the broadband provider into a format your computer, tablet, or phone can understand. A **router**, another small piece of equipment, takes this signal and makes it accessible to all the devices in your home. In other words, it routes the connection from the broadband provider to your devices. You may be able to plug a computer directly into a router using an ethernet cable, but modern routers provide

“over-the-air” (no cables) home **Wi-Fi networks** that can be accessed by laptops, tablets, smartphones, and even smart appliances, such as thermostats. Depending on the broadband service, a device may be provided to you that works as both a modem and a router, or you may need to rent or buy this equipment.

## What's the difference between broadband and Wi-Fi?

Broadband is the actual internet connection that your internet service provider supplies to your home or business. It is always on, with or without Wi-Fi. Wi-Fi is a type of connection to access the internet that allows for various devices to connect to broadband through a router.

### Types of broadband internet technologies

There are five different types of broadband internet services available to Texans, although not all options are available in all locations.



**Cable:** uses existing cable television connections through coaxial cables to provide broadband access. The cable plugs into a modem or router that can provide a home Wi-Fi network, as well as wired connections.

**PROS:** low cost, reliable option if cable television is already installed at the residence.

**CONS:** the copper in coaxial cables does not deliver digital information as quickly/efficiently as fiber, and bandwidth is shared among multiple residences in the neighborhood, potentially leading to slow speeds at peak usage times.



**Digital Subscriber Line (DSL):** uses existing phone lines to provide broadband access to the modem/router, which can support a home Wi-Fi network, as well as wired connections.

**PROS:** low cost, reliable option if there are existing phone lines at the residence. Bandwidth is not shared directly with neighbors as with cable, so speeds may be more reliable.

**CONS:** phone lines transmit digital information less efficiently than fiber or even cable, so download and upload speeds are not optimally fast.



**Fiber:** uses fiber optic cables, rather than coaxial/copper cables or phone lines, to provide broadband access to the modem/router. Fiber is the gold standard for modern internet connectivity.

**PROS:** digital information can be transmitted up to 10x more quickly and efficiently than DSL or cable. Download and upload speeds are both excellent. You can simultaneously stream and conference on multiple devices within a household without latency.

**CONS:** laying fiber optic cable is expensive (as it is outside, underground); meaning fiber internet tends to be available only in population-dense areas.



**Fixed Wireless:** uses antennas on or near your home to provide internet from nearby access points (typically cell towers) through radio waves.

**PROS:** depending on the location, may be very easy to install and set up. Service is typically low cost and very reliable.

**CONS:** speed depends on the phone networks, so it is fastest in densely populated areas where 5G networks exist; may be very slow in rural areas, making it impossible for households to fully participate in the modern internet. The technology depends on line of sight, so it may be impractical in hilly or heavily forested areas.



**Satellite:** radio waves are exchanged between the home dish through a satellite to the ISP by radio waves to provide broadband access.

**PROS:** a way to get broadband when no other option is available.

**CONS:** very expensive compared to the other options. Sometimes a large up-front investment in equipment is required. Some services cap the amount of data that can be used within a certain time period. Satellite transmissions can be disrupted by certain types of weather, so reliability is an issue. Because data must travel a long distance, with every request making a round trip into space, latency can be an issue. New technology using satellites in low earth orbit has made latency less of an issue, but the other issues remain.

# How to Get Broadband Access in Your Home

## How to research your options

Many locations in Texas, especially those located in rural areas, may have very limited options for broadband. In order to identify the services available, it is usually necessary to do research on the internet. Your local public library is an excellent resource, and should have internet-enabled computers that are free for public use. You can also use your smartphone in a location where it has good service, or you may use any device where there is a Wi-Fi connection available (the [Texas Free Wi-Fi map](#) may be helpful in finding these locations.)

Once you are online, the following resources can provide guidance:

- **Texas Free Wi-Fi Map** (<https://www.tsl.texas.gov/ld/tech/wifimap>) is available in English and Spanish if you need to use Wi-Fi as you look into broadband.
- **Broadband Now** (<https://broadbandnow.com/>) is a service run by a private company that allows you to enter your Zip code in order to see all broadband service providers in your area, along with phone numbers to call for more information. Not all providers listed will provide service to your home address.
- **The FCC National Broadband Map** (<https://broadbandmap.fcc.gov/home>) is run by the federal government and allows you to input your specific street address to see companies that serve your precise location.



- **The Texas Broadband Development Map** (<https://comptroller.texas.gov/programs/broadband/outreach/maps/>) is under development as of January 2024. Details will be forthcoming from the Texas Broadband Development Office.

## Frequently Asked Questions about getting broadband

### 1. What if I need help affording broadband service?

The Affordable Connectivity Program (ACP) (<https://www.fcc.gov/acp>) is a federal program that provides a monthly discount toward internet service. Households qualify for \$30/month in assistance if total income is below 200% of the Federal Poverty Guidelines, or if certain other criteria are met; or for \$75/month for households on qualifying Tribal Lands.

### 2. What if I can't afford a device such as a laptop, desktop computer, tablet, or smartphone, on which to access the internet from my home?

In addition to discounted broadband service, the ACP can provide one-time assistance to qualifying households for the purchase of an internet-capable device.

### 3. What if I need help learning how to use technology?

Your local public library is an excellent place to start. Most libraries have internet-enabled computers that are free for public use. A librarian will likely be able to help you get started in using one.

Look for instructional videos from reputable organizations or companies that explain how technology works and how best to take advantage of it. You can also look into classes that teach you basic skills at your local library, community college, or other community center.

### 4. What if there are no reasonable broadband services available for my home?

If the FCC National Broadband Map shows that your location is “served,” but there are actually no feasible or affordable broadband options, you or your local municipality may challenge the map via the “Location Challenge” option on the website after the address has been entered. More information can be found at the FCC’s Broadband Data Collection Help Center (<https://help.bdc.fcc.gov/hc/en-us/articles/10475216120475-How-to-Submit-a-Location-Challenge>).

If your residential address is not “served,” your local municipal government may qualify for a grant from the state or federal government in order to pursue better options. It is a good idea to reach out to your local city or county government or your Texas State Representative to let them know you support such action.

### 5. How does this work if I live in an apartment complex?

If you live in an apartment complex, sometimes utilities are included in your rent. Most of the time, these utilities include some combination of electricity, water, gas, trash, and/or sewage, but sometimes cable and/or internet (broadband) are included. If internet is included, ask the landlord or manager about what type of internet it is and how to get set up with the apartment provider.

If you do not live in an apartment complex where broadband is included in your rent, you will need to find a local provider and contact them to get connected.



# Why Broadband Access is Important

## The Digital Divide

More and more of our world is moving online, and we must ensure that people who don't have appropriate access are not left behind. More than two million Texas households do not have access to high-speed internet. Residents in rural areas are particularly underserved. Creating access to broadband offers better opportunities for Texans and also businesses:

- **Health/telemedicine:** Sixty-four Texas counties have no hospital, while 25 lack even one primary care physician. Video appointments with a doctor, or other telemedicine visits, can help fill gaps in care, but only where a reliable internet connection is available.
- **Education:** Technology is a cornerstone of modern schooling. Students without home internet access may not be able to complete their homework, causing them to fall behind. Furthermore, students with broadband can participate in additional specialized online learning opportunities, such as remote college courses.
- **Business/agriculture:** Any type of business can benefit from the increased opportunities and efficiencies that result from reliable access to the internet. According to the U.S. Chamber of Commerce and Amazon, nearly \$4 billion worth of value has been added to the Texas economy as the result of increased access to digital tools. Modern "precision" agriculture also relies on web-enabled technology. Farmers and small business owners without broadband may not reach their full potential.
- **Employment:** Being able to easily look for and apply for jobs, many of which are posted online, is helpful in the digital age.

Increasing equity in internet access across the state of Texas is necessary to ensure all Texans have the opportunity to thrive in the modern world.

## About Texas Appleseed

### Learn about us and get in touch

Texas Appleseed is a nonpartisan, nonprofit policy and advocacy organization. We are committed to supporting children, families, and communities through policy change. Our work has shaped hundreds of laws and positively affected millions of Texans by breaking down barriers through transformative policy solutions.



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