

2020

West Virginia Broadband Enhancement Council

2020 ANNUAL REPORT TO THE WEST VIRGINIA LEGISLATURE



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C. Edward Gaunch, *Cabinet Secretary*

Robert L. Morris, Jr., *Chair*

December 30, 2020

The Honorable Jim Justice
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The Honorable Mitch Carmichael, Senate President
West Virginia Senate
Building 1, Room 229M
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The Honorable Roger Hanshaw, Speaker of the House
West Virginia House of Delegates
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1900 Kanawha Boulevard, East
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**Subject: 2020 Report of the West Virginia Broadband Enhancement Council
Legislative Reporting Requirement, West Virginia Code §31G-1-4**

Dear Governor Justice, Senate President Carmichael and House Speaker Hanshaw:

On behalf of the West Virginia Broadband Enhancement Council, I am pleased to submit the Council's 2020 Report to the West Virginia Legislature's Committee on Government and Finance, pursuant to West Virginia Code §31G-1-4.

As we begin a new decade, broadband is front and center. 2020 has proven the importance of this vital infrastructure which supports nearly every aspect of our lives. The Council has identified four key priority areas – education, healthcare, public safety and economic development – to help guide communities as they adapt to the present and plan for a future that must include broadband.

As directed by the West Virginia Legislature, the Council is diligently working to develop resources that will expedite the expansion of broadband infrastructure within the State of West Virginia, with an emphasis on unserved and underserved areas. Since 2017, West Virginia has secured more than \$50 million for locally driven broadband projects through various Federal programs.

This report provides a detailed review of broadband mapping and speed testing. The Council is constantly seeking ways to improve the utilization of data to support and promote broadband development in West Virginia. In this regard, the Council's goals and strategies focus on the following key areas:

- Improving broadband infrastructure;
- Improving information about broadband access and broadband availability;
- Increasing and improving broadband use; and
- General strategies by key priority area, including education, healthcare, public safety and economic development.

In this comprehensive approach, the Council builds upon input from numerous state agencies and recognizes the value of representation from urban and rural communities throughout West Virginia. The Council's composition, which includes a cross-section of state agency directors, legislative advisory members, business community leaders and both urban and residential users, ensures that multiple voices are heard, that West Virginia's needs are represented and that viable solutions are thoughtfully pursued.

The Council is extremely grateful for the support and direction provided by each of you. In addition, the Council's legislative advisory members and the West Virginia Department of Commerce provide invaluable support for this important work.

On behalf of the entire Council, we extend our appreciation for your support. We are honored to serve West Virginia in this important role. Should you need additional information, please do not hesitate to contact me at 304-637-0803. Staff members in the West Virginia Department of Commerce can be reached at 304-558-2234 and will assist you in any way possible.

Sincerely,



Robert L. Morris, Jr., Chair
West Virginia Broadband Enhancement Council

cc: The Honorable Joe Manchin, III, United States Senator
The Honorable Shelley Moore Capito, United States Senator
The Honorable Craig Blair, Senate President-elect, West Virginia Senate
C. Edward Gaunch, West Virginia Secretary of Commerce



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About the Council

The West Virginia Broadband Enhancement Council has 13 voting members; as well as 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 or virtually.

The Council is committed to enacting the provisions of House Bill 3093, which direct the development of policies, plans, and procedures to expand and enhance broadband access throughout West Virginia. The Council places 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:

<http://www.wvlegislature.gov/WVCODE/31G>.

The Council is created under the West Virginia Department of Commerce for administrative, personnel and technical support services. In July 2016, \$1,475,641, was transferred to the newly formed West Virginia Broadband Enhancement Council from the previous Broadband Deployment Fund to the Broadband Enhancement Fund in the West Virginia Department of Commerce. The Fund's beginning balance on July 1, 2019 was 1,098,987.41. Fiscal Year 2020 expenses from July 1, 2019 through June, 30 2020 totaled \$531,691. With the addition of a Fiscal Year 2021 appropriation of \$500,000, the Broadband Enhancement Fund balance as of June 30, 2020 was \$1,067,295.

The Council's annual budget includes the purchase of the licensing necessary to continue speed testing and mapping projects, associated data subscriptions, software, marketing and communications, and other limited expenses. Additionally, the Council has approved the expenditure of funding for specific legal services and technical consulting services.

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

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Help improve broadband access in your community

Take the Speed Test



1. Executive Summary

As West Virginia begins a new decade, broadband is front and center. West Virginia’s leaders understand that broadband has moved beyond optional to essential. 2020 has illustrated the essential need for broadband in all aspects of life. Four key priority areas were identified through the development of the State’s 2020-2025 Broadband Plan. These priority areas represent the important and essential services and functions related to education, healthcare, public safety, and economic development.

With these primary areas in mind, recent policy initiatives indicate that improving broadband and bridging the digital divide is one of the State’s highest priorities.

As the Council continues to advocate for greater connectivity, its mission is supported by the West Virginia Legislature, the West Virginia Development Office, West Virginia Department of Commerce, West Virginia Office of Technology 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.

State and local government leaders recognize that broadband is the essential economic infrastructure that West Virginia needs to compete regionally, nationally and globally. In addition, ventures and partnerships between public agencies and private companies demonstrate the collaboration needed to improve connectivity. The Council strongly supports these efforts and will continue working to develop a more connected West Virginia.

In this mission, the Council is pursuing primary goals to:

- Encourage the development of broadband infrastructure in the State;
- Evaluate and map the broadband infrastructure and service systems through an Interactive Mapping Program and other data collection methods;
- Eliminate barriers to broadband infrastructure development within the State;
- Engage and mobilize the expertise, funding, and partners to facilitate the creation of reliable and affordable broadband service; and
- Expand economic development and represent the State in matters related to broadband infrastructure development.

The Council extends appreciation to Tilson Technology Management, Inc., for significant contributions to broadband development in West Virginia. Similarly, the Council’s long-standing partnership with Ookla continues to strengthen the State’s growing ability to collect, analyze and visualize important broadband consumer speed test data.



2. Existing, Continuing and New Initiatives

The Council continuously seeks ways to improve broadband in West Virginia through the development of efficient policies and the collection of important data. The following charts provide a brief overview of existing, continuing or new initiatives.

Initiative	Summary	New Initiative	
		Existing	Continuing or
Right-of-way access policy	Wired and wireless broadband have clear access to public ROW; Dig Once policy.	✓	✓
Streamline permitting, zoning, and franchises	State and local permits offer certainty for common construction methods; clear, up-to-date and published standards, rapid turn-around for permits and inspections, broadband franchises not required or having clear and simple standards.	✓	✓
Reduction and elimination of fees	Low, cost-based permit processing fees. No fees for placement of facilities directly serving WV. Reasonable in-kind compensation for long-haul facilities transiting the state.	✓	✓
Pole attachment reforms	Certainty of access to poles for broadband and wireless facilities; reasonable, regulated rates for attachments and make-ready; rapid resolution of disputes; one-touch make-ready.	✓	✓
Asset inventory and access (towers, poles, fiber, conduit)	Well-documented publicly-controlled telecom assets that are available for use by broadband providers; GIS data for planning networks is made available.	✓	✓

Initiative	Summary	New Initiative	
		Existing	Continuing or
Speed test surveys	Collect address-level speed test results; analyze patterns of speed tests vs. reported results.	✓	✓
Recurring granular provider data requests from the state	Request voluntary annual requests from the state, mandatory for companies receiving state assistance; seek data as close to the address level as possible.	✓	✓
Critical desktop review of provider-supplied data	Critique provider-reported data for inconsistencies and implausible results; follow-up with providers asking for explanations or		✓
Collaborative wireless coverage modeling	Work with wireless providers to develop more accurate, transparent, and granular models of wireless coverage; seek submission of propagation plots.		✓
Targeted field verification	Ride out areas with questionable reported cable or fiber coverage; field-validate wireless propagation models.		✓
Federal advocacy and collaboration	Continue to work with NTIA and advocate for more granular and accurate federal data collection at the FCC.	✓	✓
Map information for broadband providers	Compile GIS layers that potential network builders can use for planning and estimating the cost to deploy networks.		✓

Initiative	Summary	New Initiative	Existing Continuing or
"Match Fund"	Flexible 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 and supporting middle-mile infrastructure.		✓
Electric utility investments in infrastructure in broadband	Electric utilities are allowed to make investments in broadband infrastructure unserved areas; costs may be recovered by revenues generated by the investment and/or electric rate recovery.	✓	✓
Loan and loan guarantee programs	Existing WV Economic Development Authority programs.	✓	✓
Broadband coops	Council assists municipalities to form a state-wide or regional coop in areas without a viable private ISP partner, using existing statutory authority.	✓	✓
Anchor tenant agreement	State and/or local government spending on telecommunications services is committed to support networks that improve access in un/underserved areas		✓

3. Broadband Mapping

The Council has established a statewide Interactive Broadband Mapping System, featured on the Council's website at broadband.wv.gov. The mapping system includes a variety of maps that feature statewide and county data. Broadband mapping, like other infrastructure mapping, must be a continuous process. Mapping services are updated continuously on the Council's website.

3.1 Key Components of the Interactive Mapping System

Broadband speed and services shown on the interactive map provide baseline data from the Federal Communications Commission (FCC). This data is submitted by the internet service provider to the FCC and is known as FCC Form 477 data. It is widely observed that this reporting system overstates broadband availability. The FCC presents the data in U.S. census blocks, equivalent to a neighborhood block in an urban area. As a result, if there is one customer served in a census block, the entire block will be reported as having broadband.

FCC data releases follow semi-annual reporting cycles. The latest available mapping data was published by the FCC on November 12, 2020, based upon broadband deployment data collected in the December 31, 2019 reporting cycle. This data, the latest available as of this report, is represented in the FCC Broadband Availability Mapping Appendix.

Wireline broadband data is based upon the U.S. Census Bureau's census block data. Both wireline and wireless broadband data are represented by coverage areas, as submitted by the service providers on a semiannual basis through FCC Form 477 data reporting. 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.

The following maps are featured on the Council's ArcGIS online broadband mapping system:

[Interactive Broadband Mapping System](#)

1. Broadband Advertised Speed Ranges
2. Broadband Development Hub
3. Public Project Development
4. Public Wi-Fi Locator

Mapping services will be provided to the State and federal agencies and local governments to support efficient broadband infrastructure development. Static maps are also available, including:

[Static PDF Maps](#)

5. Speed Tiers by County
6. Speed Tiers Statewide
7. Providers Statewide
8. Public Project Development
9. Unfunded and Underserved Areas

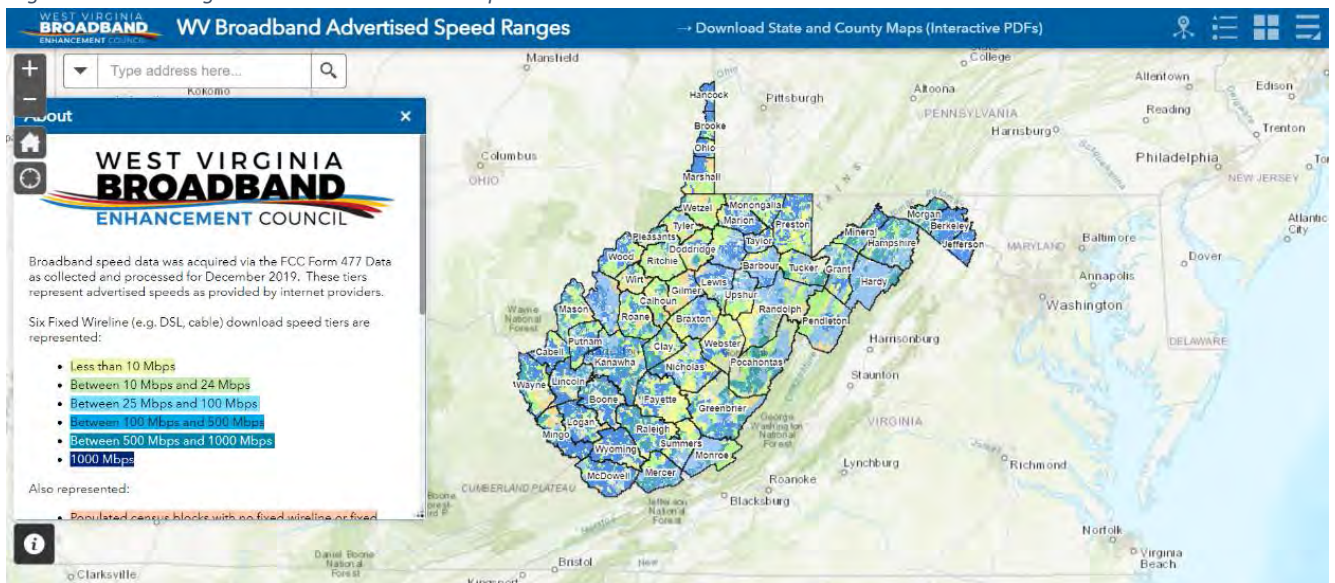
3.2 Broadband Advertised Speed Ranges Interactive Map

The interactive Broadband Mapping System displays broadband speed services as reported to the FCC in December 2019 and included in its November 2020 data release. The Broadband Advertised Speed Ranges Map areas are represented by 2010 census blocks in West Virginia and census blocks in neighboring states within one mile of West Virginia's border. Interactive features for the web map show the fastest provider representing each census block, the associated technology, and maximum advertised download and upload speeds. Related tables provide information on wired, wireless, and mobile service providers along with advertised downstream, and upstream service speeds. Each table displays information on other ISP's present in each census block. The interactive map can be accessed on the [West Virginia Broadband Council website](#).

The map symbolizes ranges of advertised wired service speeds of megabits per second (Mbps) categorized in six tiers:

- 500 – 1000,
- 100 – 500,
- 25 – 100,
- 10 – 24,
- Less than 24,
- and populated areas that do not receive service.

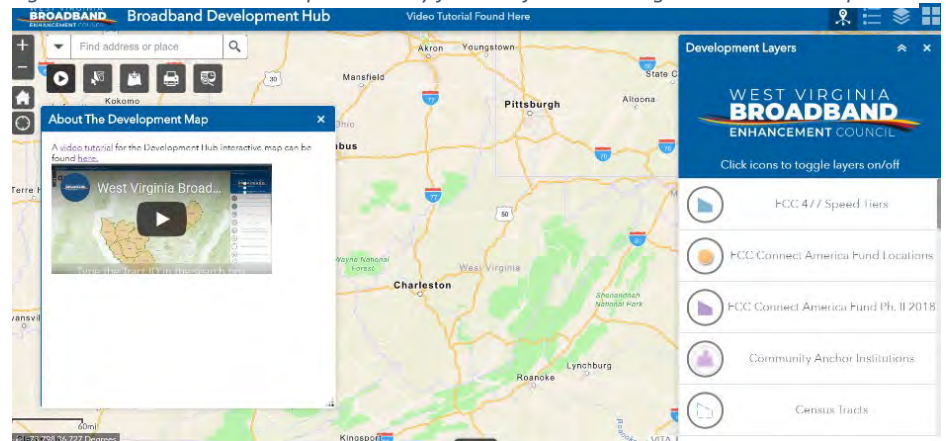
Figure 3.1: West Virginia Broadband Advertised Speed



3.3 Broadband Development Hub

The Broadband Development Hub is an interactive map available on the [Council's website](#) which includes all features related to project development and the West Virginia broadband initiative. Map viewers can utilize the interactive map to learn more about ongoing broadband development in particular areas of the State. Over a dozen interactive features are available, including but not limited to, publicly funded broadband infrastructure, opportunity zones, Community Anchor Institutions, previous FCC Connect America Fund award locations, development sites, buildings and industrial parks, historical data and additional development tools.

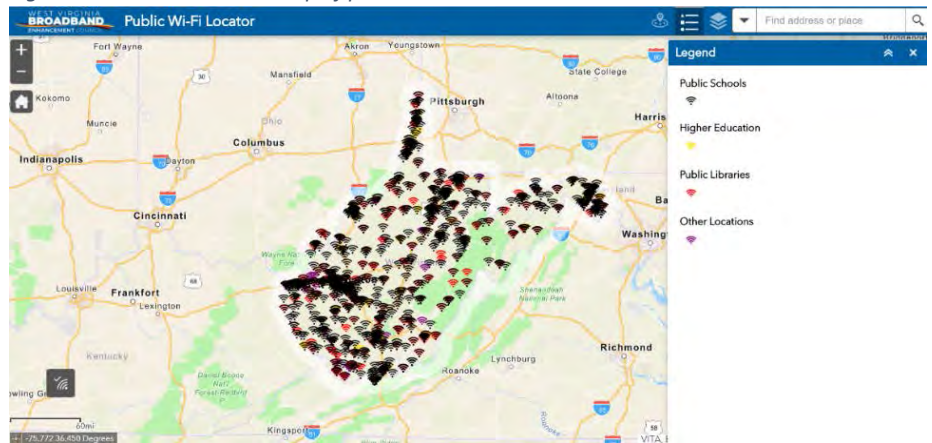
Figure 3.2: Interactive web map include key features for monitoring broadband development



3.4 Public Wi-Fi Map

The Public Wi-Fi Interactive Map was created in April 2020 to provide a consolidated view of connectivity resources in West Virginia. Location data is derived from multiple sources, including State agencies, Internet Service Providers (ISPs) and community organizations. Locations include schools, libraries, colleges and universities, restaurants, churches, and other public locations.

Figure 3.3: Interactive web map of public Wi-Fi



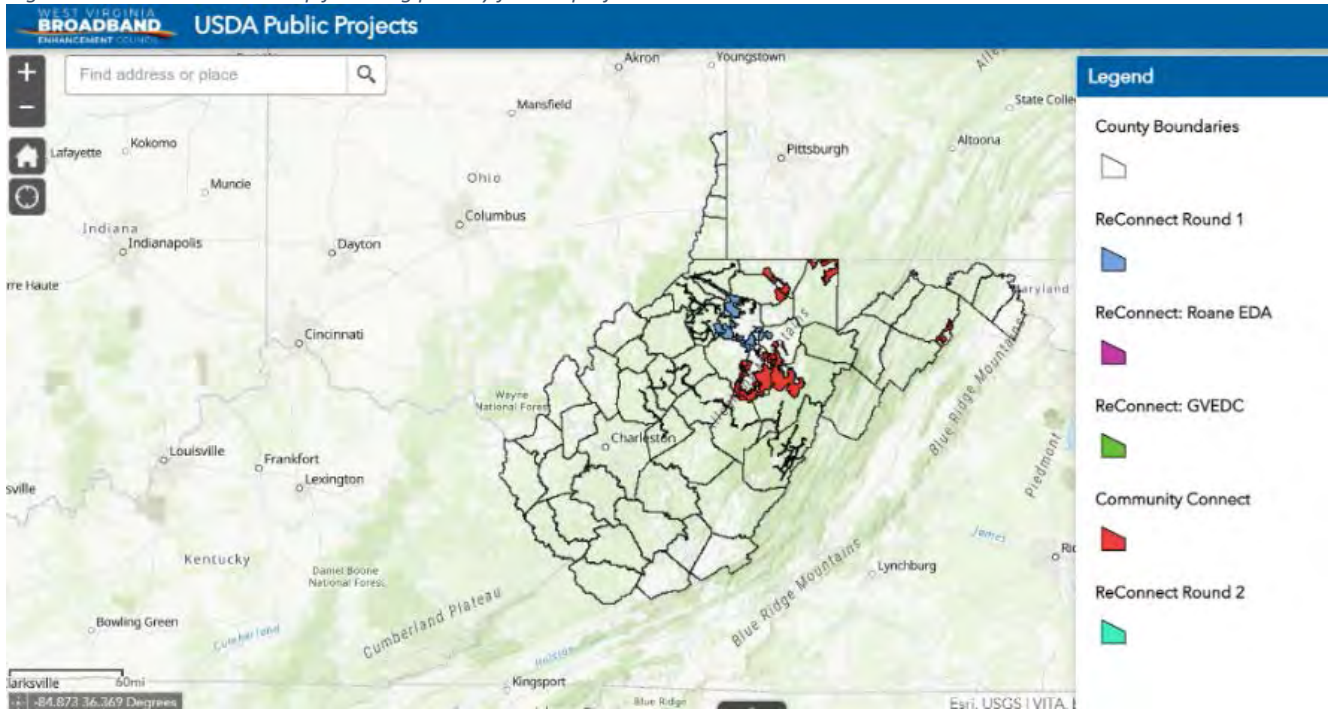
In addition to those derived through these sources, all West Virginia Kids Connect locations are included in the map, including 612 K-12 schools, 171 libraries, 39 colleges and universities, 26 state parks, 25 WV Division of Motor Vehicles offices, and 20 WV State Armory facilities. More information about WV Kids Connect is available by calling 866-k12-wifi or by visiting <https://wvkidsconnect.net/>.

This map will be updated as new locations are provided. Certain locations were provided by community resources and input and therefore, the Council and the WVDO cannot guarantee quality, safety, or availability of these networks.

3.5 Public Project Development Map

The Public Project Development Map displays broadband infrastructure for current ongoing projects, funded through specific programs. Viewers can utilize the map to learn more about the status of specific projects and follow the State of West Virginia’s progress in leveraging various funding sources to develop broadband in communities throughout the state. Interactive features display the service area, grant status, funding source, financial metrics, and demographics. The interactive Public Project Development Map is an evolving product that will be updated frequently as development progresses.

Figure 3.4: Interactive web map featuring publicly funded projects



3.6 Speed Tiers by County

The Speed Tiers by County Maps display fixed wireline speeds in each county as advertised by providers and reported to the FCC Form 477 as of December 2019, released in November 2020. The map symbolizes ranges of advertised fixed wireline service speeds of megabits per second (Mbps) categorized in six tiers:

- 500 - 1000,
- 100 – 500,
- 25 – 100,
- 10 – 24,
- Less than 10, and
- Populated areas which do not receive service.

The static maps are made available on the Council’s website in PDF format. FCC Form 477 data is released twice per year. Each census block is represented by the fastest deployed download speed (Mbps).

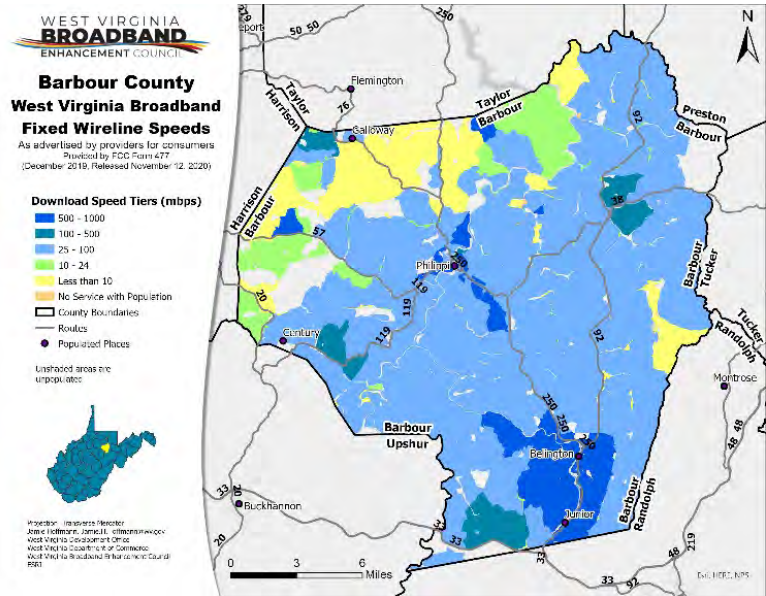


Figure 3.5: FCC Form 477 download speed ranges displayed across Barbour County.

3.7 Speed Tiers Statewide

The Speed Tiers Statewide Static Map displays fixed wireline broadband speed services as reported in December 2019 across West Virginia. Coverage areas are represented by 2010 census blocks in West Virginia. The map symbolizes ranges of advertised wired service speeds of megabits per second (Mbps) categorized in six tiers:

- 500 - 1000,
- 100 – 500,
- 25 – 100,
- 10 – 24,
- Less than 10, and
- Populated areas which do not receive service.

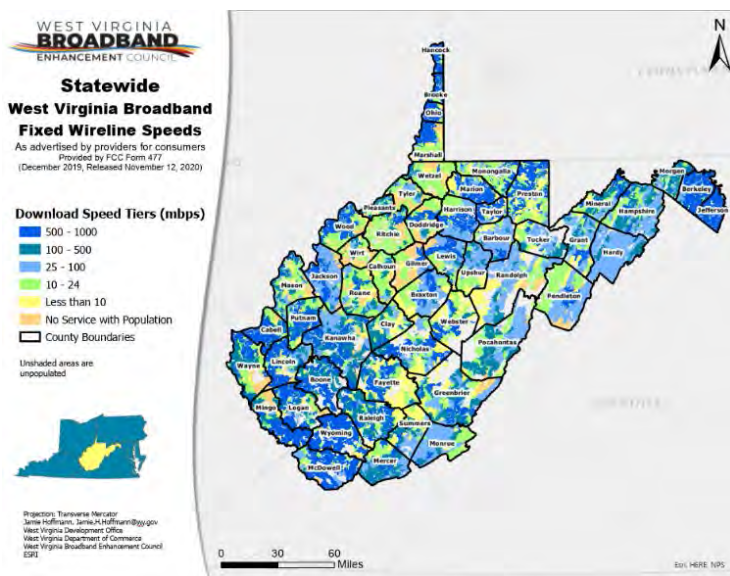


Figure 3.6: FCC Form 477 download speed ranges displayed in West Virginia.

Wired, wireless, and mobile service provider information can be found in the interactive on the [Council’s website](#) along with all advertised downstream, and upstream service speeds reported to the FCC.

3.8 Providers Statewide

The Providers Statewide Map displays the Internet Service Providers (ISPs) that report the fastest broadband services across census blocks in West Virginia. Data is derived from fastest consumer download speeds by providers reported to the FCC Form 477. In Figure 3.7, all ISPs that deploy the fastest download speed for greater than ten census blocks are represented.

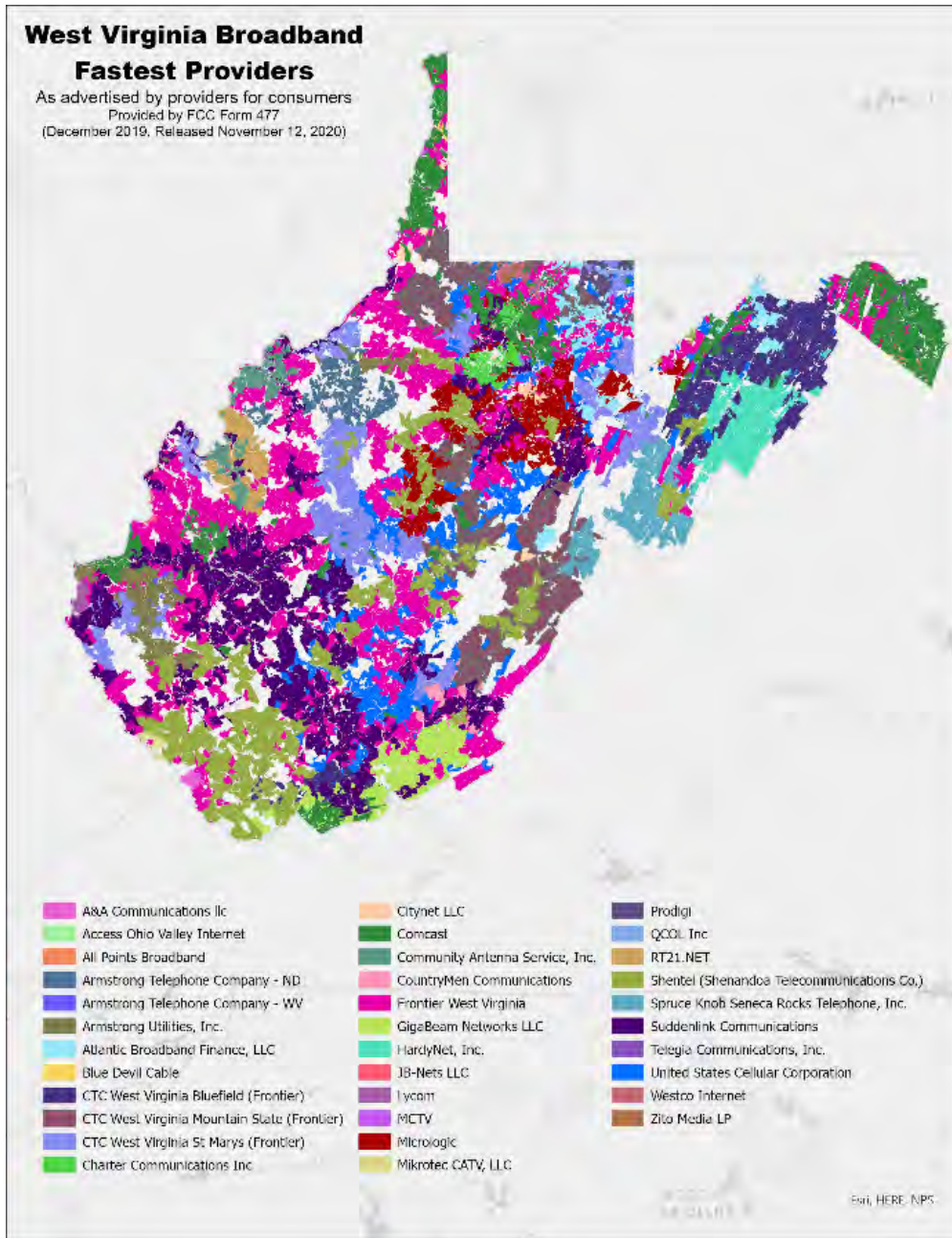


Figure 3.7: West Virginia fastest providers based upon FCC Form 477 Data

3.9 Public Project Development

Figure 3.8 shows the existing, proposed, pending, and planned publicly funded fiber routes throughout West Virginia. The PDF map is available on the Council’s website along with an interactive map depicted in Figure 3.3. Mapping initiatives will be updated frequently to represent progress on project development.

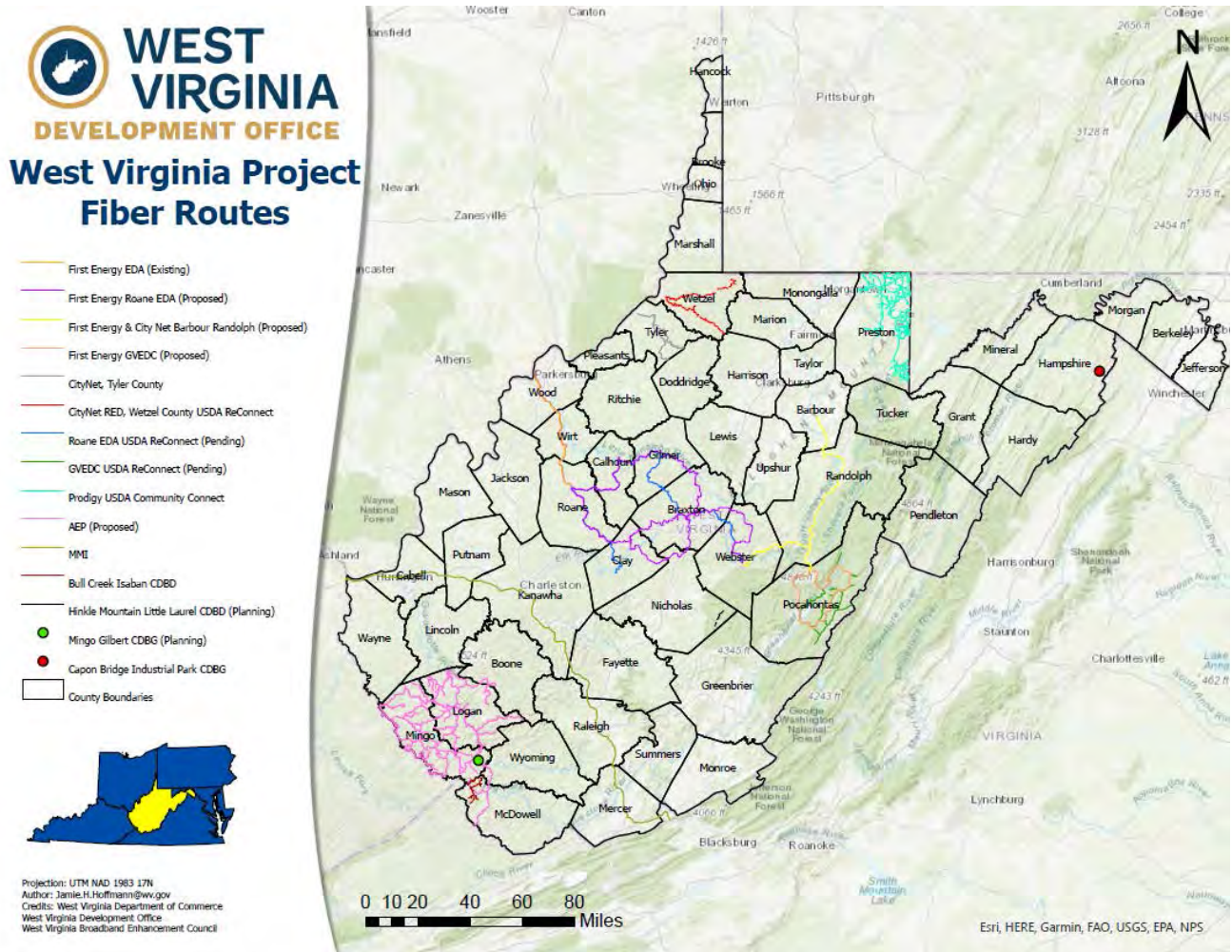


Figure 3.8: Publicly funded project fiber routes in West Virginia

3.10 Future Mapping Initiatives

The following table illustrates activities that can further enhance 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 would 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), the State’s colleges and universities with such capabilities, such as West Virginia University and Marshall University.

4. Speed Testing

In conjunction with the Interactive Broadband Mapping System, the Council launched the Speed Test Portal in October 2017, using the Ookla speed testing platform. The Speed Test Portal features an Internet Use Survey. Data from both will enhance the Broadband Advertised Speed Ranges Map to accurately identify the presence and level of broadband internet service in West Virginia.

The West Virginia Speed Test Portal and Internet Use Survey can be found at: <https://broadband.wv.gov/Home/SpeedTest>. In addition to speed test results from the West Virginia Speed Test Portal, West Virginia has access to all speed tests conducted using the Ookla speed test platform statewide. This includes the Ookla desktop speed test as well as the Ookla speed test mobile app. In 2020 Ookla speed test data produced over 1.3 million speed tests of fixed (not mobile) networks in West Virginia. Speed tests have been conducted in each of West Virginia's 55 counties, as indicated in Figure 4.1

As detailed in Section 7, the FCC reports that 82.4 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 speed test data as a validation tool.

Figure 4.1: 2020 Statewide Ookla speed test results

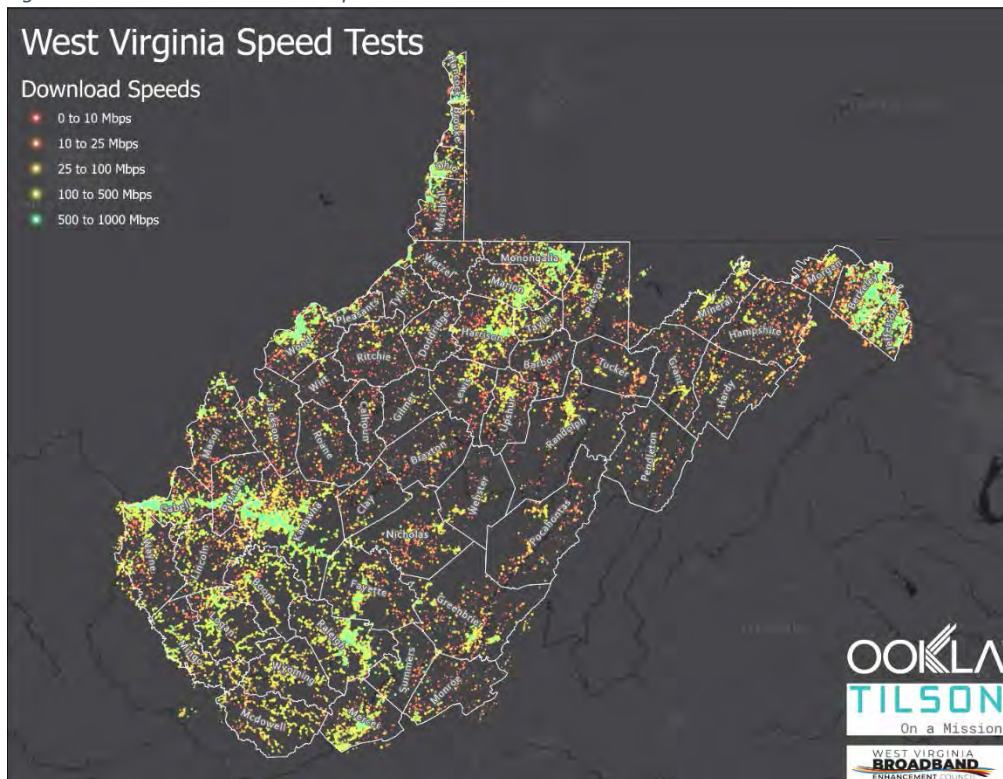


Figure 4.2: 2020 Statewide Ookla speed test summary

2020 Speed Test Summary Data					
Total Number of Statewide Speed Tests	Number of Statewide Speed Tests 500 – 1000 Mbps	Number of Statewide Speed Tests 100 – 500 Mbps	Number of Statewide Speed Tests 25 – 100 Mbps	Number of Statewide Speed Tests 10 - 25	Number of Statewide Speed Tests 0 - 10
1,312,365	40,679	417,637	390,041	41,489	257,610

Figure 4.3: Ookla Speed Test Count per Speed Tier

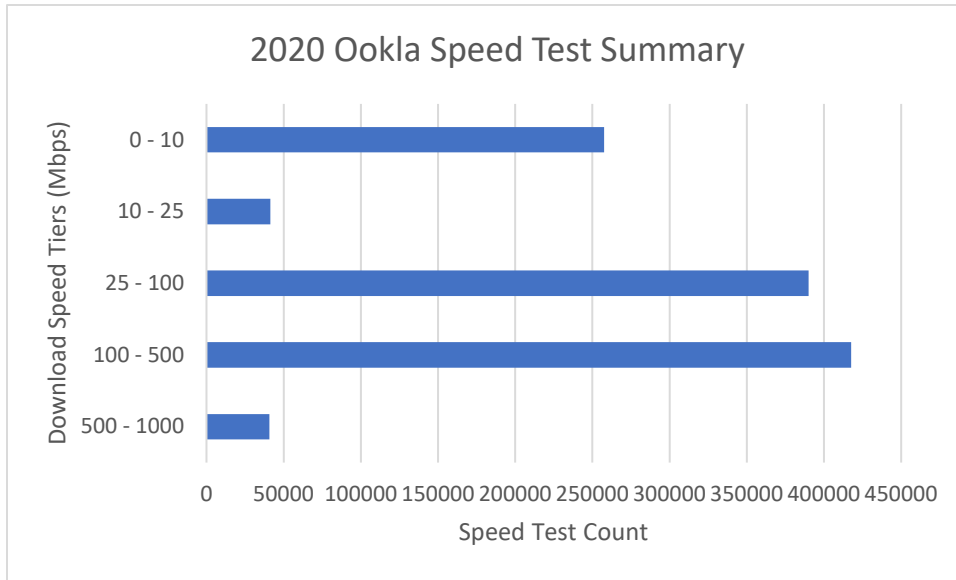
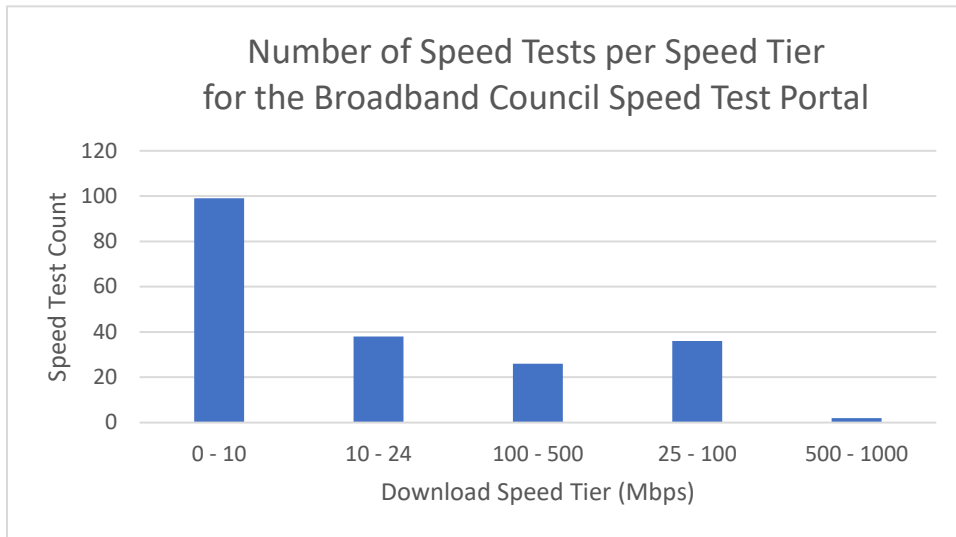


Figure 4.4: Broadband Council speed test portal test count per speed tier



4.1 Speed Test Data Points

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 West Virginians. Further, the Council undertook the process of digitizing records available from the West Virginia Division of Highways which detailed 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. As detailed in the State's 2020-2025 Broadband Plan, 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 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 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.** Where feasible, 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.

4.2 How Much Speed Do You Need?

The current FCC definition of broadband as 25 Mbps downstream and 3 Mbps upstream is considered a minimum level of service, and does not address the many business, commercial, and residential uses that demand much higher speed.

According to the National Telecommunications Information Administration (NTIA), an agency of the U.S. Department of Commerce, fast, reliable internet service is vital for communities to fully participate in the economy. NTIA provides the following guidelines for broadband speeds in certain settings:

Suggested Download Speeds, NTIA BroadbandUSA		
1. Hospital	1 Gbps+	Sharing health records, performing virtual consultations, connecting first responders.
2. Library	100 Mbps-1 Gbps+	Operating public computer centers, mobile hotspot lending, enabling collaborative workspaces.
3. School	100 Mbps-1 Gbps+	Sharing educational material, online testing, accessing databases.
4. Small Business	50 Mbps+	Managing inventory, operating point-of-sales terminals, coordinating shipping.
5. Home	25 Mbps+	Completing homework, streaming video, internet browsing.

U.S. Department of Commerce, NTIA, BroadbandUSA

With the conversion to High Definition (HD) video, and Ultra High Definition (UHD) video such as 4K, the bandwidth demands for traditional broadcast video as well as streaming video are increasing rapidly. Add to that increased bandwidth demands for telecommuting and distance learning, which also rely heavily on streaming video for teleconferencing, and their effects on bandwidth needs over time.

The need for increased bandwidth over time is driven by several different factors, but the increase in video quality to HD and UHD (and the bandwidth demands of that high definition video compared to standard definition video) is the primary driver. Both telecommuting and distance learning require frequent video conferencing, telehealth appointments often have a video component, and accessing entertainment content using an Internet connection is largely replacing access through a traditional broadcast signal.

In addition, the number of Internet connected devices in use in a single residence at one time has increased dramatically in recent years and the trend continues. In addition to a desktop or laptop computer, tablets, smart phones, smart TVs, web cams and a host of other Internet enabled devices can be utilizing a home's single Internet connection at any one time, and many of those devices will be utilizing an application involving high definition video. The growth of video and associated bandwidth requirements are further detailed in graphics featured on the following pages.

Figure 4.1: Growth of 4K (UHD) TVs Over Time¹

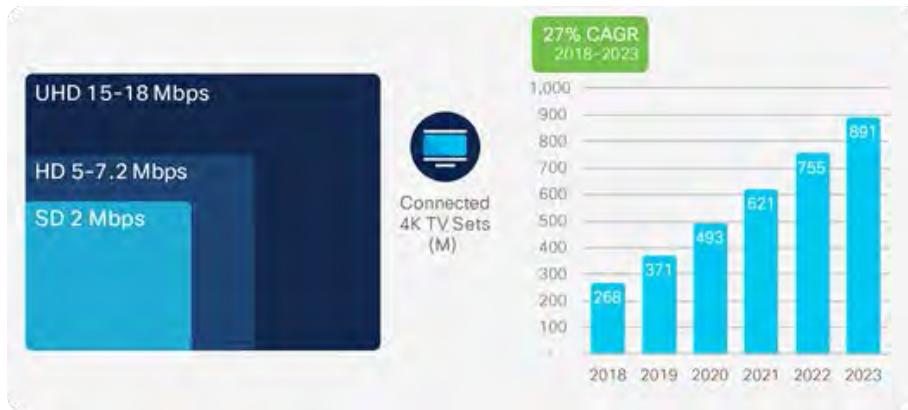
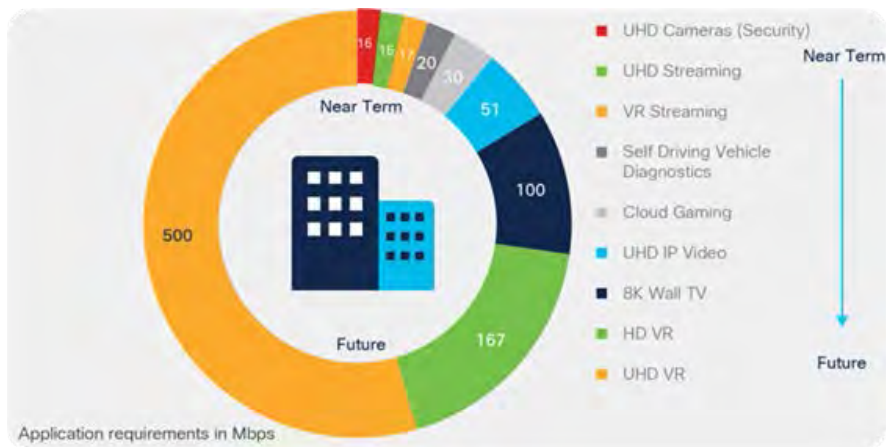


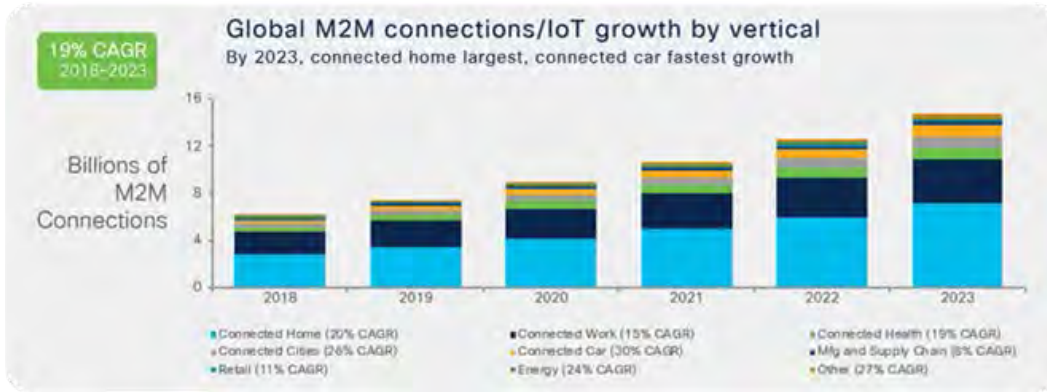
Figure 4.2: Bandwidth Demands of Video Over Time²



¹ Cisco Annual Internet Report, 2018–2023

² Ibid

Figure 4.3: Bandwidth Demand Growth Over Time³



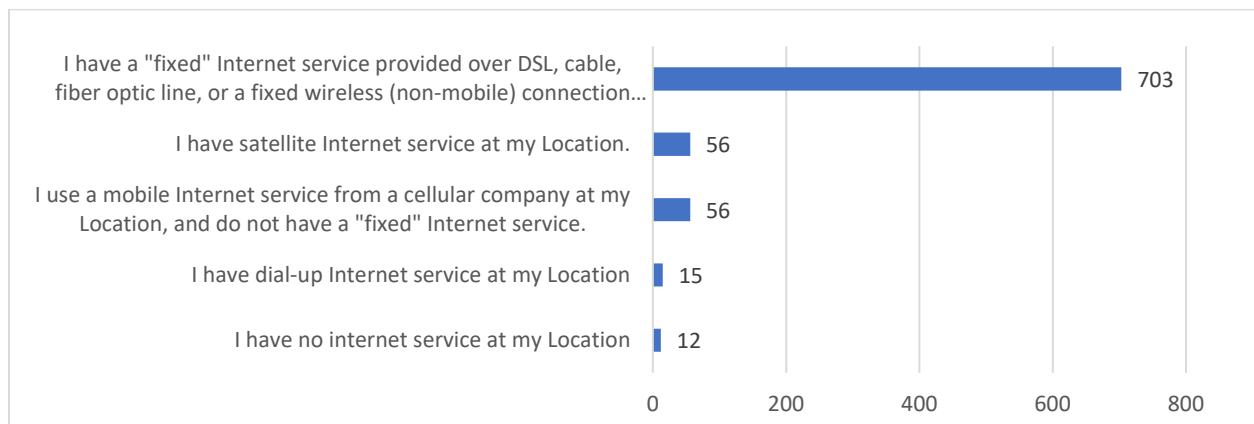
*M2M stands for Machine to Machine

5. Online Survey

The Speed Test Portal at broadband.wv.gov also includes an online survey to capture information regarding internet uses and broadband service. Information requested in the online survey includes data related to internet speed, subscription level, customer satisfaction, and other research points. Between November 25, 2020 and December 3, 2020, 885 West Virginia residents completed this online survey.

This survey also provides residential and business users with an opportunity to submit comments to the Council concerning internet service. Approximately 268 of those taking the speed test have provided comments, which are displayed in Appendix C of this report. A sample of the results from the online broadband survey are shown below, with the full results located in Appendix C.

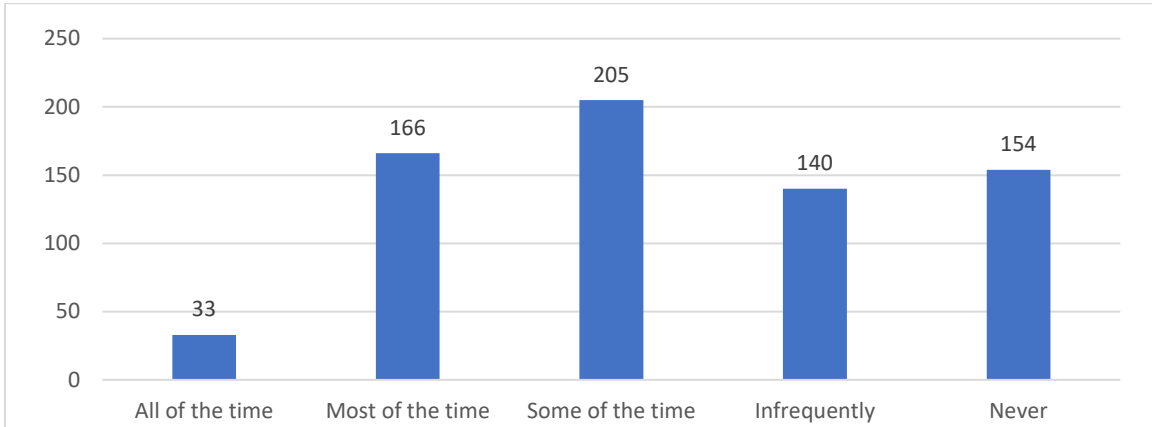
What statement best describes the Internet service at your Location?



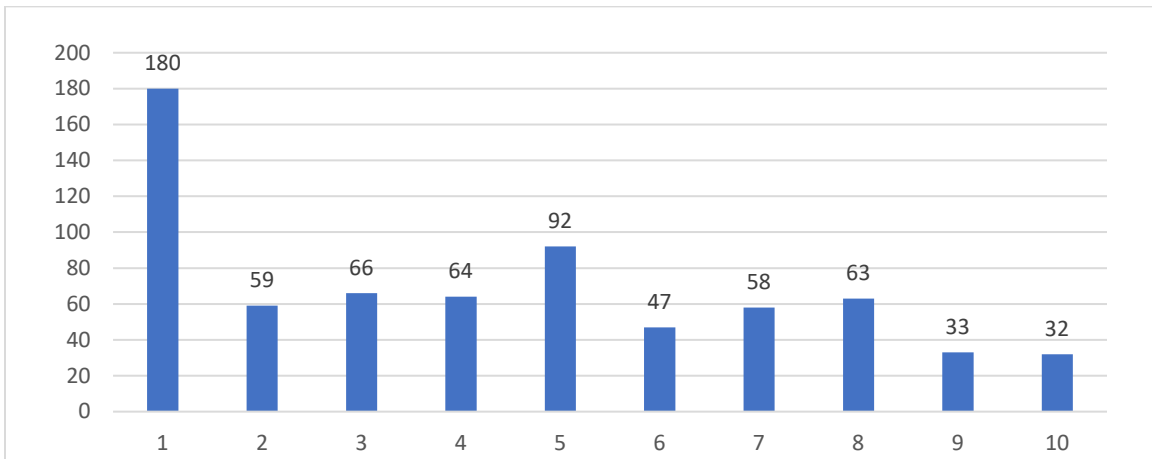
³ Ibid

If answered “fixed Internet service” to: *What statement best describes the Internet service at your Location?*

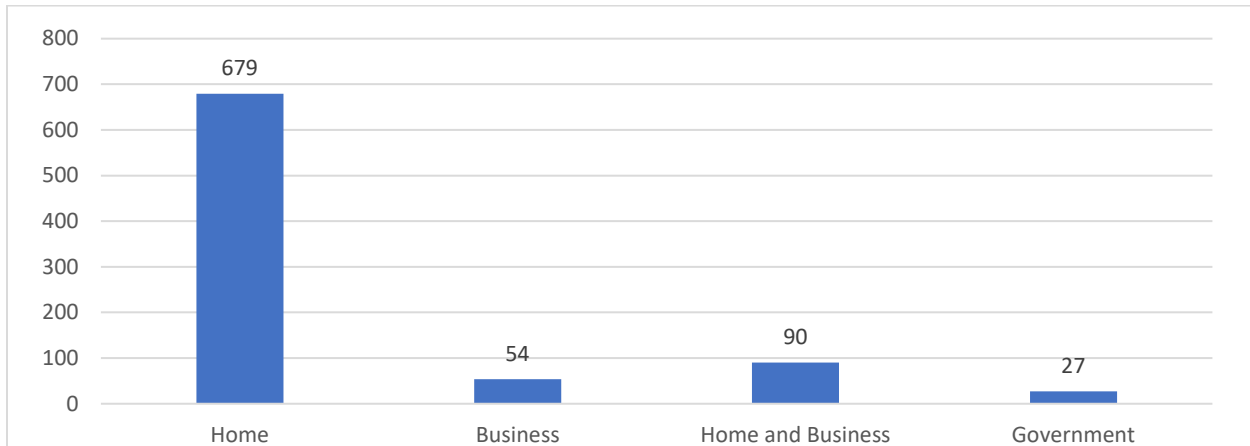
How often do you believe Internet service at your Location provides the speed level to which you have subscribed?



How satisfied are you with the Internet service currently provided to your Location?



Which of these categories best describes your Location?



6. Analysis of Unserved and Unfunded

The West Virginia Unfunded and Unserved Map was created in August 2020 by analyzing and comparing several key data sets, including publicly available information from the Federal Communications Commission (FCC) and the U.S. Department of Agriculture (USDA), as well as speed test data provided by Ookla. This map utilized the federal definition of broadband, 25/3 Mbps, to determine “unserved” locations; those locations that do not have access to 25/3 Mbps Internet access are considered “unserved.”

Unserved locations were identified with speed test data provided by Ookla, using only speed tests of “fixed” networks (not cellular or mobile networks) and only speed tests that were conducted using a device with an embedded GPS chip. These devices provide results with exact location information, not estimated locations.

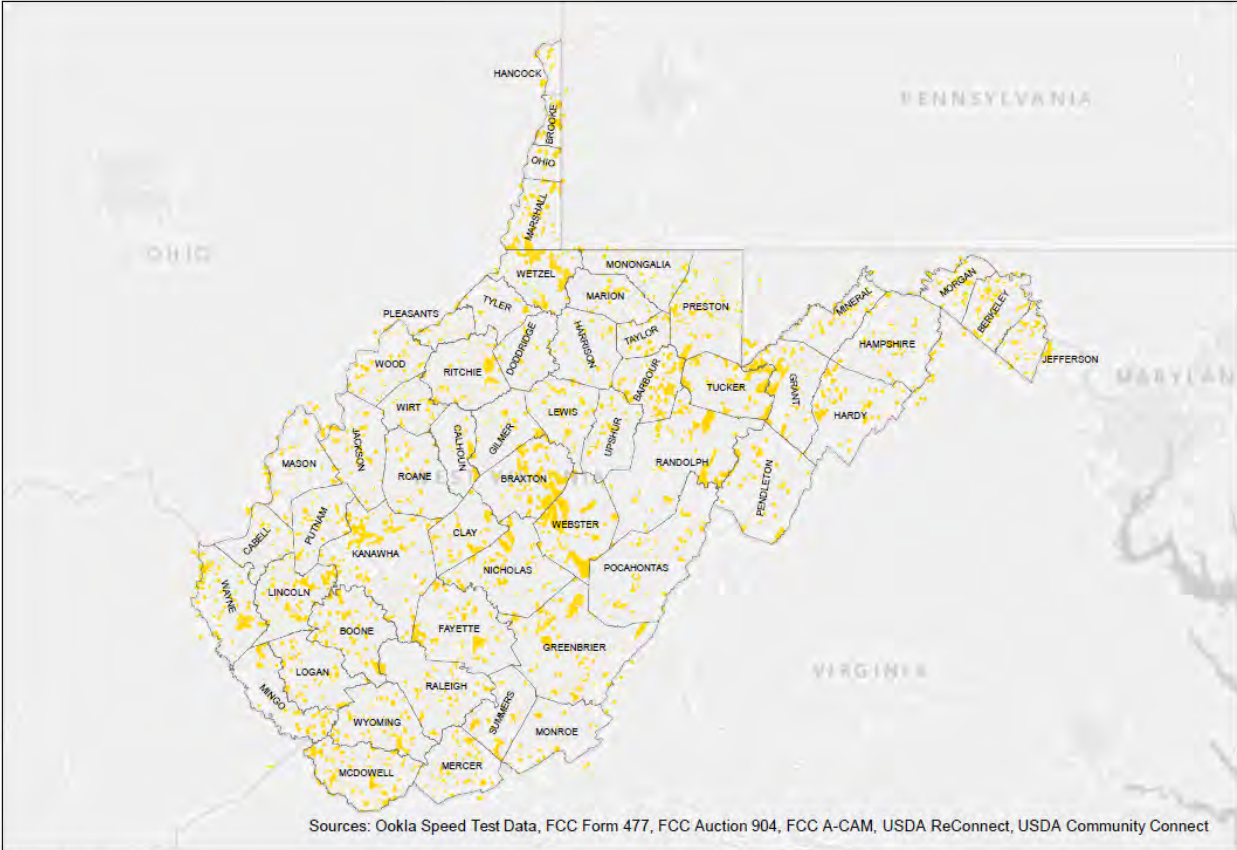
Actual speed test data was used to identify “unserved” locations rather than what is sometimes used to identify unserved locations, which is data that is self-reported by ISPs to the FCC and known as FCC Form 477 data. FCC Form 477 data is self-reported by ISPs to the FCC twice a year and is known to have several crucial limitations:

- First, according to FCC reporting rules, if a single location within a census block is reported as served by an ISP, the FCC then considers every location within that census block as served.
- Second, reporting rules even allow ISPs to report as served locations they do not currently serve but can within a reasonable amount of time. In addition, since these data are self-reported and are not currently subject to a public challenge process the accuracy of the data is questionable. Once a public challenge process is allowed, which is supposed to be an aspect of the FCC’s forthcoming Digital Opportunity Data Collection program (discussed below in Section 8.3) data such as the Ookla speed test data will be an important tool to use in such a challenge process.

The “unfunded” areas include a comprehensive data set of areas that have already received, or have been earmarked to receive, either state or federal funding for broadband infrastructure. Also included were all areas that are considered eligible for High Cost Universal Service Funding by the FCC, including those areas that were eligible for the recent FCC Rural Digital Opportunity Fund (RDOF) auction.

“Unfunded” areas are those without funding already appropriated, earmarked or proposed by state or federal programs. Displayed in Figure 6.1, unserved and unfunded locations therefore are those locations without access to 25/3 Mbps service that are in areas with no broadband infrastructure funding currently identified.

Figure 6.1: West Virginia Unserved and Unfunded Areas



West Virginia
 □ County Boundaries
 ■ Unserved & Unfunded



7. FCC Broadband Data

There are two sources of information on broadband availability published by the FCC: FCC Form 477 Data and FCC Broadband Deployment Reports. Links to each data source are provided here:

- [FCC Form 477 Data](#)
- [FCC 2020 Broadband Deployment Report](#)

A full set of maps showing coverage in West Virginia based on data published by the FCC in its December 31, 2019 broadband deployment data, released by the FCC on November 12, 2020 (the latest available as of this Plan) are included in the Mapping Appendix.

Even though many critics consider the FCC's measurement metrics to be flawed, West Virginia's low rankings in various measures is consistent with consumer experience and feedback from the Council's own speed tests and survey work.

Overall, the FCC data provides an indication of the State's relative position in national and regional rankings. As shown in Figure 7.1, West Virginia trails all surrounding states by double digits when measuring the percent of population with access to fixed broadband service.

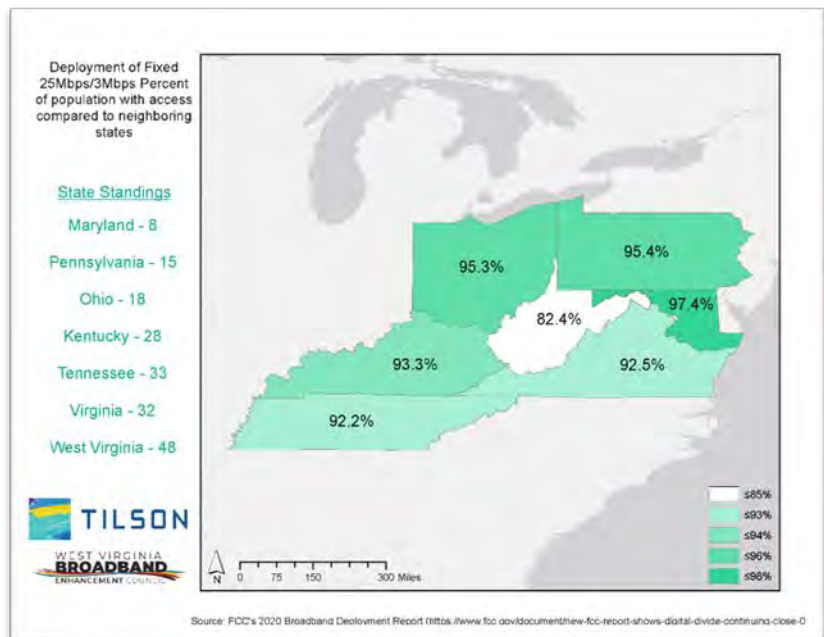


Figure 7.1: West Virginia fastest providers based off FCC Form 477 Data

7.1 FCC Form 477 Data

All facilities-based broadband providers are required to file data with the FCC twice a year through Form 477 data, detailing where they offer Internet access service speeds exceeding 200 Kbps in at least one direction. The Form 477 Instructions require each provider to indicate their minimum advertised speeds and where users should expect to receive those advertised speeds.

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.

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.⁴ 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 census block.

7.2 2020 FCC Broadband Progress Report

The FCC released its [2020 Broadband Deployment Report](#) on April 24, 2020. This report evaluates the availability of fixed and mobile services over a 5-year time period (2014-2018). The report provides consumer data in four categories:

1. Access to Fixed Services
2. Access to Mobile LTE Services;
3. Access to Fixed *and* Mobile Mobile LTE Services Combined
4. Access to Fixed *or* Mobile LTE Services

The FCC has noted that mobile services are not full substitutes for fixed services and that mobile and fixed services must be evaluated separately.

7.3 Key Findings from the 2020 FCC Report

According to the *FCC 2020 Broadband Deployment Report*, West Virginia is ranked 48th in the nation for percent of population with access to fixed broadband service.

The report concludes that approximately 70 percent 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 broadband service increases to approximately 95 percent. For West Virginia as a whole, the report finds approximately 82.4 percent of consumers have access to at least 25 Mbps/3 Mbps service.⁵

1. West Virginia ranks 48th in the nation, followed only Mississippi and Arkansas
2. West Virginia trails all surrounding states by double digits, as shown on the State Overview Map.
3. The FCC indicates that 82.4 percent of the West Virginia's total population has access to broadband; however, this overall measurement blends the urban and rural percentages.
4. While the report shows that 95 percent of the urban population has access, just 70 percent of the rural population has access.
5. Using the FCC's data, which includes evaluation of 1,806,000 residents, 1,489,000 are reported as having access to broadband, leaving 317,000 without such service.
6. Of the 317,000 reported as lacking broadband service, 274,000 (86.4 percent) are in rural areas.
7. This striking disparity illustrates a significant challenge for rural areas of West Virginia, indicating that nearly 30 percent of the State's rural population lacks broadband service.

⁴ [Federal Communications 2020 Broadband Deployment Report](#)

⁵ [Federal Communications 2020 Broadband Deployment Report, Appendix 1](#)

Deployment (Millions) of Fixed 25 Mbps/3 Mbps; Mobile LTE with a Minimum Advertised Speed of 5 Mbps/1 Mbps; and Mobile LTE with a Median Speed of 10 Mbps/3 Mbps by State and District of Columbia

	Population Evaluated (millions)	Fixed 25 Mbps/3 Mbps		State Standing
		Population with Access	Percent of Population	
United States	327.167	308.913	94.40%	
US Rural	64.504	50.099	77.70%	
US Urban	262.663	258.814	98.50%	
Maryland	6.043	5.887	97.40%	8
Pennsylvania	12.807	12.213	95.40%	15
Ohio	11.689	11.114	95.30%	18
Kentucky	4.468	4.171	93.30%	28
Virginia	8.523	7.884	92.50%	32
Tennessee	6.77	6.243	92.20%	33
West Virginia	1.806	1.489	82.40%	48
WV Rural	0.921	0.647	70.30%	
WV Urban	0.885	0.842	95.1%	

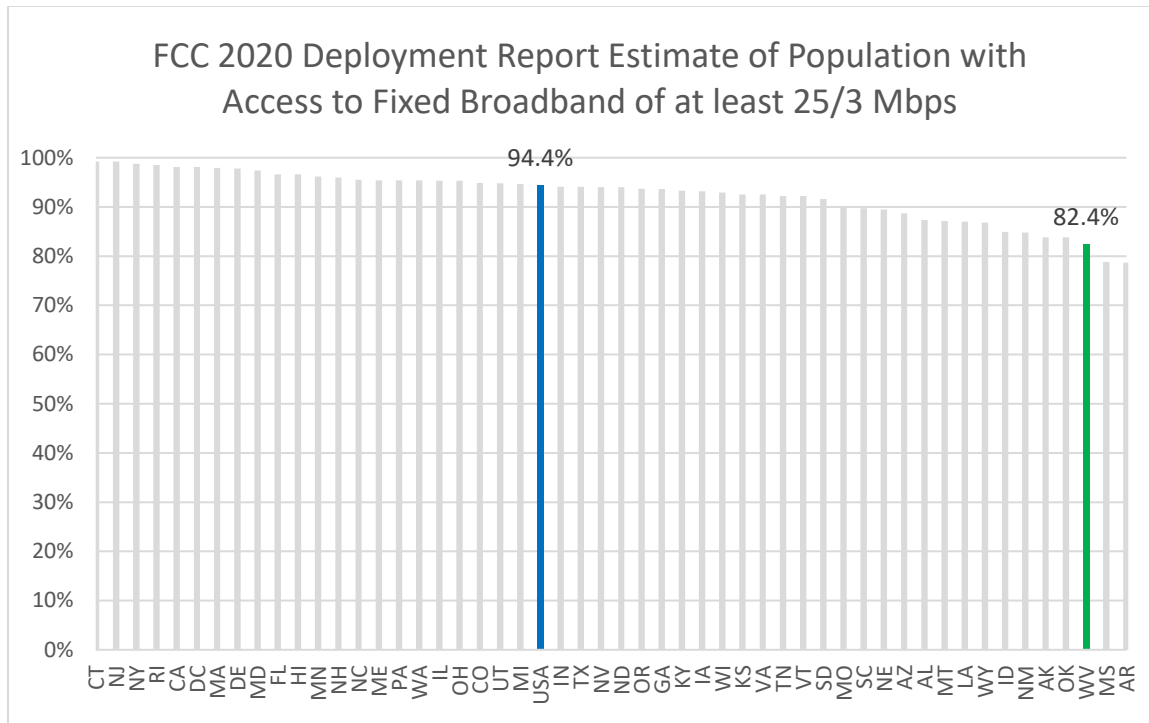
Source: FCC 2020 Broadband Deployment Report

<https://docs.fcc.gov/public/attachments/FCC-20-50A2.pdf>

The Council maintains that data reported to the FCC at the census block level likely overstates the availability of broadband service in West Virginia. The FCC reporting is generally known to overstate broadband availability, but it provides baseline data and shows relative bottom-tier position as compared to surrounding states and in national rankings.

Nationally, West Virginia ranks 3rd-lowest in fixed wireline broadband access as shown on Table 7.1:

Table 7.2 Consumer access to 25/3 Mbps wireline broadband



Source: [Federal Communications Commission 2020 Broadband Development Report, Appendix 1](#)

Figure 7.2 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. As the map series below demonstrates, options available to consumers decrease sharply as need for higher speed increases.

Figure 7.3 shows the fastest available broadband access by broadband service provider for each deployment technology, as reported by the companies to the FCC. Technologies depicted are cable modem, DSL, optical carrier/fiber to end user, and fixed wireless. There is a great variety in the companies reporting the fastest available speed of a given area.

Figure 7.4 details the fastest providers using Cable Modem DOCSIS 3.0 and 3.1. DSL technologies in Figure 7.5 include Asymmetric xDSL, ADSL 2, ADSL 2+, and VDSL.

Figure 7.6 displays ISP's that provide optical carrier/fiber to the end user or otherwise known as fiber optics. Fiber broadband exceeds speeds far greater than DSL or cable modem. Figure 7.7 displays the fastest providers using fixed wireless technology.

Figure 7.3: West Virginia Broadband Advertised Speed Ranges

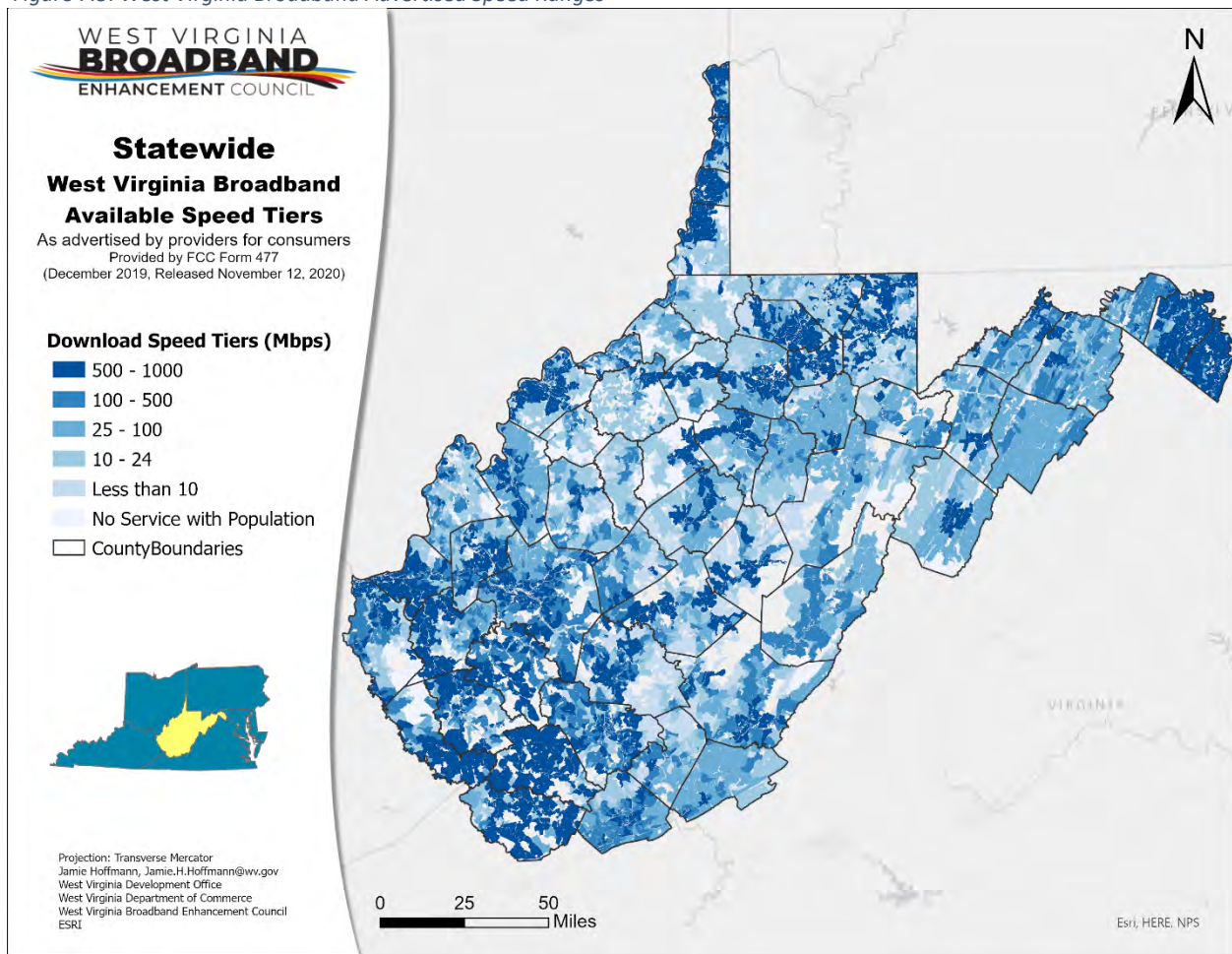


Figure 7.4: Fastest Providers for Cable Modem DOCSIS 3.0 and 3.1

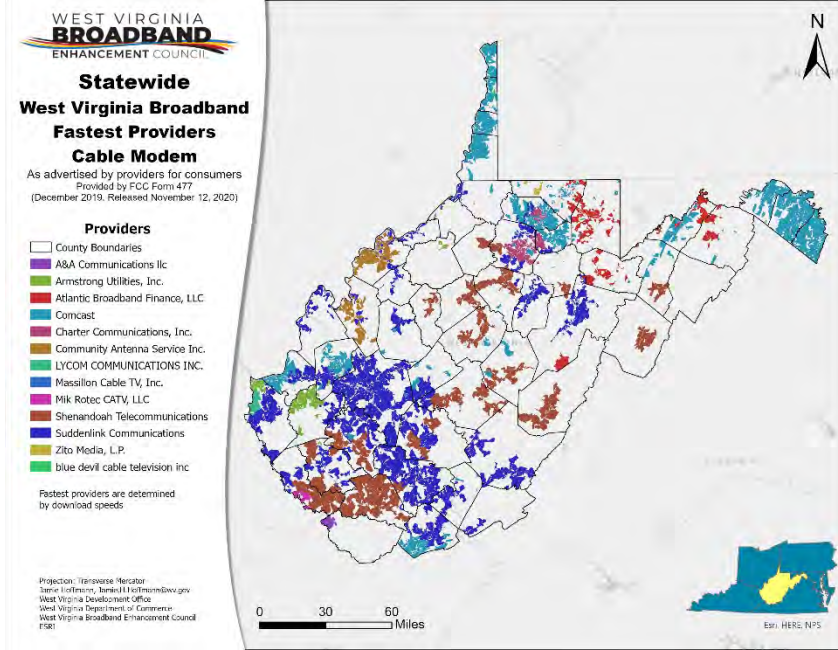


Figure 7.5: Fastest Providers for DSL (excluding Symmetric xDSL)

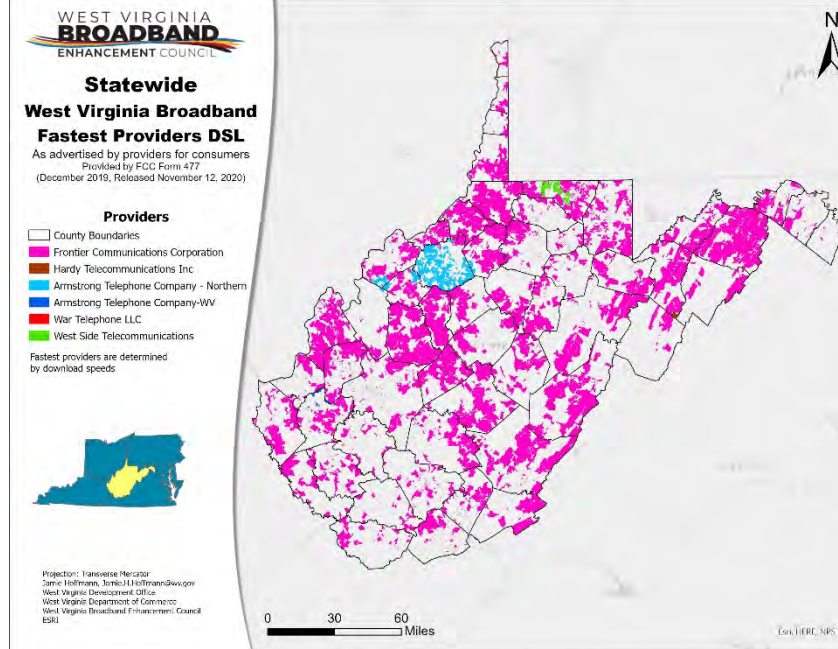


Figure 7.6: Fastest Providers for Optical Carrier/Fiber to End User

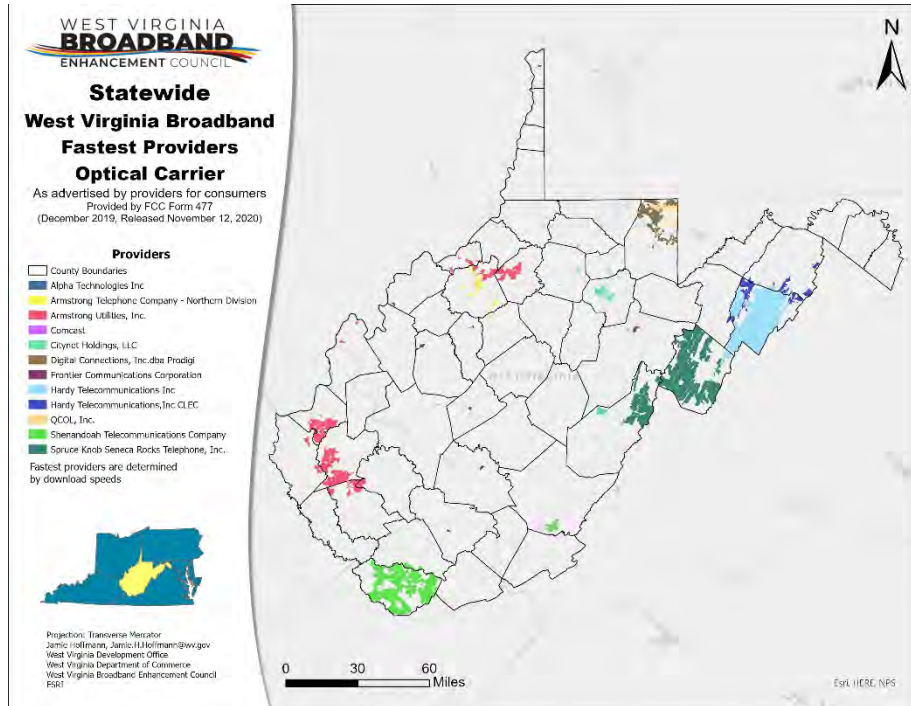
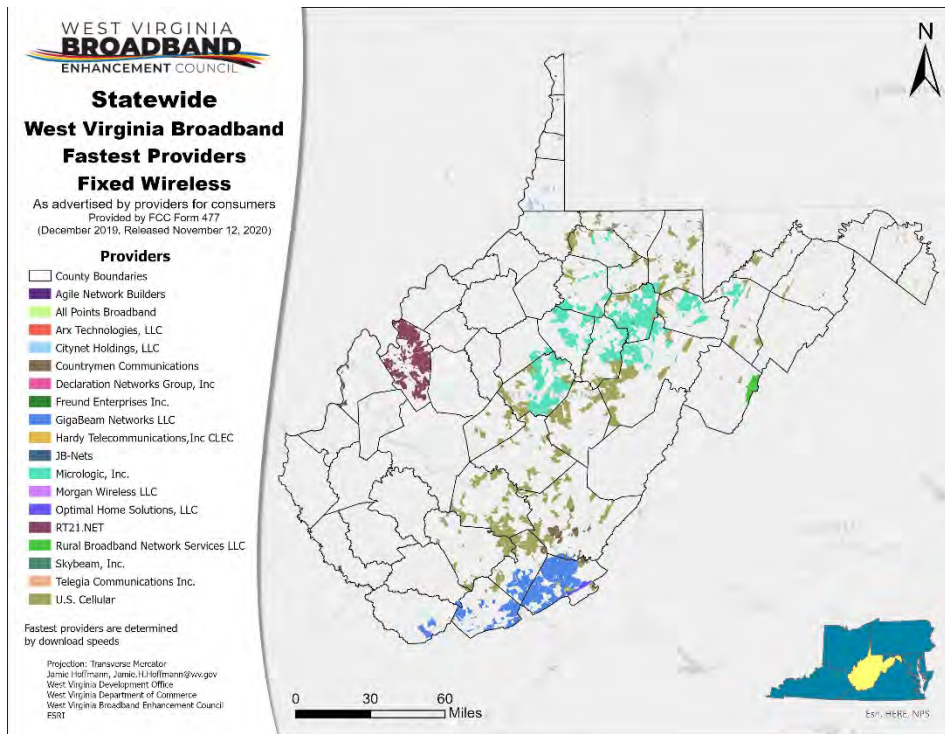
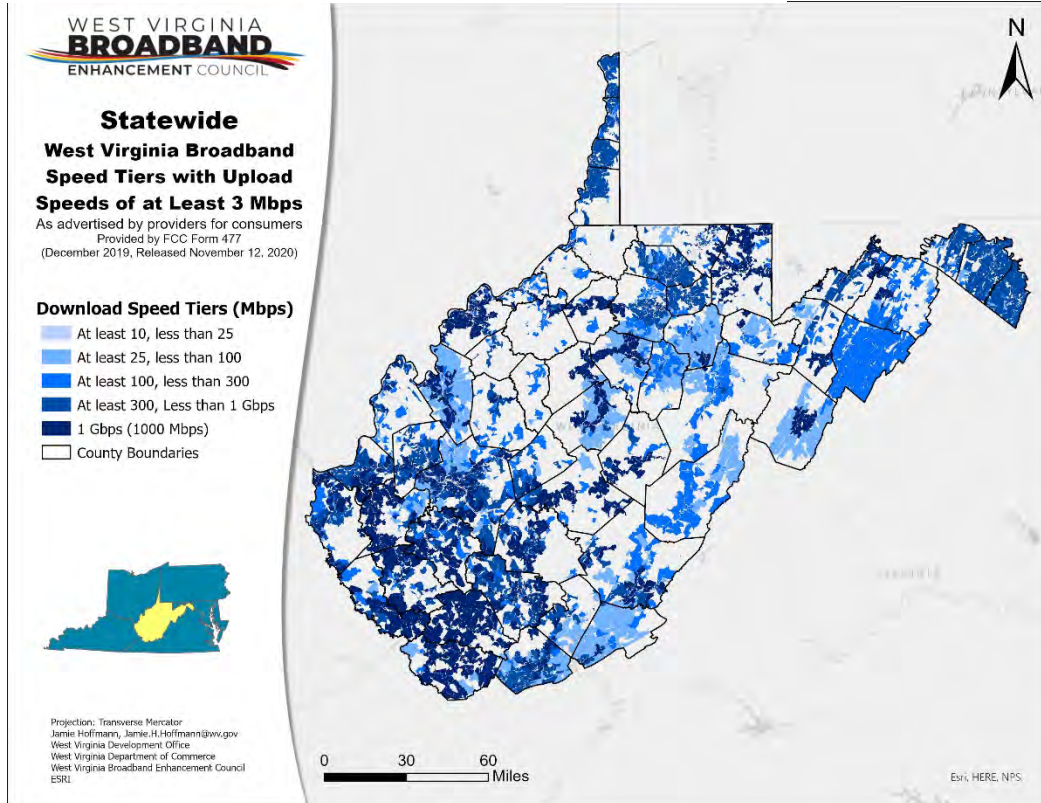


Figure 7.7: Fastest Providers for Fixed Wireless



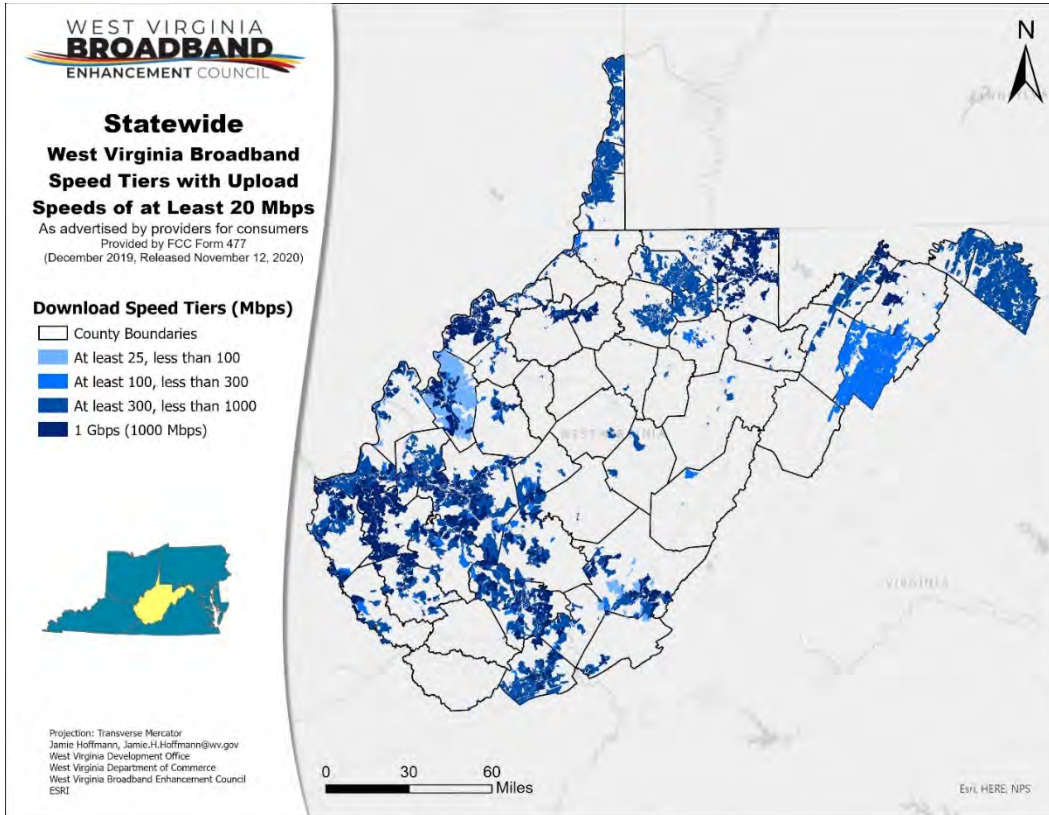
Using the federal broadband definition of 25/3 Mbps, with respect to upload speeds, which are particularly important for ecommerce, there is again a concentration of faster service options in the more populated parts of the State, as shown in Figure 7.8.

Figure 7.8: Download Speed tier ranges with at least upload speeds of 3 Mbps



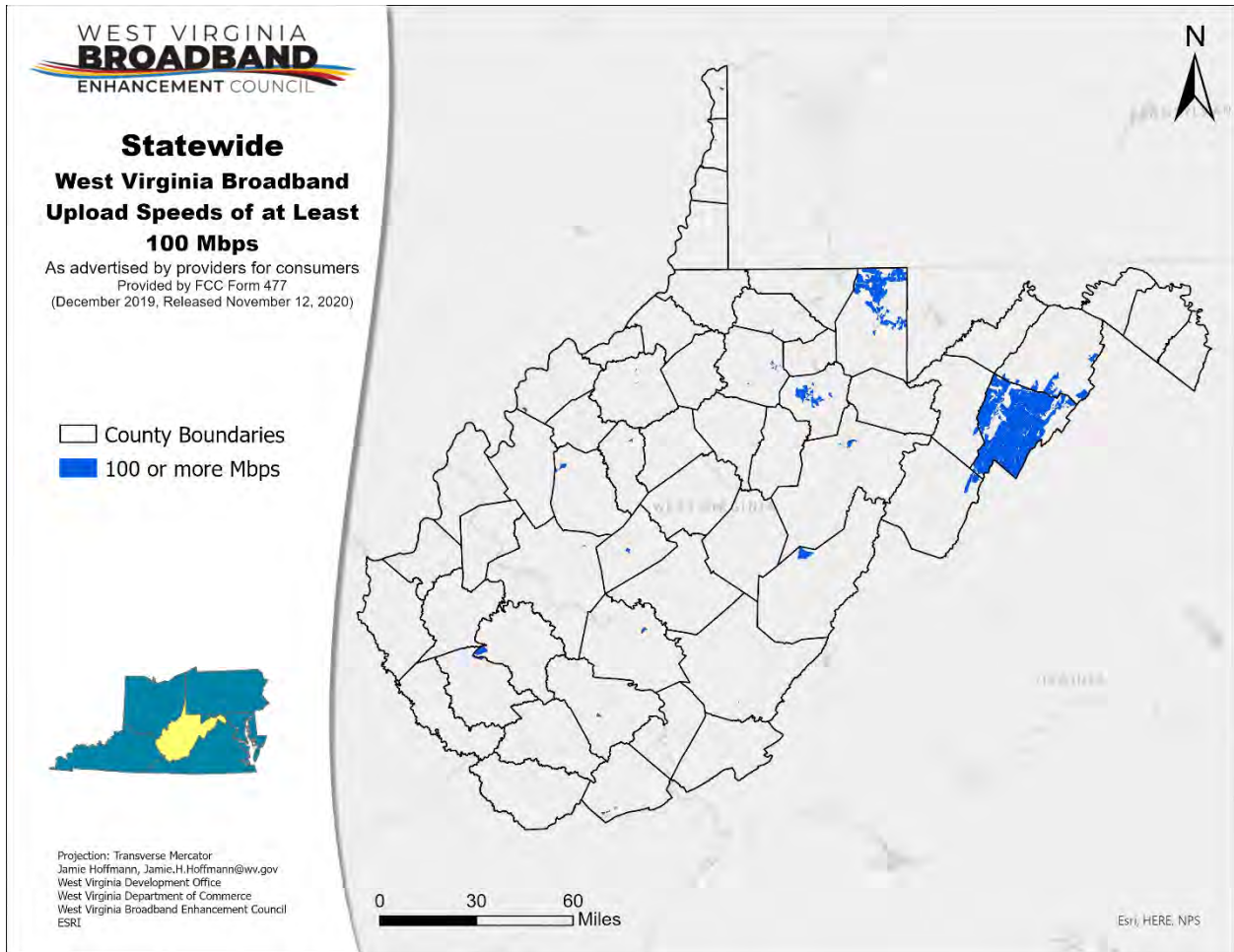
As necessary upload speeds increase to at least 20 Mbps, available services decrease sharply, as shown in Figure 7.9.

Figure 7.9: Download speed tiers with 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 7.10.

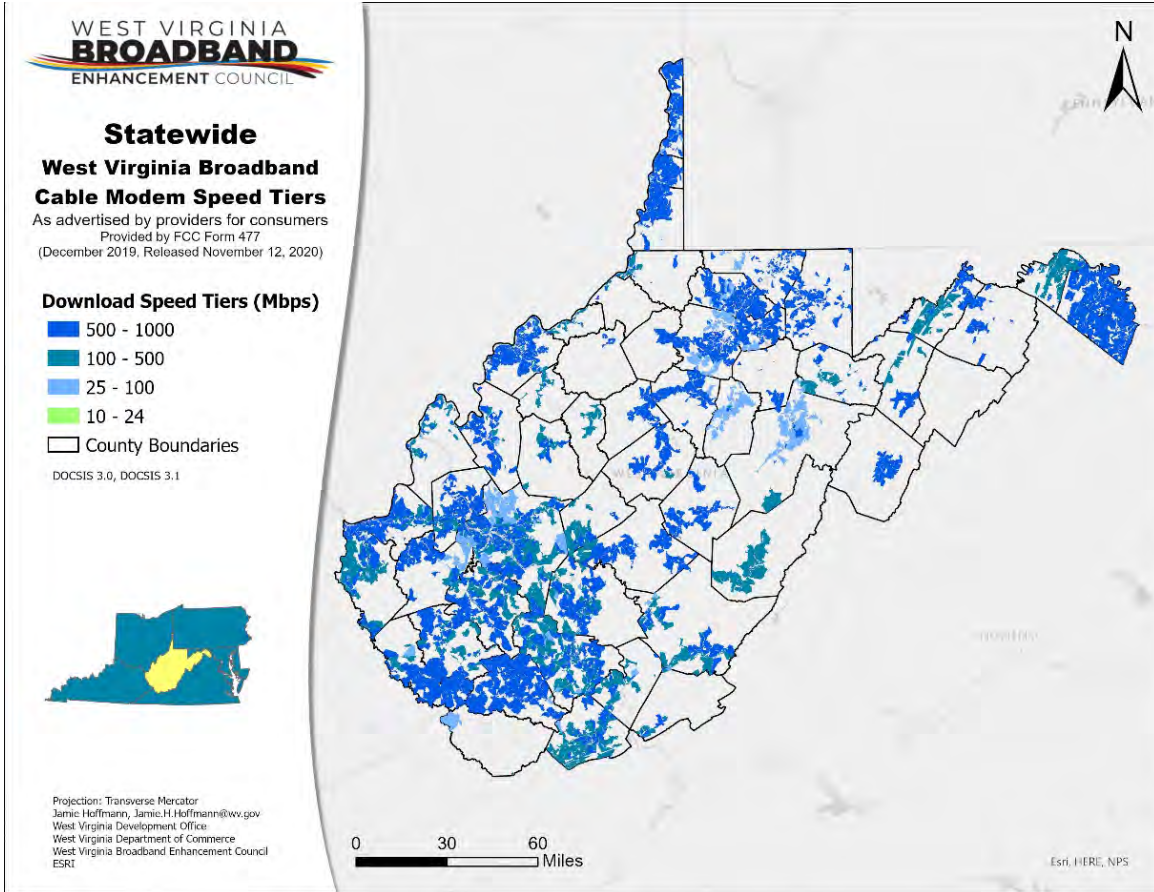
Figure 7.10: Download speed tiers with upload speeds of at least 100 Mbps



7.4 Wireline Broadband Technology

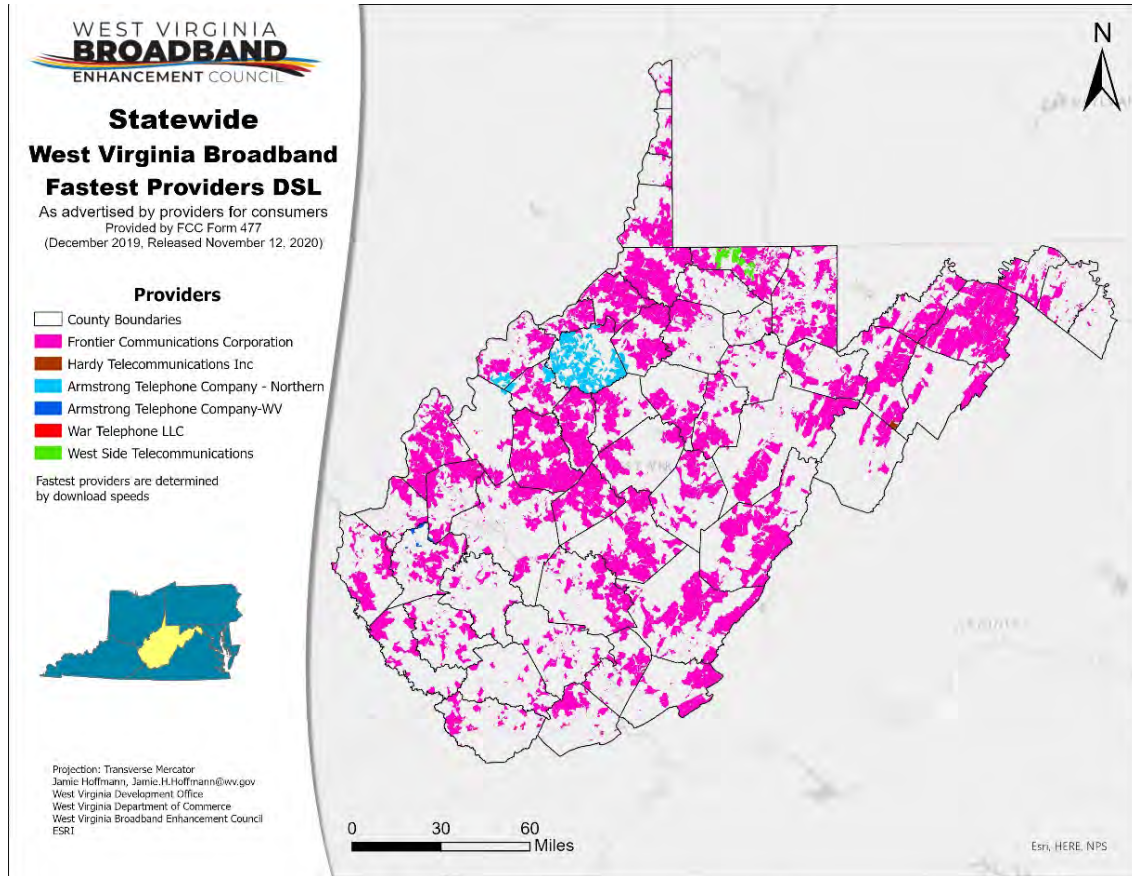
The available service and speeds vary greatly depending on the technology. For example, based on reported cable broadband access, systems that are upgraded to DOCSIS 3.0 or 3.1, the most recent standards, support higher speeds, as shown in Figure 7.11.

Figure 7.11: Download Speed Tiers for Cable Modem DOCSIS 3.0 and 3.1



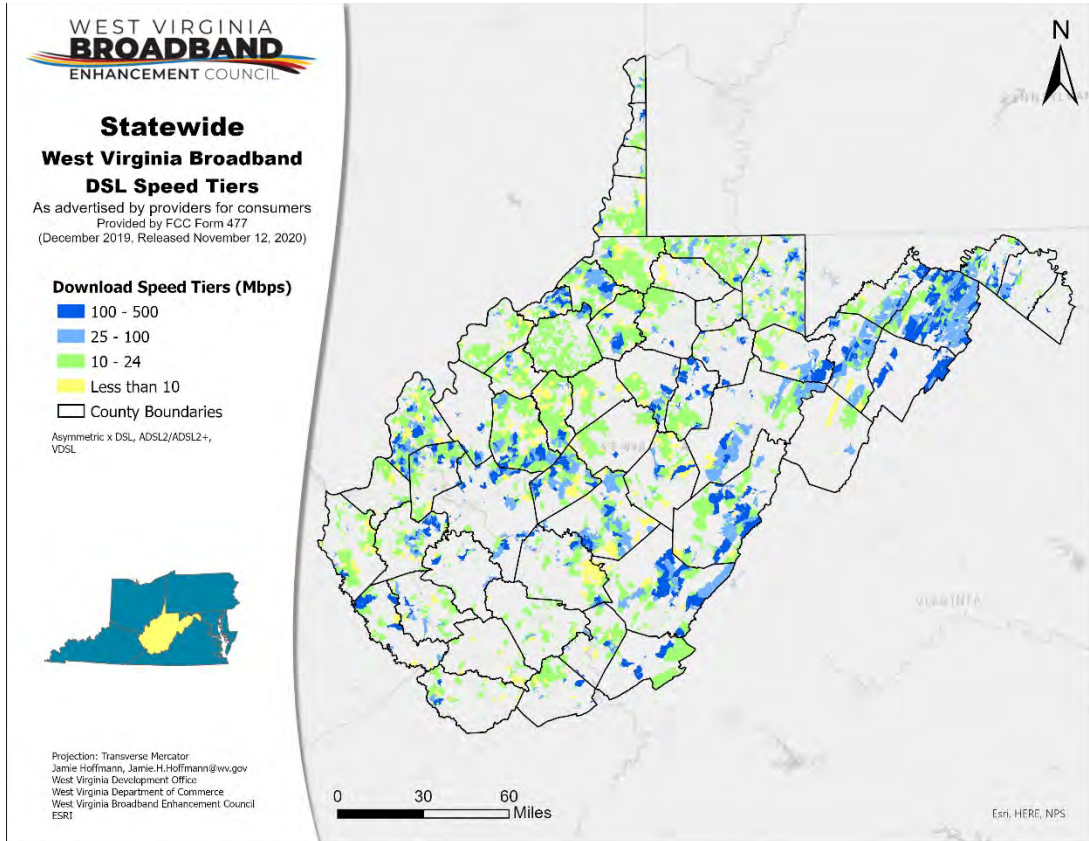
DSL service is widely available in most parts of the State, primarily through Frontier, the incumbent telephone company, as shown in Figure 7.12. DSL services tend to have download speeds less than 25 Mbps as shown in Figure 7.13. As broadband development progresses, West Virginia is moving in the direction to decrease the number of census blocks represented by DSL technologies.

Figure 7.12: Fastest providers for DSL (excluding Symmetric xDSL)



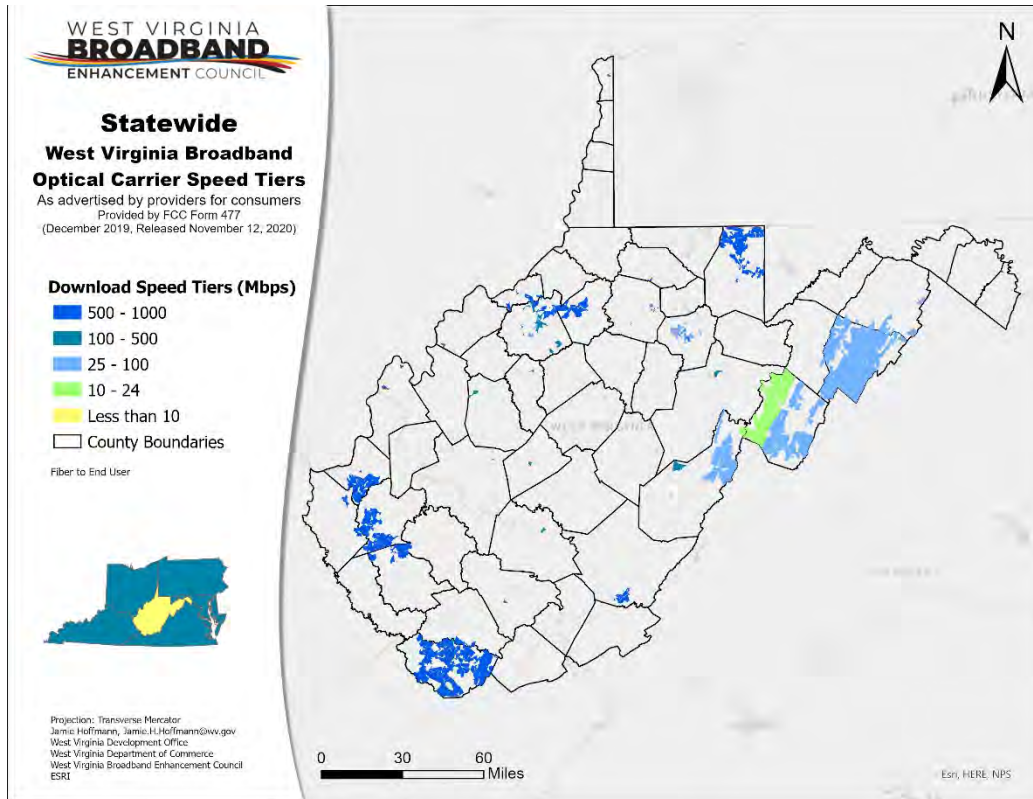
A majority of DSL speeds do not meet the current federal definition of broadband of 25 Mbps/3 Mbps, as shown in Figure 7.13. The light green shows areas with DSL above 10/1 Mbps, and the grey shows areas with no DSL availability at all. However, only small clusters of census blocks with oDSL speeds meet the 25/3 Mbps definition of broadband.

Figure 7.13: Download speed tiers for DSL (excluding Symmetric xDSL)



Fiber-to-the-Premise (FTTP) is currently considered the most advanced infrastructure 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 in West Virginia and almost none that can provide gigabit download speeds of 1 Gbps or more, as shown in Figure 7.14

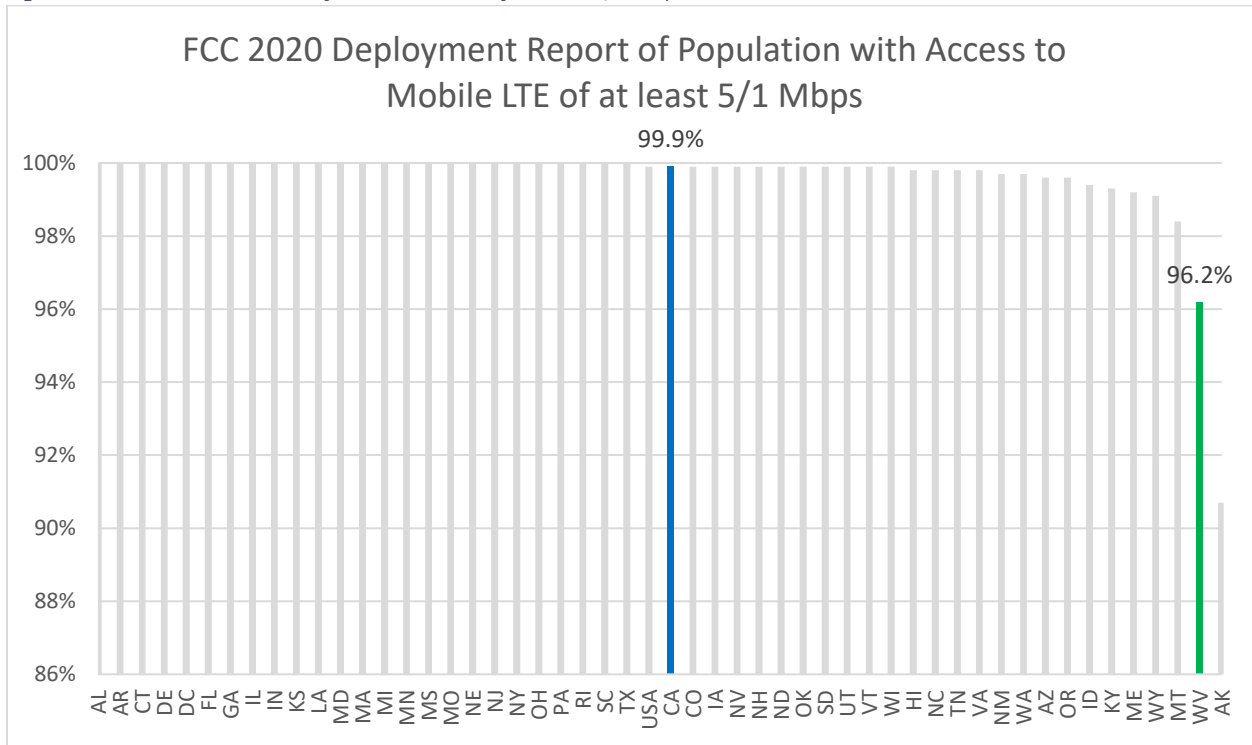
Figure 7.14: Download speed tiers for Optical Carrier/ Fiber to End User



7.5 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 7.2. ⁶

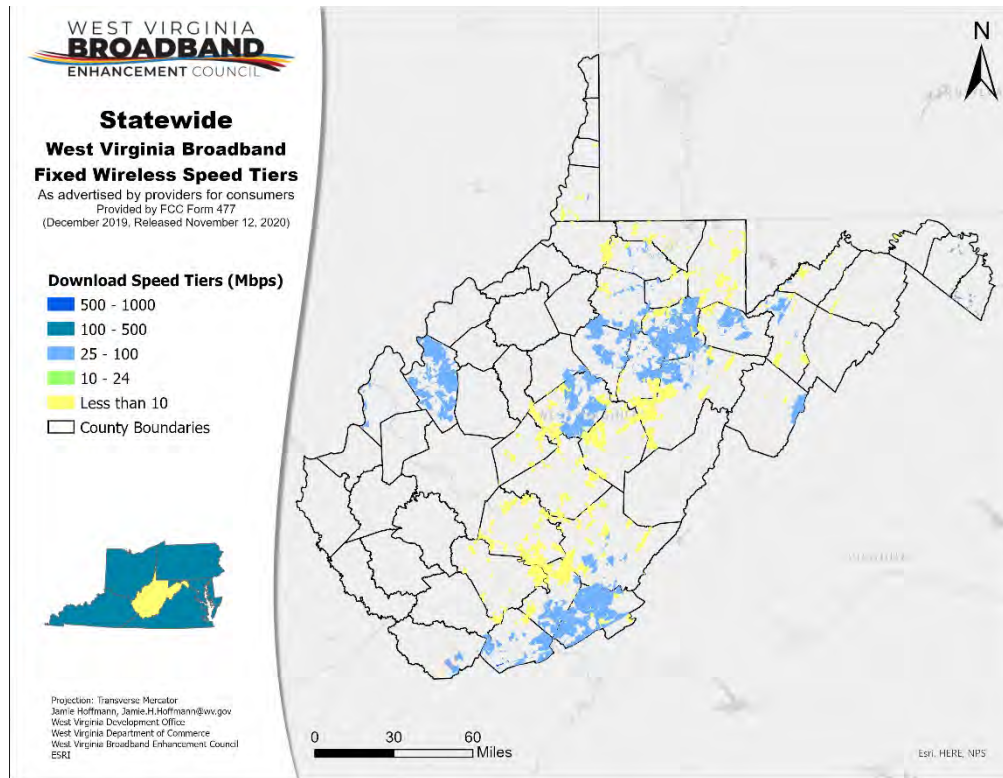
Figure 7.15: FCC 2020 estimate of wireless access of at least 5/1 Mbps



⁶ [Federal Communications Commission 2020 Broadband Deployment Report, Appendix 1](#)

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 7.7. Fixed wireless will generally provide faster services than DSL and long-range directional equipment can provide broadband to remote areas where other broadband services may be too costly to provide to.

Figure 7.16: Download speed tiers for Fixed Wireless



8. FCC Rural Digital Opportunity Fund

The FCC conducted Phase 1 of the Rural Digital Opportunity Fund (RDOF) multi-round, reverse auction in October and November 2020. Through the entire RDOF program, the FCC outlined plans to award up to \$20.4 billion to support fixed broadband development nationwide. Phase 1 of the RDOF auction program included \$16 billion in potential funding. Of the \$16 billion, \$9.2 billion, or 57.5 percent, was awarded through a competitive, reverse auction framework designed to reduce costs through repetitive rounds of bidding by location(s). Winning bidders were announced on December 7, 2020.

West Virginia's initial auction eligibility profile, as determined by the FCC, included 120,506 locations. The maximum statewide award possible was slightly more than \$766 million, or \$76 million per year, for ten years. This figure was the maximum potential subsidy to be awarded by the FCC to carriers that competed in the auction process. However, through the reverse auction process, the ultimate subsidy amount awarded in West Virginia was \$362 million, approximately 47.2 percent of the maximum amount. Additionally, of the 120,506 initially eligible locations, 119,267, 98.9 percent, were 'won' by auction participants.

RDOF Auction results for West Virginia are detailed below:

Figure 8.1: FCC Rural Digital Opportunity Fund Auction Results

West Virginia FCC RDOF Maximum				
Competing Bidders	WV Eligible Locations	Maximum Annual Subsidy	Maximum 10-Year Subsidy	Auction Speed Tier
	120,156	\$76,621,628	\$766,216,280	
West Virginia FCC RDOF Awarded by Bidder				
Winning Bidders	WV Locations Assigned	Announced Annual Subsidy	Announced 10-Year Subsidy	Auction Speed Tier
Altice USA, Inc.	536	12,552.80	125,528	100/20 Mbps
Citynet West Virginia, LLC	13,460	5,351,685.83	53,516,858.3	1000/500 Mbps
CommNet Wireless, LLC	206	19,695.20	196,952	50/5 Mbps
Digital Connections, Inc. dba Prodigy	4,771	858,300.14	8,583,001.4	1000/500 Mbps
Frontier Communications Corporation, DIP	79,391	24,762,639.53	247,626,395.3	1000/500 Mbps
GigaBeam Networks, LLC	9,071	2,806,778.92	28,067,789.2	1000/500 Mbps
MicroLogic, Inc.	2,076	1,003,604.77	10,036,047.7	1000/500 Mbps
Shenandoah Cable Television, LLC	419	9,186.70	91,867	50/5 Mbps
Space Exploration Technologies Corp.	9,337	1,382,222.13	13,822,221.3	100/20 Mbps
TOTAL	119,267	36,206,666.02	362,066,660.2	NA

As shown in Figure 8.1, of the approximately \$362 million (total amount of subsidy over ten years) in RDOF Phase 1 subsidy awarded in West Virginia, approximately \$247 million was assigned to Frontier. This was the largest award in West Virginia and the third largest award as detailed in Figure 8.2.

Of the 119,267 West Virginia locations assigned to bidders at the auction, approximately 80,000 of those were assigned Frontier. Notably, Frontier bid and won in the auction’s Gigabit Performance Tier, specifying the use of “Optical Carrier – Fiber to the End-User” as the technology to be utilized to satisfy deployment obligations. All auction winners must fulfill deployment obligations to serve 40 percent of the total locations won in a state by the end of year 3 (starting when the FCC announces final approval of auction winners to receive Universal Service Funds) and an additional 20 percent of auction subsidized locations per year until 100 percent completion by the end of year 6.

The specification of “Optical Carrier – Fiber to the End User” as a technology is presumed to necessitate the deployment of a Gigabit Passive Optical Network (GPON) as a fiber-to-the-home (FTTH) network that is able to provide service to each of the estimated 80,000 subsidized locations in West Virginia. To remain compliant with FCC RDOF auction rules, this GPON FTTH network must reach approximately 32,000 locations within three years after final FCC award approval. The network must then reach an additional 16,000 locations per year for each of the three years after the initial deployment.

These deployment milestones apply to all auction participants and represents a significant investment in broadband infrastructure in West Virginia.

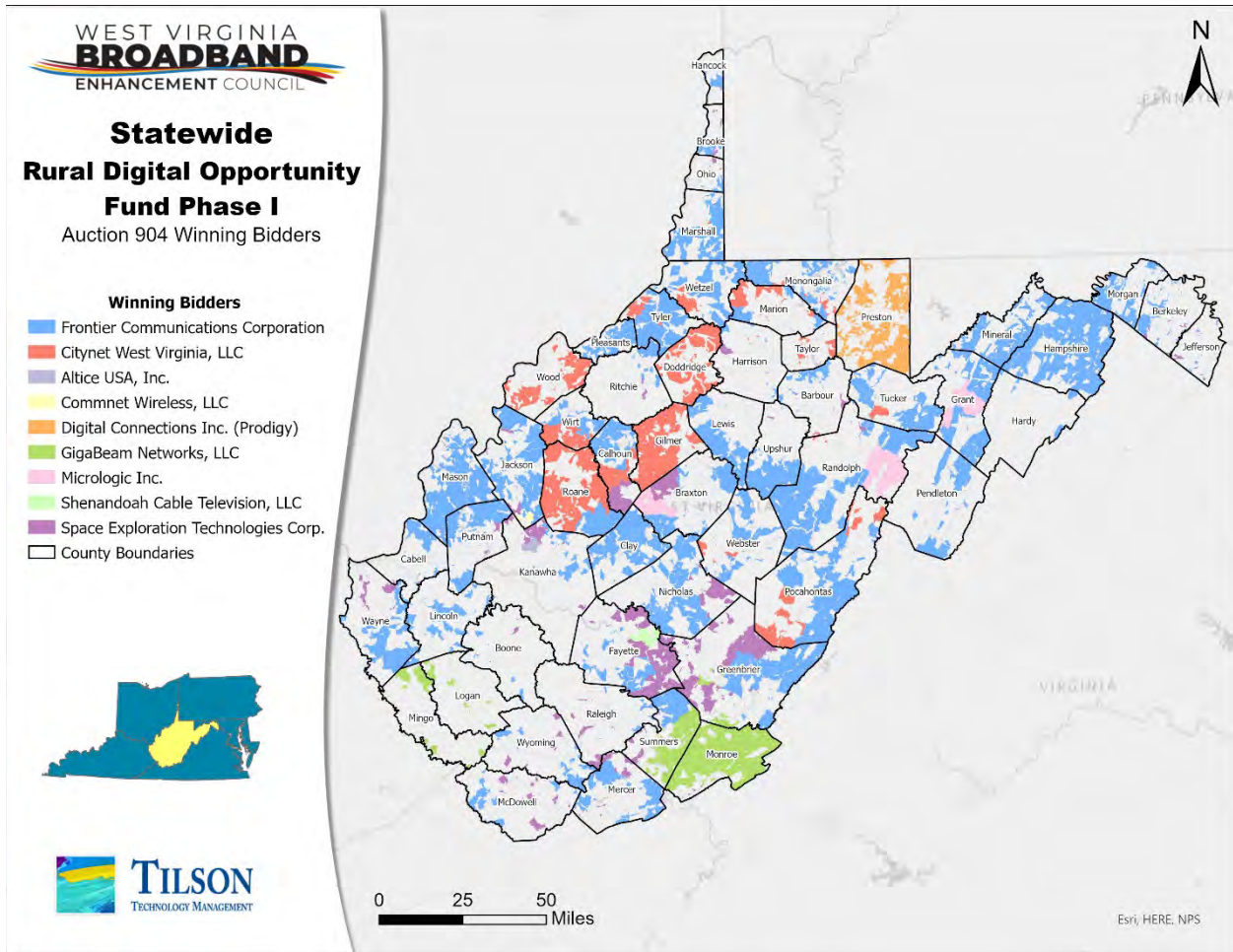
Figure 8.2: Highest RDOF Statewide Awards

Bidder	State	Annual Support	Locations Assigned
LTD Broadband LLC	MN	\$31,187,793.64	102005
Etheric Communications LLC	CA	\$24,863,496.31	64463
Frontier Communications Corporation, DIP	WV	\$24,762,639.53	79391
Rural Electric Cooperative Consortium	MS	\$22,057,663.18	89505
AMG Technology Investment Group LLC	IL	\$19,309,883.99	68921
LTD Broadband LLC	WI	\$18,927,018.41	88070
Consortium of AEG and Heron Broadband I	MI	\$18,766,912.40	48449
LTD Broadband LLC	CA	\$18,750,605.97	76856
CCO Holdings, LLC	TX	\$18,679,335.99	133993

A map which details RDOF locations by winning bidder is provided in Figure 8.3.

To assist companies as they prepared to compete in the auction, the WV Broadband Enhancement Council, WV Development Office, and Tilson Technology presented a series of webinars detailing the RDOF auction requirements, available here: [WVBEC RDOF Webinar 4.28.2020.pptx](#); [FCC RDOF Webinar April 28, 2020.mp4](#). The webinars provided an in-depth look at RDOF auction process and eligible areas in West Virginia. The FCC’s Eligible Areas Public Notice and related materials can be [found here](#).

Figure 8.3: RDOF Phase I Locations by Winning Bidder



9. Electric Utility Feasibility Studies

Under legislation adopted in 2019, West Virginia electric utilities began reviewing 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 (WVPSC) are assisting the electric utilities in the preparation of the feasibility studies, which will 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
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 State's electric utilities, Appalachian Power and First Energy, are working through the feasibility study process. The status of each study is briefly described in this section.

9.1 Appalachian Power Company and Wheeling Power Company (AEP)

Pursuant to legislation passed by the West Virginia Legislature in 2019, Appalachian Power Company and Wheeling Power Company (AEP) prepared and submitted to the West Virginia Broadband Enhancement Council (Council) a Broadband Feasibility Study for the construction of a middle-mile fiber optic network in Logan and Mingo Counties, known as the Logan-Mingo Broadband Project.

The proposed network would provide utility communications and contain fiber optic strands that AEP could lease to Internet Service Providers (ISPs) who would provide broadband internet service to end-user, "last-mile" customers through the construction of more than 400 new fiber miles and the utilization of approximately 200 existing fiber miles. *(See Figure 9.1, Logan-Mingo project map.)*

AEP submitted its study to the Council on October 22, 2019. The Council approved the study in December 2019, concluding that the proposed project was feasible and in the interests of both AEP and the citizens of West Virginia. In considering the proposed project's feasibility, the Council identified one or more last-mile broadband Internet providers that may lease the middle-mile broadband internet capacity created by the proposed project pursuant to lease terms and conditions set by the Council.

AEP conducted a Request for Proposal process and selected GigaBeam Networks as an ISP partner. The project review will continue with formal submission to the WVPSC, anticipated by the close of 2020.

AEP’s study included a review of statutory requirements authorizing electric utilities to prepare such studies. It also identified regulatory and public policy hurdles, a number of which were addressed in legislation enacted into law in 2020.

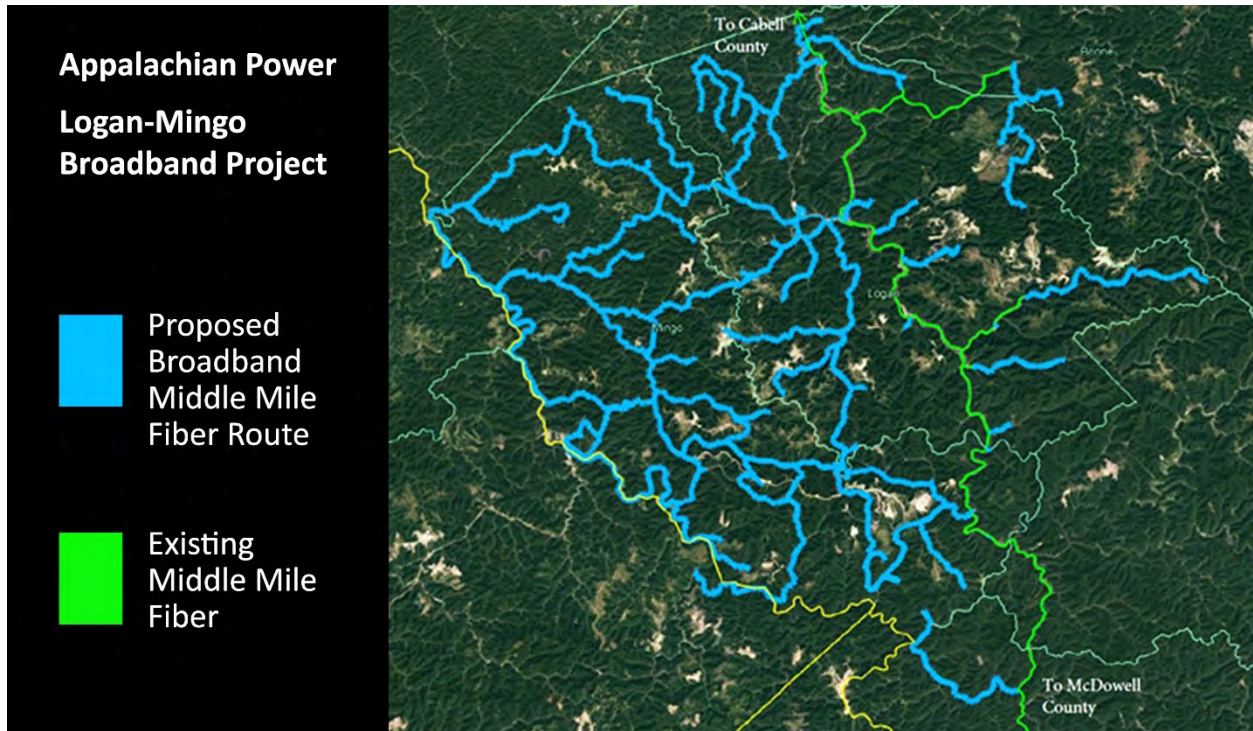


Figure 9.1: Appalachian Power Logan-Mingo Broadband

9.2 First Energy Mon Power

Monongahela Power (Mon Power) and Potomac Edison (PE) prepared and submitted a Broadband Feasibility Study for the construction of three separate projects that, taken together and fully implemented, would result in new middle mile fiber throughout ten counties – Roane, Calhoun, Gilmer, Braxton, Clay, Nicholas, Webster, Randolph, Barbour and Pocahontas counties.

The proposed project includes three distinct project areas were selected, in part, based upon the Council’s RFI, which identified key target areas in West Virginia that lacked significant broadband level connectivity. Notably, these projects would leverage projects under consideration by the U.S. Department of Agriculture (USDA) ReConnect program. The USDA projects are pending as of December 2020. Corresponding to the USDA applicant names, these project areas are known as:

- Roane Economic Development Authority, including Roane, Calhoun, Gilmer, Braxton, Clay, Nicholas, and Webster Counties,
- Greenbrier Economic Development Authority, including Pocahontas County, and
- Randolph-Barbour Southern Route, including Randolph and Barbour Counties.

The proposed network would provide utility communications and contain fiber optic strands that Mon Power and PE could lease to Internet Service Providers (ISPs) who would provide broadband internet service to end-user, “last-mile” customers through the construction of more than 430 new fiber miles and the utilization of approximately 45 existing fiber miles.

Mon Power and PE submitted its study to the Council on June 4, 2020. The Council approved the study in July 2020, concluding that the proposed project was feasible and in the interests of both Mon Power and PE and the citizens of West Virginia. In considering the proposed project’s feasibility, the Council identified one or more last-mile broadband Internet providers that may lease the middle-mile broadband internet capacity created by the proposed project pursuant to lease terms and conditions set by the Council.

9.3 Middle Mile Fiber Asset Request for Information (RFI)

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 was directed broadly to companies who deliver broadband service, operate broadband networks, and/or invest in broadband infrastructure. 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.

The RFI also requested comment from last-mile providers that may participate and help operationalize middle-mile assets such as these and further extend their reach and continued work on this initiative through 2020. Among other requests, the RFI sought interest from last-mile broadband service providers who would be interested in partnering with electric utilities offering access to middle-mile networks in unserved areas of West Virginia.

Following the initial RFI, the Council worked cooperatively with the electric utilities throughout 2020 to identify internet service providers that could be potential users of these projects, building networks to reach rural areas of West Virginia.

9.4 Federal Policy and Advocacy

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 2020, the Council continued work related to the following FCC initiatives:

1. Federal Communications Commission, Rural Digital Opportunities Fund (RDOF)

The Council provided comment on the notice of proposed rulemaking in September 2019 and continued working with internet service providers in West Virginia throughout 2020. While the RDOF Phase I Auction closed in November 2020, RDOF Phase II is expected to commence in 2021. The Council submitted comments regarding the RDOF Phase I Auction to the FCC in September 2019 and will continue to advocate for efficient broadband investment in the RDOF Phase II process.

2. Federal Communications Commission, Digital Opportunity Data Collection and Modernizing the FCC Form 477 Data Program.

The Council strongly supports the establishment of the DODC because the success of broadband expansion initiatives including the RDOF, depends heavily upon the accuracy of the data used to determine which areas are “unserved” and therefore eligible for funds. To this end, the Council supports sunseting Form 477 and implementing a new, more accurate polygon-based system of reporting with a public challenge process, which will represent service at a greater granularity than census blocks. However, the Council continues to advocate for the use of address-level data, as it provides the most granular and therefore accurate depiction of broadband availability.

Creation of an Online Portal: The Council also supports the creation of an online portal for local, state, and Tribal governmental entities, as well as members of the public, to review and dispute the broadband coverage polygons filed by internet service providers. As the Council has mentioned in previous comments submitted to the FCC, the geographic areas in West Virginia eligible for funding in the Connect America Fund Phase II auction were drastically reduced by inaccurate representations made during that application process. Allowing interested parties to submit data to contest representations will ensure that polygons are not mislabeled and wrongfully excluded from broadband expansion initiatives. This will also help the FCC more precisely target universal service dollars to areas lacking broadband service.

Crowdsourcing and USAC Data Verification: The Council also supports the FCC’s proposal to collect and use crowdsourced data, meaning data collected by the Universal Service Administrative Company (USAC) from state governments, including state public utility commissions, and local and Tribal governmental entities, as well as members of the public, about the accuracy of the coverage polygons gathered from fixed providers and to make such data publicly available.⁷

The Council encourages the FCC and USAC to structure the interface of this online data collection portal to support the submission of both 1) bulk data submissions by state and local entities, and 2) individual data submissions by members of the public. In order to standardize crowdsourced data collected by state, local, and Tribal entities, the Council encourages the FCC and USAC to create a common set of criteria for submitting crowdsourced data and has suggested key categories for this data.

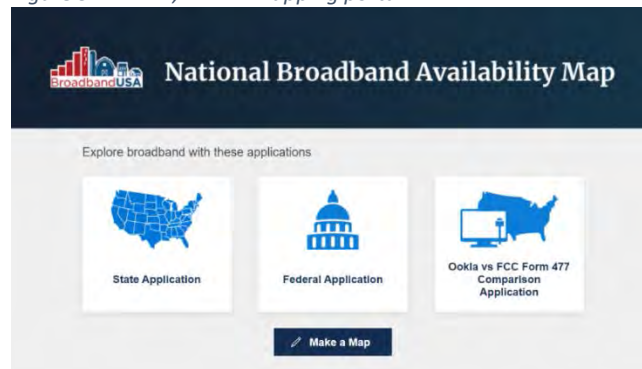
9.5 NTIA National Broadband Availability Map (NBAM) Project

West Virginia was one of the initial eight States selected by the U.S. Department of Commerce, 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. The initial eight 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.⁸

The NBAM is a secure GIS (geographic information system) platform for the visualization 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.

Figure 9.1: NTIA, NBAM mapping portal



⁷ [Establishing the Digital Opportunity Data Collection and Modernizing the FCC Form 477 Data Program, 84 Fed. Reg. 43764, ¶ 88 \(August 22, 2019\).](#)

⁸ [“NTIA Partners with 8 States on Improvements to Broadband Availability Map,”](#) ntia.doc.gov.

Interactive layers utilized in the NBAM include Ookla speed test data, FCC Form 477 data, and public entities relevant to broadband development. Users can add state data to the NBAM as well as design web maps. NTIA provides monthly webinars on the NBAM.

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.

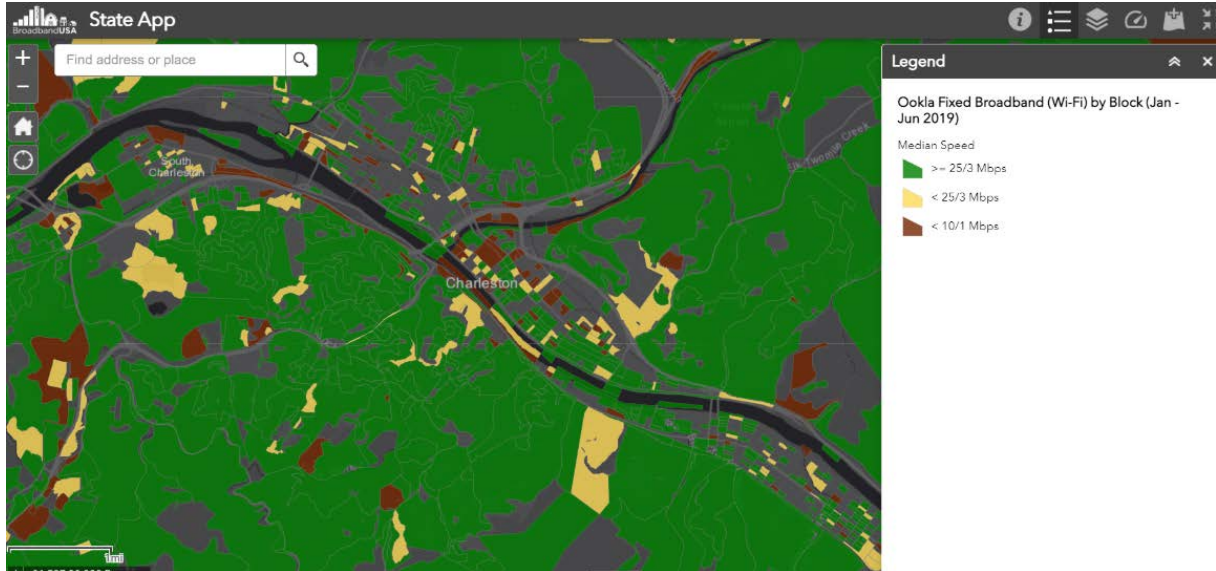


Figure 9.3: NTIA – NBAM Interactive web map featuring Ookla speed test data across census blocks

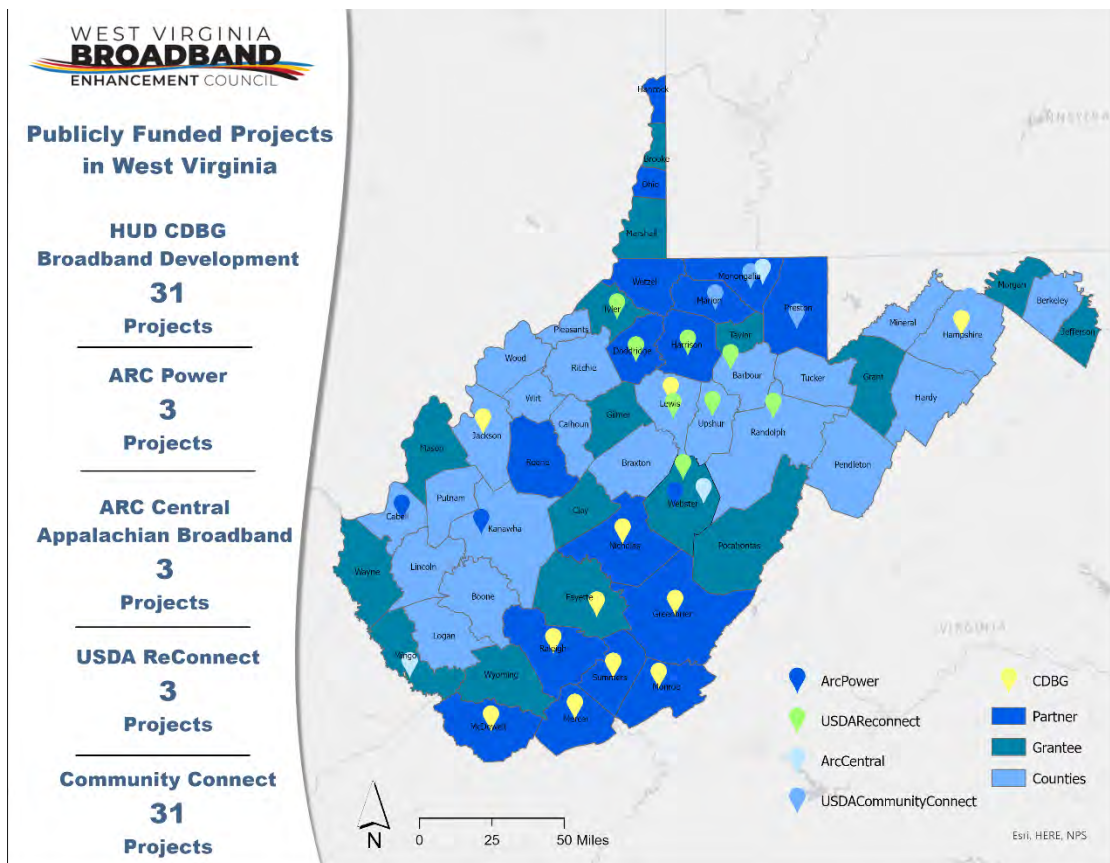
10. Broadband Investment

West Virginia leaders recognize that broadband connectivity must be part of the state’s overall economic development strategy. The projects described in this section represent numerous strategic partnerships at the state, federal and local levels. While significant challenges remain ahead, these partnerships are critical to improving connectivity in communities throughout West Virginia.

The map below details publicly funded projects in West Virginia. These projects illustrate significant growth in West Virginia’s capacity for broadband development. Since 2017, project teams throughout West Virginia have secured more than \$50 million to support local broadband projects with successful applications to numerous federal programs. Key programs detailed in this section include:

1. Appalachian Regional Commission
2. Community Development Block Grant
3. USDA Community Connect
4. USDA ReConnect
5. USDA Distance Learning and Telemedicine (DLT)
6. FCC RDOF
7. Other Broadband Infrastructure Investments

Figure 10.1 Publicly funded projects in West Virginia



10.1 Appalachian Regional Commission (ARC) Central Appalachian Broadband Initiative

In 2018, the Council and the West Virginia Development Office (WVDO) coordinated 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.

In 2020, the WVDO obtained approval from the ARC to administer broadband projects through designation as a Responsible State Basic Agency (RSBA). The RSBA designation authorized the WVDO to administer ARC funding for broadband in West Virginia.

ARC Central Appalachian Broadband Projects in West Virginia		
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

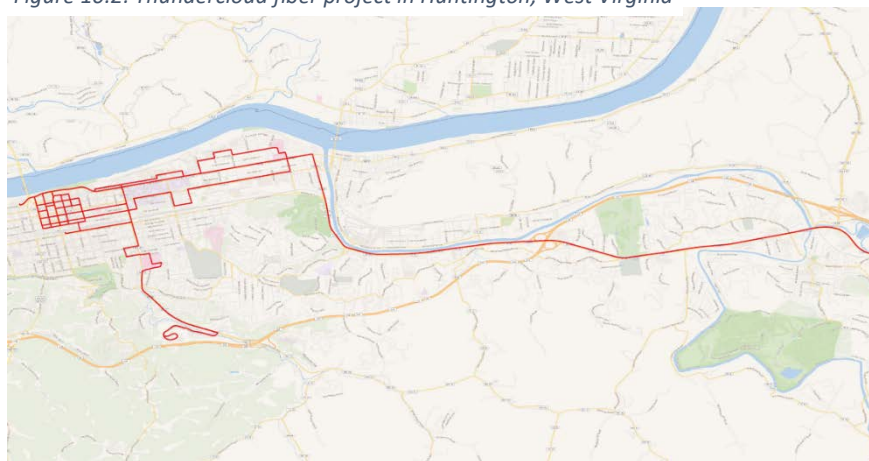
ARC Central Appalachian Broadband Projects Announced in 2019

10.2 ARC POWER

The Appalachian Regional Commission (ARC) launched the POWER (Partnerships for Opportunity and Workforce and Economic Revitalization) program to help communities and regions that have been affected by job losses in coal mining, coal power plant operations, and coal-related supply chain industries due to the changing economics of America's energy production.

Recently, ARC Power had issued an award of \$2,353,788 to Huntington, WV for the Thundercloud project: a 25-mile fiber loop that connects downtown Huntington to Barboursville, WV.

Figure 10.2: Thundercloud fiber project in Huntington, West Virginia



For more information about ARC POWER, visit: <https://www.arc.gov/funding/POWER.asp>. The 2020 POWER application cycle will begin in January 2021.

10.3 Community Development Block Grants (CDBG)

Governor Jim Justice announced the first broadband projects funded by Community Development Block Grant (CDBG) funding for broadband development projects in West Virginia in 2018. Through 2020, approximately \$6.3 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: 20 projects including 41 counties, and
2. Broadband Infrastructure: 11 projects that will provide broadband connectivity to more than 3,500 residential and business customers upon completion.

The CDBG program is one of the longest running programs of the U.S. Department of Housing and Urban Development (HUD). The CDBG broadband program has 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. The following chart summarizes CDBG infrastructure projects.

CDBG Broadband Infrastructure In West Virginia						
Applicant	Project	Amount	FY	Date Awarded	Completion	
1. Greenbrier County	Quinwood Fiber Extension	\$583,000	2019	6/3/2020	2023	
2. Meadow Bridge	Fiber Development Project	\$906,600	2019	6/3/2020	2023	
3. Monroe County	Keenan-Doss-Shaver Road Fiber	\$50,059	2019	6/3/2020	2023	
4. Raleigh County	Airport Industrial Park	\$643,999	2019	6/3/2020	2023	
5. Summers County	Talcott Area Fiber Project	\$220,500	2019	6/3/2020	2023	
6. Lewis County	Southern Lewis -Walkersville Towers	\$500,000	2018	4/1/2019	2022	
7. McDowell County	Bull Creek – Isaban Area Fiber Expansion	\$630,000	2018	4/1/2019	2022	
8. Mercer County	Cumberland Industrial Park Fiber Project	\$155,000	2018	4/1/2019	2022	
9. Hampshire County	Capon Bridge Industrial Park Fiber	\$434,137	2017	2/1/2018	2021	
10. Jackson County	Sandyville Tower Wireless Project	\$137,500	2017	2/1/2018	2021	
11. Nicholas County- Richwood	Richwood-Hinkle Mountain Hybrid Fiber-Tower Project	\$600,000	2017	2/1/2018	2023	
Total CDBG Infrastructure Awards 2017-2020		\$4,860,795				

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

The U.S. Department of Agriculture (USDA) West Virginia Rural Development team partnered with the Council to conduct a series of workshops in 2018 and 2019 to detail program requirements and encourage the development of USDA project proposals from West Virginia. Building upon this momentum, the USDA continued webinars through 2020. Training events focused on three primary USDA broadband programs:

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

10.4.1 USDA Community Connect

Applications for USDA Community Connect are accepted annually during specific application cycles, with the most recent cycle closing in December 2020. For more information about USDA Community Connect, visit <https://www.rd.usda.gov/programs-services/community-connect-grants>.

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:

USDA Community Connect Projects in West Virginia <i>Approved and Administered by U.S. Department of Agriculture</i>				
Applicant	Provider	Counties	Award	Year Awarded
1. Hampshire County Commission	HardyNet	Hampshire	\$3,000,000	2020
2. Preston County Economic Development Authority	Digital Connections-Prodigi	Preston	\$3,000,000	2019
3. ClearFiber	ClearFiber	Marion, Monongalia	\$1,960,000	2019
4. Central West Virginia Dev. Association	MicroLogic	Randolph, Barbour, Upshur	\$3,000,000	2017

Recent USDA Community Connect Projects Announced 2017-2020

10.4.2 USDA ReConnect

In December 2018, the U.S. Department of Agriculture (USDA) launched its \$600 million ReConnect Program. In 2019, during the first round of USDA ReConnect, five proposals, representing approximately \$45 million in broadband infrastructure investment, were submitted to USDA ReConnect program from West Virginia. These applications represented \$25 million requested for grant-only funding, and nearly \$20 million requested for grant-loan combinations.

A second round of USDA ReConnect funding availability began in early 2020, with three applications submitted from West Virginia on March 16, 2020. For more information about USDA ReConnect, visit <https://www.usda.gov/reconnect>.

Building upon the USDA ReConnect first-round funding awards announced in 2019, second-round awards announced in 2020 are included below:

USDA ReConnect Projects in West Virginia <i>Approved and Administered by U.S. Department of Agriculture</i>					
Applicant	Provider	Counties	Total Project Cost	USDA Award	Year
1. Citynet	Citynet	Doddridge, Barbour, Randolph, Webster	\$8,000,000	\$7,623,651 Grant	2020
2. Harrison Rural Electrification Association (HREA)	Digital Connections-Prodigi	Harrison, Doddridge, Lewis, Upshur, Barbour	\$24,999,920	\$18,700,000 Grant	2020
3. Tyler County Development Authority	Citynet	Tyler	\$3,516,000	50/50 Loan-Grant	2019
4. Regional Economic Development Partnership (RED)	Citynet	Wetzel	\$4,189,000	50/50 Loan-Grant	2019

10.4.3 USDA Distance Learning and Telemedicine

The USDA Distance Learning and Telemedicine (DLT) 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. West Virginia was strongly represented in the 2020 application cycle and funding announcements are pending as of December 2020. For more information, visit <https://www.rd.usda.gov/programs-services/distance-learning-telemedicine-grants>.

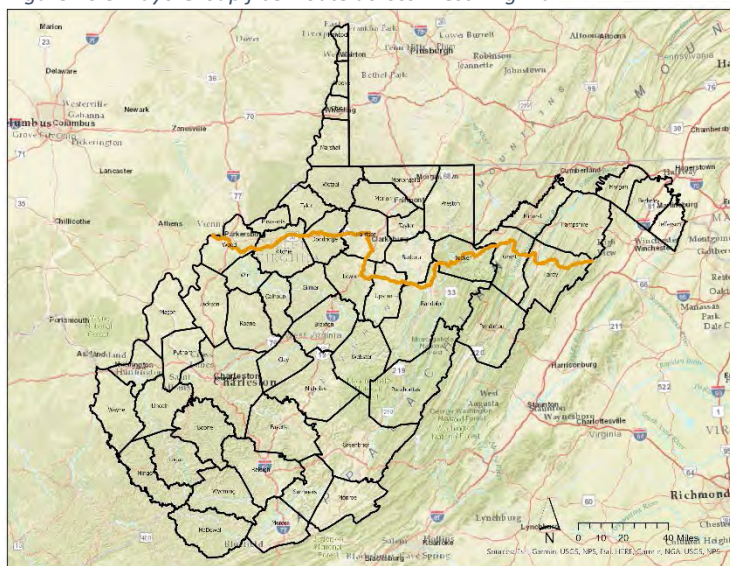
USDA Distance Learning and Telemedicine (DLT) Projects in West Virginia <i>Approved and Administered by U.S. Department of Agriculture</i>		
Applicant	Awarded Funds	Year
1. Garret County* <i>MD applicant with benefit to West Virginia</i>	\$430,000	2020
2. Cabell Huntington Hospital Foundation, Inc.	\$206,000	2019
3. Salem University, LLC	\$231,436	2019
4. Charleston Area Medical Center Health Education and Research Institute	\$163,223	2018
5. CHANGE, Inc.	\$500,000	2018
6. Toronto Board of Education* <i>OH applicant with service benefit in WV</i>	\$500,000	2018
7. Lincoln County Board of Education	\$440,295	2017
8. Charleston Area Medical Center Health Education and Research Institute	\$100,079	2017

10.5 Broadband Infrastructure Investments

10.5.1 Zayo Group

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. Zayo is in the final stages of permitting for this 200-mile fiber project. The company expects to begin construction in early 2021.

Figure 10.3: Zayo Group fiber route across West Virginia



10.5.2 Facebook: MMI

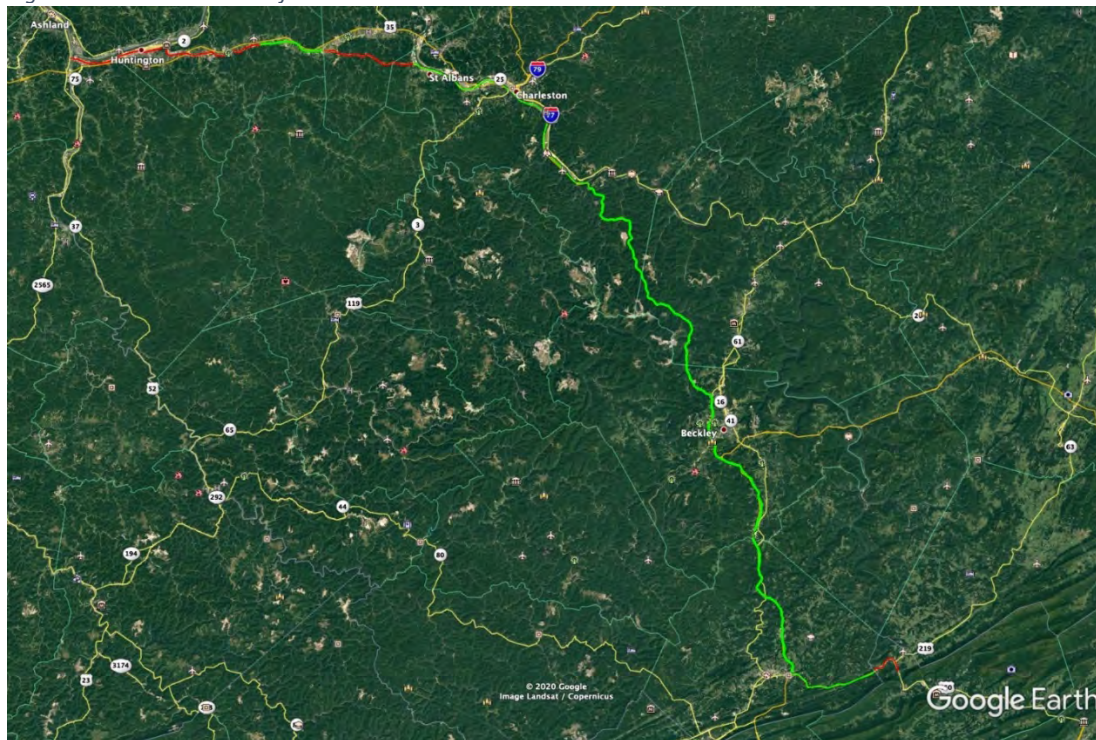
In March 2019, Facebook, through its subsidiary Middle Mile Infrastructure, announced plans to build a high capacity fiber optic cable network crossing a portion of West Virginia as part of the company's ongoing larger network infrastructure build stretching from Virginia to Ohio. The company has pledged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

A substantial portion of the construction mileage is complete. With remaining permits cleared and approved, the estimated construction completion is in the second quarter of 2021. In the image below, constructed conduit is shown in green and areas still under construction are shown in red.

Many carriers and local service providers have already inquired about capacity availability and Facebook remains committed to ensuring that excess capacity is available.

Each of the projects described in this section are part of the West Virginia'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.

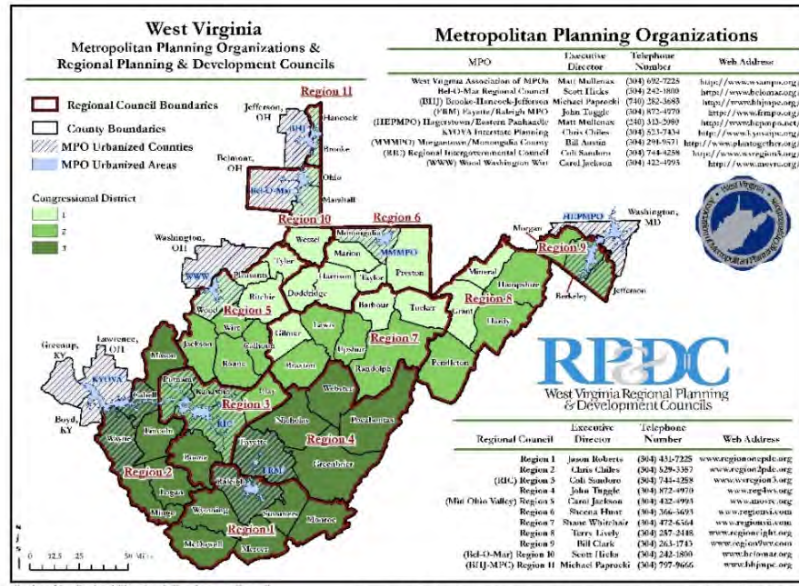
Figure 10.4: Facebook MMI fiber



10.6 Regional Planning and Development Council Partnerships

West Virginia's 11 Regional Planning and Development Councils (RPDCs) play a critical role in determining where and how public funds can be utilized for broadband development. The RPDCs assist communities in the formation of public-private partnerships. The RPDCs also provide project administration services and other essential services related to environmental review and GIS mapping.

Notably, 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.



When pursuing broadband development projects, local governments are encouraged to partner with Local Economic Development agencies and RPDCs to form a broadband development team. This team will coordinate projects with State and Federal agencies and perform essential administrative functions.

Local planning teams include residents, business owners, educators, first responders, nonprofit leaders, elected officials, technical consultants, ISPs, and other potential partners.

These local planning teams can coordinate communication with potential ISP partners and work with a State team consisting of representatives of the WVDO and the Council.

11. 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.

11.1 Mission of West Virginia Broadband Enhancement Council

The West Virginia Broadband Enhancement Council was established pursuant to legislation in 2017. 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. Pursuant 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;

(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.

11.2 Middle Mile Broadband Expansion Program

In 2020, the West Virginia Legislature passed HB 4619, which amended §24-2-1 of the W. Va Code and added a new section, §24-2-10, both of which concern the powers and duties of the West Virginia Public Service Commission (PSC). HB 4619 allows electric utilities to install “middle-mile” broadband fiber on their existing infrastructure to facilitate the expansion of broadband service into unserved and underserved areas of the State.

The **Middle-Mile Fiber Broadband Expansion Program** will be coordinated by the Council and the WVPSC and allow participating electric utilities to recover the net costs of any middle-mile fiber project. The Council must review the feasibility study and post the study on the Council’s website for written public comment for a period of seven (7) days. Within sixty (60) days, the Council shall render a determination by majority vote as to the feasibility of the proposed project and identify broadband internet providers that may be interested in leasing the middle-mile broadband internet capacity created by the project. The Council is required to produce an annual report of its consideration of feasibility studies to the Governor and the Legislature. A review of projects in development pursuant to this legislation is provided in Section 9.

11.3 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. HB 4447 created a new article of code, §17-2E-1 *et seq.*, that established the “Dig Once” policy. It directed the West Virginia Division of Highways (WVDOH) 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.

The West Virginia Division of Highways (WVDOH) has updated [guidance](#) to implementing the State’s Dig Once Policy Act. [The Dig Once Application Submission Checklist](#) is now available online.

In 2019, Senate Bill 270 amended the Dig Once Policy, W. Va. Code § 17-2E-1 *et seq.*, in addition to W. Va. Code § 17-2A-17a, which governs utility accommodation leases. Section 17-2A-17a provides that the Commissioner (Commissioner) of the WVDOH may lease real property held by the Division to accommodate any utility providing telecommunications or broadband services if the Commissioner finds that entering said lease is in the public interest. The utility is required to pay fair market value for the real property interest under the lease. Senate Bill 270 amends this section to provide that the fair market value of such property interest shall be \$0 in monetary compensation. However, the legislation does not prohibit in-kind compensation if the lease concerns multiple districts within the Division.

Senate Bill 270 amended § 17-2E-3 of the Dig Once Policy to provide that the fair market value of the Division’s spare conduit or related facilities shall be \$0 in monetary compensation. It also amends the Dig Once Policy by eliminating the newspaper notice requirements, and by reducing the notice period from thirty (30) days to fifteen (15) days.

This legislation also provided new exemptions from the Dig Once Policy’s requirements, including:

- 1) Projects that are less than 1,000 feet in length,
- 2) Projects that use the direct bury of cable or wire,
- 3) Projects that are solely for the service of entities involved in national security matters, and
- 4) Projects where the carrier installs an amount of spare conduit or innerduct equal to what is being installed for its own use and which is made available for lease to competing carriers on a nondiscriminatory basis at rates established by the FCC.

Finally, the legislation permits the WVDOH, with the Governor’s written approval, to transfer or assign ownership, control, or any rights related to any in-kind compensation received by the Division to any other state agency.

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

In 2019, 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 is codified at W. Va Code §31G-4-1 *et seq.* 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 West Virginia Public Service Commission (WVPSC) 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 filed comments in support of the new rules and urged that the WVPSC 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. Senate Bill 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 WVPSC adopted new rules implementing One-Touch Make-Ready based on the FCC's rules on December 5, 2019, 2019.⁹

11.5 West Virginia Economic Development Authority Loan Insurance Fund

Since 2018, West Virginia has provided incentives for investors to support deployment of broadband infrastructure, through a non-lapsing fund administered by the West Virginia Economic Development Authority (WVEDA). 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 W. Va. Code § 31-15-8, *et seq.*

The most significant federal program undertaken to date for the expansion of broadband service is the Federal Communication Commission's Rural Digital Opportunity Fund ("RDOF") program. The RDOF program rules were announced by a January 2020 FCC order. The phase I RDOF auction concluded on November 24, 2020. The FCC announced that it would award over \$362 million to nine winning bidders to extend broadband service in West Virginia. One of the requirements of the RDOF process is for

⁹ [General Order No. 261](#), Public Service Commission of West Virginia (December 5, 2019).

winning bidders to post a letter of credit with the FCC for up to 30% of the award amount to secure performance.

Governor Justice issued Executive Order 66-20 on September 3, 2020 pursuant to his authority to suspend statutory regulations during a state of emergency. That Executive Order mentioned the RDOF program, suspended the per recipient and program dollar limits in the BLINS program and directed the WVEDA to make modifications to the BLINS program consistent with the Executive Order.

The WVEDA, in consultation with the Council, has undertaken modifications to its guidelines for the BLINS program. The revised guidelines allow the BLINS program to be used to provide insurance to the banks that will be providing letters of credit to winning RDOF bidders.

When the state of emergency lifts, Executive Order 66-20 will no longer be effective. Consequently, statutory changes need to be adopted in the 2021 Legislative Session to enable the BLINS program to support applicants proposing broadband expansion in West Virginia using funds from RDOF and other federal programs. The Council is actively conferring with the WVEDA to develop such legislation in advance of the start of the legislative session.

Under the BLINS program prior to the Governor's Executive Order, the WVEDA could insure up to 80 percent of a bank loan for a broadband infrastructure or development project. The insured portion could not exceed \$10 million and could be for a maximum term of 20 years. The EDA's revised guidelines issued November 2020 permit the BLINS program to insure up to 100% of a letter of credit, and the cap of \$10 million per recipient has been eliminated.

Prior to the Governor's Executive Order, the program required the certification of eligibility by the Council. Since the FCC and other federal programs have extensive vetting processes, the Council will not certify eligibility to applicants that have been determined to be eligible under a federal broadband expansion program.

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

11.6 Vertical Real Estate Management and Availability Act

In 2020, HB 4015 created a new article of the W. Va Code, § 31G-1-3; §§ 31G-5-1 – 4 , known as the **Vertical Real Estate Management and Availability Act**, which requires the West Virginia Department of Administration to request proposals to manage state-owned Vertical Real Estate. "Vertical Real Estate" is defined as towers or other structures mounted on rooftops or other prominent places, and any facilities associated with that structure, including ground facilities.

All funds in excess of management fees will be deposited by the West Virginia Office of Technology (WVOT) as follows: 50 percent to the Technology Infrastructure Reinvestment Fund for reinvestment in Vertical Real Estate or other infrastructure supporting broadband on state-owned property, and 50 percent to the Broadband Expansion Fund established in § 31G-1-5 and under the control of the Council.

The West Virginia Office of Technology (WVOT) is currently researching opportunities and potential relationship links of the vertical real estate initiative with other state technology initiatives, such as modernization of the State Interoperable Radio Network (SIRN) and the state's Wide Area Network (WAN). A professional services solicitation to assist the state in drafting a Request for Proposal that addresses the full range of requirements will soon be completed.

11.7 Wireless Technology Business Property Valuation Act

This act of the Legislature creates a new article of the West Virginia Code, designated as § 11-6L-1 *et seq.* and known as the **Wireless Technology Business Property Valuation Act**. It provides for the valuation of towers constructed or erected between July 1, 2019, and July 1, 2024, that host antenna or other equipment used for transmitting cellular or wireless communications signals. Under this new article, for the five years immediately following the tower's erection, the value of the tower is its "salvage value," or five percent of its original cost. Thereafter, the value of the tower is determined in accordance with existing West Virginia Code § 11-6-1 *et seq.*

11.8 Small Wireless Facilities Deployment Act

Senate Bill 3 also creates a new chapter of the West Virginia Code, designated as § 31H-1-1 *et seq.* and known as the **Small Wireless Facilities Deployment Act**. The Legislature found that small wireless facilities, also known as small cells and distributed antenna systems, are often deployed most effectively in public rights-of-way. Therefore, this chapter allows wireless providers to collocate small wireless facilities and install, modify, or replace utility poles for such facilities in public rights-of-way. This chapter also sets rates for the occupancy and use of the rights-of-way and provides some zoning and permitting guidelines.

11.9 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 be established in West Virginia. The Council will continue its partnership with the Law Clinic to assist communities in the formation of cooperatives.

11.10 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.

11.11 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).

11.12 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.

12. 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

Taken together, these barriers make broadband deployment to unserved and underserved consumers difficult and expensive. Development barriers and challenges are briefly described here:

1. **Permitting Process:** Building broadband infrastructure involves obtaining both state and local permits, accessing utility poles and under the street conduit, and coordinating streetscape openings and road closures for construction. These processes are not necessarily synchronized or sequenced, leading to long construction delays as ISPs wait to for permission to access a pole or for approvals to close a particular street or road for construction.
2. **Access to Poles and Conduit:** The rules for accessing poles and conduit are also not always clear or expedient. Finding ways to coordinate permitting for construction and road closings and to facilitate clear, fair, and timely access to poles and conduit is also essential for broadband deployment in West Virginia.
3. **Centralized Mapping of Existing Assets:** Having access to existing assets such as towers or dark fiber helps reduce construction costs and speed deployment of broadband infrastructure, but there are often challenges discerning where these existing assets are and whether they are available to an ISP.

There is typically not a centralized mapping resource that shows these assets or a set process for accessing them. Increasing transparency around existing assets and facilitating access to them where appropriate is also helpful to decrease construction costs and increase the pace of deployment.

The Council, recognizing these many issues, to date has taken numerous actions, instituted or supported many policies, and worked with State and local officials and other stakeholders to address these challenges and barriers. The Council thanks the many stakeholders that assist them in these efforts, especially Governor Justice and the West Virginia Legislature and looks forward to the progress ahead.

13. 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.

13.1 Goals and Strategies to Improve Broadband Infrastructure

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

Lack of broadband infrastructure, particularly in the most rural parts of the State, continues to be one of the greatest challenges for the State. Reducing and Eliminating Barriers to Infrastructure Development

Permitting and access to public rights-of-way *Expediting Access to utility poles*

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: *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.

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 approved**" 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 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.

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.

13.1.1 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 3 and 4.

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 Sections 3 and 4.

13.1.2 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 **“Matching 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.

13.1.3 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.

13.1.4 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.

13.1.5 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 investors**. 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

13.1.6 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. Upon the completion of that program, the State's broadband mapping program languished until the Council revived the program in 2017. Since that time, the State's broadband mapping has continued to improve. Broadband mapping, like other infrastructure mapping, must be a continuous process.

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.

13.1.7 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.

13.1.8 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 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.

The State is modeling a cooperative approach, wherein the Council focuses its efforts on expansion of broadband infrastructure and services, while partner organizations focus on adoption, i.e., 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.

A cornerstone of this approach is the empowerment of communities through the State's creative use of Community Development Block Grant (CDBG) funding. The CDBG program is administered by the State of West Virginia under the guidelines of the U.S. Department of Housing and Urban Development (HUD). All projects funded through this program must fulfill one of three HUD National Objectives, to:

1. Benefit low- to moderate-income persons;
2. Aid in the elimination of slum or blight; and/or
3. Meet an urgent need due to a serious and immediate threat to health and welfare.

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.

Recognizing that broadband connectivity is essential for economic success, the West Virginia Development Office (WVDO) has partnered with the Council 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.

The primary objective of the CDBG program is to benefit low- and/or moderate-income persons. While CDBG funding is primarily utilized for the development of water and sewer infrastructure, the State recognizes that broadband infrastructure is a critical factor in West Virginia's ability to compete for economic development and job creation opportunities. As communities and economies become more connected, broadband infrastructure is an increasing concern, particularly among rural areas of West Virginia, and in areas in which low- to moderate-income residents do not have adequate access to this technology.

While the State does not have a formal adoption program, the utilization of CDBG funding provides assistance to local communities in their pursuit of better connectivity. Through this program, the State is building capacity for broadband development in areas that lack resources and creating a process through which these areas can seek funding for broadband infrastructure development. As the program evolves, adoption strategies can be executed through State and local partnerships or additional program enhancements.

13.1.9 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 online 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. Online classes and online 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.

K-12 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.

13.1.10 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 online training and continuing education best practices for local organizations who support workforce development efforts in their communities.*

Access to broadband service opens 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.

13.1.11 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.

13.1.12 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 online.

STRATEGY: *Designate a lead organization to support the deployment of broadband applications for State and local government agencies to deliver high-quality online 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 online, 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 online information and services would foster the development and use of broadband services for the purpose of better serving the public.

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

To support the enhanced broadband mapping initiative outlined in Sections 3 and 4, 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 (RF) engineer
4. Field inspectors qualified to document cable and fiber outside plant and wireless signal strength
5. Ombudsman to serve as expediter 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, The Council will need assistance and partnership from other State and local agencies.

2020-2025 Five-Year Broadband Plan 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; Regional Planning & Development Councils	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	9.1.1.3		

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
		Services; Legislature; ISPs, Utility Pole Owners, including Electric Utilities and Municipalities; Municipalities: Regional Planning & Development Councils			
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; Regional Planning & Development Councils	9.1.4		
Have multiple “Gigabit ready” cities and counties	Provide a roadmap for cities and counties to demonstrate that they are	Economic Development Authority; Department of Commerce, Development Office; City and	9.1.5		

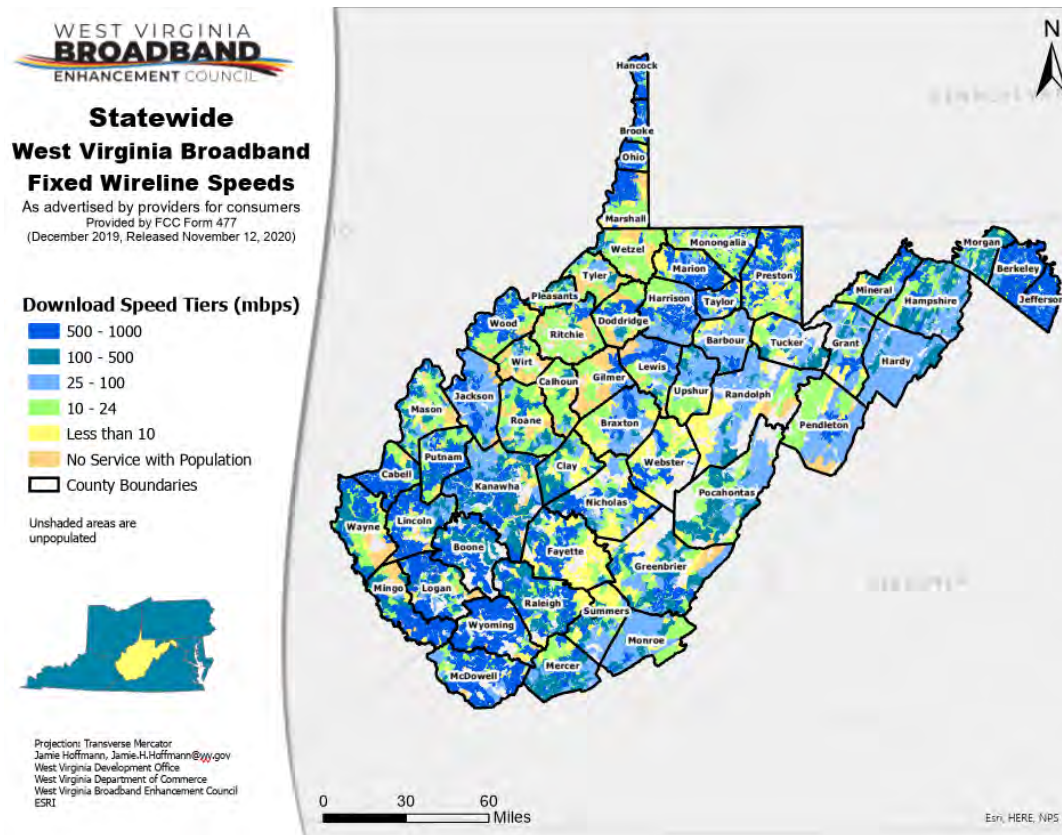
Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
	ready for private investments in gigabit infrastructure.	County Officials and Boards; Local Economic Development, Regional Planning & Development Councils; Authorities; Chambers of Commerce			
Have 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 online 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		
	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		

Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
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	Designate lead organization(s) to act as a clearinghouse of information on online training and continuing education best practices for local organizations who support workforce development efforts in their communities.	Department of Commerce, Workforce West Virginia; Library Commission; Department of Education; Higher Education Policy Commission; WV Community and Technical College System	9.3.2		
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		

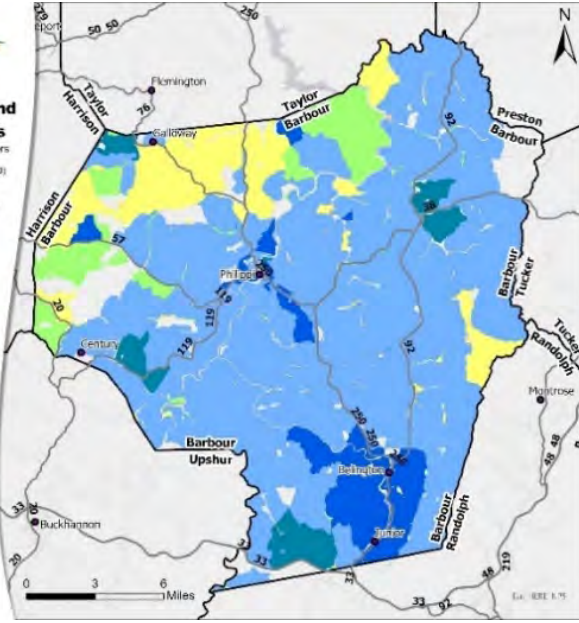
Goal	Strategy	Key Sector Partners	Plan Section	Council Priority/ Timeline	Additional Resources Needed
Support the ability of State and local government to deliver citizens access to a range of government services online	Designate lead organization(s) to support the deployment of broadband applications for State and local government agencies to deliver high-quality online services.	WV Office of Technology; State Agencies; Municipal and County Agencies	9.3.4		

WEST VIRGINIA BROADBAND ENHANCEMENT COUNCIL

Appendix A - FCC Broadband Availability

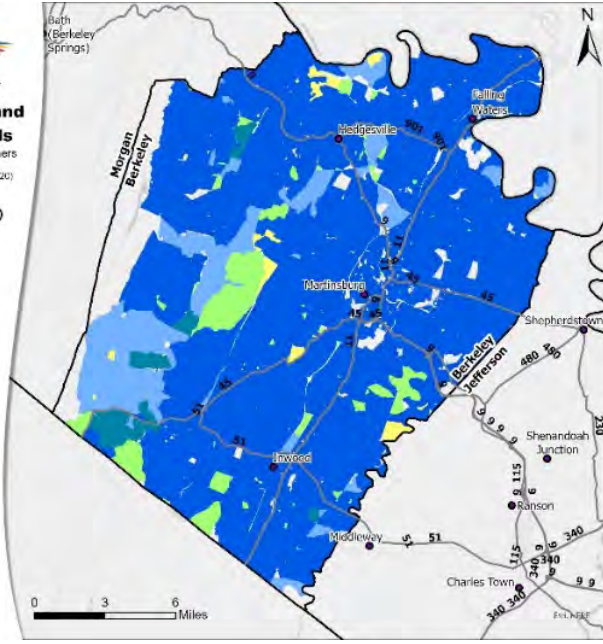
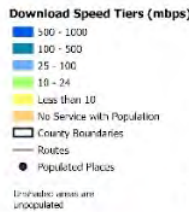


Barbour County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



Barbour				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Charter Communications, Inc.	Charter Communications Inc	4	940	35
Citynet Holdings, LLC	Citynet LLC	102	253	251
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	4	987	35
Frontier Communications Corporation	CTC West Virginia St Marys	17	26	2
Frontier Communications Corporation	Frontier West Virginia	147	39	2
Micrologic, Inc.	Micrologic	327	25	4
Shenandoah Telecommunications Company	Shentel	168	1000	10
Skybeam, Inc.	Rise Broadband	1	50	5
Suddenlink Communications	Suddenlink Communications	7	89	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	117	2	0.064
County Total		894	341	35

Berkeley County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



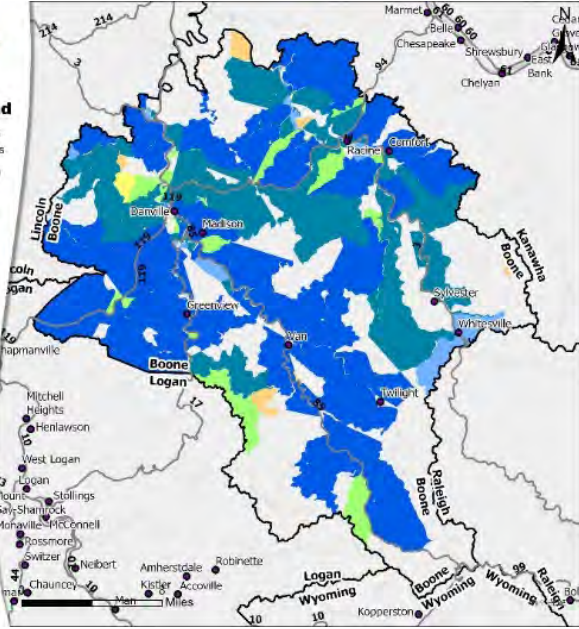
Berkeley				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
All Points Broadband	All Points Broadband	8	25	3
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1707	985	35
Frontier Communications Corporation	CTC West Virginia Bluefield	4	41	3
Frontier Communications Corporation	Frontier West Virginia	215	31	2
Telegia Communications Inc.	Telegia Communications, Inc.	16	30	15
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	12	2	0.064
County Totals		1962	186	10

Boone County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Prepared: Thomas M. Marston
Data: FCC Form 477
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
©2020



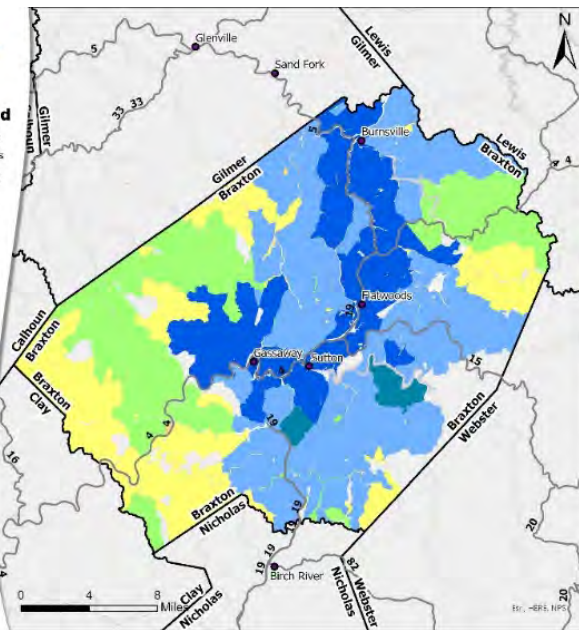
Boone					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	11	1000	291	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	4	987	35	
Frontier Communications Corporation	Frontier West Virginia	244	36	4	
Shenandoah Telecommunications Company	Shentel	278	1000	10	
Suddenlink Communications	Suddenlink Communications	415	455	36	
County Totals		952	696	75	

Braxton County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Prepared: Thomas M. Marston
Data: FCC Form 477
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
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Braxton					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	3	758	27	
Frontier Communications Corporation	CTC West Virginia Mountain State	42	20	1	
Frontier Communications Corporation	CTC West Virginia St Marys	21	12	1	
Frontier Communications Corporation	Frontier West Virginia	162	16	1	
Micrologic, Inc.	Micrologic	153	25	4	
Shenandoah Telecommunications Company	Shentel	300	1000	10	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	173	2	0.064	
County Totals		854	262	6	

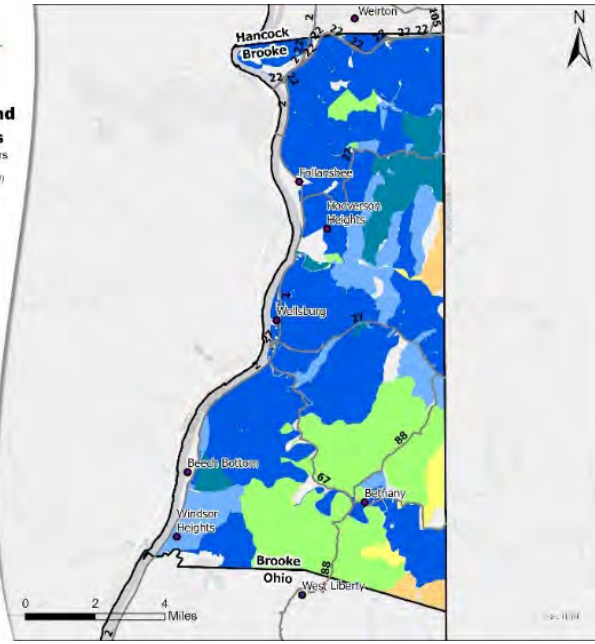


Brooke County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Routes
 - Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
 Author: John H. Johnson, James H. Johnson
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
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Brooke					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	
blue devil cable television inc	Blue Devil Cable	50	25	5	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	561	985	35	
Freund Enterprises Inc.	Access Ohio Valley Internet	9	20	5	
Frontier Communications Corporation	Frontier West Virginia	79	40	5	
Massillon Cable TV, Inc.	MCTV	47	100	10	
County Totals		746	234	12	

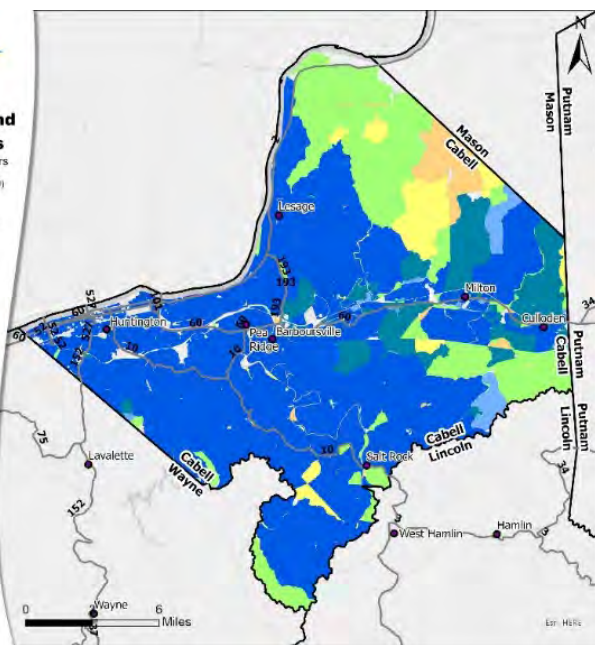


Cabell County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Routes
 - Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
 Author: John H. Johnson, James H. Johnson
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 ©2020



Cabell					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company-WV	Armstrong Telephone Company - WV	2	10	1	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	137	1000	25	
Arx Technologies, LLC	Arx Web	1	75	8	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1532	987	35	
Frontier Communications Corporation	CTC West Virginia St Marys	14	7	1	
Frontier Communications Corporation	Frontier West Virginia	255	22	2	
Suddenlink Communications	Suddenlink Communications	267	528	39	
County Totals		2208	376	16	

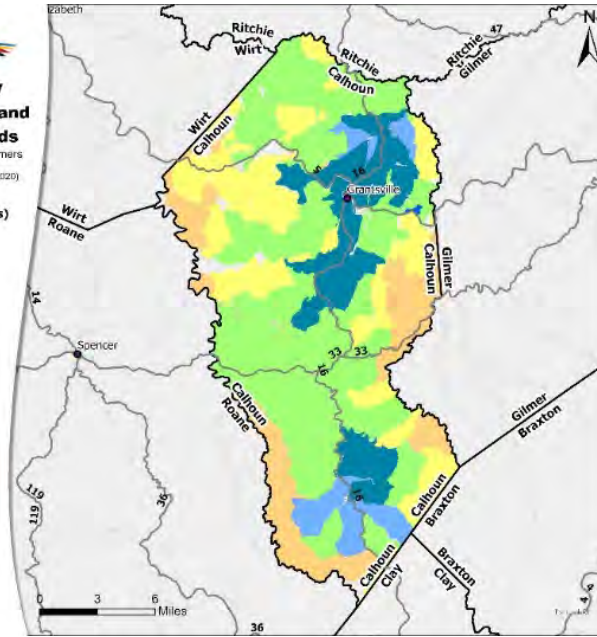
Calhoun County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
- Unshaded areas are unpopulated



Prepared by: Tracey Keroses
James Hoffmann, Senior Information Systems
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020



Calhoun					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	3	10	1	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35	
Frontier Communications Corporation	CTC West Virginia St Marys	265	14	2	
Frontier Communications Corporation	Frontier West Virginia	3	11	1	
Shenandoah Telecommunications Company	Shentel	76	150	10	
Suddenlink Communications	Suddenlink Communications	1	1000	50	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	7	2	0.064	
County Totals		356	311	14	

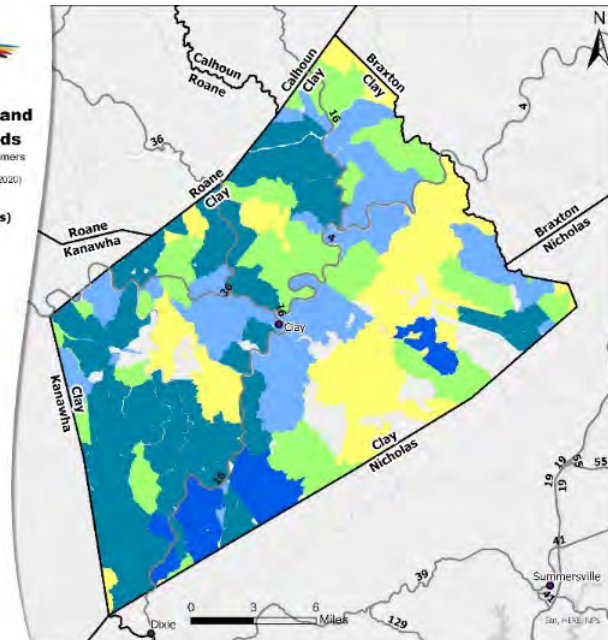
Clay County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
- Unshaded areas are unpopulated



Prepared by: Tracey Keroses
James Hoffmann, Senior Information Systems
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020



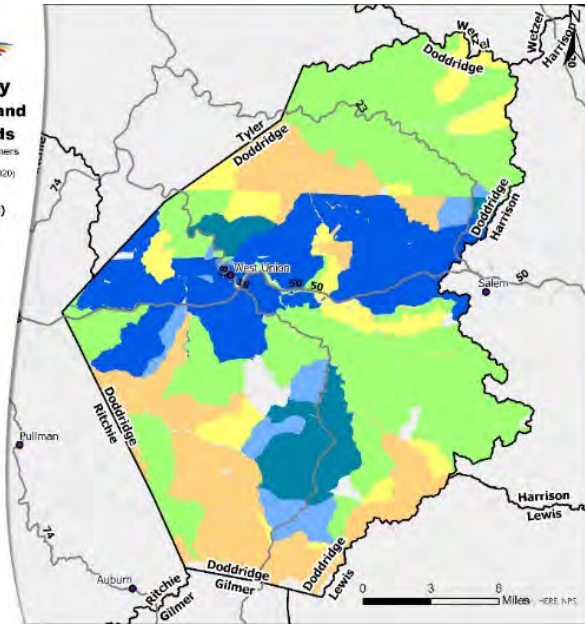
Clay					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	8	386	13	
Frontier Communications Corporation	CTC West Virginia St Marys	278	33	4	
Frontier Communications Corporation	Frontier West Virginia	82	45	3	
Suddenlink Communications	Suddenlink Communications	41	470	35	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	96	2	0.064	
County Totals		505	187	11	

Doddridge County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Projection: Tennessee Mercator
State: West Virginia
Data: Federal Communications Commission
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
ES&C



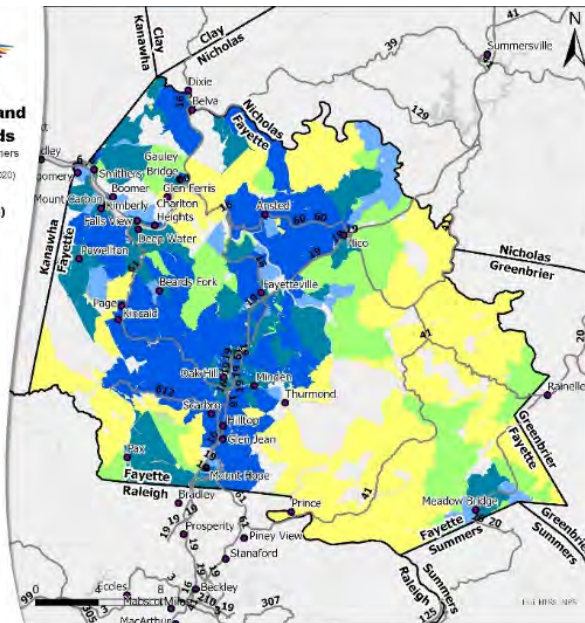
Doddridge				
Provider Name	DBA Name	Census Block Served	Average Download Speed	Average Upload Speed
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	9	10	1
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	90	1000	25
Frontier Communications Corporation	CTC West Virginia Mountain State	2	7	1
Frontier Communications Corporation	CTC West Virginia St Marys	5	12	1
Frontier Communications Corporation	Frontier West Virginia	223	19	1
Micrologic, Inc.	Micrologic	6	25	4
Shenandoah Telecommunications Company	Shentel	40	1000	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	1	2	0.064
County Totals		376	259	5

Fayette County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



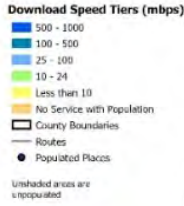
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State: West Virginia
Data: Federal Communications Commission
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
ES&C



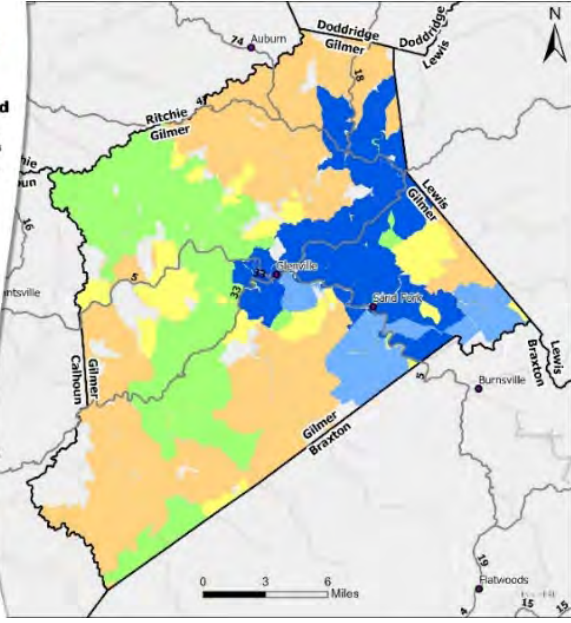
Fayette				
Provider Name	DBA Name	Census Block Served	Average Download Speed	Average Upload Speeds
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35
Frontier Communications Corporation	CTC West Virginia St Marys	3	115	7
Frontier Communications Corporation	Frontier West Virginia	567	34	3
Shenandoah Telecommunications Company	Shentel	344	1000	10
Suddenlink Communications	Suddenlink Communications	708	472	37
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	245	2	0.064
County Totals		1868	435	15



Gilmer County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



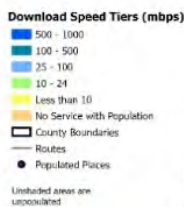
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 Datum: North American Datum of 1983
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 ESRI



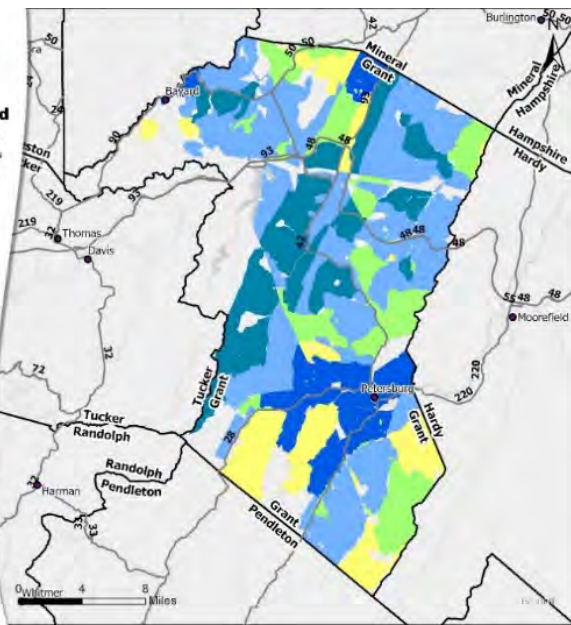
Gilmer					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	8	10		1
Frontier Communications Corporation	CTC West Virginia St Marys	18	10		1
Frontier Communications Corporation	Frontier West Virginia	157	12		1
Micrologic, Inc.	Micrologic	13	25		4
Shenandoah Telecommunications Company	Shentel	157	995		10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	7	2		0.064
County Totals		360	176		3



Grant County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



Projection: NAD83 West Virginia
 Spheroid: GRS80
 Datum: North American Datum of 1983
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 ESRI



Grant					
Provider Name	DBA Name	Census Block Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	7	398		14
Frontier Communications Corporation	CTC West Virginia Bluefield	264	26		3
Frontier Communications Corporation	CTC West Virginia St Marys	2	70		5
Frontier Communications Corporation	Frontier West Virginia	39	36		2
Hardy Telecommunications Inc	HardyNet, Inc.	12	69		67
Hardy Telecommunications, Inc CLEC	HardyNet, Inc.	7	76		72
Micrologic, Inc.	Micrologic	32	25		4
Shenandoah Telecommunications Company	Shentel	208	1000		10
Spruce Knob Seneca Rocks Telephone, Inc.	Spruce Knob Seneca Rocks Telephone, Inc.	3	18		5
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	66	2		0.064
County Totals		640	172		18



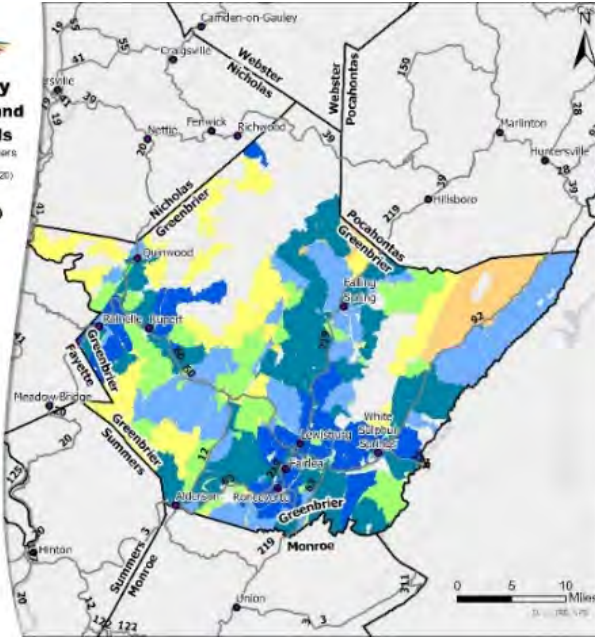
Greenbrier County West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Followed November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
Routes
Populated Places
- Unshaded areas are unpopulated



Provider: Tennessee Provider
Jesse Williams, jesse.williams@provider.com
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020



Greenbrier				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Countrymen Communications	CountryMen Communications	24	75	30
Frontier Communications Corporation	CTC West Virginia Mountain State	126	57	4
Frontier Communications Corporation	CTC West Virginia St Marys	118	17	1
Frontier Communications Corporation	Frontier West Virginia	430	31	2
GigaBeam Networks LLC	GigaBeam Networks LLC	13	50	3
Shenandoah Telecommunications Company	Shentel	134	1000	10
Suddenlink Communications	Suddenlink Communications	608	444	36
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	228	2	0.064
County Totals		1681	210	11



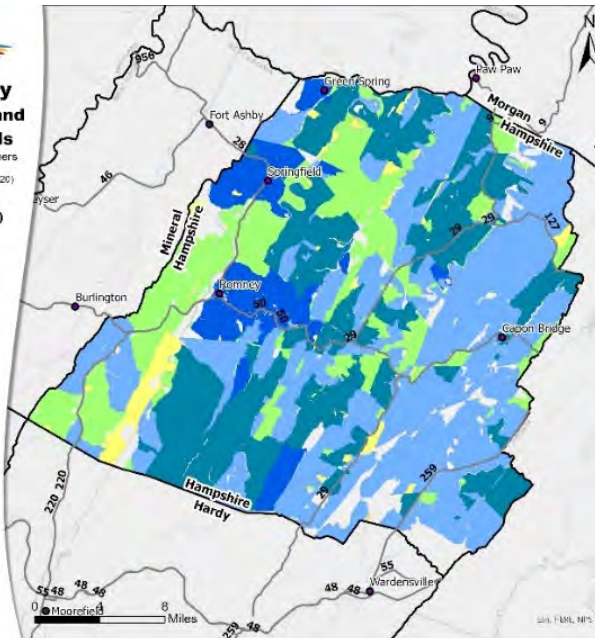
Hampshire County West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2016, Followed November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
Routes
Populated Places
- Unshaded areas are unpopulated



Provider: Tennessee Provider
Jesse Williams, jesse.williams@provider.com
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020



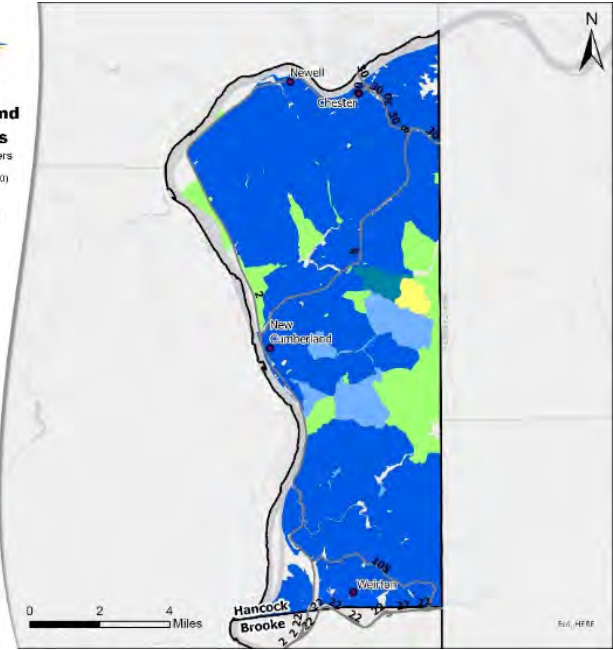
Hampshire				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	135	1000	50
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	6	873	31
Frontier Communications Corporation	CTC West Virginia Bluefield	855	36	2
Hardy Telecommunications Inc	HardyNet, Inc.	20	100	100
Hardy Telecommunications, Inc CLEC	HardyNet, Inc.	35	100	100
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	109	2	0.064
County Totals		1160	352	47



Hancock County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



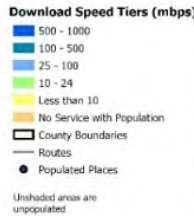
Projection: Transverse Mercator
 Janes Hillman, Janes.Hillman@wv.gov
 West Virginia Development Office
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 1541



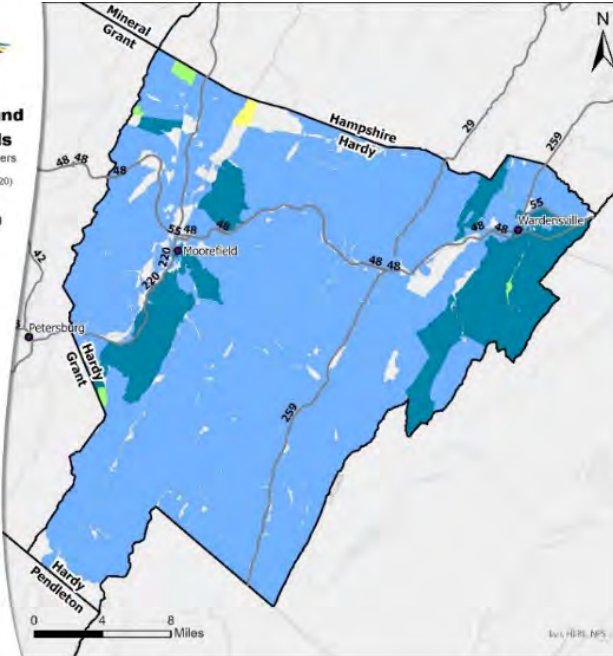
Hancock				
Provider Name	DBA Name	Census Block Served	Average Download Speed	Average Upoad Speed
Agile Network Builders	Agile Networks	1	25	5
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	796	987	35
Freund Enterprises Inc.	Access Ohio Valley Internet	2	20	5
Frontier Communications Corporation	Frontier West Virginia	64	21	3
County Totals		863	263	12



Hardy County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



Projection: Transverse Mercator
 Janes Hillman, Janes.Hillman@wv.gov
 West Virginia Development Office
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 1541



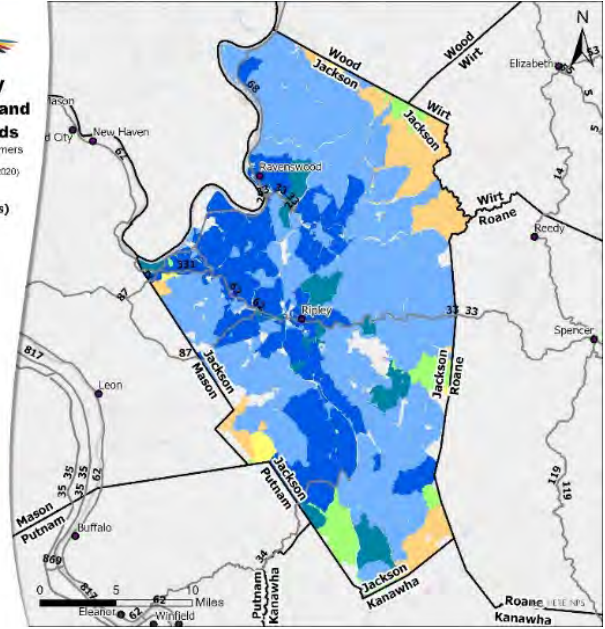
Hardy				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Frontier Communications Corporation	CTC West Virginia Bluefield	103	82	5
Hardy Telecommunications Inc	HardyNet, Inc.	380	99	99
Hardy Telecommunications, Inc CLEC	HardyNet, Inc.	256	100	100
Shenandoah Telecommunications Company	Shentel	3	1000	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	10	2	0.064
County Totals		752	256	43

Jackson County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Provider: Business Manager
 James Hoffmann, James Hoffmann@wvbc.org
 West Virginia Broadband Office
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 2020



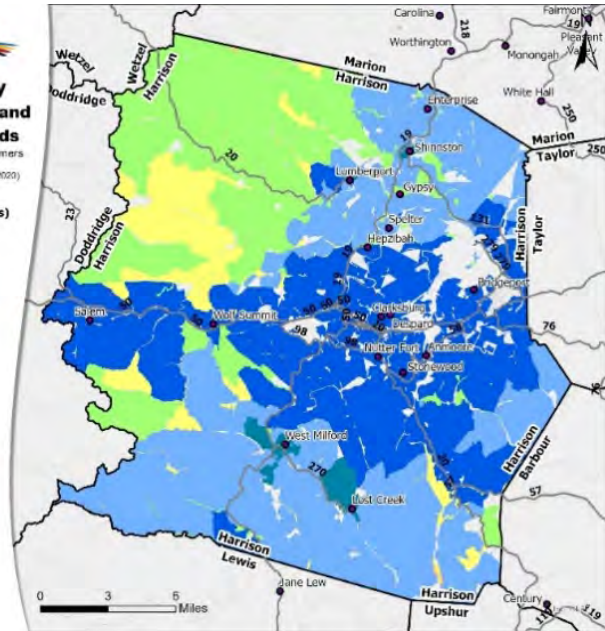
Jackson				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	10	10	1
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	300	10
Community Antenna Service Inc.	Community Antenna Service, Inc.	293	1000	75
Frontier Communications Corporation	CTC West Virginia St Marys	3	16	1
Frontier Communications Corporation	Frontier West Virginia	152	39	3
RT21.NET	RT21.NET	542	50	50
Suddenlink Communications	Suddenlink Communications	125	490	37
County Totals		1126	272	25

Harrison County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Provider: Business Manager
 James Hoffmann, James Hoffmann@wvbc.org
 West Virginia Broadband Office
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 2020



Harrison				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Charter Communications, Inc.	Charter Communications Inc	1401	940	35
Citynet Holdings, LLC	Citynet LLC	40	1000	1000
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	13	987	35
Frontier Communications Corporation	CTC West Virginia Mountain State	4	18	1
Frontier Communications Corporation	CTC West Virginia St Marys	119	15	1
Frontier Communications Corporation	Frontier West Virginia	360	38	3
Micrologic, Inc.	Micrologic	112	25	4
Shenandoah Telecommunications Company	Shentel	111	1000	10
Suddenlink Communications	Suddenlink Communications	325	96	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	122	2	0.064
County Totals		2607	412	110



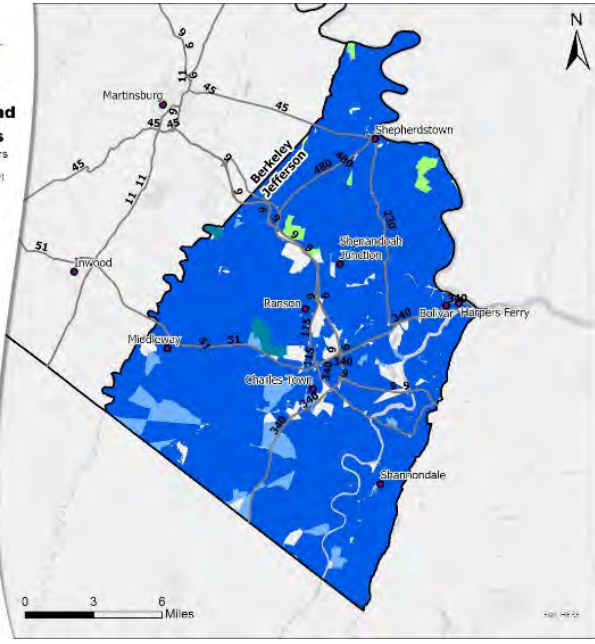
Jefferson County
West Virginia Broadband

Fixed Wireline Speeds
As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



Projection: Transverse Mercator
Datum: GRS80, Spheroid: Everest
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
09/21



Jefferson					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
All Points Broadband	All Points Broadband	58	25	3	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1174	987	36	
Frontier Communications Corporation	CTC West Virginia Bluefield	26	41	15	
Frontier Communications Corporation	Frontier West Virginia	1	9	1	
Telegia Communications Inc.	Telegia Communications, Inc.	11	30	15	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	6	2	0.064	
County Totals		1276	182	12	



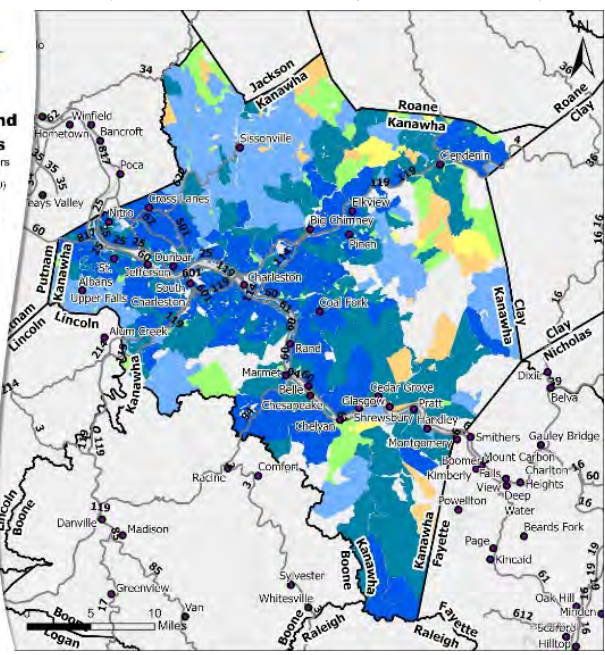
Kanawha County
West Virginia Broadband

Fixed Wireline Speeds
As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



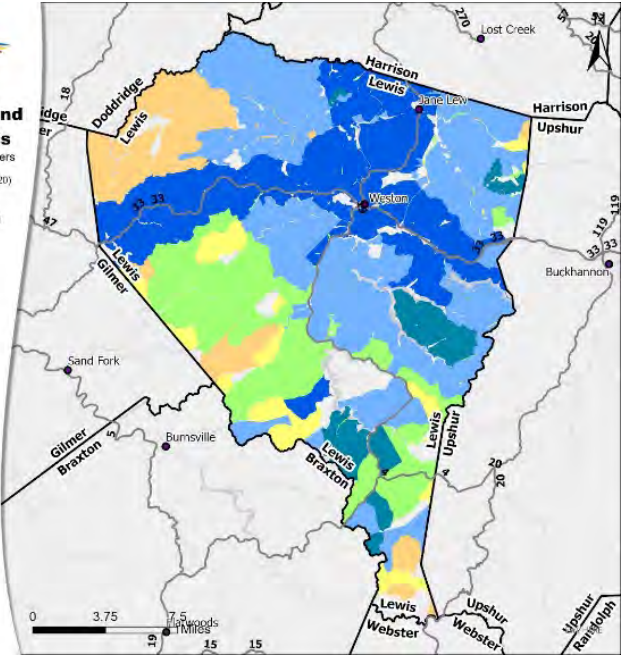
Projection: Transverse Mercator
Datum: NAD83, Spheroid: North American
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
LR1



Kanawha					
Provider Name	DBA Name	Census Blocks Served	Average Download Speeds	Average Upload Speed	
Alpha Technologies Inc	Alpha Technologies Inc	1	1000	1000	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	26	670	23	
Frontier Communications Corporation	CTC West Virginia St Marys	2	9	1	
Frontier Communications Corporation	Frontier West Virginia	1342	33	2	
Suddenlink Communications	Suddenlink Communications	4071	504	37	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	2	2	0.064	
County Totals		5444	370	177	



Lewis County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

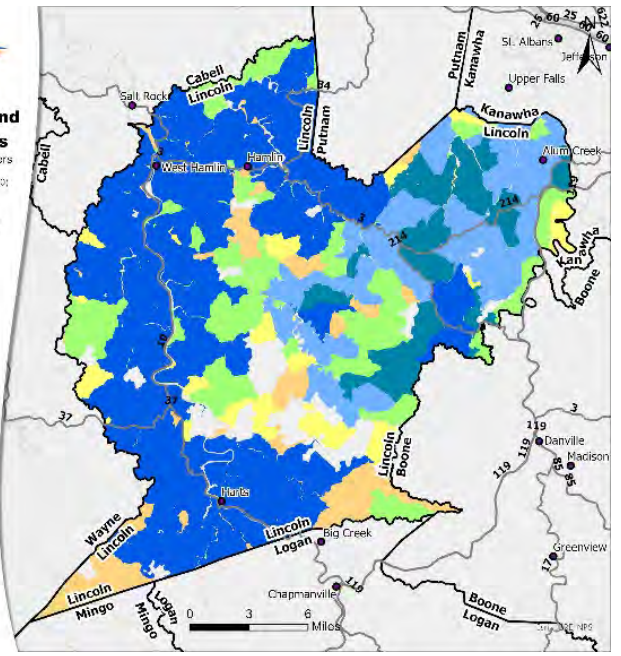


Projection: Transverse Mercator
 James H. Williams, James H. Williams/GIS/Geography
 West Virginia Department of Commerce
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 R201

Lewis					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	644	23	
Frontier Communications Corporation	CTC West Virginia Mountain State	105	29	2	
Frontier Communications Corporation	Frontier West Virginia	95	21	1	
Micrologic, Inc.	Micrologic	98	25	4	
Shenandoah Telecommunications Company	Shentel	497	1000	10	
Suddenlink Communications	Suddenlink Communications	16	92	10	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	18	2	0.064	
County Totals		831	259	7	



Lincoln County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



Projection: Transverse Mercator
 James H. Williams, James H. Williams/GIS/Geography
 West Virginia Department of Commerce
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 R201

Lincoln					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company-WV	Armstrong Telephone Company - WV	37	10	1	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	241	1000	29	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	987	35	
Frontier Communications Corporation	CTC West Virginia St Marys	103	9	1	
Frontier Communications Corporation	Frontier West Virginia	220	35	2	
Shenandoah Telecommunications Company	Shentel	6	1000	10	
Suddenlink Communications	Suddenlink Communications	76	167	14	
County Totals		685	458	13	



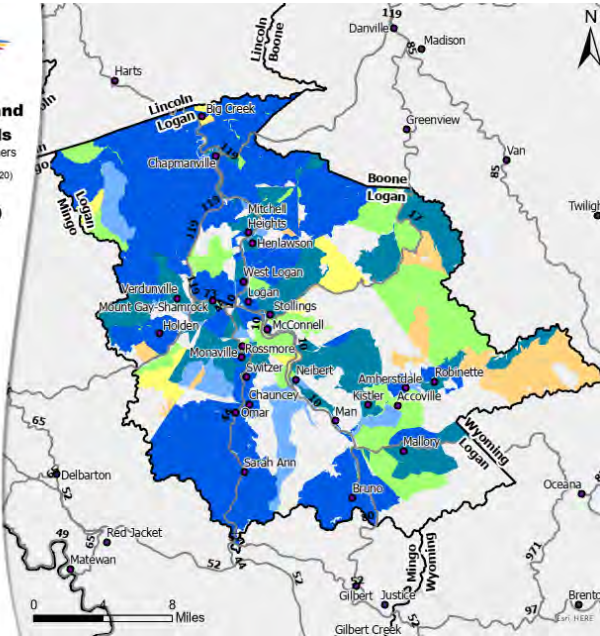
Logan County
West Virginia Broadband

Fixed Wireline Speeds
As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (Mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Routes
 - Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
Janis Hoffmann, Janis.Hoffmann@wv.gov
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
©2020



Logan				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	62	1000	104
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35
Frontier Communications Corporation	Frontier West Virginia	462	31	2
Shenandoah Telecommunications Company	Shentel	157	1000	10
Suddenlink Communications	Suddenlink Communications	435	504	38
County Totals		1117	704	38



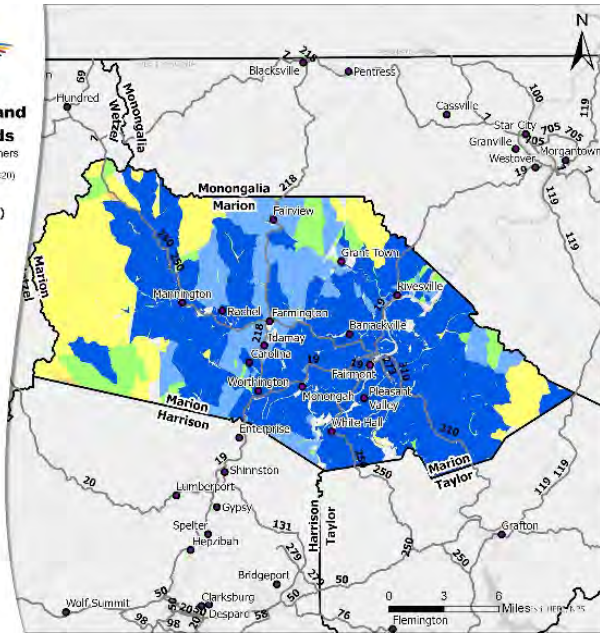
Marion County
West Virginia Broadband

Fixed Wireline Speeds
As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (Mbps)**
- 500 - 1000
 - 100 - 500
 - 75 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Routes
 - Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
Janis Hoffmann, Janis.Hoffmann@wv.gov
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
©2020



Marion				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Charter Communications, Inc.	Charter Communications Inc	659	940	35
Citynet Holdings, LLC	Citynet LLC	1	1000	1000
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	898	987	35
Frontier Communications Corporation	CTC West Virginia Mountain State	9	11	1
Frontier Communications Corporation	CTC West Virginia St Marys	33	13	1
Frontier Communications Corporation	Frontier West Virginia	231	36	2
Micrologic, Inc.	Micrologic	82	25	4
Suddenlink Communications	Suddenlink Communications	90	97	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	119	2	0.064
West Side Telecommunications	Westco Internet	1	25	3
County Totals		2123	314	109

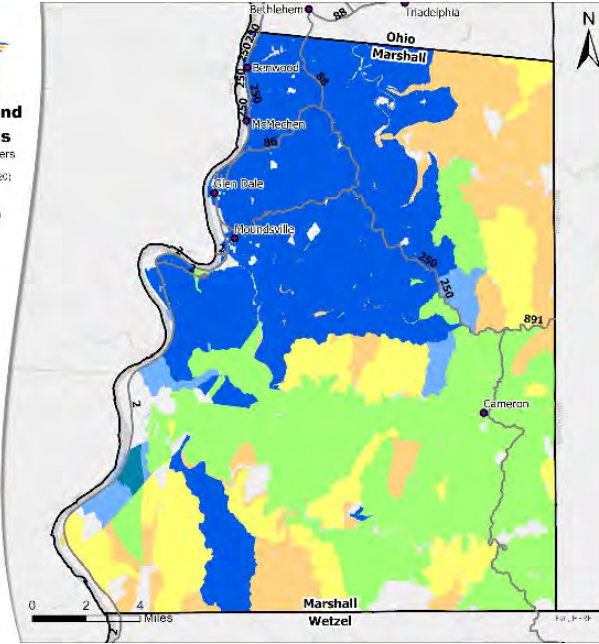


Marshall County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Projection: Transverse Mercator
Units: Feet
Datum: North American Datum of 1983
Spheroid: Geoid
Datum: North American Datum of 1983
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
10/24

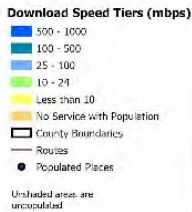


Marshall					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Citynet Holdings, LLC	Citynet LLC	10	7	1	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	860	987	35	
Frontier Communications Corporation	CTC West Virginia Mountain State	125	15	1	
Frontier Communications Corporation	Frontier West Virginia	142	17	1	
Massillon Cable TV, Inc.	MCTV	2	100	10	
County Totals		1139	225	10	

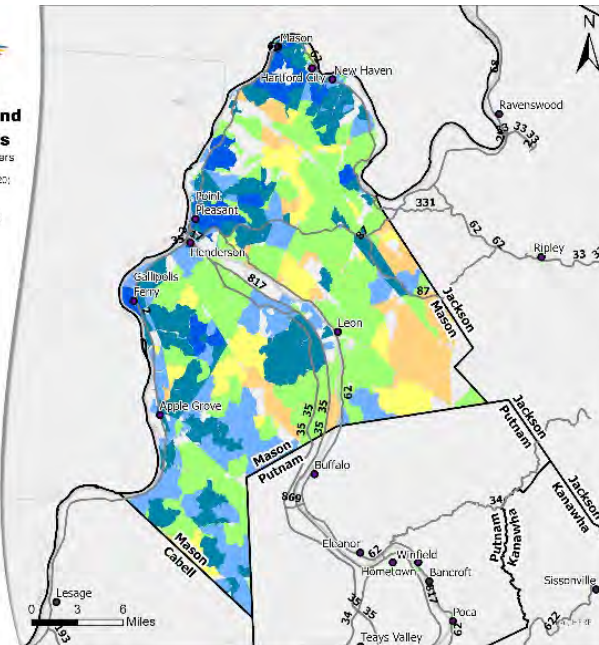


Mason County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Projection: Transverse Mercator
Units: Feet
Datum: North American Datum of 1983
Spheroid: Geoid
Datum: North American Datum of 1983
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
10/24



Mason					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	2	1000	25	
Community Antenna Service Inc.	Community Antenna Service, Inc.	2	1000	75	
Frontier Communications Corporation	CTC West Virginia St Marys	222	31	3	
Frontier Communications Corporation	Frontier West Virginia	518	32	3	
JB-Nets	JB-Nets LLC	55	30	30	
RT21.NET	RT21.NET	5	50	50	
Suddenlink Communications	Suddenlink Communications	397	473	38	
County Totals		1201	374	32	



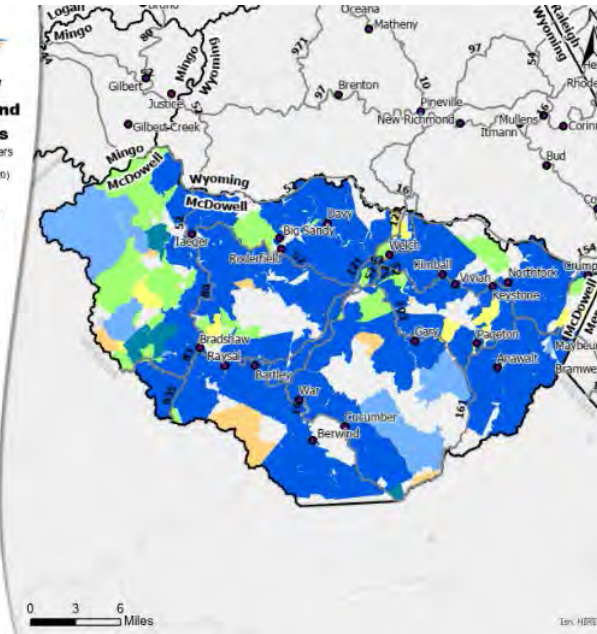
McDowell County West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



Projection: Transverse Mercator
Janice Hoffmann, James J. Hoffmann/Geogary
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
©2021



McDowell				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
A&A Communications llc	A&A Communications llc	19	40	3
Charter Communications, Inc.	Charter Communications Inc	5	300	20
Frontier Communications Corporation	CTC West Virginia Bluefield	95	11	1
Frontier Communications Corporation	Frontier West Virginia	101	23	2
GigaBeam Networks LLC	GigaBeam Networks LLC	14	50	3
Shenandoah Telecommunications Company	Shentel	924	1000	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	1	2	0.064
War Telephone LLC	Otelco	1	10	1
County Totals		1160	180	5



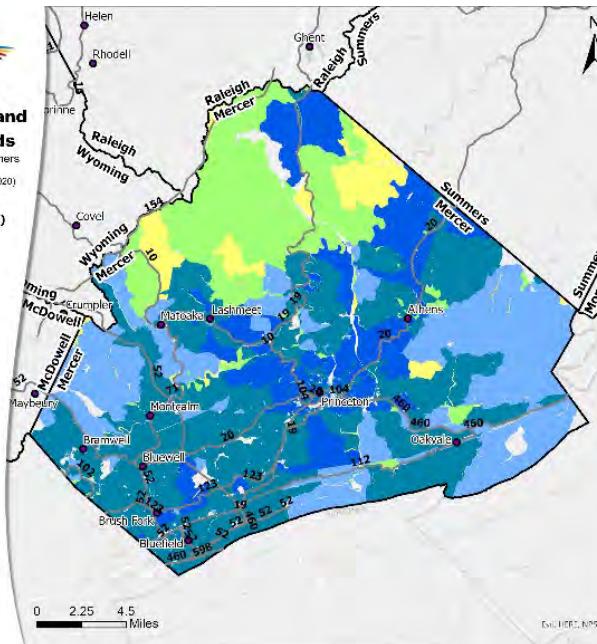
Mercer County West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



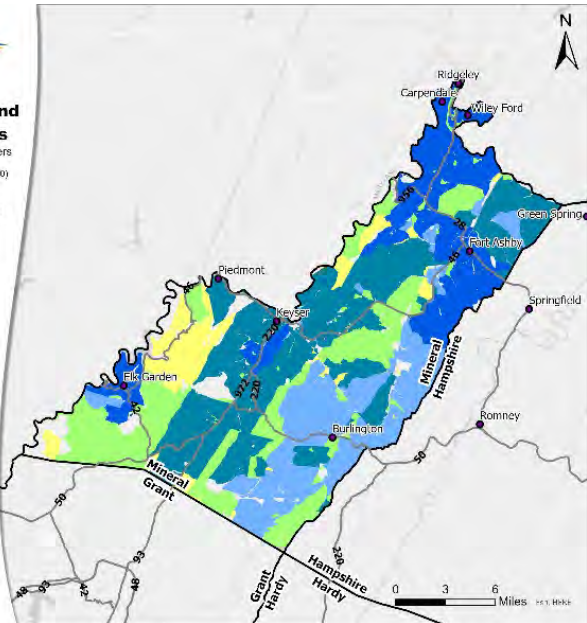
Projection: Transverse Mercator
Janice Hoffmann, James J. Hoffmann/Geogary
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
©2021



Mercer				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	727	303	10
Frontier Communications Corporation	CTC West Virginia Bluefield	314	24	2
Frontier Communications Corporation	Frontier West Virginia	11	25	2
GigaBeam Networks LLC	GigaBeam Networks LLC	275	237	199
Shenandoah Telecommunications Company	Shentel	4	1000	10
Suddenlink Communications	Suddenlink Communications	644	524	40
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	62	2	0.064
County Totals		2037	302	37

Mineral County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated

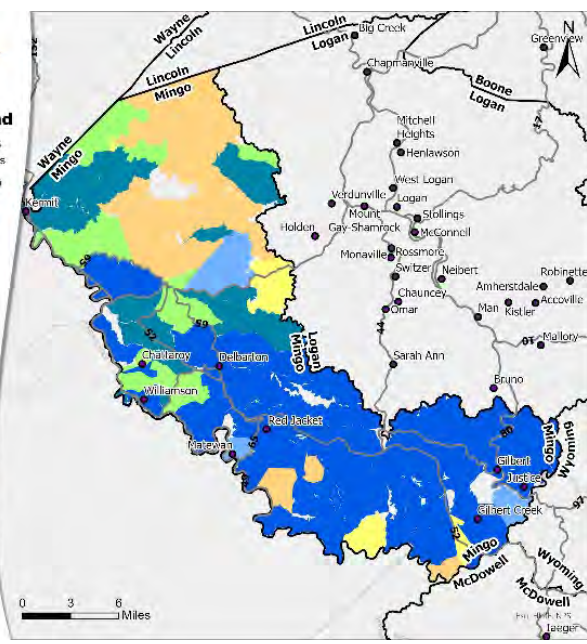


Prepared by: Thomas M. Hester
 James H. Williams
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 LLC

Mineral					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	138	1000	50	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	379	305	10	
Declaration Networks Group, Inc	NeuBeam	1	25	10	
Frontier Communications Corporation	CTC West Virginia Bluefield	227	37	2	
Frontier Communications Corporation	Frontier West Virginia	288	22	1	
Micrologic, Inc.	Micrologic	1	25	4	
Shenandoah Telecommunications Company	Shentel	33	1000	10	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	91	2	0.064	
County Totals		1158	302	11	

Mingo County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



Prepared by: Thomas M. Hester
 James H. Williams
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 LLC

Mingo					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	1	1000	25	
Frontier Communications Corporation	Frontier West Virginia	232	28	4	
Mik Rotec CATV, LLC	Mikrotec CATV, LLC	38	750	40	
Shenandoah Telecommunications Company	Shentel	216	1000	10	
Suddenlink Communications	Suddenlink Communication	96	560	41	
County Totals		583	668	24	

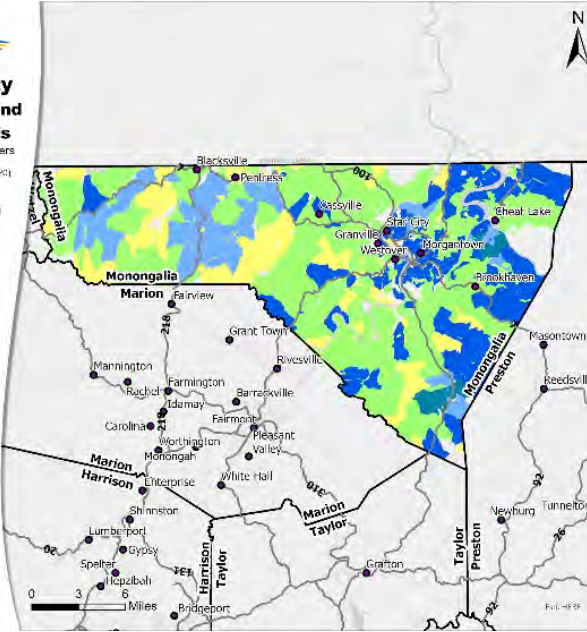
Monongalia County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
Routes
Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
Data: National, State, and Federal Providers
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020



Monongalia				
Provider Name	DBA Name	Census Block Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	60	1000	50
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	925	987	35
Frontier Communications Corporation	CTC West Virginia Mountain State	182	16	1
Frontier Communications Corporation	CTC West Virginia St Marys	1	3	0
Frontier Communications Corporation	Frontier West Virginia	1097	21	1
Micrologic, Inc.	Micrologic	1	25	4
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	214	2	0.064
West Side Telecommunications	Westco Internet	117	14	1
Zito Media, L.P.	Zito Media LP	18	50	5
County Totals		2615	235	11

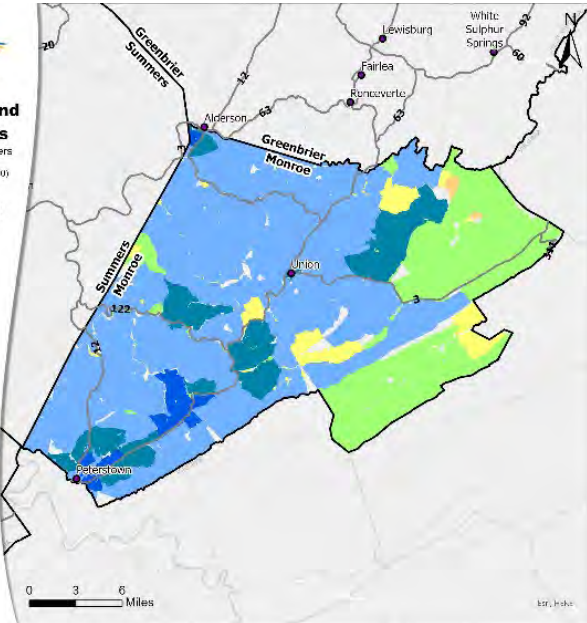
Monroe County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- Country Boundaries
Routes
Populated Places
- Unshaded areas are unpopulated



Projection: Transverse Mercator
Data: National, State, and Federal Providers
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020

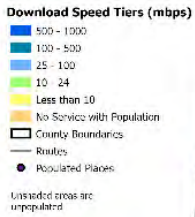


Monroe				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Countrymen Communications	CountryMen Communications	5	75	30
Frontier Communications Corporation	Frontier West Virginia	217	45	3
GigaBeam Networks LLC	GigaBeam Networks LLC	301	50	3
Optimal Home Solutions, LLC	OHS Broadband	5	25	3
Suddenlink Communications	Suddenlink Communications	56	496	38
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	85	2	0.064
County Totals		669	116	13

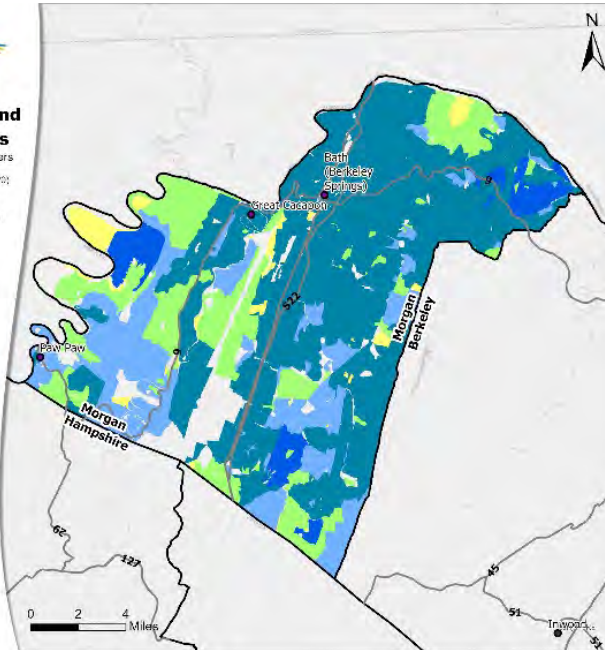


Morgan County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Project as: Transition Plan for
Bath, Berkeley Springs, Clay, Hampshire, Morgan, and Putnam Counties
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
EPRI

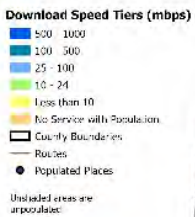


Morgan					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	319	334	11	
Frontier Communications Corporation	CTC West Virginia Bluefield	115	47	3	
Frontier Communications Corporation	Frontier West Virginia	247	38	2	
Morgan Wireless LLC	Morgan Wireless, LLC	2	25	3	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	37	2	0.064	
County Totals		720	89	4	

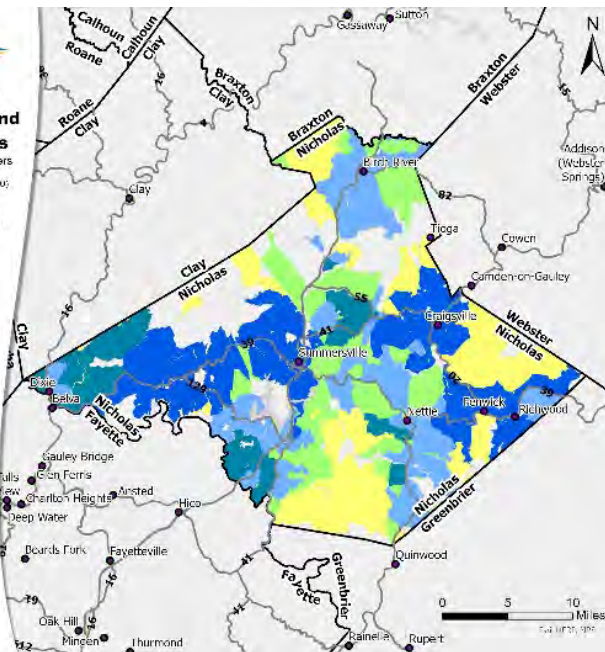


Nicholas County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Project as: Transition Plan for
Bath, Berkeley Springs, Clay, Hampshire, Morgan, and Putnam Counties
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
EPRI



Nicholas					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35	
Frontier Communications Corporation	CTC West Virginia Mountain State	2	15	1	
Frontier Communications Corporation	CTC West Virginia St Marys	73	23	2	
Frontier Communications Corporation	Frontier West Virginia	368	27	2	
Micrologic, Inc.	Micrologic	6	25	4	
Shenandoah Telecommunications Company	Shentel	476	1000	10	
Suddenlink Communications	Suddenlink Communications	31	407	34	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	165	2	0.064	
County Totals		1122	311	11	

Ohio County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2015; Released November 12, 2020)

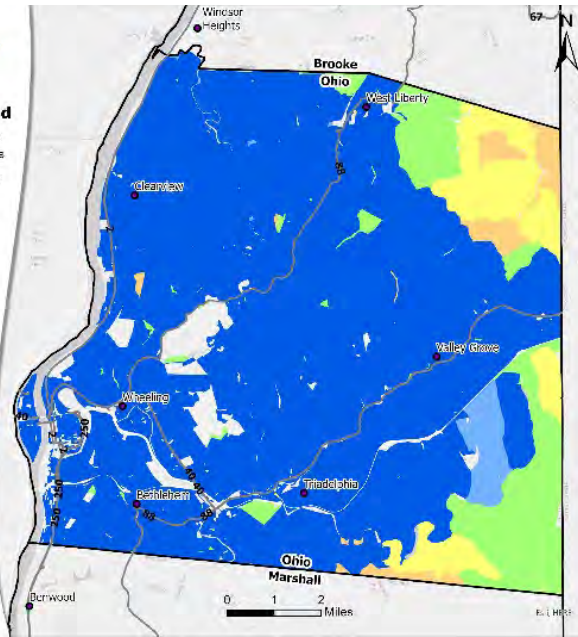
Download Speed Tiers (mbps)

- 500 - 1000
- 100 - 500
- 25 - 100
- 10 - 24
- Less than 10
- No Service with Population
- County Boundaries
- Routes
- Populated Places

Unshaded areas are unpopulated



Producers: Broadband Access
Data: FCC Form 477
Map: Virginia Department of Commerce
Data: Virginia Department of Transportation
© 2020



Ohio				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Citynet Holdings, LLC	Citynet LLC	3	5	1
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1357	987	36
Freund Enterprises Inc.	Access Ohio Valley Internet	1	20	5
Frontier Communications Corporation	Frontier West Virginia	108	22	3
Massillon Cable TV, Inc.	MCTV	15	100	10
County Totals		1484	227	11

Pendleton County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2015; Released November 12, 2020)

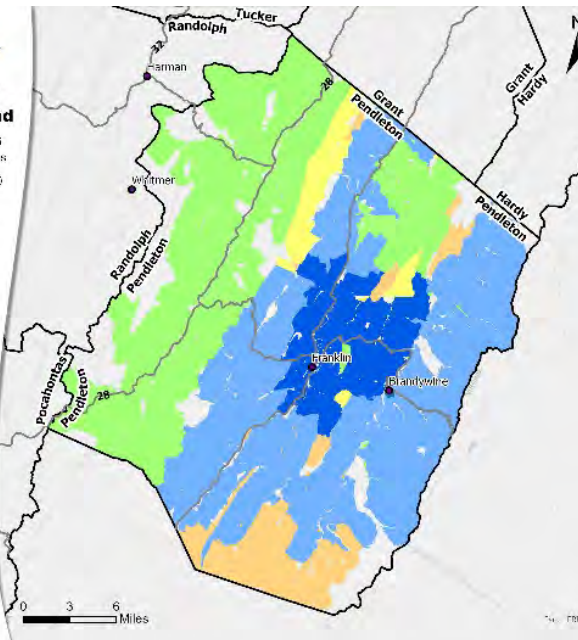
Download Speed Tiers (mbps)

- 500 - 1000
- 100 - 500
- 25 - 100
- 10 - 24
- Less than 10
- No Service with Population
- County Boundaries
- Routes
- Populated Places

Unshaded areas are unpopulated



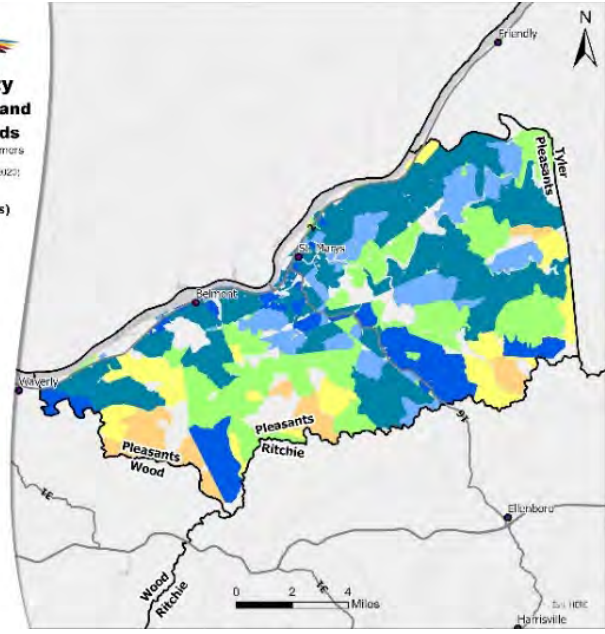
Producers: Broadband Access
Data: FCC Form 477
Map: Virginia Department of Commerce
Data: Virginia Department of Transportation
© 2020



Pendleton				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Frontier Communications Corporation	CTC West Virginia Bluefield	5	21	2
Frontier Communications Corporation	CTC West Virginia St Marys	5	26	2
Frontier Communications Corporation	Frontier West Virginia	90	22	1
Hardy Telecommunications Inc	HardyNet, Inc.	5	81	80
Rural Broadband Network Services LLC	HighSpeedLink.net	2	25	3
Shenandoah Telecommunications Company	Shentel	117	1000	10
Spruce Knob Seneca Rocks Telephone, Inc.	Spruce Knob Seneca Rocks Telephone, Inc.	338	20	4
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	6	2	0.064
County Totals		568	150	13

Pleasants County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 717
(December 2019, Released November 12, 2020)

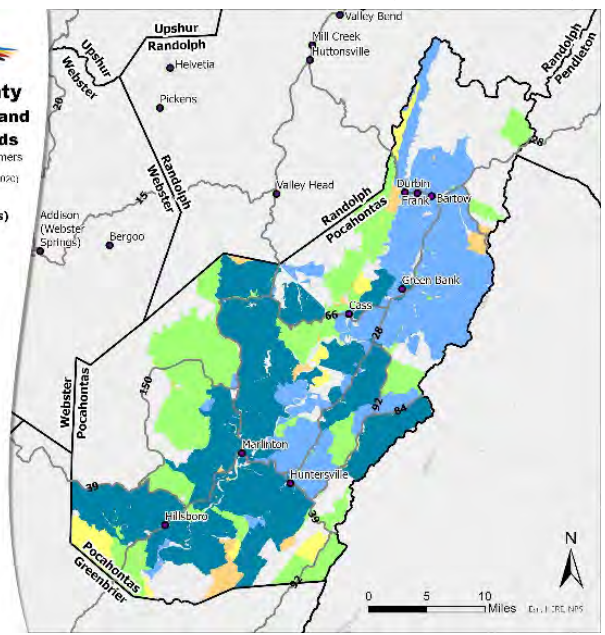


Source: FCC Form 717
Data provided by providers for consumers
West Virginia Broadband Enhancement Council
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020

Pleasants				
Provider Name	DBA Name	Census Blocks Served	Average Download Speeds	Average Upload Speeds
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	8	58	5
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	17	1000	25
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35
Community Antenna Service Inc.	Community Antenna Service, Inc.	1	1000	75
Frontier Communications Corporation	CTC West Virginia St Marys	286	37	2
Frontier Communications Corporation	Frontier West Virginia	4	6	1
Suddenlink Communications	Suddenlink Communications	168	470	37
County Totals		485	508	26

Pocahontas County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 717
(December 2019, Released November 12, 2020)



Source: FCC Form 717
Data provided by providers for consumers
West Virginia Broadband Enhancement Council
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
2020

Pocahontas				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	1	134	14
Citynet Holdings, LLC	Citynet LLC	4	300	300
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	300	10
Frontier Communications Corporation	CTC West Virginia Mountain State	346	42	3
Shenandoah Telecommunications Company	Shentel	172	150	10
Spruce Knob Seneca Rocks Telephone, Inc.	Spruce Knob Seneca Rocks Telephone, Inc.	126	25	3
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	3	2	0.064
County Totals		653	136	49

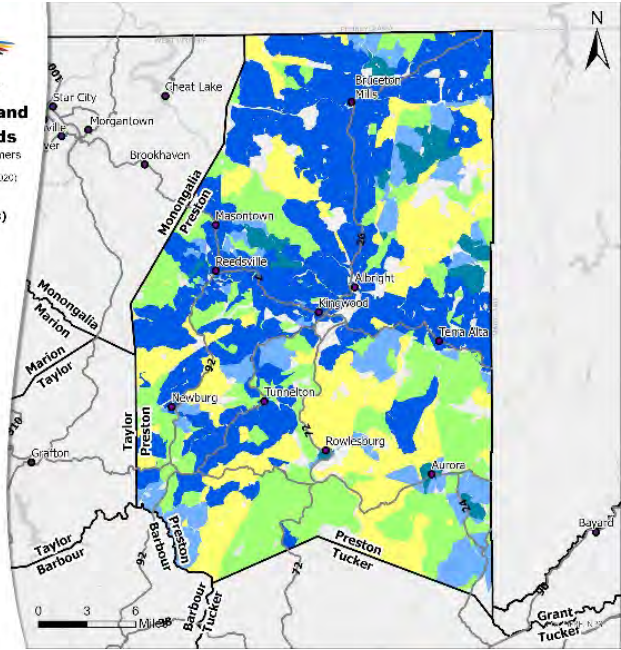
Preston County
West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



Provisional: Broadband Hierarchy Data for West Virginia, based on the Broadband Data Collection, Version 14.0, published by the Federal Communications Commission, West Virginia Division of Commerce, West Virginia Broadband Enhancement Council, 1/24/21



Preston				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	432	1000	50
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	18	987	35
Declaration Networks Group, Inc	NeuBeam	1	25	10
Digital Connections, Inc.dba Prodigy	Prodigi	268	1000	1000
Frontier Communications Corporation	CTC West Virginia Mountain State	185	31	2
Frontier Communications Corporation	CTC West Virginia St Marys	205	30	2
Frontier Communications Corporation	Frontier West Virginia	368	22	2
Micrologic, Inc.	Micrologic	16	25	4
QCOL, Inc.	QCOL Inc	64	1000	1000
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	258	2	0.064
County Totals		1815	412	210

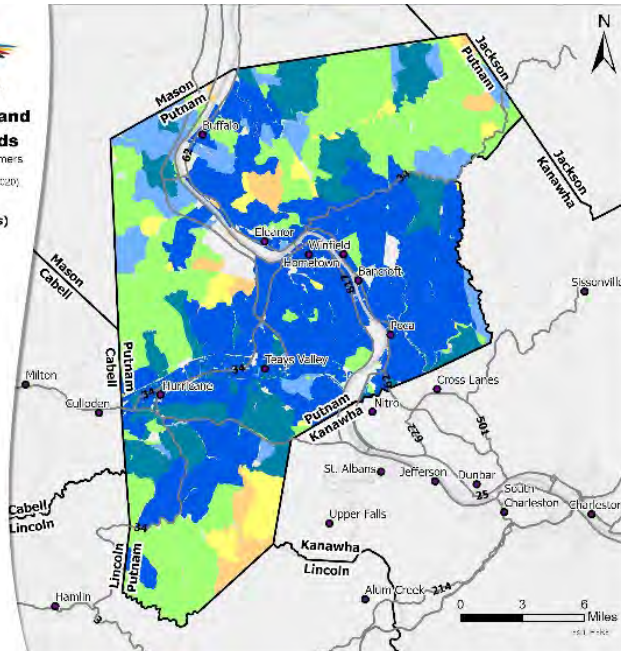
Putnam County
West Virginia Broadband Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
- County Boundaries
 Routes
 Populated Places
 Unshaded areas are unpopulated



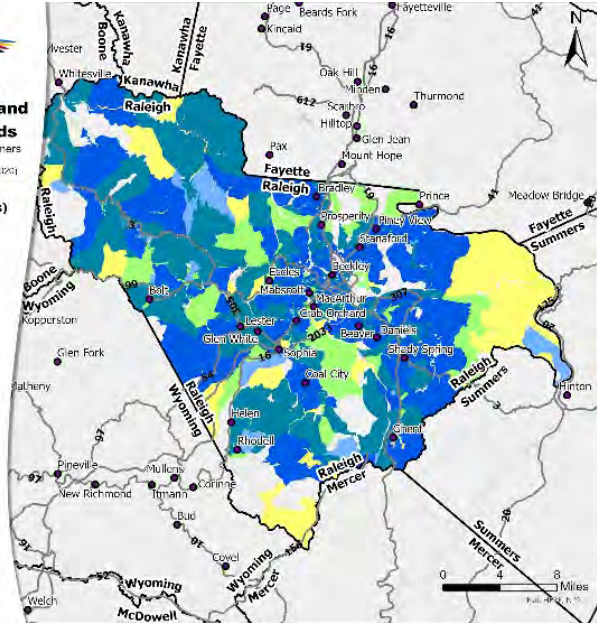
Provisional: Broadband Hierarchy Data for West Virginia, based on the Broadband Data Collection, Version 14.0, published by the Federal Communications Commission, West Virginia Division of Commerce, West Virginia Broadband Enhancement Council, 1/24/21



Putnam				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Armstrong Telephone Company-WV	Armstrong Telephone Company - WV	4	10	1
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	8	1000	25
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	412	977	35
Community Antenna Service Inc.	Community Antenna Service, Inc.	1	1000	75
Frontier Communications Corporation	Frontier West Virginia	544	26	2
Suddenlink Communications	Suddenlink Communications	457	603	41
County Totals		1426	603	30



Raleigh County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

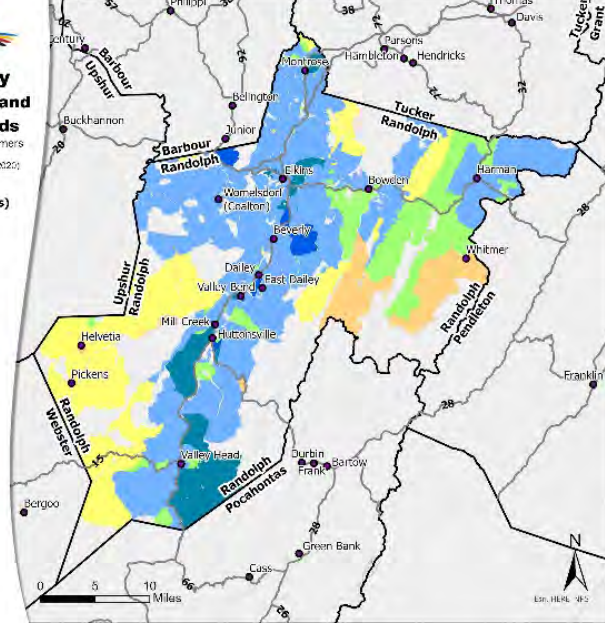


Projection: Transverse Mercator
 Joint National Grid - NAD 83
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council

Raleigh				
Provider Name	DBA Name	Census Blocks Served	Average Download Speeds	Average Upload Speeds
Frontier Communications Corporation	CTC West Virginia Bluefield	2	15	1
Frontier Communications Corporation	Frontier West Virginia	519	20	2
Shenandoah Telecommunications Company	Shentel	24	1000	10
Suddenlink Communications	Suddenlink Communications	1422	508	38
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	118	2	0.064
County Totals		2085	309	10



Randolph County
West Virginia Broadband
Fixed Wireline Speeds
 As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)



Projection: Transverse Mercator
 Joint National Grid - NAD 83
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council

Randolph				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	5	134	14
Citynet Holdings, LLC	Citynet LLC	1	150	150
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	987	35
Frontier Communications Corporation	CTC West Virginia Mountain State	179	39	3
Frontier Communications Corporation	CTC West Virginia St Marys	58	36	2
Frontier Communications Corporation	Frontier West Virginia	146	49	13
Micrologic, Inc.	Micrologic	263	25	4
Shenandoah Telecommunications Company	Shentel	5	1000	10
Spruce Knob Seneca Rocks Telephone, Inc.	Spruce Knob Seneca Rocks Telephone, Inc.	6	17	6
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	106	2	1
Suddenlink Communications	Suddenlink Communications	571	98	10
County Totals		1342	231	22



Ritchie County
West Virginia Broadband
Fixed Wireline Speeds

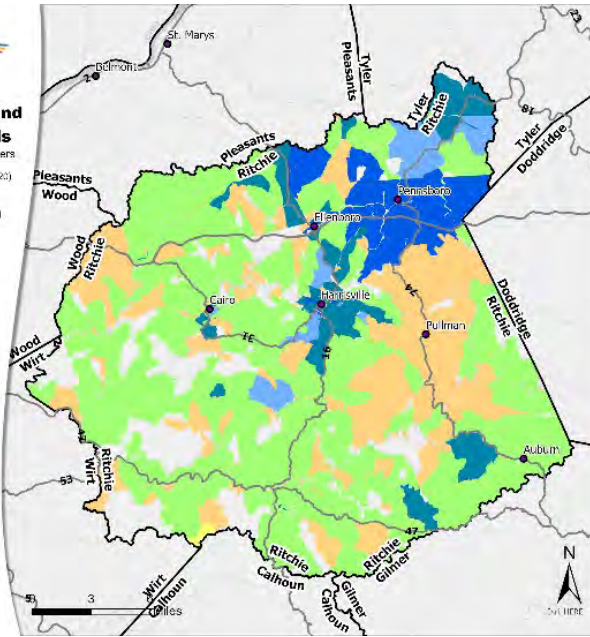
As advertised by providers for consumers
Provided by TCC Form #77
(December 2019, Revised November 12, 2023)

Download Speed Tiers (mbps)

- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Roads
 - Populated Places
- Unshaded areas are unpopulated.



Project Lead: Terrence Ruffolo
Data Sources: 2012-2013 Federal Census
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Bureau of Economic and Cultural Development



Ritchie				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	374	63	5
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	71	697	121
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	987	35
Frontier Communications Corporation	CTC West Virginia St Marys	24	14	1
Frontier Communications Corporation	Frontier West Virginia	75	38	2
County Totals		545	360	33



Roane County
West Virginia Broadband
Fixed Wireline Speeds

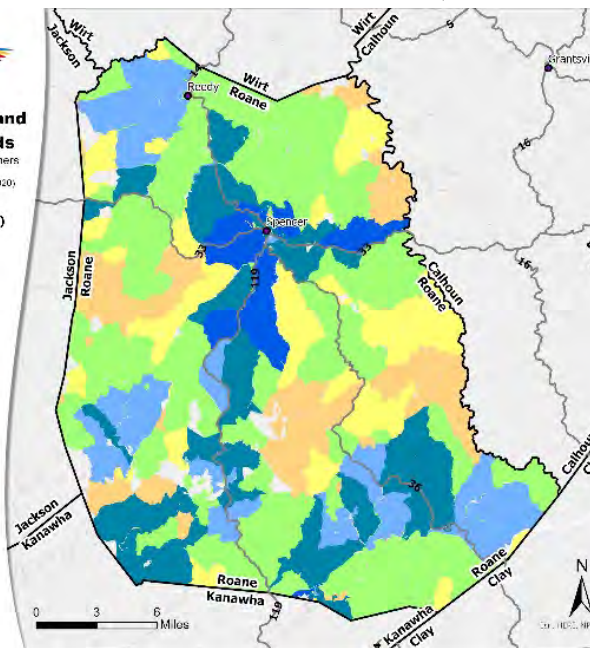
As advertised by providers for consumers
Provided by TCC Form #77
(December 2019, Revised November 12, 2020)

Download Speed Tiers (mbps)

- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Roads
 - Populated Places
- Unshaded areas are unpopulated.



Project Lead: Terrence Ruffolo
Data Sources: 2012-2013 Federal Census
West Virginia Development Office
West Virginia Department of Commerce
West Virginia Bureau of Economic and Cultural Development



Roane				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	3	529	18
Community Antenna Service Inc.	Community Antenna Service, Inc.	1	1000	75
Frontier Communications Corporation	CTC West Virginia St Marys	108	25	2
Frontier Communications Corporation	Frontier West Virginia	370	22	2
RT21.NET	RT21.NET	3	50	50
Suddenlink Communications	Suddenlink Communications	118	443	37
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	1	2	0.064
County Totals		604	296	26



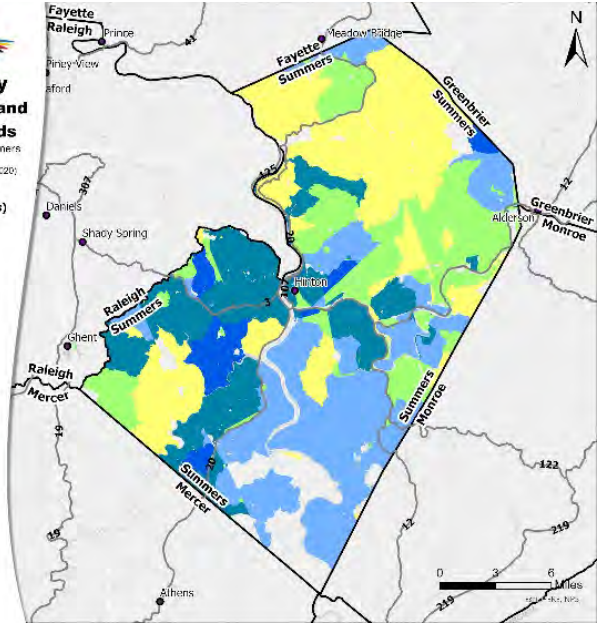
Summers County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Roads
 - Populated Places
- Unshaded areas are unpopulated



Prepared by: Tennessee Broadband Enhancement Council
Data by: Tennessee Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Department of Governmental Services
West Virginia State Office of Information Technology
West Virginia Broadband Enhancement Council
ERIC



Summers					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	6	644	23	
Countrymen Communications	CountryMen Communications	2	75	30	
Frontier Communications Corporation	CTC West Virginia Bluefield	1	6	1	
Frontier Communications Corporation	Frontier West Virginia	289	23	2	
GigaBeam Networks LLC	GigaBeam Networks LLC	56	50	3	
Suddenlink Communications	Suddenlink Communications	223	412	35	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	170	2	0.064	
County Totals		747	173	13	



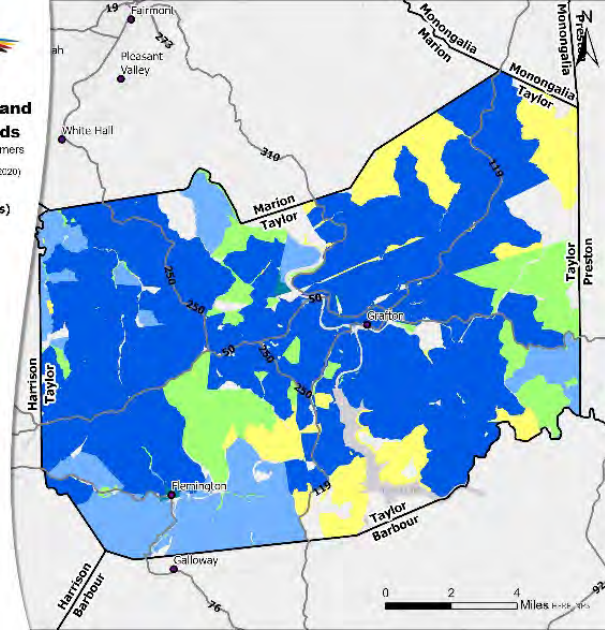
Taylor County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 24
 - Less than 10
 - No Service with Population
 - County Boundaries
 - Roads
 - Populated Places
- Unshaded areas are unpopulated



Prepared by: Tennessee Broadband Enhancement Council
Data by: Tennessee Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Department of Governmental Services
West Virginia State Office of Information Technology
West Virginia Broadband Enhancement Council
ERIC



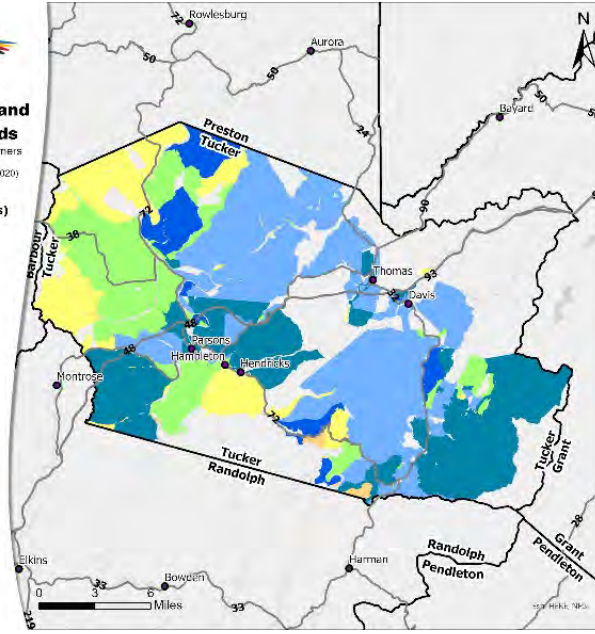
Taylor				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Charter Communications, Inc.	Charter Communications Inc	55	940	35
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	426	985	35
Frontier Communications Corporation	CTC West Virginia St Marys	62	38	3
Frontier Communications Corporation	Frontier West Virginia	105	18	1
Micrologic, Inc.	Micrologic	14	25	4
Suddenlink Communications	Suddenlink Communications	53	93	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	82	2	0.064
County Totals		797	300	13

Tucker County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



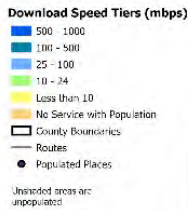
Prepared by: Tereasa Hester
Data Provided by: FCC Form 477
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
2020



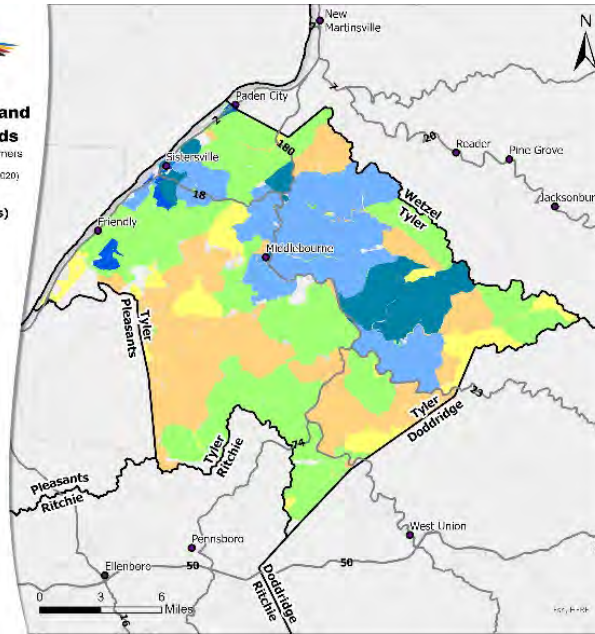
Tucker				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Atlantic Broadband Finance, LLC	Atlantic Broadband Finance, LLC	140	190	16
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	5	712	25
Frontier Communications Corporation	CTC West Virginia Bluefield	1	115	7
Frontier Communications Corporation	CTC West Virginia St Marys	259	26	2
Frontier Communications Corporation	Frontier West Virginia	9	16	1
Micrologic, Inc.	Micrologic	67	25	4
Suddenlink Communications	Suddenlink Communications	3	92	10
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	47	2	0.064
County Totals		531	147	8

Tyler County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Prepared by: Tereasa Hester
Data Provided by: FCC Form 477
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
2020



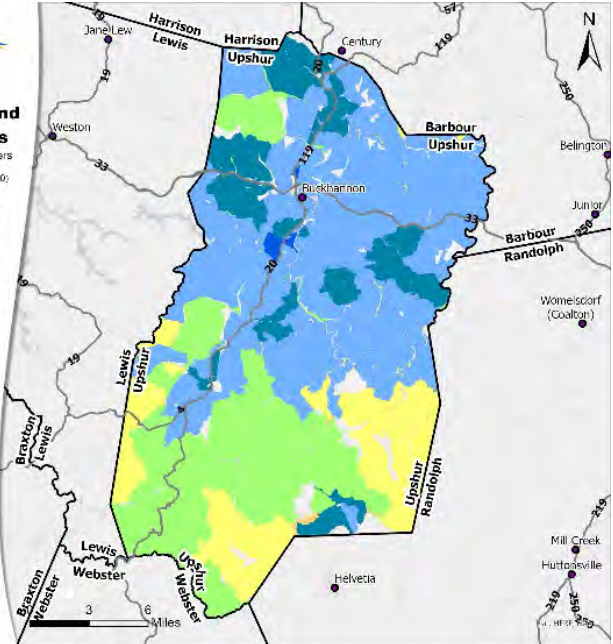
Tyler				
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	2	10	1
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	2	1000	25
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	644	23
Frontier Communications Corporation	CTC West Virginia Mountain State	24	13	1
Frontier Communications Corporation	CTC West Virginia St Marys	8	48	3
Frontier Communications Corporation	Frontier West Virginia	297	34	2
Suddenlink Communications	Suddenlink Communications	126	486	37
County Totals		461	319	13

Upshur County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Projection: Transverse Mercator
Datum: North American Datum of 1983
Spheroid: GRS80
Datum Shift: 1111000.000
Scale: 0.9996012519
False Easting: 1000000.000
False Northing: 0.000
Units: Meter
West Virginia Broadband Enhancement Council
2020



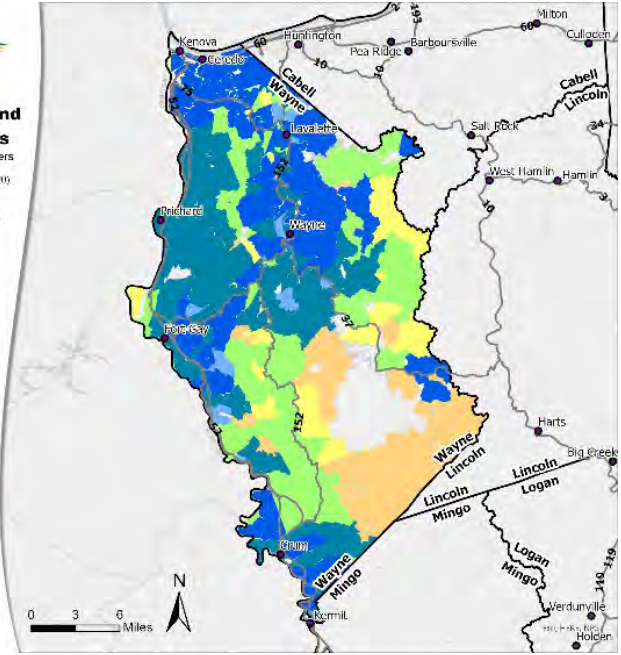
Upshur					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	987	35	
Frontier Communications Corporation	CTC West Virginia Mountain State	5	30	2	
Frontier Communications Corporation	Frontier West Virginia	335	43	4	
Micrologic, Inc.	Micrologic	237	25	4	
Shenandoah Telecommunications Company	Shentel	1	1000	10	
Suddenlink Communications	Suddenlink Communications	372	100	10	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	91	2	0.064	
County Totals		1043	312	9	

Wayne County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Projection: Broadhurst Mercator
Datum: North American Datum of 1983
Spheroid: GRS80
Datum Shift: 1111000.000
Scale: 0.9996012519
False Easting: 1000000.000
False Northing: 0.000
Units: Meter
West Virginia Broadband Enhancement Council
2020



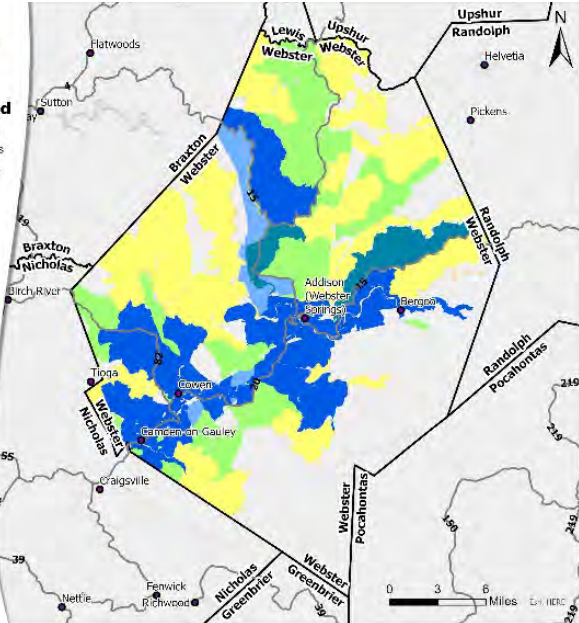
Wayne					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Utilities, Inc.	Armstrong Utilities, Inc.	349	1000	25	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	116	987	35	
Frontier Communications Corporation	CTC West Virginia St Marys	189	17	1	
Frontier Communications Corporation	Frontier West Virginia	294	18	2	
LYCOM COMMUNICATIONS INC.	Lycom	90	200	10	
Suddenlink Communications	Suddenlink Communications	309	485	37	
County Totals		1347	451	18	

Webster County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



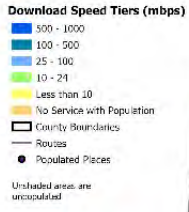
Original and Re-release Provided:
Sutton-Holmes, Sarah H. | Sutton-Holmes
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
USA



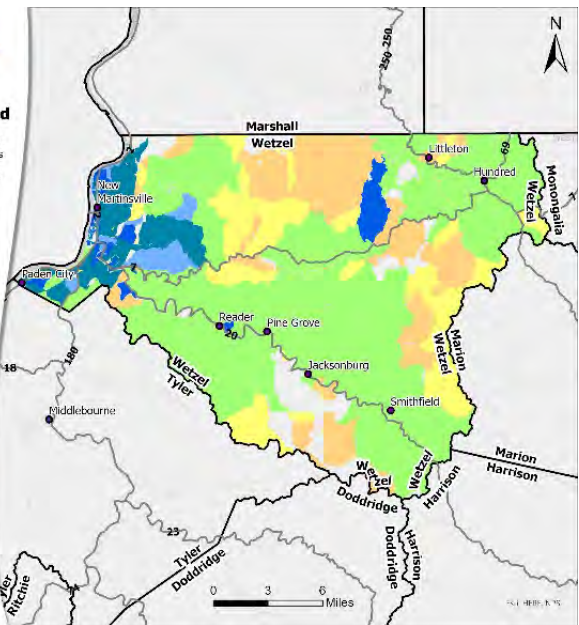
Webster					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	2	987	35	
Frontier Communications Corporation	CTC West Virginia Mountain State	209	18	1	
Frontier Communications Corporation	CTC West Virginia St Marys	2	19	2	
Frontier Communications Corporation	Frontier West Virginia	3	11	1	
Micrologic, Inc.	Micrologic	1	25	4	
Shenandoah Telecommunications Company	Shentel	296	1000	10	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	84	2	0.064	
County Totals		597	294	8	

Wetzel County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Original and Re-release Provided:
Sutton-Holmes, Sarah H. | Sutton-Holmes
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
USA



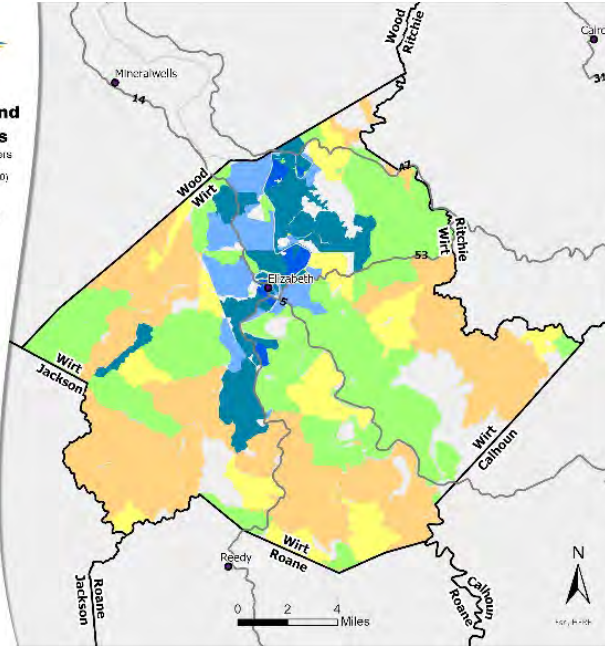
Wetzel					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Citynet Holdings, LLC	Citynet LLC	7	5	1	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	8	987	35	
Frontier Communications Corporation	CTC West Virginia Mountain State	319	14	1	
Frontier Communications Corporation	CTC West Virginia St Marys	2	7	1	
Frontier Communications Corporation	Frontier West Virginia	139	30	2	
Suddenlink Communications	Suddenlink Communications	344	489	37	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	15	2	0.064	
County Totals		834	219	11	

Wirt County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Prepared by: Jennifer Hester
Data: FCC Form 477, released November 12, 2020
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
1346



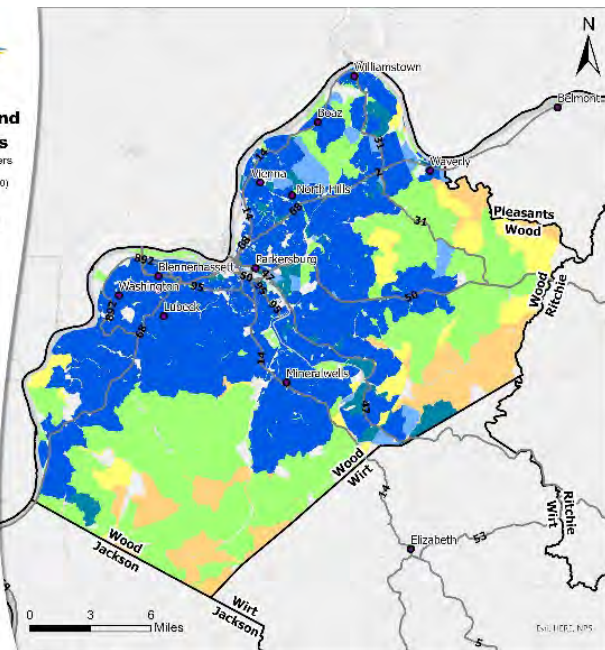
Wirt					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	27	10	1	
Frontier Communications Corporation	CTC West Virginia St Marys	10	5	0.49	
Frontier Communications Corporation	Frontier West Virginia	181	25	2	
RT21.NET	RT21.NET	1	50	50	
Suddenlink Communications	Suddenlink Communications	80	429	35	
County Totals		299	104	18	

Wood County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
Provided by FCC Form 477
(December 2019, Released November 12, 2020)



Prepared by: Jennifer Hester
Data: FCC Form 477, released November 12, 2020
West Virginia Department of Commerce
West Virginia Broadband Enhancement Council
West Virginia Broadband Enhancement Council
1346



Wood					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
Armstrong Telephone Company - Northern Division	Armstrong Telephone Company - ND	21	10	1	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	300	10	
Community Antenna Service Inc.	Community Antenna Service, Inc.	1673	1000	75	
Frontier Communications Corporation	CTC West Virginia St Marys	1	3	0.38	
Frontier Communications Corporation	Frontier West Virginia	563	19	2	
RT21.NET	RT21.NET	2	50	50	
Suddenlink Communications	Suddenlink Communications	568	459	36	
County Totals		2829	263	25	



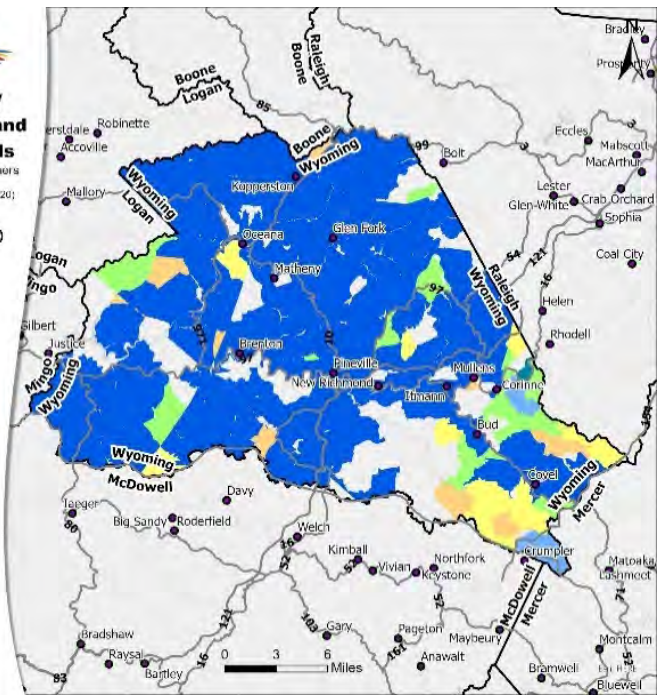
Wyoming County
West Virginia Broadband
Fixed Wireline Speeds

As advertised by providers for consumers
 Provided by FCC Form 477
 (December 2019, Released November 12, 2020)

- Download Speed Tiers (mbps)**
- 500 - 1000
 - 100 - 500
 - 25 - 100
 - 10 - 25
 - Less than 10
 - No Service with Population
- County boundaries
 — Routes
 ● Populated Places
 Unshaded areas are unpopulated



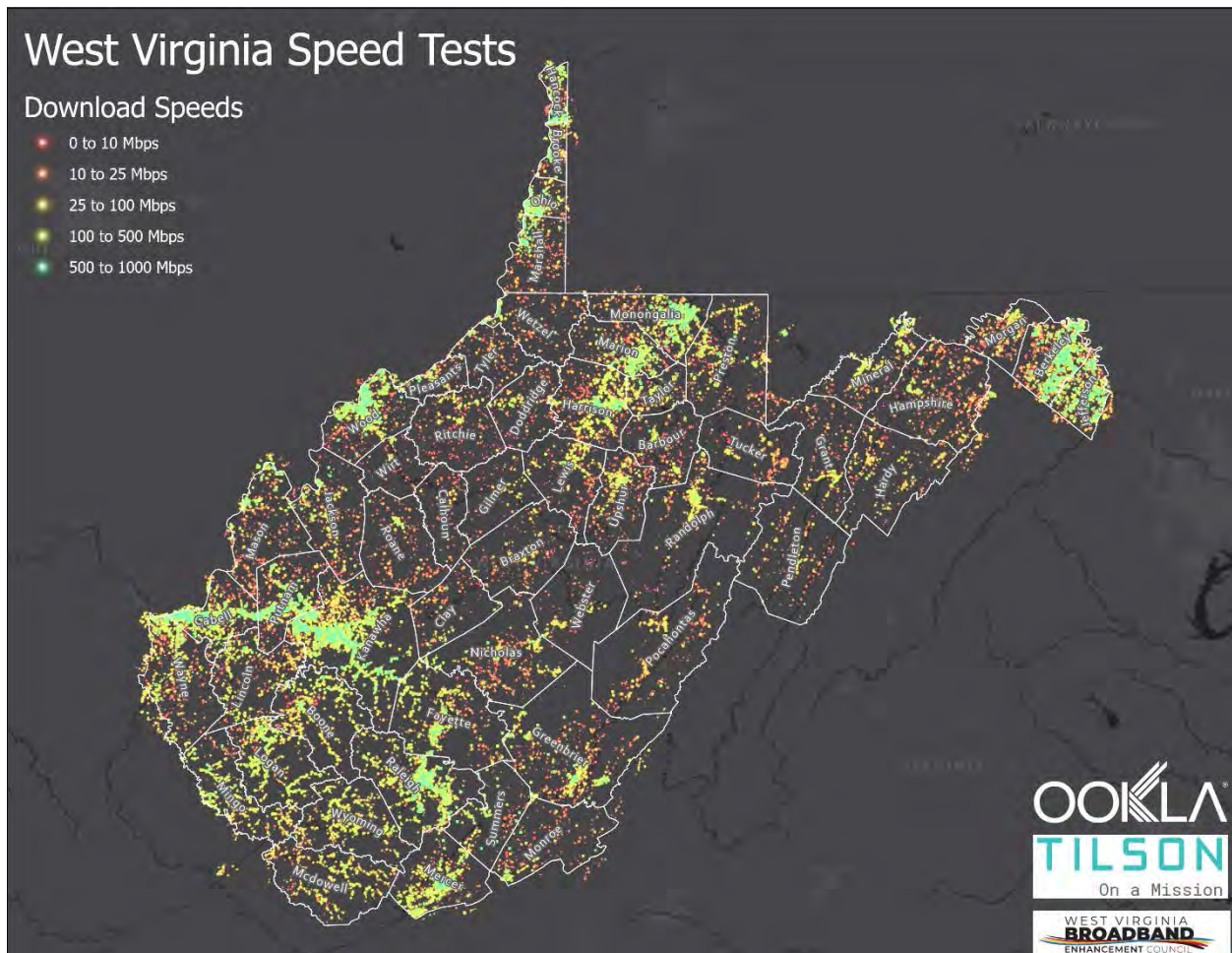
Prepared by: Thomas McElroy
 Anna Hillberry, James Hill, Thomas Swartz
 West Virginia Department of Commerce
 West Virginia Broadband Enhancement Council
 DSI



Wyoming					
Provider Name	DBA Name	Census Blocks Served	Average Download Speed	Average Upload Speed	
COMCAST CABLE COMMUNICATIONS, LLC	Comcast	1	300	10	
Frontier Communications Corporation	CTC West Virginia Bluefield	16	9	1	
Frontier Communications Corporation	Frontier West Virginia	75	13	1	
GigaBeam Networks LLC	GigaBeam Networks LLC	2	50	3	
Shenandoah Telecommunications Company	Shentel	831	1000	10	
Suddenlink Communications	Suddenlink Communications	17	344	32	
UNITED STATES CELLULAR CORPORATION	United States Cellular Corporation	9	2	0.064	
County Totals		951	245	8	

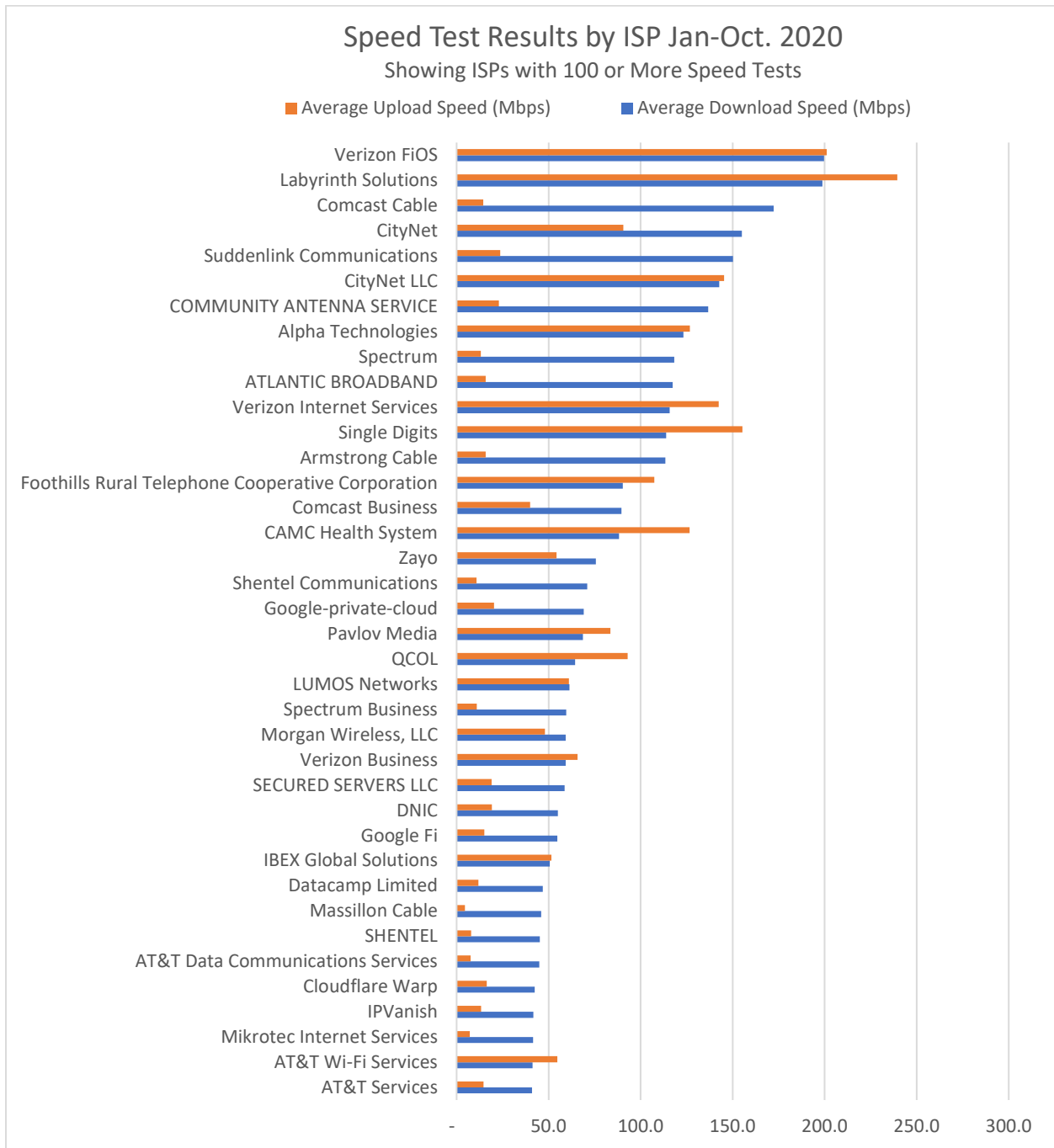
WEST VIRGINIA **BROADBAND** ENHANCEMENT COUNCIL

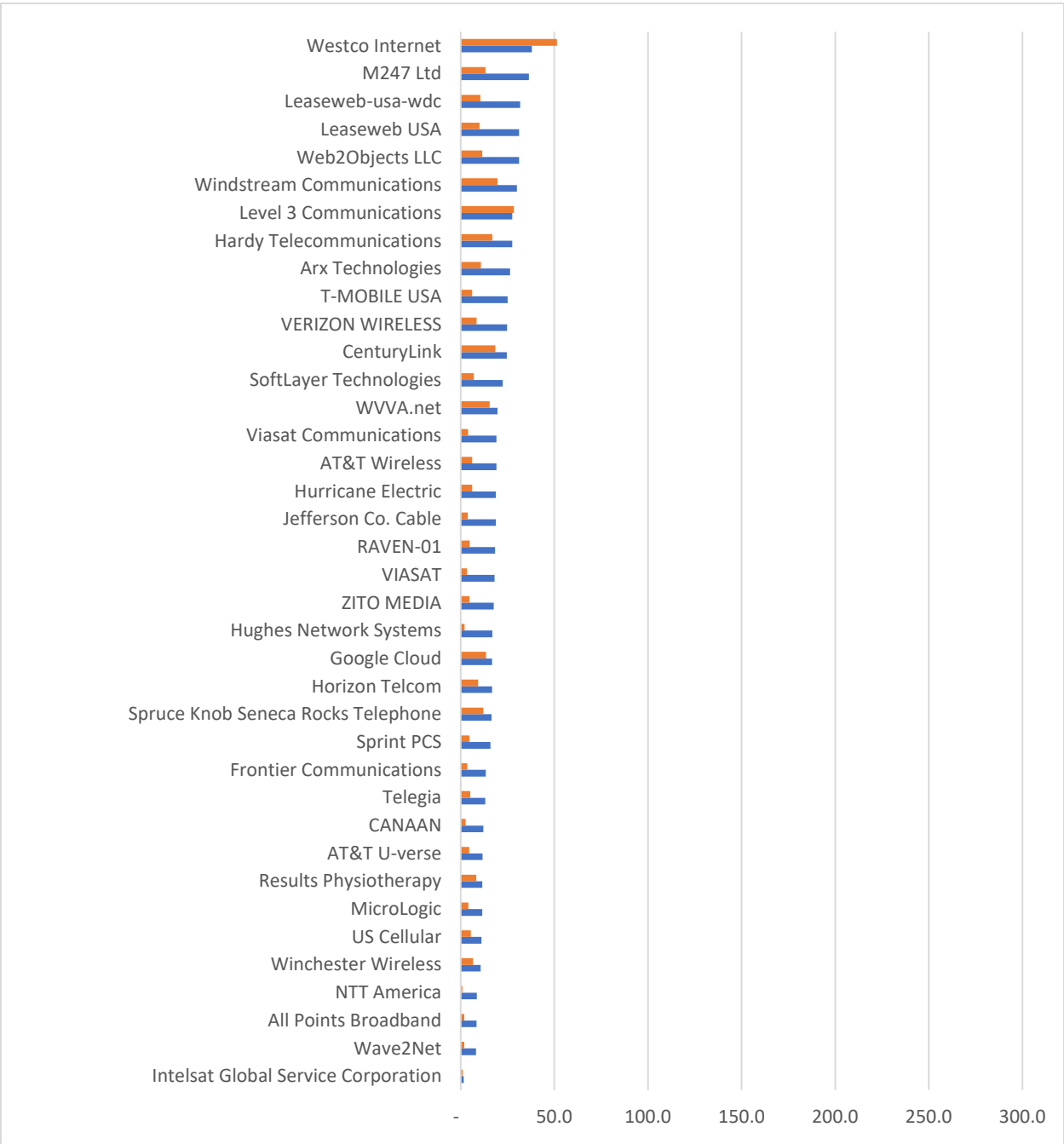
Appendix B-2020 Ookla Speed Test Results



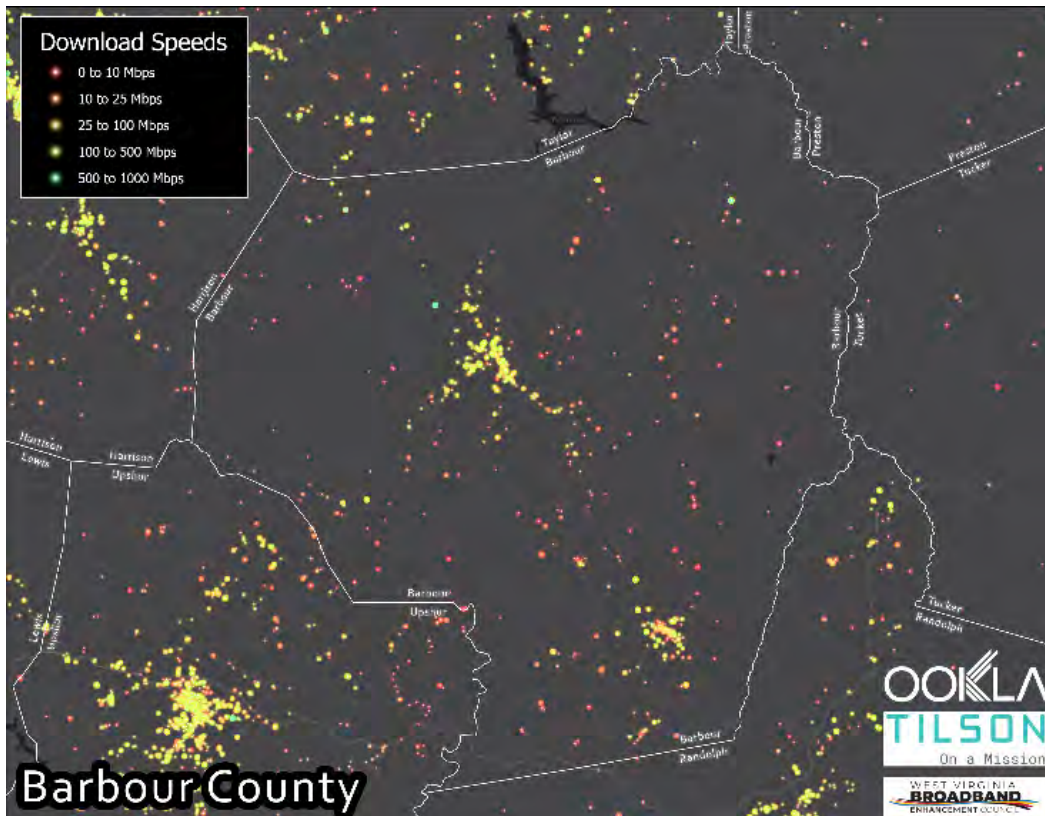
2020 Speed Test Results

2020 Speed Test Results shown in Appendix B are speed test data collected by Ookla and acquired by the West Virginia Broadband Enhancement Council. Tables and charts show results for January 2020, through November 2020. The county locations of speed test results were determined by latitude and longitude points associated with the speed test in Ookla reports. The “User Count” was determined by the number of unique devices associated with the tests. Tables in this Appendix exclude results from ISPs with fewer than 100 test results.

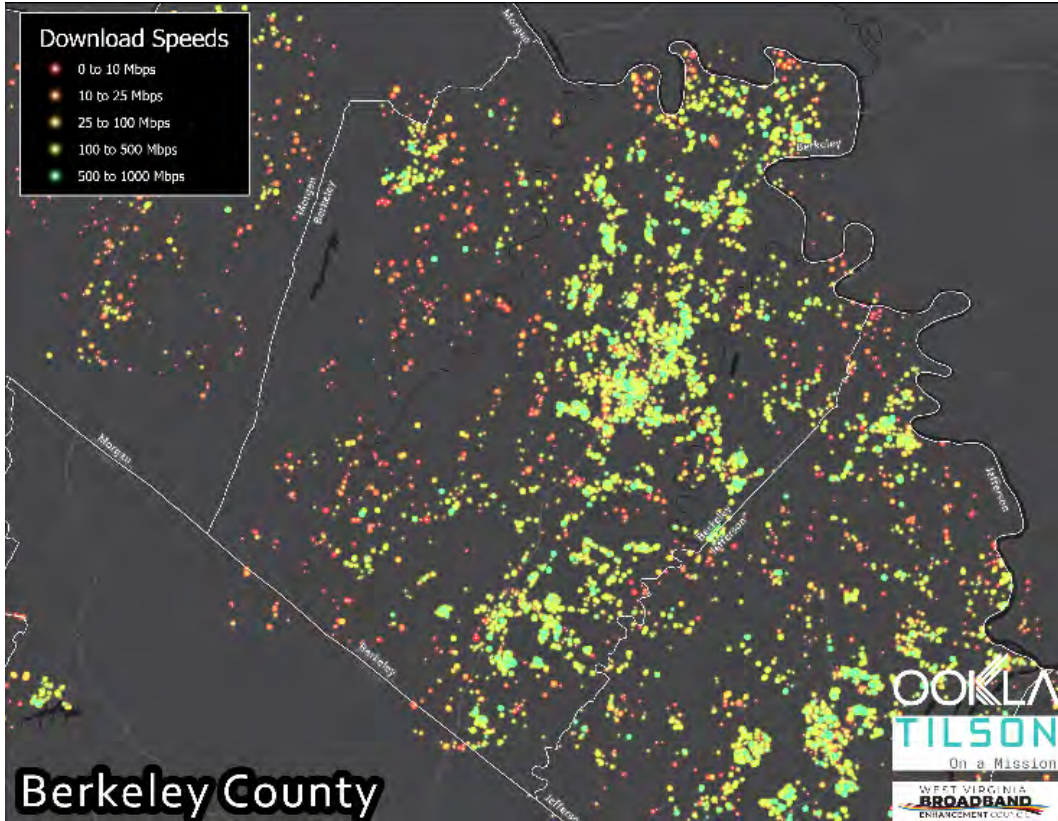




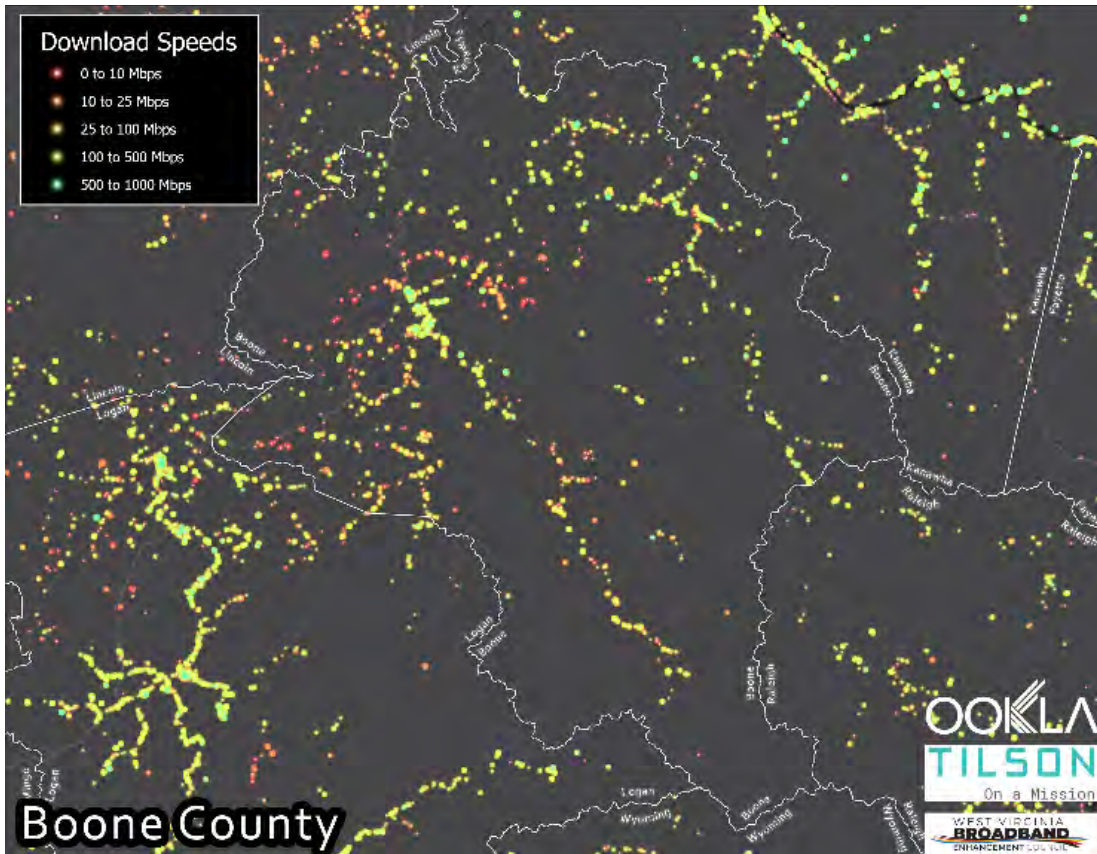
ISP	ISP Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
All Points Broadband	All Points Broadband	8	2	46	523	14
Alpha Technologies	UNKNOWN	123	127	19	616	6
Armstrong Cable	Zoom Internet	113	16	45	23929	141
Arx Technologies	UNKNOWN	26	11	52	1122	5
AT&T Data Communications Services	AT&T Enterprise	45	8	26	3153	21
AT&T Services	AT&T Enterprise	41	15	54	4303	78
AT&T U-verse	AT&T Internet	12	4	104	140	35
AT&T Wi-Fi Services	AT&T Internet	41	55	41	434	36
AT&T Wireless	AT&T Internet	19	6	83	27298	91
ATLANTIC BROADBAND	Atlantic Broadband	117	16	28	14558	147
CAMC Health System	UNKNOWN	88	127	26	358	3
CANAAN	UNKNOWN	12	3	57	902	3
CenturyLink	CenturyLink	25	18	62	259	30
CityNet	CityNet	155	91	58	2812	12
CityNet LLC	Citynet	143	145	12	20247	68
Cloudflare Warp	UNKNOWN	42	16	46	176	13
Comcast Business	Comcast Business	90	40	33	11100	967
Comcast Cable	XFINITY	172	14	24	279338	1087
COMMUNITY ANTENNA SERVICE	CAS Cable	137	23	36	15116	36
Datacamp Limited	UNKNOWN	47	12	76	140	36
DNIC	UNKNOWN	55	19	123	315	5
Foothills Rural Telephone Cooperative Corporation	Foothills Broadband	90	107	5	797	15
Frontier Communications	Frontier	13	4	61	167276	1159
Google-private-cloud	UNKNOWN	69	20	72	127	2
Google Cloud	Google Cloud Platform	17	14	92	126	31
Google Fi	Google Fi	55	15	65	449	11
Hardy Telecommunications	Hardy Telecommunication	28	17	21	3503	16
Horizon Telcom	Horizon	17	9	46	148	3
Hughes Network Systems	HughesNet	17	2	862	5375	24
Hurricane Electric	UNKNOWN	19	6	53	1125	7
IBEX Global Solutions	UNKNOWN	51	52	183	648	1
Intelsat Global Service Corporation	Intelsat	2	1	625	142	3
IPVanish	UNKNOWN	42	13	68	434	16
Jefferson Co. Cable	JCC	19	4	29	2237	11
Labyrinth Solutions	Labyrinth Solutions	199	239	9	6387	12
Leaseweb-usa-wdc	UNKNOWN	32	11	61	347	36
Leaseweb USA	Leaseweb	31	10	72	232	46
Level 3 Communications	Level 3	28	28	101	1635	50
LUMOS Networks	Lumos Networks	61	61	29	9550	172
M247 Ltd	M247	36	13	74	160	59
Marshall University	UNKNOWN	206	278	27	981	66
Massillon Cable	MCTV	46	4	27	376	6
MicroLogic	Micrologic	12	4	64	8766	13
Mikrotec Internet Services	Mikrotec	42	7	19	1426	54
Morgan Wireless, LLC	UNKNOWN	59	48	40	2189	5
NTT America	NTT Communications	9	1	265	220	2
Pavlov Media	UNKNOWN	69	84	35	736	5
QCOL	QCOL	64	93	13	153	3
RAVEN-01	UNKNOWN	18	5	47	526	4
Results Physiotherapy	UNKNOWN	12	8	289	8968	1
SECURED SERVERS LLC	PhoenixNAP	59	19	95	850	4
SHENTEL	Shentel	45	8	26	2235	8
Shentel Communications	Shentel	71	11	32	52778	106
Single Digits	Single Digits	114	155	24	2947	1
SoftLayer Technologies	SoftLayer	22	7	170	274	14
Spectrum	Spectrum	118	13	45	39709	135
Spectrum Business	Spectrum Business	60	11	90	1435	97
Sprint PCS	Sprint	16	5	65	4299	582
Spruce Knob Seneca Rocks Telephone	SKSRT	16	12	22	1675	7
Suddenlink Communications	Suddenlink	150	24	18	515251	1068
T-MOBILE USA	T-Mobile	25	6	71	8288	64
Telegia	Telegia	13	5	52	323	7
US Cellular	US Cellular	11	5	80	1933	43
Verizon Business	Verizon Enterprise Solutio	59	66	134	1185	22
Verizon FIOS	Verizon	200	201	19	352	24
Verizon Internet Services	Verizon	116	142	34	4889	115
VERIZON WIRELESS	Verizon	25	9	74	6580	375
VIASAT	Exede	18	3	682	7155	587
Viasat Communications	Exede	19	4	702	323	16
Wave2Net	Wave2Net	8	2	77	814	1
Web2Objects LLC	Web2Objects	31	12	210	237	13
Westco Internet	Westco	38	51	45	2587	8
Winchester Wireless	Winchester Wireless	11	7	66	1162	5
Windstream Communications	Windstream	30	20	40	480	142
WVVA.net	GigaBeam Networks	20	15	72	1956	8
Zayo	UNKNOWN	76	54	61	257	8
ZITO MEDIA	Zito	18	5	62	529	2
Statewide		55	36	97	1292381	8129



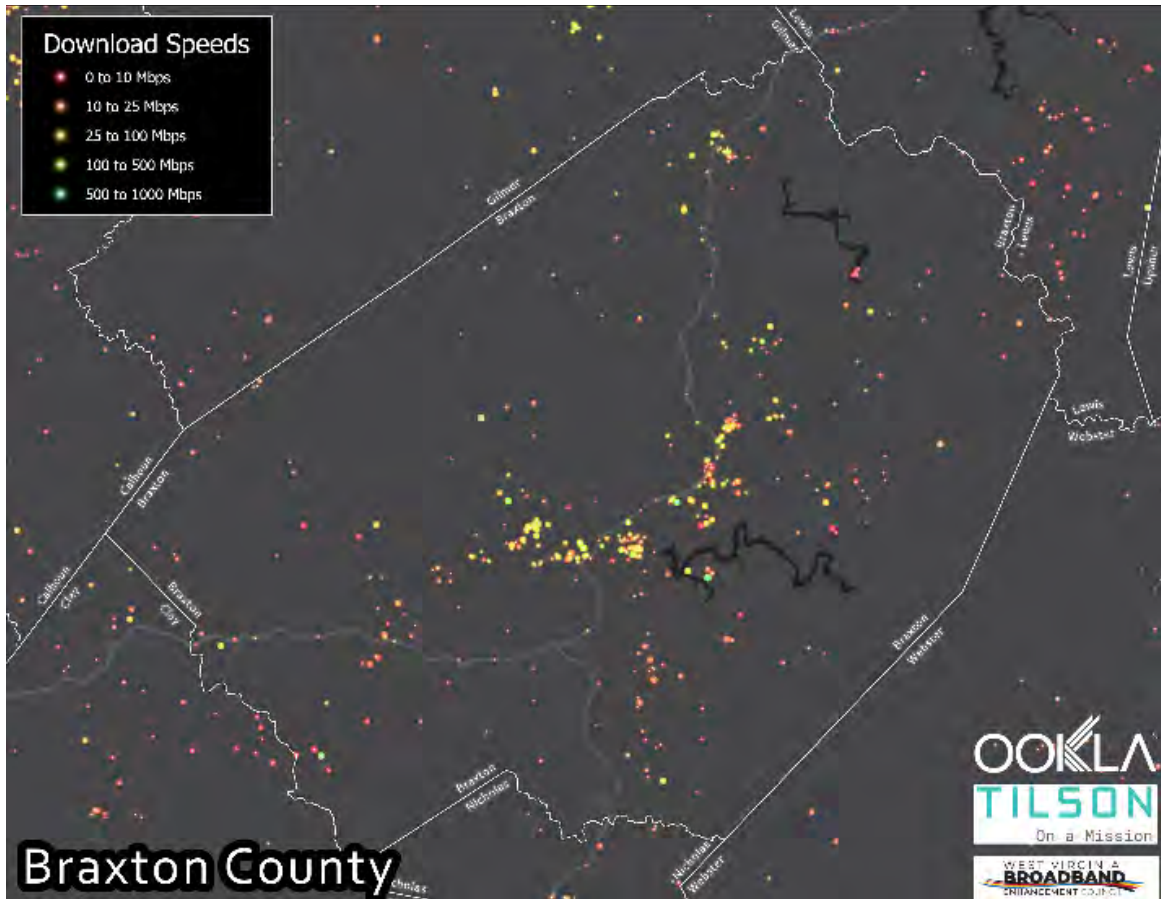
Barbour						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Wireless	AT&T Internet	12	2	95	1882	9
CityNet LLC	Citynet	131	123	7	1922	13
Cloudflare Warp	UNKNOWN	7	3	87	1	1
Comcast Business	Comcast Business	42	6	14	1	1
Comcast Cable	XFINITY	93	11	19	23	3
Datacamp Limited	UNKNOWN	8	4	42	1	1
Frontier Communications	Frontier	10	1	60	1952	174
Hughes Network Systems	HughesNet	9	2	992	50	6
IPVanish	UNKNOWN	55	74	48	2	2
Leaseweb-usa-wdc	UNKNOWN	9	4	43	1	1
LUMOS Networks	Lumos Networks	80	94	21	5	1
MicroLogic	Micrologic	7	3	60	1544	7
RAVEN-01	UNKNOWN	23	4	76	101	1
Shentel Communications	Shentel	66	15	27	374	13
Spectrum	Spectrum	69	9	46	21	1
Sprint PCS	Sprint	4	1	195	66	18
Suddenlink Communications	Suddenlink	60	7	20	803	26
T-MOBILE USA	T-Mobile	3	1	109	5	2
US Cellular	US Cellular	7	3	90	18	9
Verizon Business	Verizon Enterprise Solutions	10	3	138	9	1
VERIZON WIRELESS	Verizon	7	3	118	198	35
VIASAT	Exede	16	5	663	32	10
Viasat Communications	Exede	34	5	651	23	2
Web2Objects LLC	Web2Objects	25	6	3	1	1
County Totals		33	16	151	9035	338



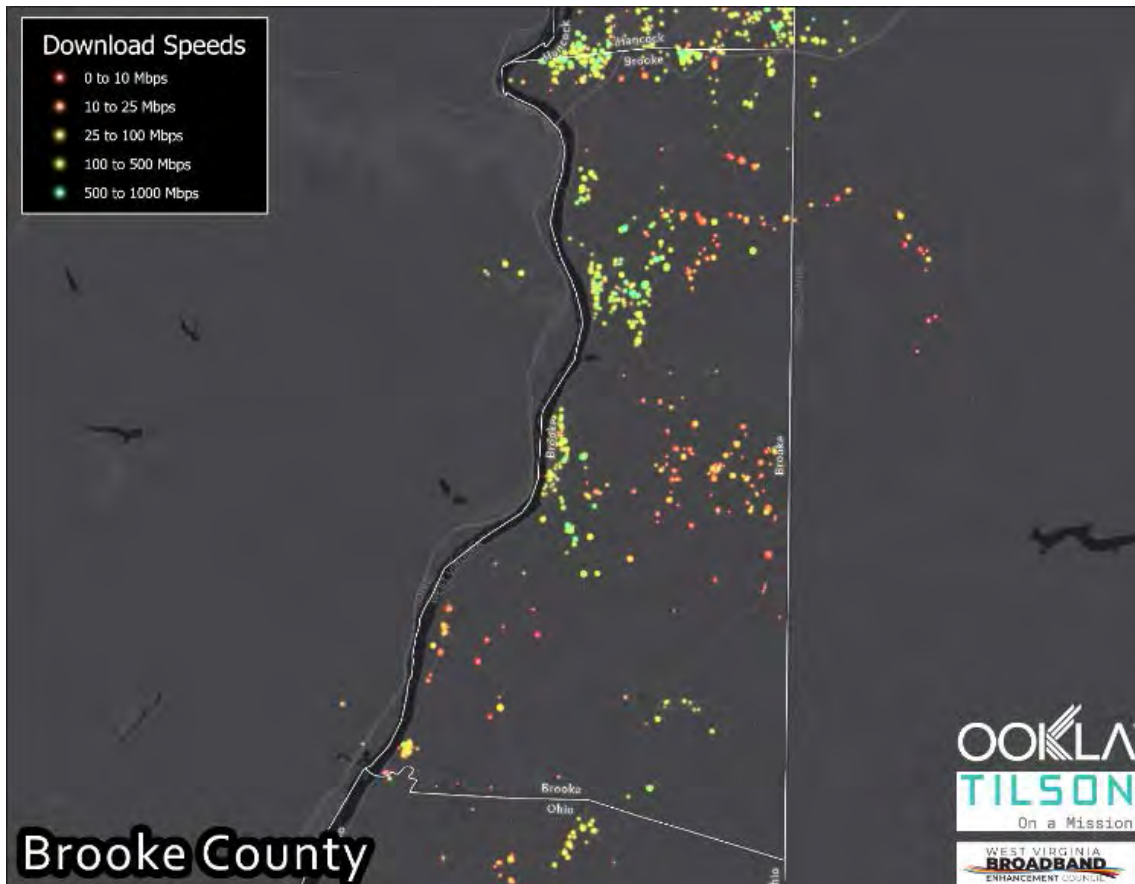
Berkeley						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	20	15	77	39	4
AT&T Wi-Fi Services	AT&T Internet	26	31	43	14	3
AT&T Wireless	AT&T Internet	14	5	82	1368	8
ATLANTIC BROADBAND	Atlantic Broadband	192	20	32	1	1
CenturyLink	CenturyLink	18	27	27	2	1
Cloudflare Warp	UNKNOWN	147	11	14	2	1
Comcast Business	Comcast Business	82	33	27	1447	180
Comcast Cable	XFINITY	185	15	20	62295	230
Datacamp Limited	UNKNOWN	32	8	30	9	4
DNIC	UNKNOWN	38	23	23	11	2
Frontier Communications	Frontier	11	2	113	8104	140
Google Cloud	Google Cloud Platform	41	9	36	1	1
Google Fi	Google Fi	72	15	65	23	4
Hughes Network Systems	HughesNet	11	2	877	122	7
Intelsat Global Service Corporation	Intelsat	17	8	81	1	1
IPVanish	UNKNOWN	127	7	18	11	4
Leaseweb-usa-wdc	UNKNOWN	56	9	47	4	3
Leaseweb USA	Leaseweb	57	13	30	8	6
Level 3 Communications	Level 3	93	108	48	47	5
LUMOS Networks	Lumos Networks	97	78	20	214	15
M247 Ltd	M247	45	7	96	15	10
Morgan Wireless, LLC	UNKNOWN	45	22	26	164	1
Shentel Communications	Shentel	2	5	47	2	1
SoftLayer Technologies	SoftLayer	92	12	23	12	3
Spectrum	Spectrum	61	9	46	3	1
Sprint PCS	Sprint	16	3	59	842	63
T-MOBILE USA	T-Mobile	14	4	51	646	15
Telegia	Telegia	13	5	54	304	5
US Cellular	US Cellular	8	5	62	201	17
USDA	USDA	9	4	152	18	2
Verizon Business	Verizon Enterprise Solut	12	3	138	148	4
Verizon FIOS	Verizon	151	151	13	27	4
Verizon Internet Services	Verizon	6	3	97	516	40
VERIZON WIRELESS	Verizon	30	8	54	199	65
VIASAT	Exede	13	4	659	377	35
Viasat Communications	Exede	13	5	677	2	1
Wave2Net	Wave2Net	11	2	78	338	1
Web2Objects LLC	Web2Objects	48	7	33	11	5
Winchester Wireless	Winchester Wireless	12	12	84	157	4
Windstream Communications	Windstream	35	24	49	16	4
County Totals		49	18	105	77721	901



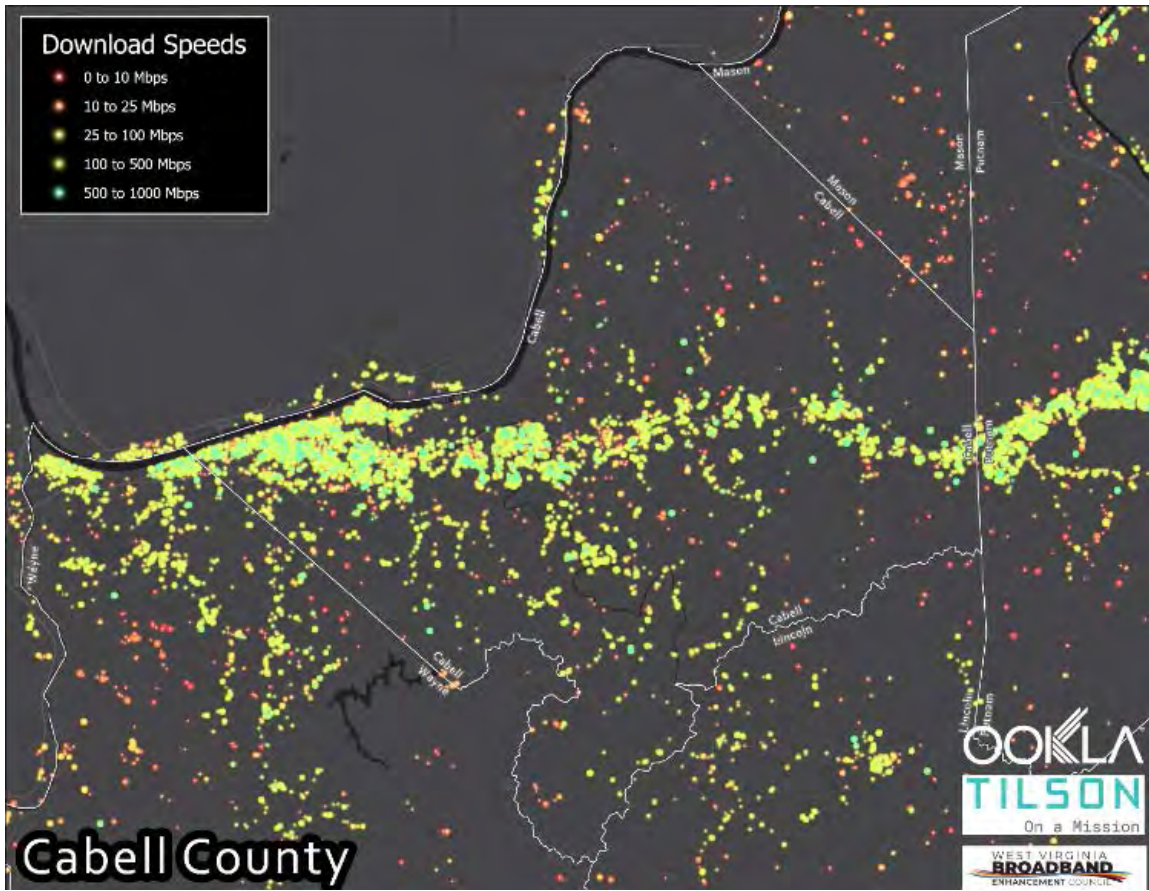
Boone						
ISP	Common Name	Average Download Speed(Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	117	16	43	45	9
AT&T Services	AT&T Enterprise	8	3	90	4	1
AT&T Wireless	AT&T Internet	15	5	73	31	4
Frontier Communications	Frontier	9	1	61	8440	298
Google Cloud	Google Cloud Platform	5	3	128	5	4
Hughes Network Systems	HughesNet	19	2	773	189	4
IPVanish	UNKNOWN	31	7	68	5	3
Leaseweb USA	Leaseweb	94	10	48	2	1
LUMOS Networks	Lumos Networks	25	25	9	6	3
Shentel Communications	Shentel	70	10	53	3086	7
SoftLayer Technologies	SoftLayer	45	8	51	5	3
Sprint PCS	Sprint	0	0	42	1	1
Suddenlink Communications	Suddenlink	139	26	17	7089	149
T-MOBILE USA	T-Mobile	18	2	74	2	2
Verizon Internet Services	Verizon	5	5	46	2	2
VERIZON WIRELESS	Verizon	30	7	56	34	17
VIASAT	Exede	8	3	665	41	7
Windstream Communications	Windstream	14	14	27	9	2
County Totals		36	8	129	18996	517



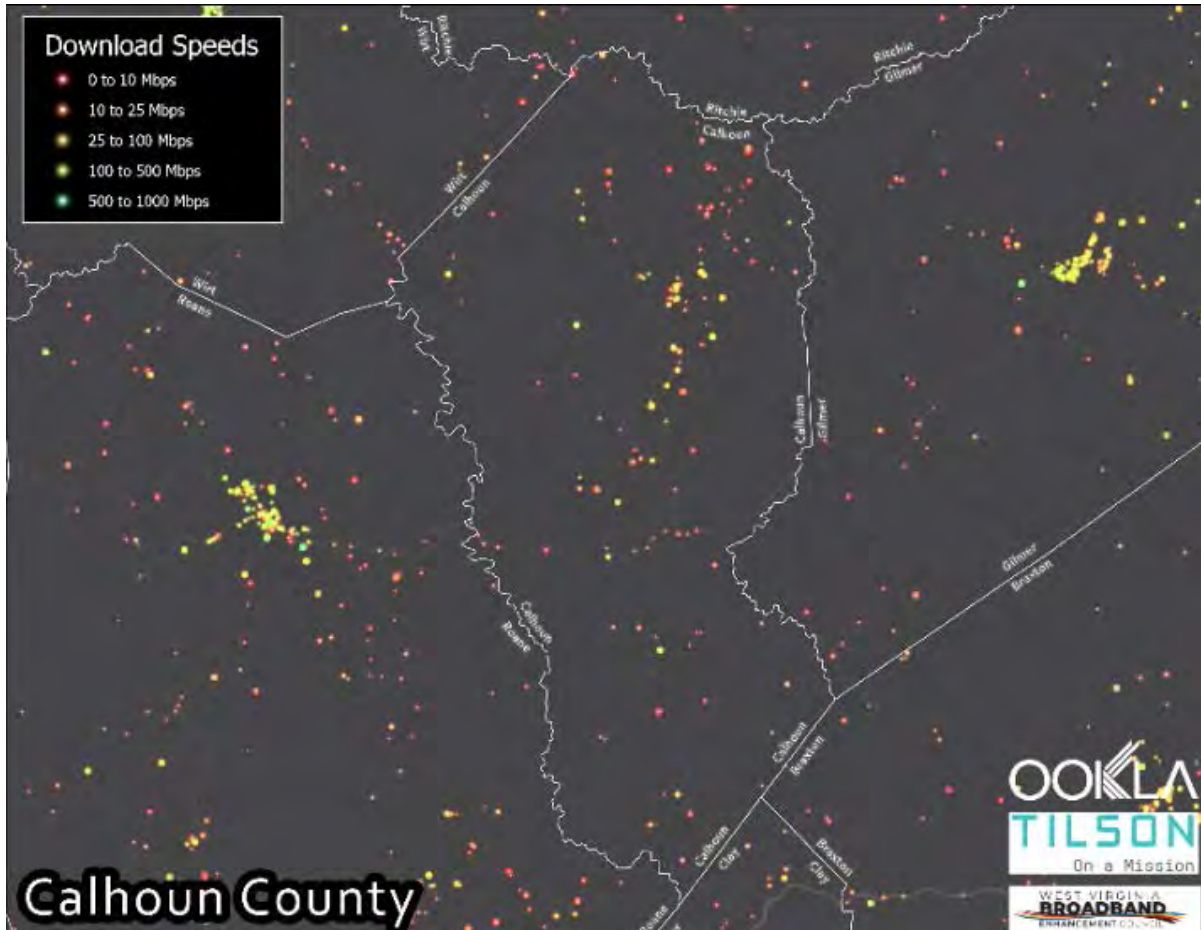
Braxton							
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count	
AT&T Services	AT&T Enterprise	11	4	100	9	1	
AT&T Wi-Fi Services	AT&T Internet	73	72	29	2	1	
AT&T Wireless	AT&T Internet	14	5	114	481	9	
Comcast Business	Comcast Business	5	6	26	4	1	
Comcast Cable	XFINITY	359	12	14	1	1	
Frontier Communications	Frontier	15	3	46	1294	196	
Google Cloud	Google Cloud Platform	8	5	206	2	2	
Google Fi	Google Fi	2	0	24	1	1	
Hughes Network Systems	HughesNet	9	2	775	362	4	
Leaseweb-usa-wdc	UNKNOWN	10	10	33	23	6	
Leaseweb USA	Leaseweb	10	11	35	23	1	
LUMOS Networks	Lumos Networks	109	127	33	99	9	
MicroLogic	Micrologic	11	3	79	900	2	
SHENTEL	Shentel	63	9	30	78	4	
Shentel Communications	Shentel	84	10	17	813	31	
Spectrum Business	Spectrum Business	132	5	34	2	1	
Sprint PCS	Sprint	19	5	95	37	13	
Suddenlink Communications	Suddenlink	379	32	9	4	1	
T-MOBILE USA	T-Mobile	5	2	146	24	3	
US Cellular	US Cellular	12	6	68	65	11	
USDA	USDA	5	1	46	1	1	
VERIZON WIRELESS	Verizon	15	9	67	87	16	
VIASAT	Exede	11	3	696	64	19	
Viasat Communications	Exede	11	4	790	12	1	
Zayo	UNKNOWN	51	50	22	2	1	
County Totals		57	16	141	4390	336	



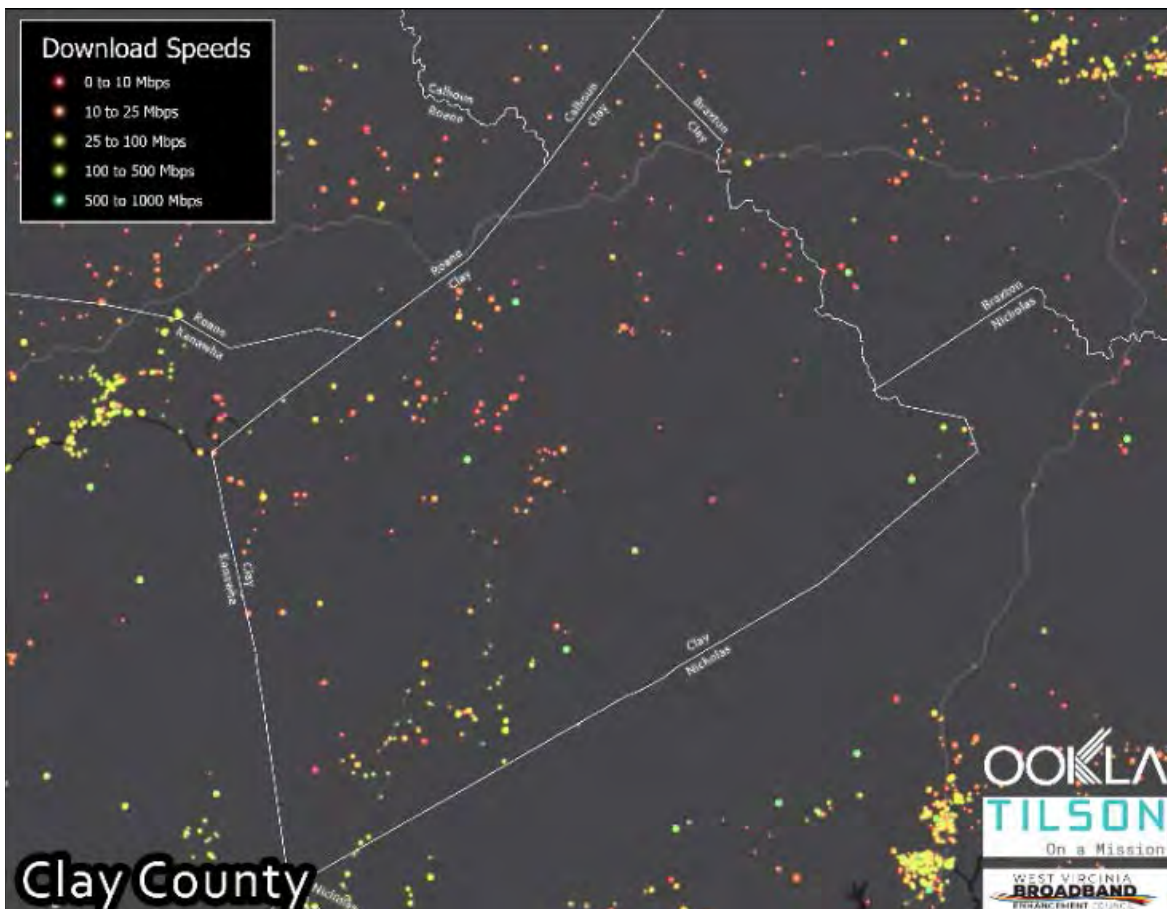
Brooke						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	118	41	20	110	9
AT&T Services	AT&T Enterprise	8	3	48	215	8
AT&T Wi-Fi Services	AT&T Internet	56	79	27	1	1
AT&T Wireless	AT&T Internet	22	9	80	105	6
CityNet	CityNet	17	20	21	1	1
Comcast Business	Comcast Business	85	19	53	207	44
Comcast Cable	XFINITY	181	15	21	3699	77
Datacamp Limited	UNKNOWN	47	11	46	1	1
Frontier Communications	Frontier	14	7	111	494	133
Google Fi	Google Fi	26	5	26	1	1
Hughes Network Systems	HughesNet	3	3	778	1	1
Hurricane Electric	UNKNOWN	33	6	24	199	2
Jefferson Co. Cable	JCC	19	4	29	2159	11
Level 3 Communications	Level 3	6	2	48	4	2
Massillon Cable	MCTV	47	4	28	271	3
Spectrum	Spectrum	52	11	23	15	1
Sprint PCS	Sprint	14	2	27	4	3
T-MOBILE USA	T-Mobile	21	8	79	56	4
UNKNOWN	UNKNOWN	10	6	264	1	1
Verizon FIOS	Verizon	164	185	21	74	4
VERIZON WIRELESS	Verizon	18	7	78	298	21
VIASAT	Exede	23	3	762	169	7
Viasat Communications	Exede	33	4	598	1	1
Web2Objects LLC	Web2Objects	72	4	24	1	1
Windstream Communicator	Windstream	97	159	24	6	3
County Totals		47	25	130	8093	346



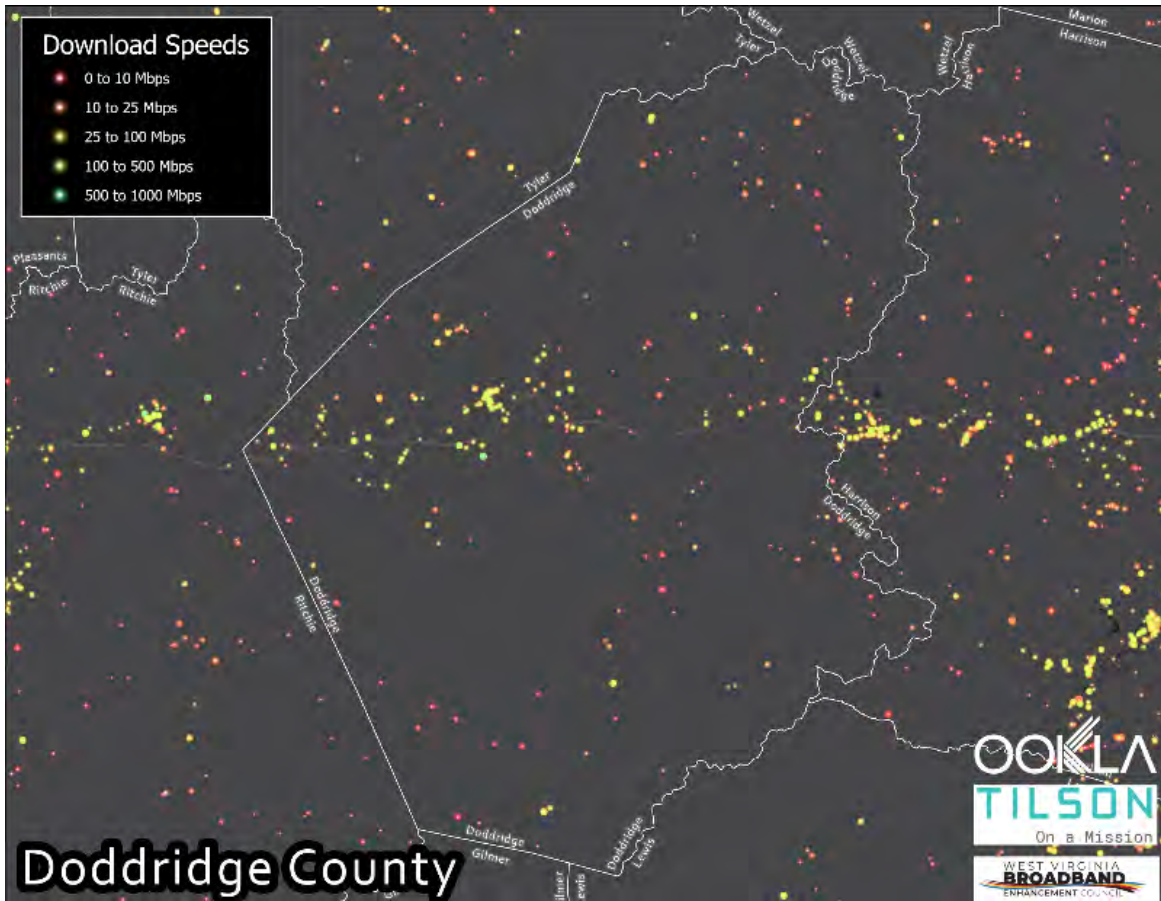
Cabell						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	1	8	57	1	1
Armstrong Cable	Zoom Internet	125	16	43	3051	45
Arx Technologies	UNKNOWN	26	11	52	1122	5
AT&T Services	AT&T Enterprise	23	19	95	52	8
AT&T Wi-Fi Services	AT&T Internet	43	39	34	27	6
AT&T Wireless	AT&T Internet	25	7	137	815	22
CenturyLink	CenturyLink	7	4	60	8	4
CityNet LLC	Citynet	20	21	14	13	1
Cloudflare Warp	UNKNOWN	11	1	52	8	3
Comcast Business	Comcast Business	102	21	37	1587	150
Comcast Cable	XFINITY	151	13	35	45844	113
Datacamp Limited	UNKNOWN	13	5	87	3	2
DNIC	UNKNOWN	58	19	127	273	2
Frontier Communications	Frontier	16	7	38	3399	342
Google Cloud	Google Cloud Platform	20	10	71	8	6
Google Fi	Google Fi	92	11	46	13	5
Hughes Network Systems	HughesNet	12	1	899	94	4
IPVanish	UNKNOWN	42	10	34	31	6
Leaseweb-usa-wdc	UNKNOWN	83	13	26	8	4
Leaseweb USA	Leaseweb	83	21	89	4	3
Level 3 Communications	Level 3	324	261	20	7	2
LUMOS Networks	Lumos Networks	59	55	29	1215	40
M247 Ltd	M247	7	6	78	2	2
Marshall University	UNKNOWN	207	280	26	946	66
NTT America	NTT Communications	3	3	60	1	1
Results Physiotherapy	UNKNOWN	13	9	294	3410	1
Shentel Communications	Shentel	0	8	31	1	1
SoftLayer Technologies	SoftLayer	9	5	127	1	1
Spectrum	Spectrum	268	23	22	6	1
Spectrum Business	Spectrum Business	37	29	19	8	3
Sprint PCS	Sprint	23	3	72	48	27
Suddenlink Communications	Suddenlink	160	22	18	24904	142
T-MOBILE USA	T-Mobile	26	9	78	232	7
UNKNOWN	UNKNOWN	16	3	24	2	1
Verizon FIOS	Verizon	8	0	57	1	1
Verizon Internet Services	Verizon	12	11	33	2	1
VERIZON WIRELESS	Verizon	34	14	65	357	44
VIASAT	Exede	5	3	692	353	26
Web2Objects LLC	Web2Objects	46	11	51	6	4
Windstream Communication	Windstream	43	31	158	7	3
Zayo	UNKNOWN	35	42	31	29	2
County Totals		56	26	98	87899	1108



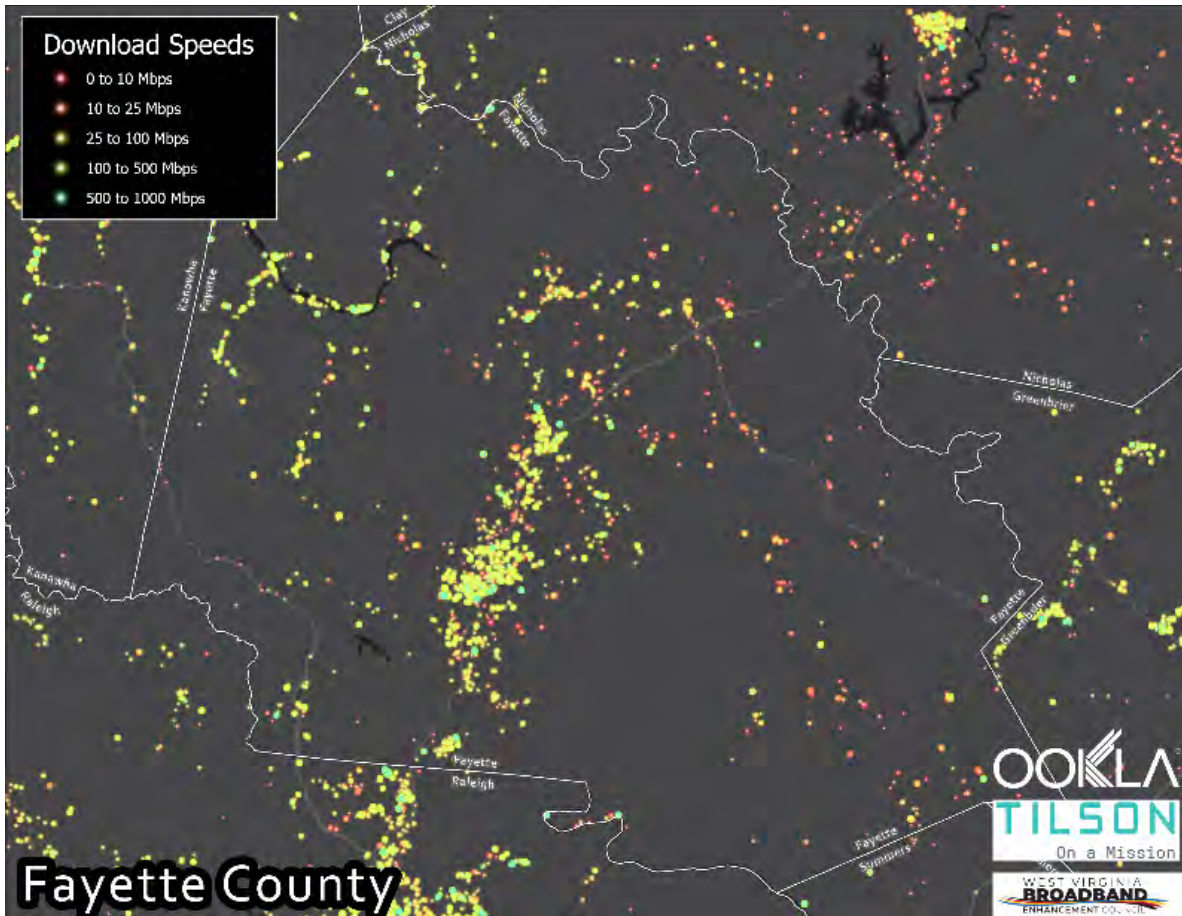
Calhoun						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	4	0	37	2	2
AT&T U-verse	AT&T Internet	68	210	32	1	1
AT&T Wireless	AT&T Internet	15	5	78	63	7
Cloudflare Warp	UNKNOWN	3	0	298	4	2
Datacamp Limited	UNKNOWN	3	0	191	6	2
Frontier Communications	Frontier	17	12	137	617	118
Hughes Network Systems	HughesNet	23	3	1049	26	4
LUMOS Networks	Lumos Networks	130	98	24	47	4
Shentel Communications	Shentel	36	10	63	365	2
Sprint PCS	Sprint	6	2	63	36	19
Suddenlink Communications	Suddenlink	100	21	14	66	1
TransCanada Pipelines Limited	UNKNOWN	3	3	82	7	2
VERIZON WIRELESS	Verizon	13	1	51	2	2
VIASAT	Exede	11	3	698	125	29
Viasat Communications	Exede	13	4	658	20	2
County Totals		30	25	232	1387	197



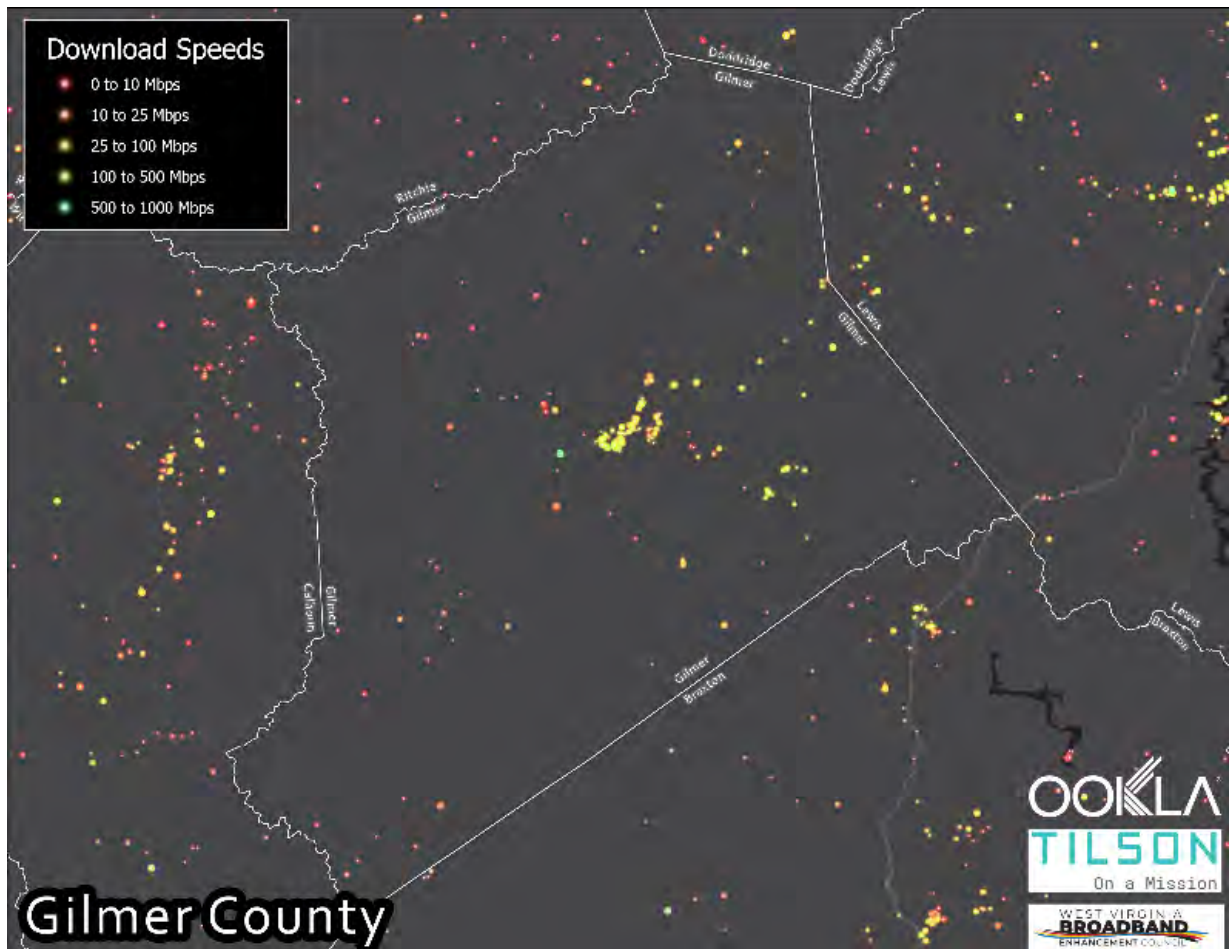
Clay						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Wireless	AT&T Internet	12	5	189	79	8
Comcast Cable	XFINITY	30	24	44	1	1
Frontier Communications	Frontier	12	2	90	1016	172
Hughes Network Systems	HughesNet	12	2	991	22	2
M247 Ltd	M247	14	7	99	1	1
Shentel Communications	Shentel	67	7	81	42	2
Sprint PCS	Sprint	8	2	45	25	12
Suddenlink Communications	Suddenlink	144	22	18	287	36
US Cellular	US Cellular	13	3	73	39	13
VERIZON WIRELESS	Verizon	7	2	132	12	7
VIASAT	Exede	6	4	694	65	11
Viasat Communications	Exede	16	5	663	1	1
County Totals		28	7	260	1590	266



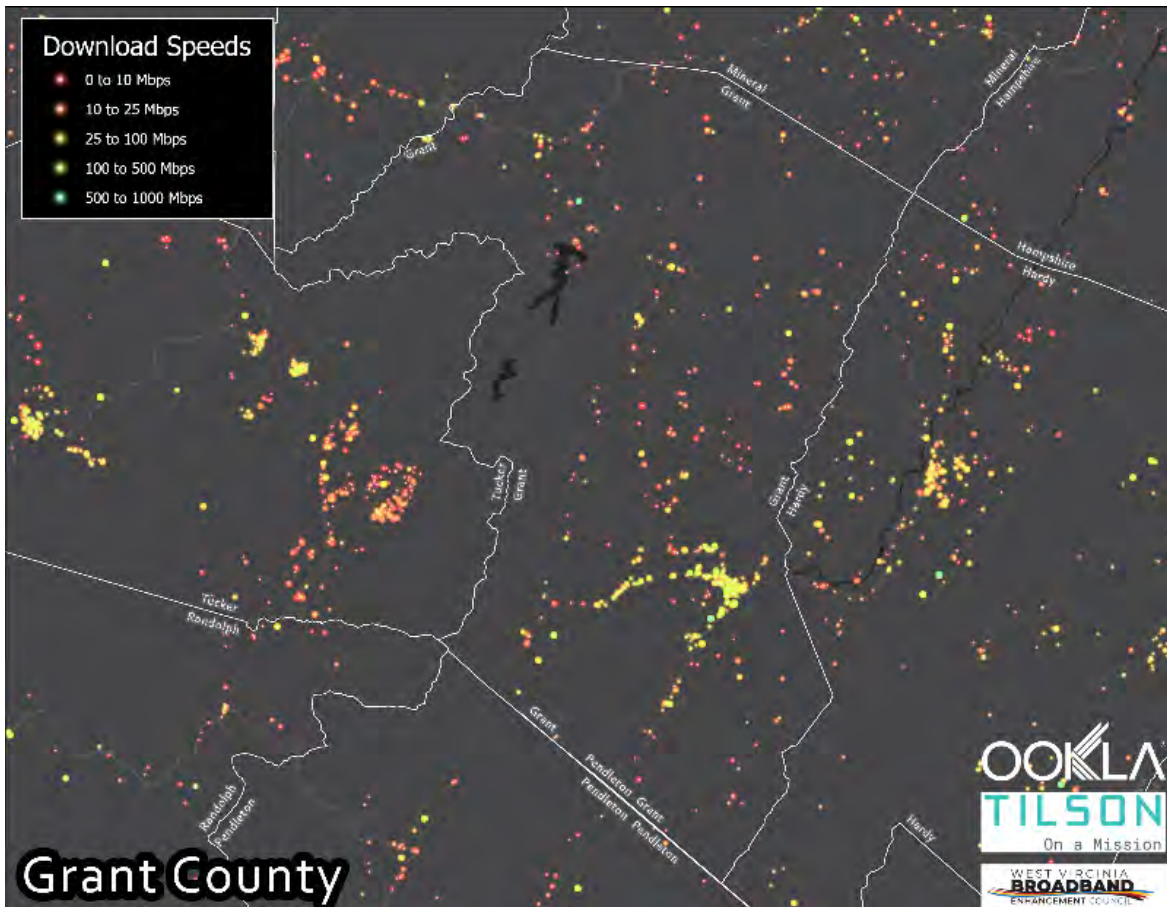
Doddridge						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	106	12	41	649	12
AT&T Services	AT&T Enterprise	13	16	98	4	1
AT&T Wireless	AT&T Internet	13	4	125	63	7
CenturyLink	CenturyLink	5	8	63	5	1
CityNet LLC	Citynet	187	515	10	3	2
Frontier Communications	Frontier	11	2	73	575	147
Google Fi	Google Fi	48	9	80	1	1
Hughes Network Systems	HughesNet	14	2	888	314	8
Intelsat Global Service Corporation	Intelsat	1	0	549	1	1
LUMOS Networks	Lumos Networks	17	18	14	3	1
Shentel Communications	Shentel	51	8	14	195	14
Spectrum	Spectrum	61	10	41	40	2
Spectrum Business	Spectrum Business	11	30	62	8	1
Sprint PCS	Sprint	22	4	74	17	12
Suddenlink Communications	Suddenlink	205	35	9	19	3
T-MOBILE USA	T-Mobile	13	5	74	292	4
Verizon Business	Verizon Enterprise Solutions	6	2	167	24	2
VERIZON WIRELESS	Verizon	27	4	90	4	3
VIASAT	Exede	52	3	652	144	28
Viasat Communications	Exede	25	4	667	16	2
County Totals		44	35	190	2377	252



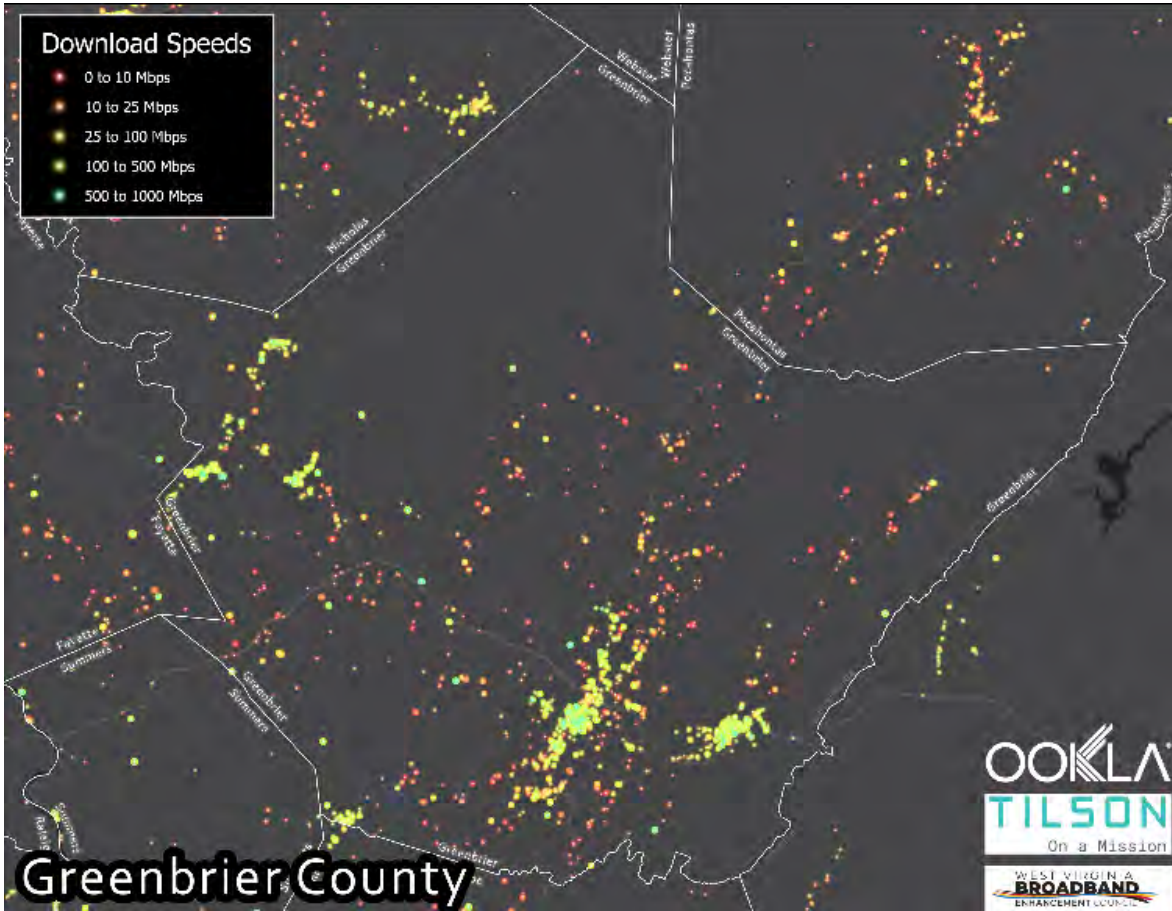
Fayette						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	56	45	7	9	1
AT&T Services	AT&T Enterprise	84	90	31	110	4
AT&T Wi-Fi Services	AT&T Internet	51	50	32	9	2
AT&T Wireless	AT&T Internet	14	4	97	355	10
CenturyLink	CenturyLink	16	2	112	3	1
Cloudflare Warp	UNKNOWN	11	4	48	1	1
Comcast Business	Comcast Business	68	28	13	2	2
Datacamp Limited	UNKNOWN	107	22	64	3	2
Frontier Communications	Frontier	21	3	48	3265	310
Google Cloud	Google Cloud Platform	8	4	73	6	5
Google Fi	Google Fi	7	5	159	5	4
Hughes Network Systems	HughesNet	15	3	803	19	3
IPVanish	UNKNOWN	34	20	68	3	1
Leaseweb-usa-wdc	UNKNOWN	31	13	49	4	3
Level 3 Communications	Level 3	41	10	47	1	1
LUMOS Networks	Lumos Networks	44	54	21	40	8
SHENTEL	Shentel	63	8	23	331	4
Shentel Communications	Shentel	80	23	26	2257	19
SoftLayer Technologies	SoftLayer	28	13	56	2	1
Sprint PCS	Sprint	21	7	48	62	28
Suddenlink Communications	Suddenlink	157	28	18	14555	197
T-MOBILE USA	T-Mobile	4	3	115	9	7
UNKNOWN	UNKNOWN	43	2	48	1	1
US Cellular	US Cellular	10	3	90	73	12
VERIZON WIRELESS	Verizon	35	7	92	84	35
VIASAT	Exede	29	3	675	47	15
Web2Objects LLC	Web2Objects	79	15	55	9	4
West Virginia University	UNKNOWN	693	96	12	1	1
Windstream Communications	Windstream	13	15	24	7	1
County Totals		64	20	102	21273	683



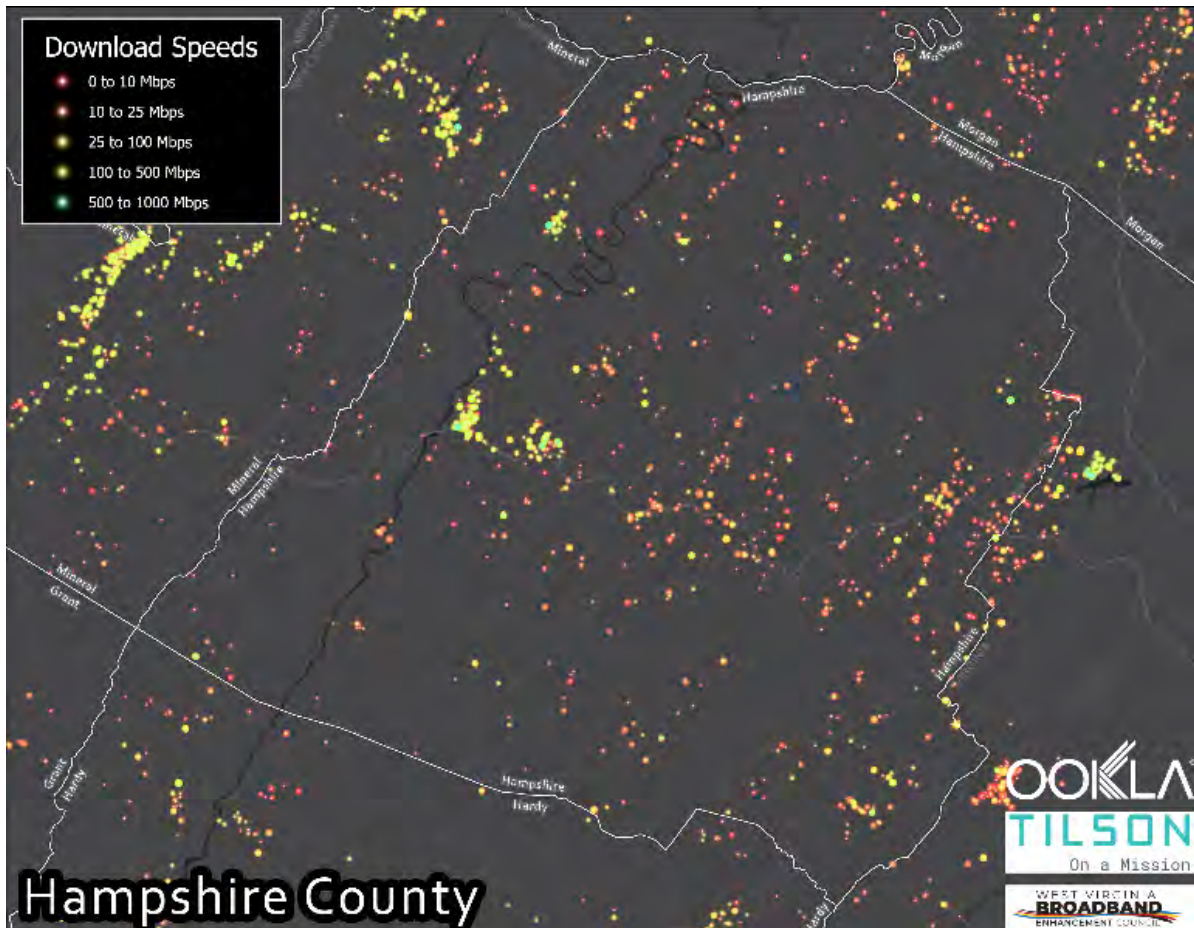
Gilmer						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	4	0	39	3	2
AT&T Services	AT&T Enterprise	9	6	101	2	1
AT&T Wireless	AT&T Internet	14	2	92	155	4
CityNet LLC	Citynet	67	55	3	9	1
Frontier Communications	Frontier	20	16	43	288	82
Hughes Network Systems	HughesNet	13	2	918	102	5
IPVanish	UNKNOWN	31	9	53	5	2
Leaseweb-usa-wdc	UNKNOWN	14	1	21	1	1
LUMOS Networks	Lumos Networks	29	15	12	7	3
Shentel Communications	Shentel	65	8	16	827	19
Spectrum	Spectrum	27	10	14	1	1
Sprint PCS	Sprint	40	11	80	43	21
T-MOBILE USA	T-Mobile	61	17	70	30	9
VERIZON WIRELESS	Verizon	18	7	43	28	12
VIASAT	Exede	8	2	748	58	10
County Totals		28	11	150	1559	173



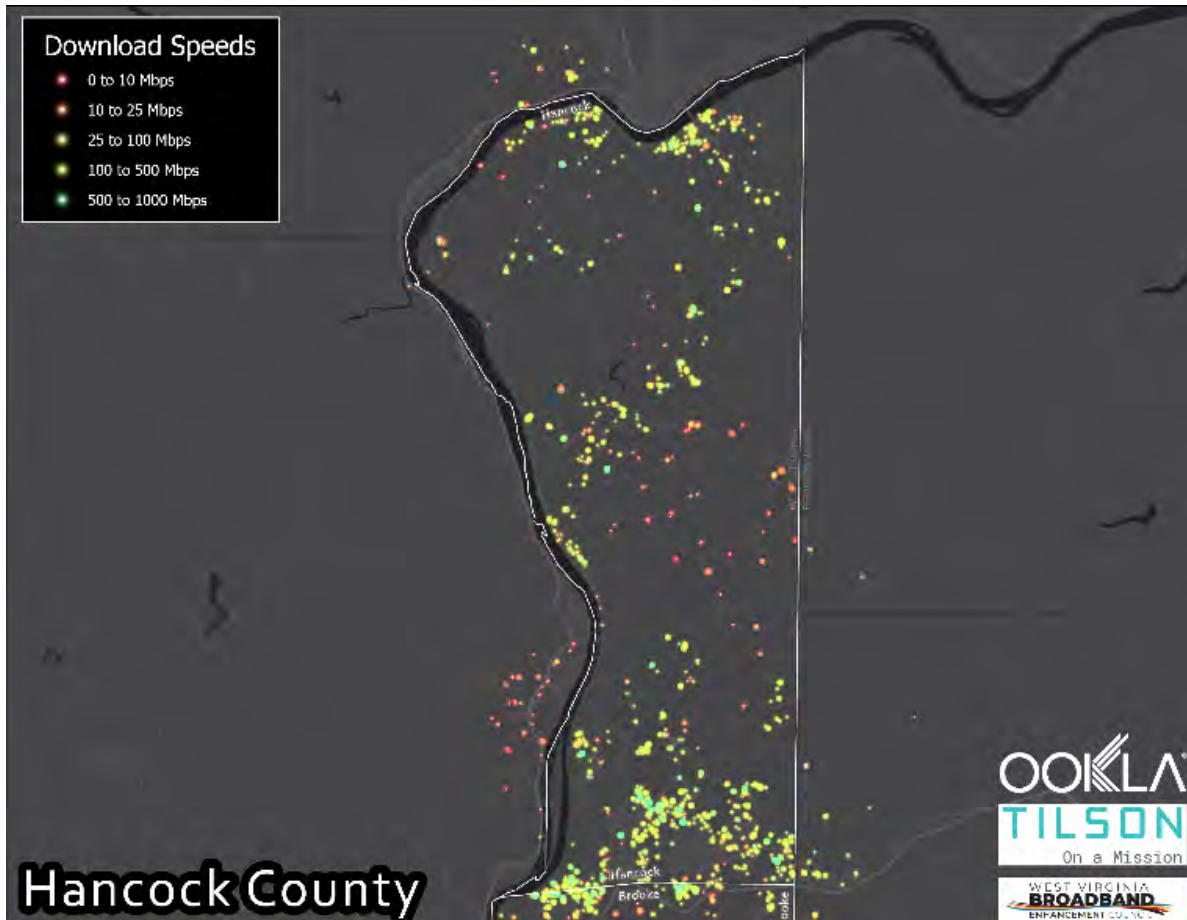
Grant						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	3	3	120	2	1
AT&T Wi-Fi Services	AT&T Internet	7	6	69	2	2
AT&T Wireless	AT&T Internet	10	4	87	140	5
Comcast Business	Comcast Business	26	8	16	4	2
Comcast Cable	XFINITY	333	12	24	15	2
Frontier Communications	Frontier	18	8	37	1146	121
Hardy Telecommunications	Hardy Telecommunications	61	51	9	18	4
Hughes Network Systems	HughesNet	19	2	844	34	7
Leaseweb-usa-wdc	UNKNOWN	1	5	44	1	1
Leaseweb USA	Leaseweb	44	9	23	4	2
SHENTEL	Shentel	60	6	15	5	2
Shentel Communications	Shentel	66	20	17	2143	17
SoftLayer Technologies	SoftLayer	43	7	29	2	1
Sprint PCS	Sprint	6	3	70	31	9
T-MOBILE USA	T-Mobile	7	1	62	6	4
US Cellular	US Cellular	16	4	76	11	4
Verizon Internet Services	Verizon	12	4	13	51	2
VERIZON WIRELESS	Verizon	0	0	151	1	1
VIASAT	Exede	31	13	640	59	14
Viasat Communications	Exede	17	4	645	9	1
County Totals		43	9	156	3680	199



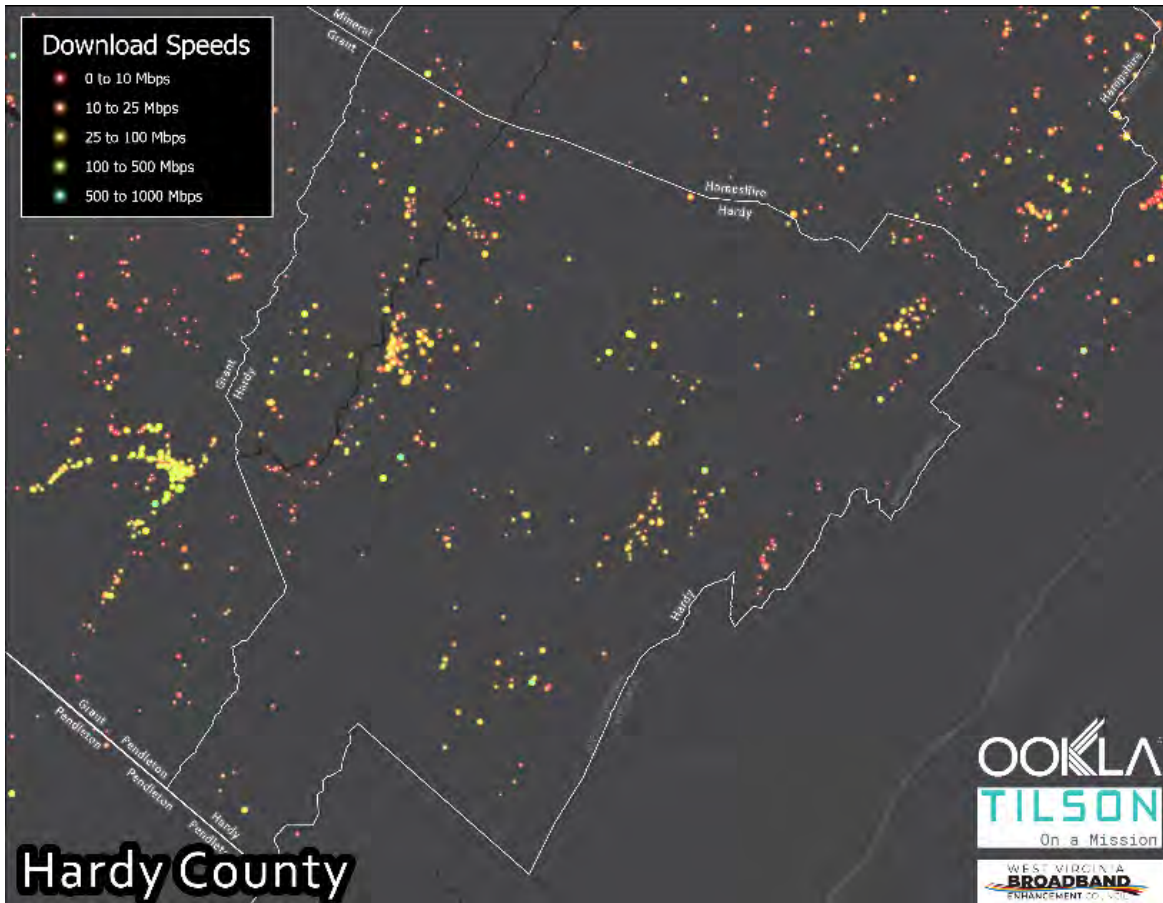
Greenbrier						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	6	41	54	2	1
AT&T Services	AT&T Enterprise	11	9	107	28	2
AT&T Wi-Fi Services	AT&T Internet	72	78	38	4	2
AT&T Wireless	AT&T Internet	18	7	83	1098	8
CityNet LLC	Citynet	23	26	11	4	1
Datacamp Limited	UNKNOWN	34	19	147	4	4
Frontier Communications	Frontier	13	6	53	3531	314
Google Cloud	Google Cloud Platform	10	8	67	6	1
Google Fi	Google Fi	7	9	52	9	3
Hughes Network Systems	HughesNet	14	2	1037	99	7
IPVanish	UNKNOWN	20	3	167	7	3
Leaseweb-usa-wdc	UNKNOWN	31	8	58	10	5
Leaseweb USA	Leaseweb	34	16	64	6	4
LUMOS Networks	Lumos Networks	41	36	33	1722	15
SECURED SERVERS LLC	PhoenixNAP	29	15	110	1	1
Shentel Communications	Shentel	49	9	32	468	12
SoftLayer Technologies	SoftLayer	5	8	47	1	1
Sprint PCS	Sprint	9	6	48	417	162
Suddenlink Communications	Suddenlink	148	30	18	9941	161
T-MOBILE USA	T-Mobile	10	4	99	94	8
US Cellular	US Cellular	10	5	94	49	15
Verizon Business	Verizon Enterprise Soluti	13	5	158	28	1
Verizon Internet Services	Verizon	263	239	13	4	1
VERIZON WIRELESS	Verizon	47	11	46	60	20
VIASAT	Exede	32	3	672	195	33
Viasat Communications	Exede	21	4	780	59	6
Web2Objects LLC	Web2Objects	10	10	96	2	2
Windstream Communications	Windstream	24	29	31	1	1
Zayo	UNKNOWN	35	47	45	4	1
County Totals		36	24	147	17854	795



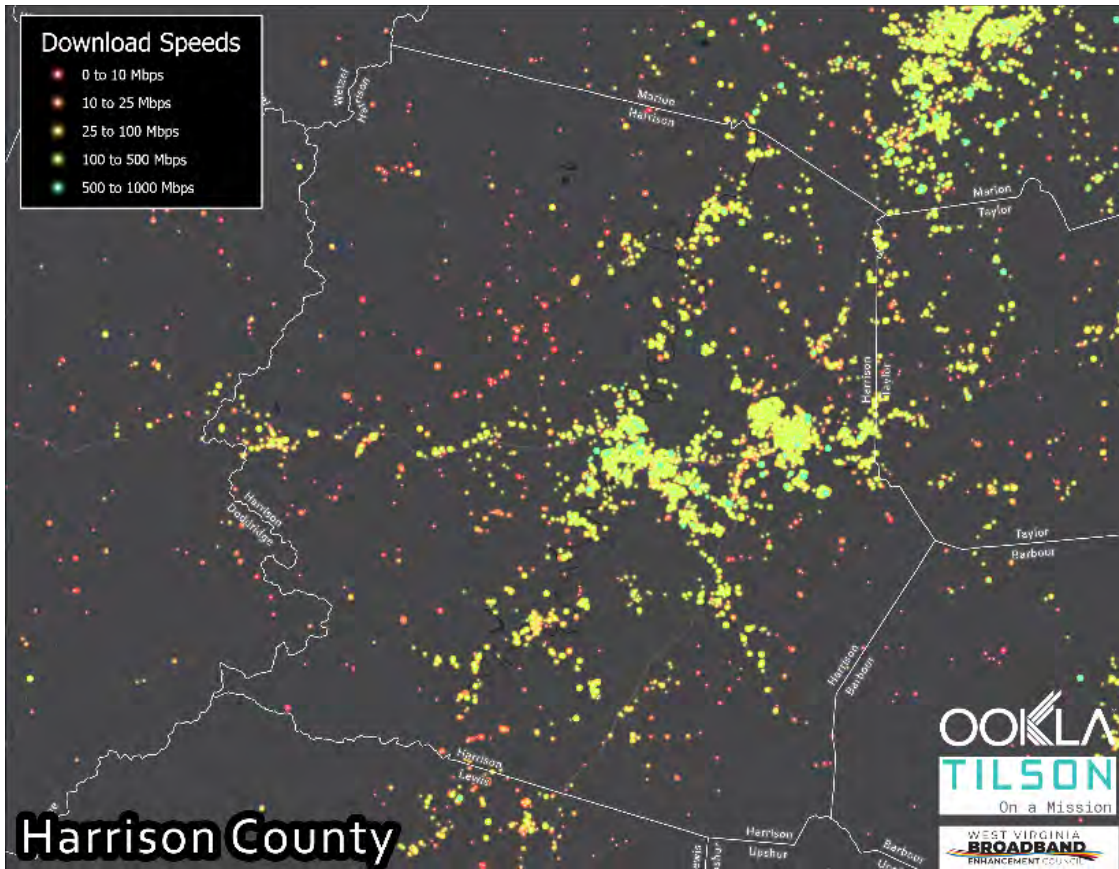
Hampshire						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
All Points Broadband	All Points Broadband	9	2	95	25	1
AT&T Services	AT&T Enterprise	9	1	86	7	1
AT&T Wireless	AT&T Internet	25	9	66	1599	12
ATLANTIC BROADBAND	Atlantic Broadband	142	18	25	1567	54
Cloudflare Warp	UNKNOWN	2	0	21	1	1
Comcast Business	Comcast Business	59	28	40	57	12
Comcast Cable	XFINITY	184	17	24	148	7
Datacamp Limited	UNKNOWN	29	6	32	10	3
Frontier Communications	Frontier	13	2	51	11708	127
Google Fi	Google Fi	8	4	52	5	2
Hardy Telecommunications	Hardy Telecommunications	25	14	15	354	5
Hughes Network Systems	HughesNet	23	2	916	118	6
Hurricane Electric	UNKNOWN	39	15	12	72	1
IPVanish	UNKNOWN	4	0	333	2	2
Leaseweb-usa-wdc	UNKNOWN	18	7	55	4	3
Leaseweb USA	Leaseweb	35	15	32	2	1
M247 Ltd	M247	46	8	39	25	1
SHENTEL	Shentel	17	11	23	1	1
Shentel Communications	Shentel	14	4	21	43	3
Sprint PCS	Sprint	5	2	97	60	36
T-MOBILE USA	T-Mobile	14	4	51	461	10
US Cellular	US Cellular	12	3	85	174	17
Verizon Business	Verizon Enterprise Solutions	0	1	132	1	1
Verizon Internet Services	Verizon	23	12	73	101	10
VERIZON WIRELESS	Verizon	5	2	70	17	10
VIASAT	Exede	10	3	675	266	44
Viasat Communications	Exede	28	4	626	4	1
Wave2Net	Wave2Net	13	4	46	9	1
Winchester Wireless	Winchester Wireless	9	7	74	60	2
Windstream Communications	Windstream	8	10	32	1	1
Zayo	UNKNOWN	30	37	49	6	2
County Totals		28	8	127	16908	378



Hancock						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	122	72	35	104	7
AT&T Data Communications Services	AT&T Enterprise	14	3	31	189	7
AT&T Services	AT&T Enterprise	43	41	18	3	2
AT&T Wi-Fi Services	AT&T Internet	56	70	31	3	2
AT&T Wireless	AT&T Internet	21	11	59	156	14
Comcast Business	Comcast Business	101	65	27	477	70
Comcast Cable	XFINITY	195	17	23	11203	102
Frontier Communications	Frontier	22	9	32	729	141
Hughes Network Systems	HughesNet	14	2	1123	6	2
IPVanish	UNKNOWN	118	32	38	16	4
Leaseweb-usa-wdc	UNKNOWN	57	12	37	1	1
LUMOS Networks	Lumos Networks	60	27	26	14	1
M247 Ltd	M247	2	3	20	1	1
SoftLayer Technologies	SoftLayer	41	31	15	1	1
Spectrum Business	Spectrum Business	9	8	21	2	1
Sprint PCS	Sprint	28	3	53	50	24
Suddenlink Communications	Suddenlink	17	5	107	1	1
T-MOBILE USA	T-Mobile	22	8	74	30	7
Verizon FIOS	Verizon	184	208	20	77	4
VERIZON WIRELESS	Verizon	23	6	64	132	29
VIASAT	Exede	23	2	634	16	7
Windstream Communications	Windstream	19	2	51	10	1
County Totals		54	29	115	13221	429

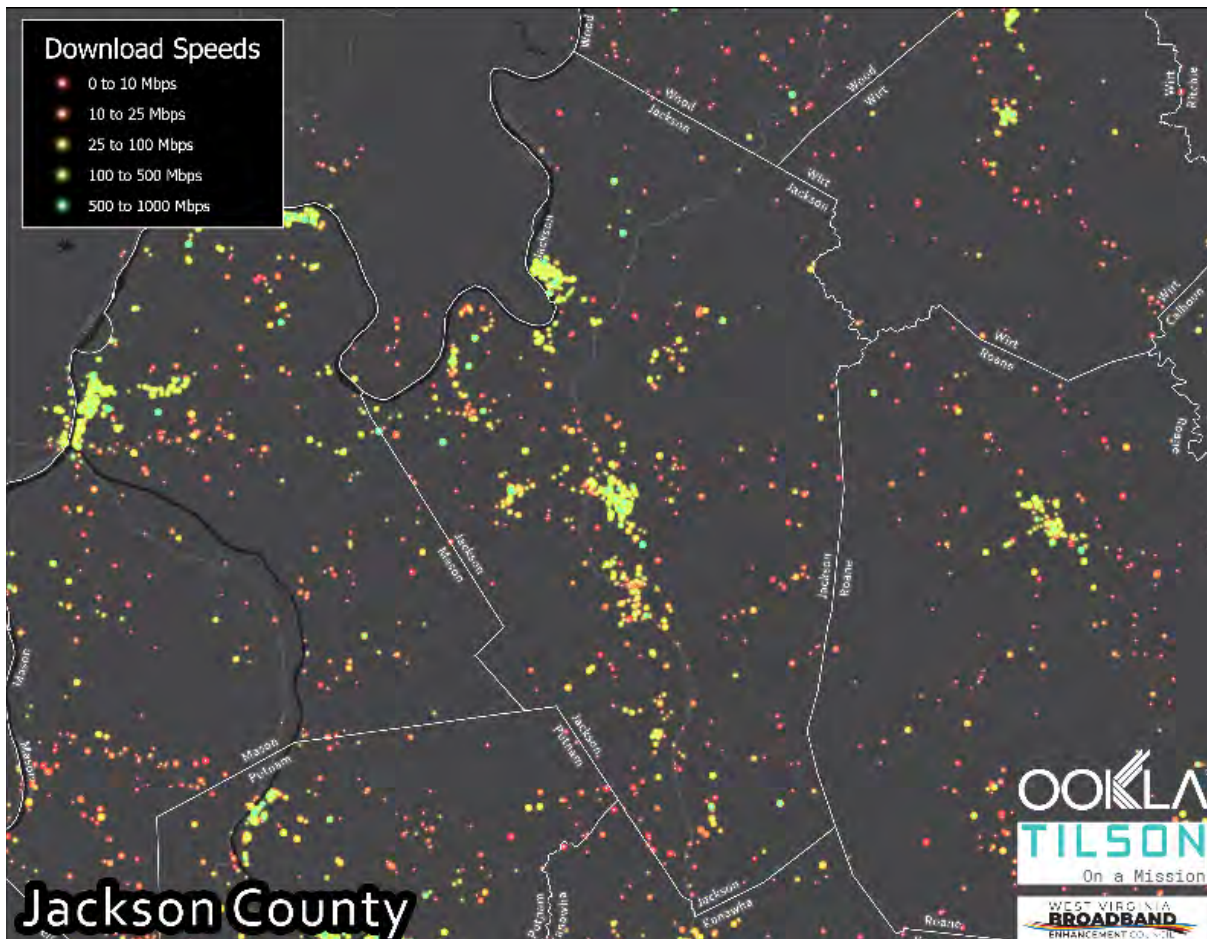


Hardy						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Wi-Fi Services	AT&T Internet	61	76	50	2	1
AT&T Wireless	AT&T Internet	20	9	90	141	6
Comcast Business	Comcast Business	98	20	18	5	5
Comcast Cable	XFINITY	171	12	22	106	4
Datacamp Limited	UNKNOWN	12	11	101	1	1
Frontier Communications	Frontier	17	3	31	674	108
Google Cloud	Google Cloud Platform	8	3	185	1	1
Google Fi	Google Fi	26	15	41	2	1
Hardy Telecommunications	Hardy Telecommunications	28	17	22	3131	16
Hughes Network Systems	HughesNet	9	2	777	81	3
IPVanish	UNKNOWN	15	10	40	2	2
Leaseweb-usa-wdc	UNKNOWN	46	26	48	27	3
Level 3 Communications	Level 3	8	7	116	2	2
LUMOS Networks	Lumos Networks	75	27	46	5	2
M247 Ltd	M247	42	52	16	1	1
Shentel Communications	Shentel	130	205	6	5	3
Sprint PCS	Sprint	16	5	35	32	15
T-MOBILE USA	T-Mobile	11	6	55	61	2
US Cellular	US Cellular	3	1	224	5	3
Verizon Business	Verizon Enterprise Solutions	22	9	8	78	3
Verizon Internet Services	Verizon	31	17	20	1217	4
VERIZON WIRELESS	Verizon	0	0	186	1	1
VIASAT	Exede	5	4	657	4	4
Web2Objects LLC	Web2Objects	58	32	73	21	2
County Totals		38	24	119	5605	193

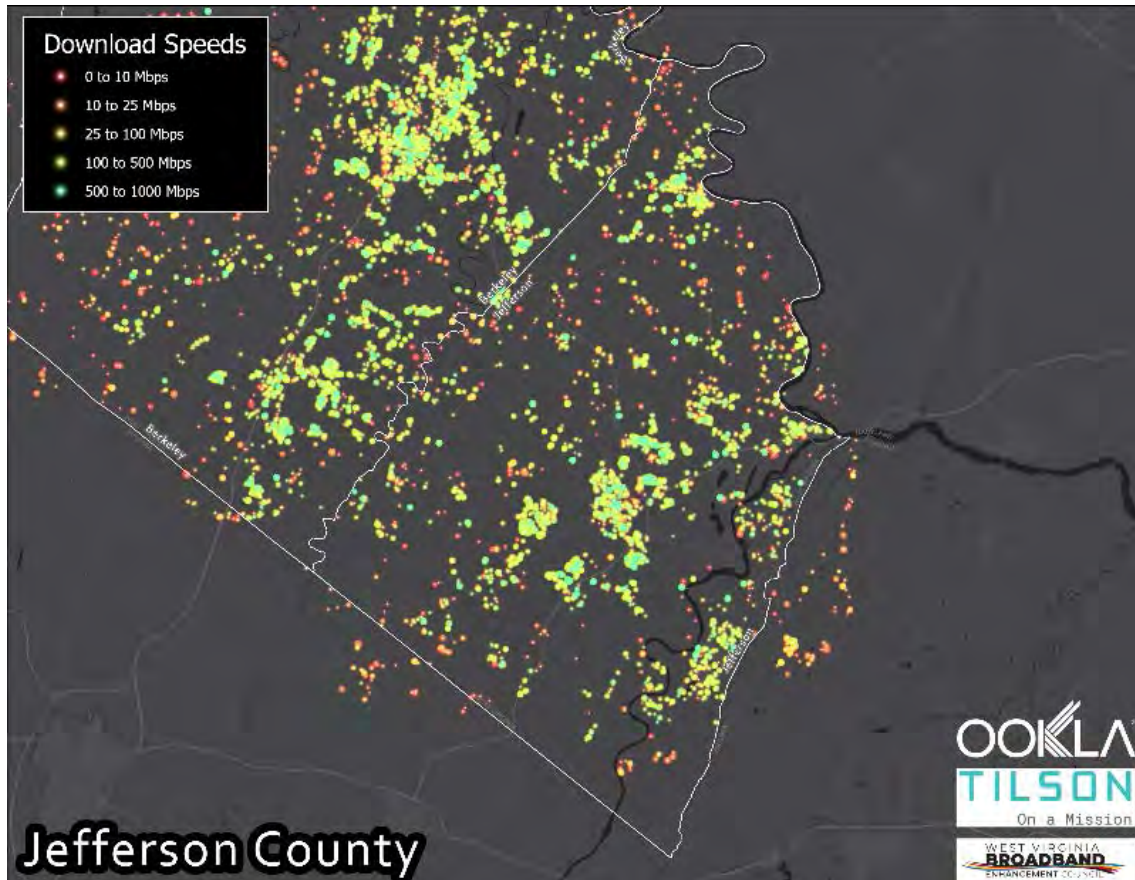


Harrison County

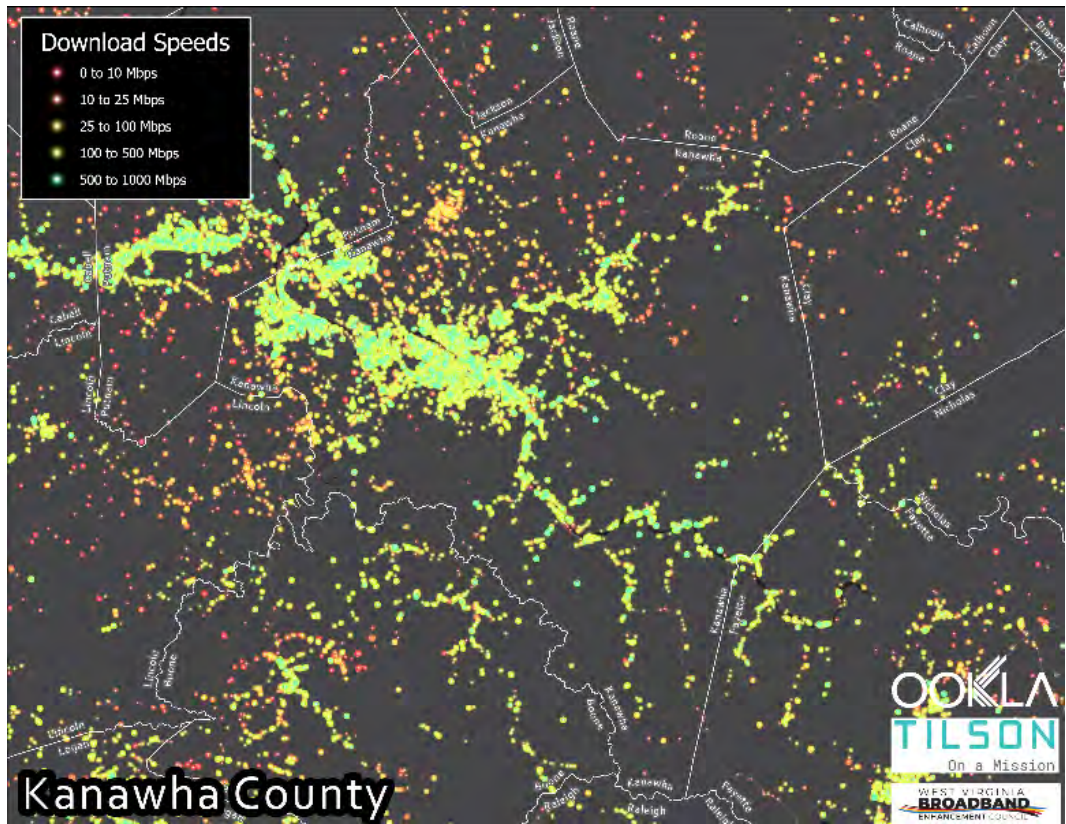
Harrison						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	27	96	26	11	1
AT&T Services	AT&T Enterprise	15	9	152	33	1
AT&T Wi-Fi Services	AT&T Internet	27	29	58	25	7
AT&T Wireless	AT&T Internet	19	4	113	1130	14
CenturyLink	CenturyLink	5	5	16	6	2
CityNet LLC	Citynet	181	186	8	11652	26
Cloudflare Warp	UNKNOWN	76	9	49	2	1
Comcast Business	Comcast Business	28	181	15	93	9
Comcast Cable	XFINITY	5	8	18	6	1
Datacamp Limited	UNKNOWN	20	3	45	2	2
Frontier Communications	Frontier	11	3	62	16318	240
Google-private-cloud	UNKNOWN	78	14	69	24	1
Google Cloud	Google Cloud Platform	22	29	89	11	5
Google Fi	Google Fi	38	6	83	4	2
Hughes Network Systems	HughesNet	21	2	818	1649	5
IBEX Global Solutions	UNKNOWN	52	52	181	625	1
Intelsat Global Service Corporation	Intelsat	3	0	604	20	1
IPVanish	UNKNOWN	47	15	36	19	3
Leaseweb-usa-wdc	UNKNOWN	49	8	56	2	2
Leaseweb USA	Leaseweb	44	34	43	3	3
Level 3 Communications	Level 3	42	70	60	2	2
LUMOS Networks	Lumos Networks	75	86	22	336	17
M247 Ltd	M247	26	7	119	7	4
MicroLogic	Micrologic	16	4	80	913	1
National Aeronautics and Space Ad	NASA	96	203	38	12	1
Results Physiotherapy	UNKNOWN	11	8	287	5558	1
Shentel Communications	Shentel	62	9	16	644	17
SoftLayer Technologies	SoftLayer	96	11	35	1	1
Spectrum	Spectrum	117	13	45	22337	72
Spectrum Business	Spectrum Business	116	15	52	644	85
Sprint PCS	Sprint	19	6	68	126	33
Suddenlink Communications	Suddenlink	60	7	24	8483	61
T-MOBILE USA	T-Mobile	11	7	102	14	7
TransCanada Pipelines Limited	UNKNOWN	27	14	93	682	2
US Cellular	US Cellular	10	6	119	293	24
US Department of the Treasury	UNKNOWN	60	17	119	79	1
Verizon Business	Verizon Enterprise Solut	16	6	97	15	4
Verizon Internet Services	Verizon	76	83	27	10	2
VERIZON WIRELESS	Verizon	19	7	76	336	72
VIASAT	Exede	24	4	669	556	42
Viasat Communications	Exede	29	5	662	25	3
Web2Objects LLC	Web2Objects	39	53	73	3	2
West Virginia University	UNKNOWN	130	168	14	243	3
Windstream Communications	Windstream	24	34	28	4	2
County Totals		45	35	124	72958	786



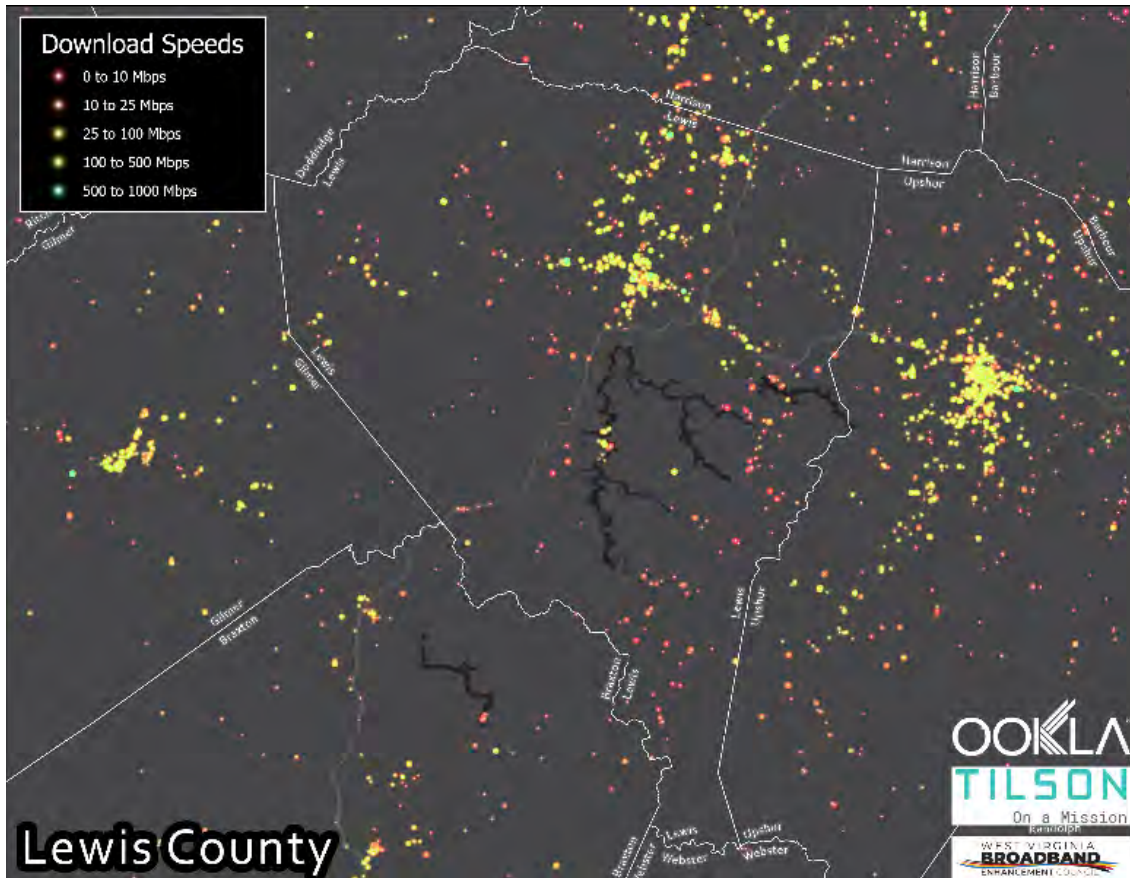
Jackson						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	7	15	14	2	1
Armstrong Cable	Zoom Internet	19	19	50	114	11
AT&T Services	AT&T Enterprise	85	21	36	460	6
AT&T Wi-Fi Services	AT&T Internet	28	68	29	1	1
AT&T Wireless	AT&T Internet	18	5	96	295	16
CenturyLink	CenturyLink	8	8	33	1	1
Cloudflare Warp	UNKNOWN	11	2	31	1	1
Comcast Business	Comcast Business	5	5	18	4	1
COMMUNITY ANTENNA SERVICE	CAS Cable	127	20	37	2207	32
Frontier Communications	Frontier	39	12	55	3114	287
Hughes Network Systems	HughesNet	14	2	867	36	5
IPVanish	UNKNOWN	51	16	105	10	6
Leaseweb-usa-wdc	UNKNOWN	14	4	45	7	4
Leaseweb USA	Leaseweb	14	7	81	2	2
LUMOS Networks	Lumos Networks	29	15	35	523	7
M247 Ltd	M247	14	9	37	5	2
SoftLayer Technologies	SoftLayer	15	4	54	9	3
Spectrum	Spectrum	85	12	47	2	1
Spectrum Business	Spectrum Business	24	31	37	1	1
Sprint PCS	Sprint	12	4	80	189	54
Suddenlink Communications	Suddenlink	151	27	20	4450	53
T-MOBILE USA	T-Mobile	18	3	106	129	7
Verizon Business	Verizon Enterprise Solutions	8	16	134	2	1
VERIZON WIRELESS	Verizon	14	12	116	314	43
VIASAT	Exede	9	3	689	111	26
Viasat Communications	Exede	19	4	654	17	1
Web2Objects LLC	Web2Objects	41	15	83	5	4
County Totals		35	13	133	12011	577



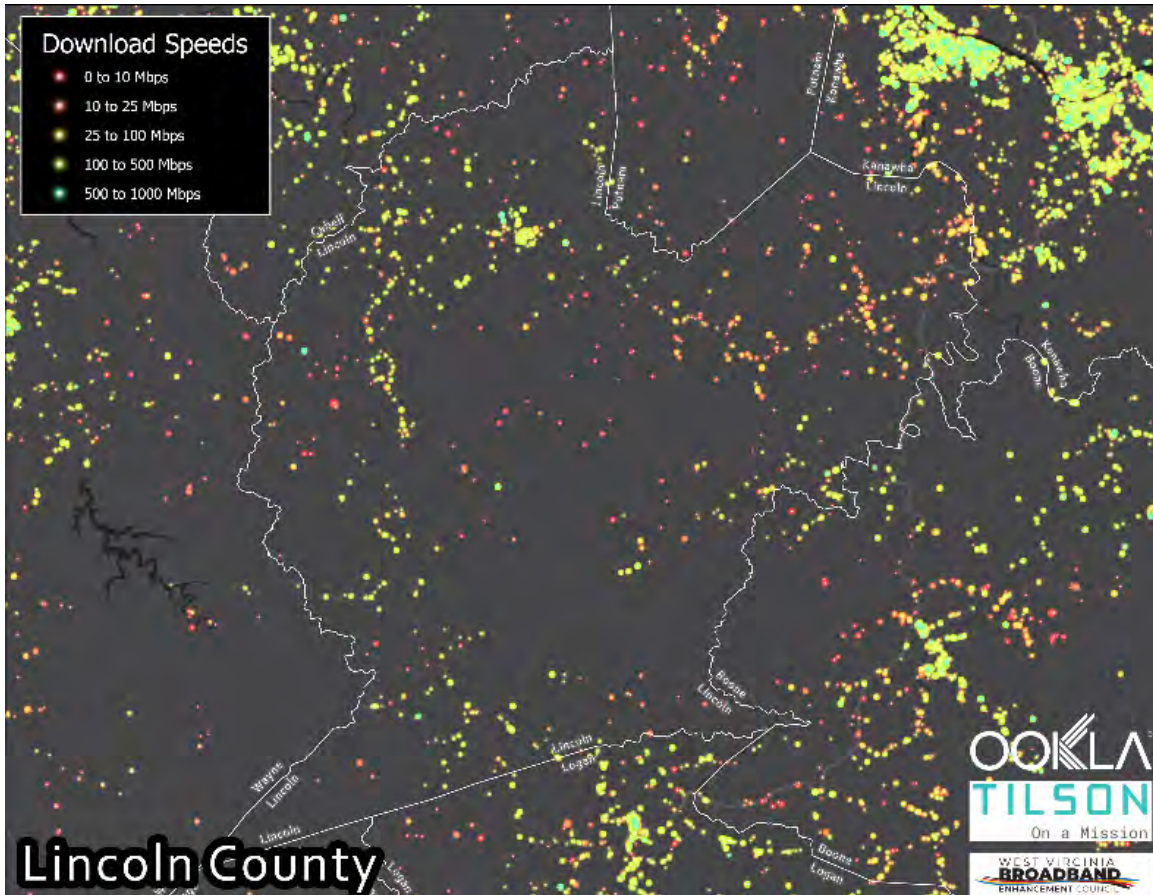
Jefferson						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
All Points Broadband	All Points Broadband	9	3	22	50	3
AT&T Services	AT&T Enterprise	19	16	65	14	4
AT&T Wi-Fi Services	AT&T Internet	41	37	90	6	3
AT&T Wireless	AT&T Internet	20	6	97	380	10
ATLANTIC BROADBAND	Atlantic Broadband	57	8	27	4	1
CenturyLink	CenturyLink	11	16	162	4	3
Cloudflare Warp	UNKNOWN	43	6	20	5	2
Comcast Business	Comcast Business	98	42	39	1558	137
Comcast Cable	XFINITY	193	15	21	35203	132
Datacamp Limited	UNKNOWN	18	5	26	1	1
DNIC	UNKNOWN	24	18	27	1	1
Frontier Communications	Frontier	13	3	48	2380	163
Google Fi	Google Fi	103	20	61	34	5
Hughes Network Systems	HughesNet	17	2	866	143	9
IPVanish	UNKNOWN	91	17	33	6	4
Leaseweb-usa-wdc	UNKNOWN	44	9	24	15	8
Leaseweb USA	Leaseweb	33	4	74	22	13
LUMOS Networks	Lumos Networks	13	4	9	1	1
M247 Ltd	M247	25	8	33	3	3
Morgan Wireless, LLC	UNKNOWN	18	35	15	1	1
Shentel Communications	Shentel	128	148	9	61	2
SoftLayer Technologies	SoftLayer	30	29	14	1	1
Sprint PCS	Sprint	23	5	54	152	47
T-MOBILE USA	T-Mobile	14	7	45	861	10
Telegia	Telegia	14	4	19	9	2
US Cellular	US Cellular	7	6	116	8	5
USDA	USDA	68	42	106	169	4
Verizon Business	Verizon Enterprise Sol	13	3	144	1	1
Verizon FIOS	Verizon	229	262	10	80	6
Verizon Internet Services	Verizon	8	5	72	18	6
VERIZON WIRELESS	Verizon	27	14	40	204	58
VIASAT	Exede	11	3	683	265	23
Wave2Net	Wave2Net	16	3	42	7	1
Web2Objects LLC	Web2Objects	58	19	47	6	3
Winchester Wireless	Winchester Wireless	13	16	57	150	4
Windstream Communications	Windstream	40	16	40	3	2
County Totals		44	24	90	41826	679



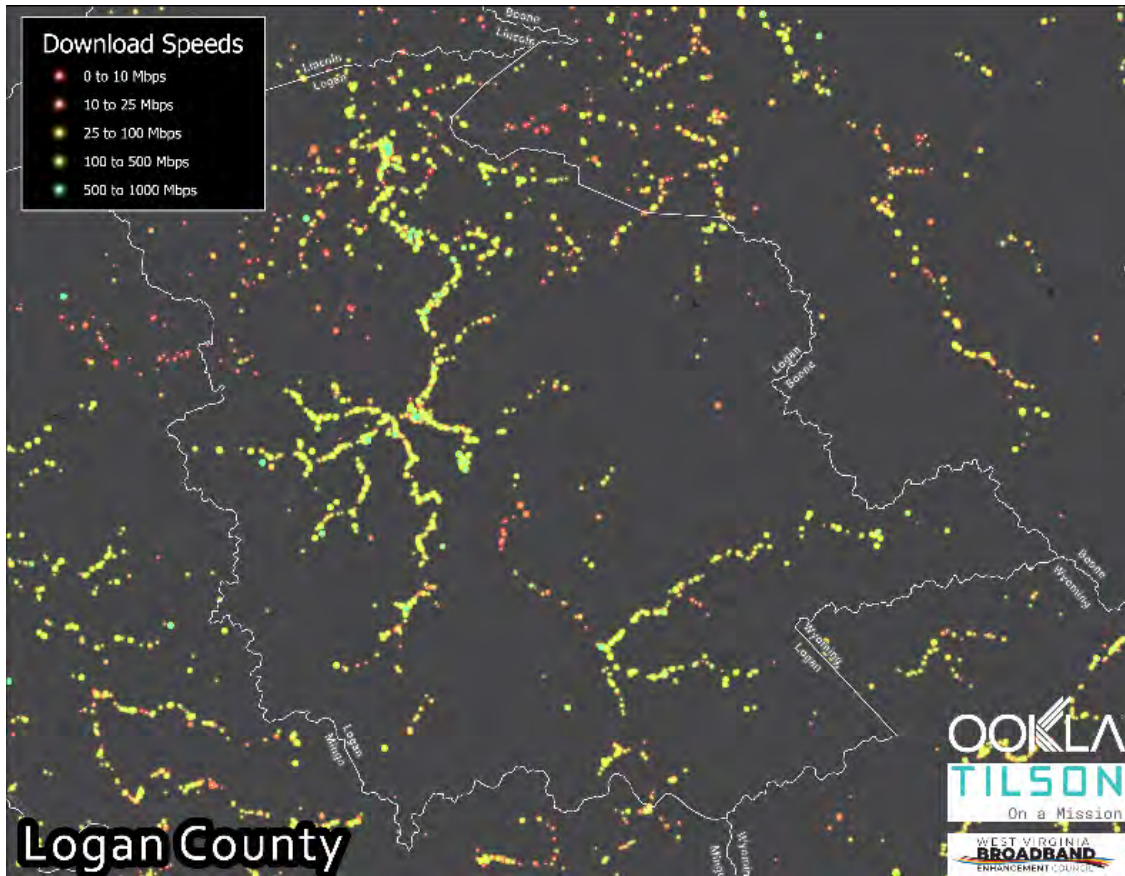
Kanawha						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	99	114	22	444	6
Armstrong Cable	Zoom Internet	179	133	29	56	2
AT&T Data Communications Services	AT&T Enterprise	133	141	35	2	1
AT&T Services	AT&T Enterprise	43	42	44	167	13
AT&T U-verse	AT&T Internet	123	129	19	1	1
AT&T Wi-Fi Services	AT&T Internet	32	42	36	37	6
AT&T Wireless	AT&T Internet	29	9	60	1133	21
CAMC Health System	UNKNOWN	90	123	26	320	3
CenturyLink	CenturyLink	21	14	49	130	4
CityNet LLC	Citynet	59	46	45	268	7
Cloudflare Warp	UNKNOWN	51	17	37	16	3
Comcast Business	Comcast Business	128	19	43	81	16
Comcast Cable	XFINITY	214	10	33	17	7
Datacamp Limited	UNKNOWN	106	15	71	7	5
Frontier Communications	Frontier	12	3	57	26098	373
Google-private-cloud	UNKNOWN	67	22	73	103	2
Google Cloud	Google Cloud Platform	18	12	66	11	4
Google Fi	Google Fi	66	21	64	72	8
Hughes Network Systems	HughesNet	18	2	854	135	5
Hurricane Electric	UNKNOWN	3	17	108	1	1
IBEX Global Solutions	UNKNOWN	21	35	221	23	1
IPVanish	UNKNOWN	38	18	80	60	12
Leaseweb-usa-wdc	UNKNOWN	40	17	44	14	9
Leaseweb USA	Leaseweb	31	9	53	9	6
Level 3 Communications	Level 3	38	35	77	64	6
LUMOS Networks	Lumos Networks	72	80	28	2697	84
M247 Ltd	M247	36	22	82	17	11
SECURED SERVERS LLC	PhoenixNAP	28	5	71	4	2
SoftLayer Technologies	SoftLayer	39	15	67	20	3
Sprint PCS	Sprint	23	6	50	315	80
Suddenlink Communications	Suddenlink	142	23	18	179046	455
T-MOBILE USA	T-Mobile	31	7	73	631	20
Verizon Business	Verizon Enterprise Soluti	2	0	174	184	3
Verizon Internet Services	Verizon	12	13	45	41	4
VERIZON WIRELESS	Verizon	31	10	74	518	73
VIASAT	Exede	20	5	685	568	13
Web2Objects LLC	Web2Objects	24	10	75	27	9
Windstream Communications	Windstream	45	34	39	43	3
Zayo	UNKNOWN	34	44	44	13	3
County Totals		56	34	97	213393	1285



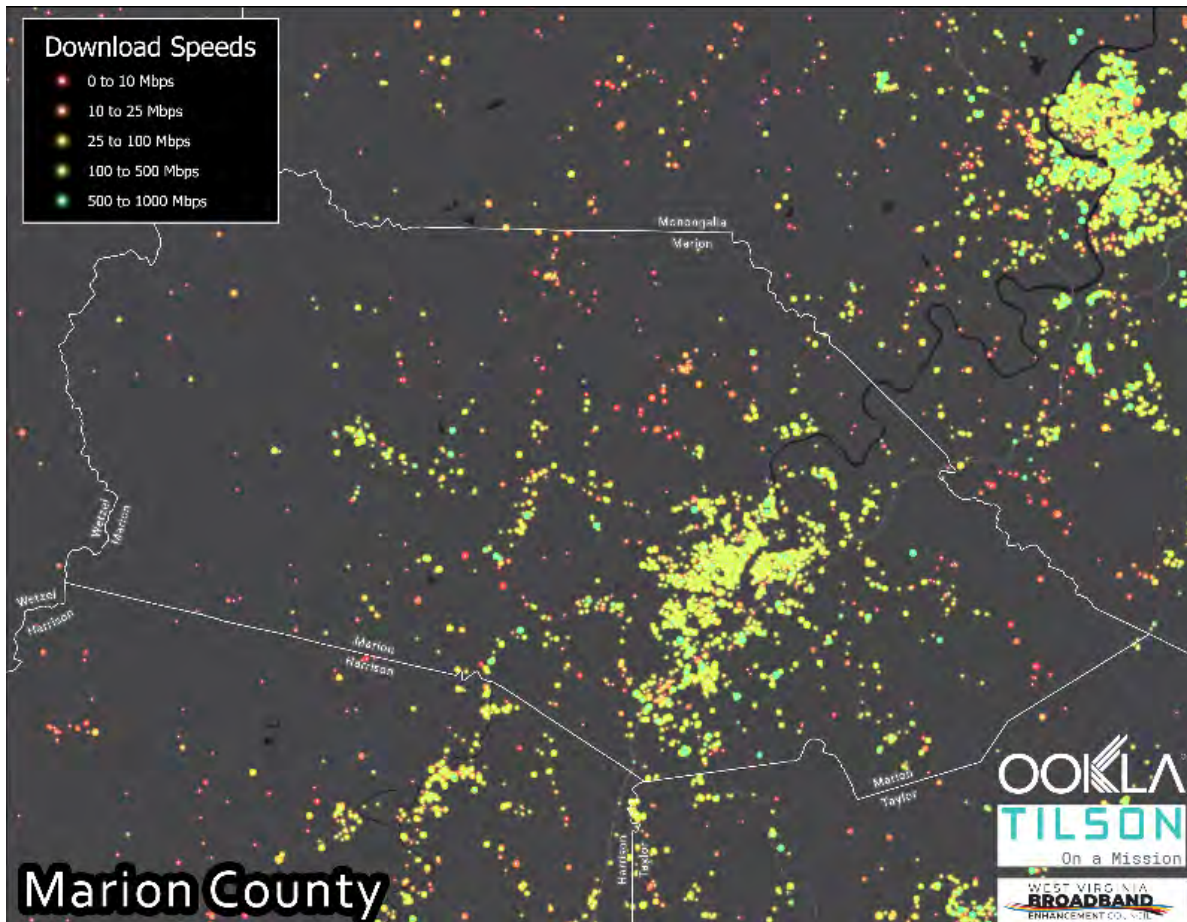
Lewis						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	10	9	211	3	1
AT&T Wi-Fi Services	AT&T Internet	44	72	26	36	1
AT&T Wireless	AT&T Internet	10	3	117	181	10
CityNet LLC	Citynet	23	12	10	5	2
Cloudflare Warp	UNKNOWN	8	2	57	2	2
Comcast Business	Comcast Business	16	4	88	5	2
Datacamp Limited	UNKNOWN	31	6	114	4	2
Frontier Communications	Frontier	11	4	64	2405	239
Google Fi	Google Fi	16	6	49	1	1
Hughes Network Systems	HughesNet	13	2	908	47	5
IPVanish	UNKNOWN	30	9	39	17	4
Leaseweb USA	Leaseweb	25	9	45	2	1
Level 3 Communications	Level 3	43	74	30	56	2
LUMOS Networks	Lumos Networks	75	63	19	139	4
MicroLogic	Micrologic	15	5	52	1060	3
Shentel Communications	Shentel	74	9	19	5065	19
Sprint PCS	Sprint	34	4	53	45	18
Suddenlink Communications	Suddenlink	49	7	16	138	21
T-MOBILE USA	T-Mobile	28	9	88	17	7
VERIZON WIRELESS	Verizon	13	10	80	13	9
VIASAT	Exede	6	4	715	151	18
Web2Objects LLC	Web2Objects	61	4	26	1	1
Zayo	UNKNOWN	35	67	27	2	1
County Totals		29	17	124	9395	373



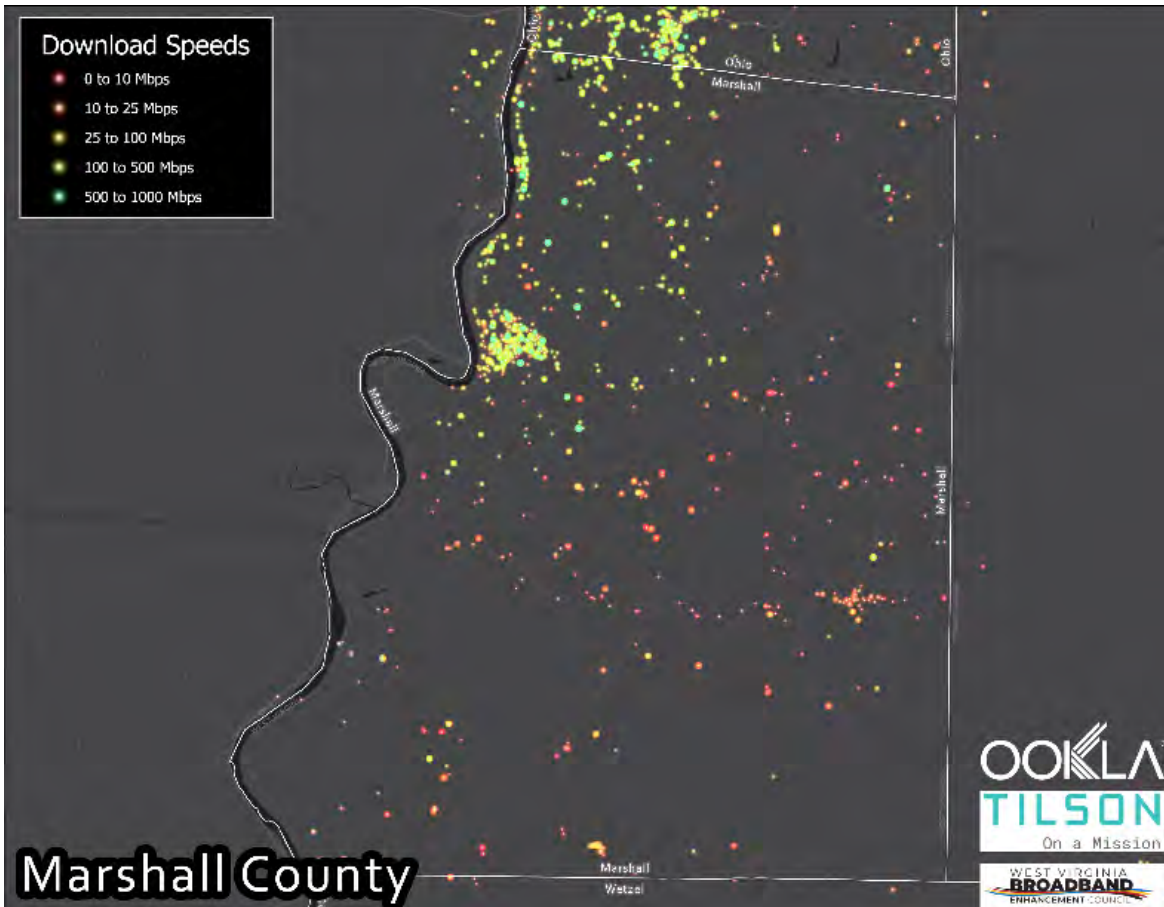
Lincoln						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	143	15	40	5173	28
AT&T Services	AT&T Enterprise	2	3	70	1	1
AT&T Wireless	AT&T Internet	21	3	133	83	3
Comcast Business	Comcast Business	176	36	35	2	1
Frontier Communications	Frontier	11	2	69	4506	281
Hughes Network Systems	HughesNet	13	2	965	138	6
IPVanish	UNKNOWN	2	0	218	4	2
Leaseweb-usa-wdc	UNKNOWN	5	3	669	1	1
LUMOS Networks	Lumos Networks	142	131	10	5	2
Marshall University	UNKNOWN	717	940	10	1	1
SoftLayer Technologies	SoftLayer	3	2	683	45	3
Sprint PCS	Sprint	6	1	162	9	7
Suddenlink Communications	Suddenlink	98	14	27	2987	86
T-MOBILE USA	T-Mobile	31	8	75	52	5
VERIZON WIRELESS	Verizon	22	11	67	29	11
VIASAT	Exede	9	3	692	260	36
Web2Objects LLC	Web2Objects	6	3	710	54	5
County Totals		83	69	273	13350	479



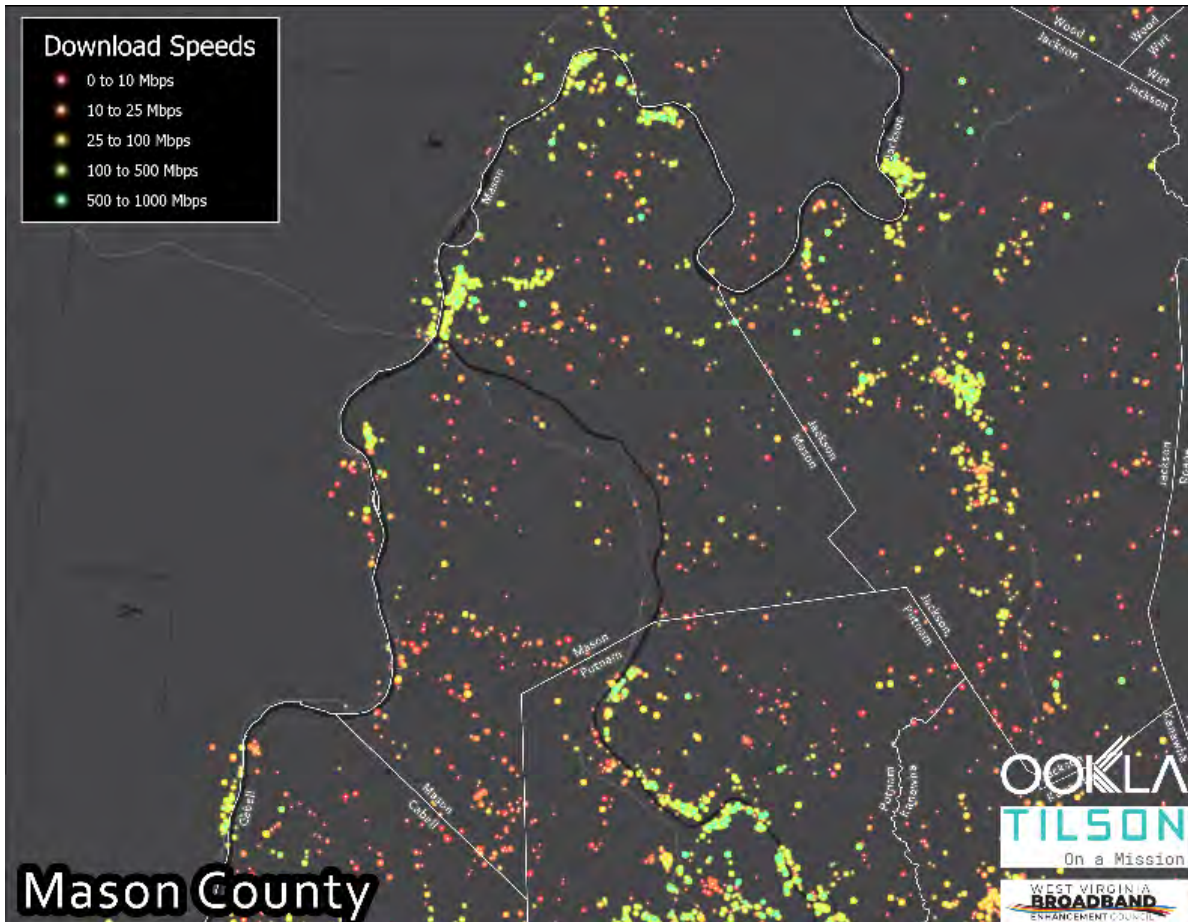
Logan						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	113	26	34	897	27
AT&T Services	AT&T Enterprise	13	12	81	9	2
AT&T Wi-Fi Services	AT&T Internet	25	33	81	7	3
AT&T Wireless	AT&T Internet	48	14	84	52	11
Cloudflare Warp	UNKNOWN	2	0	28	1	1
Datacamp Limited	UNKNOWN	23	5	43	1	1
Frontier Communications	Frontier	17	3	37	2499	297
Google Cloud	Google Cloud Platform	20	11	65	2	1
Google Fi	Google Fi	4	3	104	1	1
Hughes Network Systems	HughesNet	13	3	909	43	4
IPVanish	UNKNOWN	17	9	123	11	5
Mikrotec Internet Services	Mikrotec	38	4	11	3	1
Shentel Communications	Shentel	73	8	48	2660	4
SoftLayer Technologies	SoftLayer	21	2	95	1	1
Suddenlink Communications	Suddenlink	139	26	16	14262	59
T-MOBILE USA	T-Mobile	11	4	82	19	4
VERIZON WIRELESS	Verizon	43	9	42	45	16
VIASAT	Exede	20	3	645	152	19
Web2Objects LLC	Web2Objects	37	21	40	3	1
Windstream Communications	Windstream	9	8	31	1	1
County Totals		34	10	130	20669	459



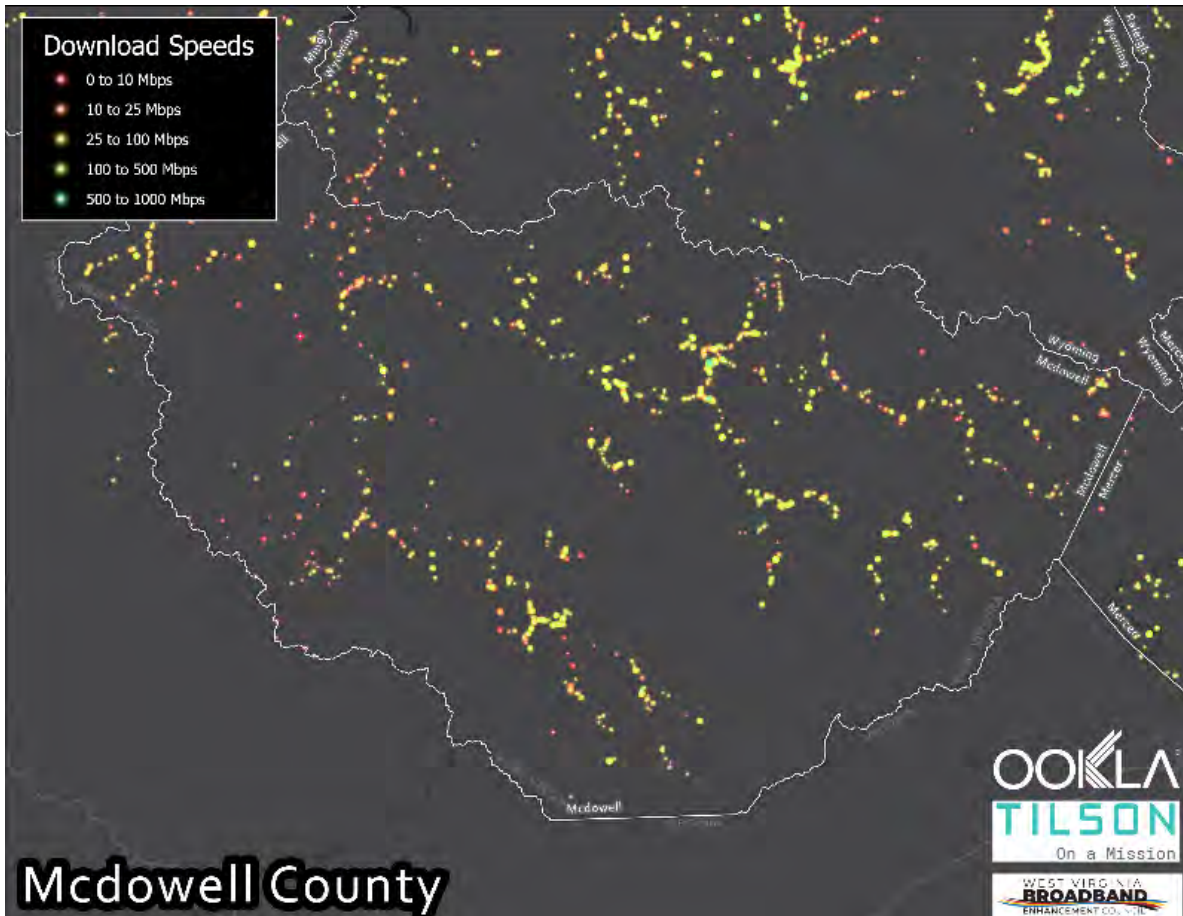
Marion						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	9	10	96	6	1
AT&T Wi-Fi Services	AT&T Internet	24	35	34	7	2
AT&T Wireless	AT&T Internet	22	8	48	158	12
CenturyLink	CenturyLink	16	13	19	2	1
CityNet LLC	Citynet	131	131	20	1107	12
Comcast Business	Comcast Business	141	34	27	571	54
Comcast Cable	XFINITY	194	16	21	8879	44
Datacamp Limited	UNKNOWN	12	11	88	14	4
Frontier Communications	Frontier	9	1	61	8390	225
Google Cloud	Google Cloud Platform	23	5	94	1	1
Google Fi	Google Fi	18	22	72	3	2
Hughes Network Systems	HughesNet	18	3	785	22	5
IPVanish	UNKNOWN	31	11	38	21	4
Leaseweb-usa-wdc	UNKNOWN	5	1	71	81	14
Leaseweb USA	Leaseweb	11	7	88	54	4
Level 3 Communications	Level 3	13	9	203	3	2
LUMOS Networks	Lumos Networks	68	66	18	188	9
M247 Ltd	M247	36	4	123	1	1
MicroLogic	Micrologic	19	29	33	1	1
SoftLayer Technologies	SoftLayer	41	7	23	2	2
Spectrum	Spectrum	121	13	45	16865	49
Spectrum Business	Spectrum Business	61	29	39	87	21
Sprint PCS	Sprint	20	5	45	150	32
Suddenlink Communications	Suddenlink	60	7	15	644	16
T-MOBILE USA	T-Mobile	30	7	84	22	5
US Cellular	US Cellular	12	8	62	79	13
Verizon Business	Verizon Enterprise Solutions	55	34	82	23	3
Verizon Internet Services	Verizon	4	1	41	1	1
VERIZON WIRELESS	Verizon	14	7	115	57	24
VIASAT	Exede	28	3	649	271	49
Viasat Communications	Exede	16	4	633	4	2
Web2Objects LLC	Web2Objects	53	8	49	4	4
Westco Internet	Westco	9	1	60	156	4
Windstream Communications	Windstream	28	9	28	5	3
ZITO MEDIA	Zito	15	5	44	21	1
County Totals		39	16	113	37900	627



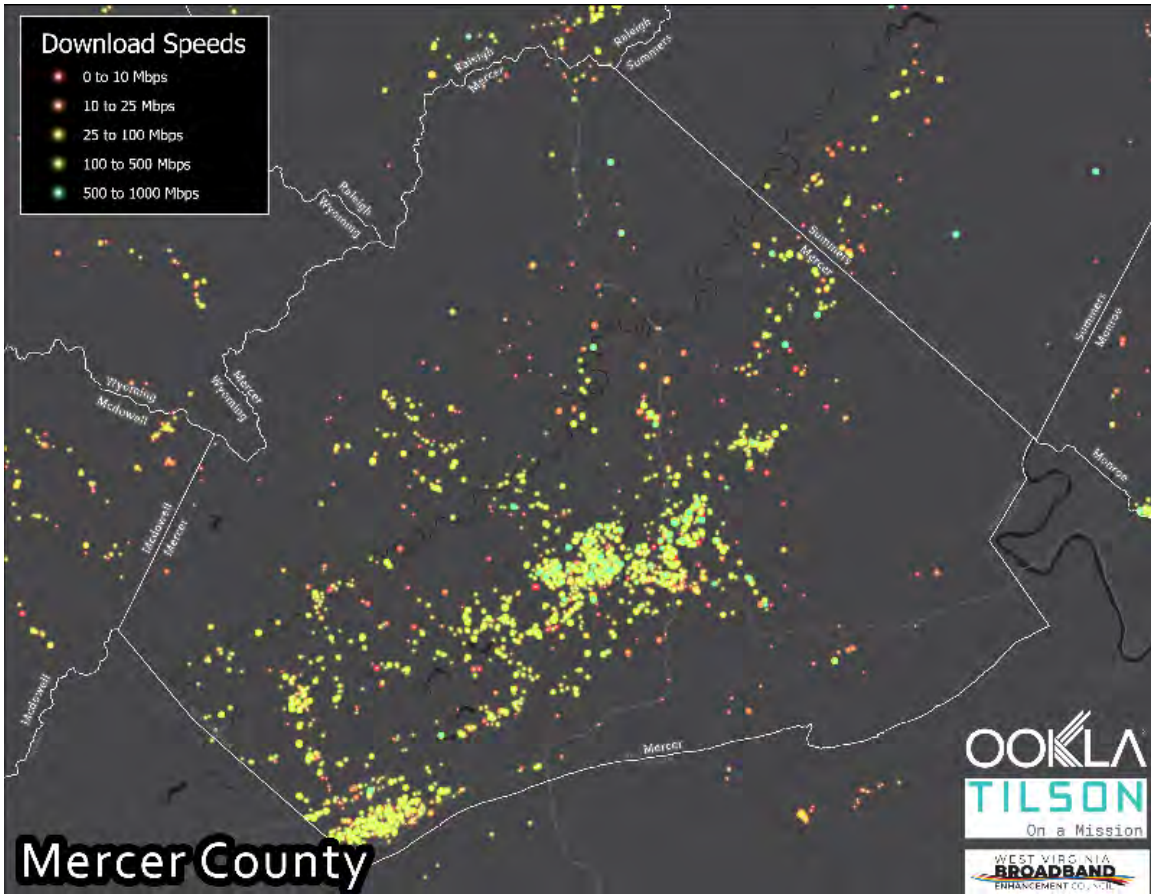
Marshall						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	132	63	19	85	6
AT&T Services	AT&T Enterprise	7	6	67	59	5
AT&T Wi-Fi Services	AT&T Internet	22	36	31	6	2
AT&T Wireless	AT&T Internet	11	4	108	462	15
CenturyLink	CenturyLink	0	0	869	1	1
CityNet	CityNet	7	6	81	1668	9
CityNet LLC	Citynet	12	6	37	259	1
Cloudflare Warp	UNKNOWN	5	0	22	1	1
Comcast Business	Comcast Business	75	24	25	184	34
Comcast Cable	XFINITY	155	14	19	8514	105
Datacamp Limited	UNKNOWN	29	10	30	14	3
Frontier Communications	Frontier	14	8	60	950	158
Google Cloud	Google Cloud Platform	23	31	97	2	2
Hughes Network Systems	HughesNet	18	2	1385	24	4
Hurricane Electric	UNKNOWN	15	4	37	10	2
Intelsat Global Service Corporation	intelsat	2	2	575	1	1
Leaseweb-usa-wdc	UNKNOWN	173	21	22	4	2
Leaseweb USA	Leaseweb	34	7	55	2	1
Level 3 Communications	Level 3	37	32	79	113	2
LUMOS Networks	Lumos Networks	75	78	16	9	2
M247 Ltd	M247	30	8	130	5	3
SoftLayer Technologies	SoftLayer	41	5	53	1	1
Spectrum Business	Spectrum Business	16	30	47	1	1
Sprint PCS	Sprint	40	10	42	2	2
Suddenlink Communications	Suddenlink	37	21	10	4	2
T-MOBILE USA	T-Mobile	15	4	112	113	5
Verizon Business	Verizon Enterprise Solutions	7	5	184	1	1
Verizon FIOS	Verizon	672	235	20	19	1
VERIZON WIRELESS	Verizon	12	5	75	156	33
VIASAT	Exede	29	3	621	135	26
Web2Objects LLC	Web2Objects	33	18	101	6	3
Windstream Communications	Windstream	44	62	7	1	1
ZITO MEDIA	Zito	5	8	42	1	1
County Totals		55	23	154	12813	436



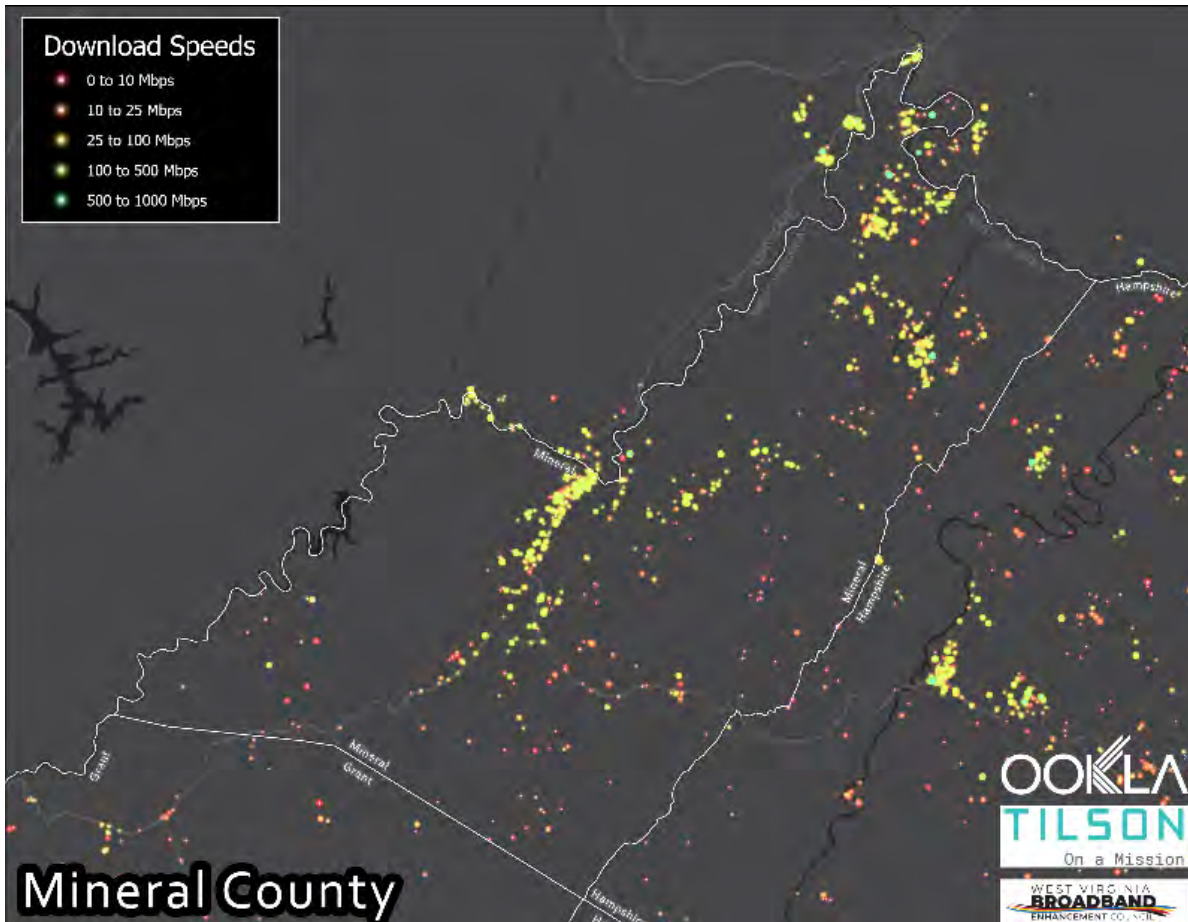
Mason						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	85	14	54	143	8
AT&T Services	AT&T Enterprise	18	26	30	21	3
AT&T Wi-Fi Services	AT&T Internet	21	17	35	1	1
AT&T Wireless	AT&T Internet	17	4	79	403	15
Cloudflare Warp	UNKNOWN	21	1	51	4	2
Comcast Business	Comcast Business	95	19	51	3	3
Comcast Cable	XFINITY	27	12	19	2	1
Frontier Communications	Frontier	12	3	50	2402	308
Horizon Telcom	Horizon	4	5	37	4	1
Hughes Network Systems	HughesNet	20	2	929	115	5
IPVanish	UNKNOWN	34	15	109	12	4
LUMOS Networks	Lumos Networks	42	38	18	35	3
M247 Ltd	M247	38	30	31	6	2
Sprint PCS	Sprint	98	10	74	5	4
Suddenlink Communications	Suddenlink	158	27	21	13620	50
T-MOBILE USA	T-Mobile	36	12	82	198	12
VERIZON WIRELESS	Verizon	34	14	64	193	23
VIASAT	Exede	12	3	717	58	20
Viasat Communications	Exede	6	4	686	20	1
Web2Objects LLC	Web2Objects	29	22	62	4	1
County Total		40	14	160	17249	467



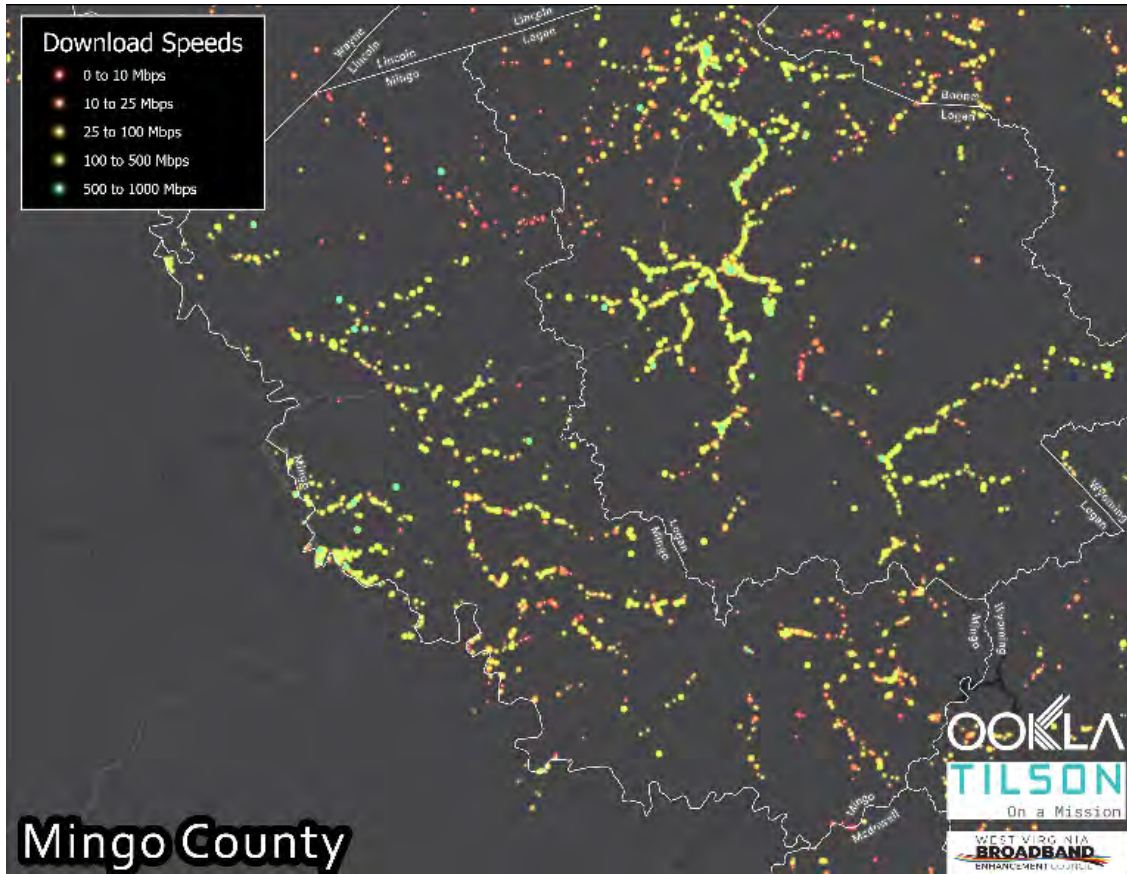
McDowell						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	45	21	54	10	2
AT&T U-verse	AT&T Internet	48	33	40	3	1
AT&T Wireless	AT&T Internet	25	8	60	48	4
Cloudflare Warp	UNKNOWN	25	9	37	2	1
Comcast Cable	XFINITY	212	12	25	10	1
Frontier Communications	Frontier	25	10	43	1732	235
Google Fi	Google Fi	45	10	30	1	1
Hughes Network Systems	HughesNet	21	2	1322	6	2
IPVanish	UNKNOWN	19	7	66	7	3
Leaseweb USA	Leaseweb	24	9	53	1	1
M247 Ltd	M247	43	10	52	1	1
Shentel Communications	Shentel	67	9	37	6736	20
Sprint PCS	Sprint	139	3	42	2	2
Suddenlink Communications	Suddenlink	87	32	10	3	2
T-MOBILE USA	T-Mobile	14	1	81	2	2
Verizon Internet Services	Verizon	2	1	162	30	6
VIASAT	Exede	34	3	688	33	13
Web2Objects LLC	Web2Objects	47	9	51	2	2
County Totals		51	10	158	8629	299



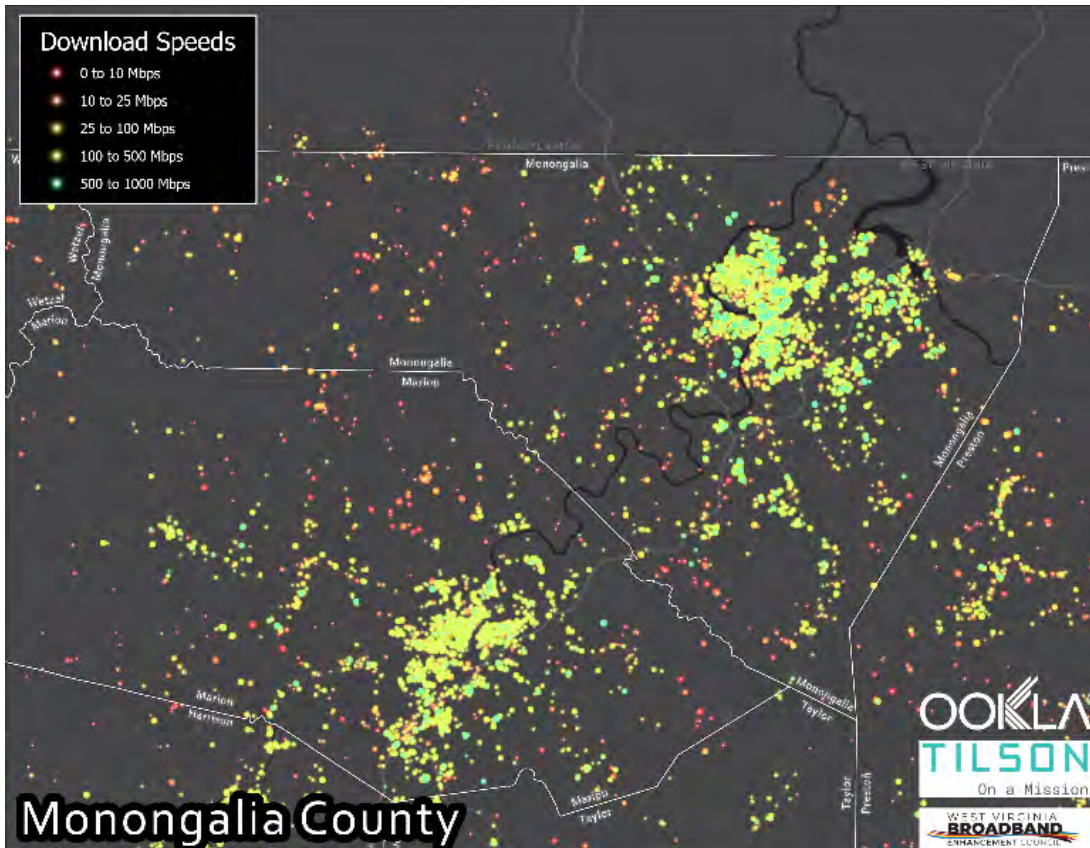
Mercer						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
All Points Broadband	All Points Broadband	6	2	56	13	1
AT&T Services	AT&T Enterprise	9	8	86	8	1
AT&T Wi-Fi Services	AT&T Internet	55	60	37	30	4
AT&T Wireless	AT&T Internet	35	9	70	548	12
Cloudflare Warp	UNKNOWN	32	27	32	18	4
Comcast Business	Comcast Business	87	20	45	173	39
Comcast Cable	XFINITY	134	9	27	10623	57
Datacamp Limited	UNKNOWN	114	12	54	5	3
Frontier Communications	Frontier	22	10	70	3782	99
Google Cloud	Google Cloud Platform	13	10	66	1	1
Google Fi	Google Fi	62	85	74	6	3
Hughes Network Systems	HughesNet	28	2	850	32	4
IPVanish	UNKNOWN	29	6	55	14	5
Leaseweb USA	Leaseweb	21	4	51	4	4
LUMOS Networks	Lumos Networks	71	97	30	255	15
M247 Ltd	M247	7	7	114	3	2
Shentel Communications	Shentel	43	26	19	14	2
SoftLayer Technologies	SoftLayer	29	5	28	1	1
Sprint PCS	Sprint	12	3	73	107	52
Suddenlink Communications	Suddenlink	163	29	18	14366	157
T-MOBILE USA	T-Mobile	10	4	69	52	6
US Cellular	US Cellular	31	6	79	50	10
Verizon Internet Services	Verizon	5	4	115	96	13
VERIZON WIRELESS	Verizon	17	6	85	109	34
VIASAT	Exede	23	3	669	70	14
Web2Objects LLC	Web2Objects	32	4	23	1	1
Windstream Communication	Windstream	10	10	64	18	2
WVVA.net	GigaBeam Networks	83	87	38	310	3
Zayo	UNKNOWN	62	75	17	3	1
County Totals		43	22	104	30712	550



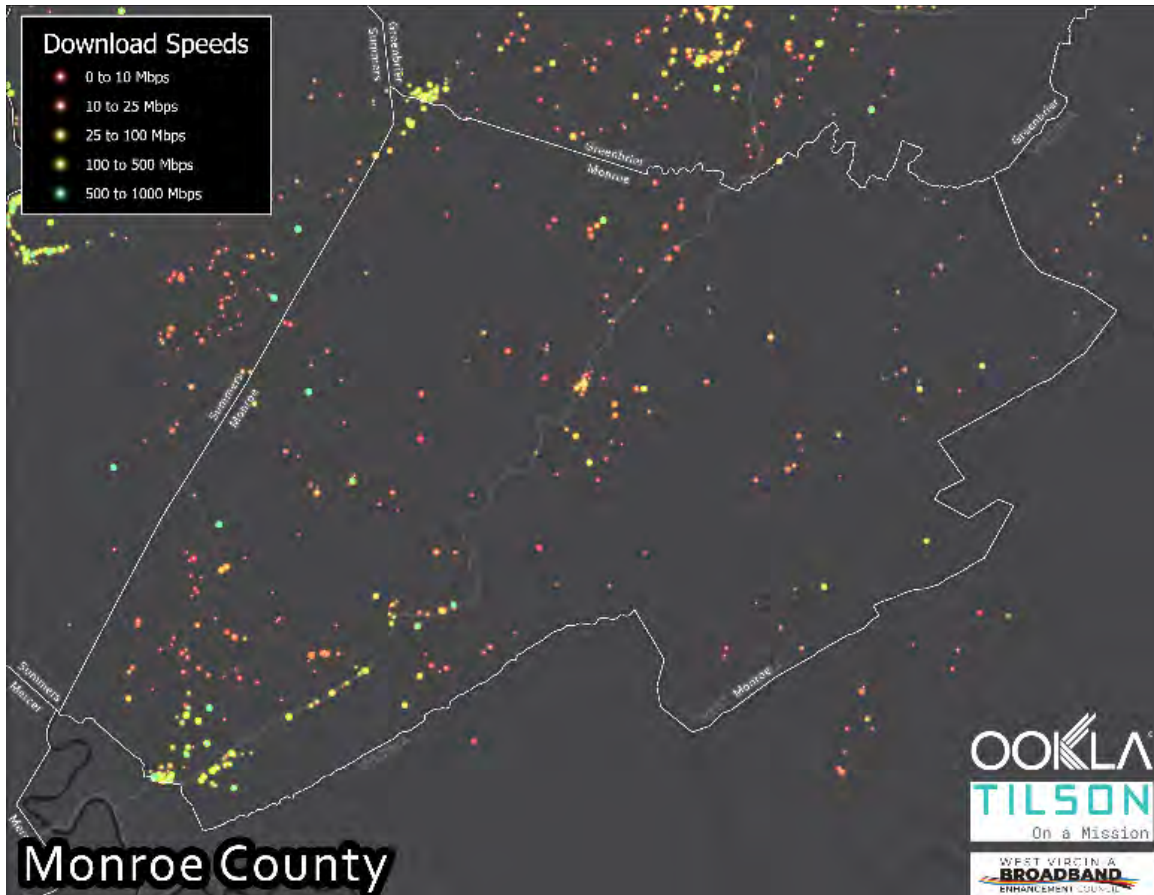
Mineral						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	9	5	89	8	1
AT&T Wi-Fi Services	AT&T Internet	29	40	47	5	2
AT&T Wireless	AT&T Internet	23	6	54	104	7
ATLANTIC BROADBAND	Atlantic Broadband	142	17	27	5636	81
Cloudflare Warp	UNKNOWN	11	0	19	1	1
Comcast Business	Comcast Business	113	111	19	92	28
Comcast Cable	XFINITY	126	9	23	4003	41
Frontier Communications	Frontier	14	3	47	977	118
Hughes Network Systems	HughesNet	24	2	839	20	4
IPVanish	UNKNOWN	15	2	37	3	2
Leaseweb-usa-wdc	UNKNOWN	132	9	62	2	2
Leaseweb USA	Leaseweb	15	6	95	1	1
Level 3 Communications	Level 3	15	8	35	139	3
LUMOS Networks	Lumos Networks	265	247	9	4	1
M247 Ltd	M247	262	11	150	1	1
Shentel Communications	Shentel	46	9	18	22	2
SoftLayer Technologies	SoftLayer	20	1	47	2	1
Sprint PCS	Sprint	18	5	47	17	8
T-MOBILE USA	T-Mobile	54	6	70	17	3
US Cellular	US Cellular	12	4	77	39	13
Verizon Internet Services	Verizon	6	5	145	20	5
VIASAT	Exede	9	4	670	53	11
County Totals		62	23	119	11166	336



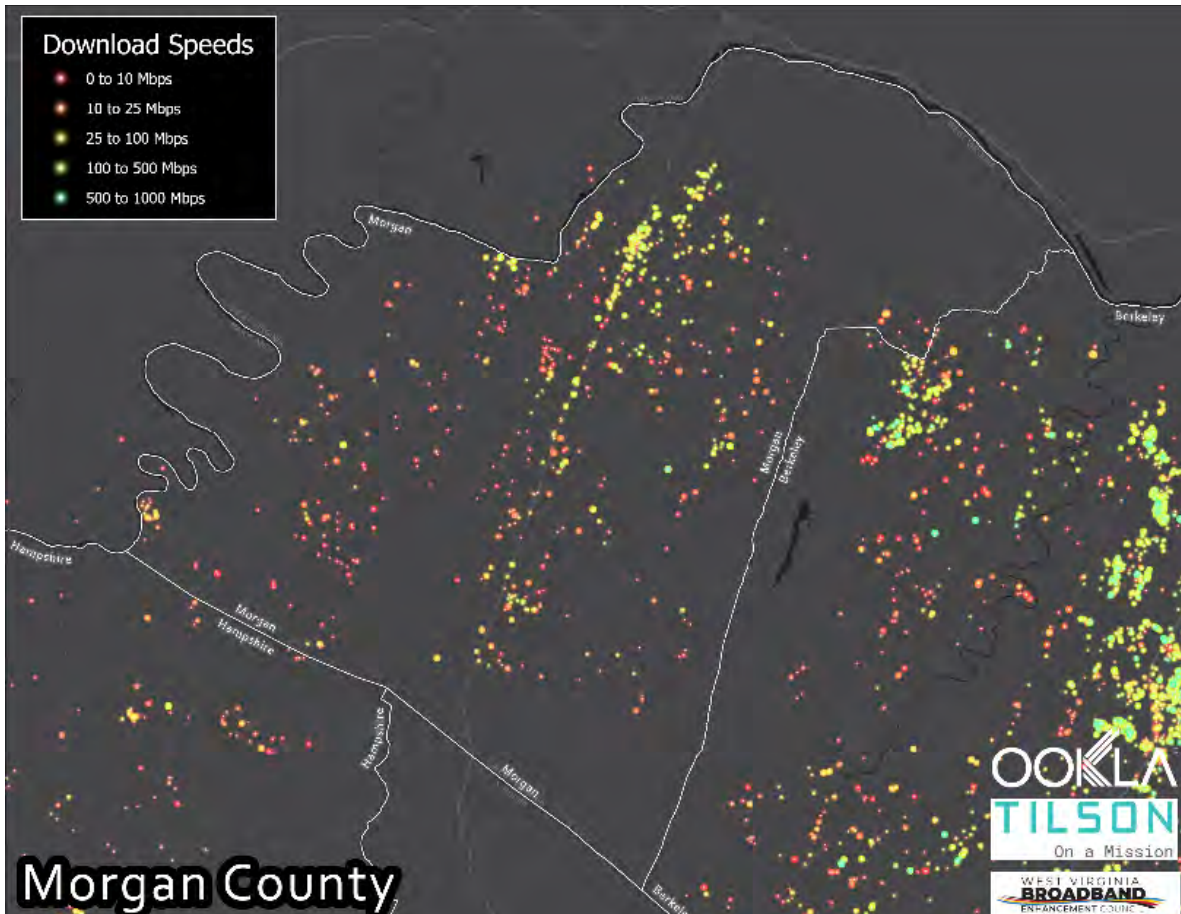
Mingo						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	6	2	85	6	4
AT&T U-verse	AT&T Internet	13	1	47	4	1
AT&T Wireless	AT&T Internet	7	1	382	1	1
Datacamp Limited	UNKNOWN	24	9	46	12	4
Foothills Rural Telephone Cooperative Corporation	Foothills Broadband	50	30	3	1	1
Frontier Communications	Frontier	28	6	35	2058	283
Google Fi	Google Fi	10	14	136	1	1
Hughes Network Systems	HughesNet	17	2	832	44	4
IPVanish	UNKNOWN	26	15	149	13	4
LUMOS Networks	Lumos Networks	6	4	32	6	1
M247 Ltd	M247	19	5	40	1	1
Mikrotec Internet Services	Mikrotec	44	8	19	1124	46
Shentel Communications	Shentel	75	9	45	2668	3
Suddenlink Communications	Suddenlink	169	27	16	9902	86
Verizon Internet Services	Verizon	3	4	175	1	1
VERIZON WIRELESS	Verizon	31	6	62	27	22
VIASAT	Exede	8	4	686	90	25
Web2Objects LLC	Web2Objects	28	4	83	2	1
County Totals		31	8	160	15961	489



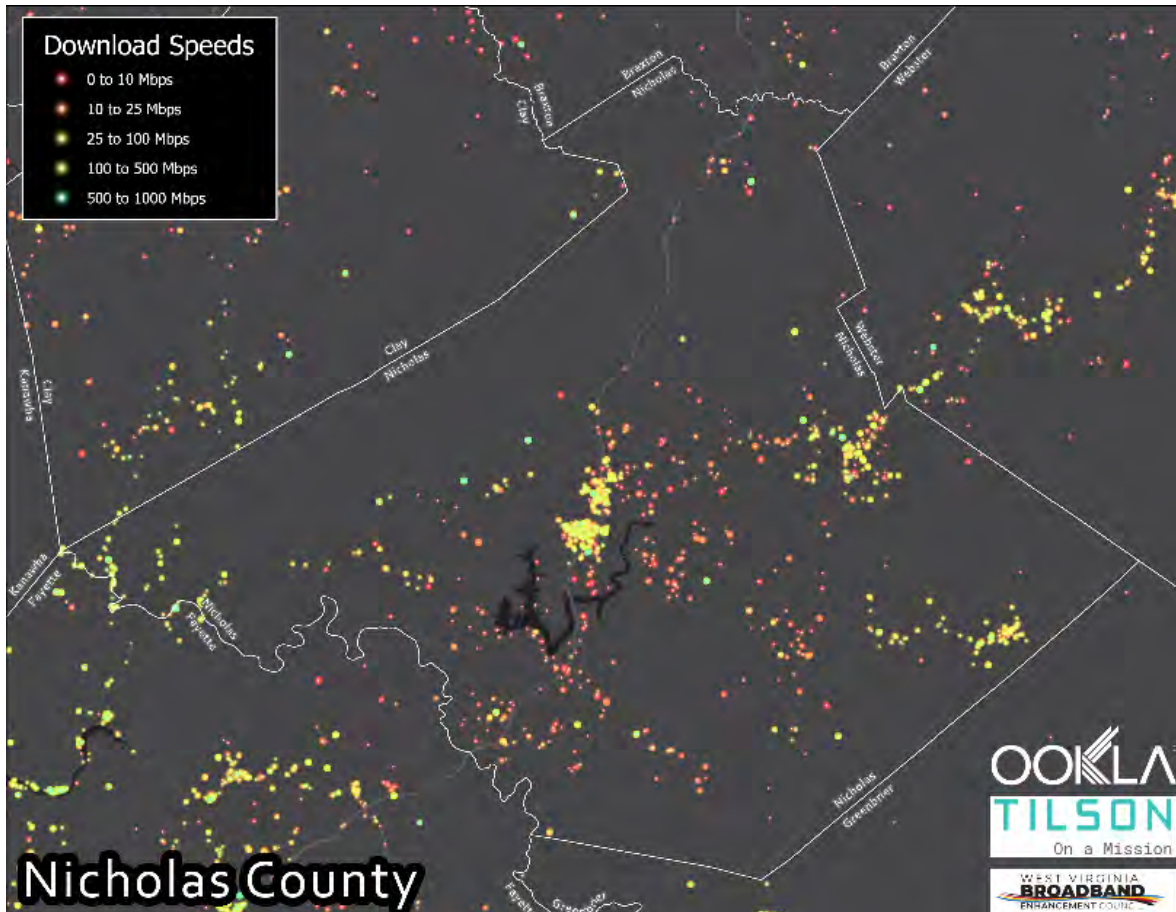
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ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	136	14	31	9	1
AT&T Services	AT&T Enterprise	33	31	55	45	3
AT&T Wi-Fi Services	AT&T Internet	28	39	62	35	9
AT&T Wireless	AT&T Internet	27	10	63	1047	21
ATLANTIC BROADBAND	Atlantic Broadband	87	13	31	776	48
CenturyLink	CenturyLink	132	125	13	9	2
CityNet LLC	Citynet	134	146	14	1661	18
Cloudflare Warp	UNKNOWN	68	60	32	2	2
Comcast Business	Comcast Business	65	29	25	1895	206
Comcast Cable	XFINITY	168	14	21	54281	160
Datacamp Limited	UNKNOWN	116	22	100	16	7
Frontier Communications	Frontier	9	3	69	2014	201
Google Cloud	Google Cloud Platform	16	6	79	11	6
Google Fi	Google Fi	69	10	65	24	3
Hughes Network Systems	HughesNet	10	2	833	54	6
IPVanish	UNKNOWN	36	9	27	10	3
Labyrinth Solutions	Labyrinth Solutions	265	323	6	4406	7
Leaseweb-usa-wdc	UNKNOWN	43	12	48	30	14
Leaseweb USA	Leaseweb	83	13	52	17	14
Level 3 Communications	Level 3	9	7	129	21	3
LUMOS Networks	Lumos Networks	80	70	29	416	18
M247 Ltd	M247	43	11	90	17	12
Pavlov Media	UNKNOWN	69	84	35	736	5
Single Digits	Single Digits	85	122	24	1072	1
SoftLayer Technologies	SoftLayer	43	12	91	14	7
Spectrum	Spectrum	51	9	76	2	2
Sprint PCS	Sprint	23	3	72	159	51
T-MOBILE USA	T-Mobile	8	3	125	25	9
US Cellular	US Cellular	12	9	54	304	15
Verizon Business	Verizon Enterprise Solutions	645	752	5	89	4
Verizon FIOS	Verizon	53	70	20	3	2
Verizon Internet Services	Verizon	425	567	4	1058	7
VERIZON WIRELESS	Verizon	26	9	44	121	37
VIASAT	Exede	30	3	679	404	41
Viasat Communications	Exede	26	3	661	6	1
Web2Objects LLC	Web2Objects	49	23	39	9	4
Westco Internet	Westco	38	52	44	2553	8
Windstream Communications	Windstream	32	27	86	21	8
ZITO MEDIA	Zito	16	4	62	382	2
County Totals		83	71	104	73754	968



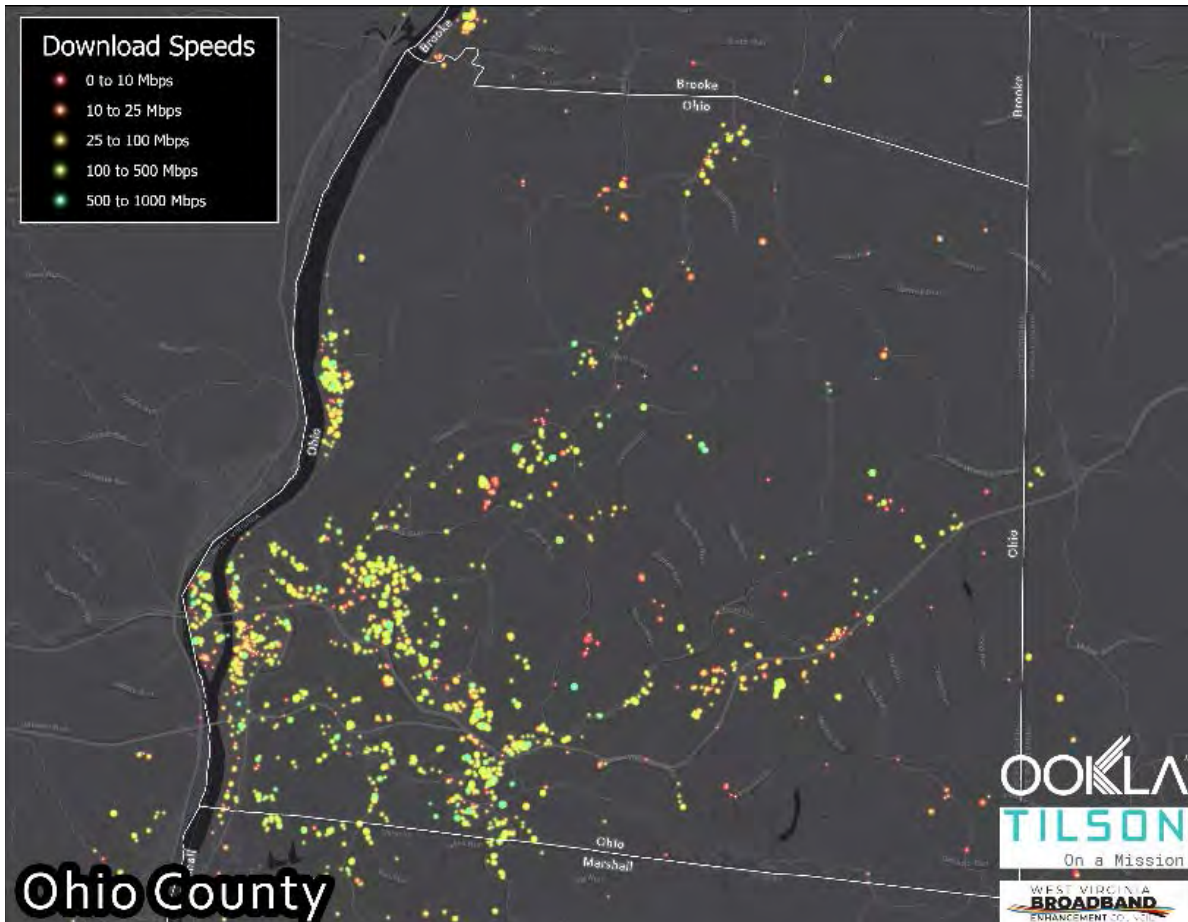
Monroe							
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count	
AT&T Services	AT&T Enterprise	11	3	94	3	1	
AT&T Wireless	AT&T Internet	13	6	78	346	5	
CenturyLink	CenturyLink	34	12	133	32	4	
Comcast Business	Comcast Business	57	68	16	7	1	
Comcast Cable	XFINITY	121	7	21	130	2	
Frontier Communications	Frontier	10	3	38	1219	246	
Hughes Network Systems	HughesNet	11	3	830	13	3	
IPVanish	UNKNOWN	16	1	125	2	1	
LUMOS Networks	Lumos Networks	32	19	24	61	3	
Mikrotec Internet Services	Mikrotec	95	95	9	1	1	
SoftLayer Technologies	SoftLayer	6	0	47	1	1	
Sprint PCS	Sprint	23	6	57	6	5	
Suddenlink Communications	Suddenlink	170	27	18	3476	70	
T-MOBILE USA	T-Mobile	31	11	59	3	2	
US Cellular	US Cellular	6	4	66	21	10	
Verizon Internet Services	Verizon	5	1	36	3	1	
VERIZON WIRELESS	Verizon	22	8	50	11	6	
VIASAT	Exede	22	3	744	187	31	
WVVA.net	GigaBeam Networks	8	2	79	1646	5	
County Totals		36	15	133	7168	398	



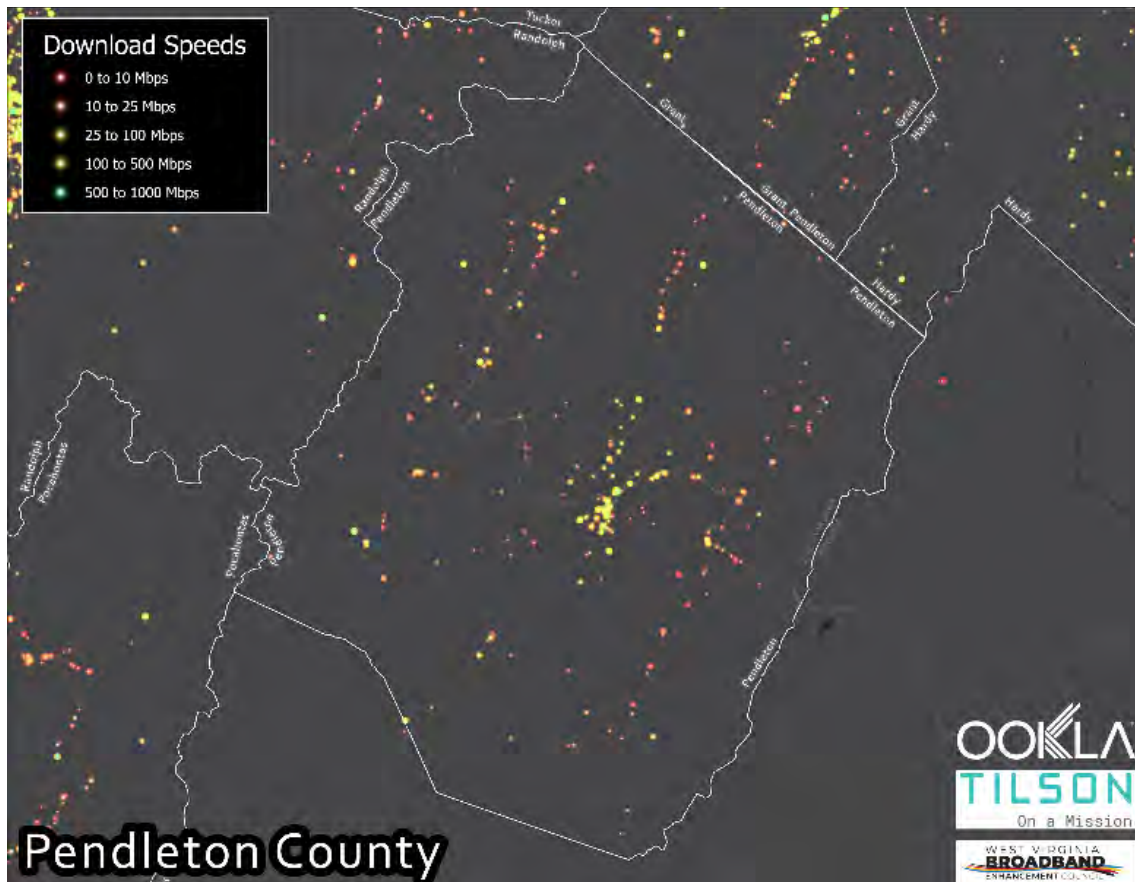
Morgan						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	7	4	101	3	1
AT&T Wireless	AT&T Internet	8	5	80	228	8
CenturyLink	CenturyLink	4	0	28	1	1
Comcast Business	Comcast Business	91	24	22	48	19
Comcast Cable	XFINITY	142	11	19	2758	22
Frontier Communications	Frontier	13	2	55	4521	122
Google Cloud	Google Cloud Platform	11	24	163	14	4
Hughes Network Systems	HughesNet	15	2	819	23	6
IPVanish	UNKNOWN	1	1	99	1	1
LUMOS Networks	Lumos Networks	461	305	19	6	2
M247 Ltd	M247	53	33	22	1	1
Morgan Wireless, LLC	UNKNOWN	61	50	42	2024	5
Shentel Communications	Shentel	48	56	9	110	3
SoftLayer Technologies	SoftLayer	29	56	27	2	1
Sprint PCS	Sprint	13	5	78	57	25
T-MOBILE USA	T-Mobile	16	7	49	166	9
US Cellular	US Cellular	7	2	74	115	13
Verizon Business	Verizon Enterprise Solutions	11	4	130	3	1
Verizon FIOS	Verizon	15	1	19	1	1
Verizon Internet Services	Verizon	9	13	78	294	24
VERIZON WIRELESS	Verizon	10	7	49	67	30
VIASAT	Exede	8	3	726	47	13
County Totals		47	28	123	10490	312



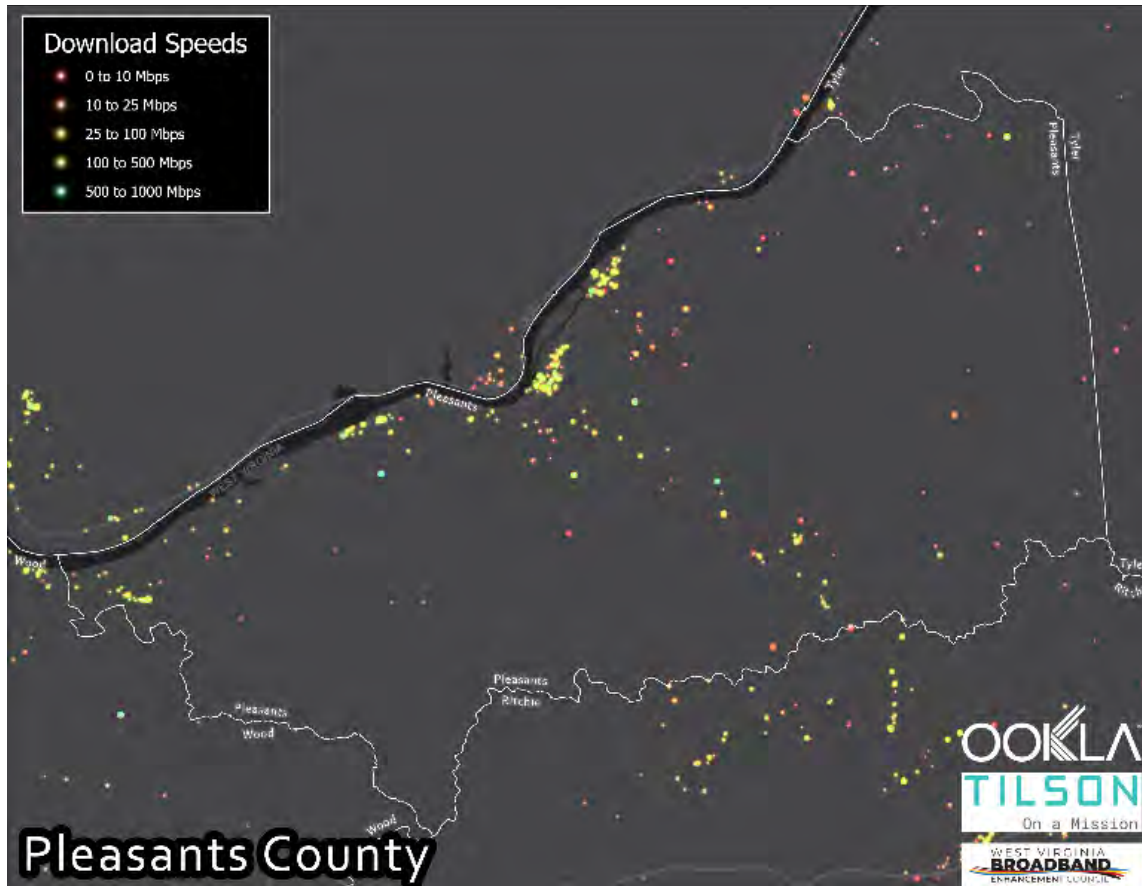
Nicholas						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency	Test Count	User Count
AT&T Services	AT&T Enterprise	7	5	156	8	1
AT&T Wi-Fi Services	AT&T Internet	43	43	53	10	3
AT&T Wireless	AT&T Internet	11	3	132	576	13
Comcast Business	Comcast Business	13	16	32	9	3
Frontier Communications	Frontier	12	3	63	4220	362
Google Cloud	Google Cloud Platform	17	10	68	8	2
Hughes Network Systems	HughesNet	18	3	902	36	3
IPVanish	UNKNOWN	42	6	15	3	3
Leaseweb-usa-wdc	UNKNOWN	23	6	96	10	6
Leaseweb USA	Leaseweb	10	9	26	2	2
LUMOS Networks	Lumos Networks	49	42	35	159	11
SHENTEL	Shentel	50	8	18	1278	4
Shentel Communications	Shentel	85	12	23	7028	19
Sprint PCS	Sprint	8	6	65	62	34
Suddenlink Communications	Suddenlink	162	29	26	567	51
T-MOBILE USA	T-Mobile	13	11	58	2	1
US Cellular	US Cellular	10	7	68	79	14
VERIZON WIRELESS	Verizon	24	8	68	73	27
VIASAT	Exede	9	2	690	64	11
Viasat Communications	Exede	41	5	638	1	1
Windstream Communications	Windstream	30	30	15	1	1
Zayo	UNKNOWN	44	64	33	22	1
County Totals		33	15	149	14218	573



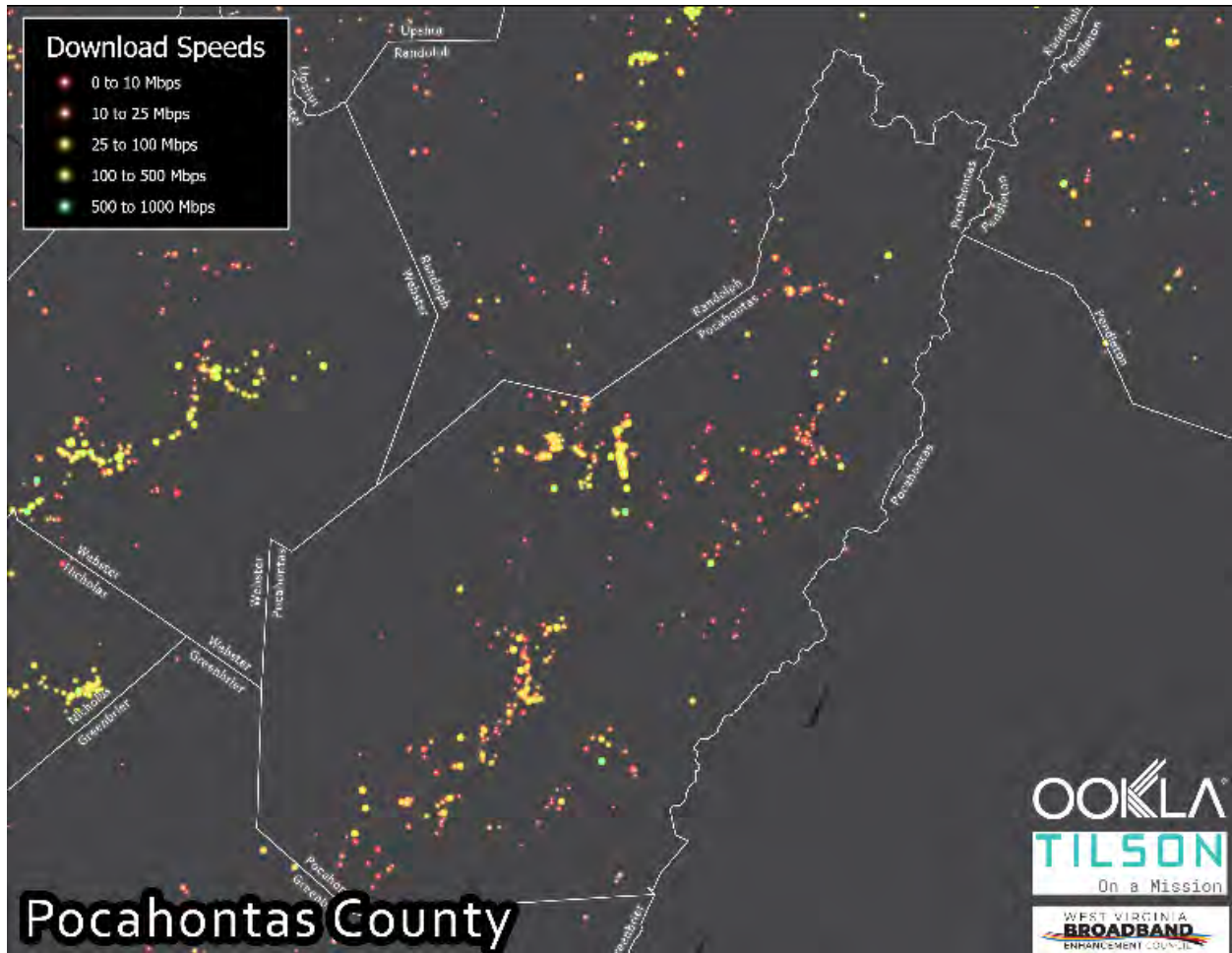
Ohio						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	133	15	32	140	6
AT&T Services	AT&T Enterprise	11	10	86	266	11
AT&T Wi-Fi Services	AT&T Internet	20	42	32	16	6
AT&T Wireless	AT&T Internet	26	11	66	176	19
ATLANTIC BROADBAND	Atlantic Broadband	68	15	24	2	1
CenturyLink	CenturyLink	45	51	27	6	2
CityNet	CityNet	463	266	13	913	8
CityNet LLC	Citynet	47	48	16	71	1
Cloudflare Warp	UNKNOWN	11	15	53	9	3
Comcast Business	Comcast Business	103	81	26	1534	167
Comcast Cable	XFINITY	177	16	20	15741	110
Datacamp Limited	UNKNOWN	14	17	158	2	2
Frontier Communications	Frontier	10	5	52	395	108
Google Fi	Google Fi	26	5	88	3	2
Hughes Network Systems	HughesNet	9	2	936	27	3
Hurricane Electric	UNKNOWN	24	2	27	200	3
IPVanish	UNKNOWN	33	12	43	10	2
Leaseweb-usa-wdc	UNKNOWN	39	7	22	3	3
Leaseweb USA	Leaseweb	12	12	394	3	1
Level 3 Communications	Level 3	50	55	44	385	13
LUMOS Networks	Lumos Networks	52	68	25	87	3
M247 Ltd	M247	26	19	107	6	4
Massillon Cable	MCTV	30	3	26	67	3
Sprint PCS	Sprint	11	2	54	18	12
T-MOBILE USA	T-Mobile	12	7	54	78	4
Verizon Business	Verizon Enterprise Solutions	23	9	138	3	1
Verizon FIOS	Verizon	124	176	32	54	1
Verizon Internet Services	Verizon	7	1	128	2	1
VERIZON WIRELESS	Verizon	19	7	58	217	48
VIASAT	Exede	12	2	1001	14	9
Web2Objects LLC	Web2Objects	46	15	105	6	4
Windstream Communications	Windstream	7	6	50	1	1
Zayo	UNKNOWN	97	56	59	160	2
County Totals		54	32	121	20615	564



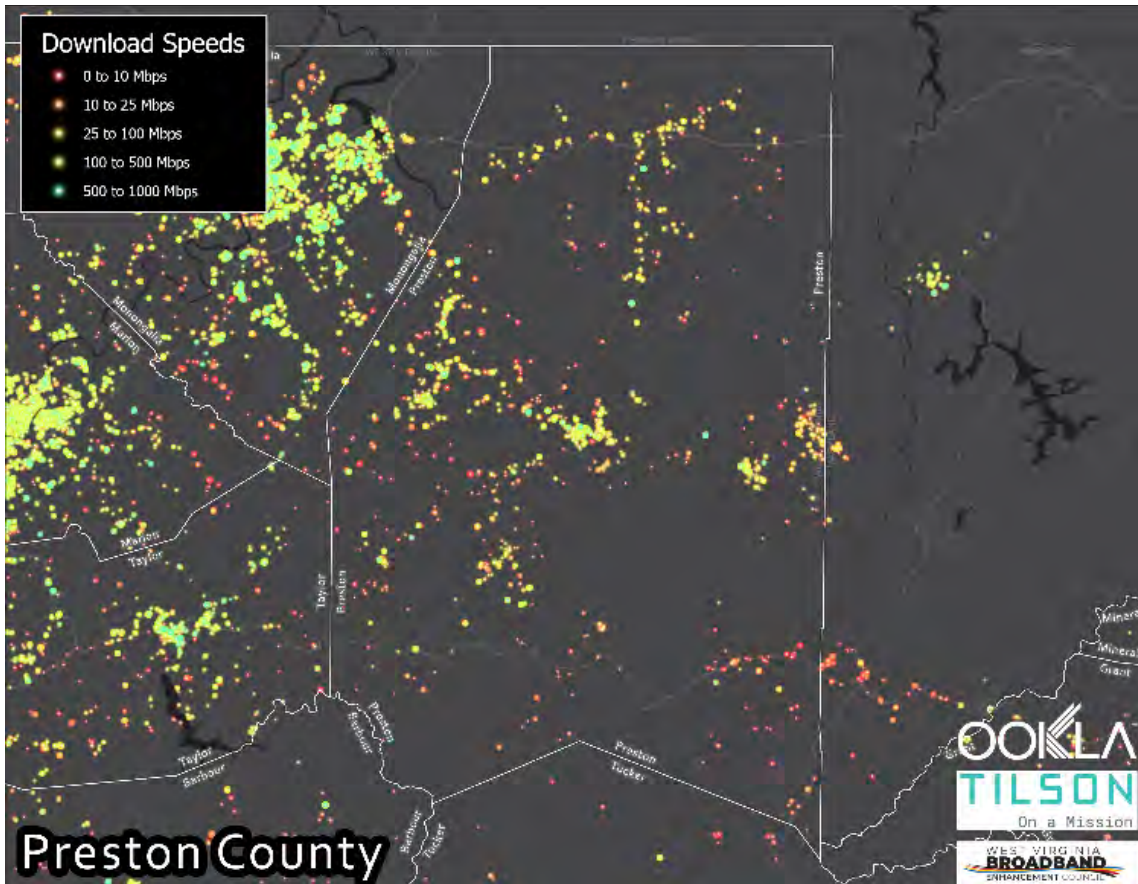
Pendleton						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	9	8	94	6	1
AT&T Wireless	AT&T Internet	15	3	73	53	3
Comcast Cable	XFINITY	143	4	154	2	1
Datacamp Limited	UNKNOWN	1	5	93	1	1
Frontier Communications	Frontier	11	1	42	353	105
Hughes Network Systems	HughesNet	16	2	1127	58	8
IPVanish	UNKNOWN	2	0	652	1	1
LUMOS Networks	Lumos Networks	22	17	12	1	1
M247 Ltd	M247	29	29	21	1	1
Shentel Communications	Shentel	72	10	23	1643	14
Spectrum Business	Spectrum Business	16	16	36	3	1
Sprint PCS	Sprint	35	2	925	5	5
Spruce Knob Seneca Rocks Telephone	SKSRT	17	13	23	1376	7
T-MOBILE USA	T-Mobile	44	14	75	8	5
TransCanada Pipelines Limited	UNKNOWN	13	5	66	4	2
VIASAT	Exede	17	3	643	27	14
Viasat Communications	Exede	7	4	641	3	2



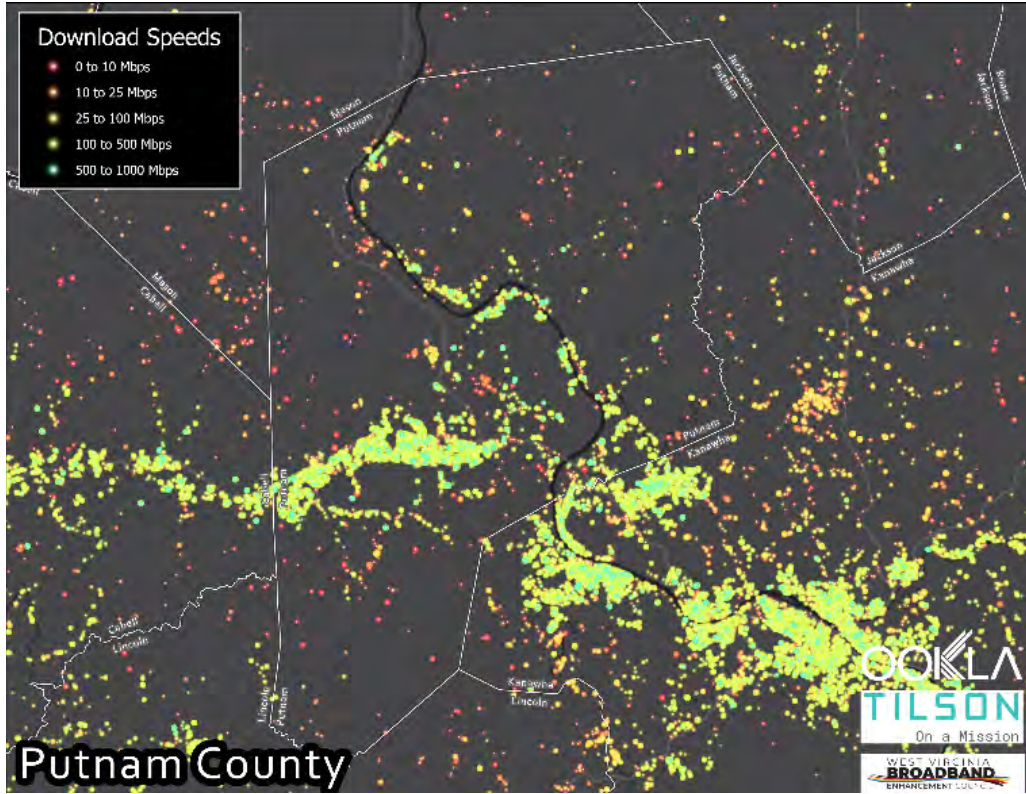
Pleasants						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	49	15	29	125	9
AT&T Services	AT&T Enterprise	11	1	47	1112	6
AT&T Wireless	AT&T Internet	21	8	71	57	12
COMMUNITY ANTENNA SERVICE	CAS Cable	48	18	35	16	2
Frontier Communications	Frontier	9	1	77	549	153
Hughes Network Systems	HughesNet	17	2	863	31	3
Hurricane Electric	UNKNOWN	41	97	19	2	1
Sprint PCS	Sprint	33	4	55	3	3
Suddenlink Communications	Suddenlink	184	27	15	1229	76
US Cellular	US Cellular	14	42	16	1	1
VERIZON WIRELESS	Verizon	2	1	72	5	5
VIASAT	Exede	3	4	779	5	3
County Totals		36	18	173	3135	274



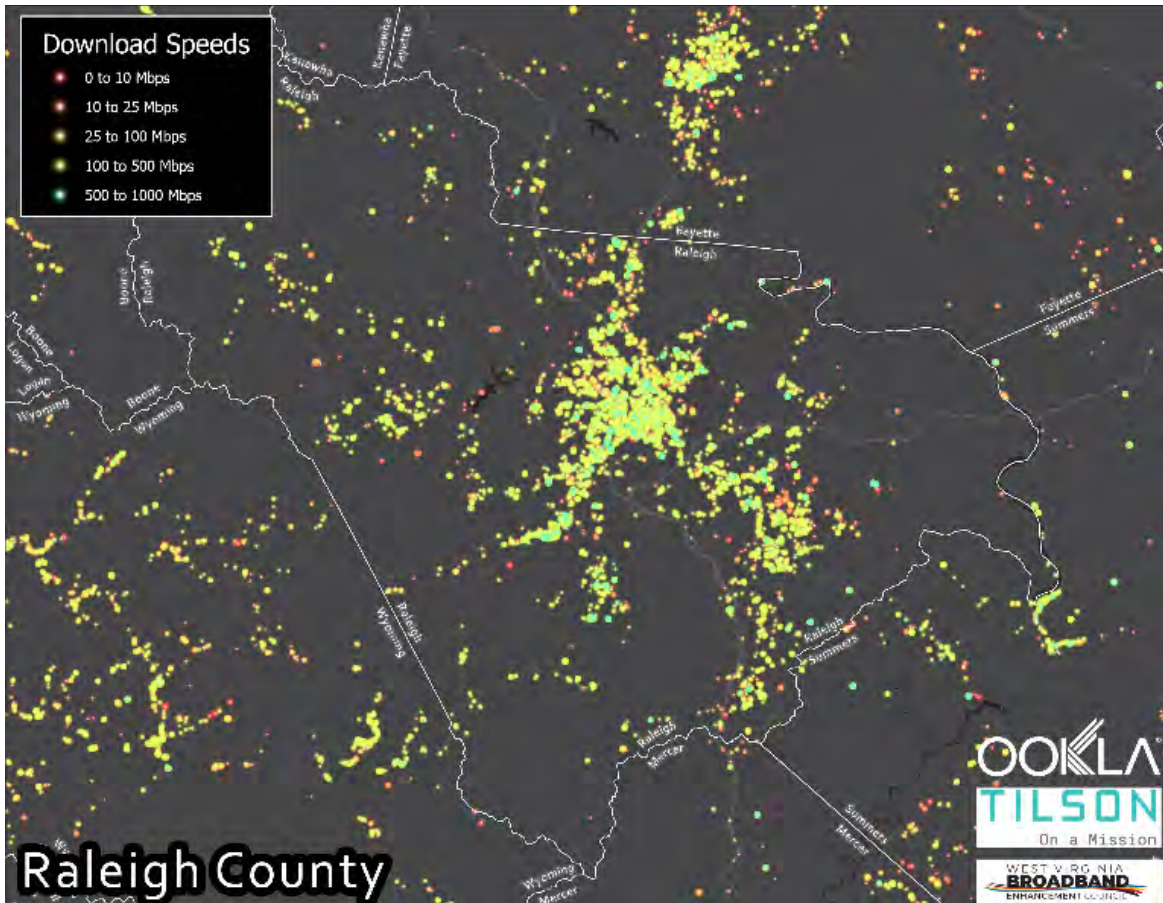
Pocahontas							
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count	
AT&T Services	AT&T Enterprise	7	1	115	2	1	
AT&T Wireless	AT&T Internet	18	3	110	277	6	
CityNet LLC	Citynet	38	33	21	2651	12	
Cloudflare Warp	UNKNOWN	68	71	11	2	1	
Comcast Cable	XFINITY	131	12	20	12	3	
Datacamp Limited	UNKNOWN	11	25	41	1	1	
Frontier Communications	Frontier	8	1	89	2161	133	
Google Fi	Google Fi	3	2	93	1	1	
Hughes Network Systems	HughesNet	15	2	925	177	10	
IPVanish	UNKNOWN	8	1	23	1	1	
Leaseweb USA	Leaseweb	49	50	40	1	1	
LUMOS Networks	Lumos Networks	8	11	115	4	1	
Shentel Communications	Shentel	43	8	29	1411	12	
Sprint PCS	Sprint	8	3	58	10	2	
Spruce Knob Seneca Rocks Telephone	SKSRT	14	9	17	299	6	
Suddenlink Communications	Suddenlink	37	15	21	33	3	
T-MOBILE USA	T-Mobile	34	8	89	21	6	
UNKNOWN	UNKNOWN	1	3	841	8	1	
VIASAT	Exede	11	3	730	71	8	
Windstream Communications	Windstream	7	9	47	14	1	
County Totals		26	13	172	7157	210	



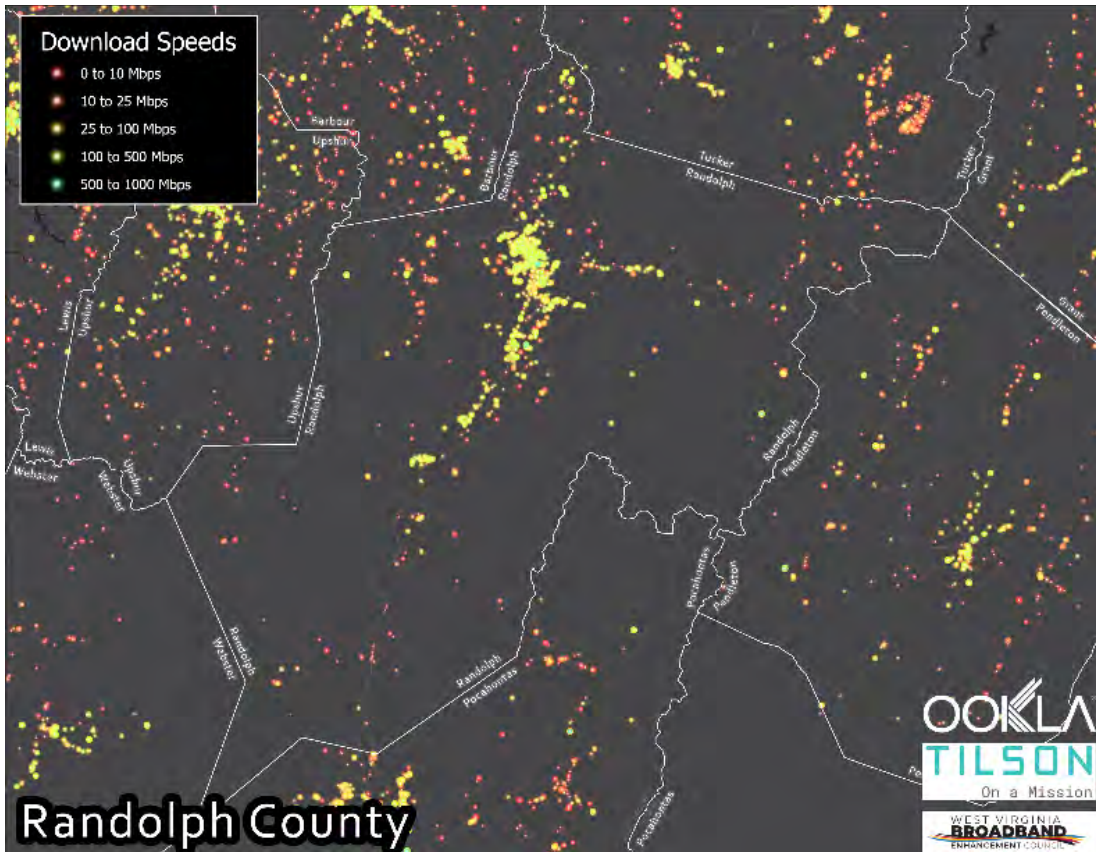
Preston						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	18	14	85	13	2
AT&T Wi-Fi Services	AT&T Internet	31	4	31	4	2
AT&T Wireless	AT&T Internet	17	5	67	910	14
ATLANTIC BROADBAND	Atlantic Broadband	105	15	29	4676	51
Comcast Business	Comcast Business	115	22	20	18	7
Comcast Cable	XFINITY	217	20	20	236	15
Datacamp Limited	UNKNOWN	7	1	146	1	1
Frontier Communications	Frontier	12	5	48	1810	202
Google Cloud	Google Cloud Platform	18	37	124	3	3
Hughes Network Systems	HughesNet	19	2	861	33	7
IPVanish	UNKNOWN	4	0	17	1	1
Labyrinth Solutions	Labyrinth Solutions	52	53	18	1974	8
Leaseweb-usa-wdc	UNKNOWN	20	5	28	1	1
Leaseweb USA	Leaseweb	44	8	17	3	2
Level 3 Communications	Level 3	1	2	99	11	1
LUMOS Networks	Lumos Networks	19	18	26	6	3
QCOL	QCOL	55	80	14	115	2
SHENTEL	Shentel	8	7	37	5	1
Shentel Communications	Shentel	47	7	18	98	3
Single Digits	Single Digits	138	175	24	1604	1
SoftLayer Technologies	SoftLayer	27	3	56	2	2
Sprint PCS	Sprint	21	4	74	19	13
T-MOBILE USA	T-Mobile	21	4	88	162	9
UNKNOWN	UNKNOWN	29	3	36	1	1
US Cellular	US Cellular	14	4	68	81	15
Verizon Business	Verizon Enterprise Solutions	26	31	19	55	2
Verizon Internet Services	Verizon	51	50	19	1289	5
VERIZON WIRELESS	Verizon	20	15	86	9	7
VIASAT	Exede	22	3	664	107	18
Viasat Communications	Exede	18	4	657	11	2
Windstream Communications	Windstream	25	30	17	2	1
County Totals		39	20	113	13260	402



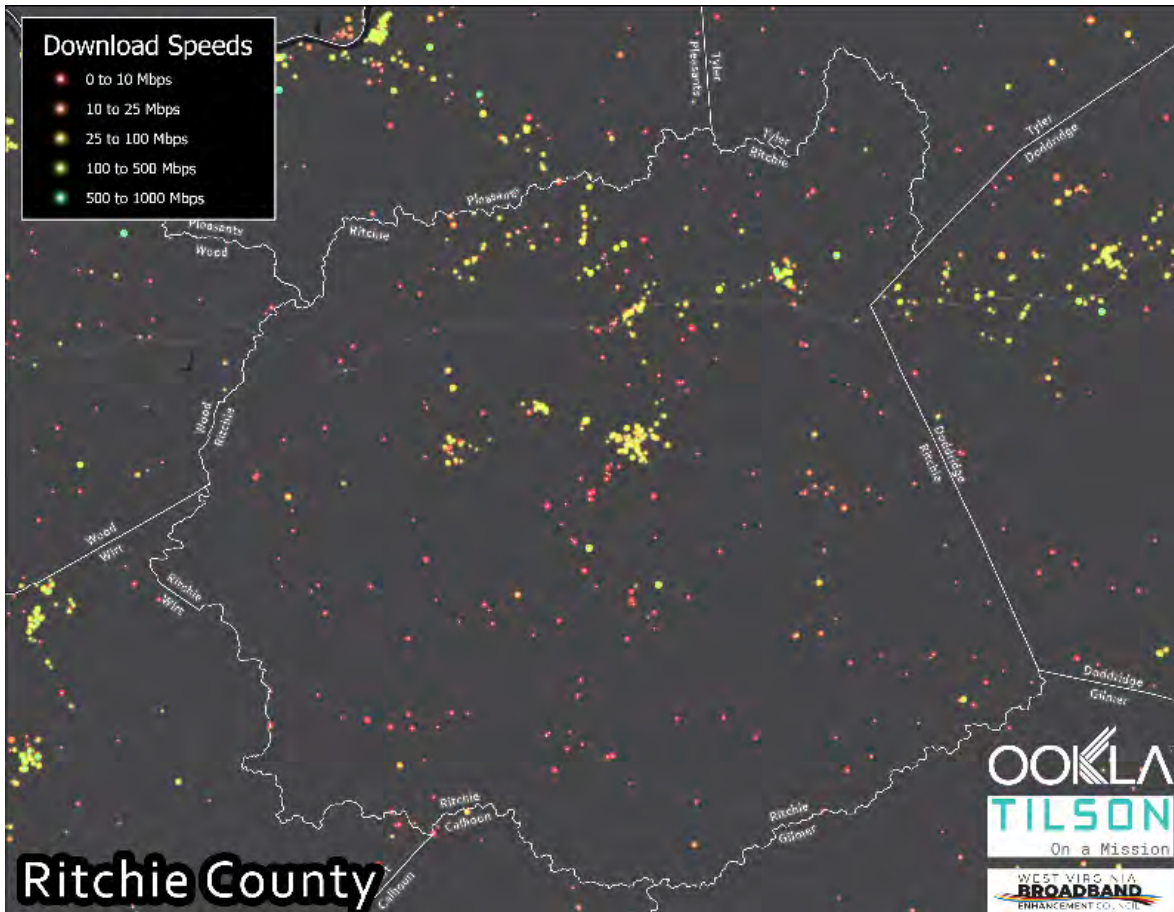
Putnam						
ISP	Common Name	Download Speed Tiers (Mbps)	Upload Speed Tiers (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	207	171	8	153	5
Armstrong Cable	Zoom Internet	91	59	41	165	13
AT&T Services	AT&T Enterprise	49	39	53	64	5
AT&T Wi-Fi Services	AT&T Internet	81	147	31	19	3
AT&T Wireless	AT&T Internet	27	8	71	1134	24
CAMC Health System	UNKNOWN	71	154	28	38	1
CenturyLink	CenturyLink	1	1	29	1	1
CityNet LLC	Citynet	13	9	15	9	2
Cloudflare Warp	UNKNOWN	36	8	8	1	1
Comcast Business	Comcast Business	76	19	58	247	36
Comcast Cable	XFINITY	170	14	34	9452	27
Datacamp Limited	UNKNOWN	29	32	41	1	1
Frontier Communications	Frontier	17	4	53	7154	322
Google Cloud	Google Cloud Plat	74	19	160	1	1
Google Fi	Google Fi	51	14	58	183	4
Hughes Network Systems	HughesNet	17	3	937	94	4
IPVanish	UNKNOWN	35	22	98	14	6
Leaseweb-usa-wdc	UNKNOWN	19	5	116	34	8
Leaseweb USA	Leaseweb	22	8	108	37	6
Level 3 Communications	Level 3	36	27	57	8	3
LUMOS Networks	Lumos Networks	74	75	18	165	19
M247 Ltd	M247	28	15	105	13	6
Marshall University	UNKNOWN	158	183	115	14	7
SECURED SERVERS LLC	PhoenixNAP	12	7	38	2	1
SoftLayer Technologies	SoftLayer	15	4	131	39	4
Spectrum	Spectrum	229	11	19	3	1
Sprint PCS	Sprint	13	5	64	166	44
Suddenlink Communications	Suddenlink	169	23	17	66691	172
T-MOBILE USA	T-Mobile	39	4	85	1542	16
VERIZON WIRELESS	Verizon	32	6	81	1229	44
VIASAT	Exede	10	3	690	48	13
Viasat Communications	Exede	14	5	666	7	1
Web2Objects LLC	Web2Objects	50	15	51	6	3
Windstream Communications	Windstream	8	9	32	1	1
Zayo	UNKNOWN	26	44	22	4	1
County Totals		57	34	118	88739	806



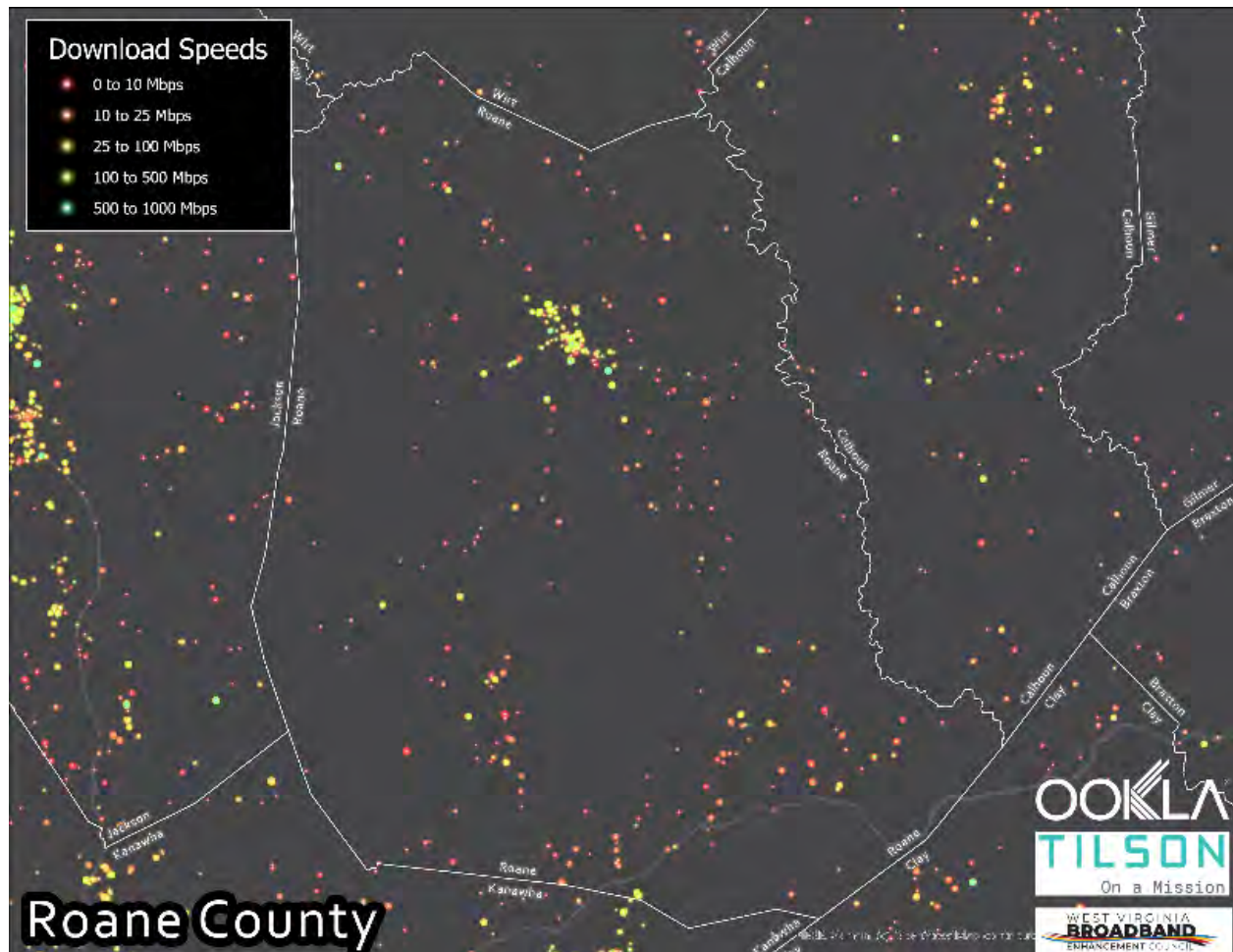
Raleigh						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	9	6	87	29	4
AT&T Wi-Fi Services	AT&T Internet	38	54	39	30	4
AT&T Wireless	AT&T Internet	20	7	97	578	15
CenturyLink	CenturyLink	11	21	96	6	3
CityNet LLC	Citynet	30	48	185	11	1
Cloudflare Warp	UNKNOWN	24	11	44	17	2
Comcast Business	Comcast Business	5	2	24	5	2
Comcast Cable	XFINITY	39	5	23	4	2
Datcamp Limited	UNKNOWN	92	12	45	2	2
Frontier Communications	Frontier	15	5	43	1907	287
Google Cloud	Google Cloud Platform	8	18	127	8	5
Google Fi	Google Fi	28	8	71	9	4
Hughes Network Systems	HughesNet	12	3	779	10	3
IPVanish	UNKNOWN	63	18	56	35	9
Leaseweb-usa-wdc	UNKNOWN	15	17	53	3	3
Level 3 Communications	Level 3	8	10	287	342	2
LUMOS Networks	Lumos Networks	55	67	22	377	23
M247 Ltd	M247	10	20	46	5	4
Shentel Communications	Shentel	44	22	35	109	5
SoftLayer Technologies	SoftLayer	22	11	49	6	1
Sprint PCS	Sprint	14	7	64	158	43
Suddenlink Communications	Suddenlink	166	27	17	45721	242
T-MOBILE USA	T-Mobile	17	6	145	6	5
UNKNOWN	UNKNOWN	35	7	104	2	1
US Cellular	US Cellular	30	8	109	19	11
Verizon Business	Verizon Enterprise Solutions	72	82	31	4	3
Verizon Internet Services	Verizon	30	46	34	2	1
VERIZON WIRELESS	Verizon	31	11	49	138	34
VIASAT	Exede	23	3	766	30	11
Web2Objects LLC	Web2Objects	34	15	72	11	4
Windstream Communications	Windstream	34	27	39	79	4
Zayo	UNKNOWN	57	69.5	24.5	4	1
County Totals		34	21	114	49667	741



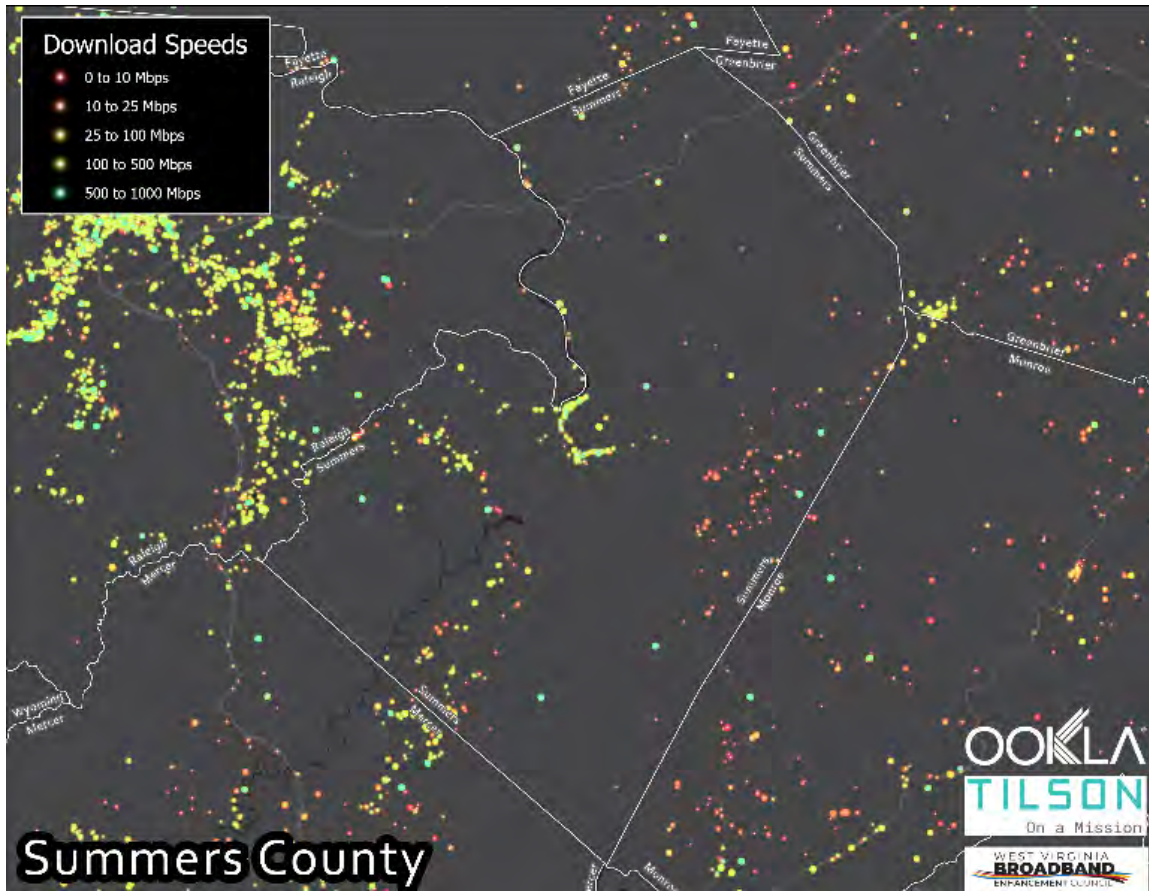
Randolph						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	4	2	144	56	2
AT&T Wi-Fi Services	AT&T Internet	18	25	30	26	6
AT&T Wireless	AT&T Internet	15	5	81	2369	9
ATLANTIC BROADBAND	Atlantic Broadband	309	30	23	7	2
CityNet LLC	Citynet	53	58	13	424	10
Frontier Communications	Frontier	18	12	75	1487	230
Google Fi	Google Fi	6	2	81	5	3
Hughes Network Systems	HughesNet	12	2	951	132	8
IPVanish	UNKNOWN	9	6	75	4	2
Leaseweb-usa-wdc	UNKNOWN	14	4	51	6	4
Leaseweb USA	Leaseweb	18	2	43	5	4
Level 3 Communications	Level 3	0	2	250	2	1
LUMOS Networks	Lumos Networks	256	244	32	3	2
M247 Ltd	M247	19	0	46	1	1
MicroLogic	Micrologic	7	3	65	535	3
RAVEN-01	UNKNOWN	16	5	34	115	1
Shentel Communications	Shentel	129	9	21	98	4
SoftLayer Technologies	SoftLayer	20	6	73	7	2
Spectrum	Spectrum	402	23	26	1	1
Sprint PCS	Sprint	13	4	74	53	22
Suddenlink Communications	Suddenlink	56	7	20	10834	50
T-MOBILE USA	T-Mobile	5	1	101	167	5
US Cellular	US Cellular	5	1	101	39	13
Verizon Business	Verizon Enterprise Solutions	10	14	179	442	2
VERIZON WIRELESS	Verizon	0	0	121	1	1
VIASAT	Exede	19	2	666	103	17
Viasat Communications	Exede	13	4	776	38	1
Web2Objects LLC	Web2Objects	20	6	64	3	2
Windstream Communications	Windstream	32	30	19	2	1
County Total		52	18	146	16965	409



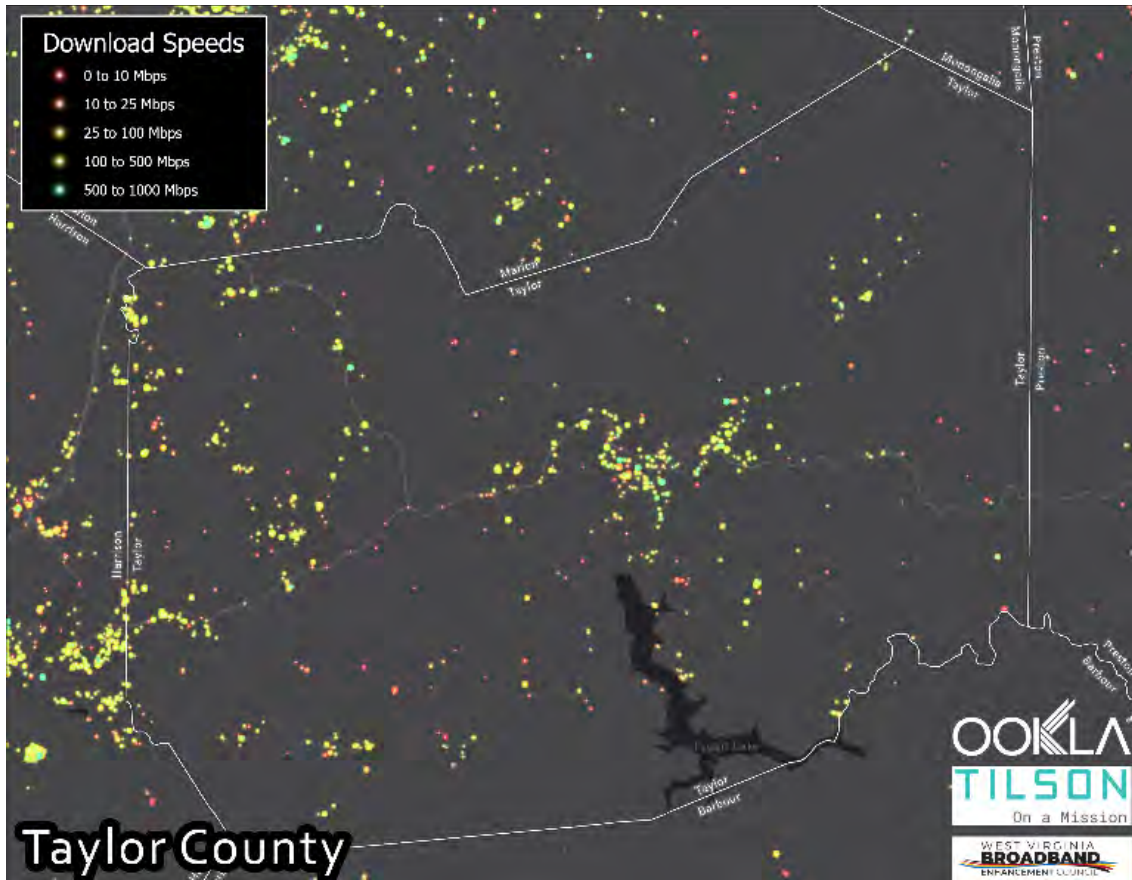
Ritchie						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	49	10	61	4107	32
AT&T Services	AT&T Enterprise	14	11	97	9	1
AT&T Wireless	AT&T Internet	9	3	217	27	3
CityNet LLC	Citynet	60	77	7	21	2
Datacamp Limited	UNKNOWN	3	0	191	6	2
Frontier Communications	Frontier	8	1	60	166	68
Hughes Network Systems	HughesNet	19	2	856	52	5
Intelsat Global Service Corporation	Intelsat	0	1	728	2	1
IPVanish	UNKNOWN	46	9	33	20	3
LUMOS Networks	Lumos Networks	28	31	11	1	1
M247 Ltd	M247	37	8	106	2	1
Spectrum	Spectrum	51	10	50	20	2
Sprint PCS	Sprint	27	5	36	3	2
UNKNOWN	UNKNOWN	19	10	95	1	1
Verizon Business	Verizon Enterprise Solutions	8	2	152	5	1
VERIZON WIRELESS	Verizon	31	7	101	20	12
VIASAT	Exede	12	3	685	93	14
Viasat Communications	Exede	11	1	656	4	1
Web2Objects LLC	Web2Objects	45	10	39	11	2
Windstream Communications	Windstream	95	92	11	1	1
County Total		29	15	209	4571	155



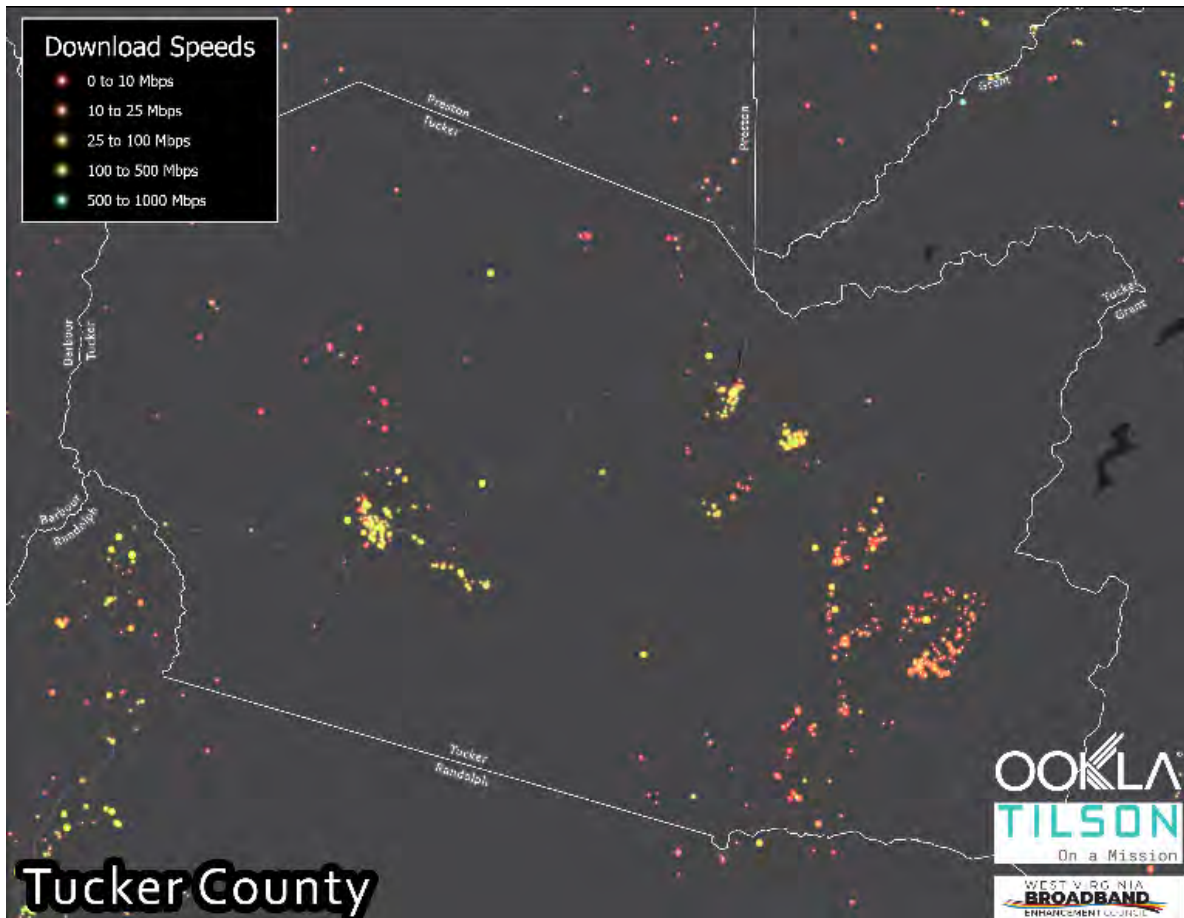
Roane						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	341	24	27	2	1
AT&T Services	AT&T Enterprise	3	1	118	2	1
AT&T Wi-Fi Services	AT&T Internet	12	30	29	2	1
AT&T Wireless	AT&T Internet	13	5	91	294	8
Comcast Business	Comcast Business	8	8	37	1	1
Frontier Communications	Frontier	10	1	48	1439	273
Hughes Network Systems	HughesNet	20	2	909	35	5
IPVanish	UNKNOWN	11	1	80	1	1
Level 3 Communications	Level 3	0	0	206	1	1
LUMOS Networks	Lumos Networks	40	47	24	151	10
M247 Ltd	M247	2	1	44	1	1
Spectrum Business	Spectrum Business	6	6	86	4	1
Sprint PCS	Sprint	14	8	65	117	31
Suddenlink Communications	Suddenlink	166	28	17	892	54
T-MOBILE USA	T-Mobile	36	9	67	71	4
Verizon Business	Verizon Enterprise Solutions	8	0	152	1	1
VERIZON WIRELESS	Verizon	12	7	89	98	29
VIASAT	Exede	11	3	807	139	27
Viasat Communications	Exede	3	4	734	1	1
Windstream Communications	Windstream	5	3	96	2	1
County Totals		36	9	186	3254	452



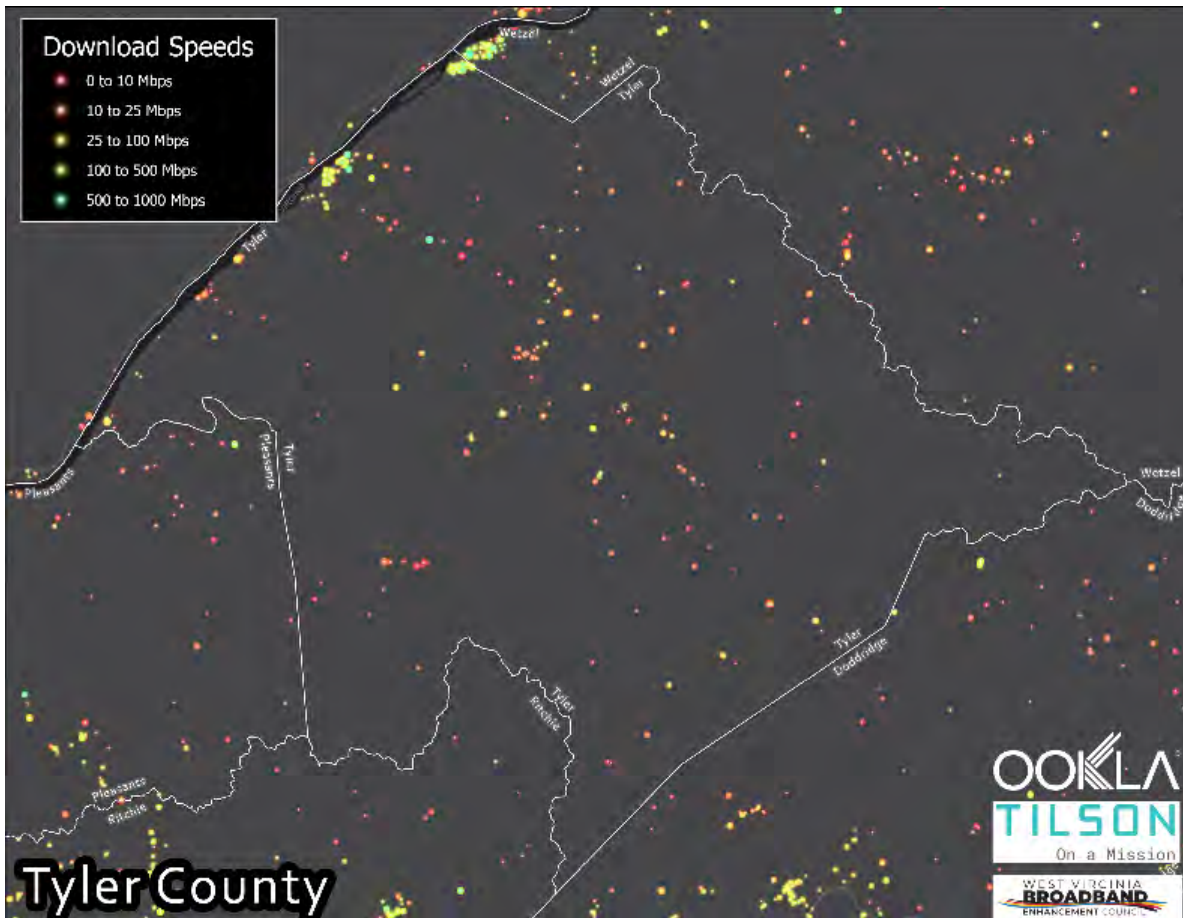
Summers						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Alpha Technologies	UNKNOWN	37	38	56	1	1
AT&T Services	AT&T Enterprise	12	7	94	4	1
AT&T Wireless	AT&T Internet	9	5	102	205	7
Cloudflare Warp	UNKNOWN	91	36	38	3	2
Frontier Communications	Frontier	13	2	58	996	215
Google Fi	Google Fi	0	0	89	1	1
Hughes Network Systems	HughesNet	21	3	765	8	2
IPVanish	UNKNOWN	1	1	133	1	1
LUMOS Networks	Lumos Networks	61	37	26	10	5
M247 Ltd	M247	4	1	56	2	1
Shentel Communications	Shentel	35	22	13	11	1
Spectrum	Spectrum	38	38	76	63	1
Sprint PCS	Sprint	18	4	96	50	33
Suddenlink Communications	Suddenlink	162	27	20	8510	139
US Cellular	US Cellular	53	9	189	6	4
Verizon Internet Services	Verizon	3	1	118	21	3
VERIZON WIRELESS	Verizon	12	4	96	43	15
VIASAT	Exede	25	3	672	88	14
Windstream Communications	Windstream	4	7	32	4	2
County Totals		31	13	144	10027	448



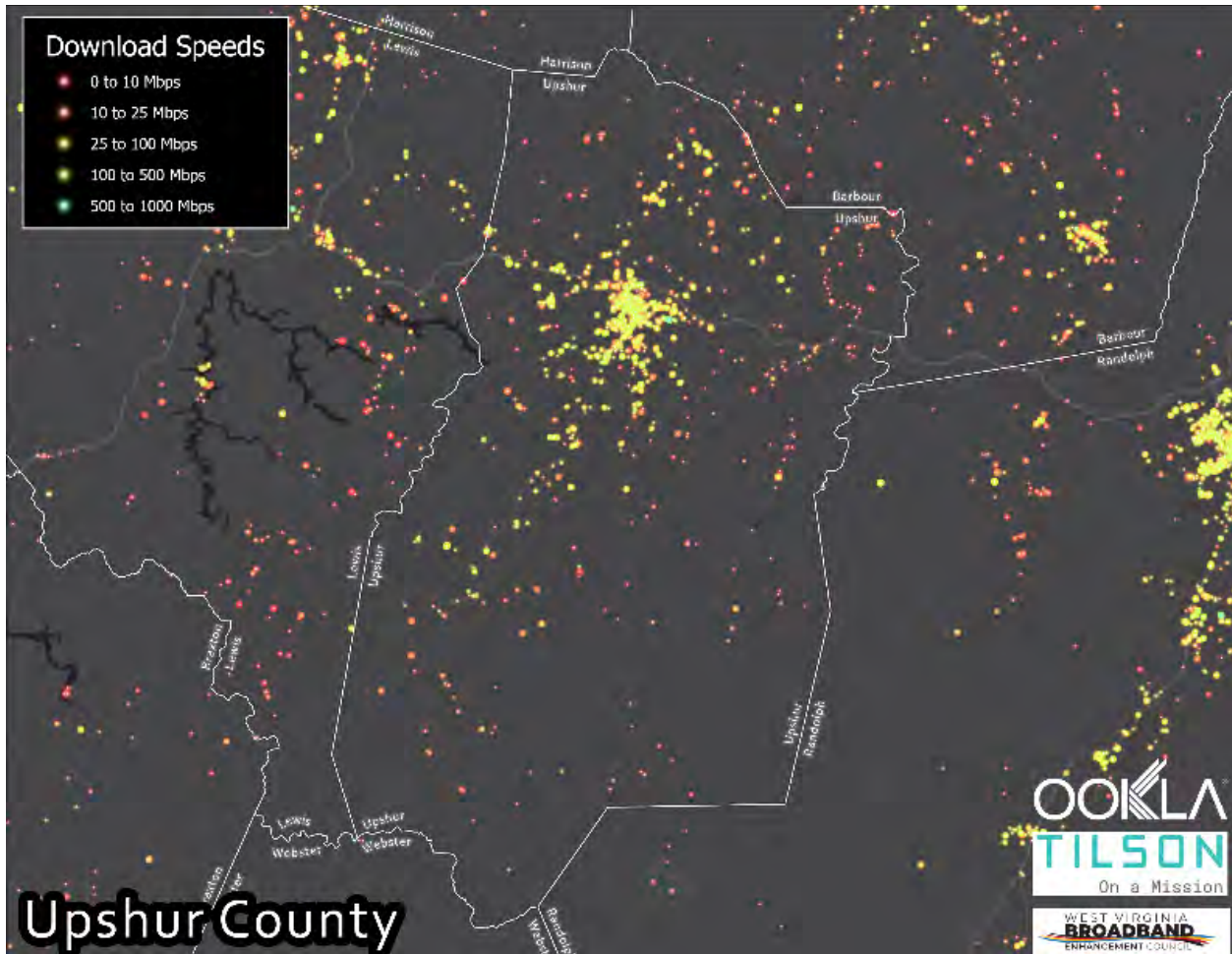
Taylor						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	21	15	101	7	1
AT&T WI-FI Services	AT&T Internet	12	28	17	1	1
AT&T Wireless	AT&T Internet	26	16	66	182	5
CenturyLink	CenturyLink	4	6	61	5	1
CityNet LLC	Citynet	102	99	4	154	11
Comcast Business	Comcast Business	152	27	17	54	6
Comcast Cable	XFINITY	181	16	21	2825	19
Datacamp Limited	UNKNOWN	2	5	69	2	2
Frontier Communications	Frontier	9	1	68	1922	163
Google Fi	Google Fi	117	27	94	2	1
Hughes Network Systems	HughesNet	21	2	796	8	3
IPVanish	UNKNOWN	16	11	22	2	1
Leaseweb-usa-wdc	UNKNOWN	51	34	23	1	1
Shentel Communications	Shentel	46	11	14	1	1
SoftLayer Technologies	SoftLayer	28	9	55	1	1
Spectrum	Spectrum	99	13	44	345	39
Spectrum Business	Spectrum Business	87	17	44	4	1
Sprint PCS	Sprint	11	6	71	125	44
Suddenlink Communications	Suddenlink	56	7	16	859	17
T-MOBILE USA	T-Mobile	0	0	185	1	1
US Cellular	US Cellular	8	5	75	39	13
Verizon Internet Services	Verizon	25	2	73	1	1
VERIZON WIRELESS	Verizon	14	8	51	30	17
VIASAT	Exede	24	1	646	2	2
Viasat Communications	Exede	12	5	666	4	2
County Totals		45	15	132	6577	354



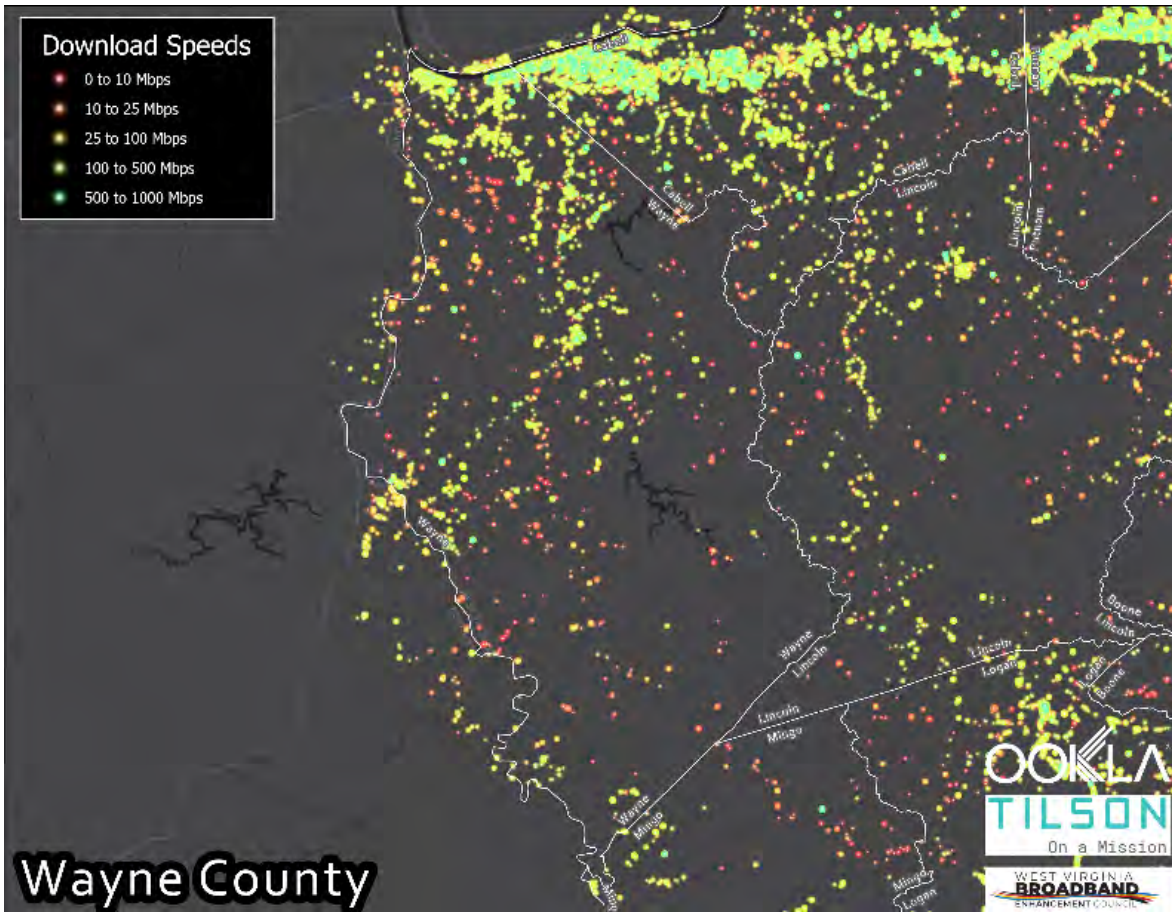
Tucker						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	2	1	120	1	1
AT&T Wireless	AT&T Internet	10	4	87	240	7
ATLANTIC BROADBAND	Atlantic Broadband	49	9	33	1122	10
CANAAN	UNKNOWN	12	3	57	902	3
Datacamp Limited	UNKNOWN	4	0	30	1	1
Frontier Communications	Frontier	7	1	93	1480	142
Google Fi	Google Fi	7	2	162	9	5
Hughes Network Systems	HughesNet	8	2	855	35	8
LUMOS Networks	Lumos Networks	10	13	35	2	1
MicroLogic	Micrologic	12	8	36	10	2
Shentel Communications	Shentel	15	3	28	338	4
Sprint PCS	Sprint	15	4	79	4	4
Suddenlink Communications	Suddenlink	112	18	12	3	3
T-MOBILE USA	T-Mobile	29	9	56	18	5
US Cellular	US Cellular	6	7	65	34	9
VERIZON WIRELESS	Verizon	1	0	844	2	2
VIASAT	Exede	12	3	670	9	7
Web2Objects LLC	Web2Objects	2	0	61	1	1
County Totals		17	5	185	4211	215



Tyler						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	13	2	40	80	3
AT&T Wireless	AT&T Internet	16	7	88	346	12
Cloudflare Warp	UNKNOWN	24	27	28	1	1
Frontier Communications	Frontier	8	2	42	565	147
Hughes Network Systems	HughesNet	12	2	891	48	7
Hurricane Electric	UNKNOWN	8	4	74	202	1
Intelsat Global Service Corporation	intelsat	2	1	630	106	2
IPVanish	UNKNOWN	3	3	718	1	1
Level 3 Communications	Level 3	50	85	23	2	1
Spectrum	Spectrum	181	28	35	7	1
Suddenlink Communications	Suddenlink	194	26	17	1205	43
T-MOBILE USA	T-Mobile	24	5	70	10	2
Verizon Business	Verizon Enterprise Solutions	8	12	122	23	1
VERIZON WIRELESS	Verizon	14	3	63	20	10
VIASAT	Exede	26	2	646	141	23
Viasat Communications	Exede	23	4	682	27	1
County Totals		38	13	260	2784	256

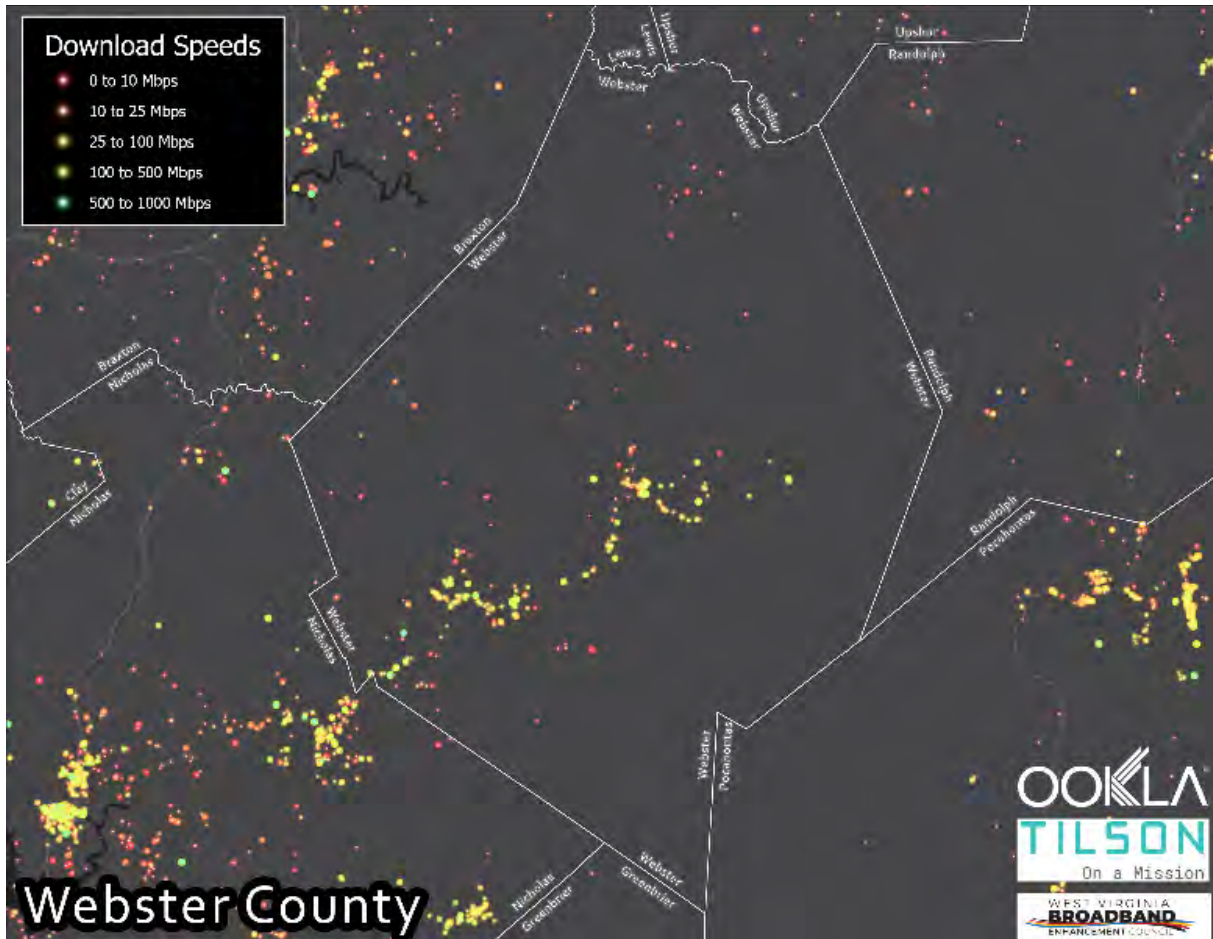


Upshur						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Total Count	User Count
AT&T Services	AT&T Enterprise	8	8	162	14	3
AT&T U-verse	AT&T Internet	32	46	24	1	1
AT&T Wi-Fi Services	AT&T Internet	25	47	35	10	2
AT&T Wireless	AT&T Internet	15	7	75	301	8
CityNet LLC	Citynet	78	52	13	20	3
Comcast Business	Comcast Business	12	6	20	6	2
Datacamp Limited	UNKNOWN	8	4	42	1	1
Frontier Communications	Frontier	33	23	73	1496	182
Google Cloud	Google Cloud Platform	25	9	35	8	1
Google Fi	Google Fi	24	12	66	7	2
Hughes Network Systems	HughesNet	20	2	908	35	5
IPVanish	UNKNOWN	41	8	79	5	3
Leaseweb-usa-wdc	UNKNOWN	18	7	43	2	2
LUMOS Networks	Lumos Networks	46	46	43	79	3
M247 Ltd	M247	5	2	28	1	1
MicroLogic	Micrologic	12	5	62	3842	8
RAVEN-01	UNKNOWN	18	5	42	310	3
Shentel Communications	Shentel	30	30	10	45	3
SoftLayer Technologies	SoftLayer	67	8	12	2	2
Sprint PCS	Sprint	13	4	83	60	17
Suddenlink Communications	Suddenlink	58	7	18	7220	50
T-MOBILE USA	T-Mobile	61	7	48	2	2
US Cellular	US Cellular	13	4	65	47	15
Verizon Business	Verizon Enterprise Solutions	10	1	176	10	1
Verizon Internet Services	Verizon	5	5	42	5	4
VERIZON WIRELESS	Verizon	3	0	157	2	2
VIASAT	Exede	8	2	676	114	12
Viasat Communications	Exede	3	5	646	1	1
Web2Objects LLC	Web2Objects	37	6	80	1	1
County Totals		25	13	130	13647	340

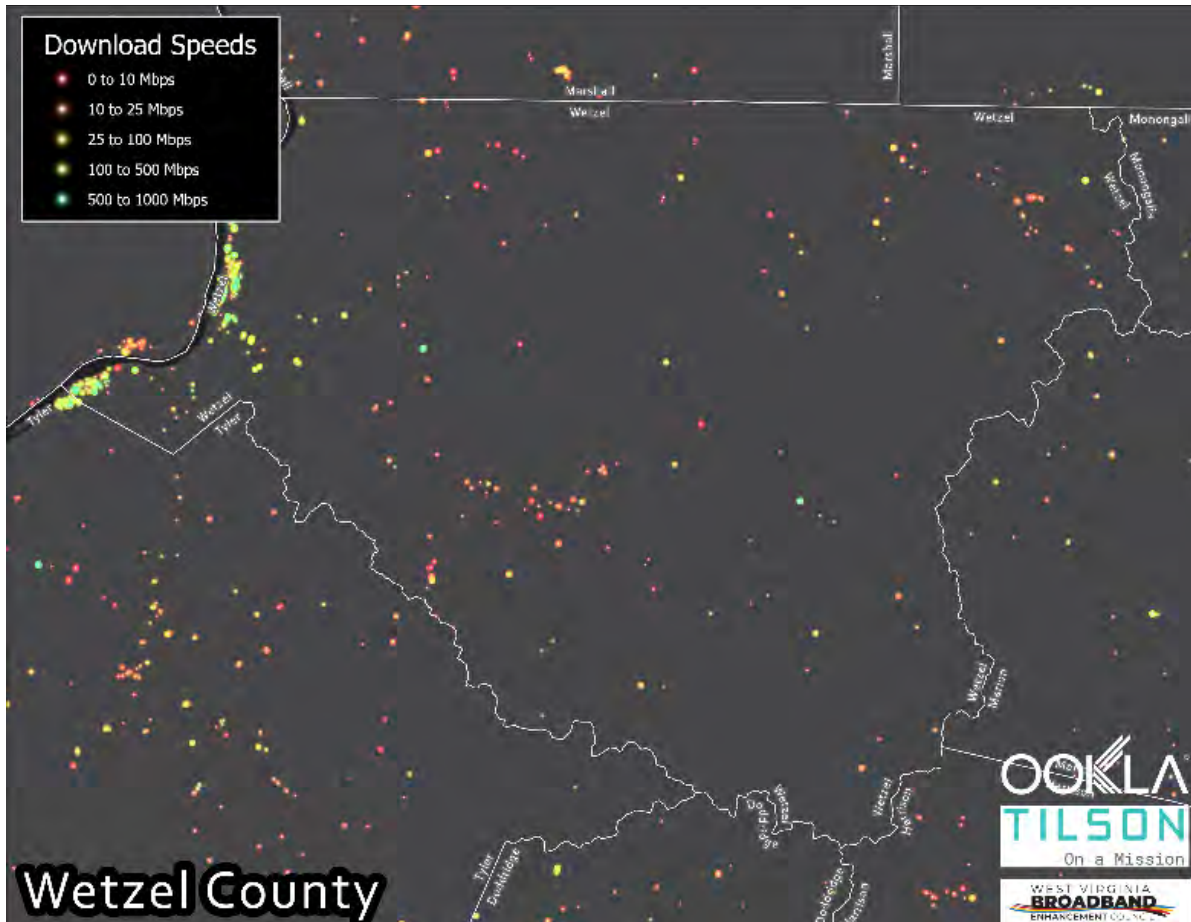


Wayne County

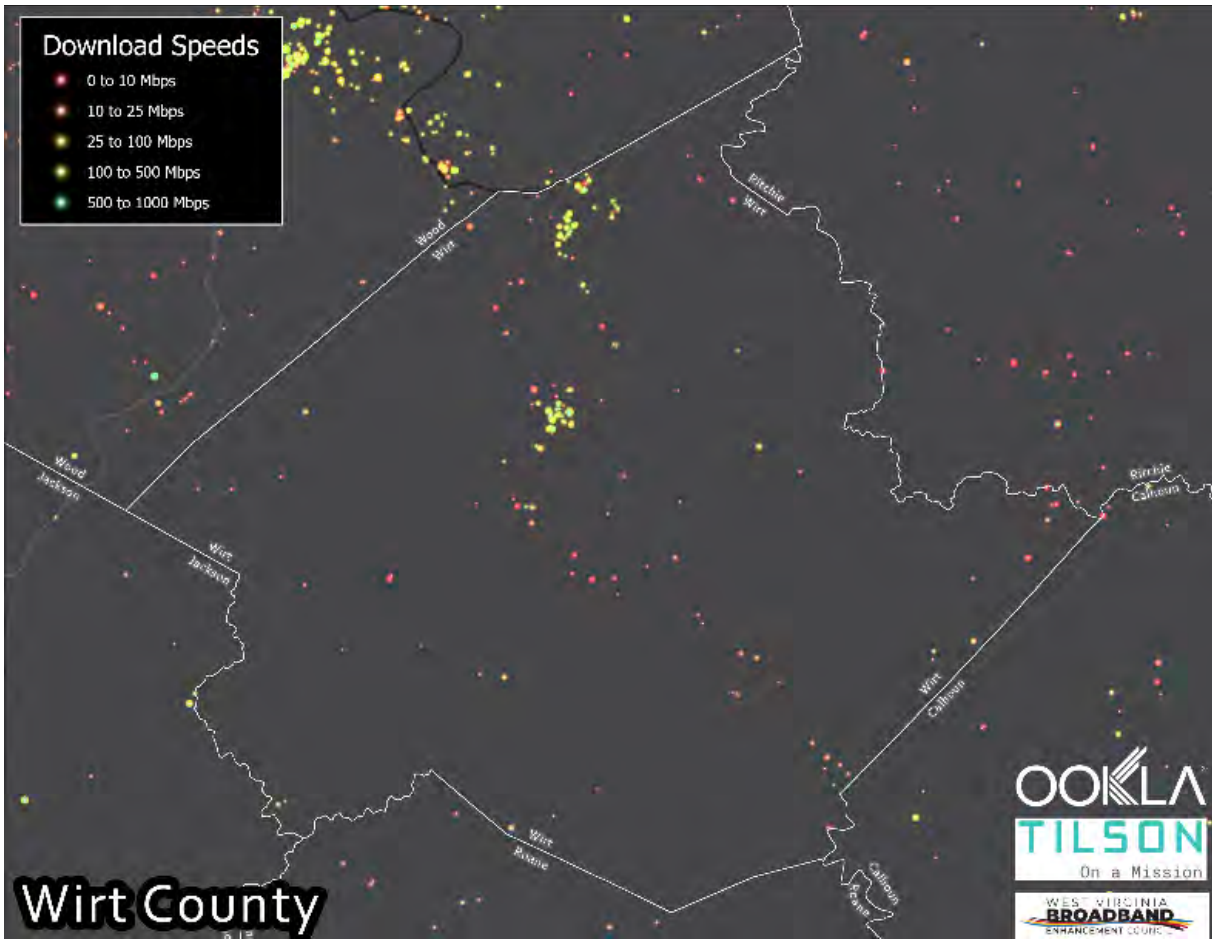
Wayne						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	125	16	45	7544	35
AT&T Data Communications Services	AT&T Enterprise	49	8	27	2467	9
AT&T Services	AT&T Enterprise	16	13	100	6	5
AT&T U-verse	AT&T Internet	8	1	79	11	2
AT&T Wi-Fi Services	AT&T Internet	70	68	32	1	1
AT&T Wireless	AT&T Internet	27	6	93	264	11
Comcast Business	Comcast Business	80	25	34	84	11
Comcast Cable	XFINITY	167	13	34	2158	62
Datacamp Limited	UNKNOWN	60	21	69	7	3
DNIC	UNKNOWN	38	20	135	30	2
Foothills Rural Telephone Cooperative Corporation	Foothills Broadband	124	184	5	138	6
Frontier Communications	Frontier	14	3	62	2491	298
Hughes Network Systems	HughesNet	19	3	817	59	4
IPVanish	UNKNOWN	57	20	61	4	4
Leaseweb-usa-wdc	UNKNOWN	12	10	50	10	2
Leaseweb USA	Leaseweb	33	16	35	1	1
Level 3 Communications	Level 3	26	40	81	6	2
LUMOS Networks	Lumos Networks	64	69	12	6	5
M247 Ltd	M247	20	17	76	6	3
SoftLayer Technologies	SoftLayer	50	9	41	9	4
Spectrum Business	Spectrum Business	21	16	12	1	1
Sprint PCS	Sprint	33	3	43	10	10
Suddenlink Communications	Suddenlink	139	25	15	5524	119
T-MOBILE USA	T-Mobile	39	10	74	71	11
VERIZON WIRELESS	Verizon	56	14	55	22	13
VIASAT	Exede	8	4	674	347	44
Web2Objects LLC	Web2Objects	43	12	59	2	2
Windstream Communications	Windstream	6	1	35	39	23
County Totals		50	23	102	21318	693



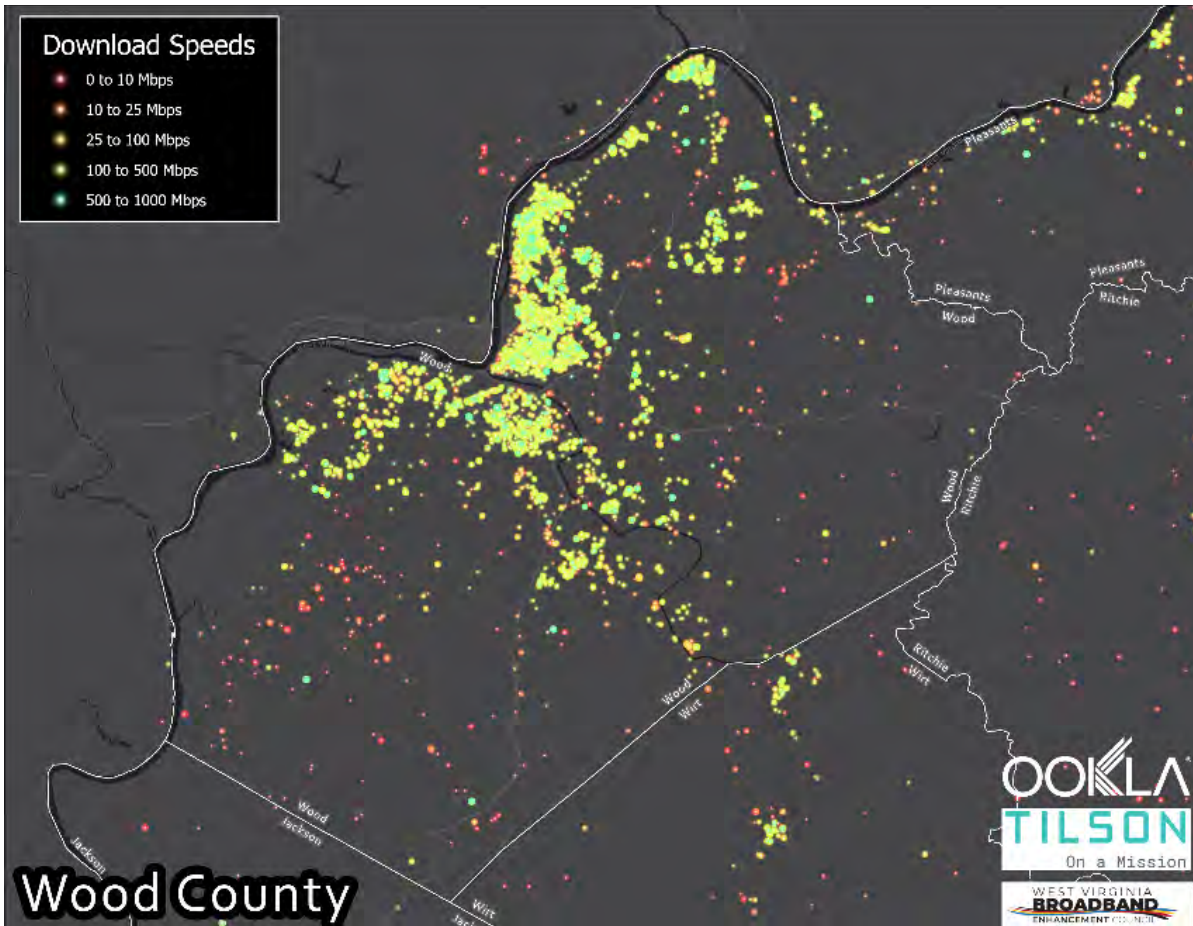
Webster						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	13	10	166	2	1
AT&T U-verse	AT&T Internet	58	21	22	1	1
AT&T Wireless	AT&T Internet	16	3	83	81	5
Comcast Business	Comcast Business	5	5	13	1	1
Frontier Communications	Frontier	6	1	86	760	65
Hughes Network Systems	HughesNet	17	3	777	55	4
IPVanish	UNKNOWN	15	8	42	7	2
Leaseweb-usa-wdc	UNKNOWN	25	68	45	1	1
LUMOS Networks	Lumos Networks	27	13	11	8	2
SHENTEL	Shentel	50	9	18	180	4
Shentel Communications	Shentel	91	8	17	1286	17
Sprint PCS	Sprint	36	5	42	14	5
Suddenlink Communications	Suddenlink	4	5	4	1	1
T-MOBILE USA	T-Mobile	3	0	100	2	2
US Cellular	US Cellular	5	4	55	3	2
VIASAT	Exede	6	4	645	7	1
County Totals		24	10	133	2409	114



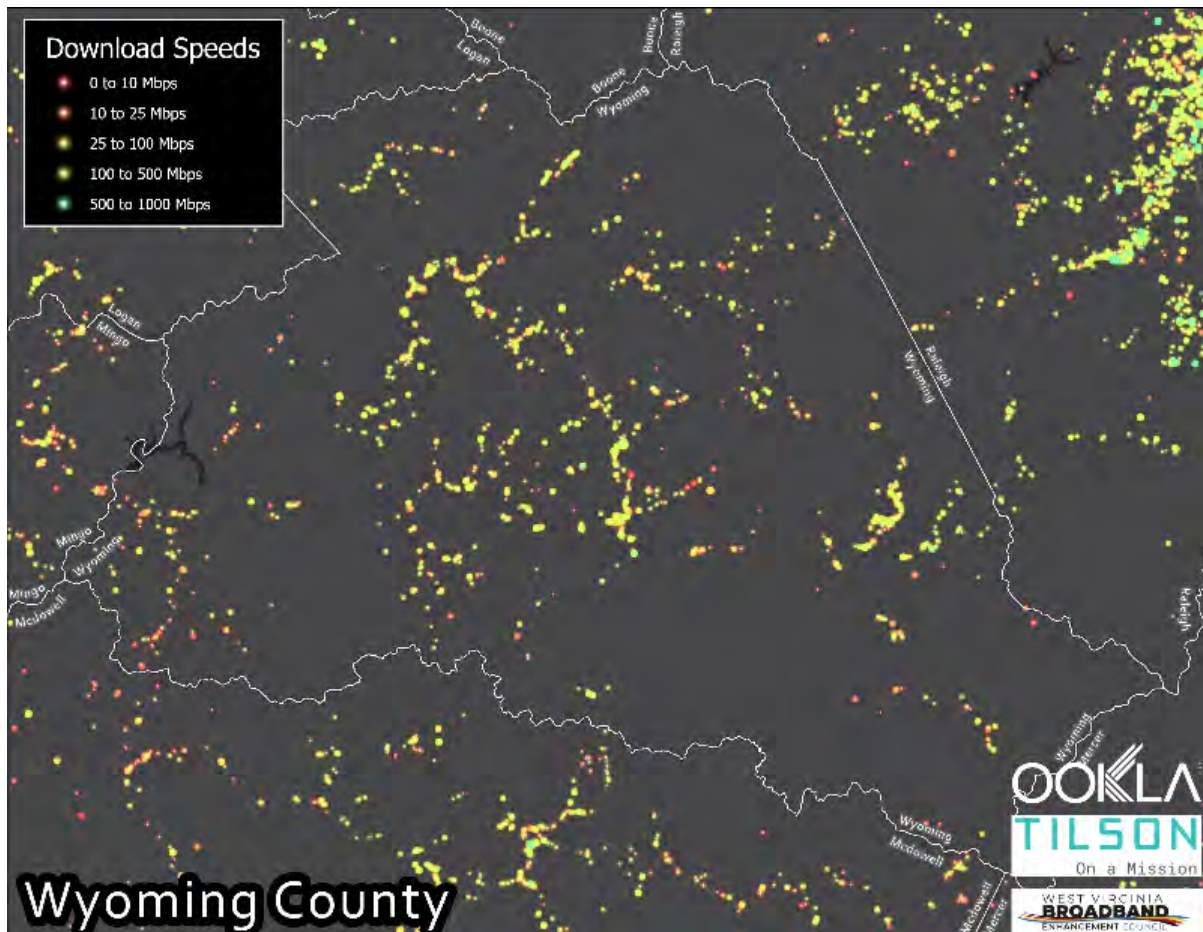
Wetzel						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	81	15	20	10	2
AT&T Services	AT&T Enterprise	13	1	43	273	1
AT&T Wi-Fi Services	AT&T Internet	32	56	32	10	4
AT&T Wireless	AT&T Internet	16	7	69	31	8
ATLANTIC BROADBAND	Atlantic Broadband	173	16	28	24	2
CenturyLink	CenturyLink	17	9	99	1	1
CityNet	CityNet	6	6	72	288	5
CityNet LLC	Citynet	10	2	20	1	1
Cloudflare Warp	UNKNOWN	29	27	27	2	1
Comcast Business	Comcast Business	14	12	41	8	3
Comcast Cable	XFINITY	338	28	18	104	1
Datacamp Limited	UNKNOWN	28	15	352	2	2
Frontier Communications	Frontier	9	1	72	1910	178
Hughes Network Systems	HughesNet	13	2	1012	53	6
Hurricane Electric	UNKNOWN	13	8	77	289	1
Intelsat Global Service Corporation	Intelsat	0	1	659	11	1
IPVanish	UNKNOWN	44	42	52	1	1
Leaseweb USA	Leaseweb	72	31	32	3	3
Level 3 Communications	Level 3	5	5	58	180	2
LUMOS Networks	Lumos Networks	104	81	19	5	2
M247 Ltd	M247	69	35	54	3	3
SoftLayer Technologies	SoftLayer	15	19	248	3	1
Spectrum Business	Spectrum Business	16	28	69	1	1
Sprint PCS	Sprint	8	0	254	1	1
Suddenlink Communications	Suddenlink	240	33	13	3158	51
T-MOBILE USA	T-Mobile	28	5	59	2	2
Verizon FIOS	Verizon	127	125	18	15	2
VERIZON WIRELESS	Verizon	32	10	78	37	17
VIASAT	Exede	28	3	663	154	42
Viasat Communications	Exede	26	0	622	2	1
Windstream Communications	Windstream	8	3	54	2	2
ZITO MEDIA	Zito	21	5	60	146	2
County Total		51	20	156	6730	350



Wirt						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	3	0	95	52	10
AT&T Services	AT&T Enterprise	4	0	71	2	2
AT&T Wireless	AT&T Internet	10	6	82	78	8
Datacamp Limited	UNKNOWN	3	0	191	6	2
Frontier Communications	Frontier	5	1	84	459	107
Hughes Network Systems	HughesNet	27	3	777	16	4
IPVanish	UNKNOWN	5	0	67	2	1
Sprint PCS	Sprint	12	3	56	4	4
Suddenlink Communications	Suddenlink	147	25	33	362	42
T-MOBILE USA	T-Mobile	31	1	95	5	4
VERIZON WIRELESS	Verizon	22	9	42	7	3
VIASAT	Exede	15	3	716	21	11
County Totals		24	4	192	1014	198



Wood						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
Armstrong Cable	Zoom Internet	50	5	44	65	12
AT&T Services	AT&T Enterprise	118	28	32	711	12
AT&T Wi-Fi Services	AT&T Internet	89	116	34	34	6
AT&T Wireless	AT&T Internet	43	10	50	432	14
CenturyLink	CenturyLink	20	19	35	36	4
Cloudflare Warp	UNKNOWN	58	33	52	24	3
Comcast Business	Comcast Business	16	166	20	31	2
Comcast Cable	XFINITY	45	56	22	18	4
COMMUNITY ANTENNA SERVICE	CAS Cable	138	23	35	12885	36
Datacamp Limited	UNKNOWN	83	19	52	5	2
Frontier Communications	Frontier	13	4	51	1390	246
Google Cloud	Google Cloud Platform	19	9	64	7	3
Google Fi	Google Fi	123	17	83	3	2
Horizon Telcom	Horizon	295	301	14	1	1
Hughes Network Systems	HughesNet	11	2	807	33	4
IPVanish	UNKNOWN	39	15	41	13	3
Labyrinth Solutions	Labyrinth Solutions	4	1	86	1	1
Leaseweb-usa-wdc	UNKNOWN	86	31	41	29	11
Leaseweb USA	Leaseweb	79	24	43	9	7
Level 3 Communications	Level 3	55	47	21	6	3
LUMOS Networks	Lumos Networks	55	52	48	351	12
M247 Ltd	M247	33	19	52	3	3
SECURED SERVERS LLC	PhoenixNAP	59	19	95	841	2
SoftLayer Technologies	SoftLayer	80	27	41	7	4
Spectrum	Spectrum	181	54	31	3	2
Sprint PCS	Sprint	23	9	48	115	36
Suddenlink Communications	Suddenlink	171	26	16	54511	172
T-MOBILE USA	T-Mobile	23	5	97	239	13
US Cellular	US Cellular	8	4	37	2	1
Verizon Business	Verizon Enterprise Solution	28	24	145	1	1
VERIZON WIRELESS	Verizon	24	12	73	544	54
VIASAT	Exede	16	4	661	83	18
Viasat Communications	Exede	4	2	691	4	1
Windstream Communications	Windstream	139	125	29	4	3
Zayo	UNKNOWN	60	67	89	8	3
County Totals		65	39	108	72449	701

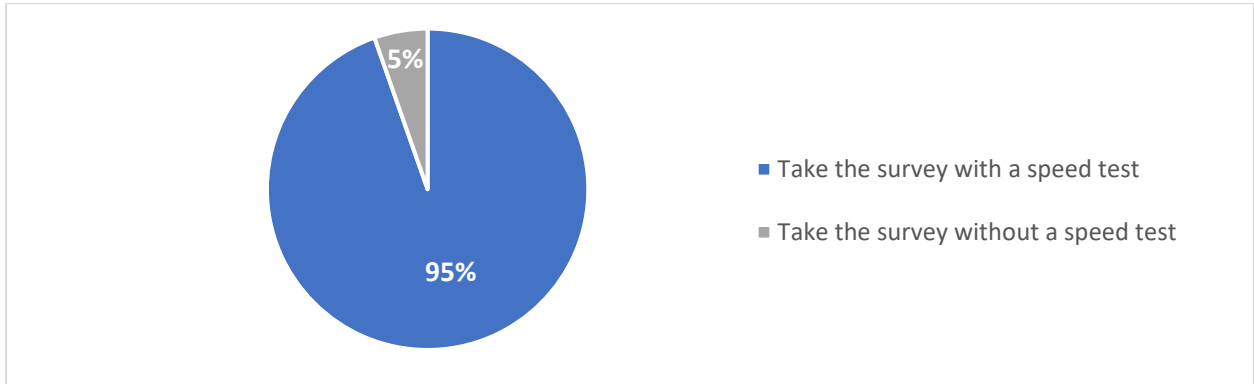


Wyoming						
ISP	Common Name	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Average Latency (ms)	Test Count	User Count
AT&T Services	AT&T Enterprise	15	5	93	9	1
AT&T Wireless	AT&T Internet	20	2	96	284	5
Cloudflare Warp	UNKNOWN	70	9	36	34	3
Comcast Business	Comcast Business	120	16	28	5	3
Frontier Communications	Frontier	14	2	58	1088	250
Hughes Network Systems	HughesNet	16	1	1002	61	4
IPVanish	UNKNOWN	22	5	58	5	3
M247 Ltd	M247	82	10	40	4	1
Shentel Communications	Shentel	69	9	36	11697	21
Sprint PCS	Sprint	8	3	52	7	6
Suddenlink Communications	Suddenlink	147	28	16	280	50
Verizon Internet Services	Verizon	8	6	155	10	3
VIASAT	Exede	23	4	692	31	5
County Totals		47	8	182	13515	355

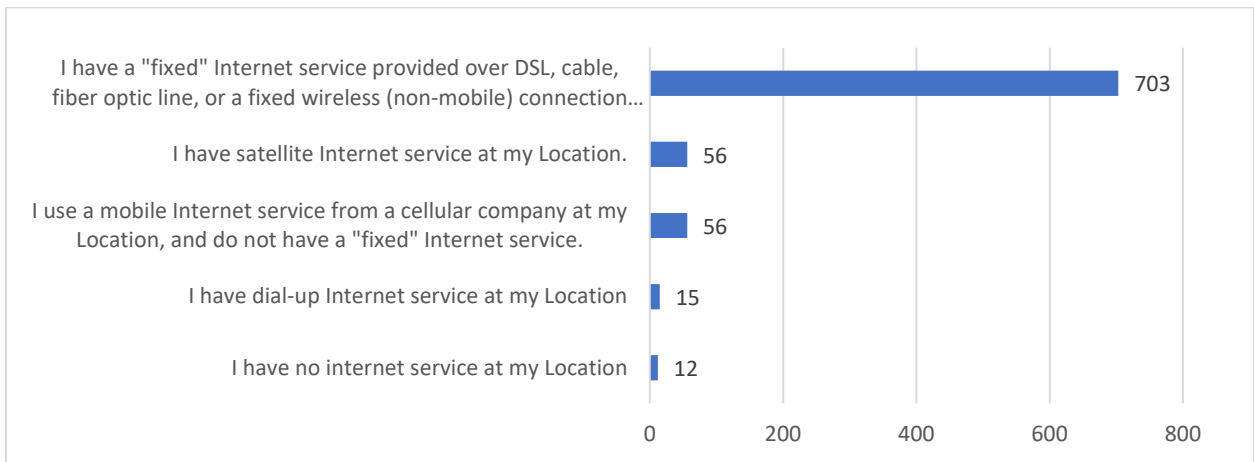


Appendix C - Market Research

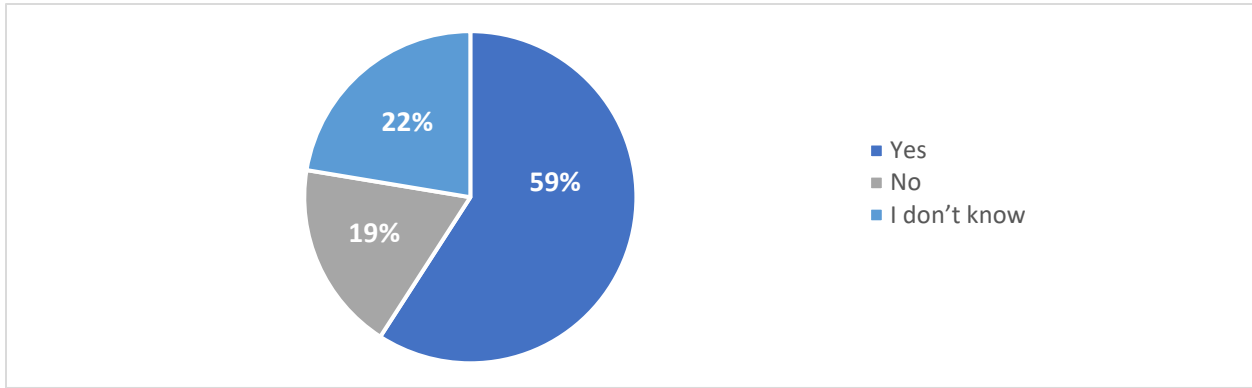
(If you are not completing this survey while at your Location, OR if you have no Internet, or only dial-up Internet at your Location, please take the survey without a speed test. Otherwise please take the survey with a speed test.)



What statement best describes the Internet service at your Location?

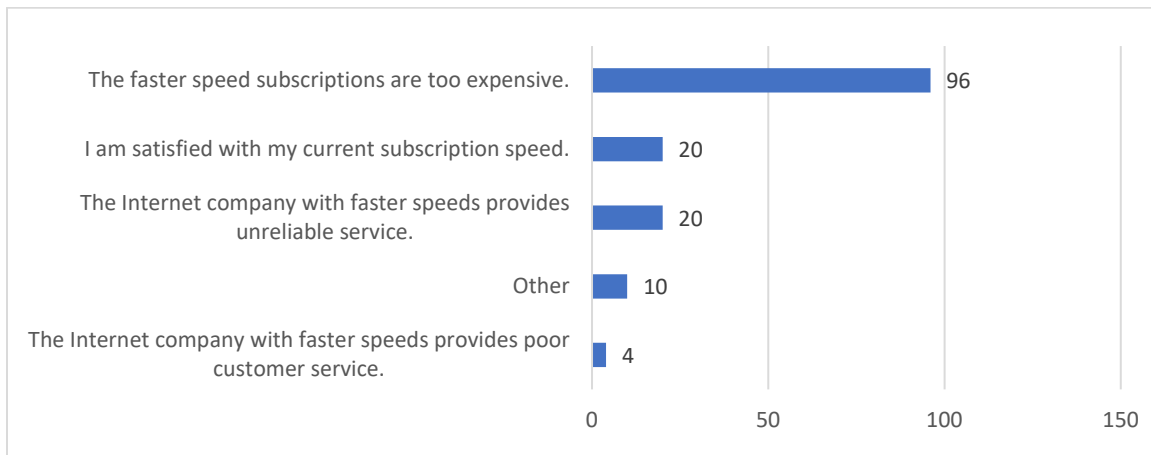


Are you subscribed to the fastest speed available to you at your location (that you are aware of)?



If answered "No" to: Are you subscribed to the fastest speed available to you at your location?

What are the reasons that you are not subscribed to the fastest speed available to you at your location?

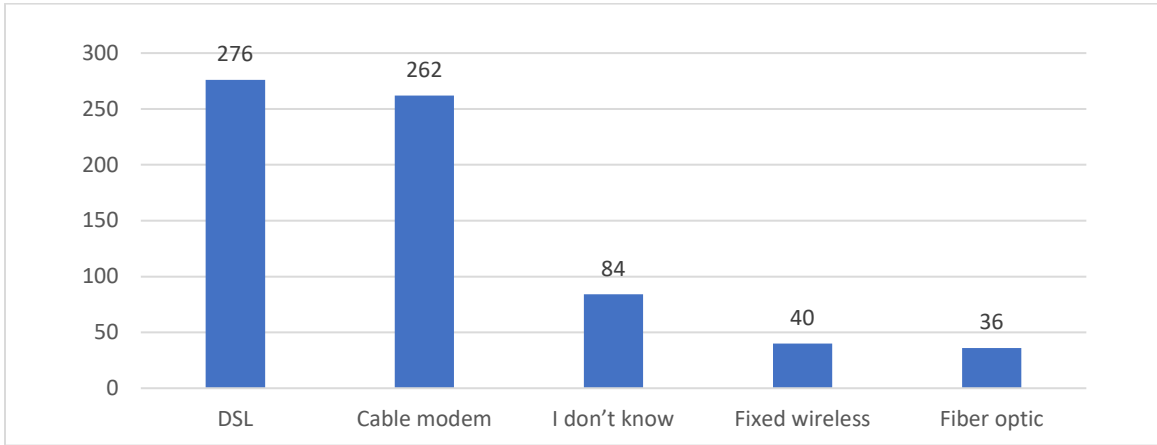


Other

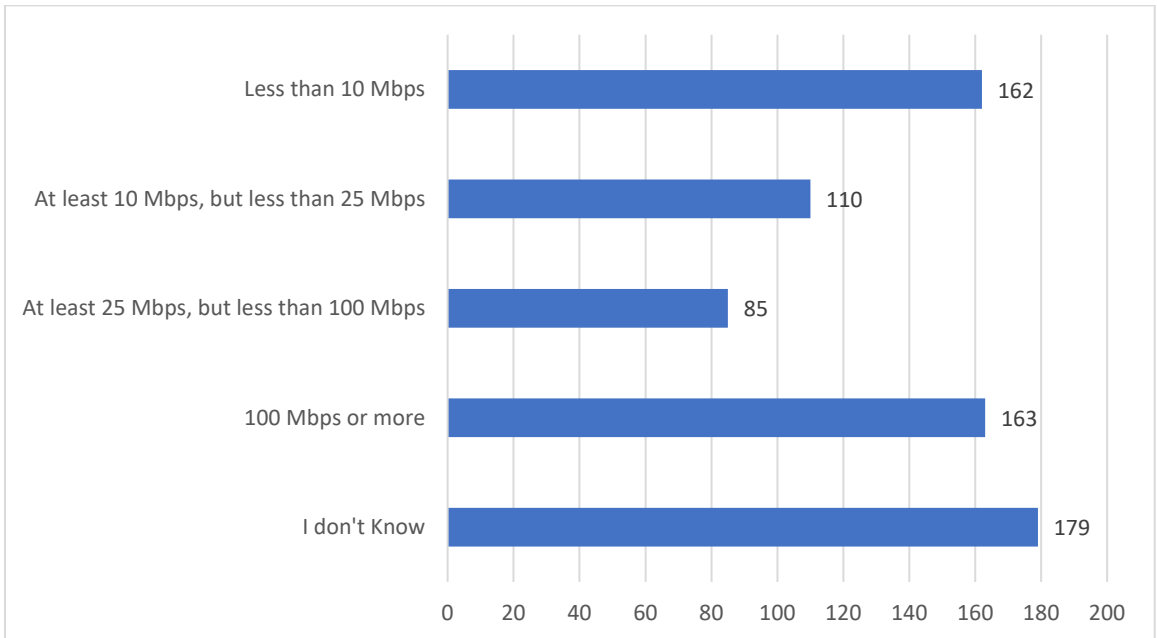
Have access at an office location
No other Internet options.
my company ""higher speeds"" do not deliver what is promised
Suddenlink is too expensive, very unreliable, and offers rude and worthless customer service.
The promised speed is rarely, if ever, actually provided by Suddenlink.
suddenlink will not run a line up this far and supply 50 customers higher internet options
The only provided available.. This s the fastest speed that I can get. They offer a faster speed but, I cannot get it.

If answered "fixed Internet service" to: *What statement best describes the Internet service at your Location?*

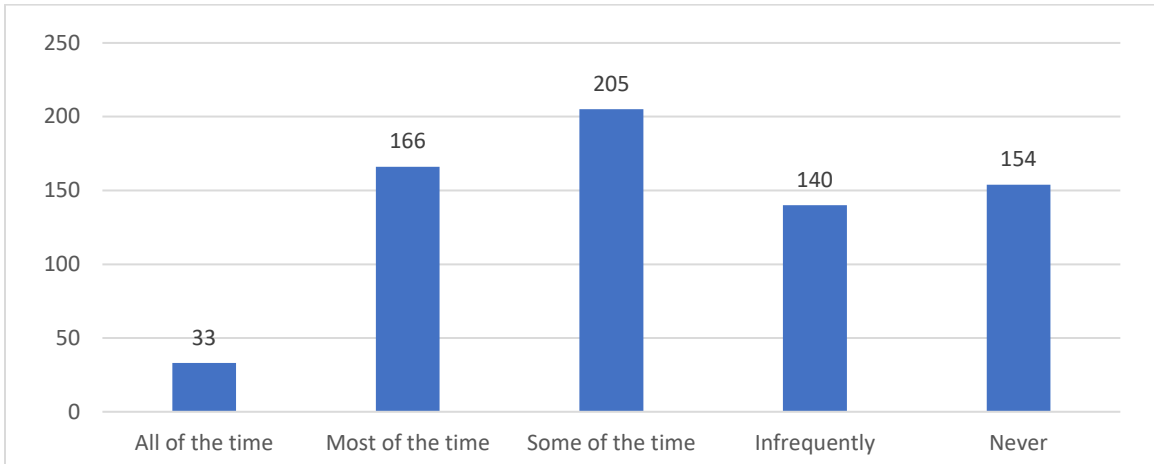
What type of "fixed" Internet service do you have at your Location?



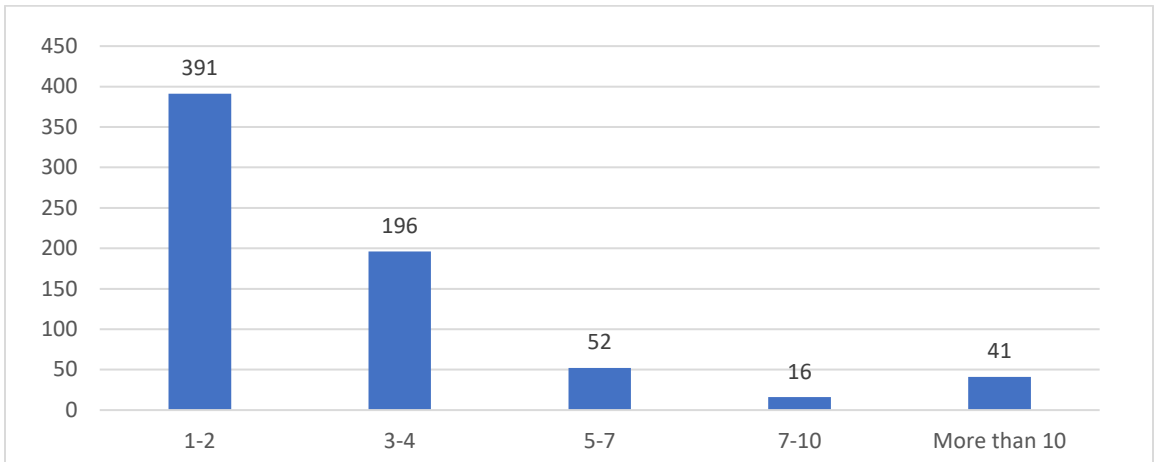
Please select the category that best describes your contracted or advertised maximum download speed on the Internet service package to which you subscribe at your Location.



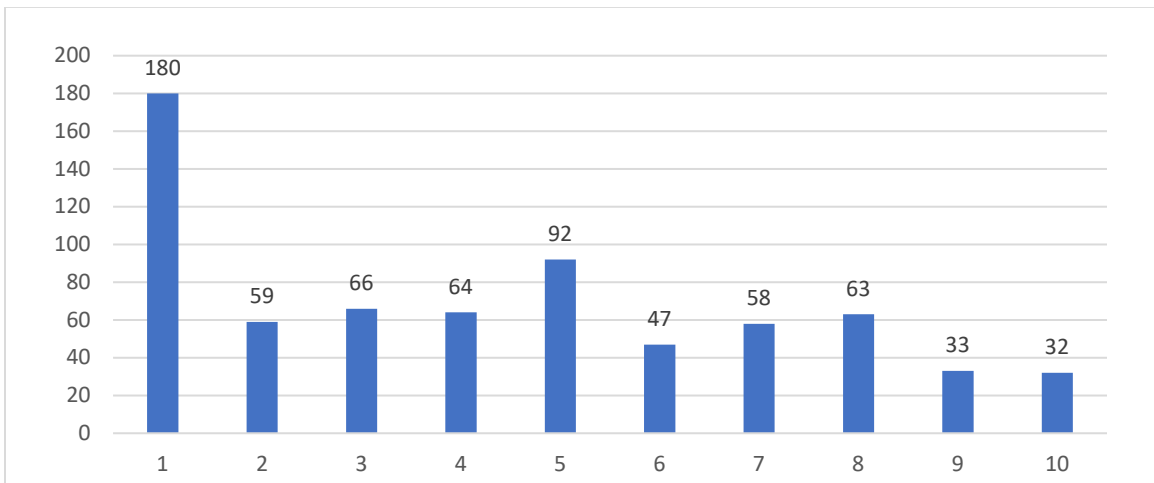
How often do you believe Internet service at your Location provides the speed level to which you have subscribed?



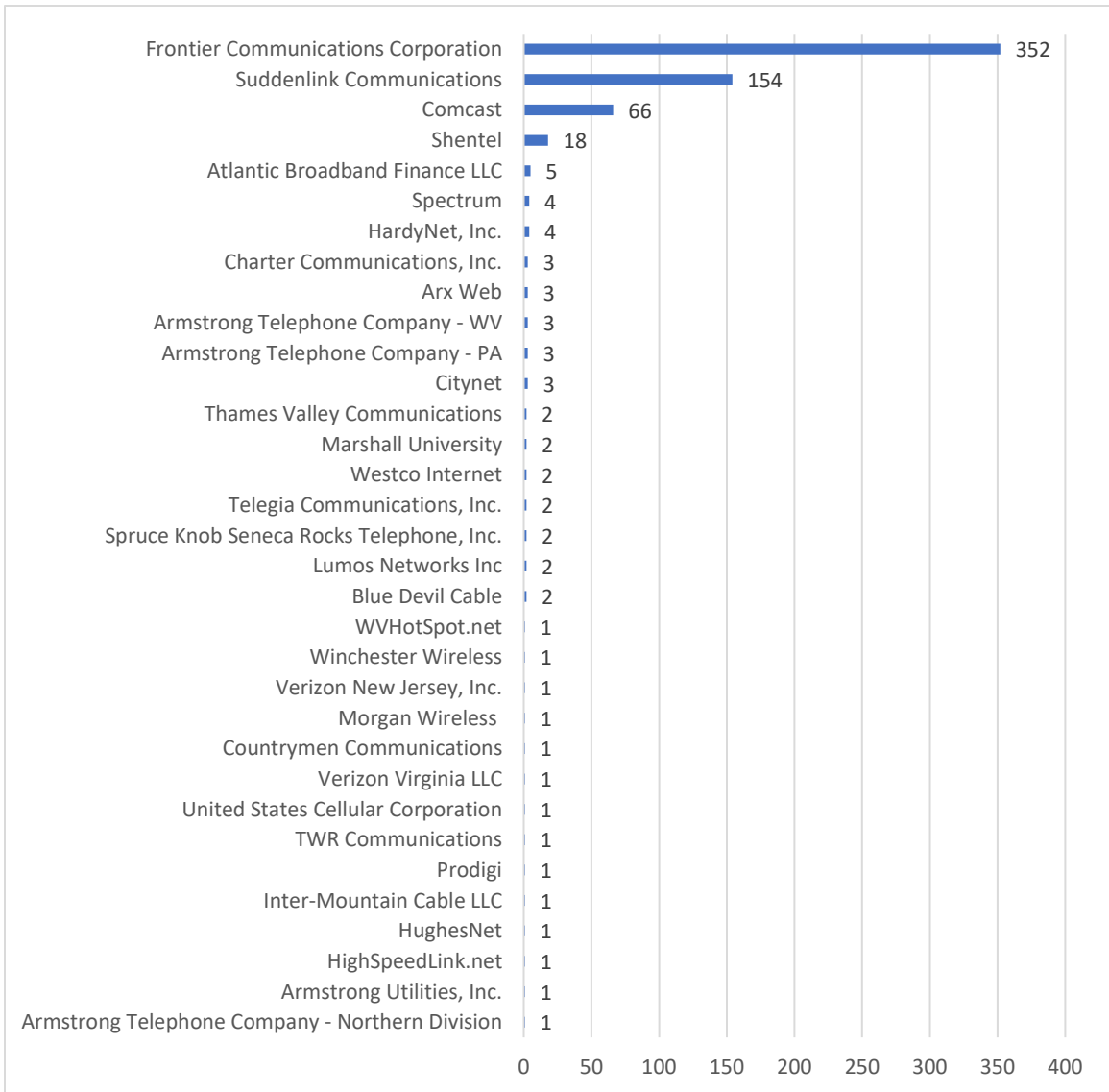
How many people use the Internet at your Location on a regular basis?



How satisfied are you with the Internet service currently provided to your Location?

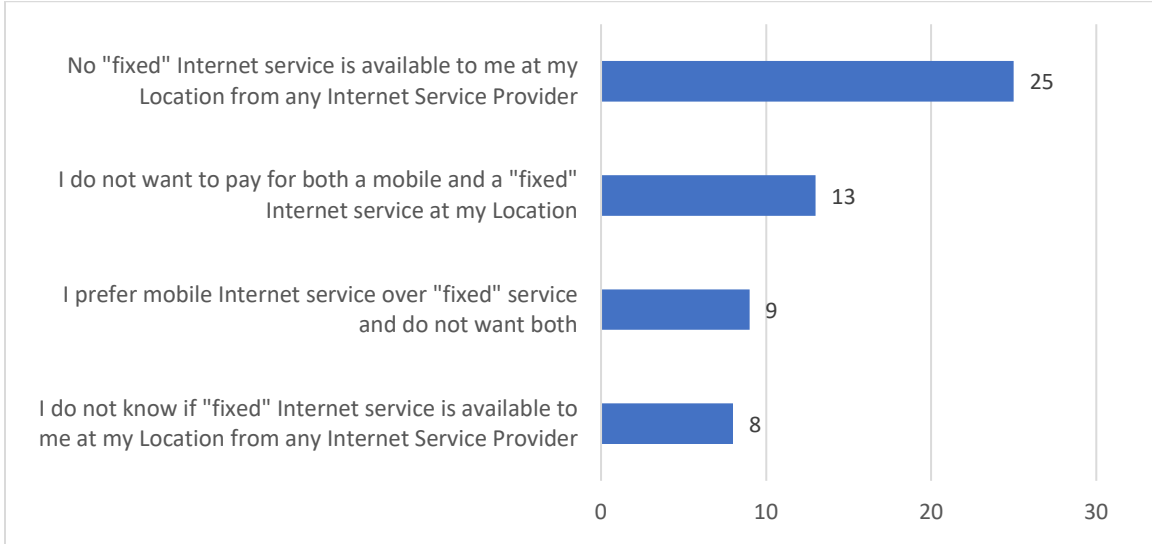


What company provides Internet service to your Location?

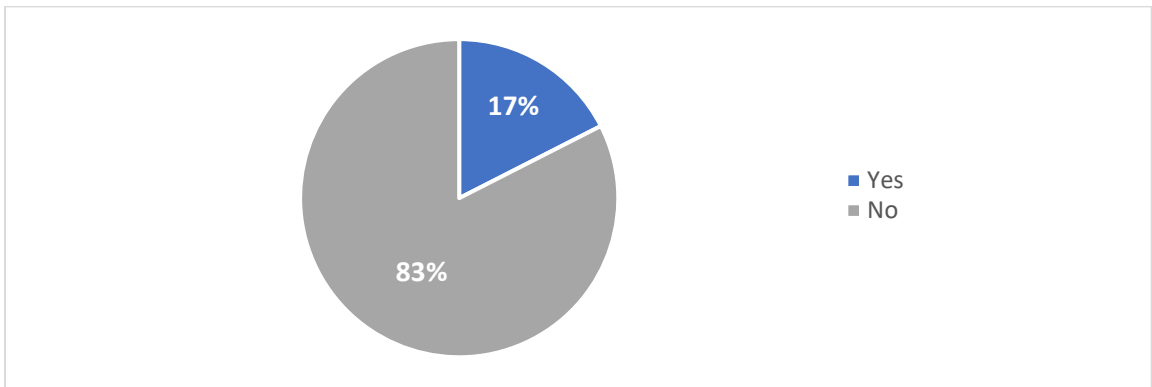


If answered "mobile Internet service" to: *What statement best describes the Internet service at your Location?*

What statements best describe the reason that you use mobile Internet access at your Location and do not have a "fixed" Internet service?

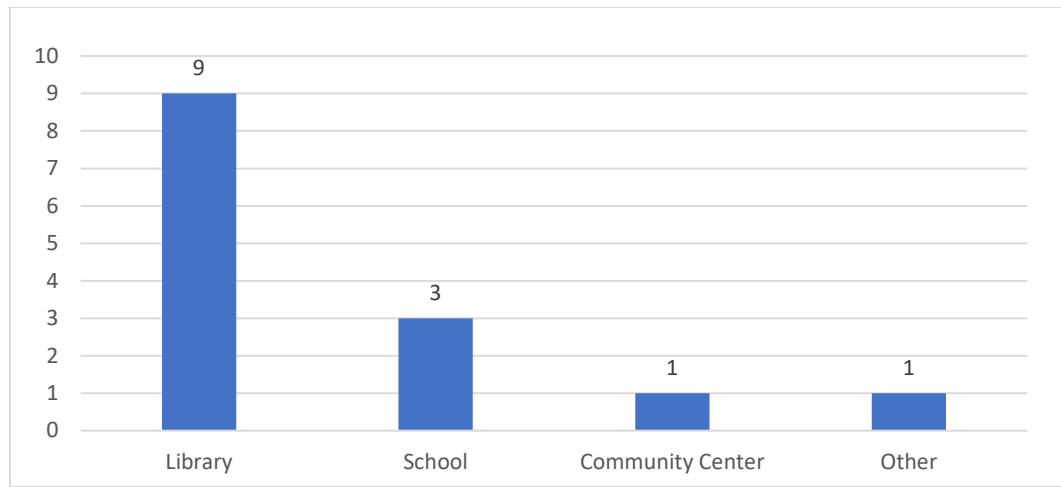


Do you have access to a community facility providing internet access?

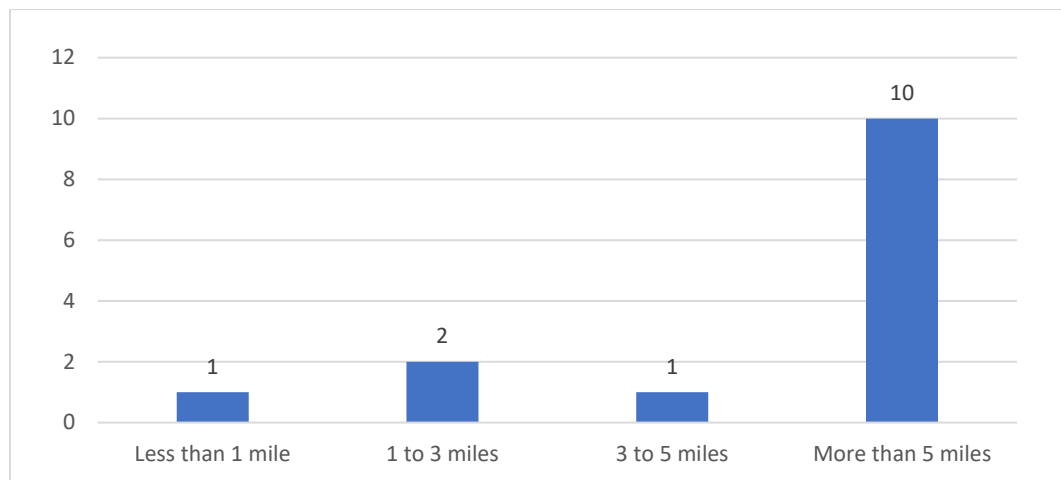


If answered "yes" to: *Do you have access to a community facility providing internet access?*

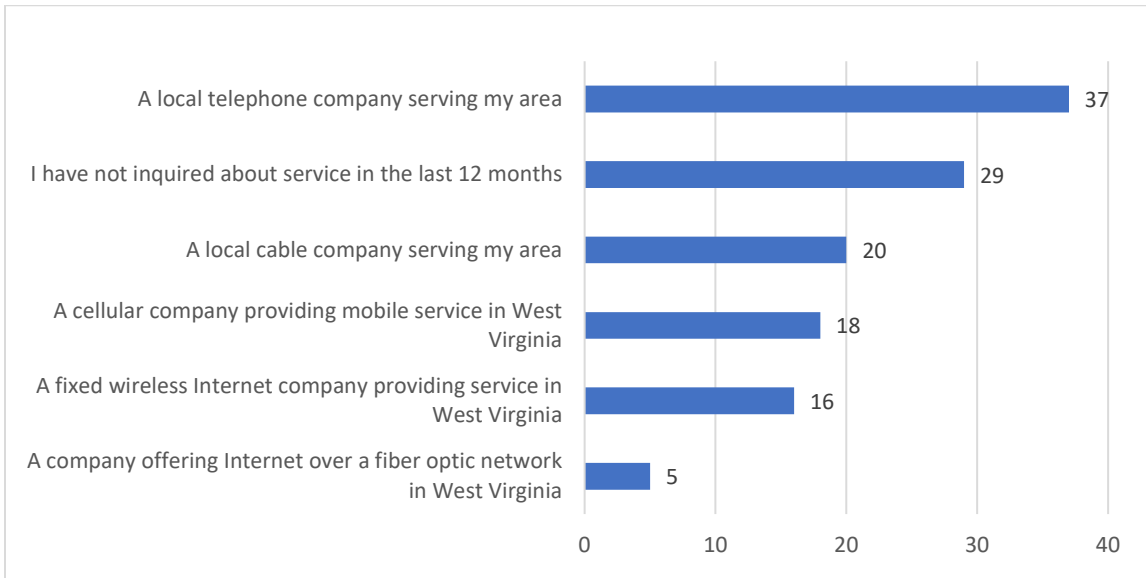
What type of community facility provides internet access to the public in your area?



What is the distance of the community facility from your home?

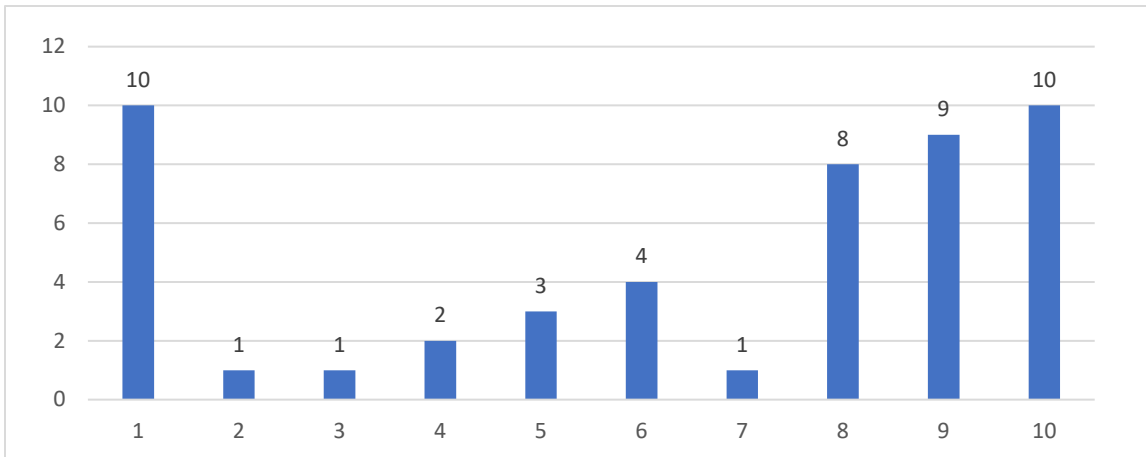


In the last 12 months, with which of the following types of companies have you inquired about Internet services that they may offer at your Location? Include inquires made by phone, e-mail, chat, visiting company websites, letter, or in person.

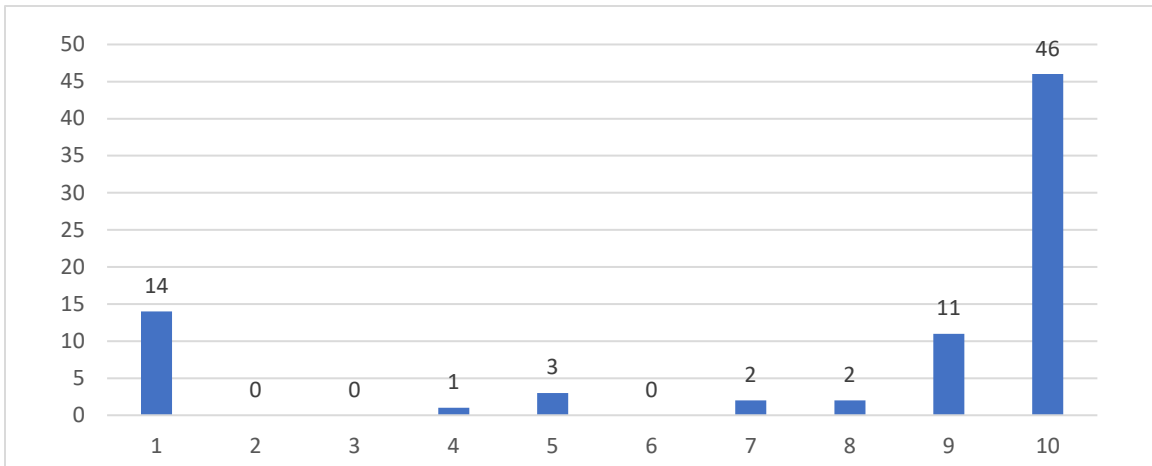


If additional Internet services were made available to your Location, how important would any of the following factors be for you in deciding whether or not to subscribe:

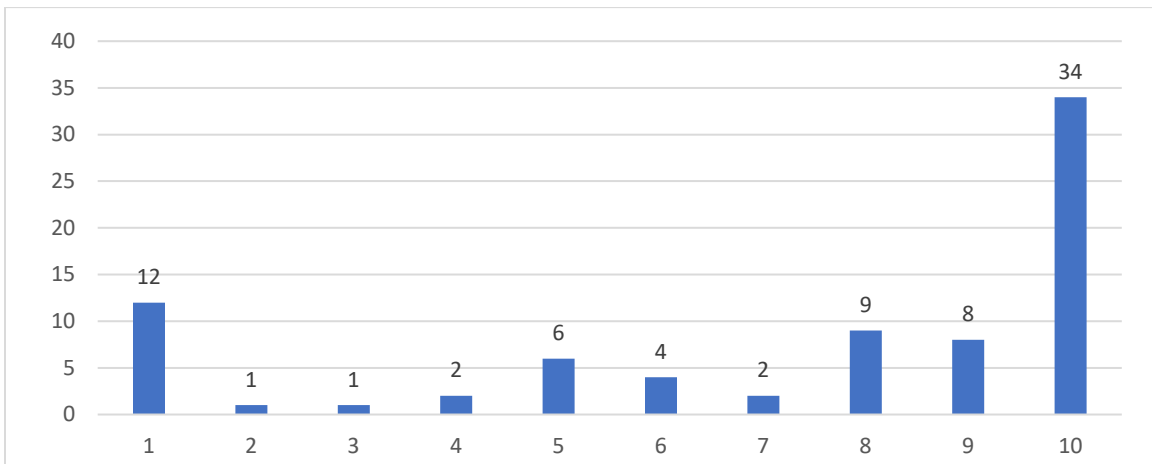
The speed of the service



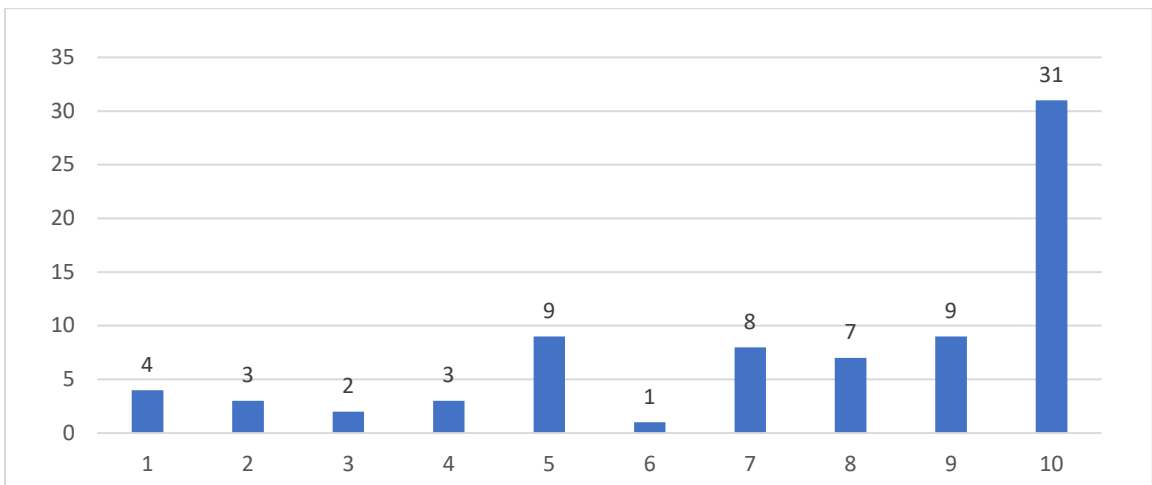
The reliability of the service



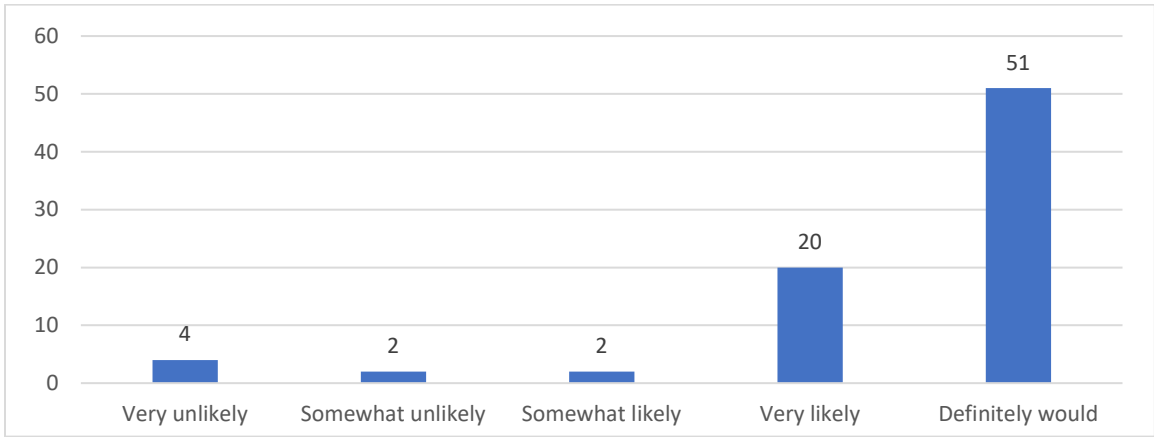
The customer service offered



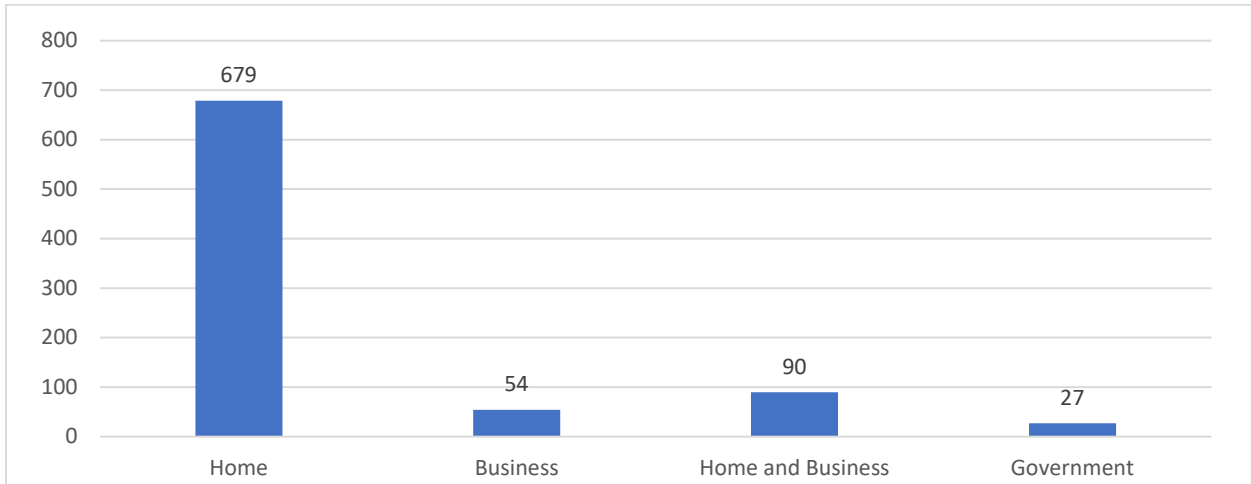
The cost of the service



If additional Internet service was made available to your Location and it addressed the factors you rated as important, how likely would you be to subscribe for service?

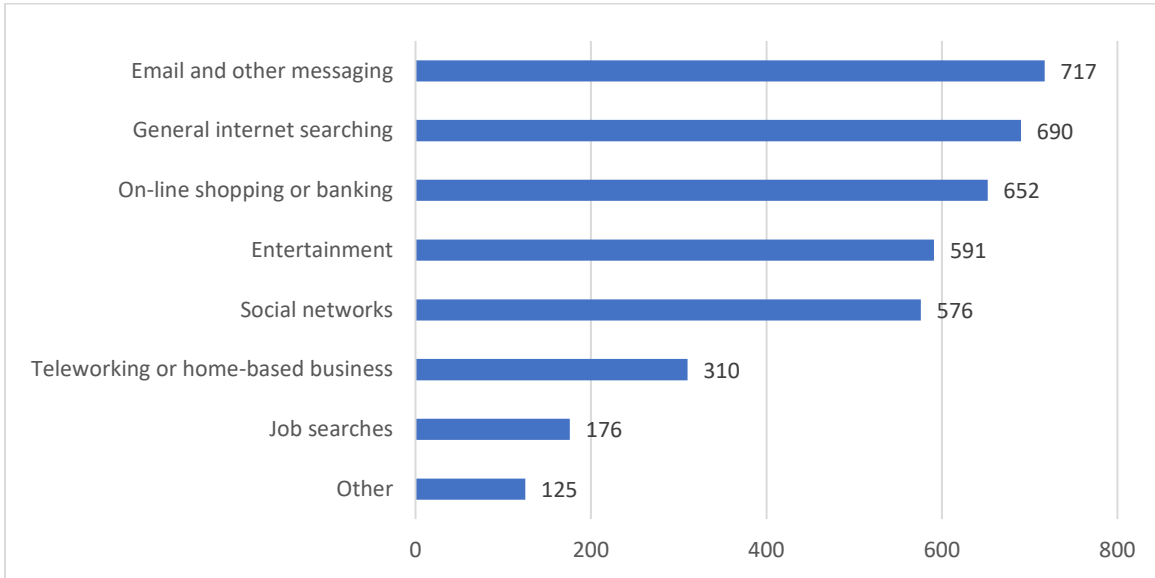


Which of these categories best describes your Location?



If answered “home” or “home and business” to: *Which of these categories best describes your Location?*

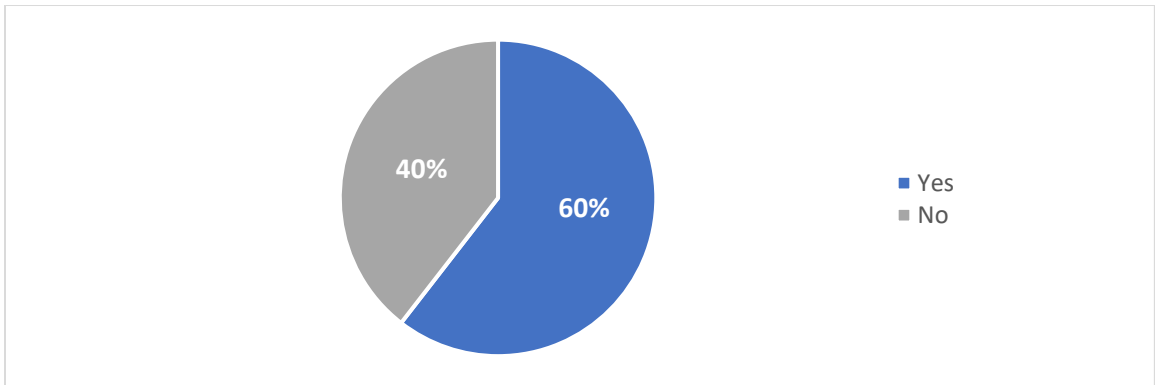
Which of the following types of Internet applications have you used in the last 3 months?



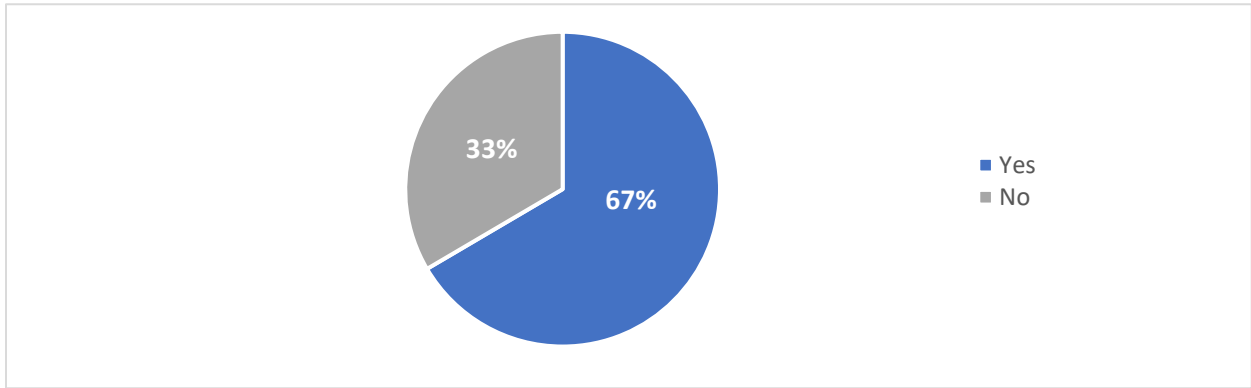
Other

Homeschooling

Have you ever used the Internet to take an online class?

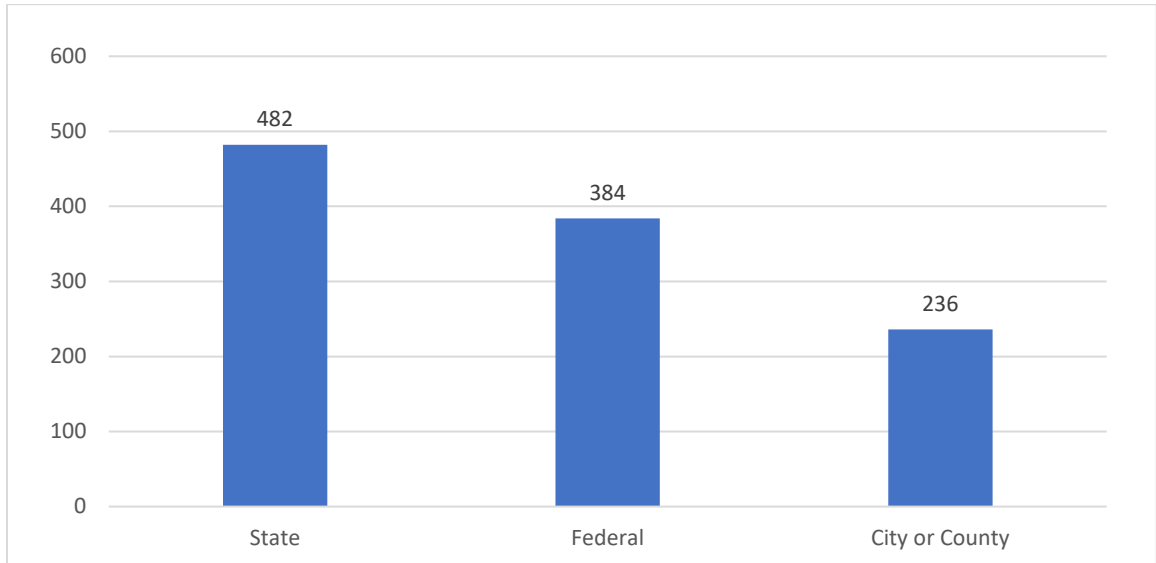


Have you used any electronic government (e-gov) services in the last 12 months?



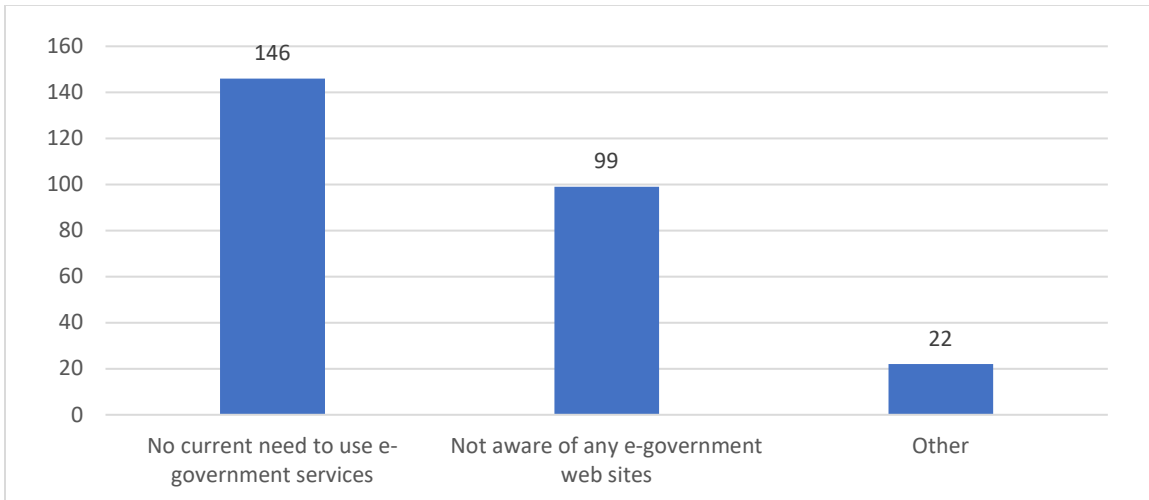
If answered "yes" to: *Which of these categories best describes your Location?*

With which level(s) of government have you had on-line interaction?



If answered “no” to: Which of these categories best describes your Location?

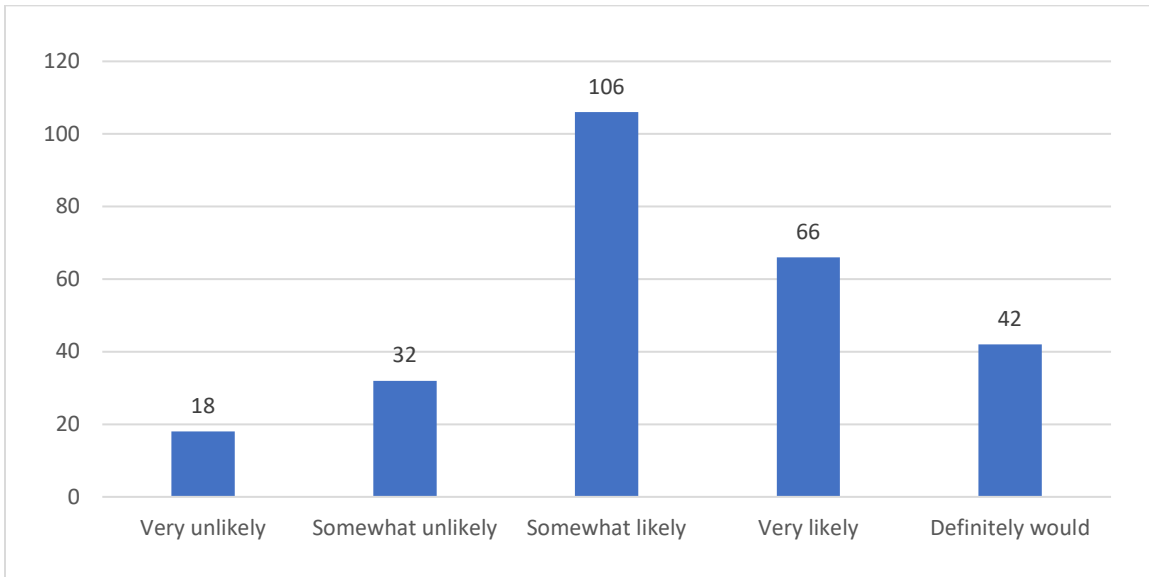
Why have you not used any e-government services in the last 12 months?



Other

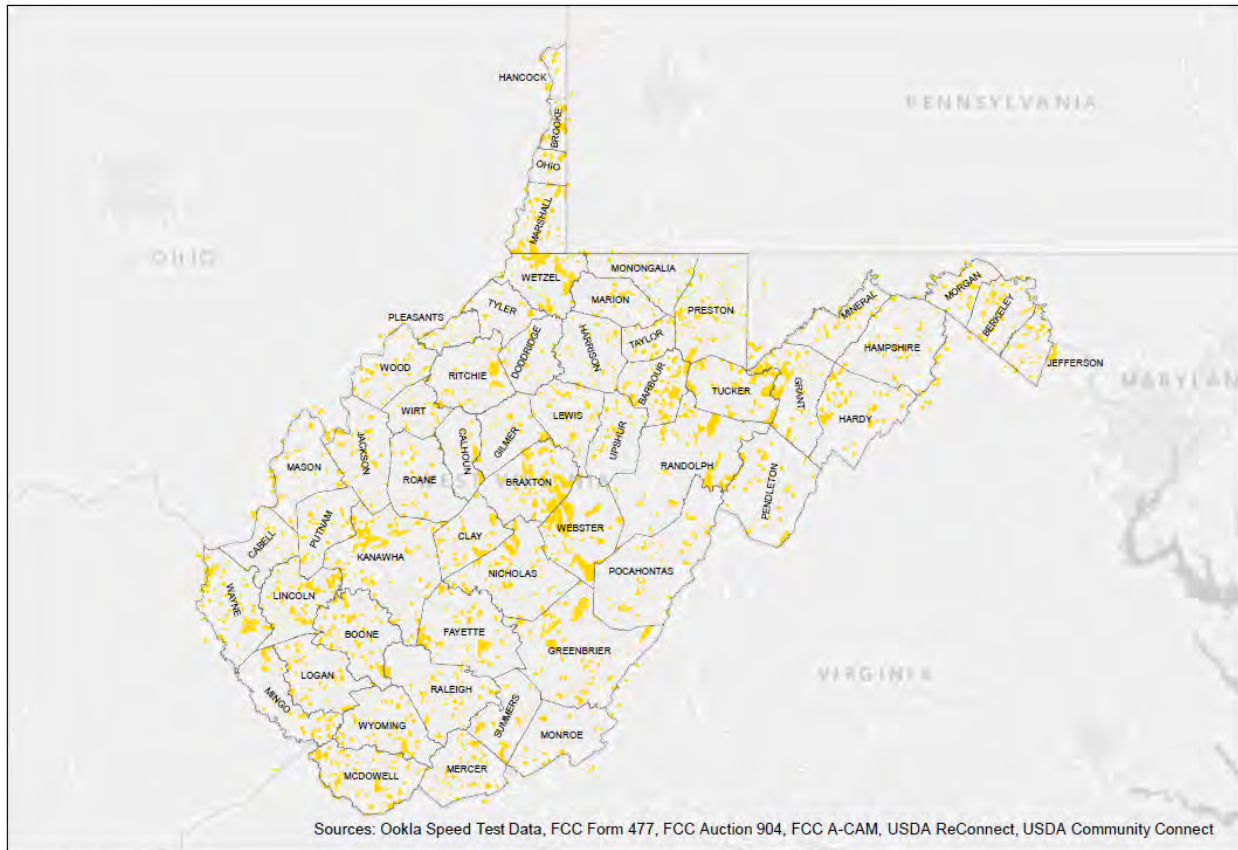
Internet to slow most of the time to do anything, my daughter can't even do her school/college work because of internet issues
not something i am involved with
takes forever to load pages
veterans affairs

If you had access to better Internet services at your Location, how likely would you be to make greater use of e-gov services?



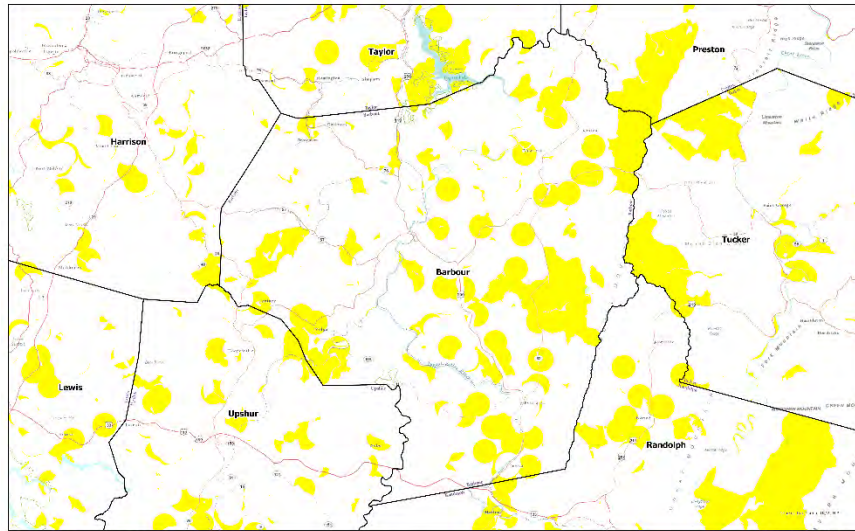
WEST VIRGINIA BROADBAND ENHANCEMENT COUNCIL

Appendix D - Unserved and Unfunded



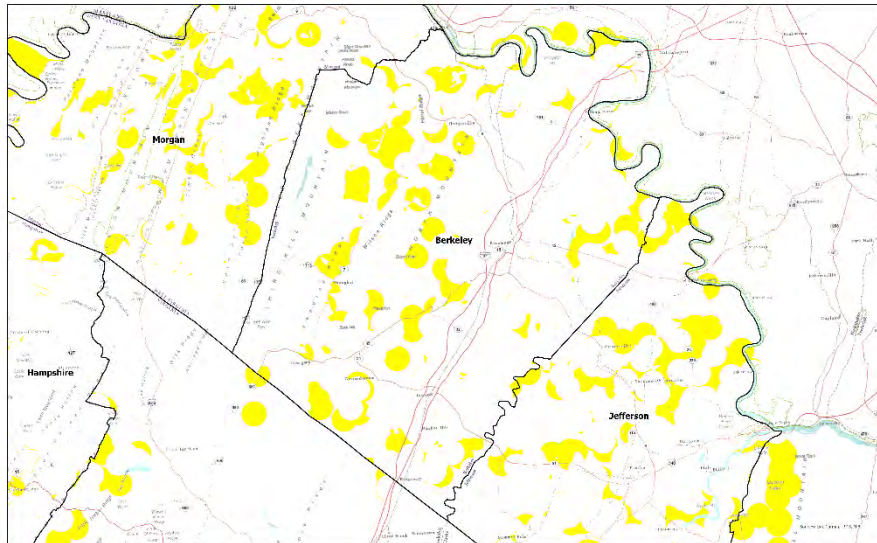
West Virginia
 □ County Boundaries
 ■ Unserved & Unfunded





West Virginia: Barbour

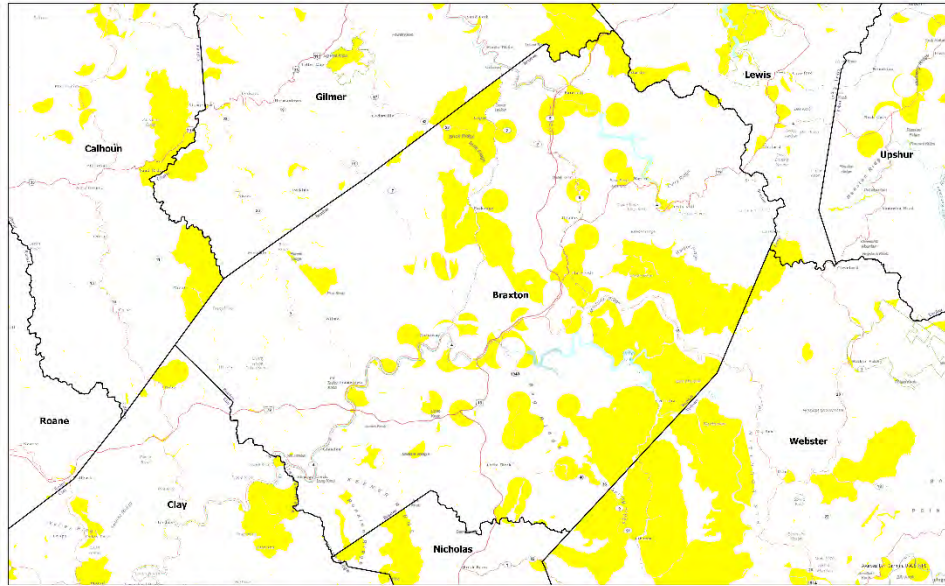
- County Boundaries
- Unserved and Unfunded



West Virginia: Berkeley

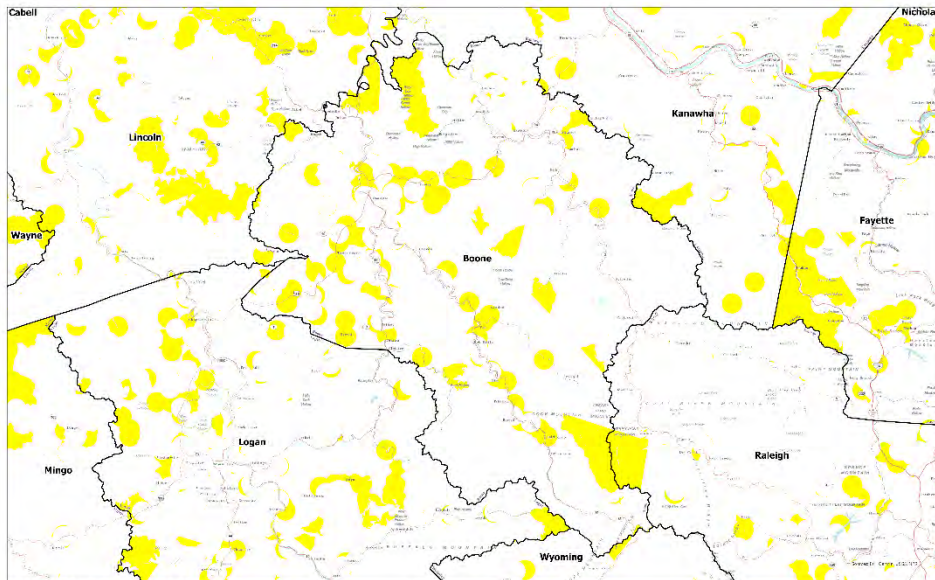
- County Boundaries
- Unserved and Unfunded





West Virginia: Braxton

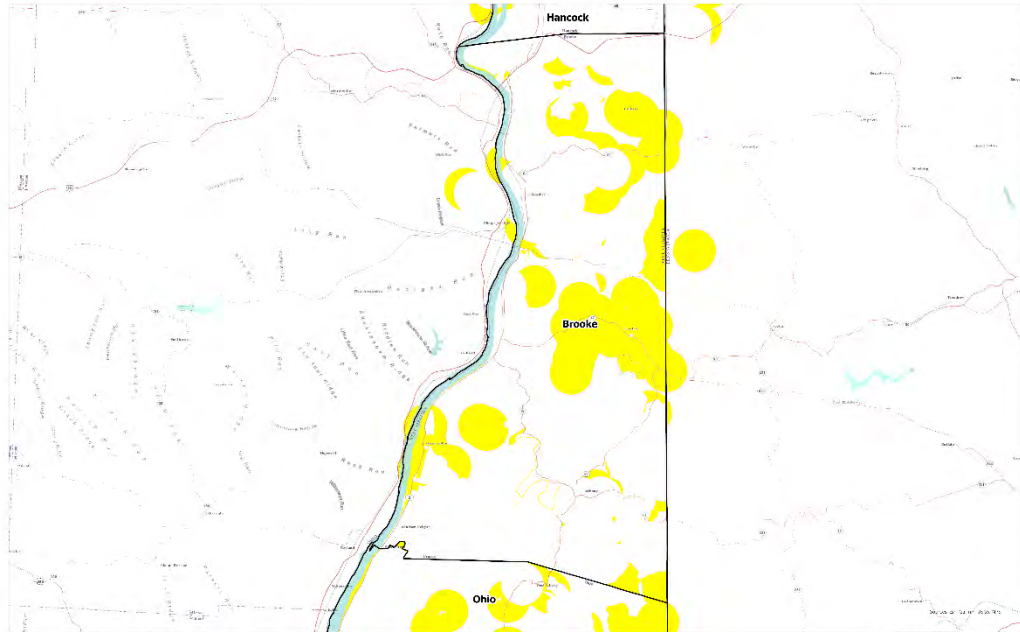
- County Boundaries
- Unserved and Unfunded



West Virginia: Boone

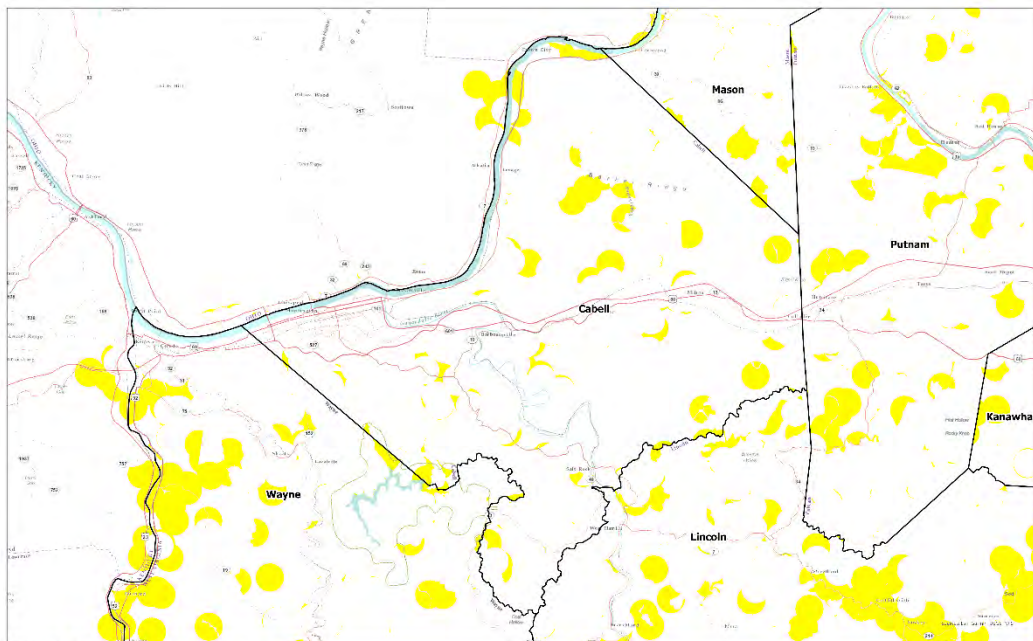
- County Boundaries
- Unserved and Unfunded





West Virginia: Brooke

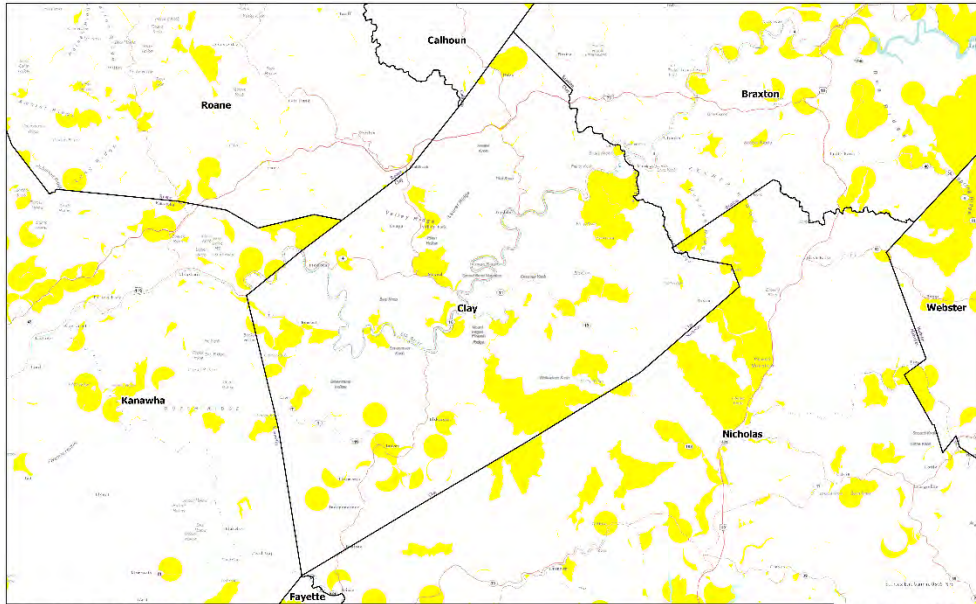
- County Boundaries
- Unserved and Unfunded



West Virginia: Cabell

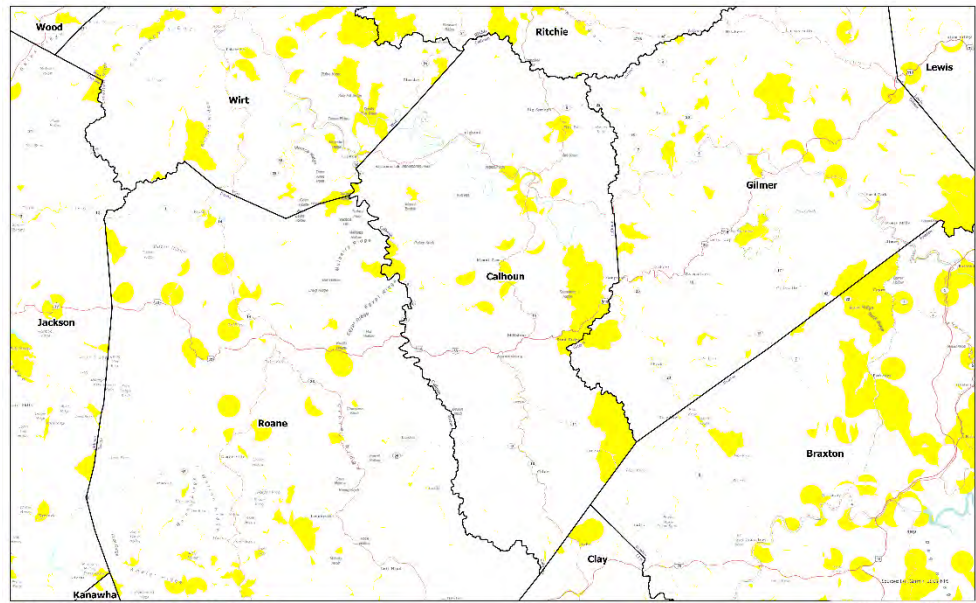
- County Boundaries
- Unserved and Unfunded





West Virginia: Clay

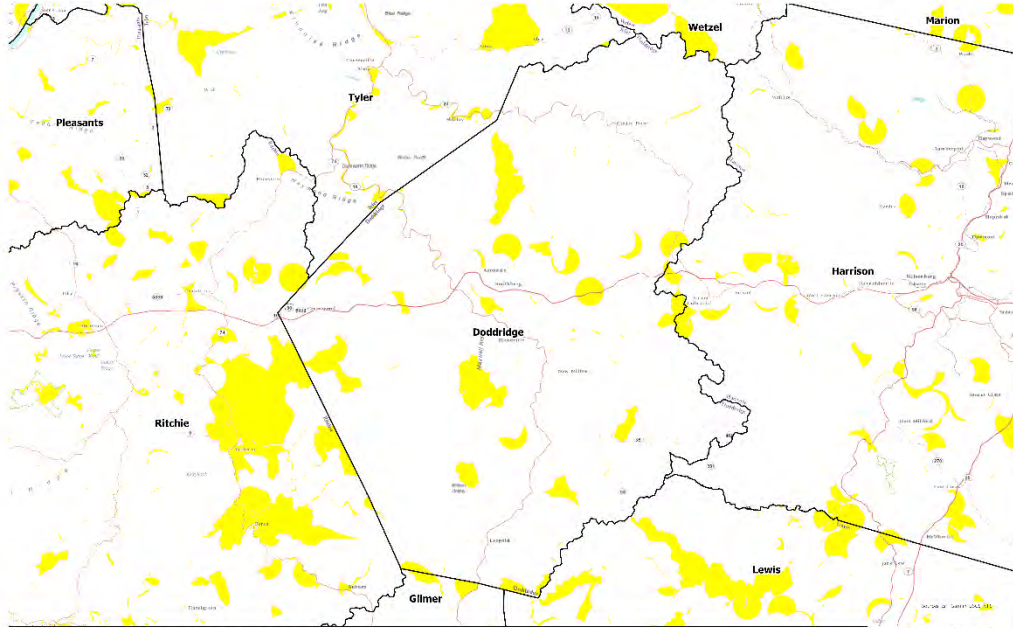
- County Boundaries
- Unserved and Unfunded



West Virginia: Calhoun

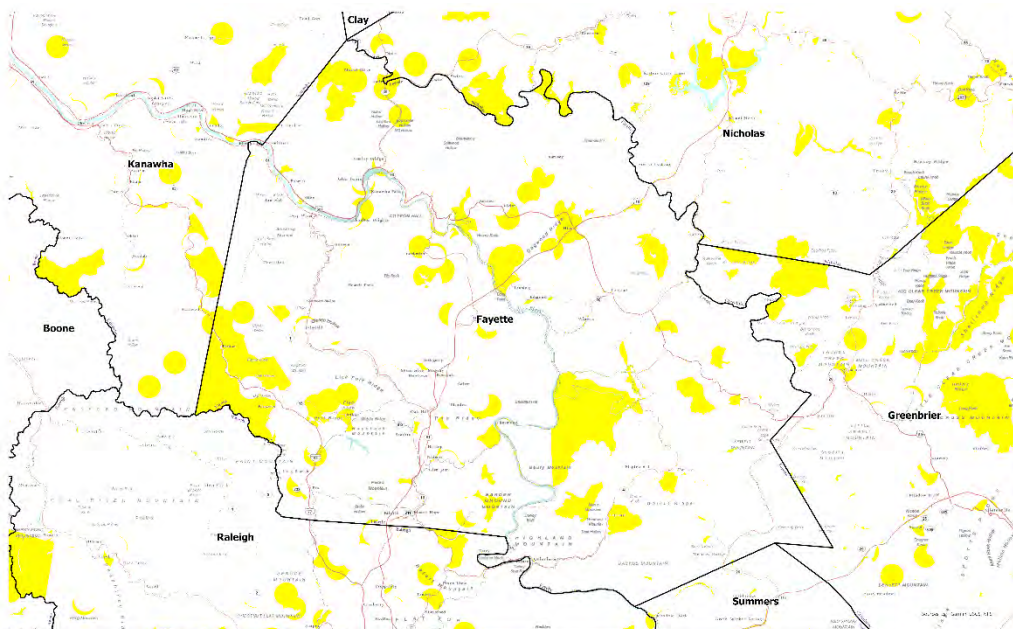
- County Boundaries
- Unserved and Unfunded





West Virginia: Doddridge

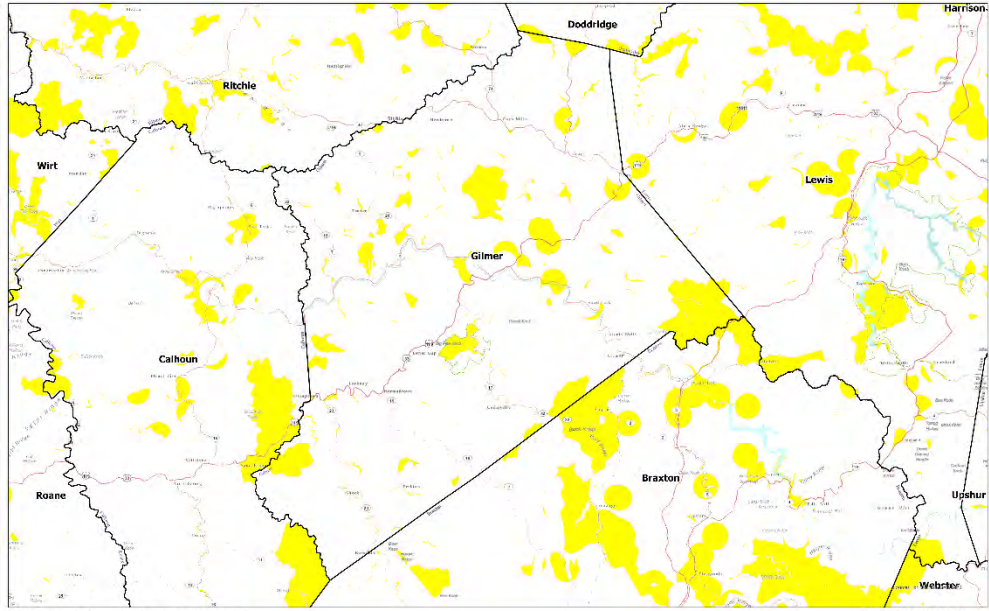
- County Boundaries
- Unserved and Unfunded



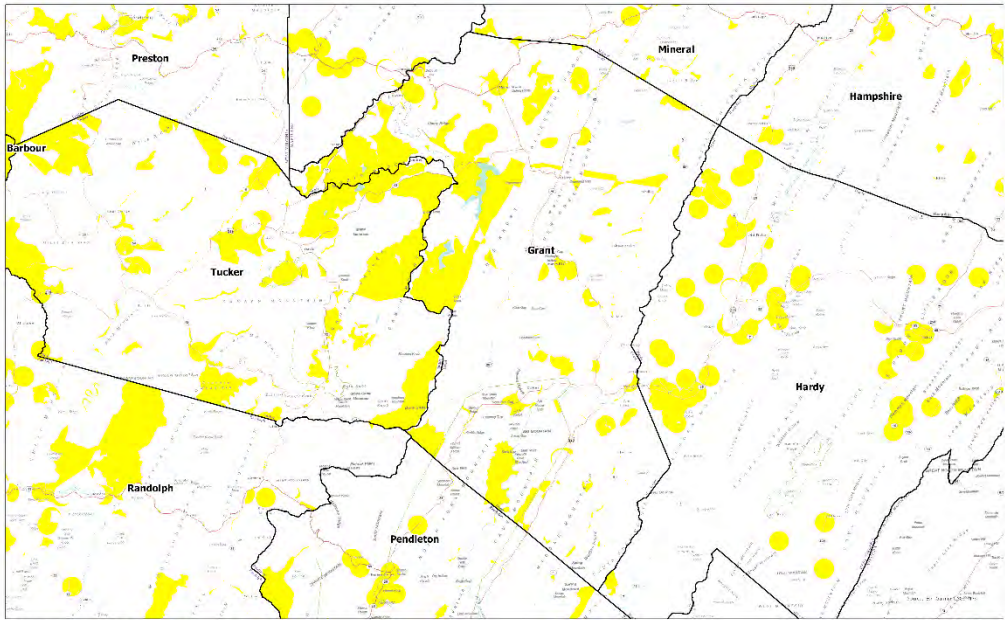
West Virginia: Fayette

- County Boundaries
- Unserved and Unfunded



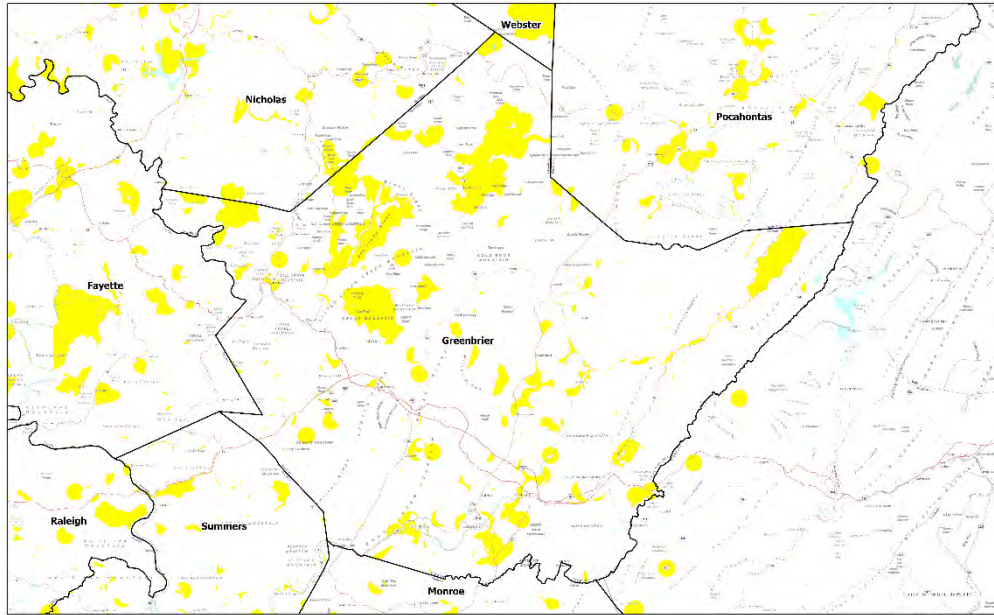


West Virginia: Gilmer
 □ County Boundaries
 ■ Unserved and Unfunded



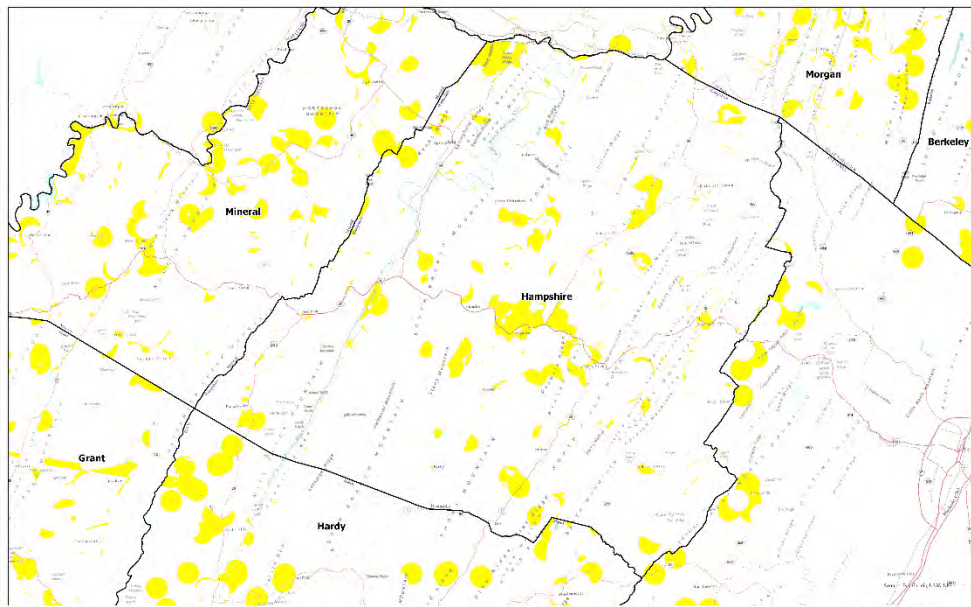
West Virginia: Grant
 □ County Boundaries
 ■ Unserved and Unfunded





West Virginia: Greenbrier

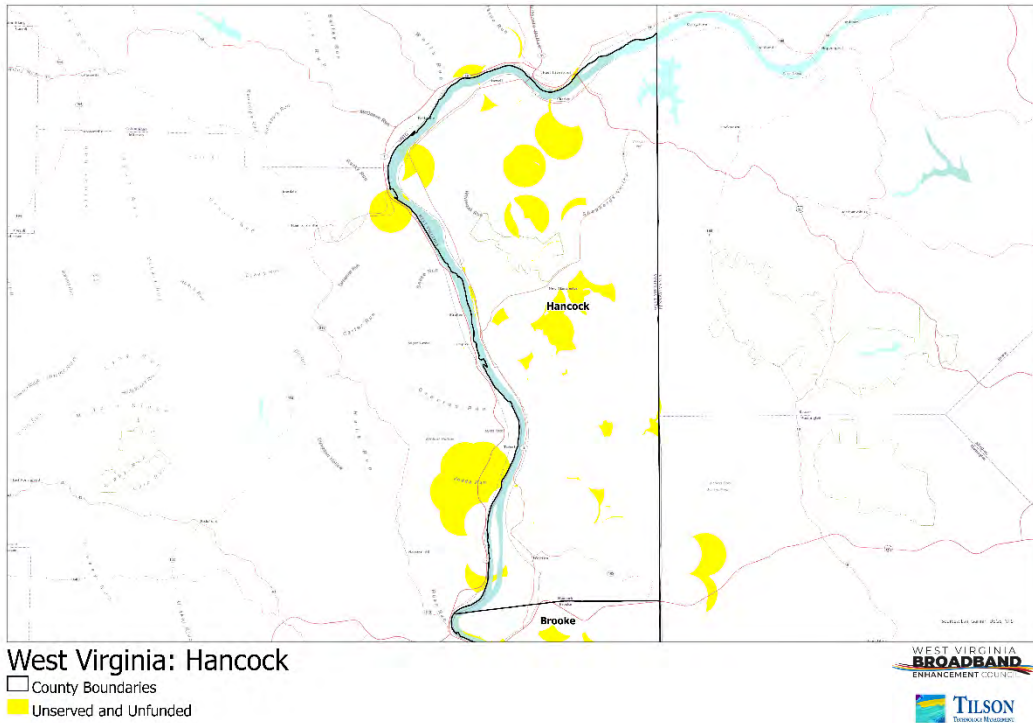
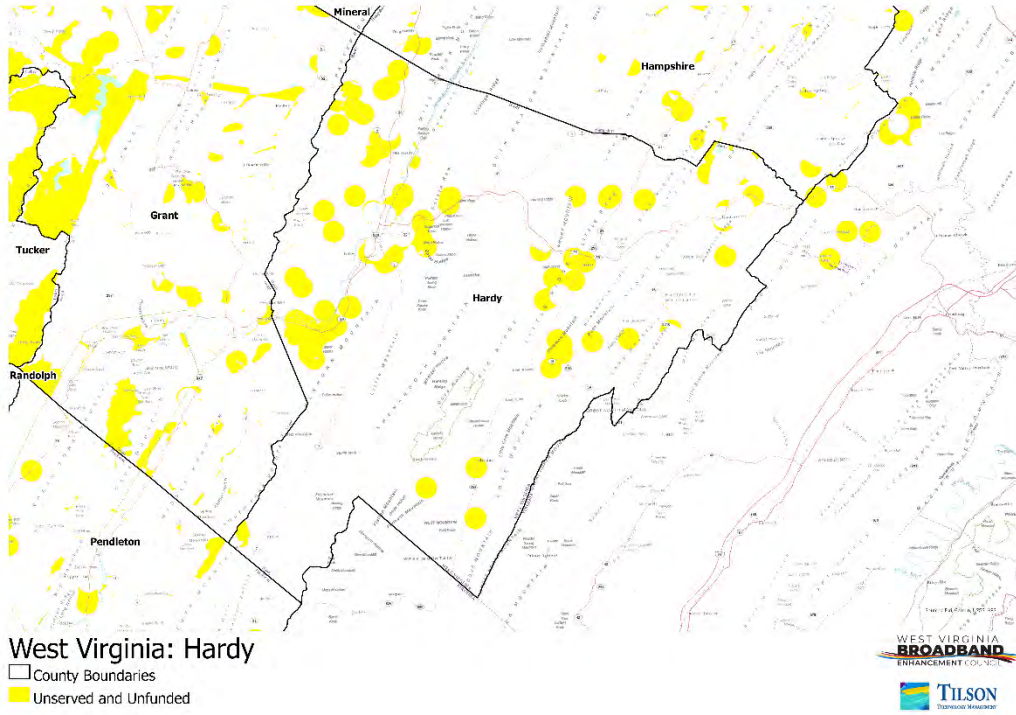
- County Boundaries
- Unserved and Unfunded

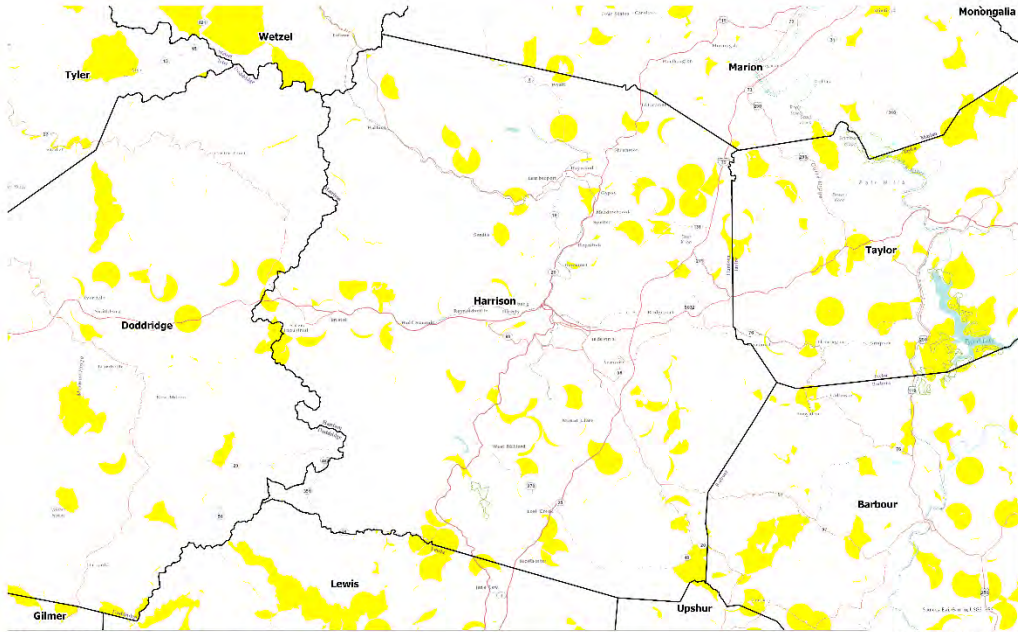


West Virginia: Hampshire

- County Boundaries
- Unserved and Unfunded

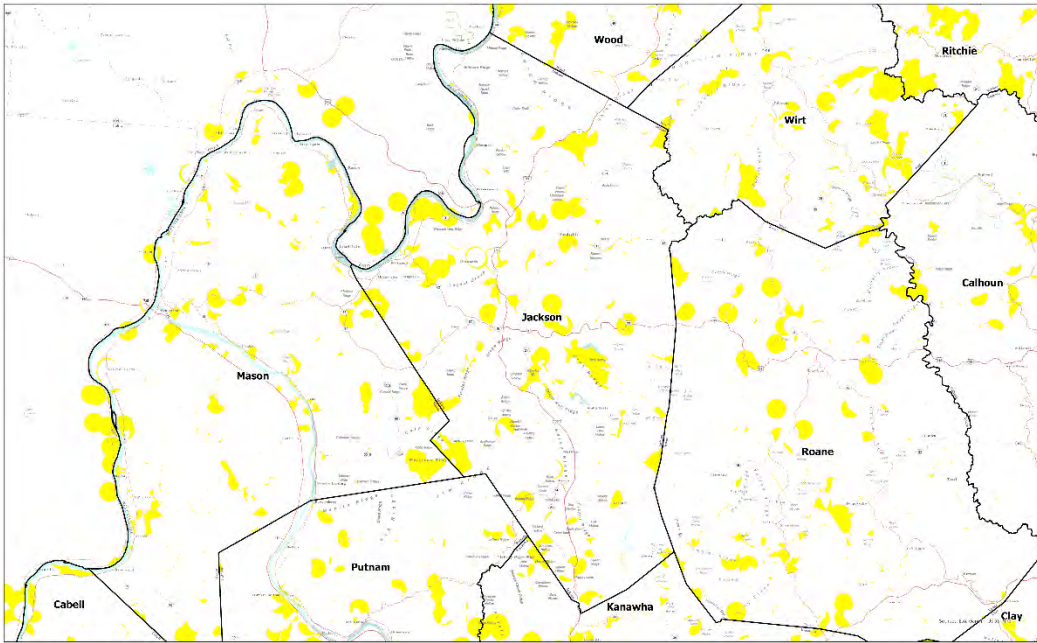






West Virginia: Harrison

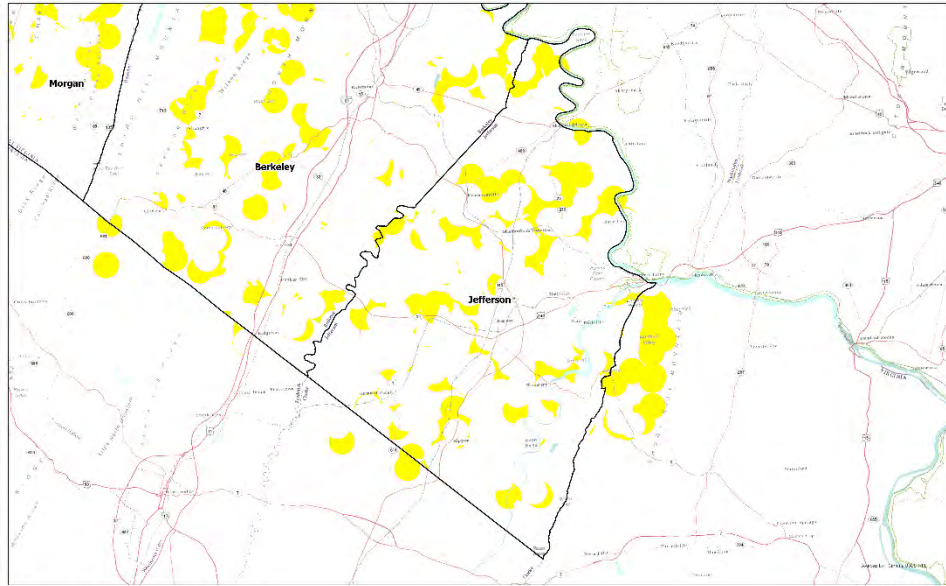
- County Boundaries
- Unserved and Unfunded



West Virginia: Jackson

- County Boundaries
- Unserved and Unfunded

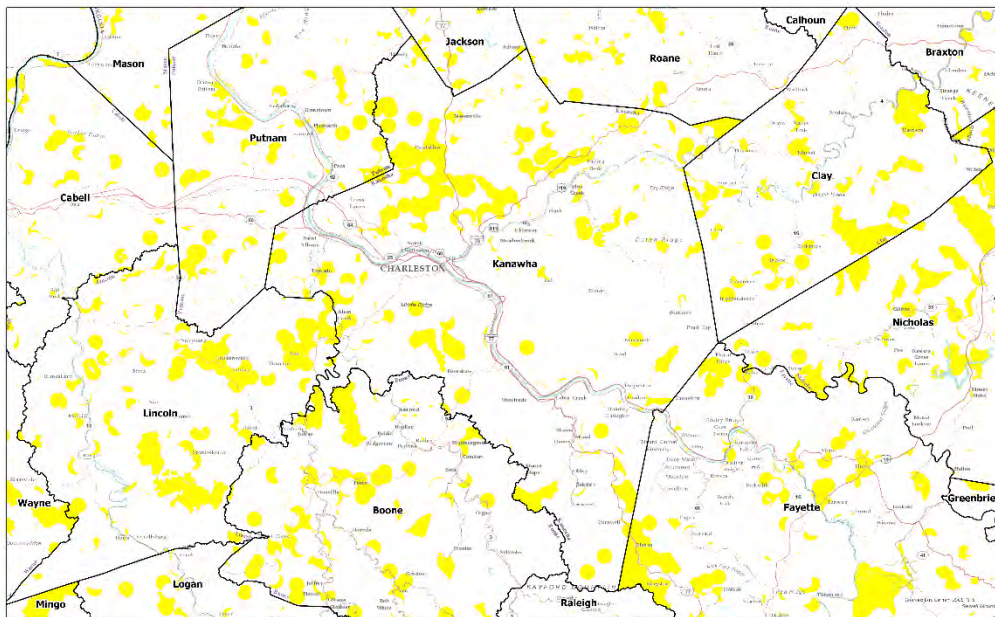




West Virginia: Jefferson

- County Boundaries
- Unserved and Unfunded

WEST VIRGINIA
BROADBAND
ENHANCEMENT COUNCIL

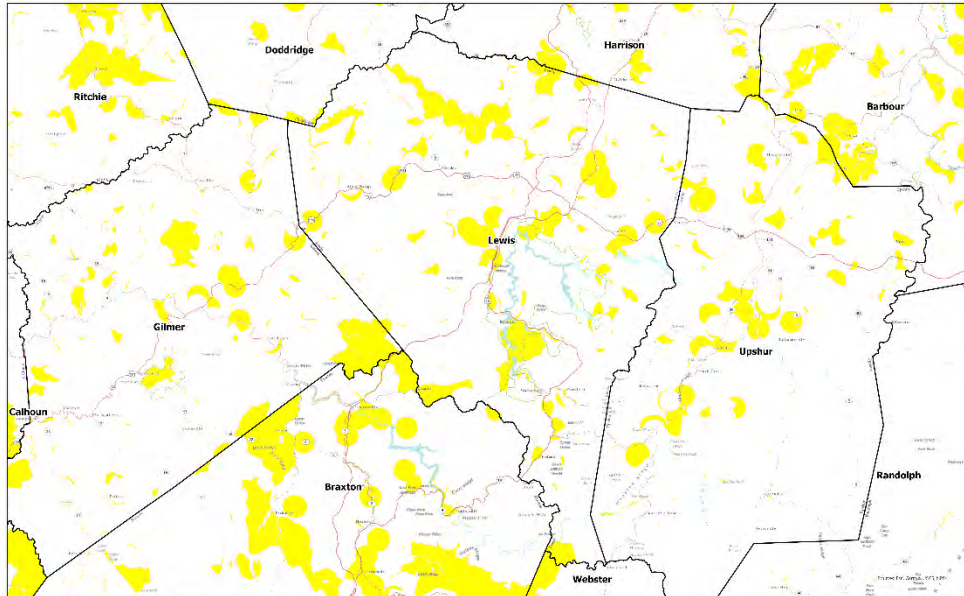


West Virginia: Kanawha

- County Boundaries
- Unserved and Unfunded

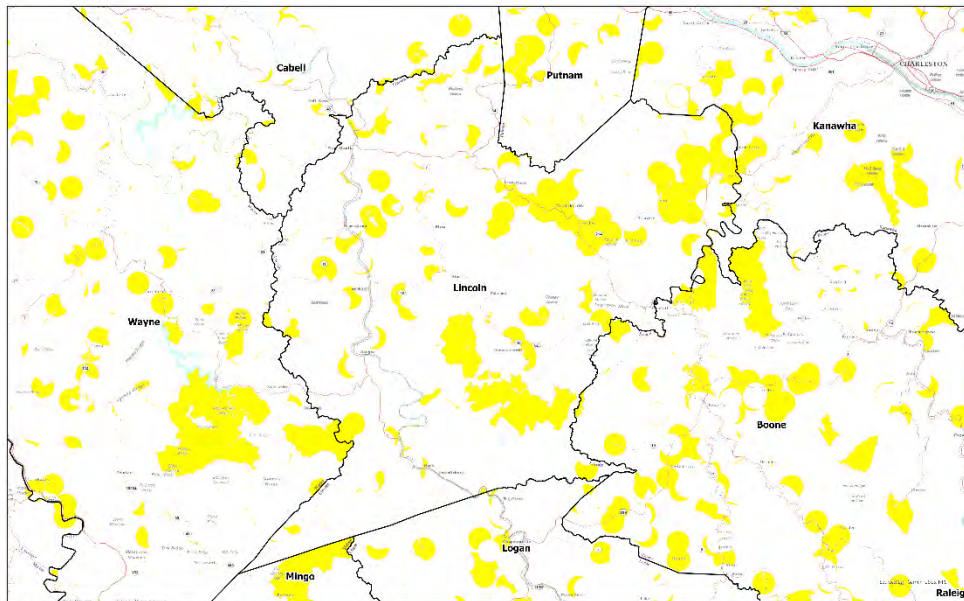
WEST VIRGINIA
BROADBAND
ENHANCEMENT COUNCIL





West Virginia: Lewis

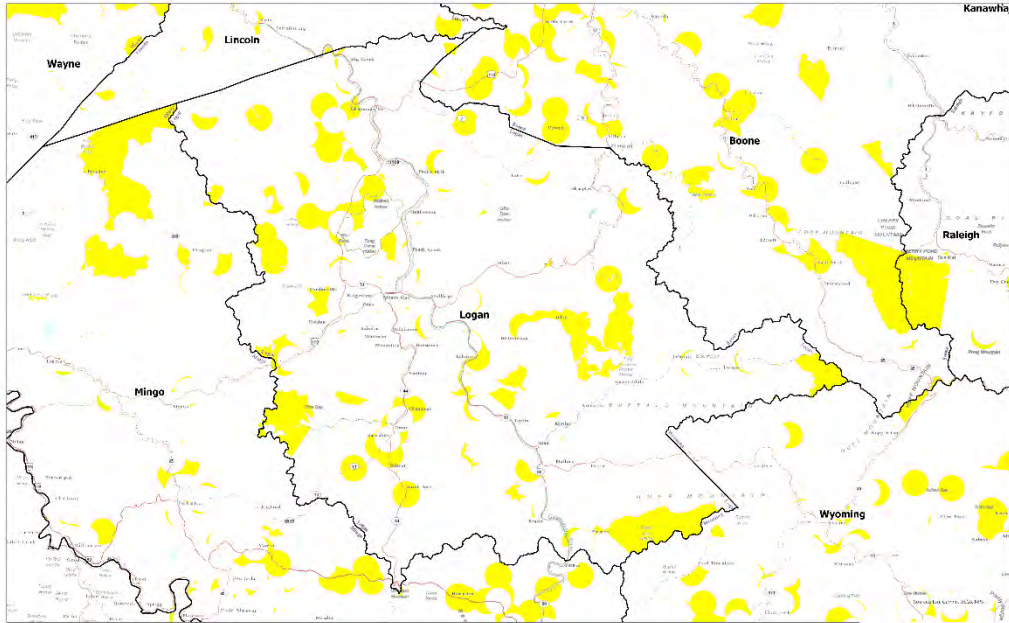
- County Boundaries
- Unserved and Unfunded



West Virginia: Lincoln

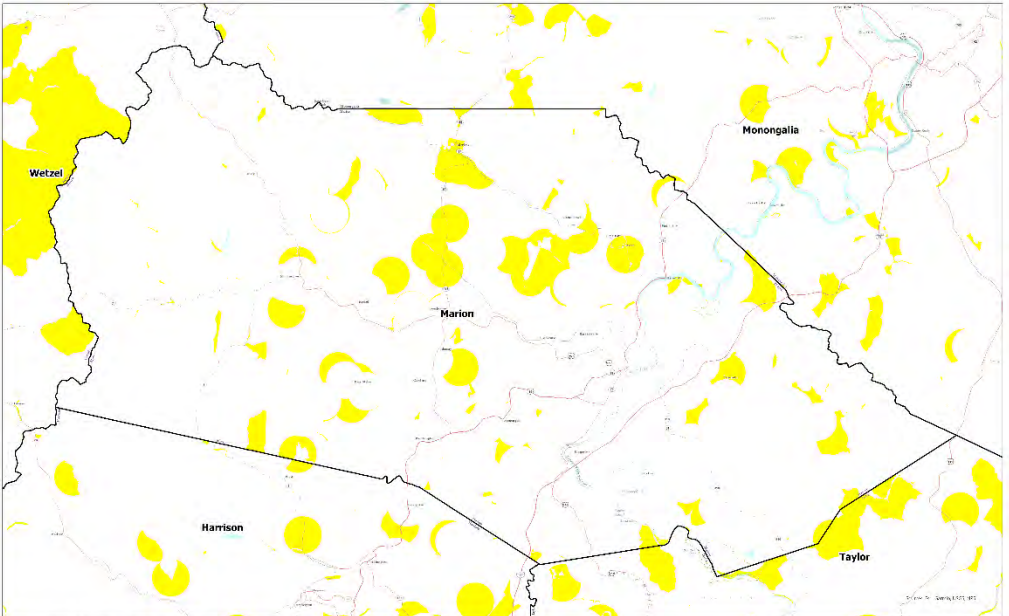
- County Boundaries
- Unserved and Unfunded





West Virginia: Logan

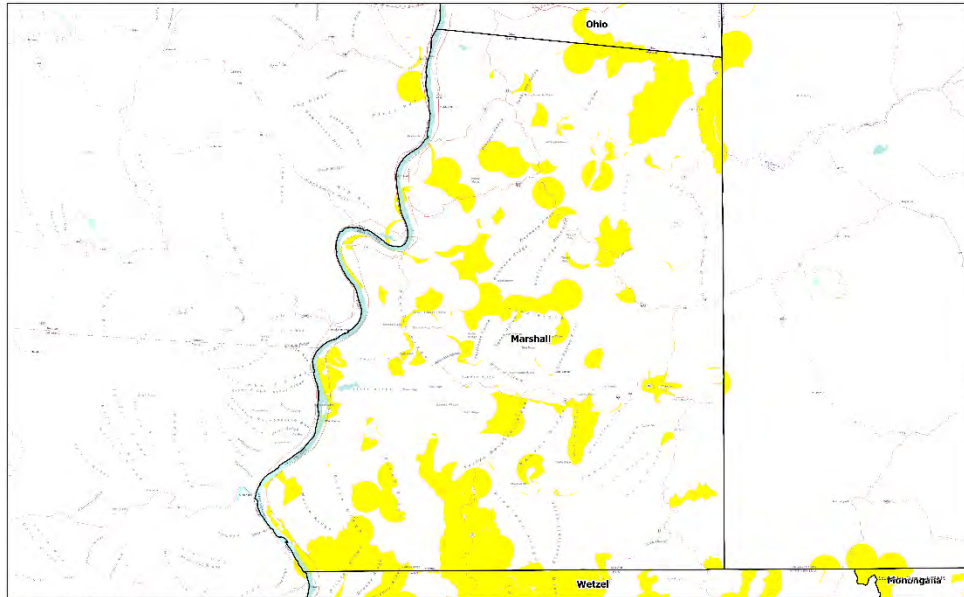
- County Boundaries
- Unserved and Unfunded



West Virginia: Marion

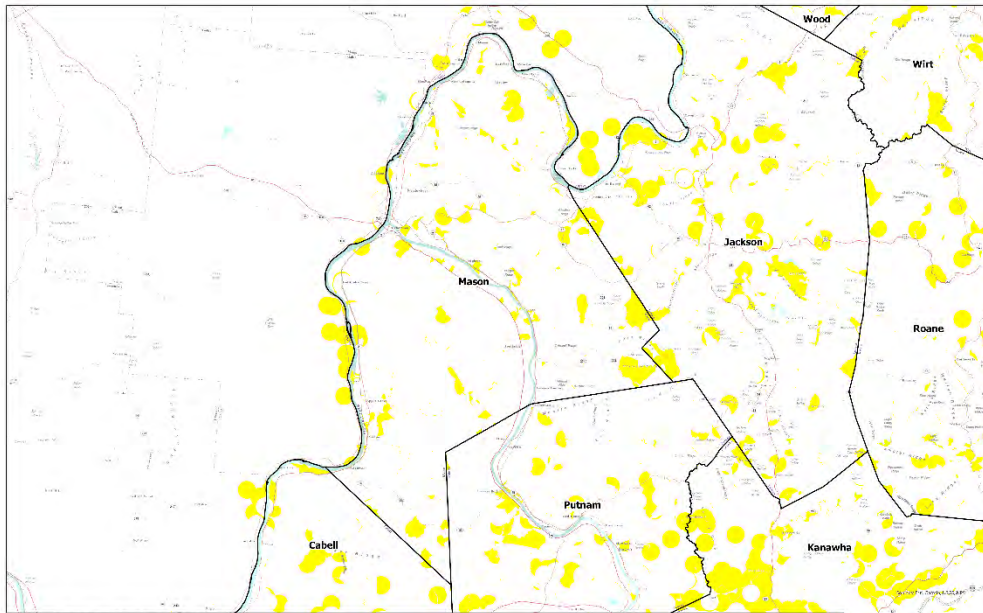
- County Boundaries
- Unserved and Unfunded





West Virginia: Marshall

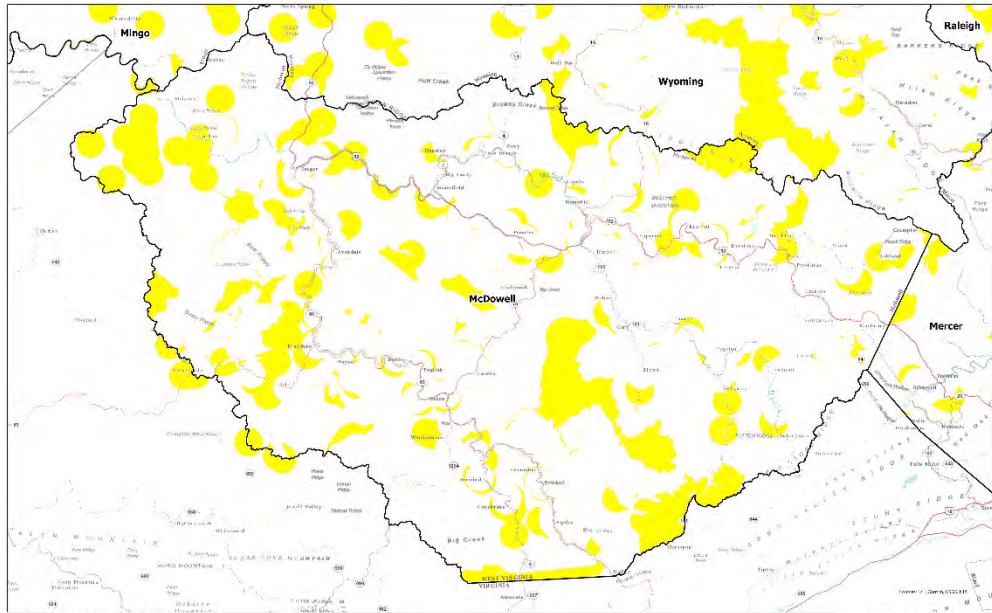
- County Boundaries
- Unserved and Unfunded



West Virginia: Mason

- County Boundaries
- Unserved and Unfunded

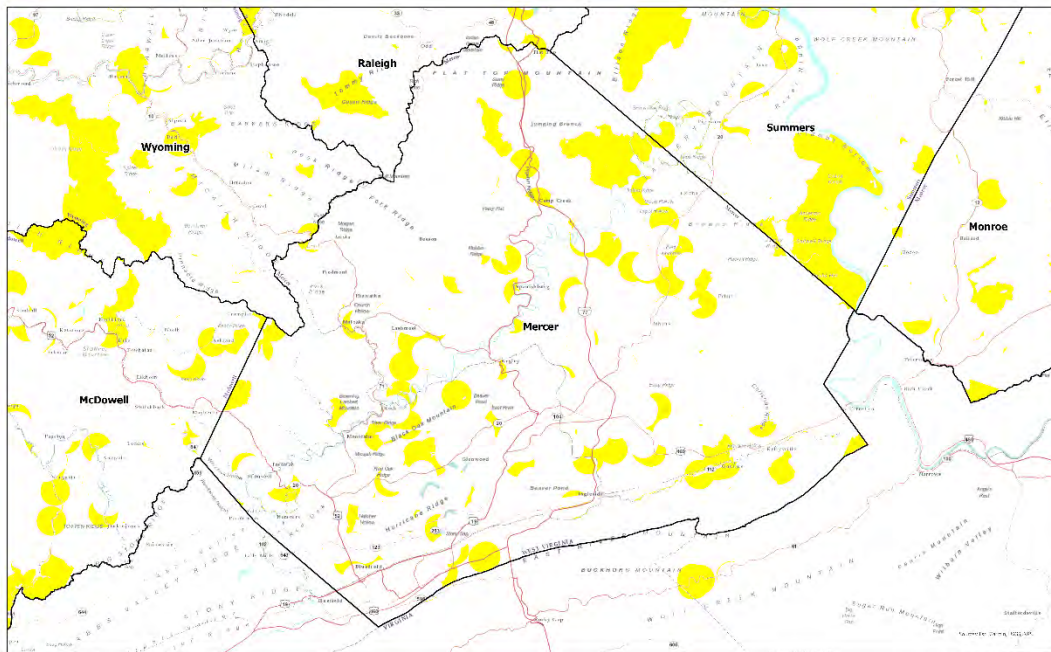




West Virginia: McDowell

- County Boundaries
- Unserved and Unfunded

WEST VIRGINIA
BROADBAND
ENHANCEMENT COUNCIL

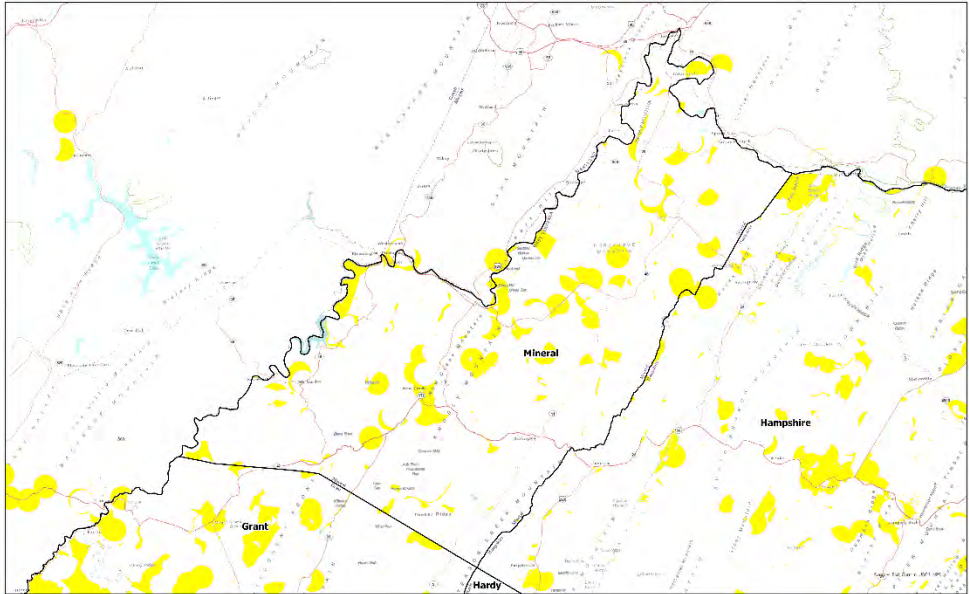


West Virginia: Mercer

- County Boundaries
- Unserved and Unfunded

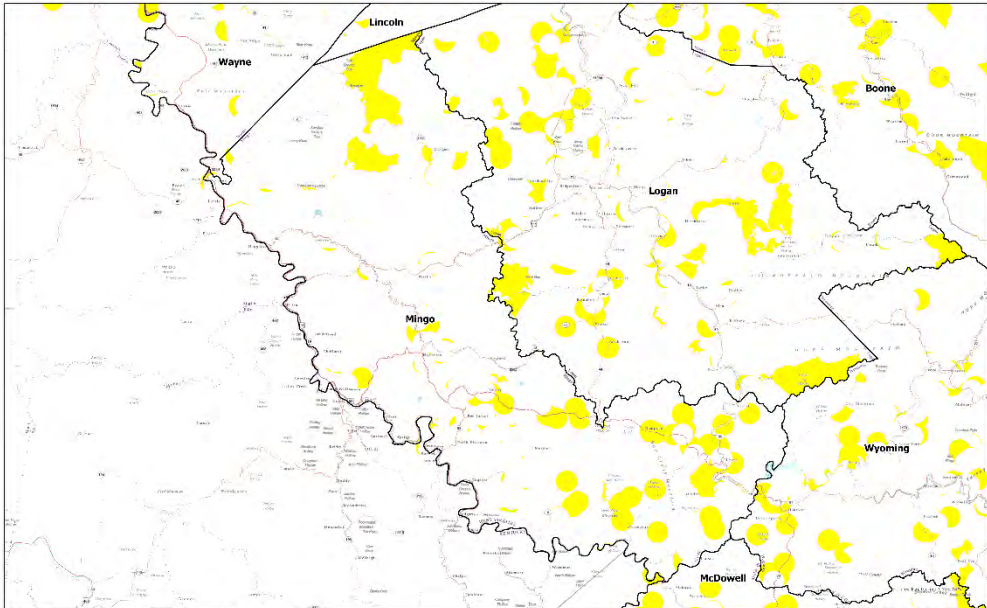
WEST VIRGINIA
BROADBAND
ENHANCEMENT COUNCIL





West Virginia: Mineral

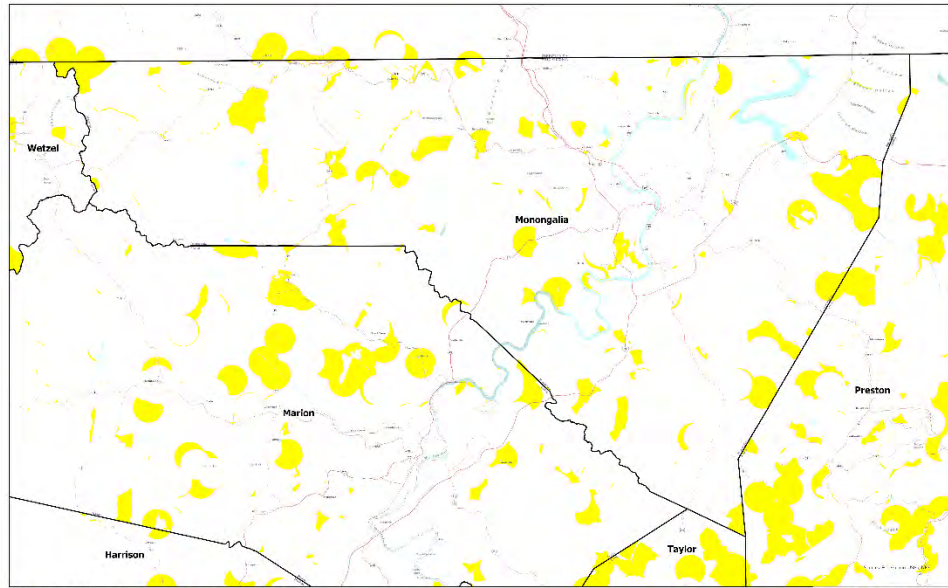
- County Boundaries
- Unserved and Unfunded



West Virginia: Mingo

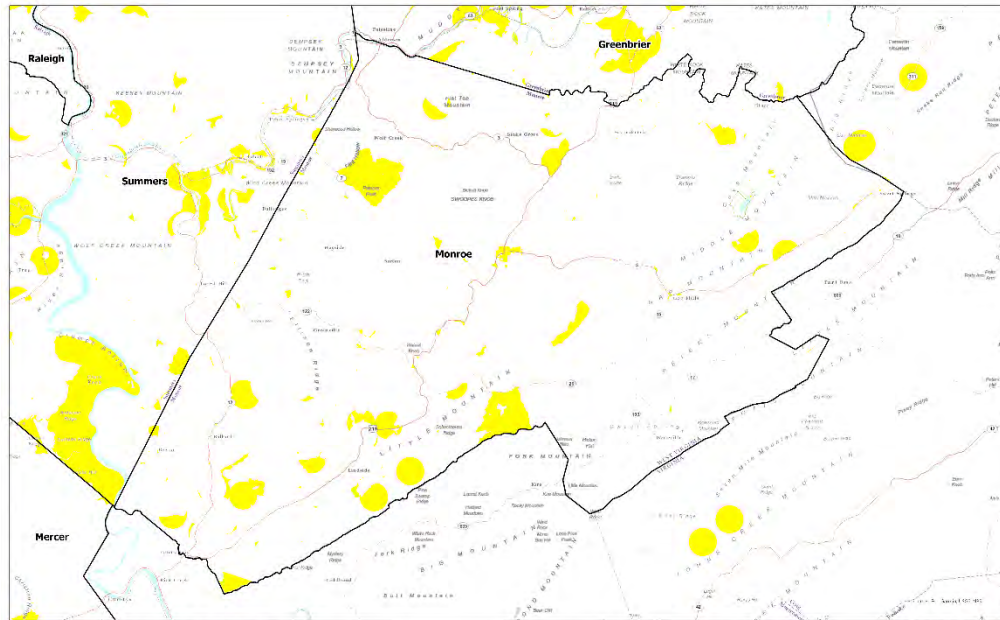
- County Boundaries
- Unserved and Unfunded





West Virginia: Monongalia

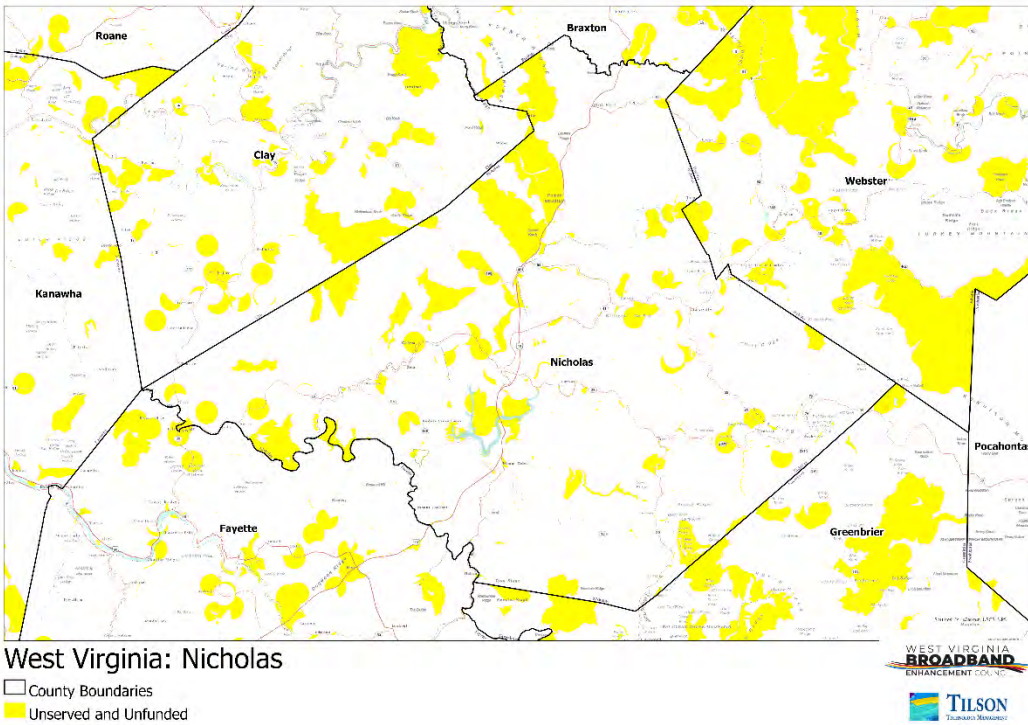
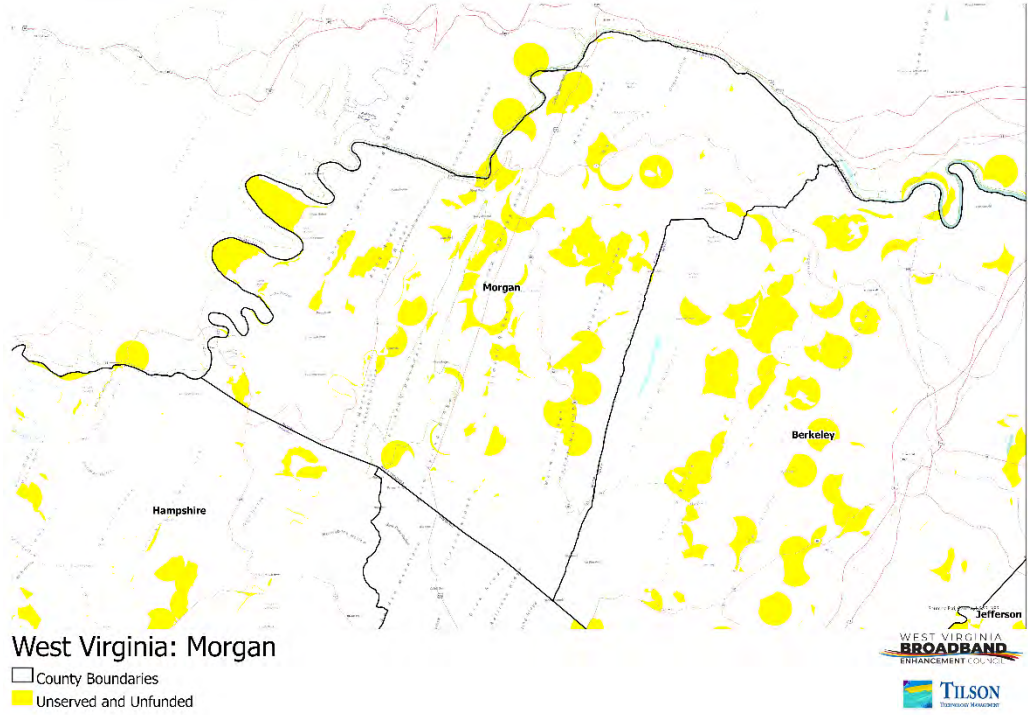
- County Boundaries
- Unserved and Unfunded

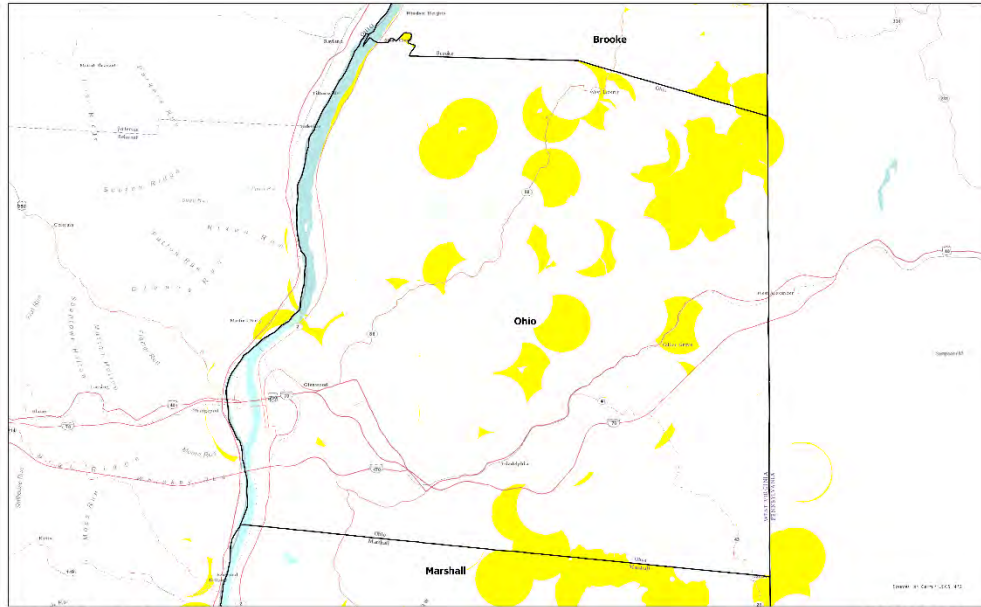


West Virginia: Monroe

- County Boundaries
- Unserved and Unfunded

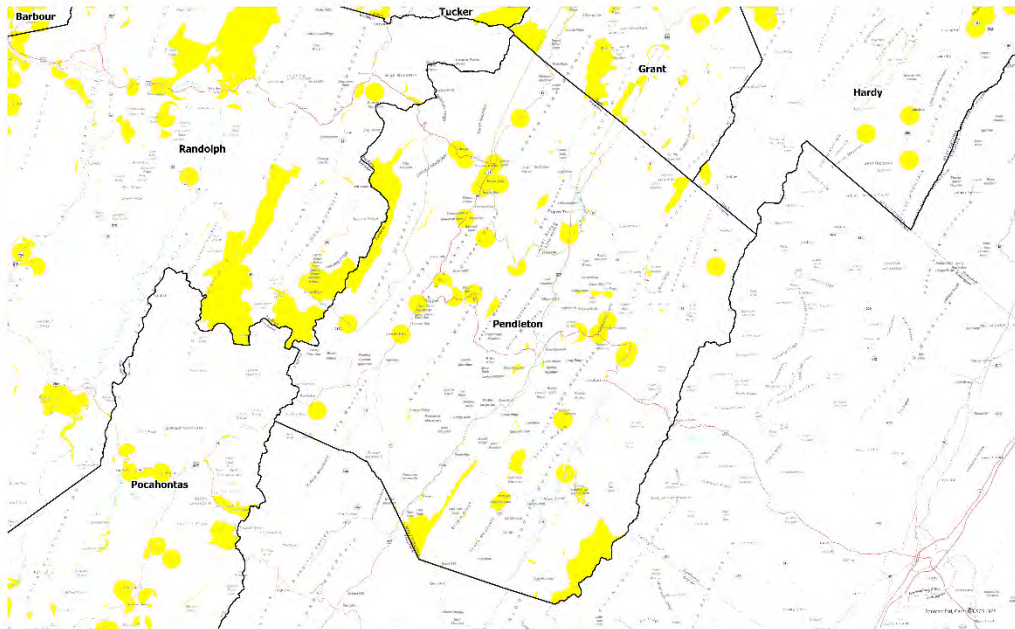






West Virginia: Ohio

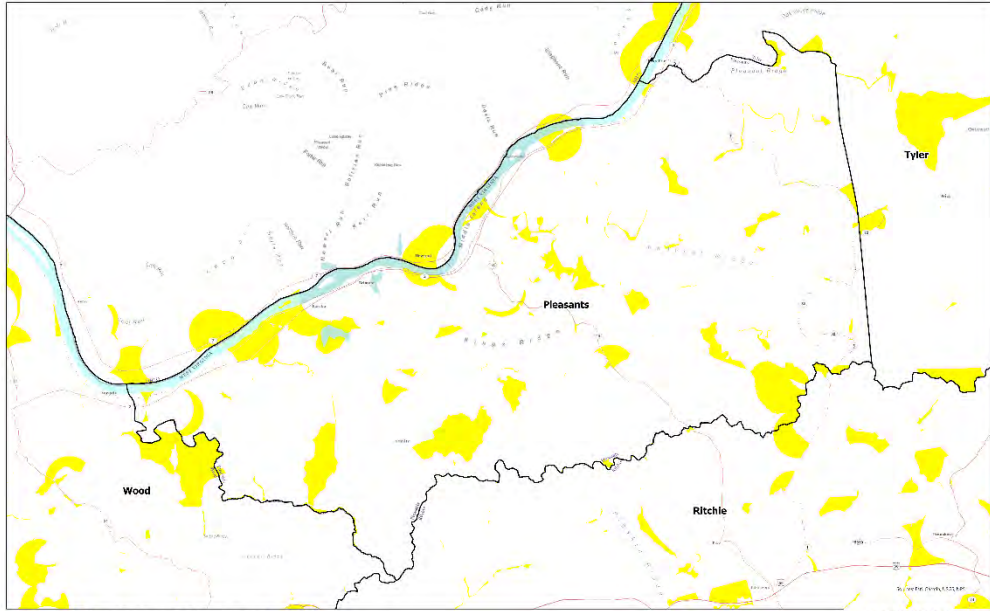
- County Boundaries
- Unserved and Unfunded



West Virginia: Pendleton

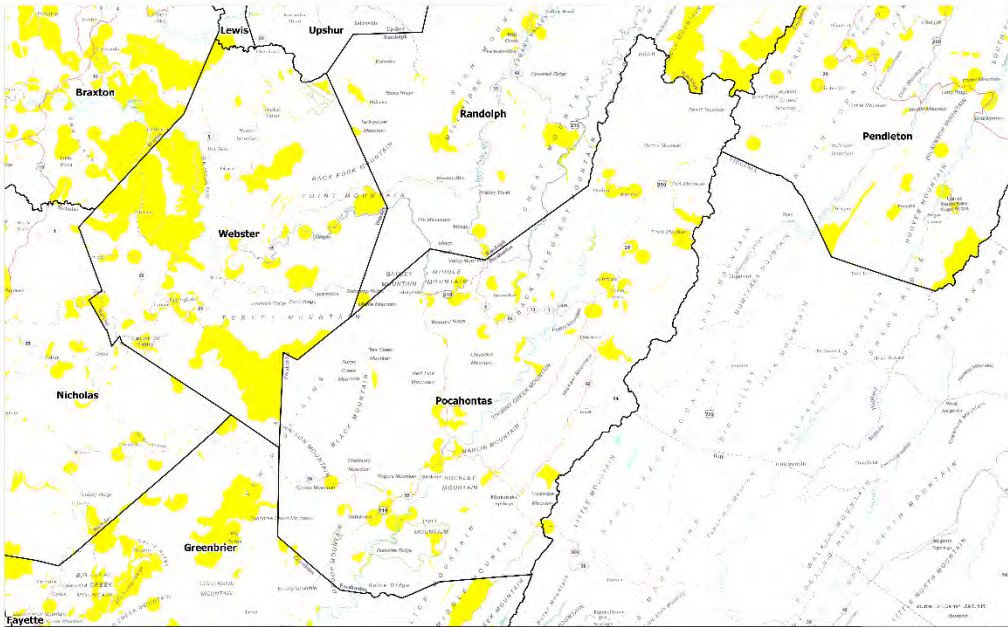
- County Boundaries
- Unserved and Unfunded





West Virginia: Pleasants

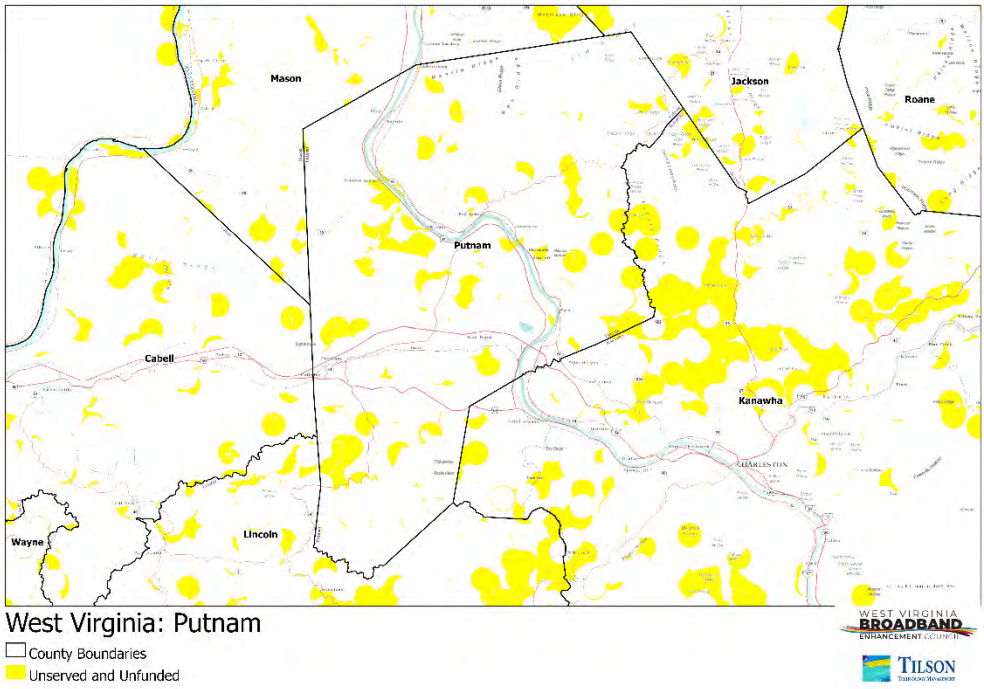
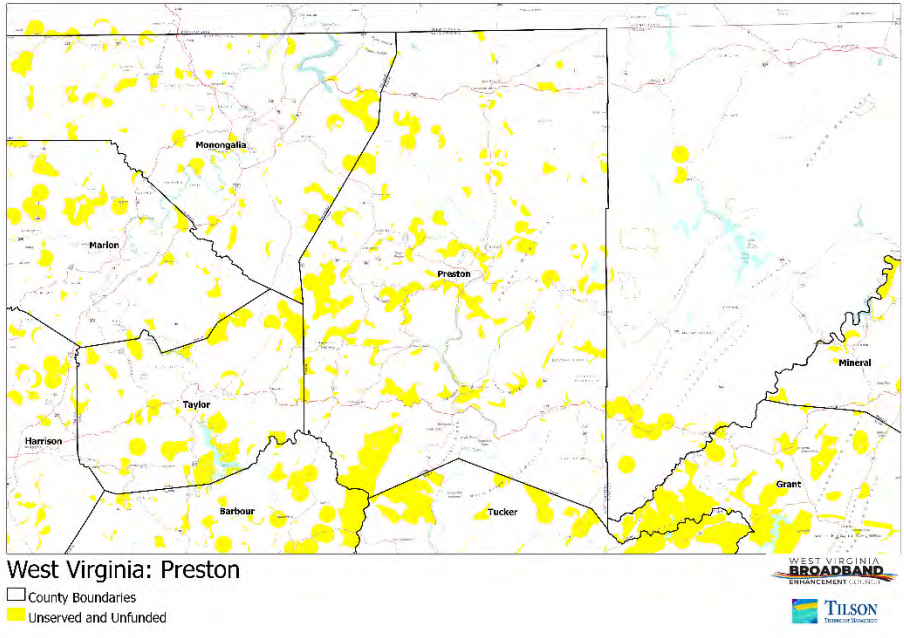
- County Boundaries
- Unserved and Unfunded

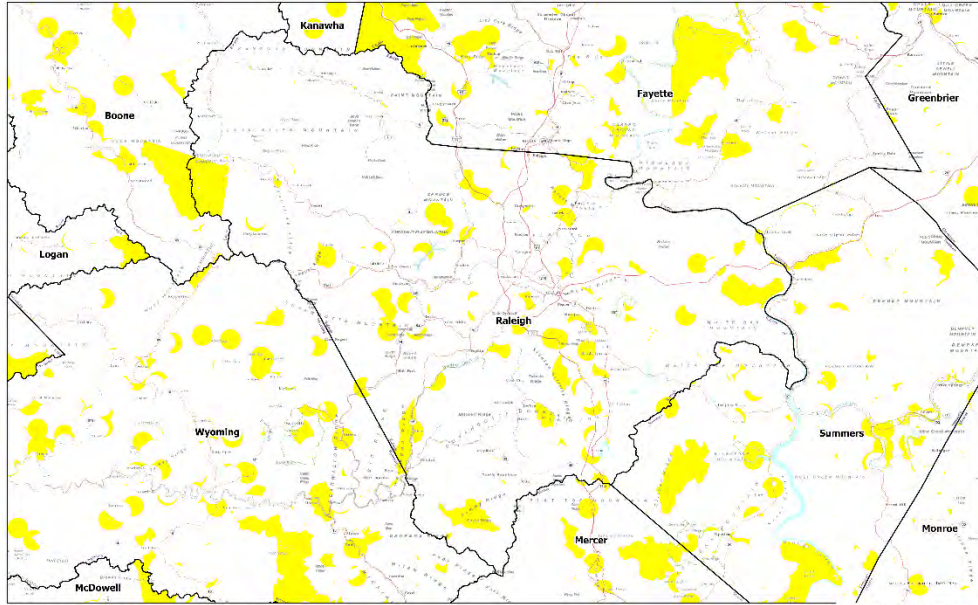


West Virginia: Pocahontas

- County Boundaries
- Unserved and Unfunded

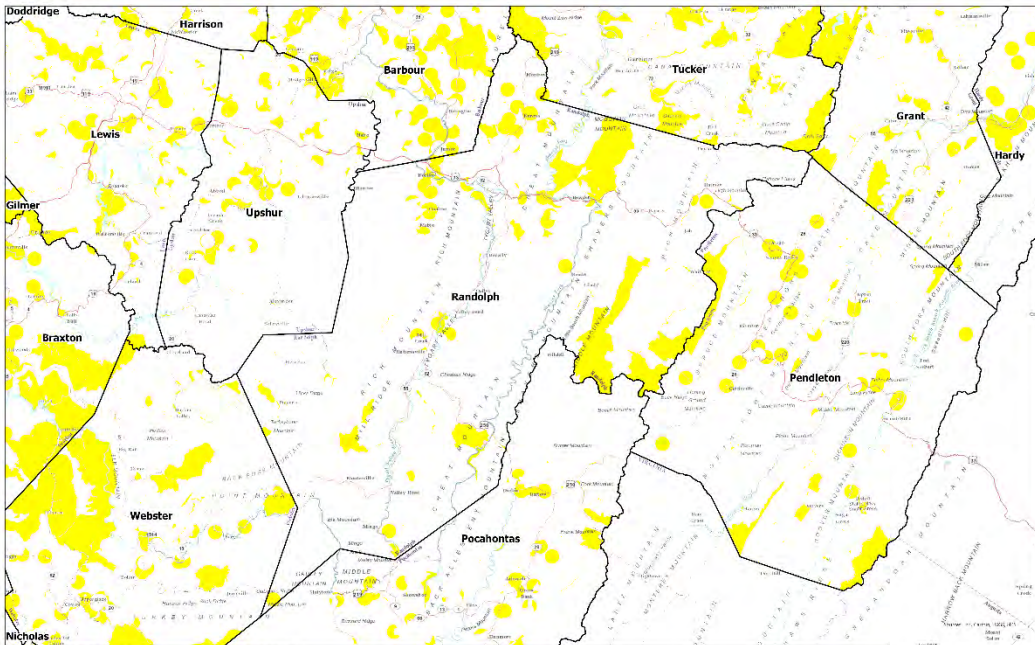






West Virginia: Raleigh

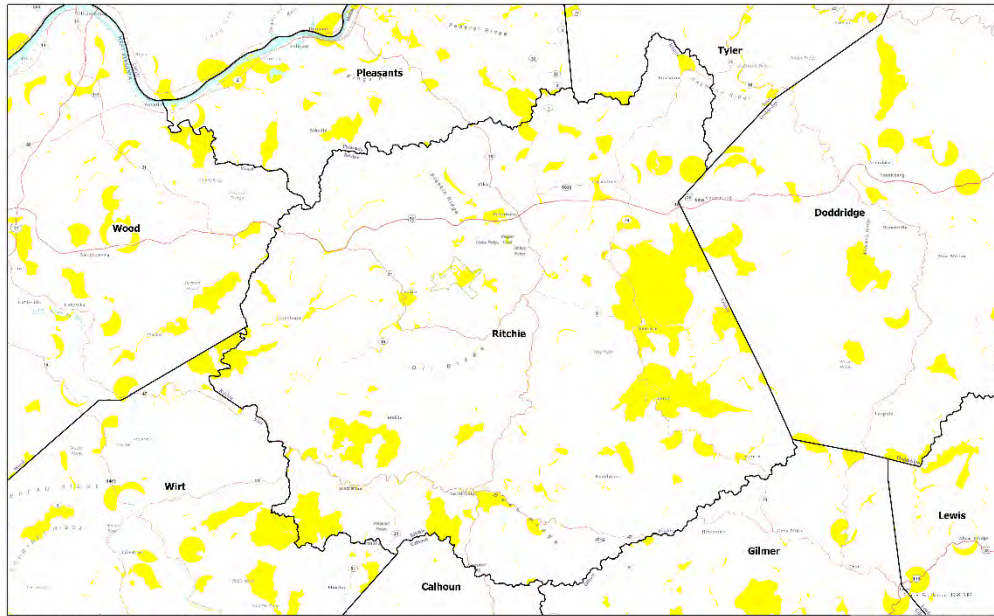
- County Boundaries
- Unserved and Unfunded



West Virginia: Randolph

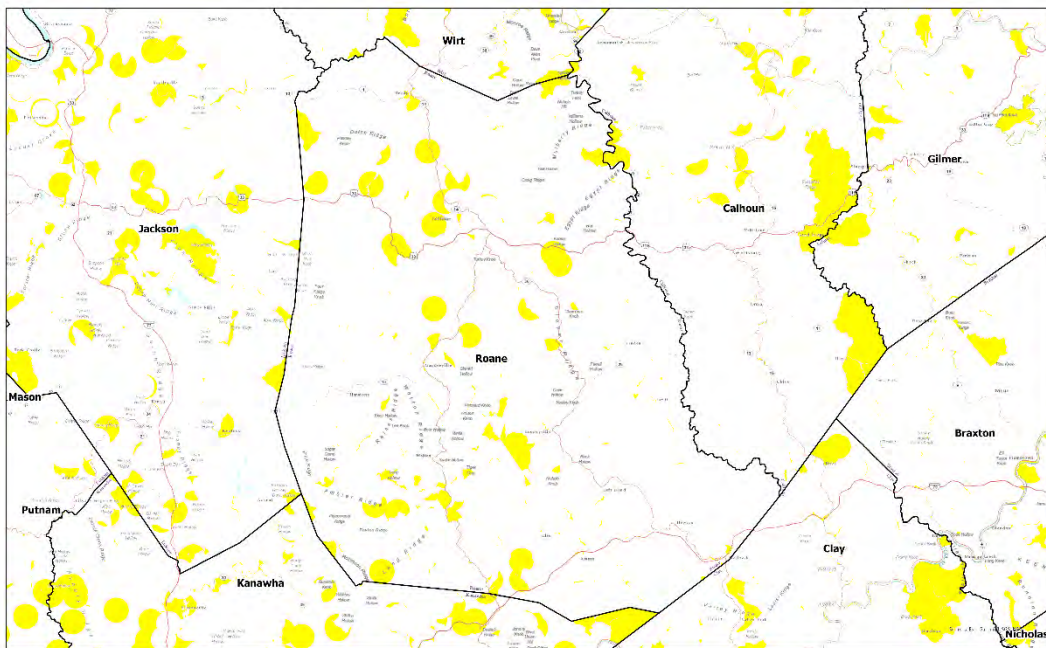
- County Boundaries
- Unserved and Unfunded





West Virginia: Ritchie

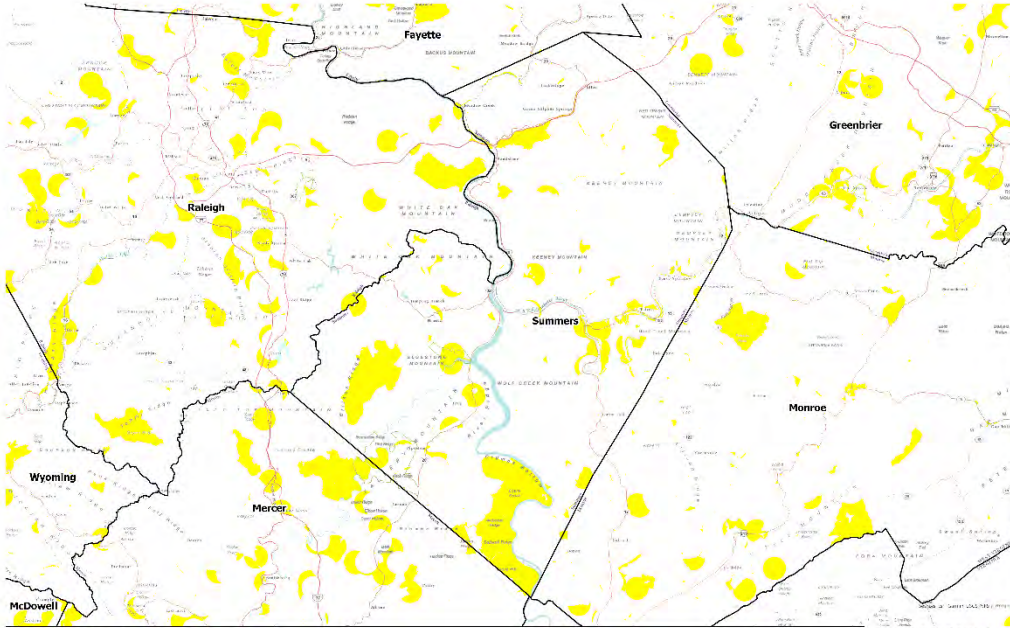
- County Boundaries
- Unserved and Unfunded



West Virginia: Roane

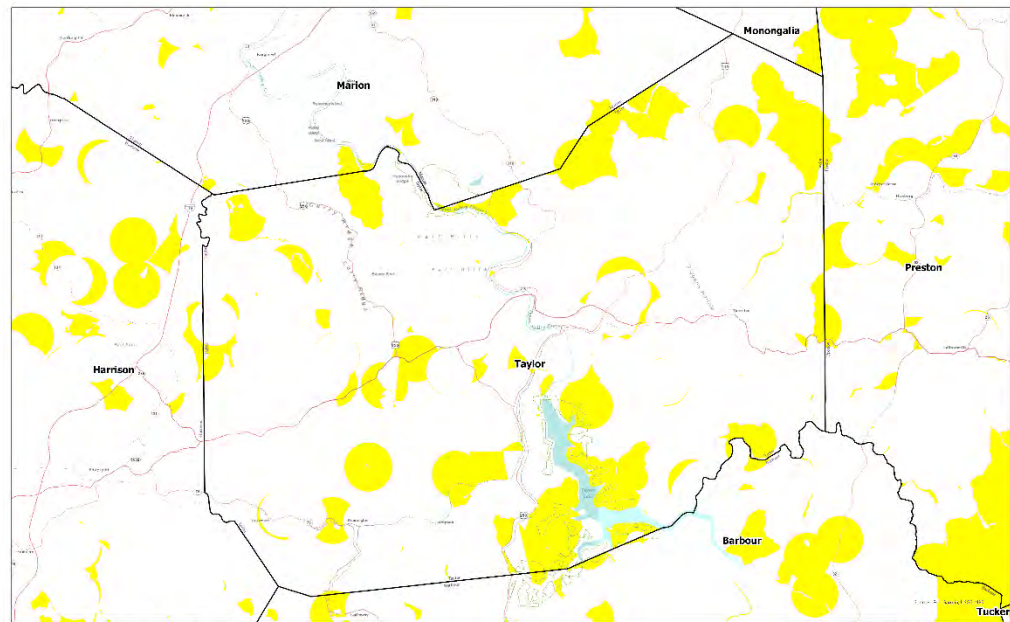
- County Boundaries
- Unserved and Unfunded





West Virginia: Summers

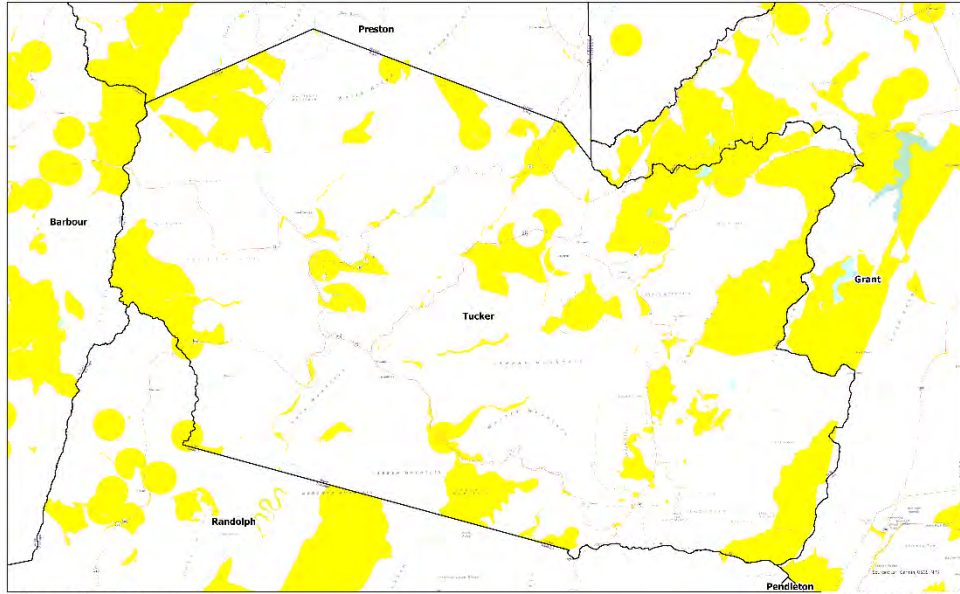
- County Boundaries
- Unserved and Unfunded



West Virginia: Taylor

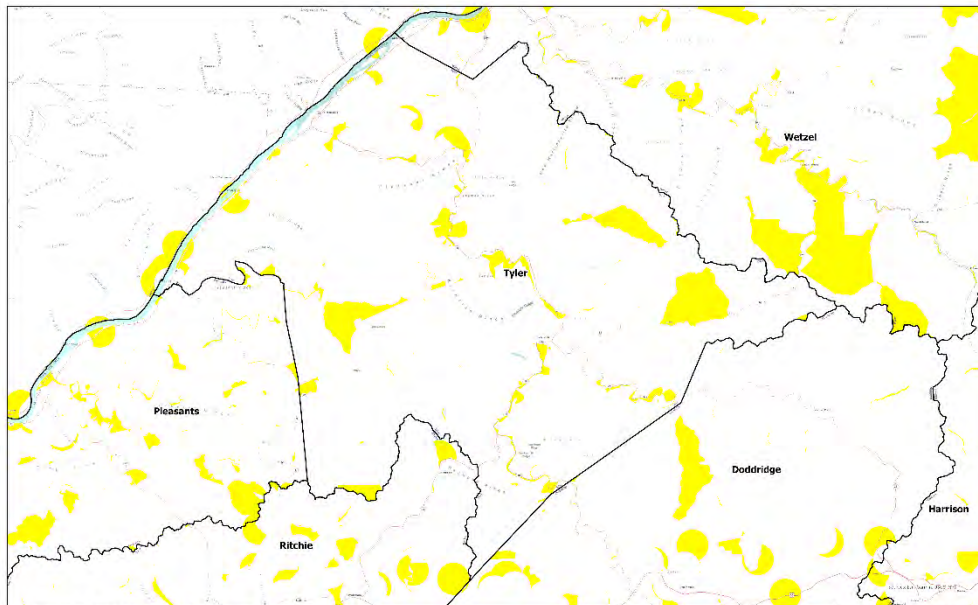
- County Boundaries
- Unserved and Unfunded





West Virginia: Tucker

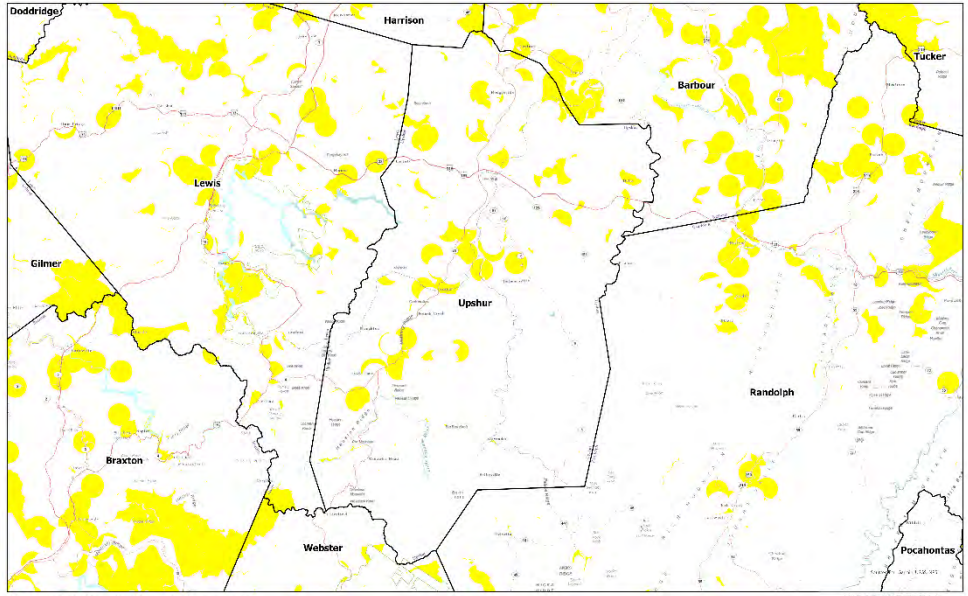
- County Boundaries
- Unserved and Unfunded



West Virginia: Tyler

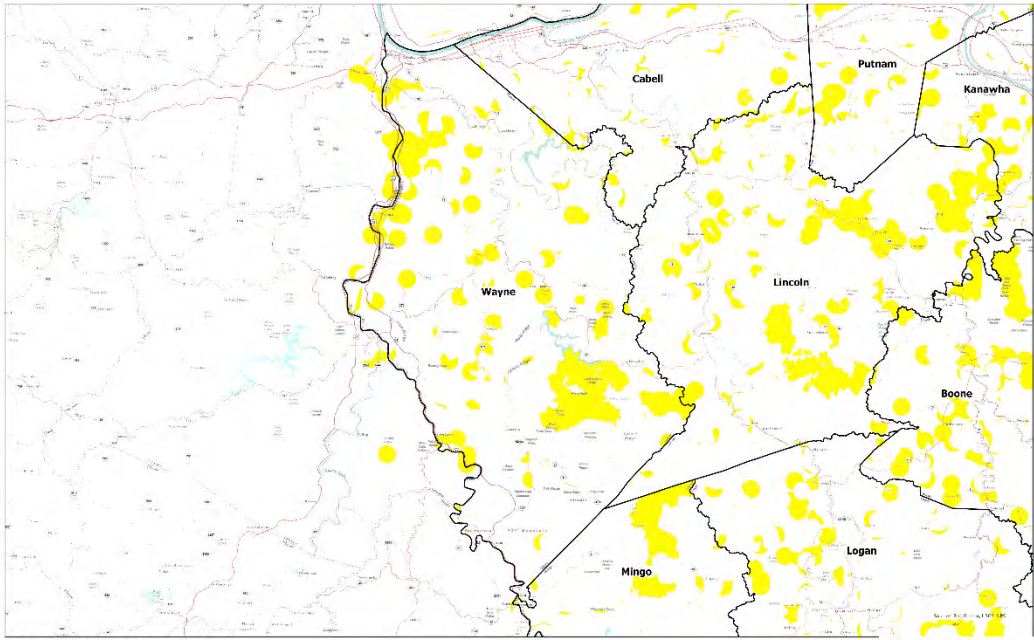
- County Boundaries
- Unserved and Unfunded





West Virginia: Upshur

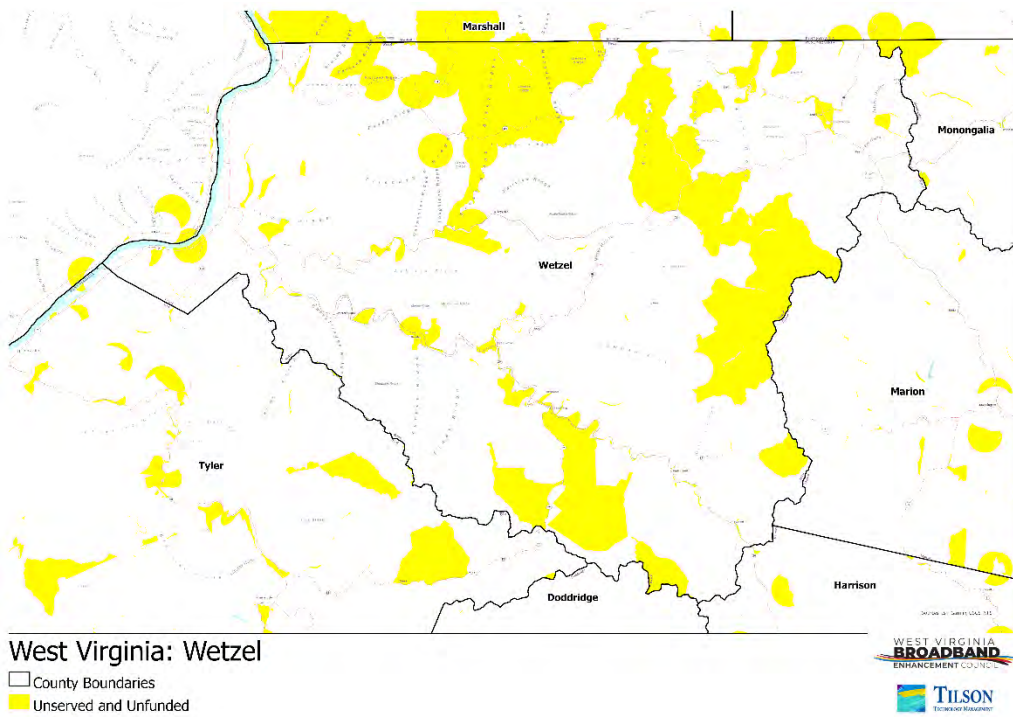
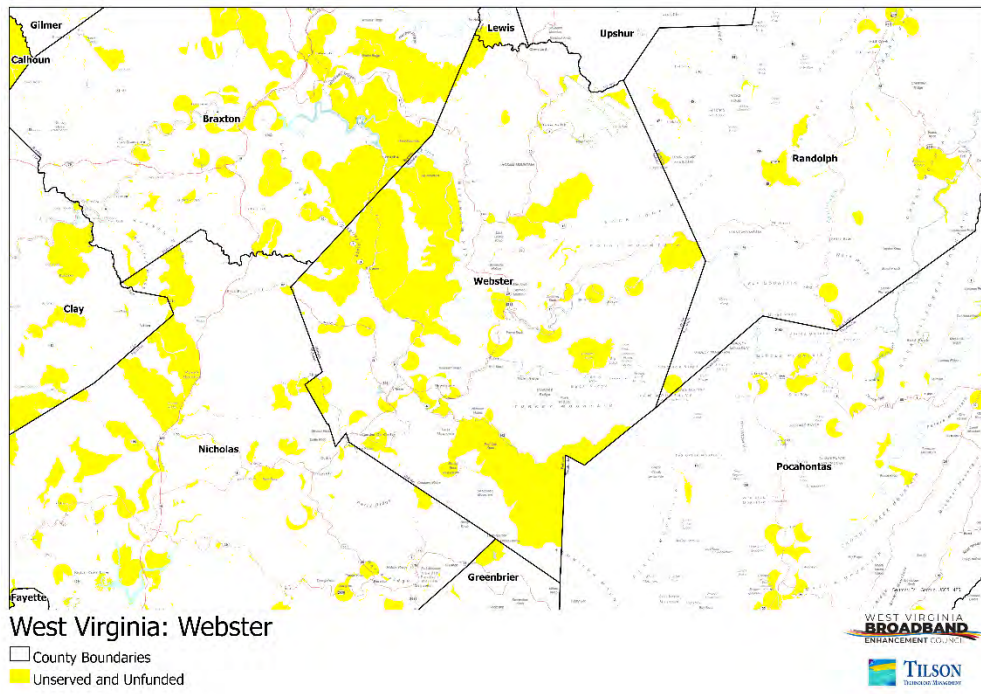
- County Boundaries
- Unserved and Unfunded

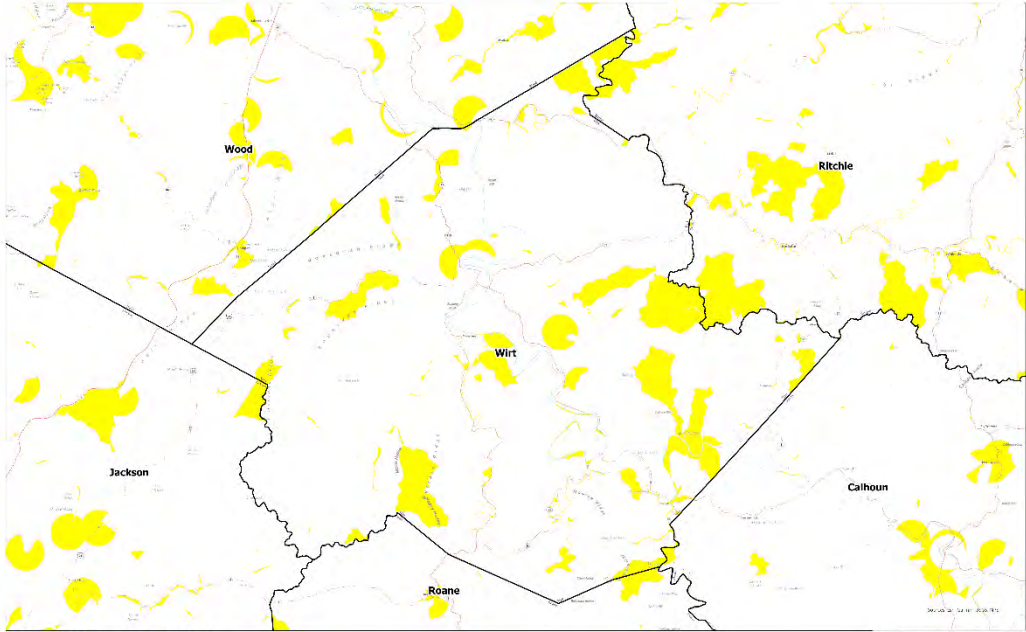


West Virginia: Wayne

- County Boundaries
- Unserved and Unfunded

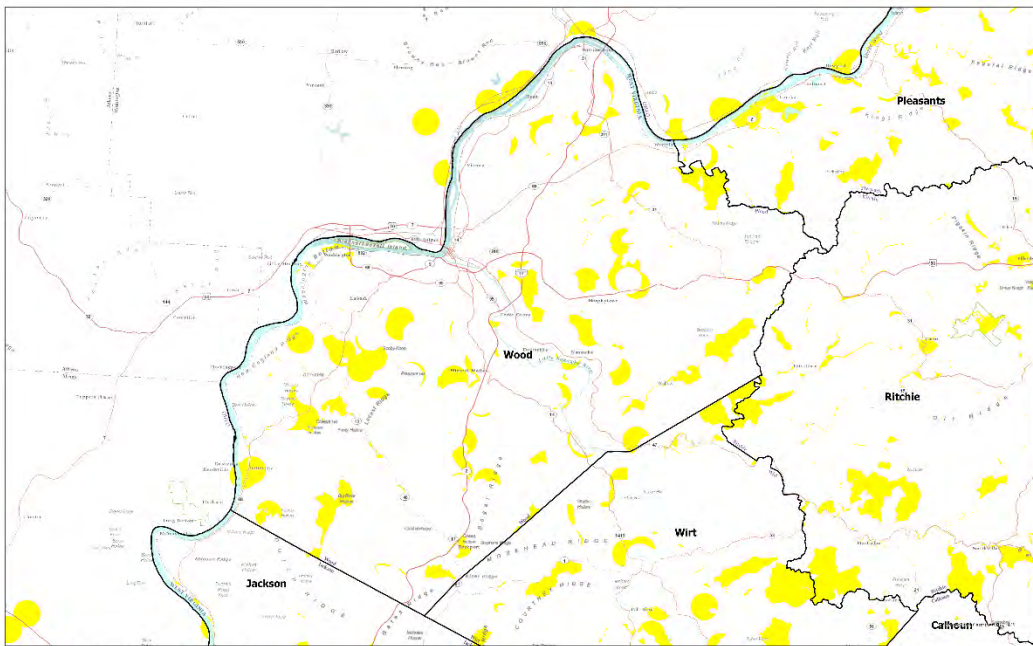






West Virginia: Wirt

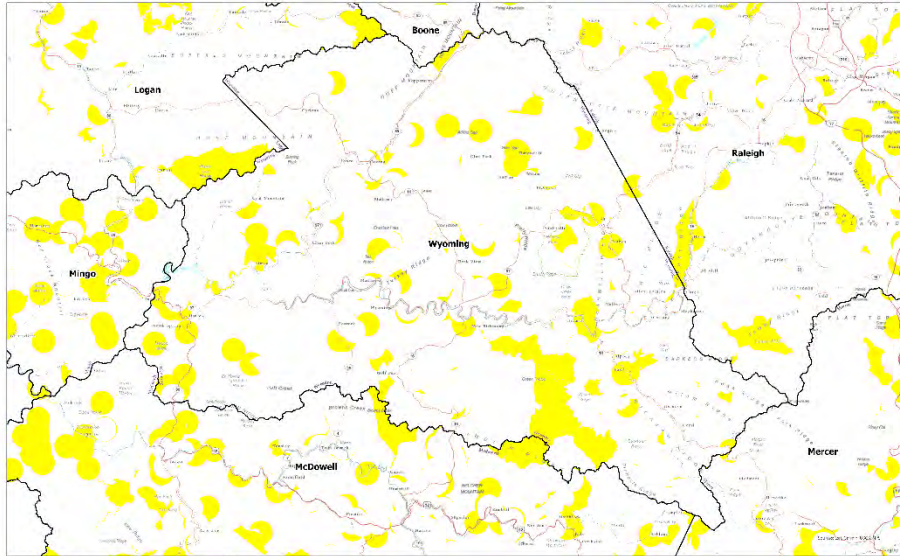
- County Boundaries
- Unserved and Unfunded



West Virginia: Wood

- County Boundaries
- Unserved and Unfunded





West Virginia: Wyoming

- County Boundaries
- Unserved and Unfunded





For more information, visit broadband.wv.gov.

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