

West Virginia State Broadband Plan

APPROVED FOR PUBLIC COMMENT

PREPARED BY TILSON IN COOPERATION WITH THE
WEST VIRGINIA BROADBAND ENHANCEMENT COUNCIL

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Placeholder for Introductory Letter



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The West Virginia Broadband Enhancement Council has 13 voting members; and two Senate Appointees and two House of Delegates Appointees, one from each party, to serve as ex officio, nonvoting advisory members. The Council conducts a regular meeting on the second Thursday of each month, at 10:00 a.m., in the West Virginia Department of Commerce offices in Building 3 at the State Capitol Complex.

For more information, visit the Council website at: broadband.wv.gov.

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1. Executive Summary

In recent years, the State of West Virginia has made great strides to advance broadband deployment to underserved and unserved areas, reflecting the State's ongoing commitment to improving broadband services for its citizens. Under the leadership and vision of Governor Jim Justice and the West Virginia Legislature, the State is creating and implementing innovative policies, procedures, and processes for facilitating broadband deployment.

There are many good-news stories. Notably, the West Virginia Broadband Enhancement Council (Council) was created within the West Virginia Department of Commerce pursuant to legislation passed in 2017. Vested with significant powers and duties to promote broadband deployment and adoption, the Council is involved in numerous innovative programs to improve the lives of unserved West Virginians by bringing access to economic opportunity, educational resources, telehealth, improved public safety, and a panoply of other benefits associated with fast, affordable, and reliable broadband internet access.

The Council is also focused on supporting next-generation services needed to create Gigabit Cities and Counties within the State. In addition, the Council has embarked upon new collaborations in West Virginia between the Council, the Public Service Commission, the State's electric utilities, and interested Internet Service Providers (ISPs) to create a middle-mile network to support last mile projects into unserved rural communities, an effort that is ongoing with implementation into 2020 and beyond.

Despite an array of important initiatives, broadband availability – or the lack thereof – continues to challenge the residents and businesses of West Virginia. Many citizens in West Virginia do not have access to and do not use broadband internet service. The problem is particularly acute in rural parts of the State. As the statistics and numbers set forth in this 2019 West Virginia State Broadband Plan (Plan) demonstrate, West Virginia lags much of the United States in access to broadband. In more than one metric, the State measures in the bottom tier, or even dead last, compared to other States across most access and adoption measures. With mountainous geography, many rural communities, and a lack of adequate existing resources to support infrastructure deployment at either the State or local level, significant challenges remain ahead.

Nonetheless, West Virginia has a strong foundational effort significantly underway to expand access to broadband services, including, but not limited to, middle mile, last mile, and wireless applications. This Plan details those efforts, identifying target areas for investment as well as goals and strategies for infrastructure deployment, speed, availability, and access, while recognizing the barriers and challenges to development. It concludes with actionable goals, strategies, and priorities. This Plan is prepared as a living document that provides a snapshot of West Virginia's ongoing efforts to improve broadband through measured and sustained action and will be amended and updated as the Council's work continues.

2. Introduction

Access to the Internet has become a staple of modern life. Access provides connection to the world: commerce, public safety, education, health care, government services, digital technology, employment, family; the list of needs and uses is almost infinite. Despite society's ever-increasing reliance on the Internet, however, there is no guarantee that every community will have access that is fast, affordable, and reliable. There is no obligation of any ISP to provide service to any particular community, business, home, hospital, or school. As a result, there are communities within West Virginia – typically more rural parts of the State – where access to the Internet is severely constrained, or even unavailable. These areas are characterized by low population density and difficult terrain, rendering the cost of deploying and maintaining the necessary communication networks providing internet access prohibitively expensive.

In these communities, young people are leaving. New businesses and industries steer away, looking to more urban centers with robust Internet connectivity. Existing small business owners face difficulty processing transactions or reaching wider markets online. Emerging and traditional industries lag urban counterparts in applying advanced technology. Rural hospitals and doctors cannot meet federal requirements to provide digital medical records. High school students labor to complete online assignments and connect with teachers and educational resources. Families strain to communicate by email or text. In short, connected communities move further ahead, while unconnected communities continue to pursue the benefits of connectivity.

West Virginia leaders recognize that broadband connectivity must be part of the State's overall economic development strategy. While providing fast, affordable Internet access is not a "magic bullet" that will ensure each of West Virginia's rural communities will thrive and flourish, without access the task is almost insurmountable.

2.1 What is Broadband?

Internet access is measured in terms of bandwidth – the amount of data that can be sent through a connection – in megabytes per second or Mbps. That measurement pertains to download and upload speeds. Download speed refers to the speed at which a computer can receive data from the Internet, such as when accessing a website, receiving an email, or watching an online video online. Upload speeds refer to how fast data is sent from a computer to the Internet, such as when sending an email, inputting information to purchase a product online, or posting a picture on social media.

2.2 What Level of Speed is Considered Adequate?

What West Virginia consumers seek is high-speed or fast internet, which is typically referred to as broadband. "Broadband" or "broadband service" is defined by the Federal Communications Commission (FCC) as Internet access with a download speed of 25 Mbps and an upload speed of 3 Mbps, often referred to with a short-hand of 25/3 Mbps. FCC officials have referred to these speeds as "table stakes" for 21st century communications. For purposes of this document and in its own work, the Council will use this definition of broadband as the minimum level of service that it seeks to deploy

within West Virginia, the minimum level of access that is considered adequate for today's consumers. The Council would change these thresholds if the FCC defines "broadband" using more stringent performance measures.

2.3 Connect the Unconnected

To set the stage for action, it is essential to understand the current state of broadband in West Virginia, so that progress can be plotted and documented. This Plan takes a deep dive into the statistics, surveying the leading sources of information concerning broadband availability and adoption. It also provides an overview of the different technologies for access currently available to West Virginians. It then explores the limitations on the available information and technology, limitations that are essential to note when deploying scarce resources so that those resources are targeted to the most effective technologies in the neediest areas.

The statewide efforts described in this Plan, led by Governor Justice and the Legislature and implemented by the Council with their fellow state agencies, have an overarching goal: connect the unconnected. There are areas of the State that are underserved, meaning there may be some limited level of Internet service, but that service is inadequate to meet the basic needs of residents or is not available to every premise within that community. There are also unserved areas, where there is no Internet service available at all. Substantial parts of West Virginia are underserved or unserved today and the State's efforts are focused on assisting projects that help bring broadband to the neediest areas. This Plan is the roadmap for those actions.

While there is much work to do, there has also been much work to date. The Council is currently working with American Electric Power/Appalachian Power Company and First Energy, the State's two investor-owned electric utilities, to develop "middle-mile" broadband infrastructure. The middle mile is the segment of a telecommunications network linking the core network to the infrastructure that runs into the community and connects to individual buildings, which is known as the "last mile." The Council is also currently working with ISPs to develop last-mile infrastructure into underserved and unserved parts of the State through a Request for Information specifically targeted at counties with the greatest need.

There have also been mapping projects, educational initiatives, and many infrastructure projects funded through Community Development Block Grants, the Appalachian Regional Commission, the U.S. Department of Agriculture, and the Federal Communications Commission. Industry-led investments are an equally important component of the State's development strategy and the Council applauds the investment of companies that are expanding connectivity in West Virginia. Several notable highlights are included in this Plan.

Legislative initiatives are also moving West Virginia forward. Legislation enacted in recent years created the Broadband Enhancement Council, implemented an innovative "Dig Once" policy for highway construction projects, developed a fund to support broadband investment, and created numerous other new statutes and policies. These are summarized throughout the Plan.

The State's Regional Planning and Development Councils have partnered with local governments throughout the State to pursue broadband development, and their efforts are to be recognized and commended. The regional plans developed by the authorities are thoughtful, thorough, and provide

both support and ideas for the Council's work. A list of those plans is provided with this Plan in Section 3.5 and applicable findings which support the State Plan are highlighted.

The Council is also gathering crucial information from key stakeholders and communities through five different surveys. These surveys are ongoing, and this Plan will be updated once this process is completed.

2.4 Accurate Data as a Priority

Accurate data is the cornerstone of solid planning. Among the Council's goals is the collection of data needed to accurately assess West Virginia's current broadband services, assets and infrastructure. Data collected at the local level will contribute to the State's strategic plan for broadband development.

The Council has established an Interactive Broadband Mapping System featured on the Council's website at broadband.wv.gov. Mapping services will be provided to the State and federal agencies and local governments to support efficient broadband infrastructure development. The following metrics are available:

1. Static Maps by County
2. ESRI's ArcGIS Desktop (ArcMap)
3. Providers by Area
4. Speed Tiers by Area

The mapping system includes maps for each of the State's 55 counties. Individual county maps are County level maps allow consumers, broadband providers, policy makers, and community leaders the ability to identify service availability and speed, provider coverage areas, and community anchor institutions. Data sources include biannual broadband service provider submissions in FCC Form 477 data, third party datasets, and other publicly available sources. Data is modified, where necessary, to meet broadband mapping standards set by the Council.

In conjunction with the Interactive Broadband Mapping System, the Council launched the Speed Test Portal in October 2017. Speed test data will enhance the Statewide Broadband Coverage Map to more accurately identify the presence and level of broadband internet service.

The Federal Communications Commission (FCC) reports that more than 84 percent of the State's residents have access to broadband level service. This measurement of access is based upon a reporting system that relies upon information submitted by the internet service provider to the FCC. While the FCC measurement reflects information submitted by the provider, West Virginians may use the speed test as a validation tool.

A complete summary of the Council's mapping program is provided in Section 9.

The capstone to this document is the pathway for the work ahead. The Council has identified subject matter priorities around broadband deployment: Workforce Development, Health Care, Public Safety, Education, and Gigabit Cities and Counties. It has also developed Target Areas with significant underserved and unserved populations and is working to detail development barriers and challenges to broadband deployment, including geography; population density; deployment expense; consumer cost; and regulatory hurdles. This leads to the essential question: what next?

The final sections of this Plan set forth the Council's goals to facilitating broadband deployment and numerous strategies to meet those goals. It also includes a high-level look at any additional resources needed to complete any particular strategy. The final step will be to evaluate these goals and strategies and then set the Council's priorities for the next five years. This Plan is thus very much an action-oriented document that will guide the work of the Council going forward.

3. The Current State of Broadband in West Virginia

3.1 Broadband Technologies

Broadband service is delivered via several different technologies. Speed, cost, reliability, and perhaps most importantly, availability, impact consumer selection of a particular technology. In broad terms, consumers access broadband either through wireline or wireless technology. Wireline technologies that provide broadband service include DSL, cable modem, and fiber. Wireless service can include mobile or fixed service, and sometimes satellite. Because satellite service is generally not capable of delivering 25/3 Mbps service, it is not included as a technology option in this report.¹

3.1.1 Fixed Wireline Broadband

Digital Subscriber Line (DSL)

DSL is a wireline transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses. DSL-based broadband provides transmission speeds ranging from several thousand to several million bits per second. The availability and speed of your DSL service may depend on the distance from your home or business to the closest telephone company facility.²

Cable Modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

Most cable modems are external devices that have two connections: one to the cable wall outlet, the other to a computer. They provide transmission speeds of 1.5 Mbps or more.

Subscribers can access their cable modem service by simply turning on their computers, without dialing-up an ISP. You can still watch cable TV while using it. Transmission speeds vary depending on the type of cable modem, cable network, and traffic load. Speeds are comparable to DSL.³

Fiber

Fiber optic technology converts electrical signals carrying data to light and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps.

The actual speed the consumer experiences will vary depending on a variety of factors, such as how close to your computer the service provider brings the fiber and how the service provider configures the

¹ [“Types of Broadband Connections,”](#) FCC website, FCC.gov.

² *Id.*

³ *Id.*

service, including the amount of bandwidth used. The same fiber providing your broadband can also simultaneously deliver voice (VoIP) and video services, including video-on-demand.

Telecommunications providers sometimes offer fiber broadband in limited areas and have announced plans to expand their fiber networks and offer bundled voice, Internet access, and video services.

Variations of the technology run the fiber all the way to the customer's home or business, to the curb outside, or to a location somewhere between the provider's facilities and the customer.⁴

3.1.2 Wireless

Wireless broadband services are similar to wired broadband in that they connect to an internet backbone usually a fiber-optic trunk; however, they don't use cables to connect to the last mile or business/residences. Instead they use Wireless Fidelity (Wi-Fi) connections or radio waves. A computer or mobile device has a wireless adapter that translates data into a radio signal and transmits the signal using an antenna. A wireless router receives the signal, decodes it and then sends it to the Internet through a wired Ethernet connection.⁵ There are different technologies to access wireless broadband:

Fixed Wireless

Fixed wireless is a type of high-speed Internet access where connections to service providers use radio signals rather than cables. Fixed wireless generally offers connections speeds between 1 and 10 Mbps (although speeds are increasing with advances in technology) and use transmission towers similar to cell phone towers that communicate to a resident's transceiver equipment that, as the name implies, is fixed at the premise. The transceiver equipment communicates with the providers' ground stations.⁶

Wireless Fidelity (Wi-Fi)

Wi-Fi is a fixed, short-range technology that is often used in combination with DSL, fixed wireless, fiber, or cable modem service to connect devices within a home or business to the Internet using a radio link between the location and the service provider's facility. Wi-Fi service can be available in your home or at community locations (airports, coffee shops, schools, businesses, etc.) and are often called "hotspots." A Wi-Fi network uses radio waves similar to two-way radio communications. A computer has a wireless adapter that translates data into a radio signal and transmits it using an antenna. A router receives the signal, decodes it, and then sends the information to the Internet using a physical connection, usually via an Ethernet cable, a cable that carries the broadband signal between the modem, router, computer, and other wired Internet capable devices.⁷

Mobile Wireless (3G, 4G, 5G)

Mobile wireless is high-speed wireless broadband connection (often referred to as cellular or cell service) that is accessible from random locations. The locations depend on the provider's cellular towers and monthly service plans. Many technologies make up wireless networks, but no matter the technology or acronyms you read or hear, mobile wireless networks are radio systems.

⁴ *Id.*

⁵ "[What are the Wireless Broadband Technologies?](#)" Broadband Matters, broadbandmatters.com.

⁶ *Id.*

⁷ *Id.*

Mobile wireless services are continually being upgraded to provide data transmission speeds considered to be broadband. The faster mobile wireless networks are referred to as 3G or 4G, and increasingly, 5G. The “G” stands for “generation,” meaning 3rd and 4th generation or the evolution of broadband cellular networks; supposedly, each generation provides a faster more secure wireless network. A mobile wireless service requires a base station that is connected to a high capacity landline data transmission network to reach the Internet. In other words, it’s never wired OR wireless; ultimately, it has to be both. Wireless broadband in common usage means that the so-called “last mile” connection to the user is done via radio signals from a tower to a cell phone or other wireless devices (e.g., a tablet).⁸

There has been much hype around 5G, the fifth generation of wireless, and much confusion as to what 5G services will bring and when it will arrive. Qualcomm, the wireless chip maker, said it had demonstrated peak 5G download speeds of 4.5 gigabytes a second, but predicts initial median speeds of about 1.4 gigabytes. That translates to roughly 20 times faster than the current 4G experience.⁹

The 5G speeds will be particularly noticeable in higher-quality streaming video. And downloading a typical movie at the median speeds cited by Qualcomm would take 17 seconds with 5G, compared with six minutes for 4G.

5G is just starting to be deployed by some major wireless carriers in major cities and requires a very dense fiber network to support the technology, so it is unlikely that 5G will be deployed beyond population centers any time in the near future.

3.2 Federal, State and Other Data Sources and their Limitations

West Virginia has assembled and created a variety of information on consumer availability of broadband services. This information is used in development of policies and deployment of investment to underserved and unserved areas of the State. The most granular data, as detailed in this Plan, comes from five sources:

- [FCC Form 477 Data](#)
- [Federal Communications 2019 Broadband Deployment Report](#)
- [American Community Survey](#)
- [The Pew Research Center](#)
- [The Pew State Broadband Policy Explorer](#)

The information provided from these sources is important for understanding the current State of broadband in West Virginia. However, these sources have limitations that should be noted when reviewing the information they provide. While no one source provides a complete picture as to West Virginia, taken together they tell a compelling story highlighting the need for continued action on facilitating broadband deployment.

⁸ *Id.*

⁹ [“What Is 5G? Here’s What You Need to Know About the New Cellular Network,”](#) Dec. 31, 2018. New York Times, nytimes.com.

There are two sources of information on broadband availability published by the FCC: FCC Form 477 Data and FCC Broadband Progress Reports.

3.2.1 FCC Form 477 data

All facilities-based broadband providers are required to file data with the FCC twice a year through Form 477 detailing where they offer Internet access service speeds exceeding 200 Kbps in at least one direction. Fixed providers file lists of census blocks in which they can or do offer service to at least one location. Mobile providers file maps of their coverage areas for each broadband technology.

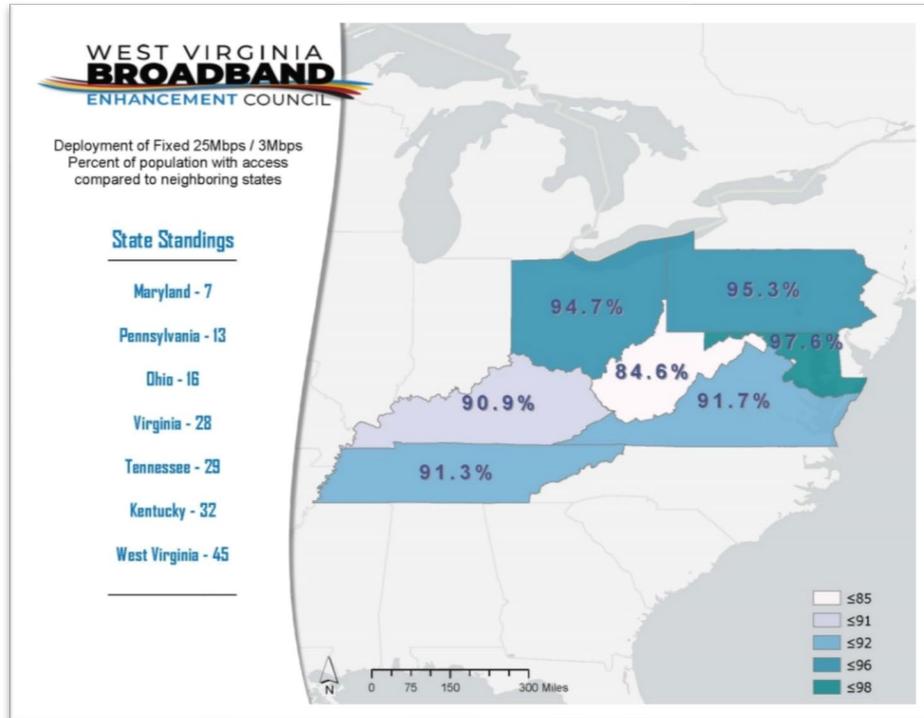
A full set of maps showing coverage in West Virginia based on data published by the FCC with respect to the June 2018 data (the latest available as of this Plan) are included in the Mapping Appendix.

The data in the Form 477 is widely considered to be flawed, because if a service provider claims that they serve a single customer in a census block, the FCC's existing data practices assume that there is service throughout the census block.¹⁰ Since census blocks can be of unlimited size and irregular shape, particularly in rural areas, the data can thus overestimate the number of consumers that can actually access the service within any consensus block. The definition of broadband as 25 Mbps/3 Mbps is also considered a minimum level of service, and does not address the many business, commercial, and residential uses that demand much higher speed. While there has been pressure on the FCC to increase the definition speeds, the FCC has declined to do so.¹¹

Even though many critics consider the FCC's measurement metrics to be flawed, West Virginia's low rankings in the various measures is consistent with consumer experience and feedback from the Council's own speed tests and survey work, discussed further below. The report provides an indication of the State's relative position in national and regional rankings, as illustrated below:

¹⁰ [Federal Communications 2019 Broadband Deployment Report](#) at pp 12-13.

¹¹ *Id.*



3.2.2 FCC Broadband Progress Report

The FCC also released a 2019 Broadband Deployment Report on May 29, 2019, and may be viewed at <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2019-broadband-deployment-report>. This report holistically evaluates the availability of fixed and mobile services over a 5-year time period (2013-2017). It breaks the consumer data into four categories:

1. Those with access to fixed services;
2. those with access to mobile LTE services;
3. those with access to both fixed and mobile LTE services; and
4. those with access to at least one of either fixed or mobile LTE services.

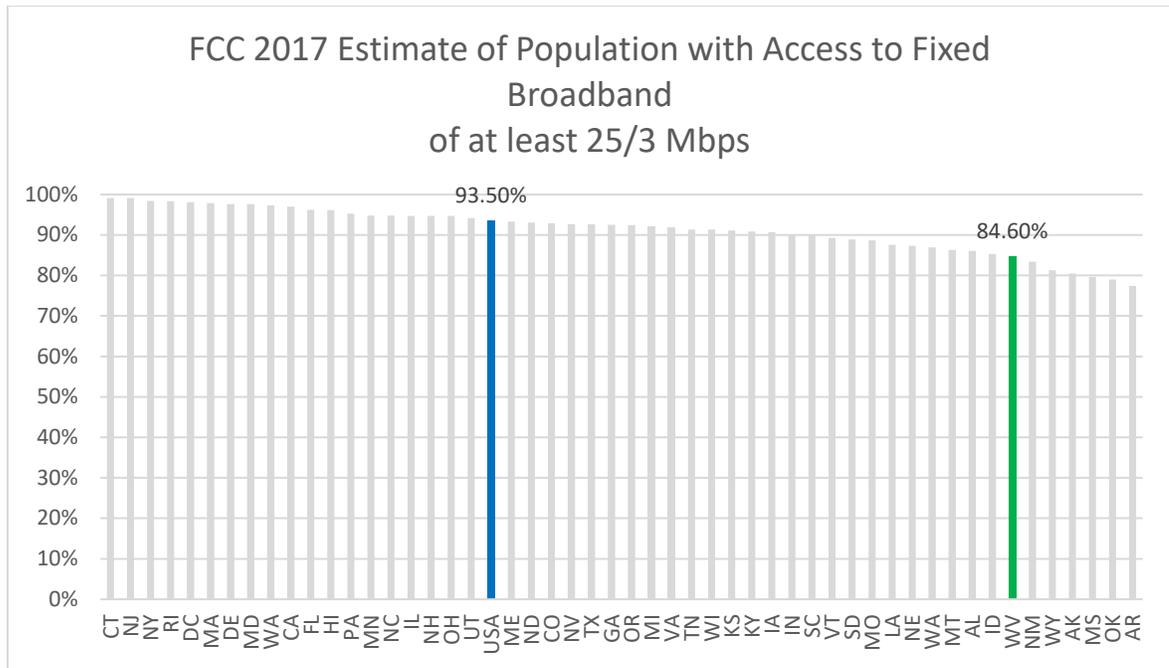
Note that the Report does not incorporate the most recent Form 477 data from June 2018 but ends with 2017 data. The FCC has noted that mobile services are not full substitutes for fixed services and that mobile and fixed services must be evaluated separately.

3.3 Broadband Availability in West Virginia

The FCC's measurement of access to broadband based on Form 477 data has been subject to much criticism, especially in rural areas, as discussed earlier. Even if the percent of consumers with access to broadband services is overstated, the FCC's report can give a rough sense of the relative position of the States.

West Virginia ranks 7th-lowest in fixed wireline broadband access as shown on Table 1:

Table 1 Consumer Access to 25/3 Mbps Wireline Broadband



Source: Federal Communications Commission, 2019 Broadband Deployment Report

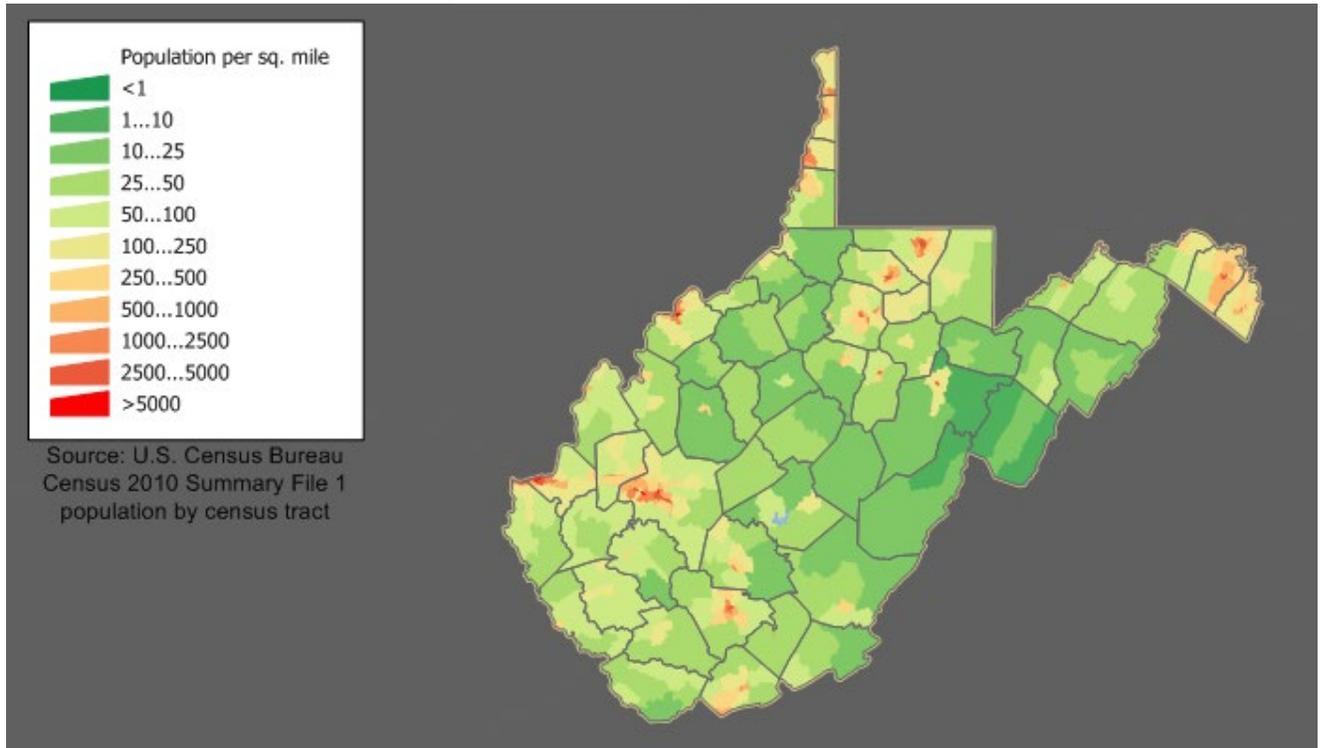
The 2019 Broadband Deployment Reports that approximately 73% of West Virginians in rural areas have access to fixed broadband services with download speeds of at least 25 Mbps and upload speeds of 3 Mbps. In urban areas, according the Report, access to services increases to approximately 97%. For West Virginia as a whole, the Report finds approximately 85% of consumers have access to at least 25 Mbps/3 Mbps service.¹²

Note that the FCC report uses Form 477 data only through 2017, although the maps included in this section and related appendix have been updated to include the more recent 2018 Form 477 data. The Council also believes that data reported to the FCC at the Census Block level likely overstates the availability of broadband service in West Virginia and hence these maps have been adjusted for to account for that known instance of overreporting that affected multiple counties.

As the map series below demonstrates, options available to consumers decrease sharply as need for higher speed increases. For context, a population map based on census data is detailed in Figure 1. Note that populations centers are in northeastern and southwestern parts of the State, with a large rural swath across the center.

¹² [Federal Communications 2019 Broadband Deployment Report..](#)

Figure 1 West Virginia Population by Census



Source: Wikimedia Commons

Figure 2 shows broadband services available to consumers based on Mbps by areas of the State for all types of technology except satellite. Note that the higher speeds are generally available in those areas with the highest population density, so this provides a visual representation of the rural digital divide in West Virginia.

Figure 2 Available Broadband Speeds by Mbps

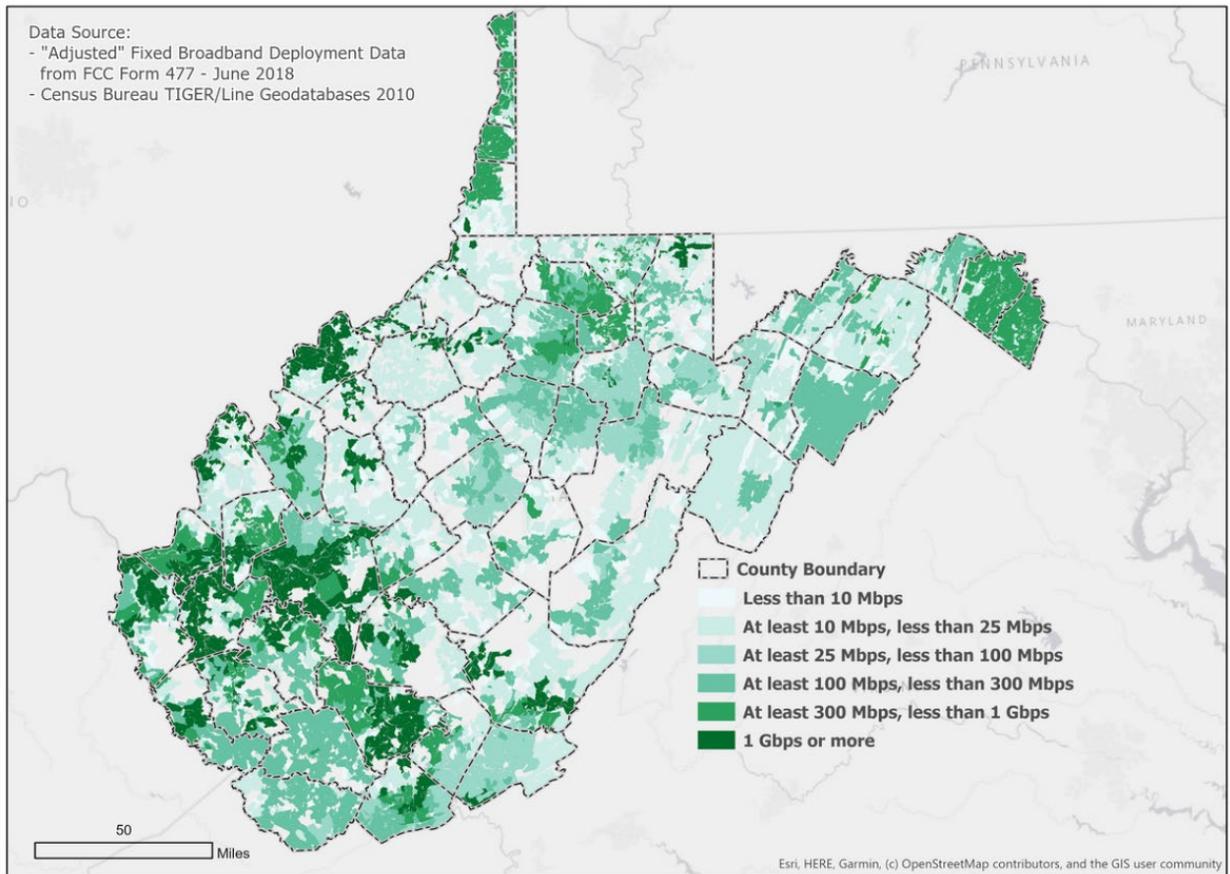
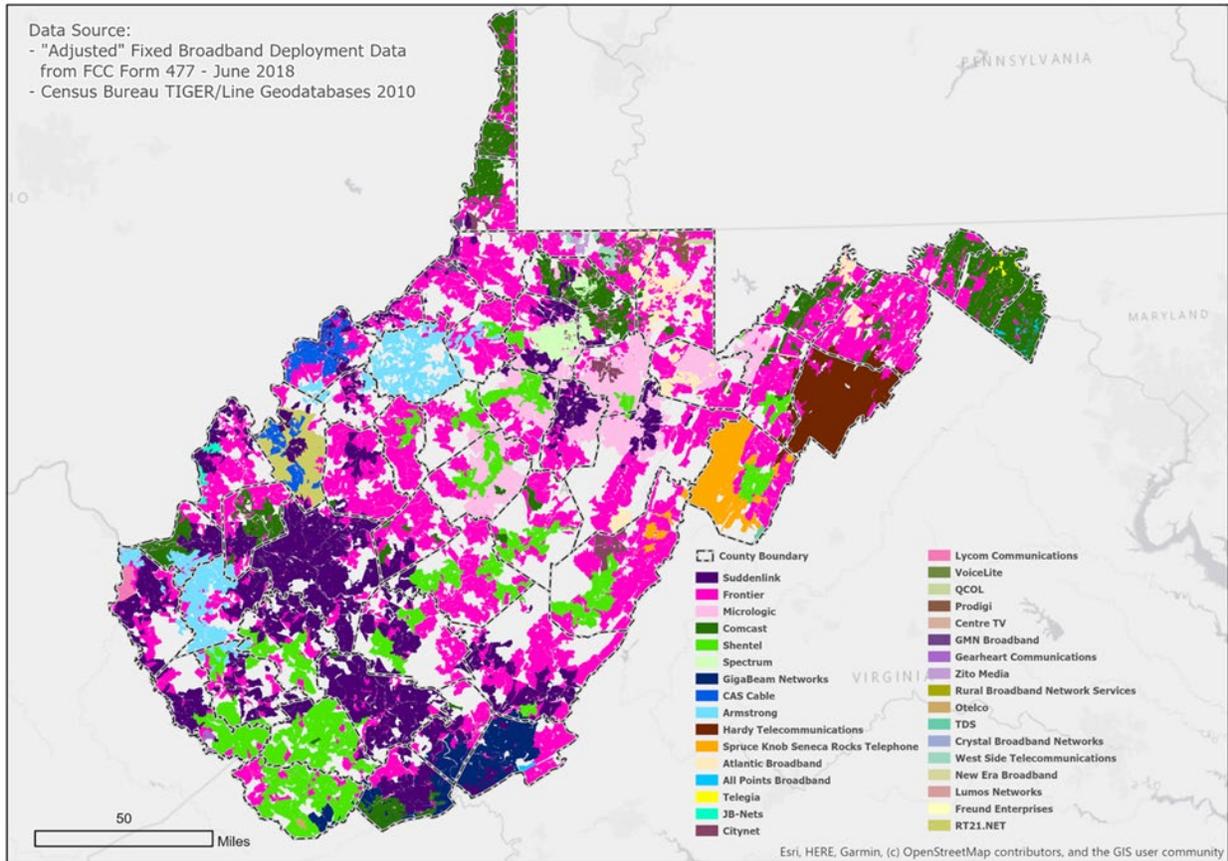


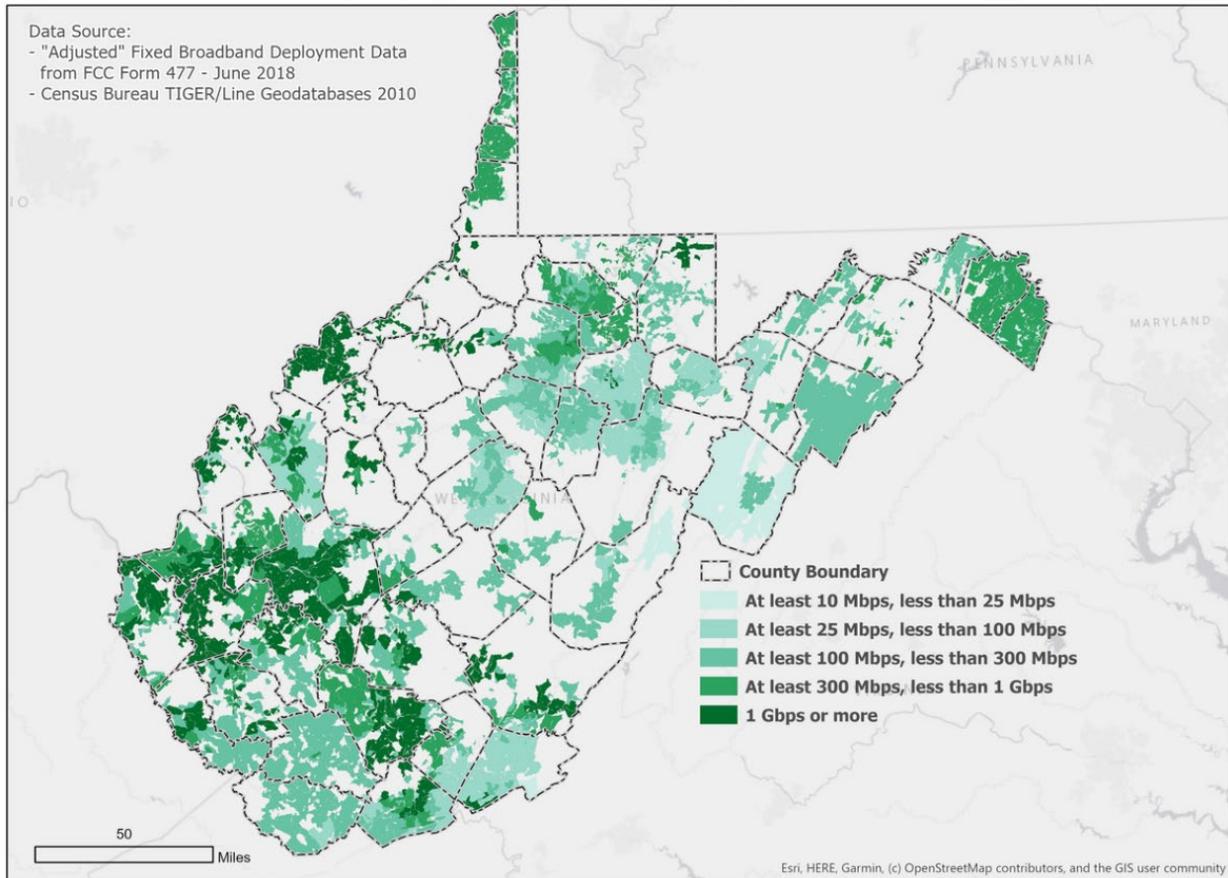
Figure 3 shows the fastest available broadband access by broadband service provider for company, as reported by the companies to the FCC. There is a great variety in the companies reporting the fastest available speed of a given area.

Figure 3 Fastest Available Broadband by Company



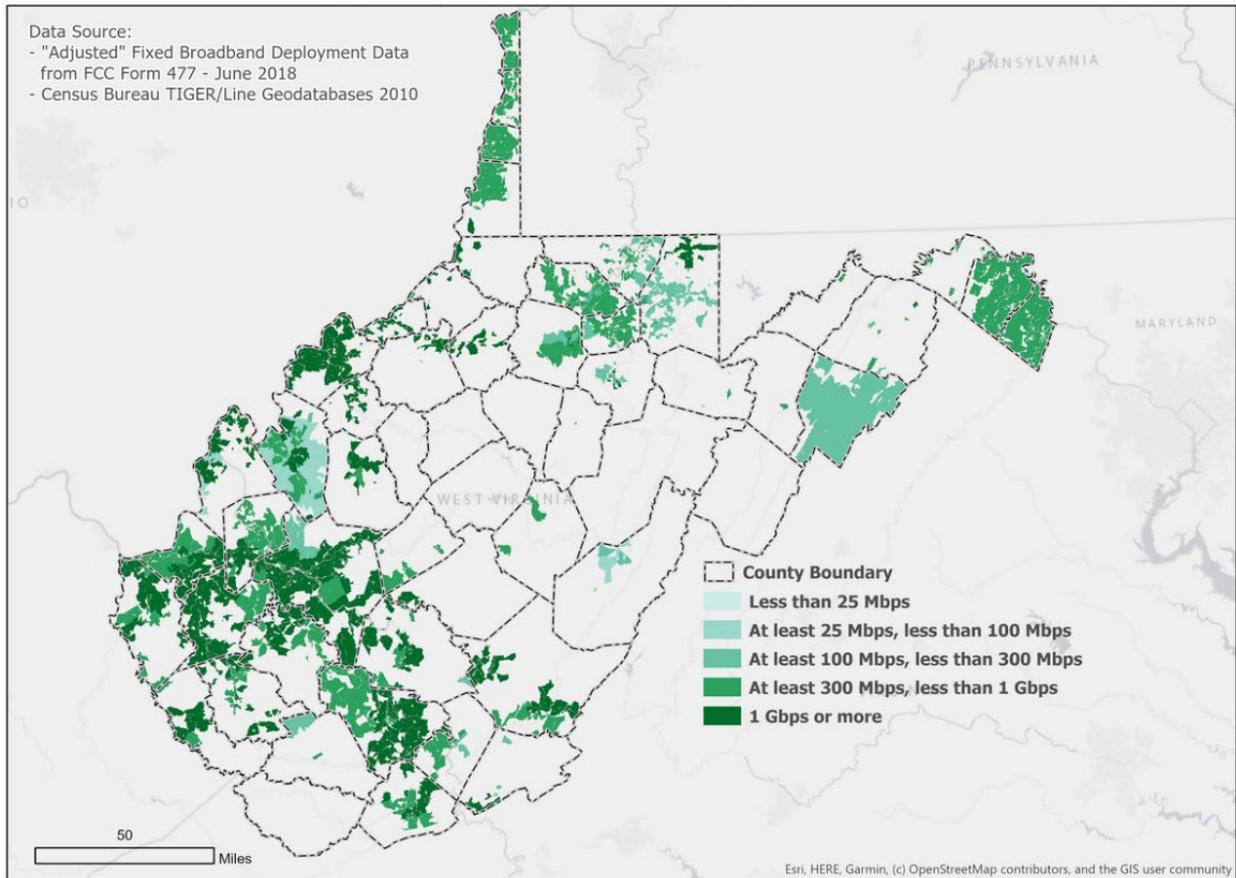
Using the federal broadband definition of 25/3 Mbps, with respect to upload speeds, which are particularly important for e-commerce, there is again a concentration of faster service options in the more populated parts of the State, as shown in Figure 4.

Figure 4 Available Uploads Speeds of at least 3 Mbps



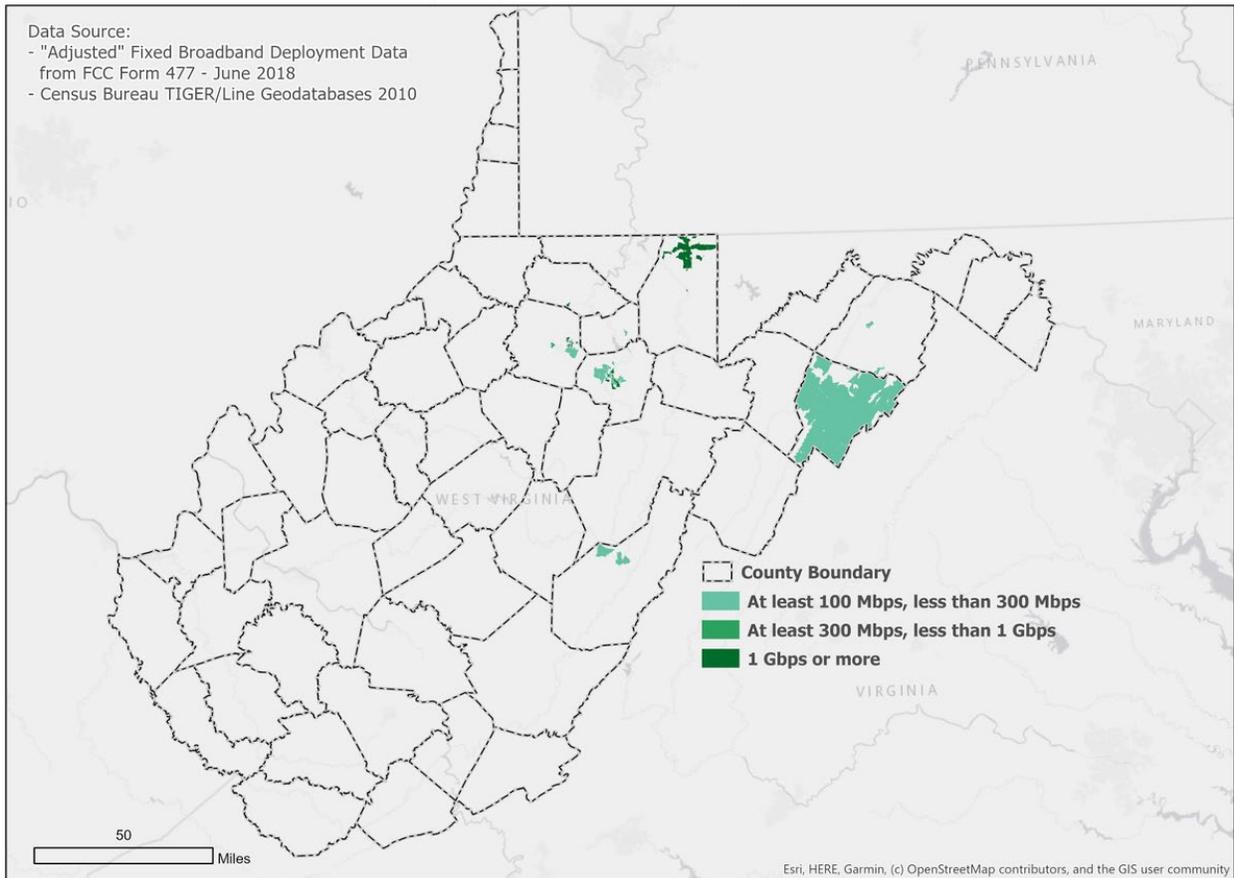
As necessary upload speeds increase to at least 20 Mbps, available services decrease sharply, as shown in Figure 5.

Figure 5 Available Upload Speeds of at least 20 Mbps



There are very few options for consumers that requires upload speeds of 100 Mbps, typically business applications with data-intensive needs, as shown in Figure 6.

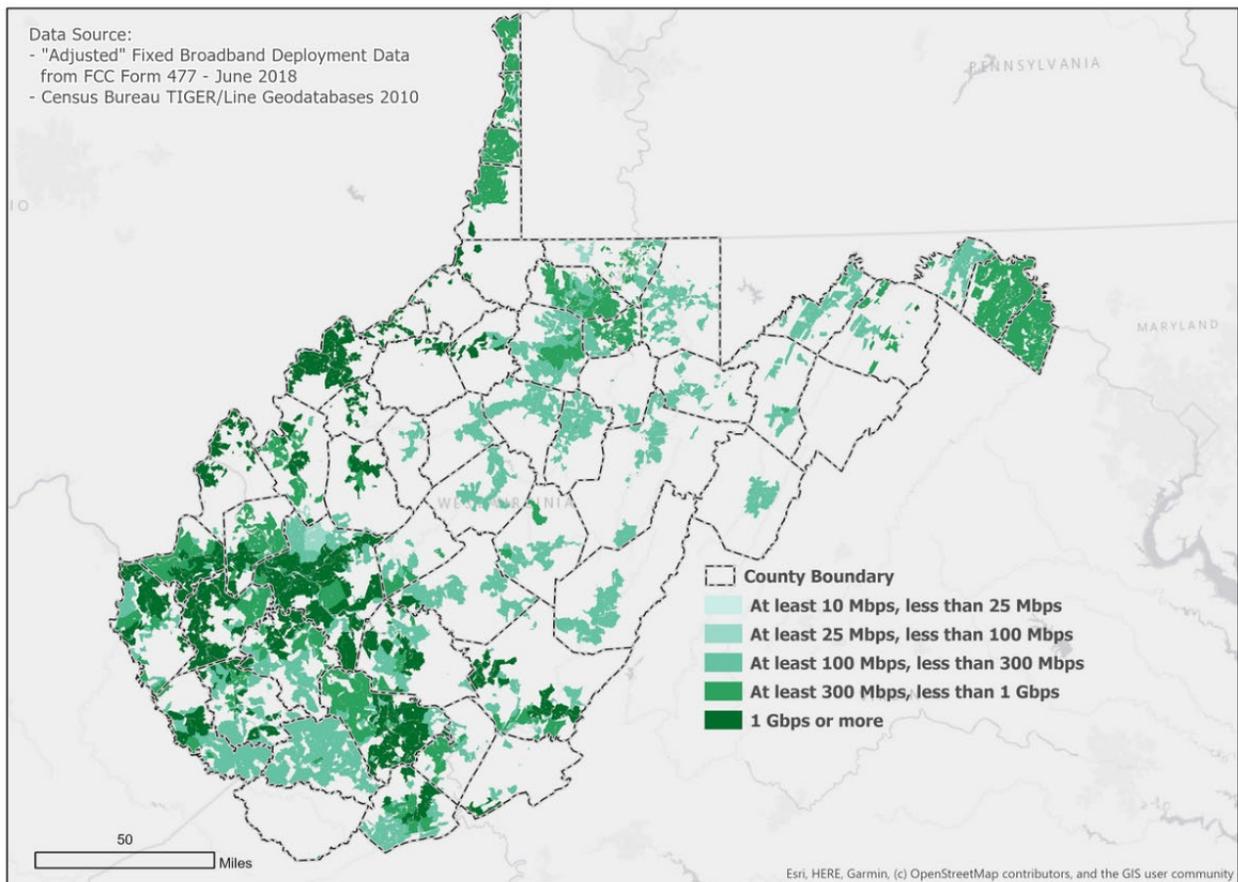
Figure 6 Available Upload Speeds of at least 100 Mbps (Non-satellite)



3.3.1 Wireline Broadband Technology

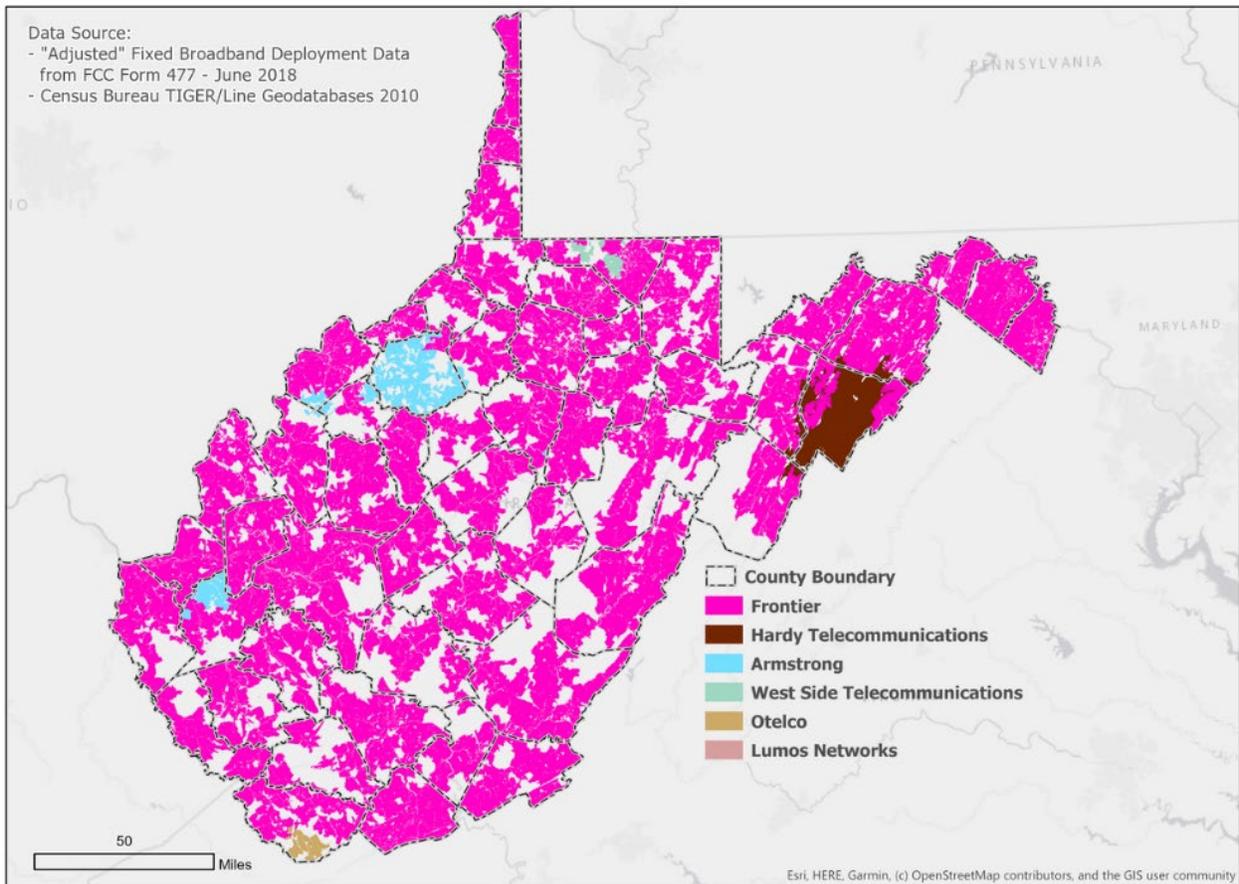
The available service and speeds vary greatly depending on the technology. For example, based on reported cable broadband access, systems that are upgraded to DOCSIS 3.1 or 3.1, the most recent standards, support higher speeds, as shown in Figure 7.

Figure 7 Fastest Cable Download Speed through DOCSIS 3.0 or 3.1



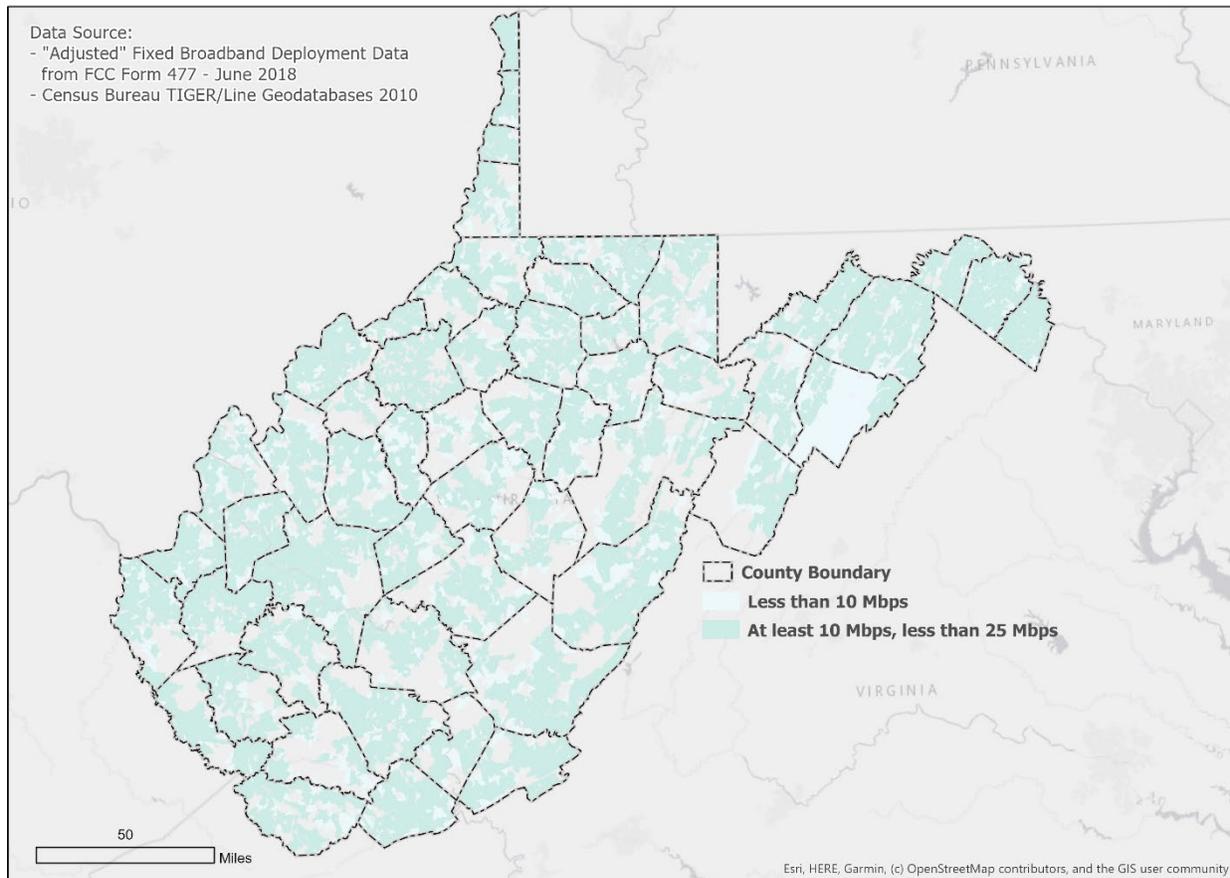
DSL service is widely available in most parts of the State, primarily through Frontier, the incumbent telephone company, as shown in Figure 8.

Figure 8 Fastest DSL Service by Carrier



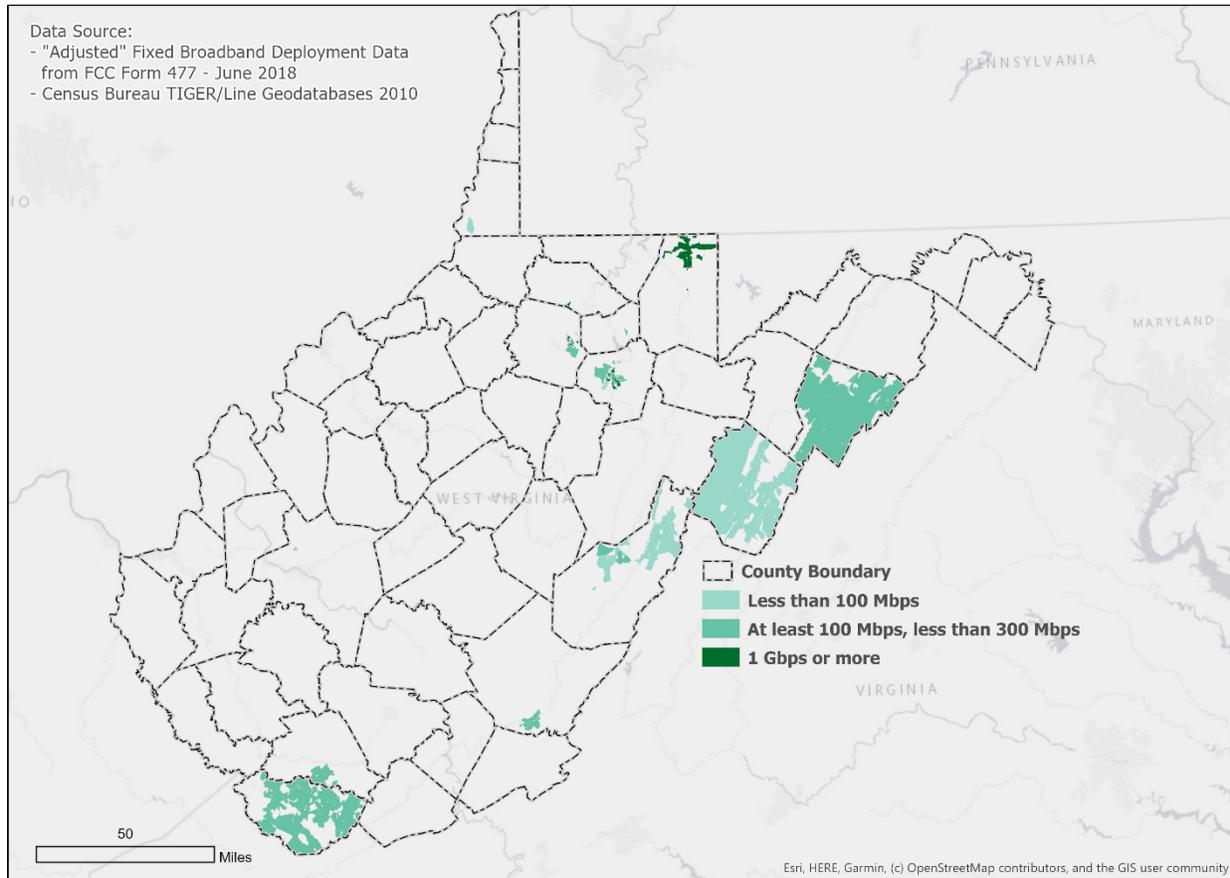
However, in no areas do the reported DSL speeds meet the current federal definition of broadband of 25 Mbps/3 Mbps, as shown in Figure 9. The light green shows areas with DSL above 10/1 Mbps, and the grey shows areas with no DSL availability at all. However, none of the DSL speeds meet the 25/3 Mbps definition of broadband.

Figure 9 DSL with Download Speeds of at least 10Mbps and Upload Speeds of at least 1 Mbps



Fiber-to-the-premise is currently considered “State of the art” for delivering broadband service, as fiber can support “symmetrical” upload and download speeds of up to multiple gigabits, depending on the technology. However, based on the data reported to the FCC, there is very limited fiber availability and almost none that can provide gigabit download speeds of 1 Gbps or more, as shown in Figure 10.

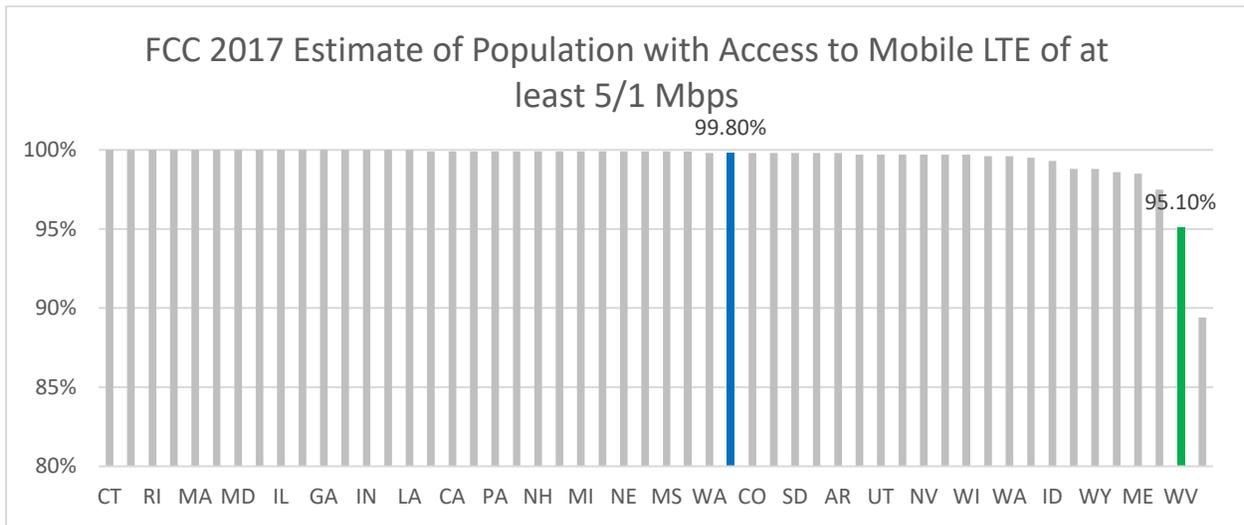
Figure 10 Available Fiber to the Premise, with Download Speeds



3.3.2 Wireless Broadband Service

With respect to mobile broadband access, West Virginia ranks as the 2nd-lowest State in the FCC’s mobile broadband access statistics, which benchmark services with minimum advertised speeds of 5 Mbps/1 Mbps, and those with a median speed of 10 Mbps/3 Mbps or higher, as shown on Table 2.¹³

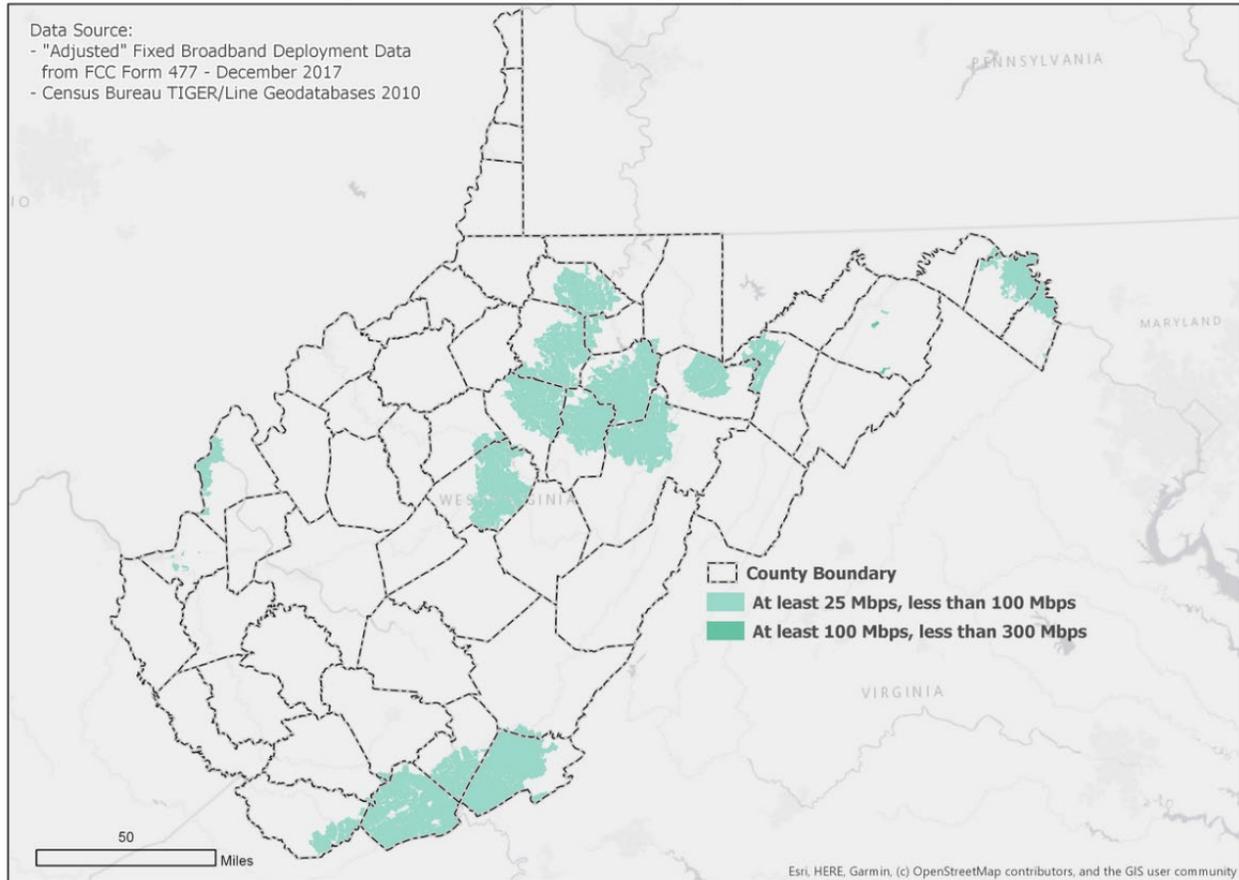
Table 2 FCC 2017 Estimate of Wireless Access of at least 5/1 Mbps



¹³ [Federal Communications Commission 2019 Broadband Deployment Report](#), p.11.

There are limited options for consumers to access fixed wireless broadband services that meet the FCC's 25/3 Mbps definition, as shown in Figure 11:

Figure 11 Fixed Wireless that Provides 25/3 Mbps



3.3.3 Broadband Adoption and Use

Even if broadband is available, not all consumers use it. When creating policies for effective deployment and integration of broadband into communities, it is important to consider not just broadband availability, but broadband adoption by consumers. The crucial questions are:

- When service is available, how many consumers subscribe to such service?
- To what extent is service available, but not used or “adopted” by consumers?
- What are the barriers to adoption?

There are sources available that attempt to discern the answers to these questions.

American Community Survey (ACS Data)

The American Community Survey (ACS) is an ongoing survey conducted by the United States Census Bureau that provides vital information on a yearly basis about our nation and its people. Information from the survey generates data that help determine how more than \$675 billion in federal and State funds are distributed each year.¹⁴ It is a nationwide, continuous survey designed to provide communities with reliable and timely social, economic, housing, and demographic data every year.¹⁵

The Census Bureau selects a random sample of addresses to be included in the ACS. Each address has about a 1-in-480 chance of being selected in a month, and no address should be selected more than once every 5 years. The Census Bureau mails questionnaires to approximately 295,000 addresses a month across the United States. This is a small number of households considering there are more than 140 million eligible addresses in the United States, and an address that receives ACS instructions will not likely find a neighbor or friend who has also received them. The Census Bureau also interviews a sampling of people living in group quarters facilities such as colleges, dormitories, and nursing homes, and conducts follow-up phone interviews for questionnaires that are returned incomplete.¹⁶ The Census Bureau releases data in one-year increments, which are then compiled into the ACS reports with a one-year summary of the data, and a five-year summary.

The ACS surveys many issues relating to broadband adoption, including type of internet subscription, number of devices in the home, and household income. These questions were added in 2013 as a requirement of the federal Broadband Data Improvement Act of 2008.¹⁷ The ACS releases its data in a 1-Year Report and a rolling 5-Year Report each September and December respectively.

The ACS research is not dispositive. Like the FCC's data, it has flaws. It is necessary to cross-reference the ACS to contextualize the Pew research (described below). The ACS also does not have county-level statistics in its 1-Year data. It was thus necessary to use data from the 5-year plan – which would be an aggregation of data from a five-year period – to develop county-level maps and statistics. In addition, the ACS has no speed benchmarks for broadband such as the FCC's 25 Mbps/3Mbps standard. Rather, it classifies broadband as anything other than dial-up internet access.¹⁸ This would make the ACS's measurements considerably more generous as to the availability of internet service than the FCC's, for example.

Nonetheless, the message across the ACS research is the same: West Virginia lags behind much of the United States in virtually all measures and metrics with respect to broadband access and adoption, and in several categories, is in last place.

The ACS measures any home internet access other than dial-up, including satellite and cellular. West Virginia is the fourth-lowest ranked State. West Virginia's percentage of households with an internet subscription of any type (76% in the 2017 ACS) is also lower than the overall U.S. percentage (83.5%) as shown in Table 3.

¹⁴ ["About the American Community Survey,"](#) United States Census Bureau, census.gov

¹⁵ ["American Community Survey Information Guide,"](#) United States Census Bureau, census.gov.

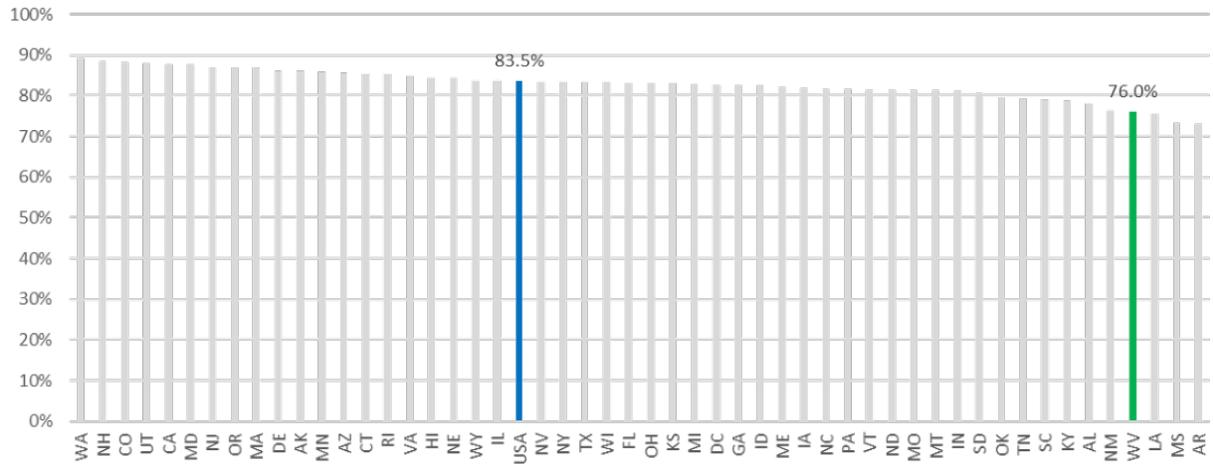
¹⁶ *Id.*

¹⁷ ["Why We Ask Questions About Computer and Internet Use,"](#) United States Census Bureau, census.gov.

¹⁸ ["Computer and Internet Use in the United States: 2016,"](#) Census.gov, fn. 2.

Table 3 Percentage of Households with Broadband of Any Type

Percent of Households with Broadband of Any Type
2017 American Community Survey

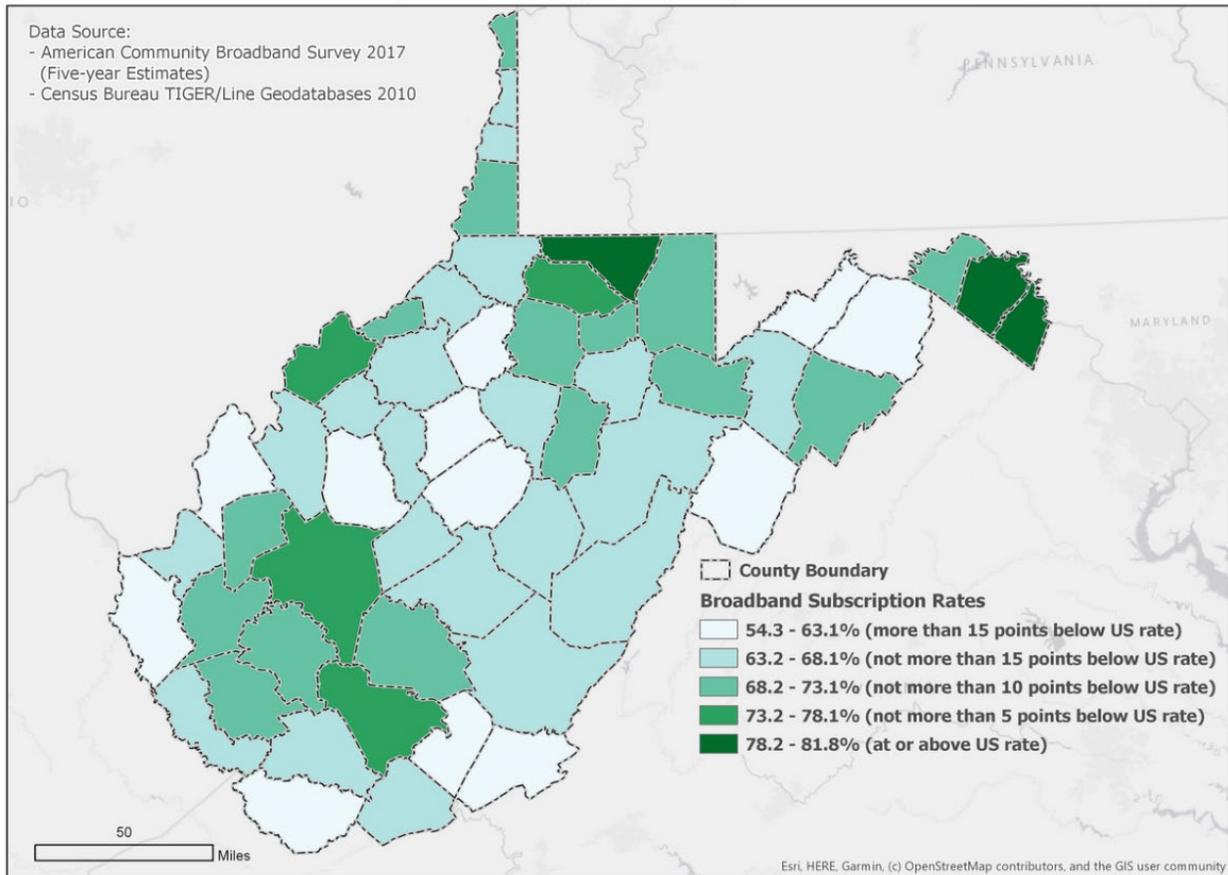


Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

Percentages of households in West Virginia with dial-up and satellite internet are both very small and close to the overall U.S. levels.

Figure 12 shows households with any type of broadband subscription (no dial-up). Most West Virginia counties have subscription rates well below the national rate.

Figure 12 Broadband Subscription Rates in West Virginia

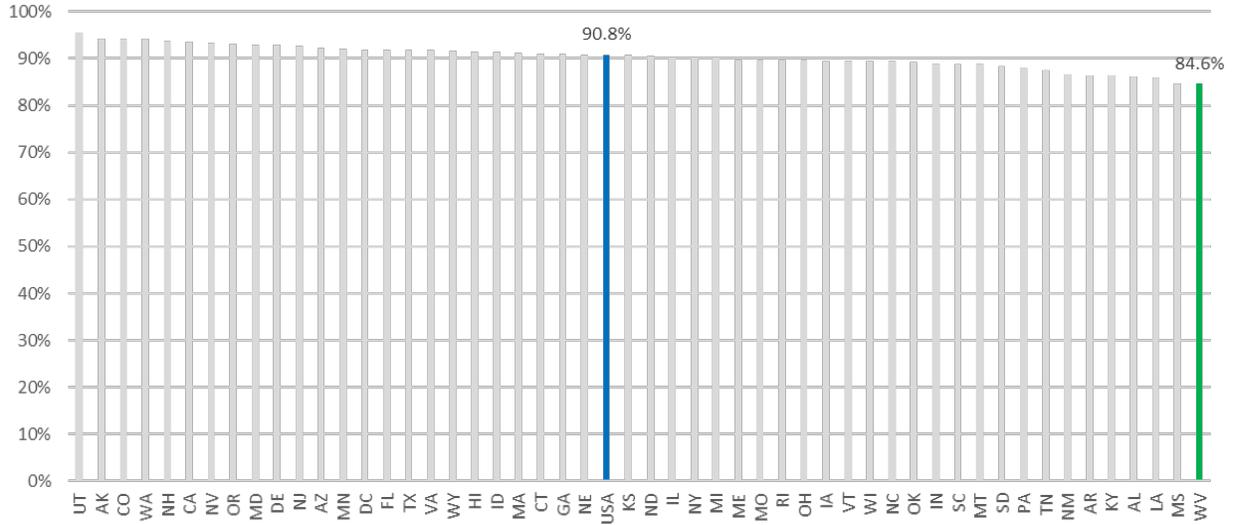


Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

The ACS also surveys households with computers. West Virginia is ranked last among States as shown on Table 4.

Table 4 Percentage of Households with One or More Computing Devices

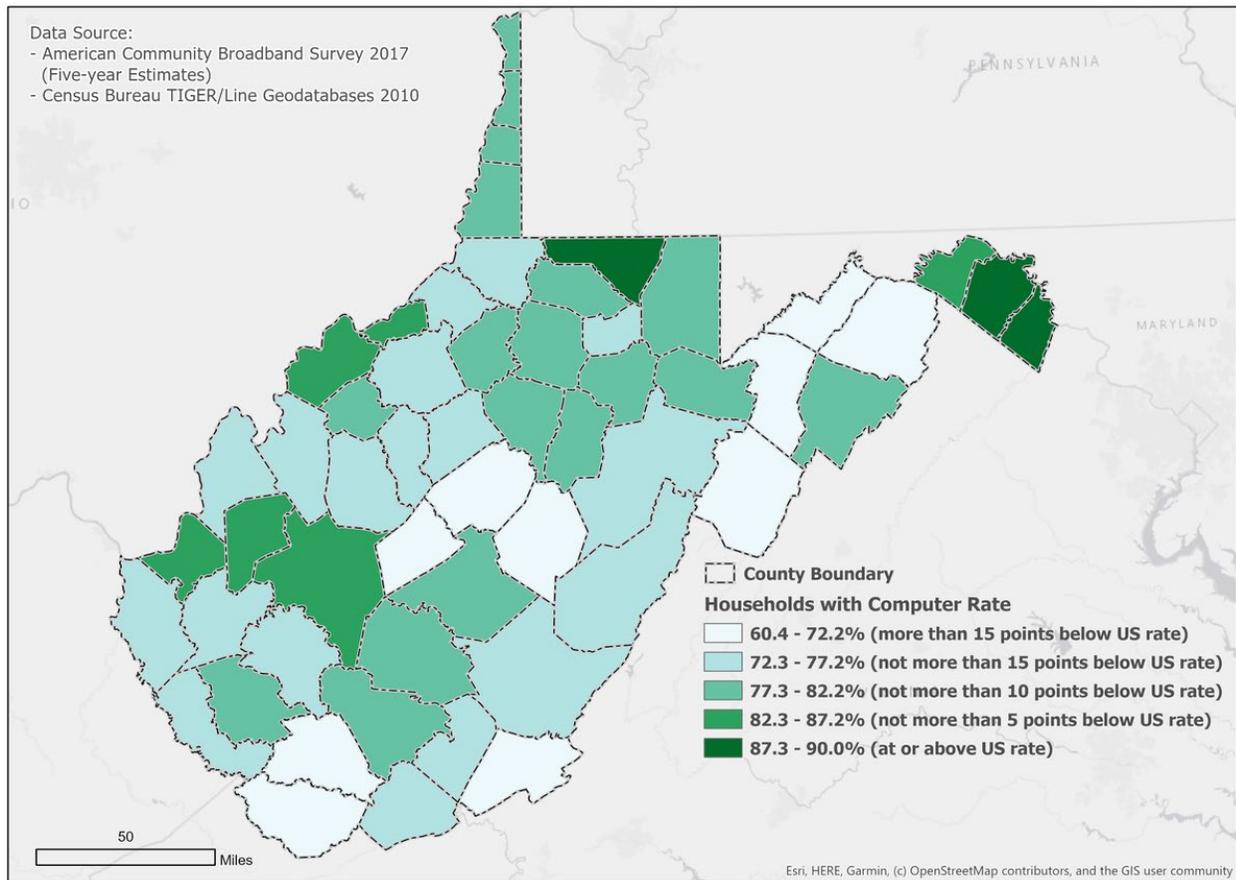
Percent of Households with One or More Types of Computing Devices
2017 American Community Survey



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

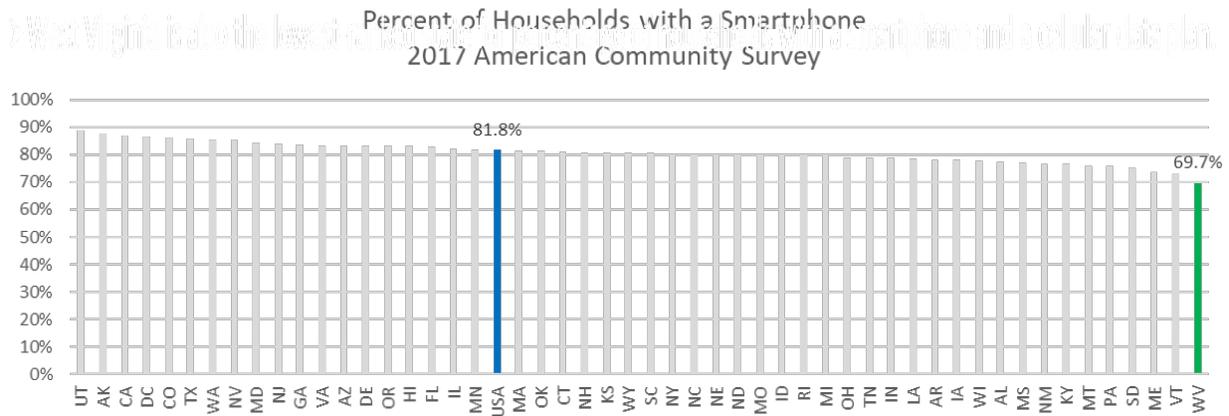
Figure 13 shows West Virginia households with any type of computer, including smartphones and tablets. Most West Virginia counties have computer rates well below the national rate.

Figure 13 West Virginia households with a computer



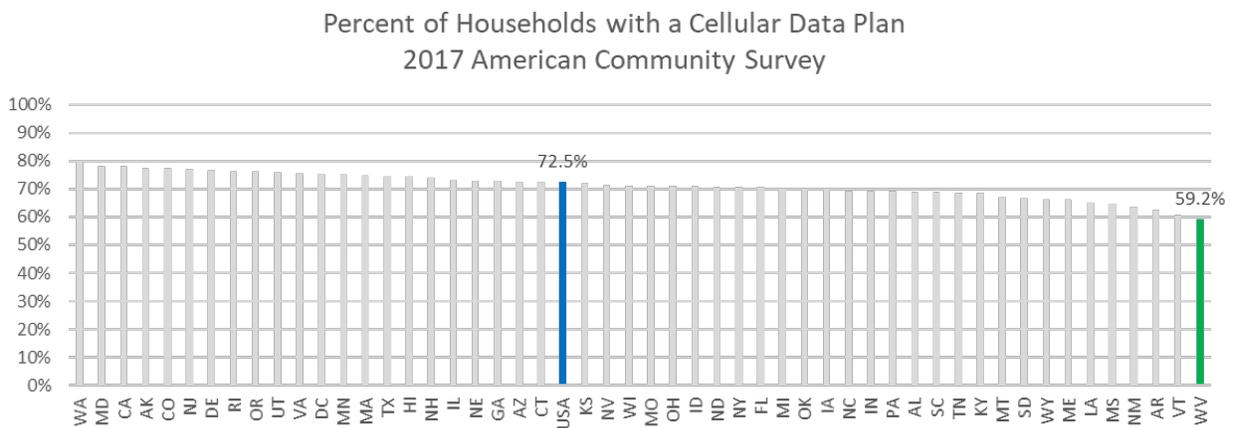
West Virginia is also the lowest ranked State for percentage of households with a smartphone or a cellular plan, as shown on Tables 5 and 6 below.

Table 5 Percentage of Households with a Smart Phone



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

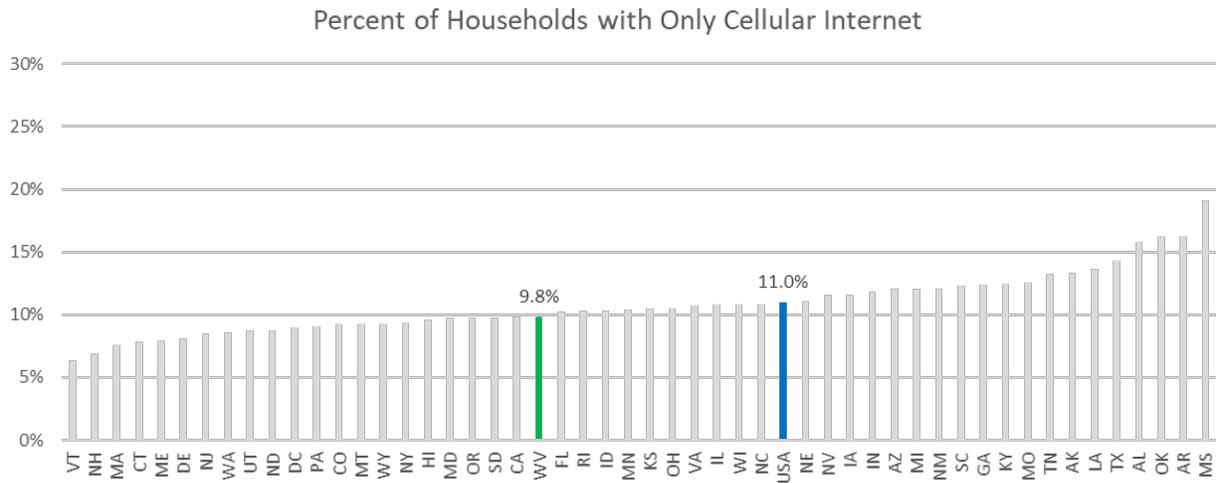
Table 6 Percentage of Households with a Cellular Data Plan



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

The share of broadband users who only use a smartphone—without home broadband—has been growing. However, West Virginia is behind the U.S. overall in this trend as shown on Table 7.

Table 7 Percentage of Households with Only Cellular Internet



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

Pew Broadband Research Initiative

Pew Research Center is a nonpartisan fact tank that conducts public opinion polling, demographic research, content analysis and other data-driven social science research. It does not take policy positions.¹⁹ It provides independent opinion research about American attitudes on politics and major policy issues and studies the changing U.S. electorate by measuring long-term trends in political values and public policy priorities, as well as conducting timely and topical polling on the issues of the day.²⁰

In the U.S., there are differences in Internet use across different age groups, incomes, and education levels. There are also some differences between races / ethnicities and urban and rural areas, as shown in Table 8 below.

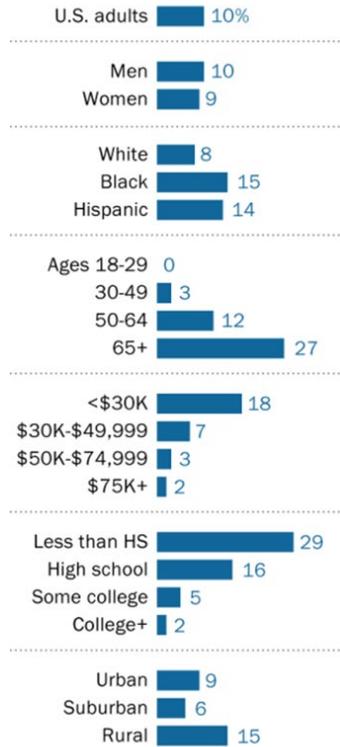
¹⁹ [“About Pew Research Center,”](#) PewResearch.org.

²⁰ [“Our Research,”](#) PewResearch.org.

Table 8 Adults Who Do Not Use the Internet

Who's not online in 2019?

% of U.S. adults who say they do not use the internet

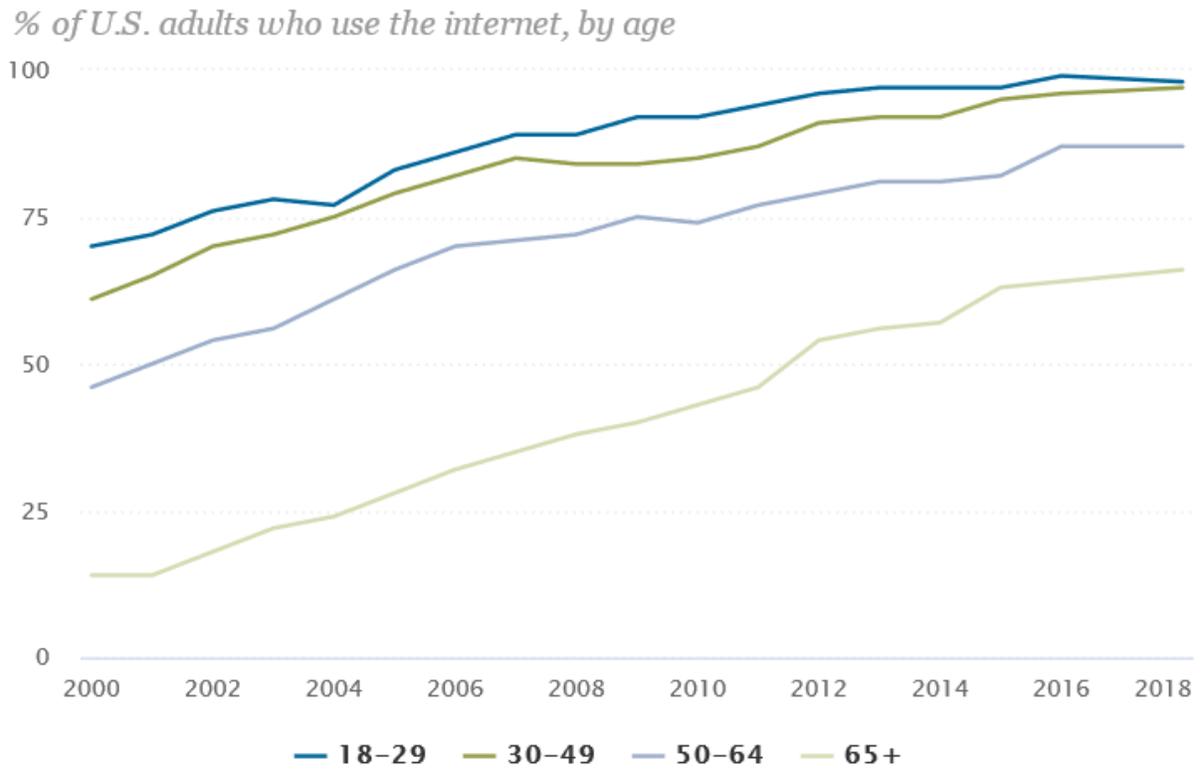


Note: Whites and blacks include only non-Hispanics. Hispanics are of any race.
 Source: Survey conducted Jan. 8-Feb. 7, 2019.

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Internet use has grown among all age groups over time. Although internet use is now nearly ubiquitous among younger people, it still lags among the eldest. Table 9 breaks out the disparities based on age.

Table 9 Percentage of Adults Who Use Internet, by Age



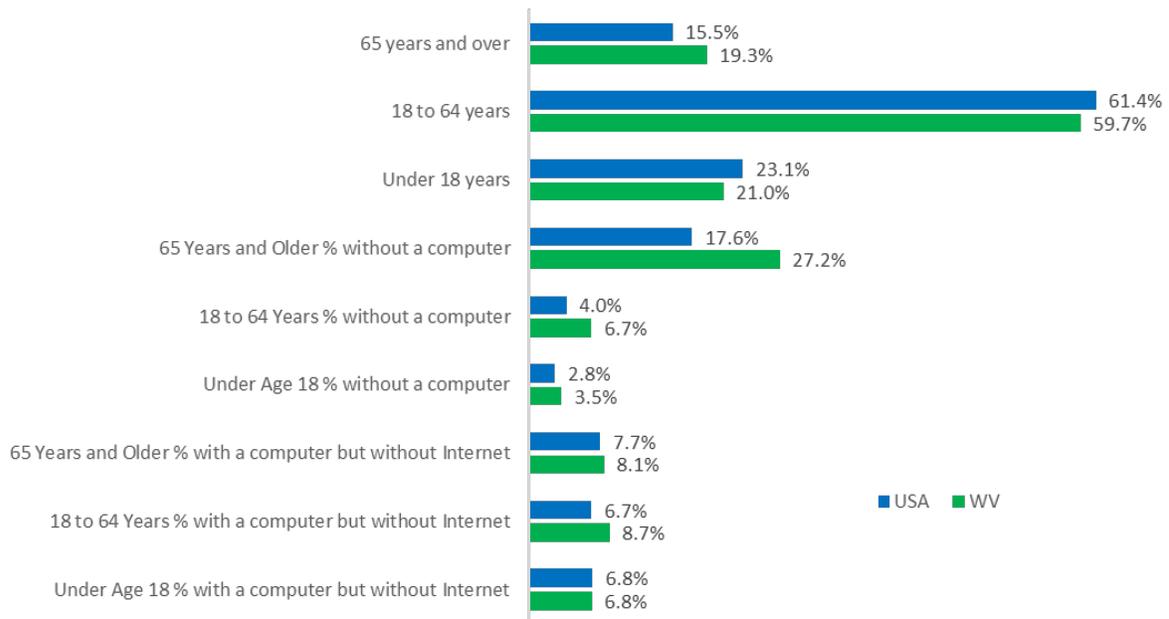
Source: Surveys conducted 2000–2018. Data for each year based on a pooled analysis of all surveys conducted during that year.

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Compared to the U.S. as a whole, West Virginia has a higher proportion of older residents, the age group least likely to use the Internet. West Virginians of any age are less likely to have a computer, but especially the oldest ones. West Virginians who do have a computer have an Internet subscription at similar rates, especially those under 18 years.²¹ See Table 10 below.

Table 10 Population in Households by Age

Population in Households by Age

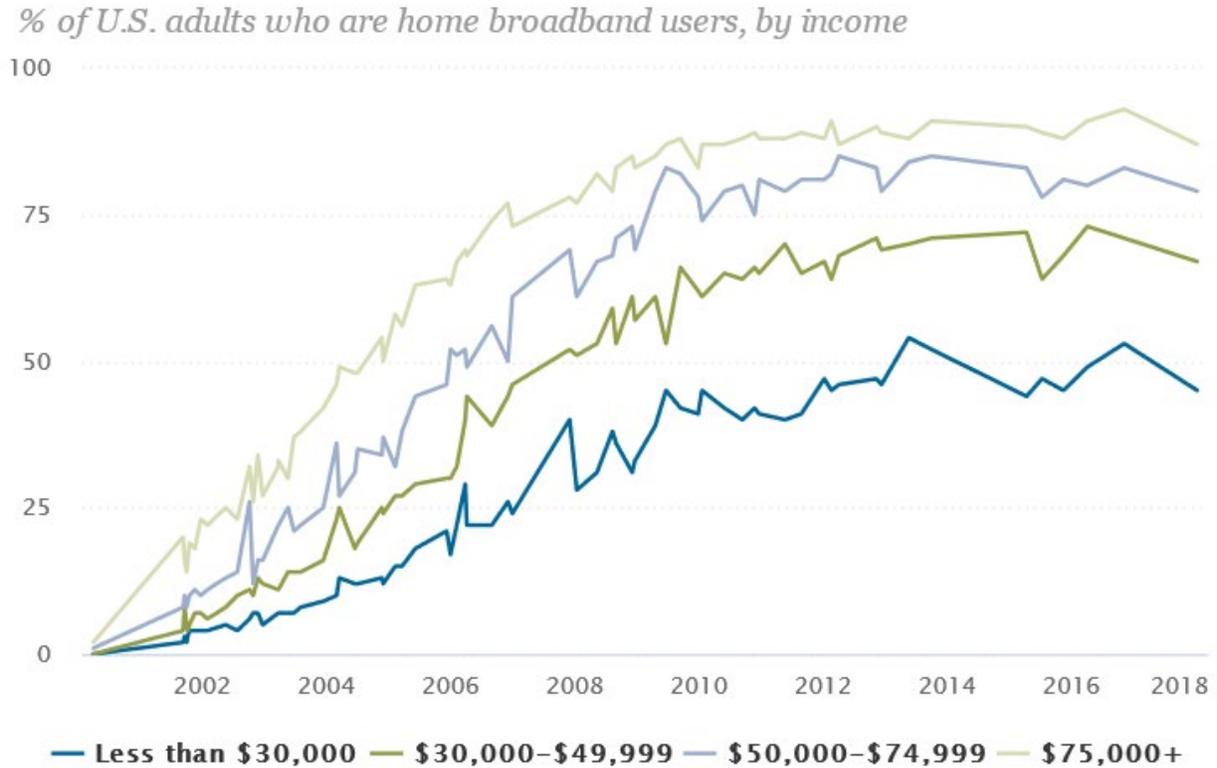


Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

²¹ Findings from the American Community Survey are included in this section to provide context for the Pew Research findings.

Internet use has been climbing across all income levels in the U.S. While a gap persists among those with lower incomes, the gap has shrunk some over time. However, the gap has grown between income groups for home broadband access, as shown on Table 11.

Table 11 Percentage of Adults Who Are Home Internet Users

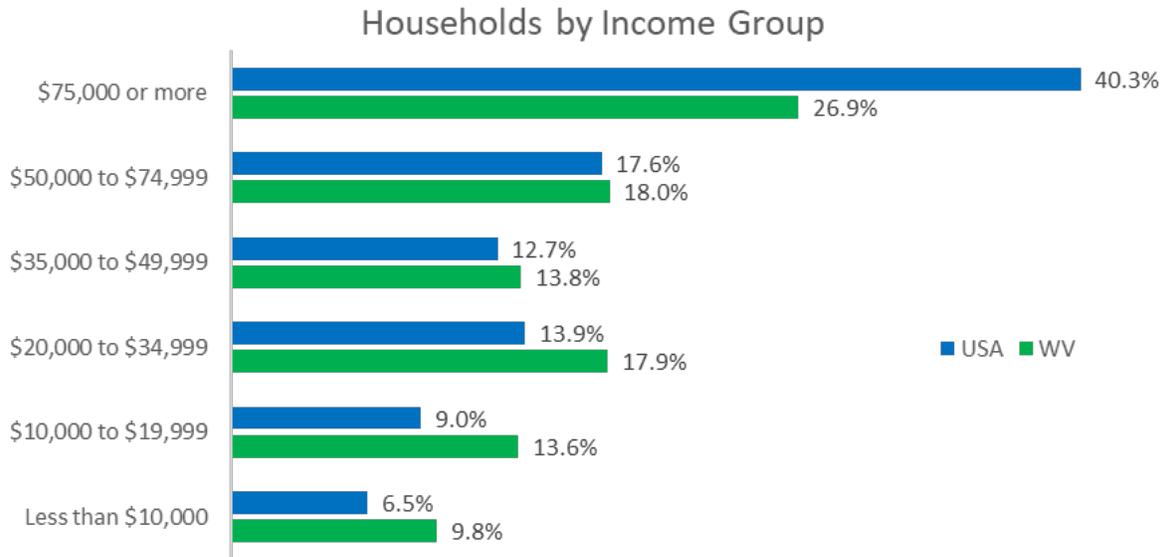


Note: The Center has used several different question wordings to identify broadband users in recent years, which may account for some variance in broadband adoption figures between 2015 and 2018. Our survey conducted in July 2015 used a directly comparable question wording to the one conducted in January 2018.
 Source: Surveys conducted 2000-2018.

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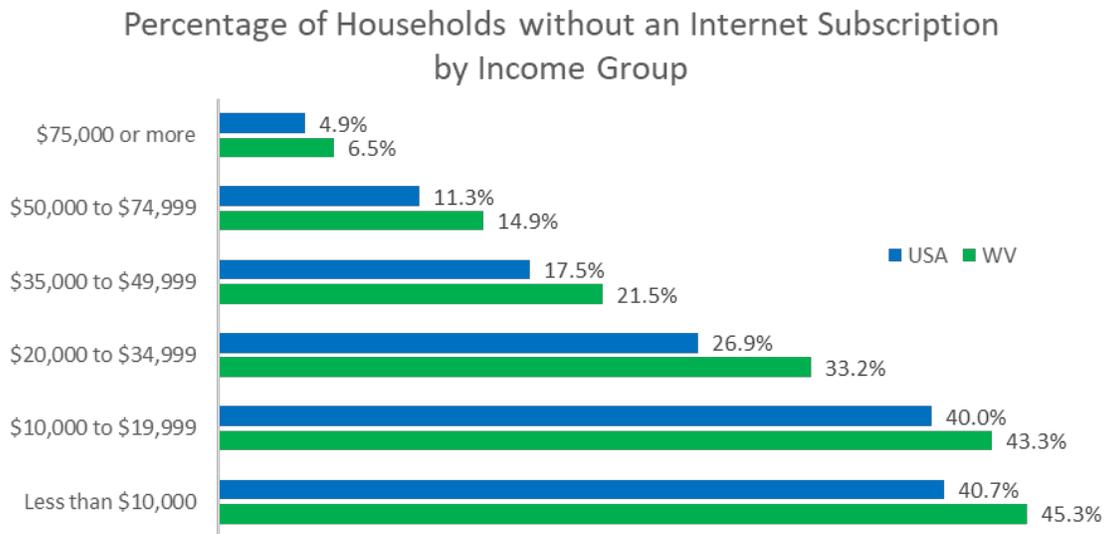
A higher proportion of West Virginia households have lower incomes, which tend to have lower Internet subscription rates. See Table 12.

Table 12 Households by Income Group



Across all income groups, Internet subscription rates are lower in West Virginia than in the U.S. as a whole, as shown in Table 13.

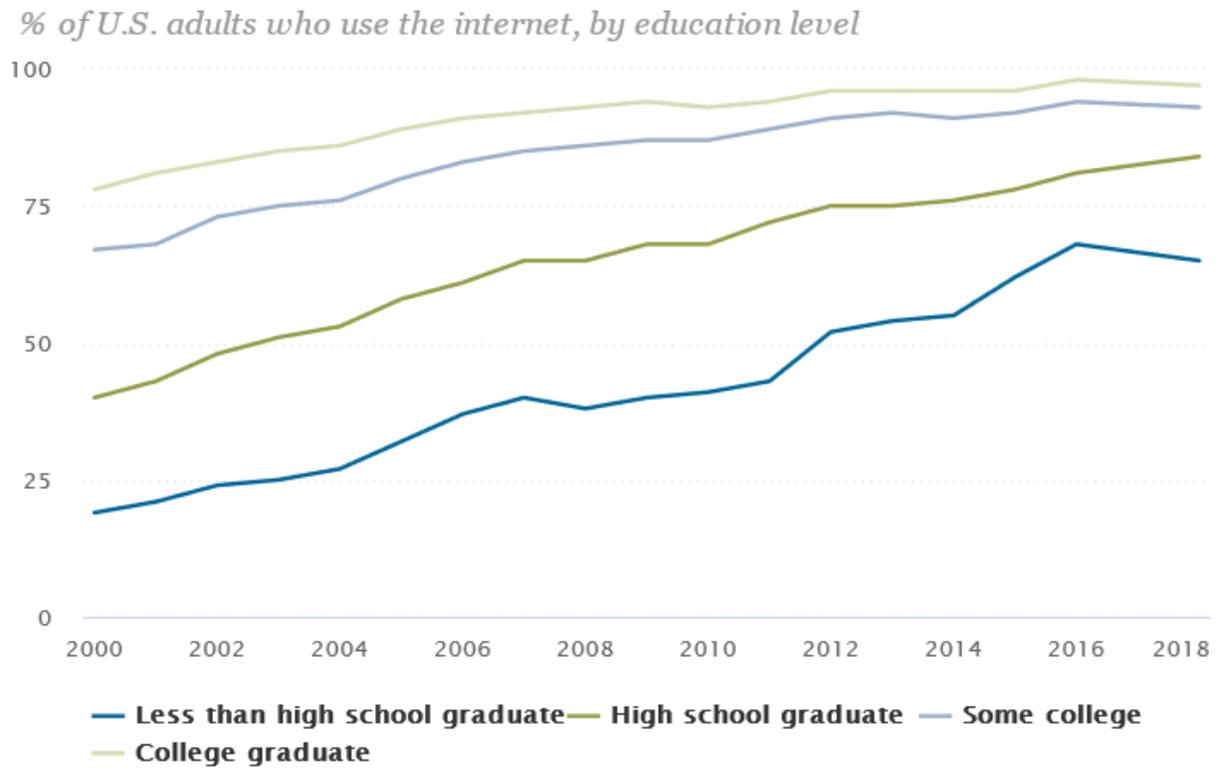
Table 13 Percentage of Households without an Internet Subscription by Income Group



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

Table 14 shows that Internet use has been climbing across all education levels, although it remains lower among those with less education.

Table 14 Percentage of Adults who Use the Internet, by Education Level.

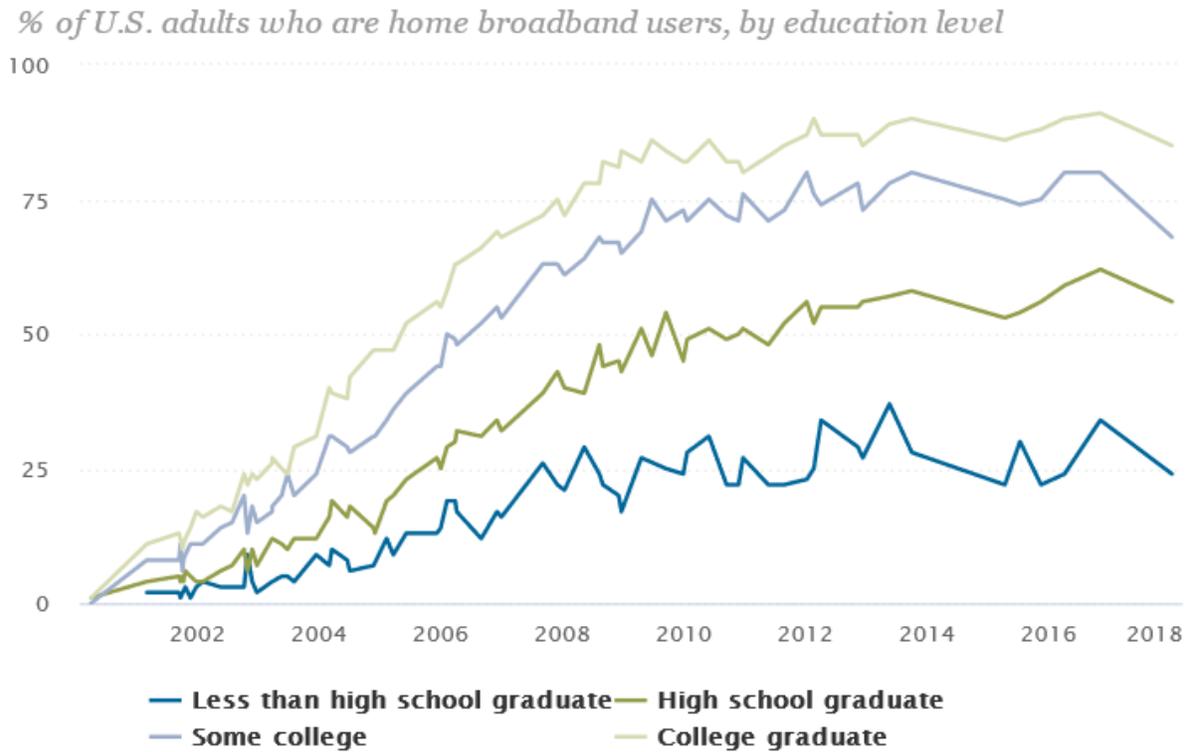


Source: Surveys conducted 2000–2018. Data for each year based on a pooled analysis of all surveys conducted during that year.

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There are wide differences in home broadband use between adults of different education levels. See Table 15.

Table 15 Adults Who Are Home Broadband Users, by Education Level

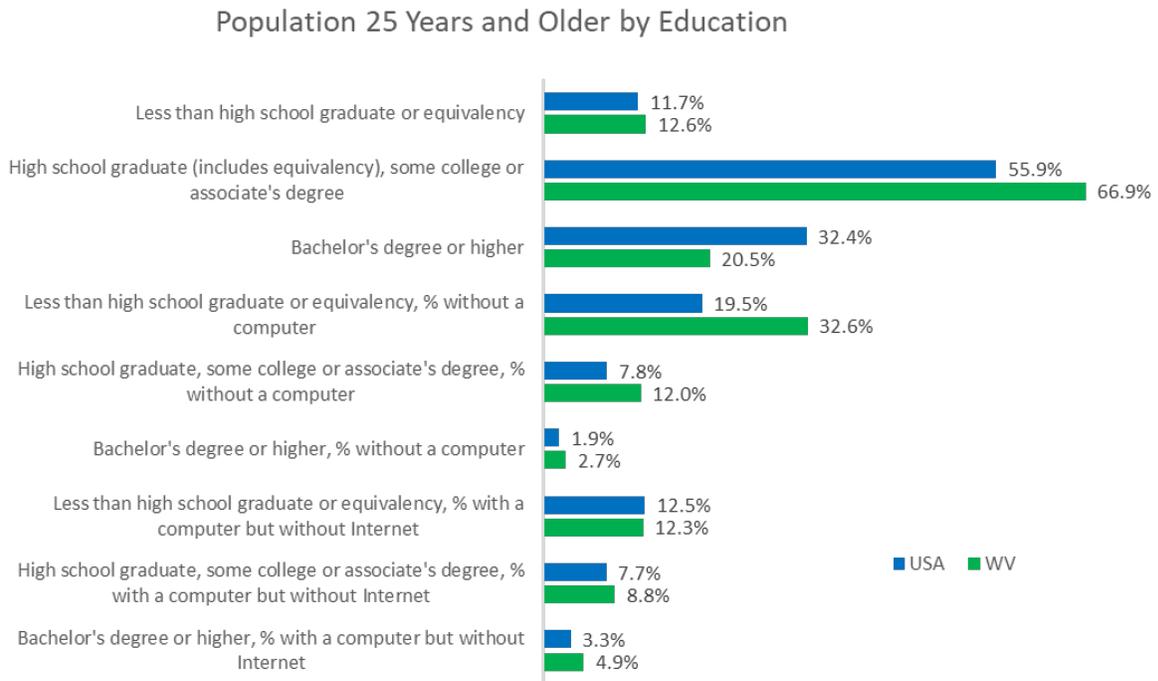


Note: The Center has used several different question wordings to identify broadband users in recent years, which may account for some variance in broadband adoption figures between 2015 and 2018. Our survey conducted in July 2015 used a directly comparable question wording to the one conducted in January 2018.
 Source: Surveys conducted 2000–2018.

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Compared to the U.S. as whole, West Virginia has a lower proportion of residents with a Bachelor's, degree, the education group most likely to use the Internet. West Virginians of any education level are less likely to have a computer than Americans overall but especially those with less than a high school education. West Virginians who do have a computer have an Internet subscription at similar rates to Americans overall. See Table 16.

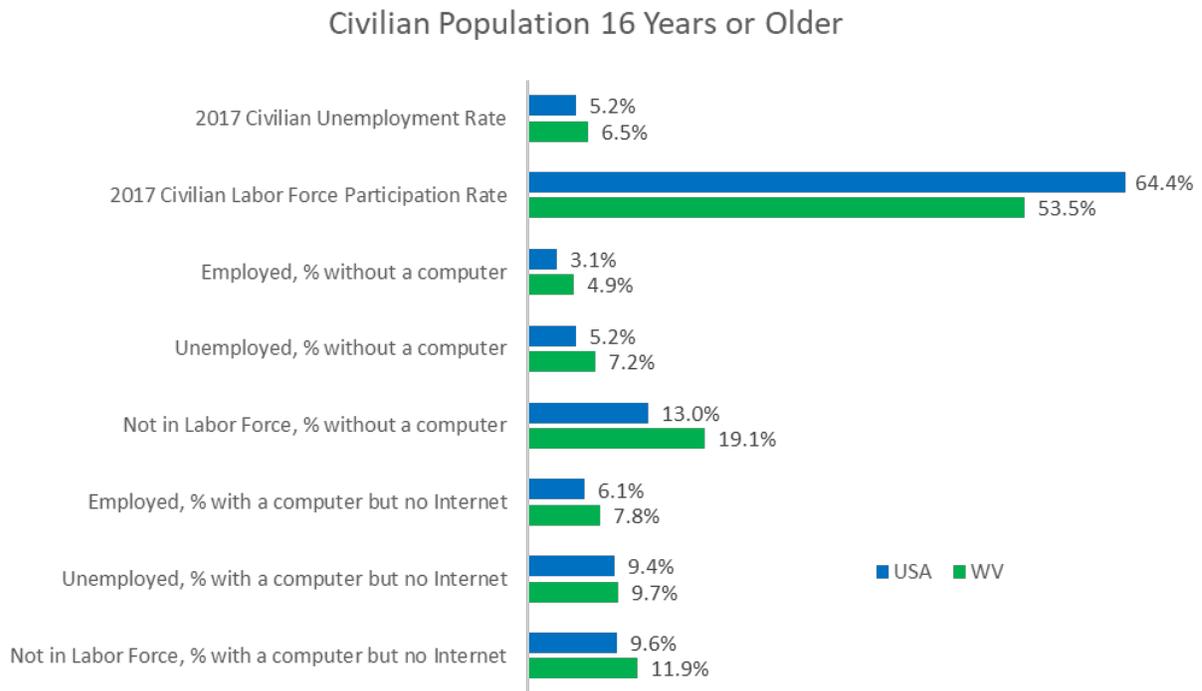
Table 16 Computer Usage by Adults Over 25, by Education



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

Compared to the U.S. as whole, West Virginia has a lower labor force participation and higher unemployment rates. Unemployed West Virginians are less likely to have a computer and subscribe to the Internet than unemployed Americans overall, but those not in the labor force are even less likely as shown on Table 17.

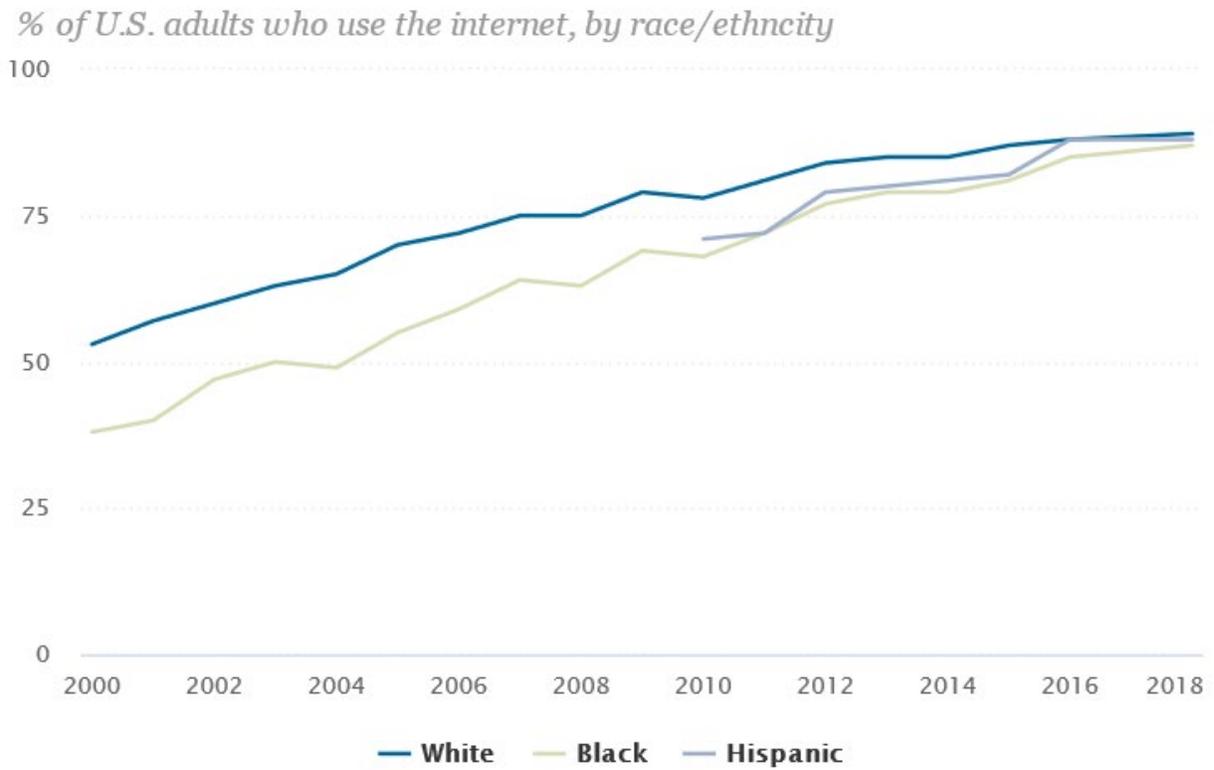
Table 17 Population 16 Years or Older, by Employment Status and Computer Usage



Source: U.S. Census Bureau, 2017 American Community Survey, 1-year data.

Differences in overall use among white, black and Hispanic groups, while present, have narrowed over time. See Table 18.

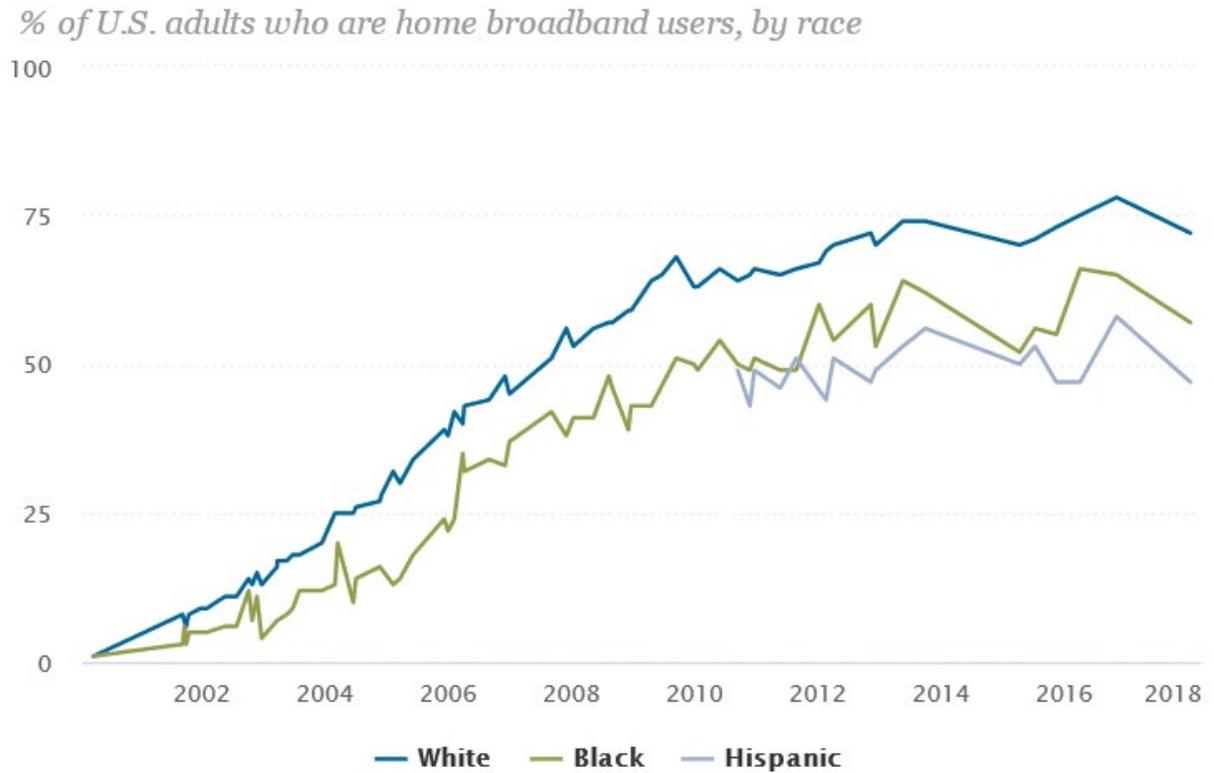
Table 18 Adults Who Use the Internet, by Race/Ethnicity



Source: Surveys conducted 2000–2018. Data for each year based on a pooled analysis of all surveys conducted during that year. Data for Hispanics includes only surveys that included Spanish-language interviews.
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Table 19 details that racial gaps have persisted for home broadband access.

Table 19 Adults with Home Internet, by Race



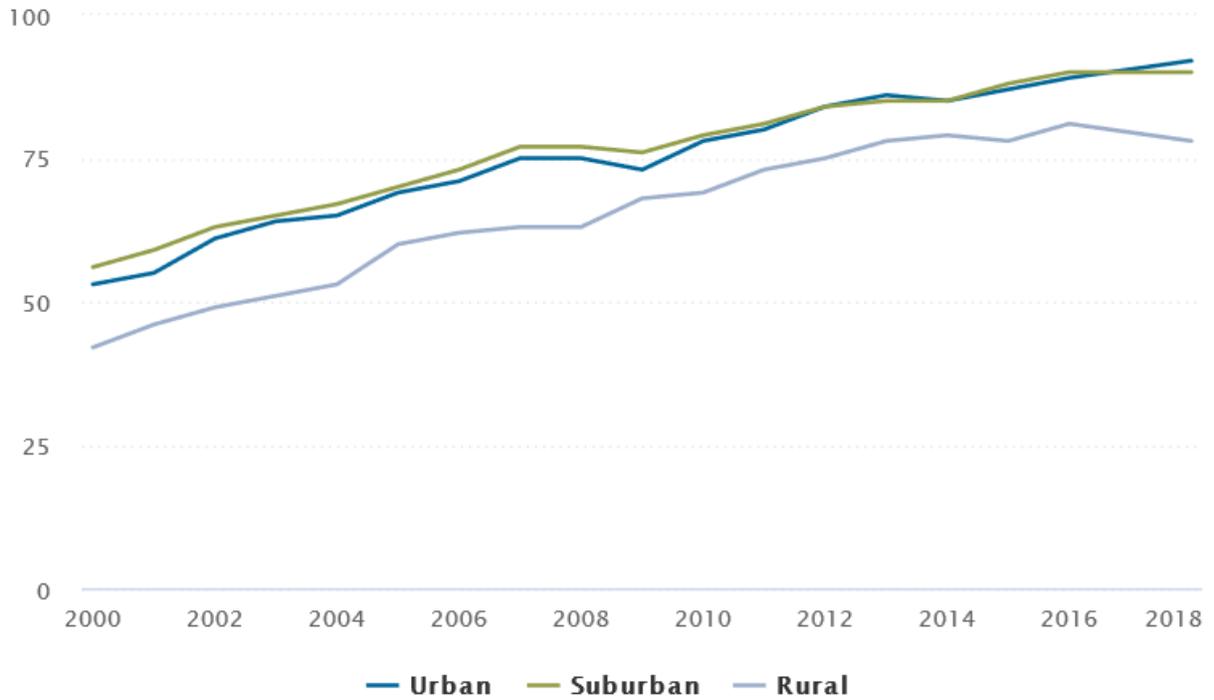
Note: The Center has used several different question wordings to identify broadband users in recent years, which may account for some variance in broadband adoption figures between 2015 and 2018. Our survey conducted in July 2015 used a directly comparable question wording to the one conducted in January 2018.
Source: Surveys conducted 2000–2018. Data for Hispanics includes only surveys that included Spanish-language interviews.

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Internet use has been growing over time in both urban and rural communities, although rural areas lag. See Table 20.

Table 20 Adults Who Use the Internet, by Community Type

% of U.S. adults who use the internet, by community type

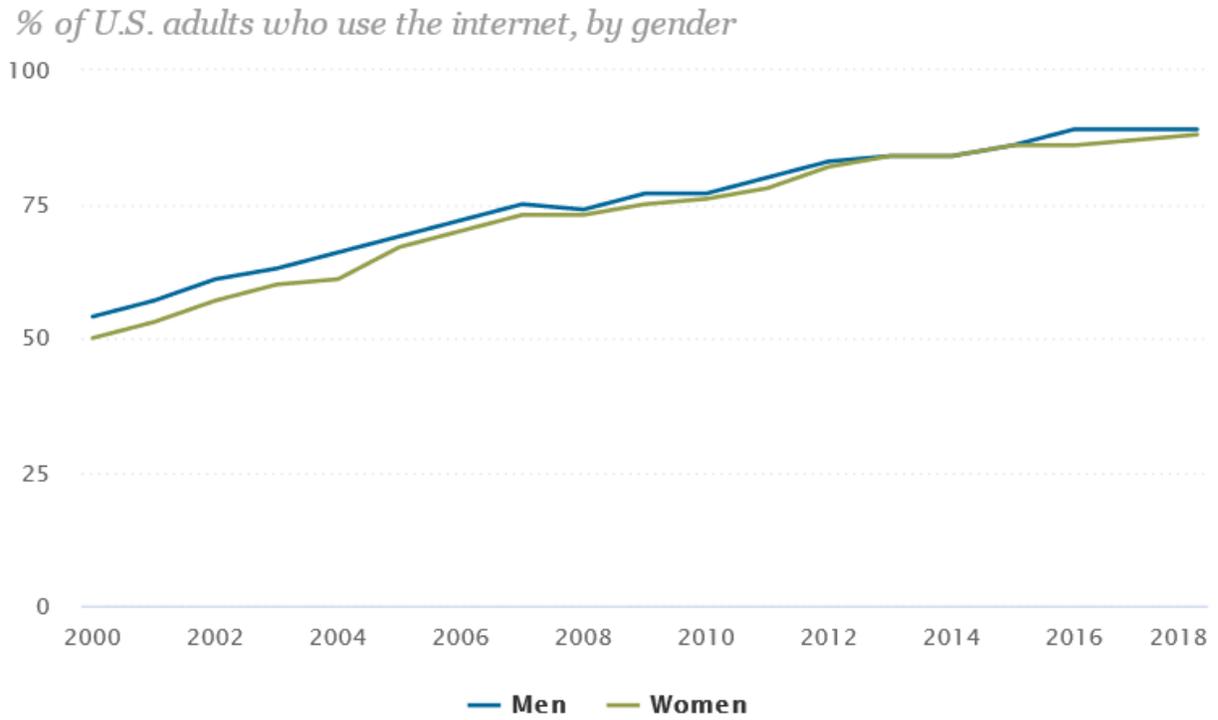


Source: Surveys conducted 2000–2018. Data for each year based on a pooled analysis of all surveys conducted during that year.

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There are low levels of difference in overall Internet use between women and men, as shown on Table 21.

Table 21 Adults Who Use the Internet, by Gender



Source: Surveys conducted 2000–2018. Data for each year based on a pooled analysis of all surveys conducted during that year.

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Pew Broadband Policy Explorer

The Pew Charitable Trusts has created a [50-State fact sheet](#), which identifies the offices, agencies, and planning tools involved in each State’s broadband deployment efforts, providing the following information:

- Office: A centralized office for broadband projects.
- Agency: State agency(ies) involved in broadband projects.
- State task force: A formalized team—often involving multiple agencies and sectors—dedicated to broadband issues.
- State broadband plan: An approach to implement efforts.
- State broadband goal: An objective or milestones.
- State broadband map: A mapping effort underway to identify where broadband is and isn’t.
- State broadband fund: A funding mechanism(s).

This information can help bring the landscape into focus as policymakers across the country work to expand connectivity. This project also features Pew’s [interactive tool of State broadband policies](#). West Virginia will continue working with Pew in this comprehensive review of promising practices aimed at improving broadband connectivity throughout the United States. The full report is slated for release in 2020. For more information on Pew’s broadband research efforts, please visit <https://www.pewtrusts.org/en/research-and-analysis/data-visualizations/2019/State-broadband-policy-explorer>.

3.3.4 Key Infrastructure Assets

West Virginia has existing infrastructure assets that may be leveraged as part of a plan to improve broadband deployment. Determining how and under what terms and conditions these assets might be used is beyond the scope of this Plan; however, it is notable that these assets exist.

If the State wishes to make these assets available for broadband deployment, it would likely require a staff person tasked with managing access to these assets and interfacing with the relevant state agencies – an “asset ombudsman” of sorts.

State Interoperable Radio Network (SIRN)

The West Virginia Statewide Interoperable Radio Network is a partnership of municipal, county, State, and federal public safety entities to establish and maintain a State-wide interoperable radio network. This radio network is comprised of a UHF digital P25 compliant trunked radio system that utilizes some of the latest technologies. Currently the SIRN has over 100 tower sites operational and provides coverage throughout most of West Virginia.

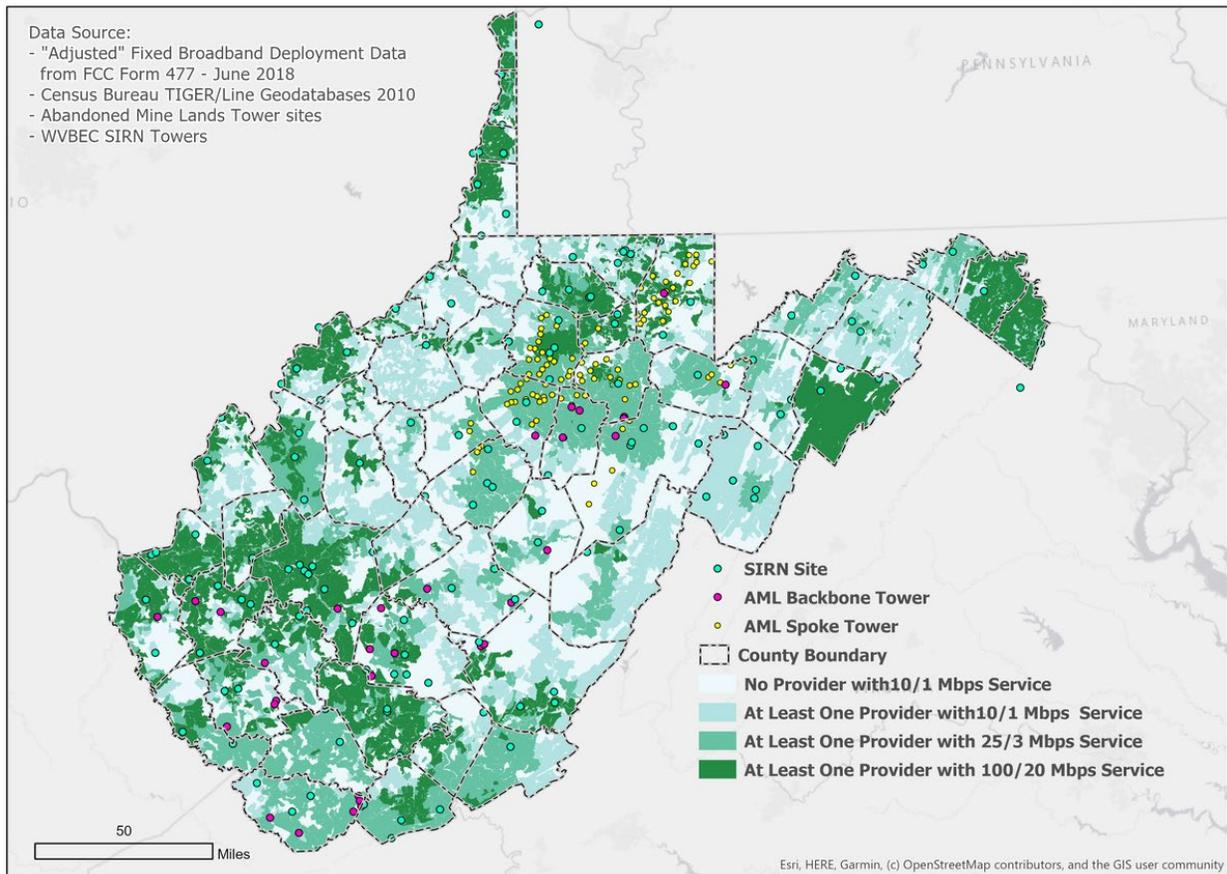
Abandoned Land Mine (AML) Tower Sites

The Upshur County Development Authority (UCDA) is the recipient of an Abandoned Mine Lands PILOT (AML) grant through the U.S. Office of Surface Mining Reclamation and Enforcement Economic Development Pilot Program. The grant’s purpose is to expand wireless broadband

tower infrastructure throughout West Virginia on AML eligible sites. This \$16 million project will support the construction of an open access network of telecommunication towers. The overall concept is to build a series of backbone fiber connected high load, high height towers with optimal view shed for backhauling to smaller spoke towers within an estimated 20-mile radius.

The SIRN and AML sites are shown on the map below. The AML site locations are projected and are subject to change.

Figure 14: State Interoperable Radio Network (SIRN) Towers and Proposed Abandoned Mine Land (AML) Tower Network



3.4 Key Ongoing Broadband Initiatives in West Virginia

In 2016, the West Virginia Broadband Enhancement Council became a voice for broadband development in the State. As the Council continues to advocate for greater connectivity, their mission is supported by the West Virginia Legislature, the West Virginia Department of Commerce and numerous partners. Each of West Virginia's Congressional representatives continue to support and enhance Federal programs for broadband development and their efforts are setting the stage for progress.

These partnerships are essential to connecting West Virginia, one community at a time. Numerous broadband infrastructure projects are underway or in planning stages. In addition, ventures and partnerships between public agencies and private companies demonstrate the collaboration needed to improve connectivity in West Virginia.

3.4.1 Broadband Enhancement Council Advocacy at the Federal Level

The Council has been a strong advocate at the federal level for sensible broadband policies, representing the interests of West Virginia in Federal matters related to broadband development through its contribution of technical responses to notices of proposed rule-making and other matters. This work is coordinated with numerous agencies, research organizations and program developers to represent the needs of West Virginia's residential and business broadband users. In 2018 and 2019, the Council submitted comments on applicable broadband policies, including but not limited to:

1. **The National Telecommunications and Information Administration (NTIA), Improving the Quality and Accuracy of Broadband Availability Data.** The Council provided comment on the notice of proposed rulemaking in July 2018.
2. **The U.S. Department of Agriculture, Broadband e-Connectivity Pilot Program.** The Council provided comment on the notice of proposed rulemaking in September 2018.
3. **The National Telecommunications and Information Administration, Improving the Quality and Accuracy of Broadband Availability Data.** NTIA intends to collect broadband availability data at a more granular level than the FCC Form 477 process. The Council provided comment on the notice of proposed rulemaking in December 2018.
4. **Federal Communications Commission, Rural Digital Opportunities Fund Connect America Fund.** The Council provided comment on the notice of proposed rulemaking in September 2019.
5. **Federal Communications Commission, Digital Opportunity Data Collection and Modernizing the FCC Form 477 Data Program.** The Council provided comment on the notice of proposed rulemaking in September 2019.

3.4.2 West Virginia Legislative Reports

The Council published a yearly Legislative Report to the West Virginia Legislature Joint Committee on Government and Finance in 2017 and 2018. These reports detail the Council's work in a given year, including mapping initiatives, speed tests, State policies, efforts to connect West Virginia communities, and notable broadband investments.

The [2018 Legislative Report](#) and the [2017 Annual Report](#) are both available online.

3.4.3 Middle Mile Fiber Asset Request for Information (RFI)

The Council seeks to identify ways in which middle-mile and tower infrastructure assets and projects may be of assistance to last-mile projects in Target Areas. Furthermore, the Council seeks comment on the usefulness of access to existing publicly owned tower assets, and the need for new tower or pole infrastructure for expanding service to Target Areas.

As a result of long-haul fiber optic infrastructure being constructed through the State, the Council expects to receive access to some of the capacity of these networks' "Fiber Assets" that can be utilized as middle-mile infrastructure to advance the State's public purposes. The Council does not operate middle-mile fiber networks and seeks information on how it may obtain the benefit of the Fiber Assets for its mission and the State of West Virginia through partnership with private companies. The Council sought input on the types of arrangements that private partners may be willing to enter, in order to operationalize the Fiber Assets through a [Request for Information](#) ("RFI"), issued on October 2, 2019.

The RFI requested input for this Plan and to identify potential partners and partnerships that could help improve broadband service in West Virginia. The RFI was directed broadly to companies who deliver broadband service, operate broadband networks, and/or invest in broadband infrastructure. The Council requests information related both to last-mile broadband networks and to middle-mile broadband networks that support them. The Council issued the RFI for several purposes:

1. Input to shape the recommendations of this Plan from broadband service providers currently in the State, as well as any other service providers who may wish to expand service within the State.
2. Identification of unserved areas which the private sector is likely to serve in the near future and identification of areas in which a public private partnership likely is required to spur the availability of required services. In areas requiring a public-private partnership, the Council seeks to identify potential private partners with which it can work together to analyze options for bringing service. By issuing this RFI, the Council seeks to provide broadly the opportunity for companies to identify their interest in working creatively with the State of West Virginia.

Input from companies related to the development of middle-mile assets that can support better last-mile service in West Virginia. In 2019, the West Virginia Legislature encouraged the State's electric utilities to undertake feasibility studies, to be reviewed by the Council, for constructing and operating middle-mile broadband internet projects. The Council requested comment from last-mile providers that may participate and help operationalize middle-mile assets such as these and further extend their reach.

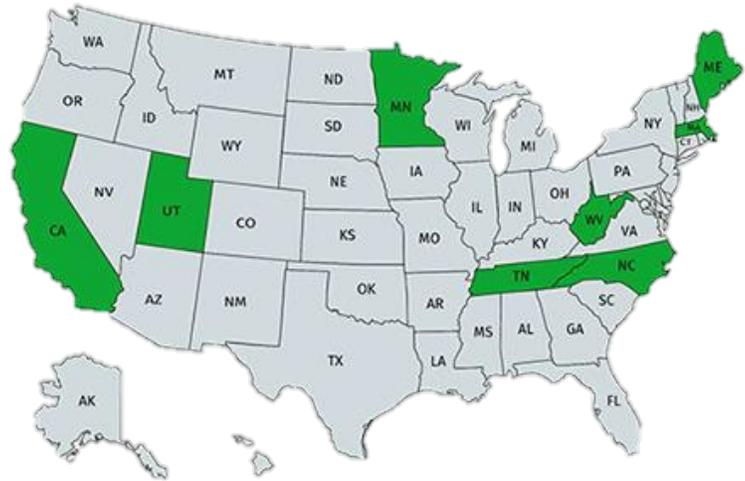
3.4.4 Electric Utility Feasibility Studies

Under legislation adopted in 2019, West Virginia electric utilities may investigate the feasibility of constructing and operating a middle-mile infrastructure project within the electric utility distribution system. The Council and the West Virginia Public Service Commission are assisting the electric utilities in the preparation of the feasibility studies. The Council released a comprehensive Request for Information (RFI) to identify potential partnerships that could better inform these studies. Following the initial RFI, the Council will identify Internet Service Providers (ISPs) that could be potential users of these projects, building networks to reach rural areas of West Virginia. The Council intends to use this information to assist participating electric utilities in their work to identify beneficial projects.

3.4.5 NTIA National Broadband Availability Map (NBAM) Project

West Virginia is one of eight States selected by the National Telecommunications and Information Administration (NTIA) to partner in the National Broadband Availability Map (NBAM) broadband mapping initiative. Through this partnership, West Virginia is collaborating with NTIA and other States in the development of innovative data collection and mapping techniques.

This two-year initiative began in 2019 following the federal Consolidated Appropriations Act of 2018, which directed NTIA to update the national broadband availability map using its previously developed State partnerships. The initial eight State partners were chosen because they reflect geographic diversity, participate in NTIA’s State Broadband Leaders Network, have active State broadband plans or programs, and were willing to contribute data that can be combined with nationwide data sources to give policymakers a deeper understanding of broadband availability.²²



NTIA Graphic, NBAM Phase I States

The NBAM is a secure GIS (geographic information system) platform for the visualization and comparison of federal, State, and commercially available data sets. The NBAM will help identify regions with insufficient service, compare multiple datasets to identify discrepancies in broadband availability (served, underserved, or unserved), and produce reports and analyses that could be used for broadband policy, planning, and investment decision-making.

The Council has long maintained that more accurate data is essential. Under this initiative, the Council is working to improve the accuracy and granularity of service provider reported data, and supplement this with data from other sources. The Council also intends to continue and refine its existing process for collecting speed test data from consumers, an additional source of data about available broadband services.

As the program moves forward, NTIA plans to add additional data from additional partner States, federal agencies, industry, and accessible commercial datasets. The platform will include both publicly available and non-public data. Non-public data may be business sensitive or have licensing restrictions that prevent public disclosure. Therefore, the NBAM will only be made available to State and federal partners.

²² [“NTIA Partners with 8 States on Improvements to Broadband Availability Map,”](https://www.ntia.doc.gov/press-releases/2019/08/20190820-ntia-partners-with-8-states-on-improvements-to-broadband-availability-map) ntia.doc.gov.

3.4.6 West Virginia Network for Educational Telecomputing (WVNET)

West Virginia Network for Educational Telecomputing (WVNET) is a dynamic service organization providing telecommunications and computing services within West Virginia. Currently focused on State colleges and universities and administered by these entities, WVNET is transitioning to expand its impact by offering services to State government, K-12, public libraries and county government. As a centralized State resource, WVNET reacts to customer needs in providing efficient and cost-effective deployment of technology, training and support.

WVNET is a centralized resource taking the lead in providing quality technology services and support to the citizens of West Virginia. WVNET supports and promotes the missions of its member institutions by providing telecommunications capabilities and enhanced access to resources and programs for their supported communities. WVNET will provide such access through the effective use of the appropriate information technology networks at a cost affordable to its users. The goals of WVNET include the following:

1. Support an information superhighway within the State of West Virginia. Connect WV information superhighway to networks within the National Information Infrastructure.
2. Serve as an information technology center for the colleges, universities, K-12 and government in WV to promote the use of information technology throughout WV.
3. Monitor the purchasing and supporting hardware, software, and information technology services in a cost-effective manner, and within the framework of a cooperative association with its members.
4. Ensure and promote that professional knowledge base among all WVNET agencies and central staff by encouraging professional development, providing training opportunities and literature.²³

WVNET fills a number of key niches in the context of this broadband plan. WVNET aggregates the broadband traffic of a range of educational and other institutional users in the State, allowing the creation of educational and institutional Wide Area Network (WANs). This aggregation has a number of beneficial effects:

1. It permits WNET and other institutions to support applications and content used by individual sites in a centralized manner, increasing the level of technical capacity available to support them, especially for smaller sites.
2. It provides educational and research institutions access to the nationwide Internet2 network developed by leading higher educational institutions in the country.
3. It allows a single nonprofit entity with an educational focus to knit together services and facilities available from different projects and service providers into a unified Statewide network for the institutions it serves. WVNet can use its purchasing power to seek improved broadband services for its institutions (and communities) Statewide while supporting local projects that provide incremental progress toward that goal.

²³ ["About WVNET," wvnet.edu.](http://wvnet.edu)

4. It provides a mechanism for a public-interest entity to respond to a State Department of Education-issued RFP for funding for E-rate support from the FCC's Universal Service Program. WVNet is currently receiving E-rate support for services provided to schools and libraries in year four of a five-year contract. The next window for bidding on these services will provide an important window of opportunity for the State to seek support for projects offering a high level of service to schools (and indirectly, communities).

3.5 Recent Broadband Projects and Initiatives

State and local government leaders recognize that broadband is the essential economic infrastructure that West Virginia needs to compete regionally, nationally and globally. The Council strongly supports these efforts and will continue working to maximize opportunities to develop a more connected West Virginia.

3.5.1 Community Development Block Grants (CDBG)

In 2018, for the first time in State history, Governor Jim Justice announced the approval of \$1.5 million in Community Development Block Grant (CDBG) funding for broadband development projects in West Virginia. Through 2019, approximately \$4 million in CDBG funding has been dedicated to broadband planning and infrastructure projects, with more than half of West Virginia's 55 counties actively pursuing broadband development as follows:

1. Broadband Planning: 16 projects including 37 counties, and
2. Broadband Infrastructure: 6 projects that will provide broadband connectivity to more than 2,000 residential and business customers upon completion.

In 2019, communities throughout West Virginia submitted 19 project applications, representing 15 infrastructure projects and four planning projects, requesting a total of \$9 million in project funds. Notably, seven of the State's 11 Regional Planning Councils are represented in these project applications.

The CDBG program is one of the longest running programs of the U.S. Department of Housing and Urban Development (HUD). The State has identified three primary community development objectives, through which CDBG will:

1. Support local government efforts to provide affordable infrastructure systems;
2. Support local community efforts to assist low- to moderate-income citizens to achieve an improved quality of life; and
3. Support job creation and retention efforts.

HUD has directed States to evaluate the availability of broadband among low- to moderate-income citizens and to expand broadband access through its rule, *"Modernizing the HUD Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards."* Recognizing that broadband connectivity is essential for economic success, the Council partnered with the West Virginia Development Office (WVDO) to develop the CDBG broadband program with a primary emphasis on the extension of broadband to unserved and underserved communities. These areas often align with CDBG priorities for low- to moderate-income residents. Broadband construction grant applications must meet HUD requirements for Low- to Moderate-Income (LMI) benefit.

The following chart summarizes the 2018 and 2019 CDBG projects, which are detailed further below. Links to county plans are provided where available.

West Virginia CDBG Broadband Projects 2018-2019			
Local Government	Project	Funding Source	Date Awarded
2018			
Clay County- Lead Applicant for 3-County Regional Project.	Calhoun-Clay-Roane Regional Plan	<u>CDBG</u>	2/1/2018
Fayette County	Fayette County Broadband Plan	CDBG	2/1/2018
Gilmer County-Braxton County	Fixed Wireless Design Plan	CDBG	2/1/2018
Hampshire County	Capon Bridge Broadband Fiber Expansion Project	CDBG Infrastructure	2/1/2018
Jackson County	Sandyville Tower Wireless Project	CDBG Infrastructure	2/1/2018
Mingo County	Mingo-Town of Gilbert Plan	CDBG	2/1/2018
Morgan County	Morgan County Broadband Plan	CDBG	2/1/2018
Nicholas County-Richwood	Richwood-Hinkle Mountain Pilot Project	CDBG Infrastructure	2/1/2018
Taylor County-Lead Applicant for 6-County Regional Project	Regional Broadband Strategic Plan, includes Taylor, Doddridge, Harrison, Marion, Monongalia and Preston counties.	CDBG	2/1/2018
Tyler County	Tyler County Broadband Plan	CDBG	2/1/2018
Webster County-Lead Applicant for 6-County Regional Plan in conjunction with Wyoming County	Broadband Initiative for Southern WV. Plan includes Webster, Fayette, Greenbrier, Nicholas, Pocahontas and Summers counties.	CDBG	2/1/2018
Wyoming County- Lead Applicant for 5-County Regional Project in conjunction with Webster County.	Regional Broadband plan includes Wyoming, McDowell, Mercer, Monroe, and Raleigh counties in the Region 4 PDC area.	CDBG	2/1/2018
2019			
Brooke County- Lead for Regional Project	Brooke-Hancock Regional Plan	CDBG	4/1/2019
Grant County	Grant County Broadband Plan	CDBG	4/1/2019
Jefferson County	Jefferson County Broadband Plan	CDBG	4/1/2019
Lewis County	Southern Lewis County Expansion Project	CDBG Infrastructure	4/1/2019
Marshall County-Lead for Regional Project	Marshall-Ohio-Wetzel Regional Broadband Plan	CDBG	4/1/2019
Mason County	Mason County Broadband Plan	CDBG	4/1/2019
McDowell County	Bull Creek – Isaban Area Expansion Project	CDBG Infrastructure	4/1/2019
Mercer County	Cumberland Industrial Park Expansion Project	CDBG Infrastructure	4/1/2019

Nicholas County	Hinkle Mountain – Little Laurel Expansion Project	CDBG Infrastructure	4/1/2019
Pocahontas County	Pocahontas County Broadband Plan	CDBG	4/1/2019
Wayne County	Wayne County Broadband Plan	CDBG	4/1/2019

3.5.2 Appalachian Regional Commission (ARC) Central Appalachian Broadband Initiative

The Council and the WVDO coordinated the release of a request for proposals for projects to be funded by an available \$3.2 million in Appalachian Regional Commission (ARC) funding as part of the agency’s broadband initiative. The goal of the initiative is to provide funding for the deployment of broadband that will increase economic and business development or provide service to unserved customers. Funding is limited to ARC-designated distressed counties in West Virginia that have been most negatively impacted by the downturn in the coal industry. Eligible counties are Boone, Clay, Logan, Lincoln, McDowell, Mingo, Webster, and Wyoming.

Through this program, the Council has also partnered with the Land Use and Sustainable Development Law Clinic within the West Virginia University College of Law to develop a legal toolkit, titled, “TURBO: Tools for Understanding Rural Broadband Opportunities.” The toolkit will examine local ordinances, taxation, common agreements, and other concerns specific to broadband development in West Virginia.

ARC Central Appalachian Broadband Projects Awarded in 2019		
Local Government	Project	Funding Source
1. Webster County Economic Development Authority	Engineering Design for Fiber, Wireless System	ARC Central Appalachian Broadband
2. Williamson Health and Wellness	Engineering Design for Downtown Fiber Ring, serving WVCTC and Williamson Hospital	ARC Central Appalachian Broadband
3. WVU Land Use and Sustainable Development Law Clinic via West Virginia University Research Corporation	TURBO: Tools for Understanding Rural Broadband Access, A Legal Toolkit for Broadband Development	ARC Central Appalachian Broadband

3.5.3 ARC POWER

The Council has also partnered with ARC and the WVDO to create the West Virginia Broadband Hub, incorporating existing highway permit data, mapping, integration of broadband into the WVDO Site Selection program, and the creation of a Guide to Broadband Development in West Virginia.

The West Virginia Geological and Economic Survey (WVGES) served as the lead applicant for Technical Assistance funding through the ARC Partnerships for Opportunity and Workforce and Economic

Revitalization (POWER) Initiative. This application is strongly supported by the West Virginia Department of Commerce and the West Virginia Broadband Enhancement Council. The ten counties included in this project are:

1. Boone
2. Clay
3. Lincoln
4. Logan
5. Mingo
6. McDowell
7. Nicholas
8. Wayne
9. Webster
10. Wyoming

The integration of data sources and the consolidation of broadband development resources will assist local governments in their pursuit of broadband connectivity. The project will increase community capacity to support broadband and economic development.

Taken together, the programs in this section demonstrate the State's commitment to improving broadband service in every region using multiple programs as shown on the following map.

Most CDBG funding is used for infrastructure development, including water and wastewater, housing, and similar projects in West Virginia.²⁴ However, HUD has recognized that broadband connectivity is an important factor in building strong, vibrant communities.

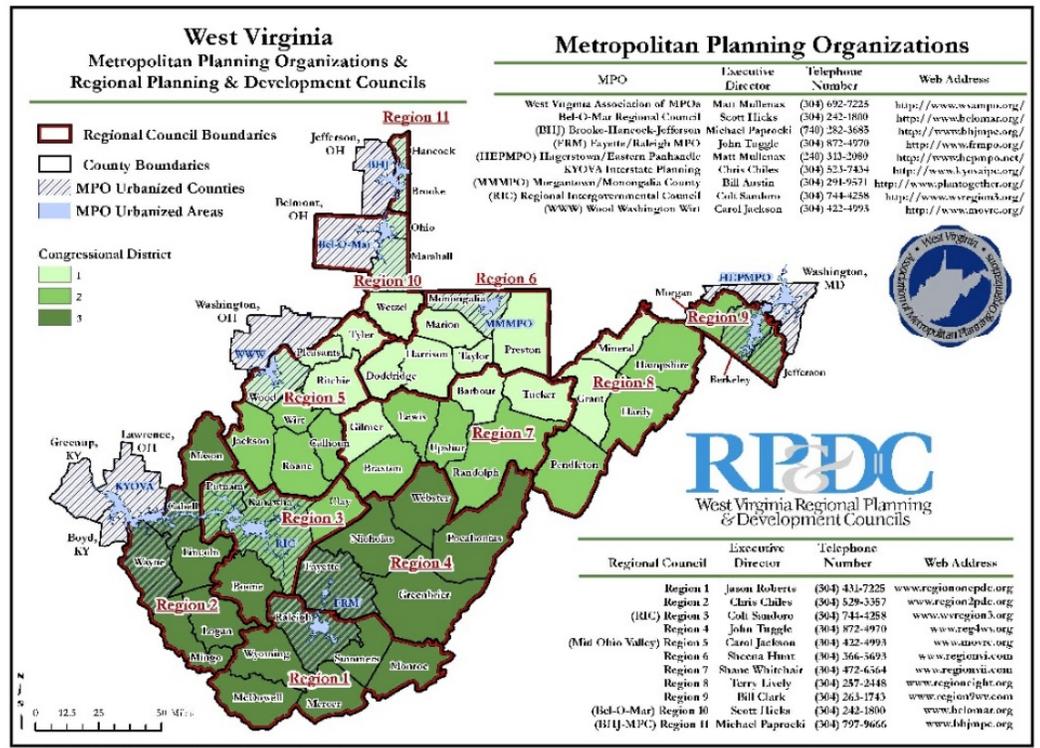
Many local governments in West Virginia are including broadband as priorities in Comprehensive Economic Development Strategies (CEDs).

A CEDS is the result of a regionally owned planning process designed to build capacity and guide the economic prosperity and resiliency of an area or region. Regions must update their CEDs at least every five years to qualify for assistance under the Public Works and Economic Adjustment Assistance programs of the U.S. Economic Development Administration. CEDS plans can be viewed at each Regional Council website.

1. www.Regiononepdc.org
2. www.region2pdc.org
3. www.wvregion3.org
4. www.reg4wv.org
5. www.movrc.org
6. www.regionvi.com
7. www.regionvii.com
8. www.regioneight.org
9. www.region9.com
10. www.belomar.org
11. www.bhjmpc.org

3.5.5 U.S. Department of Agriculture (USDA) Broadband Programs

The U.S. Department of Agriculture (USDA) Rural Development team partnered with the Council to conduct a series of workshops in 2018 and 2019 to detail program requirements and encourage the



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<https://broadband.wv.gov/index.php?p=resources/news/west-virginia-chosen-to-partner-in-national-broadband-mapping-initiative>

development of project proposals from West Virginia. Training events focused on three primary USDA broadband programs, including:

- Community Connect,
- ReConnect, and
- Distance Learning and Telemedicine

Proving that communities in West Virginia can successfully compete for this funding, the emphasis on broadband development has resulted in project applications recently selected for USDA Community Connect funding, detailed in the chart below.

Recent USDA Community Connect Projects in West Virginia		
Provider	Award	Counties
Central West Virginia Development Association, MicroLogic	\$3 million	Barbour, Randolph, Upshur
Preston County Economic Development Authority, Digital Connections	\$3 million	Preston
ClearFiber	\$1.96 million	Marion, Monongalia

For more information about USDA Community Connect, visit <https://www.rd.usda.gov/programs-services/community-connect-grants>.

In December 2018, the U.S. Department of Agriculture (USDA) announced details regarding its \$600 million ReConnect Program, <https://www.usda.gov/reconnect>. Five proposals, representing approximately \$45 million in broadband infrastructure investment, were submitted to USDA ReConnect program, with \$25 million requested for grant-only funding, and nearly \$20 million requested for grant-loan combinations. ReConnect announcements are expected to be completed by the end of December 2019.

The USDA Distance Learning and Telemedicine program helps 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. For more information, visit <https://www.rd.usda.gov/programs-services/distance-learning-telemedicine-grants>.

3.5.6 Other Notable Investments

Microsoft Airband Initiative

In August 2018, the Microsoft Corp. announced West Virginia's inclusion in its 2018 Airband Grant Fund Initiative. The Airband initiative is designed to help bring broadband internet access to rural communities through innovative technologies. Houston-based Skylark Wireless was selected to provide affordable broadband service in Mingo County, one of only eight U.S. communities to receive this grant in 2018. The Airband Grant Fund is part of the Microsoft Airband Initiative, which aims to help close the broadband access gap in rural America by 2022.

FCC CAF II Investment: August 2018

Also in August 2018, the Federal Communications Commission (FCC) announced its award of \$1.49 billion, to be paid over the next 10 years, to 103 providers nationwide in under the Connect America Fund Phase II (CAFII) program. Three services providers were collectively awarded nearly \$12 million for broadband projects in West Virginia. Announced projects in West Virginia include:

2018 Connect America Fund Phase II (CAF II) Projects in West Virginia		
Provider	Award	Counties
Citynet	\$6.5 million	Greenbrier, Nicholas, Pocahontas, Taylor, and Webster
Hardy Telecommunications	\$47,435	Rio, Hampshire County
ViaSat, Inc.	\$5.43 million	Various locations; emphasis in Calhoun, Clay, Marshall and Wetzel

West Virginia FCC CAF II Projects, Announced in August 2018

FCC Rural Digital Opportunity Fund: 2020

The Federal Communications Commission (FCC) recently announced plans to invest \$20 billion over the next 10 years through its Rural Digital Opportunity Fund (RDOF). These funds would be derived through the Universal Service Fund (USF) to support broadband expansion in unserved and underserved rural areas over the next decade. The Council provided comment on the notice of proposed rulemaking in September 2019.

Zayo Announcement: October 2018

In October 2018, the Zayo Group announced plans to build a 200-mile fiber route across West Virginia, from Ashburn, Virginia to Columbus, Ohio. This major project will provide significant opportunities for the expansion of high-speed connectivity built upon advanced fiber infrastructure.

MMI Announcement: March 2019

In March 2019, Facebook, through its subsidiary Middle Mile Infrastructure, announced plans to build a high capacity fiber optic cable network crossing a portion of West Virginia as part of the company's ongoing larger network infrastructure build stretching from Virginia to Ohio. The company has pledged to improve connectivity in West Virginia by providing access to fiber along the route and creating opportunities for network expansion.

Each of the projects described in this section are part of the State's overall approach to broadband development. No single investment will address all connectivity issues and each community approaches broadband from a different vantage point. With a long-term view, West Virginia seeks to empower local communities to pursue the benefits of connectivity by implementing policies that encourage investment.

4. Recent Legislative and Policy Changes

The State of West Virginia has made great strides in recent years with respect to broadband deployment policy and legislation. Recognizing the needs of its many underserved and unserved citizens, the West Virginia Legislature has passed numerous pieces of legislation that will encourage broadband

deployment and the development of policies that will enhance deployment. Many of these legislative changes were set forth as goals in the 2014 State of West Virginia Broadband Strategy Plan.

4.1 Creation of West Virginia Broadband Enhancement Council

One of the most significant legislative developments was the creation of the West Virginia Broadband Enhancement Council, established pursuant to legislation in 2017 under House Bill 3093. The primary goal of its creation is to ensure that every part of municipality, community, and rural area of the State has access to Internet communications. The Council is charged with exploring ways to expand access to middle mile, last mile, and wireless applications, including making legislative recommendations. The Council is also charged with mapping broadband services available within the State. The Legislature created a Broadband Enhancement Fund to support the efforts of the Council. The Council reports back each year to the Legislature on its activities.²⁵

²⁵Pursuant to WV Code § 31G-1-4(a): (a) The Council shall:

- (1) Explore any and all ways to expand access to broadband services, including, but not limited to, middle mile, last mile and wireless applications;
 - (2) Gather data regarding the various speeds provided to consumers in comparison to what is advertised. The Council may request the assistance of the Legislative Auditor in gathering this data;
 - (3) Explore the potential for increased use of broadband service for the purposes of education, career readiness, workforce preparation and alternative career training;
 - (4) Explore ways for encouraging State and municipal agencies to expand the development and use of broadband services for the purpose of better serving the public, including audio and video streaming, voice-over Internet protocol, teleconferencing and wireless networking; and
 - (5) Cooperate and assist in the expansion of electronic instruction and distance education services.
- (b) In addition to the powers set forth elsewhere in this article, the Council is hereby granted, has and may exercise the powers necessary or appropriate to carry out and effectuate the purpose and intent of this article, as enumerated herein. The Council shall have the power and capacity to:
- (1) Provide consultation services to project sponsors in connection with the planning, acquisition, improvement, construction or development of any broadband deployment project;
 - (2) Promote awareness of public facilities that have community broadband access that can be used for distance education and workforce development;
 - (3) Advise on deployment of e-government portals such that all public bodies and political subdivisions have homepages, encourage one-stop government access and that all public entities stream audio and video of all public meetings;
 - (4) Make and execute contracts, commitments and other agreements necessary or convenient for the exercise of its powers, including, but not limited to, the hiring of consultants to assist in the mapping of the State and categorization of areas within the State;

4.2 Access to Highway Rights-of-Way and Dig Once Policy

In 2018, the West Virginia legislature enacted a “Dig Once” policy, passing legislation that will create incentives over the long term to create spare conduit or opportunities to lay fiber in a joint trench. It directs the West Virginia Division of Highways to install vacant broadband conduit during highway construction projects. Interested ISPs apply to the Council for approval to use the conduit. Conduit is leased at cost-based rates. The Council is also charged with creating a strategy to facilitate the timely and efficient deployment of broadband infrastructure on State-owned lands and buildings, and to assist local governments with development of similar Dig Once and deployment policies. House Bill 4447.

4.3 Electric Utility Feasibility Studies to Provide Middle-Mile Facilities

In a bold move showing West Virginia’s continuing commitment to improving broadband access for its citizens, the Legislature passed legislation in 2019 that empowers the State’s electric utilities to develop plans for construction and operation of middle-mile broadband infrastructure expansion projects to provide access to unserved areas of the State. Senate Bill 3, codified at W. Va Code §31G-4-5 (2019). The Council and the West Virginia Public Service Commission are tasked with assisting the electric utilities in development of these studies. The studies shall address:

1. The route of the middle-mile infrastructure proposed for the project,
2. The number of fiber strands that would be utilized in connection with the proposed project and dedicated to serve as the middle mile,
3. The location of the electric utility’s distribution infrastructure that will be utilized in connection with the proposed project, and

(5) Acquire by gift or purchase, hold or dispose of real property and personal property in the exercise of its powers and performance of its duties as set forth in this article;

(6) Receive and dispense funds appropriated for its use by the Legislature or other funding sources or solicit, apply for and receive any funds, property or services from any person, governmental agency or organization to carry out its statutory duties;

(7) to oversee the use of conduit installed pursuant to section two of article three of this chapter; and to

(8) Perform any and all other activities in furtherance of its purpose.

(c) The Council shall exercise its powers and authority to advise and make recommendations to the Legislature on bringing broadband service to unserved and underserved areas, as well as to propose statutory changes that may enhance and expand broadband in the State.

(d) The Council shall report to the Joint Committee on Government and Finance on or before January 1 of each year. The report shall include the action that was taken by the Council during the previous year in carrying out the provisions of this article. The Council shall also make any other reports as may be required by the Legislature or the Governor.

4. The capacity of the middle-mile broadband infrastructure that will be available to lease to last-mile broadband Internet providers upon completion of the proposed project;
5. The estimated cost of the proposed project, including but not limited to engineering costs, construction costs, permitting costs, materials and labor, right-of-way costs, and a reasonable rate of return to the electric utility;
6. The proposed schedule of construction of the proposed project; and
7. The method of attachment and connection of the middle-mile broadband fiber assets to the electric utility's distribution infrastructure.

The Council is currently working with two of the State's electric utilities, Appalachian Power and First Energy, on development of the feasibility studies, which may be submitted to the Council for review and approval by December 1, 2019. These feasibility studies, if approved and implemented, will bring sources of private capital to bear on creating critical fiber infrastructure linking unserved and underserved communities to lower cost bandwidth.

4.4 Public Service Commission Jurisdiction Over Utility Pole Attachments and One-Touch Make-Ready

Recent legislative changes also establish the Public Service Commission's jurisdiction over the "make-ready" process for pole access within the State, the process through which internet service providers access the utility poles to attach their infrastructure for broadband deployment (typically fiber or small cells). Senate Bill 3 provided for the implementation of One-Touch Make-Ready rules for utility pole attachments, premised primarily on the FCC's rules around this process. Senate Bill 3 amended the Make Ready Pole Access Statute. Senate Bill 3, codified at W. Va Code §31G-4-1 *et seq.* (2019). One-Touch Make-Ready requires the pole owners to allow a single crew to make changes to multiple wires, rather than having the owner of each wire or strand send its own crew to move it separately.

The Public Service Commission conducted a proceeding, *General Investigation into Adopting and Implementing Rules Governing Pole Attachments and Assumption of Commission Jurisdiction Over Pole Attachments*, Case No. 19-0551-T-GI, to implement the changes to the Make Ready Pole Access Statute. Providing an affordable and timely pathway for attachment of infrastructure to utility poles has proven to be one of the most effective ways to speed broadband deployment. The Council thus filed comments in support of the new rules and urged that the Commission adopt the FCC rules largely as is, taking the position:

Improving the reach and quality of broadband is absolutely vital to West Virginia's efforts to attract and retain businesses and residents. SB 3 is appealing to broadband providers because it adopts a known framework. Many broadband providers operate on an interState basis, and distinctive State rules are a deterrent to entry and expansion.

Initial Comments of West Virginia Broadband Enhancement Council, Case No. 19-0551-T-G, July 9, 2019.

The Commission adopted new rules implementing One-Touch Make-Ready based on the FCC's rules on October 15, 2019.²⁶ The Council will continue its leadership and advocacy at the State level as additional issues arise.

4.5 West Virginia Economic Development Authority Loan Insurance Fund

West Virginia also provides incentives for investors to support deployment of broadband infrastructure, through a non-lapsing fund administered by the West Virginia Economic Development Authority (WVEDA) to support broadband investment. The Broadband Loan Insurance Program (BLINS) insures the repayment of debt on capital costs related to providing broadband service to unserved or underserved areas of the State, or that links a segment of a network operator's core network to a local network plant that serves an unserved area or an area with no more than two wireline providers as outlined in West Virginia Code § 31-15-8, et seq.

Under the BLINS program, the WVEDA can insure up to 80 percent of a bank loan for a broadband infrastructure or development project. The insured portion cannot exceed \$10 million and could be for a maximum term of 20 years.

The purpose of this program is to expand, extend and make generally available broadband service throughout the State of West Virginia with a primary emphasis on the development of broadband infrastructure in unserved and underserved areas of the State as outlined in West Virginia Code § 31G-1-1, et seq.

The program requires the certification of eligibility by the Council. Under the program, the WVEDA may insure the payment or repayment of the principal and interest of debt related to the following:

1. Providing broadband service of 25/3 Mbps to a household or business located in an Unserved or Underserved Area. The following definitions apply:
 - a. An Unserved Area is defined as a community that has no access to broadband service.
 - b. An Underserved Area is defined as an area with access to Internet service, by wireline or fixed wireless technology, whereby fifteen percent or more of the households and businesses in the area are served by Internet service with an actual downstream data rate less than ten (10) megabits per second (Mbps) and an upstream data rate less than one (1) Mbps, and no part of the area has three (3) or more wireline or fixed wireless broadband service providers.
2. Building a segment of a telecommunications network that links a network operator's core network to a local network plant that serves either an unserved area or an area in which no more than two (2) wireline providers are operating.

Public notice is required for all projects, except those that plan to provide a downstream data rate of at least one (1) Gigabyte per second throughout the proposed project service area.

²⁶ [General Order No. 261](#), Public Service Commission of West Virginia (October 15, 2019).

The process for funding has detailed requirements for as-built plans, mapping, modifications, project completion, and closeout.

4.6 Incentives for Development of Wireless Facilities

In 2019, West Virginia also passed legislation that provides for reduced property taxation for a five-year period of communications towers erected between mid-2019 and mid-2024. Towers erected in this time shall be valued at salvage value for five years, meaning five percent of its original cost. W. Va. Code §§ 11-6L-1 through – 5. This greatly reduces the tax burden on such towers. The State also gives greater certainty for the ability to place of small wireless facilities in the State.

There is also legislation acknowledging the importance of small wireless facilities (small cells and distributed antenna systems) to delivering advanced technology, broadband, and 911 service. The West Virginia Small Wireless Facilities Act creates more regulatory certainty and lower costs to providers by allowing wireless providers to collocate small wireless facilities, and to install, modify or replace utility poles for such facilities in public rights-of-way. It also prohibits exclusive arrangements for use of rights-of-way, limits pole attachment fees, and reduces regulatory burdens on installations. W. Va. Code § 31H-1-1 *et seq.*

4.7 Establishment of Broadband Cooperatives

West Virginia also provides a statutory mechanism for residents, businesses, and political subdivisions in West Virginia who have no good options for service providers to create a cooperative association to address connectivity problems. These coops are authorized to establish a provider focused on their communities, bond or finance the building of infrastructure, and engage in other related activities. W. Va. Code § 31G-2-1 *et seq.* The West Virginia University Entrepreneurship & Innovation Law Clinic has developed a Broadband Cooperative Toolkit. The toolkit contains a diagram detailing the way a broadband network could established in West Virginia. The Council will continue its partnership with the Law Clinic to assist communities in the formation of cooperatives.

4.8 Permitting Microtrenching

West Virginia Code § 31G-3-1 *et seq.* establishes the ability of fiber network builders to utilize microtrenching in the State of West Virginia, an innovative lower-cost, lower-impact option for installing underground fiber facilities. It also requires the installation of vacant conduit when a provider is performing microtrenching operations.

4.9 Nonregulation of VoIP services

West Virginia also has legislation clarifying that the Public Service Commission does not have jurisdiction over companies that offer Voice over Internet Protocol (VoIP) telephony services. W. Va. Code § 24-2-1(e).

4.10 Oversight of Cable Franchising

Cable franchising in West Virginia is subject to licensing by the State or municipality under W. Va. Code § 24D-1-1 *et seq.* The Commission determines the appropriate authority for issuance of a license,

prescribes the standards for construction, operation, and safe, adequate, and reliable service to subscribers. The municipality in which the cable system will be located usually serves as the permitting authority. At least one municipality, Jefferson County, is in the process of negotiating a cable franchise agreement for its residents.

5. Regional Broadband Plan Summaries

A complete list of recent broadband planning projects, executed in 2018 and 2019, is provided in Section 3.5. These projects will be reviewed and integrated into the State Plan in 2020. Funds for broadband planning and infrastructure are awarded through the Community Development Block Grant Program (CDBG) as detailed in Section 3.5.

Broadband planning grants are designed to enable local governments to conduct the assessments needed to develop effective strategies for the construction of broadband infrastructure. The WVDO will consider applications for planning, analysis, and assessment and construction activities that further the strategic deployment of broadband throughout the State.

A total of \$1.5 million in CDBG funding was allocated for broadband development in early 2018. Nine broadband planning grants were awarded to nine counties in early 2019. Collectively, the nine counties and their partners cover 26 West Virginia counties and include nearly 500,000 residents.

Three broadband infrastructure grants were awarded. Upon completion, these projects will provide and/or improve service for approximately 1,200 residences, businesses and community anchor institutions. The 2018 project list includes:

Clay County Commission (Lead Applicant): \$125,000

This \$125,000 project is to develop a broadband feasibility and business plan for Calhoun, Clay and Roane counties. This planning project promotes a regional approach to provide a roadmap to provide broadband throughout the three counties.

- Phased Broadband Plan
<https://public.3.basecamp.com/p/ZcDBgQusALD8ZYroDBCgYZio>
- Improving Broadband Access
<https://public.3.basecamp.com/p/sPsyVerZiHzY4WyWddyDtQvv>
- Three County Broadband Survey Report
<https://public.3.basecamp.com/p/UUDWnynadFiDyHdSGKoUD2Lg>

Fayette County Commission: \$30,000

This study will enable Fayette County officials to determine how and where to place last mile fiber to homes and businesses. The study will also allow telecommunication companies easier access to the many unserved and underserved areas of Fayette County. Tourism is one of the primary economic drivers in Fayette County and the lack of quality, affordable broadband access is a hindrance for local businesses and residents and attracting new potential new businesses and tourists.

- **Link to most recent draft for Fayette County.**
[Fayette County Broadband Study Final Report provided by Design Nine](#)

Gilmer County Commission: \$50,000

This plan will enable the Gilmer County Commission to pursue a broadband internet network and will also serve as a blueprint to pursue additional federal grants for telecommunication improvements not currently available. An increase in broadband connectivity will benefit county residents and businesses especially those at the Gilmer County Industrial park which recently received expansion funds but is still without adequate broadband access.

Hampshire County Commission: \$402,795

This project will expand the county-owned backbone fiber to bring broadband into eastern Hampshire County and the Capon Bridge municipal area. A feasibility study showed that the eastern end of the county has significant small to mid-sized business potential because of its proximity to Washington D.C., and other Virginia metro areas. Building out a hybrid broadband network in this part of the county will make it more attractive to businesses and enhance internet connectivity to unserved and underserved areas.

Jackson County Commission: \$125,000

The Jackson County Commission will use this grant to implement infrastructure improvements and equipment installation to serve the Sandyville area with broadband internet connectivity. One key factor for this initiative is public safety, as there is little to no cell connectivity in this area to serve residents, businesses, an elementary school and a senior center.

Mingo County Commission: \$75,000

The Mingo County Commission is developing a strategic plan to bring broadband internet service to the Town of Gilbert. The project is viewed as critical to the development of the local economy, which is increasingly focused on tourism due to the development of the Hatfield-McCoy Trail system.

- **Link for most recent for Mingo County-Gilbert**
<https://public.3.basecamp.com/p/JUVbAjEwjGhbpVgSVtmsTG3u>

Morgan County Commission: \$75,000

This planning project will develop a plan to make affordable high-speed broadband internet service available on a countywide basis utilizing the county's existing tower structures and radio buildings. The connectivity will allow residents and businesses to benefit from the many applicable uses that broadband affords.

- **Link to most recent draft for Morgan County.**
<https://public.3.basecamp.com/p/MtHrjakx1hy8p5chKPcYAZm7>

Nicholas County Commission: \$300,000

This project will provide broadband services to the residents of the Hinkle Mountain and Little Laurel areas of Nicholas County. This project will also serve as a Community Development Block Grant program pilot project as it coincides with a water extension project in the same area, potentially merging the construction and installation of water lines and broadband fiber lines.

Taylor County Commission (Lead Applicant): \$125,000

The Taylor, Doddridge, Harrison, Marion, Monongalia and Preston County Commissions have agreed to partner in a regional update of the area's 2013 Broadband Strategic Plan – Assessment of Broadband Coverage report. The report will identify where broadband service is lacking, particularly in the unserved and underserved areas of these counties, prioritize where service is needed in each county and develop recommendations to improve access.

Tyler County Commission: \$30,000

The Tyler County Commission has identified broadband internet service as the county's top non-water and -sewer utility project. The growth of Tyler County and its potential for further success through educational and economic avenues is very dependent on broadband internet service. This broadband study will map the direction the county needs to take to achieve these goals.

Webster County Commission (Lead Applicant): \$125,000

The Webster County Commission is the lead applicant in developing a regional plan to bring reliable and affordable broadband internet service to Webster, Fayette, Greenbrier, Nicholas and Pocahontas counties. The study will include an overall needs analysis to provide the most efficient and cost-effective broadband system to the citizens and businesses of these counties. This study is also being conducted in collaboration with the Regional Broadband Planning Project led by the Wyoming County Commission which would provide a roadmap for reliable and affordable broadband service in 11 southern West Virginia counties.

Wyoming County Commission (Lead Applicant): \$125,000

The Wyoming County Commission is the lead applicant in developing a plan to bring reliable and affordable broadband internet service to McDowell, Mercer, Monroe, Raleigh, Summers and Wyoming counties. The study will include an overall needs analysis to provide the most efficient and cost-effective broadband system to the citizens and businesses of these counties. This study is also being conducted in collaboration with the Broadband Initiative for Southern West Virginia led by the Webster County Commission which would provide a roadmap for reliable and affordable broadband service in 11 southern West Virginia counties.

2019 Broadband Planning Projects

A total of \$2.4 million in CDBG funding was allocated for broadband development in early 2019 to seven West Virginia counties in early 2019. Collectively, the seven counties and their partners cover 14 West Virginia counties and include nearly 300,000 residents, business and community anchors.

Four broadband infrastructure grants were awarded to three counties. Upon completion, these projects will provide and/or improve service for more than 900 residences, businesses and community anchor institutions. The 2019 project list includes:

Brooke County Commission (Lead Applicant): \$125,000

This project is to develop a broadband feasibility plan for Brooke and Hancock counties. The counties have identified the need to determine service gaps for unserved and underserved areas and the technology best suited to close these gaps. This study is also being conducted in collaboration with the Marshall County Commission grant to provide broadband solutions for five Northern Panhandle counties.

Grant County Commission: \$75,000

This project will enable Grant County officials to conduct a feasibility study to facilitate cloud-based operations for businesses, enhance tourism development through online marketing, and provide greater learning opportunities for students. Due to its location bordering Maryland and its proximity to the D.C. metro area, Grant County seeks more robust broadband solutions to support business and tourism development.

Jefferson County Commission: \$75,000

Jefferson County officials seek a county-wide assessment of the county's broadband service and assets, and the creation of clear strategies for improving internet coverage to attract and retain area businesses. The county's proximity to Baltimore, Washington D.C. and Northern Virginia underscores the need for better connectivity to support entrepreneurial development and telecommuting opportunities.

Lewis County Commission: \$500,000

This infrastructure project will enable the Lewis County Commission to pursue wireless broadband service for more than 450 households, seven businesses and three anchor institutions the Walkersville area of southern Lewis County. The Lewis County Economic Development Authority seeks broadband service to facilitate economic growth through digital educational, health care and public safety enhancements in this area.

Marshall County Commission (Lead Applicant): \$125,000

This tri-county project, including Marshall, Ohio and Wetzel counties, will focus on developing broadband connectivity, identified as one of the region's top economic development priorities. By obtaining faster affordable internet service, these border counties will gain a competitive edge to compete for business growth, recruitment and expansion. This study is also being conducted in collaboration with the Brooke County Commission grant to provide regional broadband solutions to five Northern Panhandle counties.

Mason County Commission: \$75,000

The Mason County Commission will use its strategic plan to bring broadband internet service to the most underserved areas of the county. County officials intend to build upon the presence of enhanced connectivity to facilitate better telemedicine options for residents, better online educational opportunities for students, and digital workforce training for displaced workers.

McDowell County Commission: \$630,000

This infrastructure project includes the installation of approximately 20 miles of aerial fiber buildout to reach an estimated 300 households in the Bull Creek-Isaban areas of McDowell County. The project will provide reliable connectivity for area residents and businesses, including several coal mining operations. Notably, the project will facilitate telemedicine platforms and capacity, as there are no medical facilities in the project area.

Mercer County Commission: \$155,000

This broadband infrastructure project will improve broadband connectivity at the Cumberland Industrial Park in Bluefield. The project will provide existing businesses the ability to operate at a higher capacity

with greater internet connectivity, facilitating the ability to retain and create jobs. This project will also strengthen the park as a competitive business location, enabling the Mercer County Economic Development Authority to further develop the property as an economic driver in this region.

Nicholas County Commission: \$500,000

This Phase II infrastructure project will provide broadband services to the residents of the Hinkle Mountain and Little Laurel areas of Nicholas County, near Richwood. This project is currently underway, connecting broadband-level service to a county telecommunications tower atop Hinkle Mountain. Phase II will include the completion of fiber buildout from the tower to the area residents and businesses.

Pocahontas County Commission: \$75,000

This planning project will assist in identifying the best locations for last-mile solutions to residents and businesses who need broadband-level connectivity for education, health, safety and commerce applications. Broadband will also provide a valuable amenity for the many outdoor enthusiasts who visit Pocahontas County but still wish to remain connected as if they were at home.

Wayne County Commission: \$75,000

This broadband planning project will identify the county's underserved and unserved areas and develop strategies to enhance internet connectivity throughout Wayne County. The plan will include the evaluation of broadband service to Wayne County's anchor institutions such as schools, libraries and medical facilities along with key industrial park sites, and the development of expansion strategies.

6. Stakeholder Surveys

The Council is in the process of conducting several surveys on broadband issues. Responses will be considered when developing recommendations and priorities for this Plan. The survey is primarily an online tool, but the survey targeted to the public can also be printed and emailed or mailed to the Council.

Five sector-specific surveys were initiated in Fall 2019. There is a [General Survey](#) that is publicly available on the Council website, <https://broadband.wv.gov/>, and on paper.

There are also four surveys that the Council has targeted for specific sectors: a [Workforce Survey](#), a [Health Care Survey](#), a [Public Safety Survey](#), and an [Education Survey](#).

Stakeholders targeted for these surveys include:

1. West Virginia Department of Education
2. Higher Education Policy Council
3. West Virginia Development Office
4. West Virginia Department of Homeland Security and Emergency Management
5. West Virginia Economic Development Council
6. Regional Planning and Development Councils
7. West Virginia Association of Counties
8. West Virginia County Commissioners Association
9. West Virginia Municipal League
10. West Virginia Community Development Hub
11. United Way of Central West Virginia
12. AARP-West Virginia
13. Generation West Virginia

This Plan will be updated once the survey results are received and processed.

7. West Virginia Key Priority Areas

7.1 Subject Matter Priorities

The Council's priority focus areas at this time are keyed to the information sought in the surveys and the RFI: Workforce Development and Economic Development, Health Care, Public Safety, Education, and Gigabit Cities and Counties. Each of these focus areas have existing needs for fast, affordable, and reliable broadband service, and demand for such service that is expected to increase exponentially in the near- and long-term. However, these are the initial concerns identified by the Council, and subject to further refinement after additional information is received from the survey and RFI processes, and the electric utility middle mile feasibility plans are submitted.

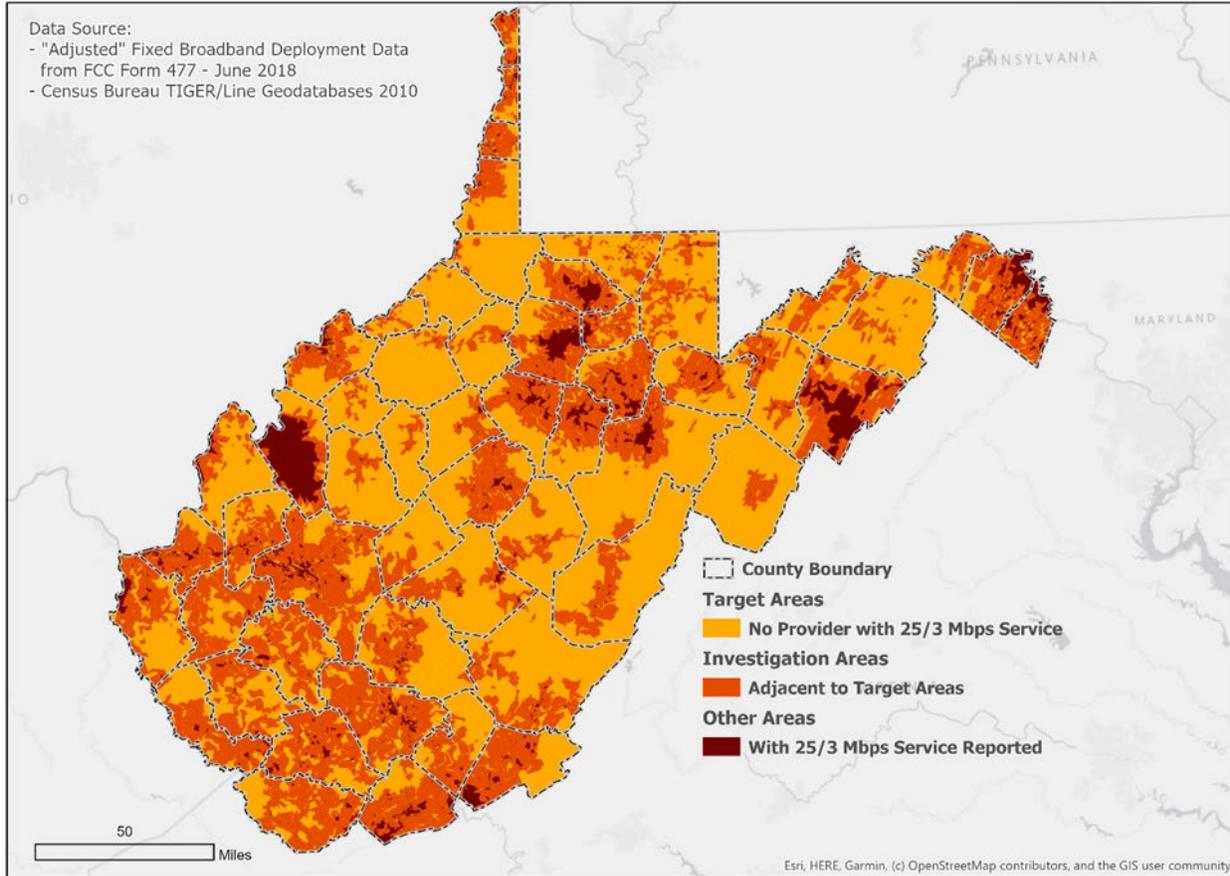
The surveys noted in Section 6 above have been developed around these priorities. Once the survey results are in and tabulated, they will provide additional information for a roadmap for the Council's work for the next five years. The Council will include the survey results as guideposts for the key sectors, goals, and strategies moving forward. This roadmap is not intended to be a fixed document but will be updated by the Council every year as its work progresses.

7.2 Target Areas

The Council has produced a map of Target Areas where it believes significant underserved or unserved populations exist. Target Areas in this map have been defined using data reported by Census Block to the Federal Communications Commission as of December 2017 as part of the Form 477 reporting process. Where the Council knows of specific corrections that reporting companies have made subsequently, it has adjusted the data to reflect them. Census Blocks adjacent to Target Areas are indicated as "Investigation Areas," to indicate that in some cases unserved areas may lie outside Census Blocks reported to the FCC as served.

The Council believes that data reported to the FCC at the Census Block level likely overstates the availability of broadband service in West Virginia, and therefore it regards the Target Areas presented as preliminary. Regardless of whether it is shown as a "Target Area" on the map below the Council will consider any area a "Target Area" where there is credible information that the area is unserved.

Available Consumer Download and Upload Speeds in West Virginia Non-satellite



8. Development Barriers and Challenges

The Council has identified the following as existing or potential barriers and challenges to broadband infrastructure deployment:

1. Geography
2. Rural Population Density
3. Deployment Cost
4. Consumer Cost
5. Regulatory Hurdles and Uncertainty
6. Difficulty Accessing Public Rights-of-Way
7. Lack of Coordination at State and Local Level
8. Regulatory Delays
9. Access to Utility Poles and Conduit
10. Lack of Transparency as to Available Assets
11. Financing Costs, Especially Concerning Deployment to Rural Areas
12. Lack of Middle Mile Infrastructure
13. Lack of Local Capacity or Authority to Develop Broadband Infrastructure

9. West Virginia Broadband Goals and Strategies

This section on goals and strategies outlines four broad focus areas for improving broadband services within West Virginia:

1. Improving broadband infrastructure;
 2. Improving information about broadband access and broadband availability;
 3. Increasing and improving broadband use; and
- General strategies by key priority area, including strategies for organizational development.

9.1 Goals and Strategies to Improve Broadband Infrastructure

Lack of broadband infrastructure, particularly in the most rural parts of the State, continues to be one of the greatest challenges for the State.

9.1.1 Reducing and Eliminating Barriers to Infrastructure Development

GOAL:

West Virginia will present low barriers for projects that seek to build and develop broadband infrastructure serving residents and businesses in the State.

Permitting and access to public rights-of-way

STRATEGY: *Implement clear West Virginia policy that wired and wireless broadband have clear access to the public rights-of-way.*

STRATEGY: *Implement clear West Virginia policy that wired and wireless broadband have clear access to the public rights-of-way.*

Providing timely and efficient access to the public rights-of-way can greatly aid in speeding broadband deployment. The Council should work with State and local officials to determine process improvements for accessing the public rights-of-way. Included in this initiative would be developing processes for pole attachments, described further below.

STRATEGY: *Continue to encourage “Dig Once” opportunities for underground projects in the public right-of-way.*

“Dig Once” legislation has been enacted with respect to certain State activities. Further action is needed to incent coordination for both State and local projects, including the development of model ordinances or policies.

STRATEGY: *Streamline State and local permitting processes and franchises.*

State and local permit permitting processes

- use clear, up-to-date and published standards
- offer certainty for common construction methods; and
- rapid turn-around for permits.

State agencies with oversight of permits for broadband projects should have a 60-day shot clock for State permit actions, with a "deemed approve" consequence if no action.

The Broadband Enhancement Council should designate key corridors for future broadband service enhancement and State agencies should identify categories of broadband infrastructure improvement projects which may be pre-permitted along these corridors. Potential lead or partner agencies include libraries, Workforce West Virginia, FirstNet, and the West Virginia Office of Information Technology. Strategy: *Reduce or eliminate fees, especially for broadband infrastructure that directly serve West Virginia residents and businesses.*

State and local agencies should adopt low, cost-based fees for reviewing permit applications.

There should be no use fees for entities placing broadband facilities in the public right-of-way when such facilities are part of a network that will directly serve users in West Virginia. The State should make a limited exception for projects whose primary use is to transit traffic between points located outside the State, and regional projects placing fiber facilities in highway rights of way between more than one Division of Highway District. In these cases, the State should seek reasonable compensation in the form of in-kind facilities that may be used to improve broadband services in unserved parts of West Virginia or deliver communication to support transportation management and intelligent transportation systems, governmental or public utility services. The State should consider full or partial exceptions to this requirement for projects funded with local, State, or federal funding, or public-private partnerships when the project is designed to address one or more of these purposes.

Placement of broadband facilities should be exempt from local franchising requirements and fees.

Access to utility poles

STRATEGY: *Adopt best practices to facilitate use of utility poles by broadband infrastructure projects.*

In its “reverse preemption” of FCC pole attachment regulations, the State should adopt national best practices for pole attachment regulation including one-touch make-ready, and should also provide:

1. Reasonable regulated rates for attachments that do not require negotiation by attaching entities.
2. Rapid resolution of disputes between pole owners and attachers.
3. The ability of broadband providers to attach to poles, not limited to PSC-regulated telecommunications carriers and cable operators.
4. The ability of wireless providers to install pole-top attachments when using approved designs and methods.

Information resources to assist broadband infrastructure development

STRATEGY: *Inventory and document publicly-controlled assets that are available for use by broadband providers.*

In many cases, broadband service providers have partnered with municipalities, counties, and States to use fiber optic lines, conduit, and towers in public ownership to improve broadband service. When these assets are available, making location information available and other key attributes is essential. The Council should serve as a clearinghouse for information about these assets provided by State agencies and local governments. This work can be a component of the enhanced broadband mapping initiative described in greater detail in Section 9.2.

STRATEGY: *Collect GIS data that broadband providers can use to plan and cost their networks.*

Broadband providers who are assessing potential projects rely on information about the built environment in the communities that they are considering to plan networks and to evaluate their business case. A robust set of data can lower the hurdle that companies need to clear to even consider a community. The following are examples of data used for this kind of work:

- the location of residential, commercial, and institutional buildings
- the location public rights-of-way and other utilities located within them
- the location of utility poles and key data about them
- sections of roads with upcoming major reconstruction activities.

This information is often held by a disparate collection of State, local, and private entities. As with information about the publicly owned assets described above, the Council should serve as a clearinghouse for information about these key components of the built environments provided by State agencies and local governments. This work can also be a component of the enhanced broadband mapping initiative described in greater detail in Section 9.2.

9.1.2 Funding and Financing for Broadband Projects in Unserved Areas

GOAL:

West Virginia will secure substantial financial assistance to build the business case for investment in broadband service improvements in unserved and underserved areas in the State.

STRATEGY: *Use targeted State funding to maximize West Virginia's opportunity to draw on federal, local, and private sources of investment to improve broadband services in unserved areas.*

The State should establish a flexible "Matching Fund" to be used primarily as an incentive to draw on larger sums of federal, local, or private funds or incentives for last-mile infrastructure in unserved areas in West Virginia. Funds committed via this "Match Fund" should be allocated transparently by the Council using formally adopted application and evaluation criteria.

STRATEGY: Continue to make available loan guarantee programs through the West Virginia Economic Development Authority.

Since borrowers are responsible for repayment of loans, it is important that companies using this program be provided the flexibility to seek out positive business cases. For this reason, access to this program should not be limited to unserved areas, but also underserved areas. However, Authority- supported broadband projects should provide substantial improvement in broadband services in the State, either by serving unserved areas, or by offering a substantially higher level of performance in underserved areas. At this time, a reasonable target for projects serving underserved areas would be download speeds of at least 250 Mbps and upload speeds of at least 25 Mbps in areas that do not have such services available to residential and business customers.

9.1.3 Expanding access to cost-effective middle-mile service access

GOAL:

West Virginia will have robust middle-mile services in West Virginia to support projects that support last-mile broadband service.

STRATEGY: Allow electric utilities to make investments in fiber infrastructure that can support last-mile broadband projects in unserved areas and grid modernization.

STRATEGY: Continue to promote development of middle-mile infrastructure to support last-mile projects in partnership with private companies

STRATEGY: Explore utilization and operational models for available middle-mile infrastructure to support last-mile projects in unserved areas, in partnership with private companies.

Legislation passed in 2019 has created mechanism for leveraging the investments made for a “smarter” electric to also improve opportunities to middle-mile infrastructure that connects last-mile broadband projects to the wider world. At the same time, the State of West Virginia, through the Council and the Division of Highways, has acquired access to dark fiber strands on long-haul networks that can be used for similar purposes. These projects are still at an early stage, but they provide the chance to extend the reach of ISPs willing to invest in West Virginia and expand the number of such companies who can participate in closing broadband gaps in the State.

These unique and innovate efforts will generate models for partnerships that will be useful moving forward.

9.1.4 Increasing local capacity to develop broadband infrastructure in unserved areas

GOAL:

West Virginia will have capable, locally supported organizations for developing broadband service where private ISPs cannot.

STRATEGY: Develop resources for local or regional coops to provide broadband service.

The Broadband Enhancement Council should assist municipalities to form a local or regional coop in areas without a viable private ISP partner, using existing statutory authority.

9.1.5 Encouraging Private Investment in Gigabit Cities and Counties

GOAL:

West Virginia will have multiple “Gigabit ready” cities and counties.

STRATEGY: Provide a roadmap for cities and counties to demonstrate that they are ready for private investments in gigabit infrastructure.

The Council should provide local governments with technical assistance to understand steps that they can take to make it easier for companies to evaluate and plan potential gigabit infrastructure investments and then deploy them. The Council should also aggregate “Gigabit ready” jurisdictions and assist them in soliciting interest from private investor. Cities and counties should demonstrate to the Council that they are “Gigabit ready” by, for example:

1. Collecting and providing GIS data for planning gigabit fiber networks, such as:
 - a. Address points with use types and number of units data
 - b. Poles and overhead utility routes
 - c. Available conduit and dark fiber
 - d. Location of existing underground utilities
 - e. ROW boundaries
2. Documenting clear ROW access requirements
3. Providing a principal permitting and inspection point of contact

9.2 Goals and Strategies to Improve Information about Broadband Availability and Broadband Speeds

GOAL:

West Virginia will have granular data on broadband availability and performance and will use this data to target assistance to those parts of West Virginia with the greatest need.

STRATEGY: Create an enhanced broadband mapping initiative for West Virginia under the direction of the Broadband Enhancement Council.

Having accurate and granular information about broadband availability in West Virginia is critical to support decisions about where to target State and local efforts to close gaps, and to solicit private sector investment in filling those gaps. Ensuring that federal broadband policymakers and programs have this information is also essential to ensure that all eligible areas of West Virginia can compete for federal funding opportunities.

The State Broadband Mapping Initiative, a federally funded, State-run broadband data collection mapping initiative performed in partnership with the National Telecommunications and Information Administration (NTIA) which fed the National Broadband Map wrapped up in 2014. Since the close of that program, the State has had to largely rely on FCC data self-reported by broadband providers at the census-block level through the FCC's "Form 477" data collection. This data is known in many cases to understate the extent of broadband service and the extent of unserved areas. This occurs systematically because the Form 477 reporting calls any census block served if any location within the block can be served by an ISP. It can also occur because of errors and overstatements by ISPs.

State data collection and verification is an important check on, and supplement to, these federal data collection efforts. The State of West Virginia can develop greater familiarity with local broadband providers and deployment patterns than federal agencies can from Washington, D.C. West Virginia is one of an initial eight States elected by the NTIA to partner in its broadband mapping initiative. As discussed in Section 3.5.4, this initiative is intended to develop ways to improve the accuracy of broadband mapping across the country. Under this initiative, the Council is working to improve the accuracy and granularity of service providers' reported data and supplement this with data from other sources.

9.2.1 Speed Testing

Since its establishment, the Council has worked to improve the broadband mapping data available in the State through such activities as initiating collection of speed test data from ordinary West Virginians and beginning the process of digitizing records available from the Division of Highways about fiber optic facilities located in State Rights-of-Way within a 10-county region.

Continued enhancement of the State's ability to map where broadband service is truly available will improve the State's ability to understand and address its gaps. An enhanced State broadband initiative should seek to achieve these objectives:

1. **Provide regular recurring data collection.** Data collection activities that take place every year will provide up-to-date information about how broadband availability is changing in West Virginia over time.
2. **Collect granular data.** To the extent possible, broadband availability should be measured at the address level or as close to that level as possible.

3. **Continuous baseline data improvement.** Some pieces of broadband infrastructure, such as fiber optic and cable routes have very long lives and continue to affect broadband availability along them over time, even as the services delivered over them may change. Documenting the locations of these key pieces of infrastructure will improve the accuracy of maps not just in one cycle, but many over time.
4. **Verification of provider-supplied data.** While broadband providers in many cases seek to provide accurate data, unverified data are more prone to filing errors, unintentional overstatements, and even misrepresentations.
5. **Improve federal broadband data.** Federal agencies often rely on federal broadband mapping initiatives to develop policy and target assistance. West Virginia should seek to raise the quality of data collected and used by federal programs.
6. **Serve the needs of broadband projects.** Broadband availability and other infrastructure data should be processed and available as a tool that can help potential projects find unserved and underserved markets effectively and understand what it may cost to serve them. Demographic and economic data should be included with this tool (requires budget for extra ESRI credits).

To meet these objectives, the State should support the further development of an enhanced broadband mapping initiative that can include the following activities:

1. **Regular recurring granular provider data requests from the State.** The Council should request voluntary annual filings from broadband service providers about broadband availability. These filings should be mandatory for companies receiving State assistance. The requests should seek data as close to the address level as possible. A template geodatabase or .csv (developed by Council staff) should be provided and encouraged for respondents use for submitting coverage data. Companies that are required to report should also be required to submit in the template format. The Council staff should also provide a data dictionary/guide for populating the templates.
2. **Fiber in State ROW.** The Council should expand its efforts to digitize maps of fiber optic facilities permitted by the Division of Highways in the State ROW. The Council should annually extend digitization efforts progressively to additional counties until complete coverage of the State is achieved. The Council and the Division should cooperate to maintain these records as additional facilities are constructed in counties previously digitized.
3. **Speed test surveys.** The Council should continue its current efforts to collect address-level speed test results. It should seek assistance from local and regional partners to encourage West Virginians to complete the test, especially in areas with slow speeds. The Council should annually analyze patterns of speed tests vs. reported results through bi-annual in-depth reporting, live monitoring, and 3D modeling.
4. **Critical desktop review of provider-supplied data.** The Council should review and critique provider data reported to the State or the FCC and NTIA for inconsistencies and implausible results. Annually, the Council should make follow-up inquiries with providers asking for explanations or corrections.
5. **Collaborative wireless coverage modeling.** The Council should work voluntarily with wireless providers to develop more accurate, transparent, and granular models of wireless coverage that predict where wireless broadband service will be available and at what speeds. The Council

should seek submission of granular data from wireless broadband providers in the form of propagation plots.

6. **Targeted field verification.** The Council should commission ride-outs in areas with questionable reported cable or fiber coverage to observe the actual extent of lines. The Council should also field-validate wireless propagation models developed in cooperation with wireless broadband providers. While it may not be possible to perform field verification efforts in all areas of the State at once, the Council should progressively sample areas of the State over a period of years and use the information to improve the baseline data available and seek improved data quality submitted by broadband service providers.
7. **Federal advocacy and collaboration.** The Council should continue its efforts to work with NTIA and advocate for more granular and accurate federal data collection at the FCC. It should make available its mapping information as a resource for agencies like USDA’s Rural Utilities Service who must determine unserved areas as part of the targeting of their broadband programs.
8. **Map information for broadband providers.** The Council, in cooperation with participating municipalities, counties, and regions, should compile GIS layers that potential network builders can use for planning and estimating the cost to deploy networks. It should also regularly publish up-to-date broadband availability maps that projects applying for funding programs can use to demonstrate that they have targeted unserved areas.

The following table illustrates how these activities can support West Virginia’s broadband mapping initiatives.

	Regular recurring data collection	Collect granular data	Continuous baseline data improvement	Verification of provider-supplied data	Improve federal broadband data	Serve the needs of broadband projects
Regular State data requests	✓	✓	✓			
Continuous ROW fiber mapping	✓	✓	✓			
Speed test surveys	✓	✓		✓		
Critical desktop review				✓	✓	
Wireless coverage modeling		✓		✓	✓	
Targeted field verification			✓	✓	✓	
Federal advocacy and collaboration					✓	✓
Map information for broadband providers						✓

To support the enhanced broadband mapping initiative outlined above, the Council must be able to utilize the following categories of resources and expertise:

1. GIS analysis
2. Cable/fiber networks engineer or technical analyst
3. Radiofrequency engineer
4. Field inspectors qualified to document cable and fiber outside plant and wireless signal strength

For continuity and consistency, the core functions of requesting, maintaining, and publishing map data should remain within Council staff as much as possible. Additional technical resources and expertise may be provided by employees or on a contracted basis, including (but not limited to), WVGES, WVU GIS Technical Center, Marshall University, etc.

9.2.2 Data Management and Performance Measures

The Council will provide a central point of contact for broadband development and related target industries. Accordingly, the Council will develop appropriate databases to manage information related to assets and resources, mapping, investments, projects and infrastructure, and performance measures.

The Council will track metrics related to broadband infrastructure and service to residents and businesses in West Virginia. The following metrics will be tracked:

1. Number of communities served.
2. Number of residents served.
3. Number of businesses served.
4. Number of jobs created.
5. All known financial investment and assistance, in the form of grants, loans, and loan guarantees.
6. All known infrastructure assets, including fiber, tower, satellite, conduit, and related system components.
7. Mapping data showing progression in all areas on a year-by-year basis.
8. Any other metrics requested.

9.3 Goals and Strategies to Increase and Improve Broadband Use

High-quality broadband services and infrastructure must be available for communities to make effective use of them. However, residents, businesses, and institutions must adopt and make meaningful use of the capabilities of broadband service for broadband availability to change communities for the better. Many of the prior recommendations in this document address better understanding of the broadband availability gap in West Virginia and taking steps to address it. On these issues, the West Virginia Broadband Enhancement Council should be the lead organization for the State. On issues of broadband adoption and meaningful use, support should be tailored to targeted communities (either geographic, or communities of different types of users, such as those in education, health care, economic development, public safety, and other governmental services). This support is best delivered by organizations closest to those user groups. This suggests a division of labor, wherein the Council focuses its efforts on expansion of broadband infrastructure and services, while partner organizations focus

efforts on supporting applications that put broadband services to better use, training, and facilitating economic assistance to users who need it in order to take advantage of what improved broadband services have to offer.

9.3.1 Education and Health Care

GOAL:

West Virginia schools and health-care institutions will deliver, and students and patients will have broad access to broadband-delivered on-line education opportunities and telehealth services.

STRATEGY: Support local use and deployment of broadband applications for education and health care institutions and users through Statewide organizations or consortia.

STRATEGY: Maximize federal support for broadband services to schools, libraries, and health care institutions through use of coordinated Statewide bids for supported services under the FCC's E-rate and Rural Health Care Programs.

Broadband is increasingly important for the delivery of education and health care services. On-line classes and on-line materials and resources for in-person classes, cloud services and collaboration tools are all mainstream in today's educational environment. Electronic patient records and medical information systems, remote diagnostics, remote consultation and specialist services, telehealth services, remote monitoring and remote home visits are increasingly important tools for delivering health care services in a timely, effective, and economic manner, especially in a rural State like West Virginia.

Many local schools, higher education institutions, and health care facilities are involved in delivering education and health care services, and therefore many such organizations need the support to do so effectively. The State's ability to effectively leverage these technologies is enhanced when they are supported by a State-level organization or consortia specializing in the deployment and utilization of these technologies through training, development or support of key applications, planning and joint purchasing, interconnection and network management. Such State-level shared services organizations and consortia will also facilitate efforts to coordinate the needs of local institutions in unserved or underserved areas with efforts to expand or improve access to broadband services in these communities. For schools, libraries, and higher education facilities, WVNet is such an existing partner described within this plan.

K12 education and health care also present important opportunities to draw on FCC Universal Service programs targeted to these users, the E-rate and Rural Health Care Programs. State-level efforts should continue to work toward the maximization of E-rate funding for rural and urban schools alike. These programs, while focused first and foremost on their targeted institutions, may also spur projects that upgrade local infrastructure and services and deliver additional benefits to the wider community. Collaborative efforts to maximize annual funding from the Rural Health Care Program are also encouraged.

9.3.2 Workforce Development

GOAL:

West Virginia's workforce will have and utilize broadband-delivered opportunities for training, and continuing education that support the needs of the State's businesses and employers.

STRATEGY: Designate a lead organization to act as a clearinghouse of information on on-line training and continuing education best practices for local organizations who support workforce development efforts in their communities.

Access to broadband service opens up new opportunities for continuing education, career readiness, workforce preparation and alternative career training. However, not all persons needing these opportunities are well-prepared to find and use them. For those not already steeped in the use of technology, it can be daunting. Efforts to address these barriers frequently involve direct outreach and engagement within the community.

Those most in need may also have limited financial means for getting access to broadband services even where they are available. Libraries, while not a panacea for this problem, have historically provided access to information to the public at no cost, and this has extended in the digital age to access to the internet for those with limited access at home. Librarians also act as information navigators for the populations that they serve, and for these reasons libraries frequently have been at the center of local digital literacy efforts.

Local efforts and institutions to connect local residents and businesses with workforce development resources would benefit from information about available training and outreach resources and best practices. While the primary point of engagement may be at the local level, these efforts would be assisted by a State level agency, such as Workforce West Virginia, or the West Virginia Library Commission, in navigating these resources.

9.3.3 Public Safety

GOAL:

West Virginia's public safety agencies will utilize a nationwide interoperable broadband network.

STRATEGY: Continue to support and inform public safety users of opportunities to use the nationwide interoperable FirstNet Public Safety Broadband Network.

Signed into law on February 22, 2012, the federal Middle-Class Tax Relief and Job Creation Act created the First Responder Network Authority (FirstNet). FirstNet is an independent authority within the U.S. Department of Commerce. Its mission is to develop, build, and operate the nationwide broadband network that serves first responders. FirstNet is nationwide wireless broadband network for first responders being built and deployed through a public-private partnership between the federal government and AT&T. The FirstNet public-private partnership leverages the commercial AT&T network in addition to new or hardened facilities developed with FirstNet funding, providing priority access to first responders in case of emergencies.

The U.S. Department of Commerce provided awardees in each State with planning and implementation grant funds to prepare for the arrival of FirstNet, managed in West Virginia by the Statewide Interoperability Executive Committee (SEIC). FirstNet provides first responder agencies with the ability to access a nationwide ecosystem of devices and public safety applications.

9.3.4 State and Municipal Use of Broadband Services

GOAL:

West Virginia will support the ability of State and local government to deliver citizens access to a range of government services on-line.

STRATEGY: Designate a lead organization to support the deployment of broadband applications for State and local government agencies to deliver high-quality on-line services.

State and local government agencies face many demands for delivering services and information, and an expectation that they will deliver these services in a fiscally prudent manner. Not every branch of government at the State and local level is necessarily expert in how to best support technology resources for their internal needs or the delivery of government services and information online. Yet citizens increasingly expect to be able to interact with organizations on-line, and their government is no exception. The State has recognized the need for specialized technical support of State agencies through the West Virginia Office of Technology (WVOT) which provides Information Technology policies, shared services, and training. Extending similar support efforts to local governments, with a focus on developing best practices and shared services to support of on-line information and services would foster the development and use of broadband services for the purpose of better serving the public.

9.4 General Strategies by Key Priority Area - Includes strategies for organizational development

To support the enhanced broadband mapping initiative outlined in Section 9.2, the Council must be able to utilize the following categories of resources and expertise:

1. GIS analysis
2. Cable/fiber networks engineer or technical analyst
3. Radiofrequency engineer
4. Field inspectors qualified to document cable and fiber outside plant and wireless signal strength
5. Ombudsman to serve as expeditor to assist broadband projects navigate the permitting processes
6. Program Manager to oversee State-awarded projects.

For continuity and consistency, the core functions of requesting, maintaining, and publishing map data should remain within Council staff as much as possible. Additional technical resources and expertise may be provided by employees or on a contracted basis.

To support the goals and strategies to increase and improve broadband use outlined in Section 9.3, The Council will need assistance and partnership from other State agencies.

The State should reassign primary responsibility for promoting adoption and use to organizations other than the Broadband Enhancement Council, which should focus primarily on identifying and addressing gaps in access to broadband services. Candidate organizations include WVOT for governmental use and WVNet for education.

9.5 Summary and Timeline for Implementation

2019 West Virginia DRAFT Broadband Plan 2019 Goals and Strategies

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
Reduce or eliminate barriers for broadband projects	Implement policies that provide efficient access to public rights-of-way	Public Service Commission; Department of Highways, Legislature	9.1.1.1		
	Encourage “Dig Once” opportunities for projects in public rights-of way	Public Service Commission; Department of Highways, Legislature	9.1.1.1		
	Reduce or eliminate fees, especially for projects that directly serve WV consumers	Public Service Commission; Department of Highways; Legislature; Municipal Officials and Local Boards	9.1.1.1		
	Adopt best practices to facility access to utility poles for broadband projects, including one-touch make-ready	Public Service Commission; Legislature; Utility Pole Owners, including Electric Utilities and Municipalities	9.1.1.2		
	Inventory and document publicly-controlled assets available for broadband deployment	State Agencies; DHSEM, SIRN Network, Municipalities, Counties	9.1.1.3		
	Collect GIS data that broadband providers can use to plan networks	Public Service Commission; Department of Commerce, Development Office, Partner Agencies, Colleges and Universities, Contracted Technical Services; Legislature; ISPs, Utility Pole Owners, including Electric	9.1.1.3		

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
		Utilities and Municipalities; Municipalities			
Secure financial assistance for broadband investments in unserved and unserved areas	Use targeted State funding to maximize availability of federal, State and private funding	Economic Development Authority; Department of Commerce, Development Office and Partner Agencies; Legislature; FCC	9.1.2		
	Continue loan guarantee program through Economic Development Authority	Economic Development Authority; Legislature; Banking Community; Federal Funding Agencies	9.1.2		
Ensure robust middle-mile services to support last-mile broadband projects	Allow electric utility investment in middle-mile fiber to support last-mile broadband service	Public Service Commission; Legislature, Electric Utilities, ISPs and Private Sector Partners	9.1.3		
	Continue to promote development of middle-mile infrastructure to support last-mile projects in partnership with private companies	Legislature; Private Sector Partners	9.1.3		
Support locally-supported organizations for developing service where private ISPs cannot	Develop resources for local or regional coops to provide broadband service	State, Regional, and Local Officials and Stakeholders, ISPs and Private Sector Partners	9.1.4		
Have multiple “Gigabit ready” cities and counties	Provide a roadmap for cities and counties to demonstrate that they are ready for private investments in gigabit infrastructure.	Economic Development Authority; Department of Commerce, Development Office; City and County Officials and Boards; Local Economic Development	9.1.5		

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
		Authorities; Chambers of Commerce			
Have granular data on broadband availability and speed to target assistance to areas w greatest need	Create an enhanced broadband mapping initiative under the direction of the Broadband Enhancement Council	Public Service Commission; Department of Commerce, Development Office, Partner Agencies, Colleges and Universities, Contracted Technical Services; Legislature; ISPs, Utility Pole Owners, including Electric Utilities and Municipalities; Municipalities	9.2		
Schools and health-care institutions will deliver and students and patients will have broad access to broadband-delivered on-line education opportunities and telehealth services	Support local use and deployment of broadband applications for education and health care institutions and users through Statewide organizations or consortia.	Department of Education; Higher Education Policy Commission; Schools; Libraries, Hospitals and Health Care System, WVNet	9.3.1		
West Virginia’s workforce will have and utilize broadband-	Maximize federal support for broadband services to schools, libraries, and health care institutions through use of coordinated Statewide bids for supported services under the FCC’s E-rate and Rural Health Care Programs.	Department of Education; Schools; Libraries, Hospitals and Health Care System, WVNet	9.3.1		
West Virginia’s workforce will have and utilize broadband-	Designate a lead organization to act as a clearinghouse of information on on-line training and continuing education best practices for local organizations	Department of Commerce, Workforce West Virginia; Library Commission; Department of Education; Higher Education Policy	9.3.2		

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
delivered opportunities for training, and continuing education that support the needs of the State’s businesses and employers	who support workforce development efforts in their communities.	Commission WV Community and Technical College System			
Public safety agencies will utilize a nationwide interoperable broadband network.	Continue to support and inform public safety users of opportunities to use the nationwide interoperable FirstNet Public Safety Broadband Network.	State Police; Dept of Military Affairs and Public Safety; SIRN; local law enforcement agencies and emergency response organizations	9.3.3		
Support the ability of State and local government to deliver citizens access to a range of government services on-line	Designate a lead organization to support the deployment of broadband applications for State and local government agencies to deliver high-quality on-line services.	WV Office of Technology; State Agencies; Municipal and County Agencies	9.3.4		