UTTyler SOULES COLLEGE OF BUSINESS

Hibbs Newsletter

Hibbs Institute for Business & Economic Research

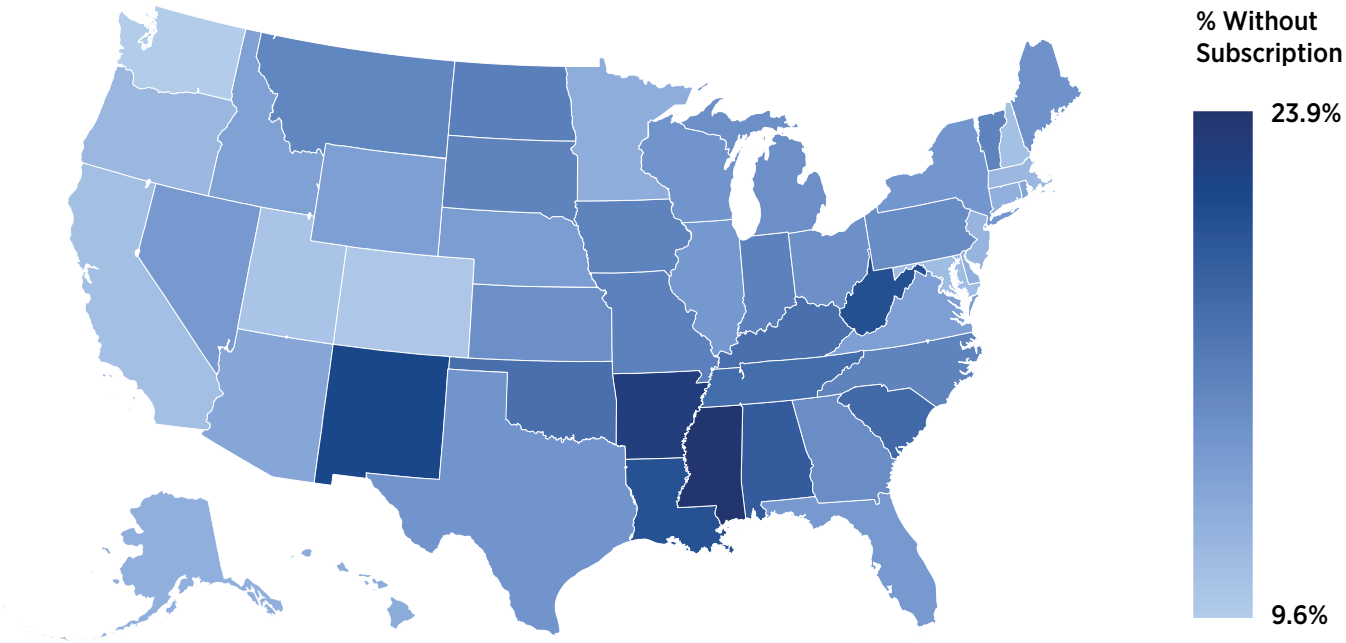
Broadband Access: Assessing the Digital Divide in East Texas

It is widely known that different individuals have different access to broadband and technology based on their geographic location, which is frequently called "the digital divide". Broadband is the access to high-speed internet that is always-on and faster than dial-up access; this can include fiber, wireless, digital subscriber line (DSL), satellite or cable.[1] Broadband access does not mean that the homes have completely adopted a broadband service program, but that if they were looking to adopt or purchase a program, it would be available to them. Whereas a household who has a subscription has access to broadband technology, decided to adopt it, and can pay to use it. This said, there is significant variance in the number of households that have access and the strength to broadband of that broadband technology.

It must be noted that the issue of broadband connectivity and subscriptions does not impact all states and geographic regions the same. **Figure 1** depicts the number of households that are unsubscribed in each state, where the lightest colored states have the best rate of subscription. The state of Washington holds the lowest population without an internet subscription (9.6%) while the state with the highest population without an internet subscription is Mississippi (23.9%).[2]

Increasing broadband access in the U.S. allows the states and their residents to leverage national and global economies. Broadband access does not mean that the homes have completely adopted a broadband service program, but that if they were looking to adopt or purchase a program then it would be available to them. Having access to quality broadband connections is crucial for economic growth, competitiveness, job creation, and a better way of life for residents of the area.[3]

Figure 1: Number of Households without an Internet Subscription (in percentage)



Source: 5-Year American Community Survey; U.S. Census Bureau.

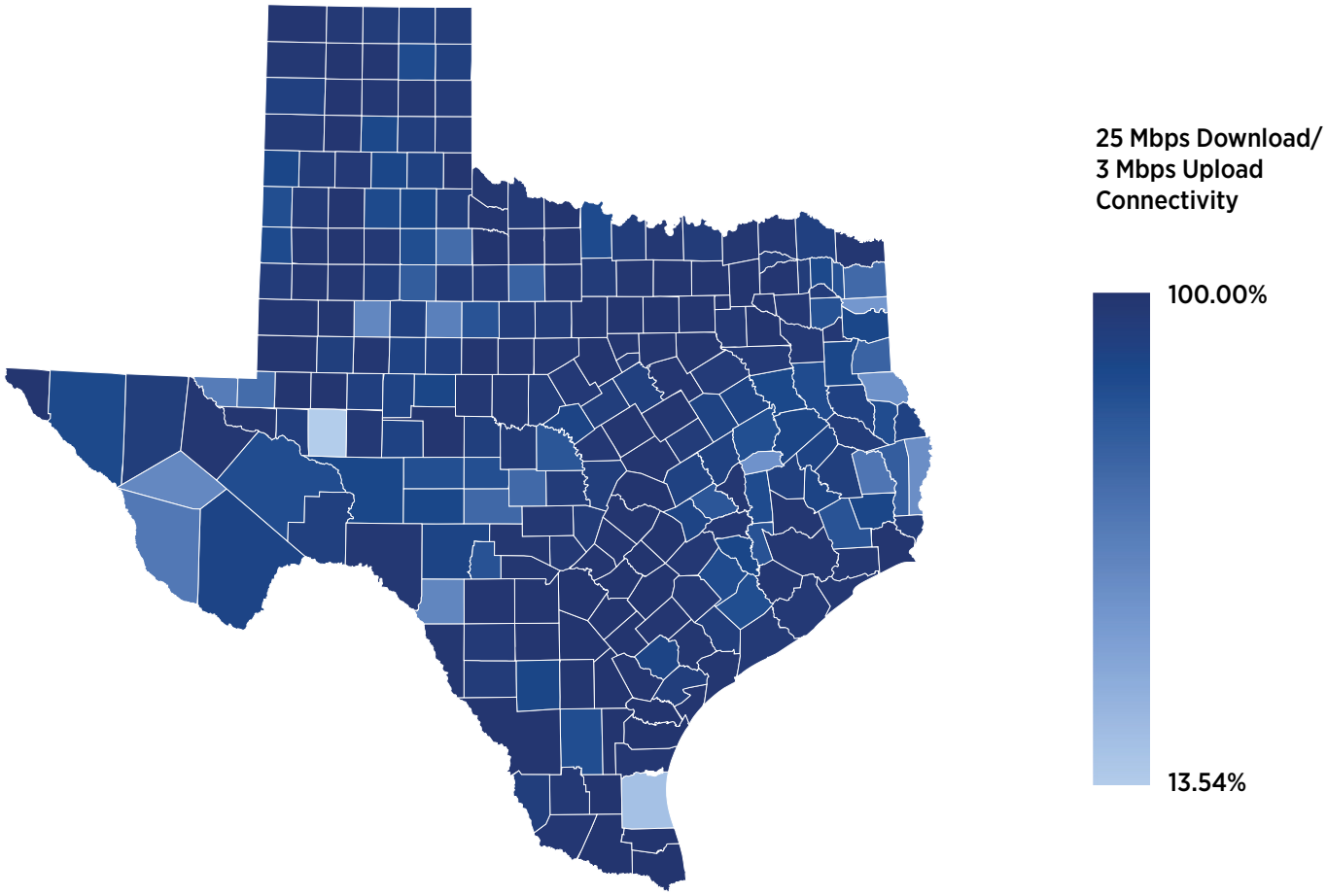
[1] Texas Governor's Broadband Development Council, Briefing Book (2020) https://gov.texas.gov/uploads/files/business/Texas_Broadband_Briefing_Book_-_April_2020.pdf
[2] 5-Year American Community Survey; U.S. Census Bureau.
[3] Texas Governor's Broadband Development Council, Briefing Book (2020) https://gov.texas.gov/uploads/files/business/Texas_Broadband_Briefing_Book_-_April_2020.pdf

Further, the COVID-19 pandemic has increased household's reliance on access to broadband to conduct work from home practices, complete online education, or other ventures that increase quality of life in the household. A large majority of the American public have said that the use of the Internet has been important during the pandemic, and other large groups have noted that it has been essential.[4]

Unfortunately, Texas and its rural areas are hit harder by lack of broadband access. According to the Federal Communications Commission (FCC), "broadband internet" access is an "always-on" connection of 25 megabits per second (Mbps) download, and 3 Mbps upload speeds.[5] Download speeds refer to the rate that data is sent from the Internet to the home, and upload speeds are the rate that data is transferred from the home to the internet.[6] For perspective, to stream a recorded lecture from a professor's YouTube channel, a UT-Tyler student would need anywhere from 5 to 8 Mbps download speed for high-quality streaming definition.

Considering this definition, approximately 516,000 households in Texas in 2020 lacked the U.S. standard of broadband access at home with over 440,000 of those listed living in a rural area of the state.[7] **Figure 2** shows the percentage of households in each county that have access to the FCC standard speed. There is a disproportionate lack of access on Texas' eastern border and its western regions, where multiple counties show lack of access. ***The Hibbs Institute*** expects Texan's overall access to the Internet to continue to increase in the coming years, with renewed focus on rural areas where many residents are impacted the most by lack of broadband infrastructure.

Figure 2: Household Broadband Access in Texas, by County (in percentage)



Source: 5-Year American Community Survey; U.S. Census Bureau.

[4] Pew Research Center, The Internet and the Pandemic (2021) https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/
[5] Federal Communication Commission (FCC)
[6] All Connect, Upload vs. Download Speed (2021) https://www.allconnect.com/blog/difference-between-download-upload-internet-speeds
[7] Texas Governor's Broadband Development Council, Briefing Book (2020) https://gov.texas.gov/uploads/files/business/Texas_Broadband_Briefing_Book_-_April_2020.pdf

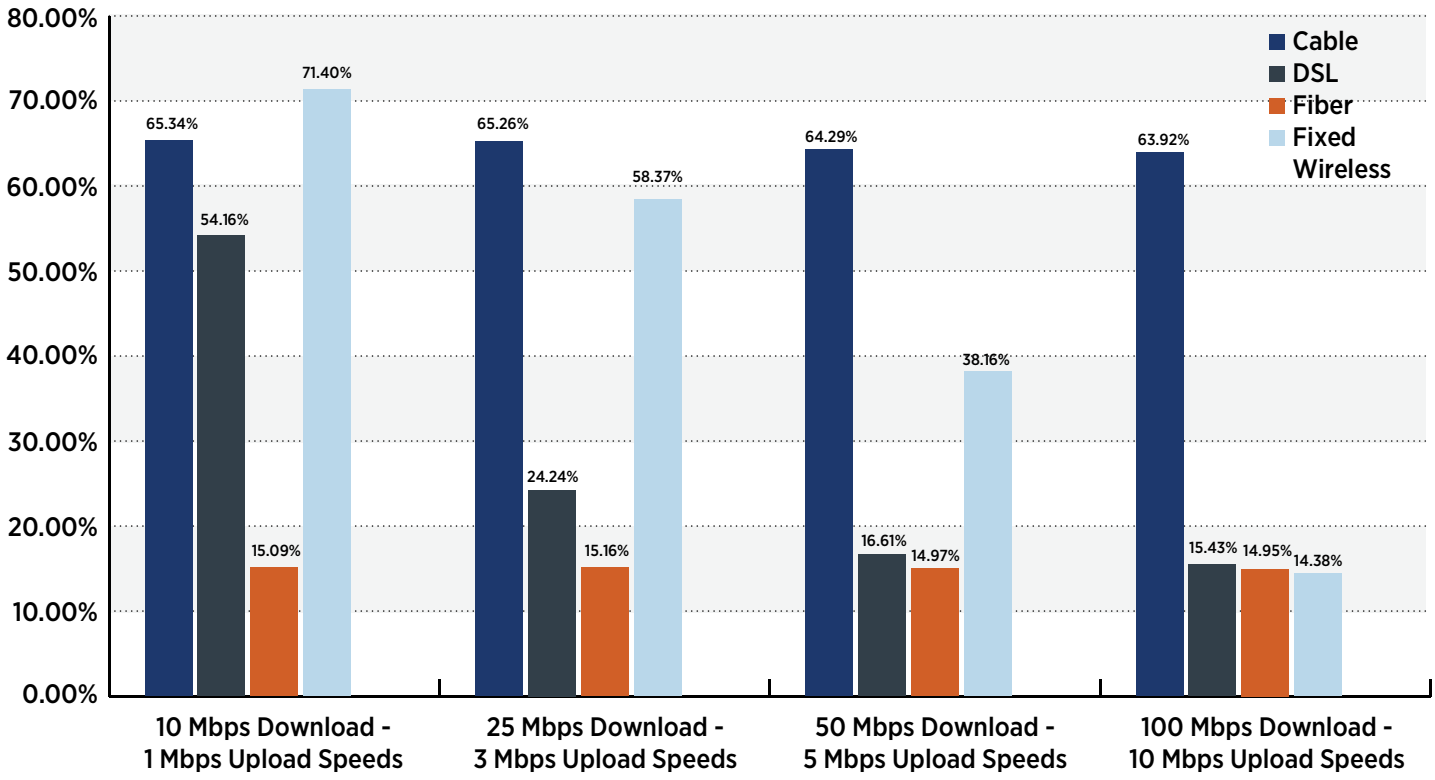
Broadband Access in East Texas

Figure 3 outlines the access to various broadband technologies in the East Texas region by the recorded speeds. *Cable* architecture uses cable television companies' network to provide a shared connection within neighborhoods, meaning the distance from the local cable provider will not hinder internet speeds. *DSL* internet uses the same wires as telephones to provide a high-speed internet connection, only requiring a DSL modem.[8] *Fiber* internet optimizes high-speed data transmission to homes using in-ground glass wire. This is a new form of internet connection that is awaiting infrastructure development to become more affordable and accessible to rural households.[9] *Fixed wireless* requires a main internet access point to send internet service to a receiver, usually in a rural or underserved area. This form of service typically requires the receivers to be within 10 miles of one another and have a line-of-sight.[10] In order of speed from fastest max speed to slowest is fiber optic broadband, cable, DSL and last is fixed wireless.[11]

It must be noted that areas of broadband access may overlap and provide certain speeds and technologies in multiple regions. For example, a household in Mount Pleasant, TX may have access to both Cable and DSL, but not Fiber connection. This causes an overlap that makes the Connect Nations percentages add up higher than 100%. Further, the graph also shows that some technologies (DSL and Fixed Wireless) decline in availability as speeds begin to increase.

For additional perspective of the broadband gap in East Texas, in order to participate in high-definition Zoom video conferencing with one other person, you are recommended to have 3.8 Mbps upload speeds and 3.0 download speeds.[12] Given the information in **Figure 3**, over 35% of households (148,000) lack access to speeds fast enough to host high-definition personal video on a Zoom conference call from home. Total households currently with speeds high enough for proper Zoom conferencing is predicted to be lower, as Connect Nation's estimations only account for households with access to broadband infrastructure adequate to support their need.

Figure 3: Household Access to Internet by Speed and Technology in East Texas (in percentage)

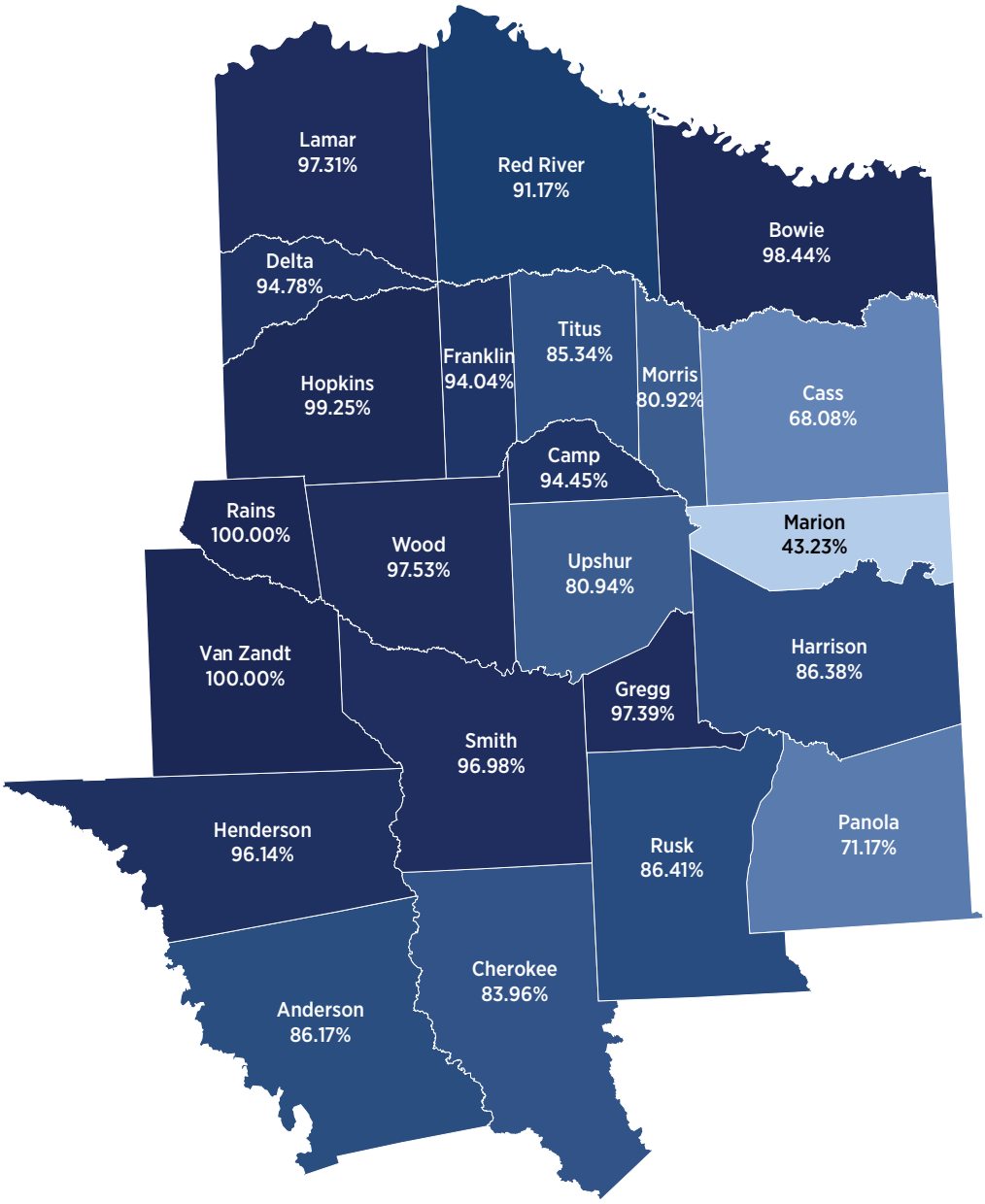


Note: U.S. Census estimates 416,985 households in East Texas.
Source: Connected Nation Texas.

[8] What is DSL internet?; Frontier.com https://frontier.com/resources/what-is-dsl-internet
[9] Texas Governor's Broadband Development Council, Briefing Book (2020)
[10] What is Fixed internet?; UpwardBroadband.com https://www.upwardbroadband.com/fixed-wireless-internet-vs-dsl-the-pros-and-cons/#:~:text=What%20is%20Fixed%20Wireless%20Internet,businesses%2C%20farms%2C%20and%20homes
[11] Peter Holslin, HighSpeedInternet.com (2021) https://www.highspeedinternet.com/resources/compare-internet-provider-types
[12] Zoom Video Conferencing, Support https://support.zoom.us/hc/en-us/articles/201362023-Zoom-system-requirements-Windows-macOS-Linux

Figure 4 depicts the percentage of households in each East Texas county that has access to the FCC standard of 25 Mbps download and 3 Mbps upload speeds. East Texas' counties currently range from 43.23% to 100% availability of the FCC standard. One clear outlier can be found in Marion County. Marion County has a similar population (4,595 households) as Rains County (4,377 households) but falls far behind in accessibility to adequate internet service (56.77% difference). Three other underperforming counties Morris, Upshur, and Cass, all border Marion County and together account for 31.33% of the total households (10,417 of 33,255) without access to the standard FCC internet connection speeds. Although Marion county is only 58 miles away from the Texarkana metro area, rural counties like Rains and Hopkins lie further away (over 70 miles) away from the Dallas metro and show stronger access to the FCC standard (100% and 99.25%, respectively).[13]

Figure 4: East Texas Access to FCC Standard Broadband Speed (25 Mbps Download/3 Mbps Upload)



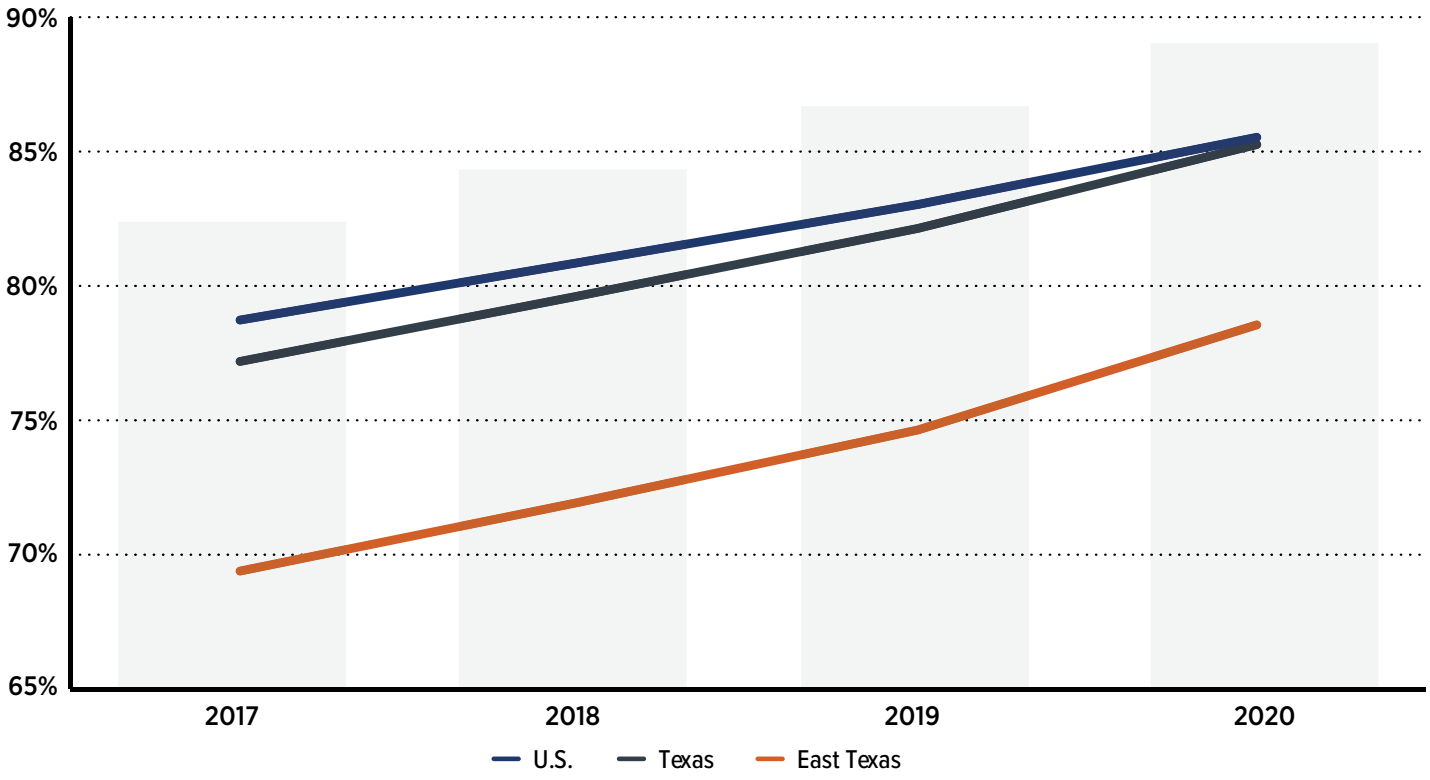
Source: Connected Nation Texas.

[13] Connected Nation Texas. https://connectednation.org/texas/mapping-analysis/

It is clear that the geographic limitations of broadband infrastructure affect rural and marginalized areas, lowering the number of households that can subscribe to the Internet. Household subscriptions do not represent technological access, but instead, represents those households that have access to broadband technology, decided to adopt it, and have paid to use it. According to the U.S. Census Bureau, over 92,000 households in the East Texas geographic region do not have a subscription to internet in their home. This is representative of over 22% of the residential living in the region. **Figure 5** depicts total household subscriptions to internet in the East Texas region by percentage since 2017. While East Texas continues to increase its total subscriptions to the Internet, it still trailed the national and state average subscription rates by 6.72% in 2020. It must be noted that the U.S. Census Bureau considers all residents of a census block to be subscribed if one person within that area subscribes to broadband.[14] If one resident asserts to have access to the Internet, then the whole block is considered as such. These differences between household access and household subscriptions accompanied by inability to acquire accurate datasets further highlights the severity of the digital divide.

Broadband access plays a key role in the future economic growth, competitiveness, educational attainment, and job creation of Texas and the East Texas region. By creating more opportunities to be connected, we will also create more opportunities to be successful over various quality of life factors. By providing accurate datasets in the future and accounting for those regions who are geographically disadvantaged, progress may be made in shrinking the digital divide.

Figure 5: Comparison of East Texas Broadband Subscriptions to U.S. and Texas



Source: 5-Year American Community Survey; U.S. Census Bureau.

[14] Government Accountability Office, FCC's Data Overstate Access on Tribal Lands (2018) https://www.gao.gov/products/gao-18-630

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