



AGENDA
POWHATAN COUNTY BOARD OF SUPERVISORS
WORKSHOP MEETING
JUNE 10, 2020
6:30 PM CALL TO ORDER

This meeting is being held electronically in accord with Virginia Code Section 15.2-1413.

The meeting is accessible by:

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**During the public comment period, you may raise your hand using the zoom controls on your screen or press *9 on your phone. Visit the Zoom Help Center for more information.

If you would like to watch in real-time, use this link: <http://powhatanva.gov/432/Live-Stream-of-Powhatan-County-Meetings>

If you would like to watch the meeting at your convenience after June 2nd use this link:
<http://powhatanva.gov/433/County-Meetings-and-Workshop-Videos-On-D>

Public comments may also be submitted to administration@powhatanva.gov. Any comments received up until 5:00 PM, June 1, 2020 shall be entered into the meeting minutes.

1. **Call to Order**
 - a. Identify Board members physically and/or electronically present
 - b. Identify opportunities for the public to access and participate in the electronic meeting
2. **Pledge of Allegiance**
3. **Invocation**
4. **Requests to Postpone Agenda Items and Additions, Deletions or Changes in the Order of Presentation**
5. **Formal Approval of Agenda**
6. **Public Comment** (time limit 3 minutes per individual/5 minutes per group, 30 minutes total time limit that can be extended by the Board)
7. **New Business**
 - a. Discussion on Broadband facilitated by Dr. Christopher Ali Page
8. **Public Comment** (time limit 3 minutes per individual/5 minutes per group, 30 minutes total time limit that can be extended by the Board)
9. **County Attorney Comments**
10. **County Administrator Comments**
11. **Board Comments**
12. **Adjournment**

Everything you wanted to know about (rural) broadband (but were afraid to ask)
Memo prepared for Powhatan County, Virginia

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1) *What is broadband?*

“Broadband” is short-hand for an “always-on,” high-speed internet connection provided by a company known as an “internet service provider” (ISP).¹ We say “always-on” to differentiate contemporary internet connections from the dial-up era of the 1990s, when a user had to dial a telephone number through their computer to connect. Today, the internet comes to us uninterrupted and we cannot get “booted off” if someone lifts up a phone receiver. We say “high-speed” connection because not all internet connections are technically broadband (see below for more on this point). Currently, the Federal Communications Commission (FCC), the federal agency in charge of telecommunications, defines a broadband connection as one with a minimum download speed of 25 megabits per second (mbps) and a minimum upload speed of 3 megabits per second (commonly depicted as “25/3”).² At this speed, someone could stream a Netflix movie, while another user on the same network could post Instagram content and neither would experience any buffering (slow down). Many people have faster internet connections than the minimum threshold. The average fixed download speed in the United States in 2018 was 96.25mbps, while the average upload speed was 32.88mbps.³

2) *Why is broadband important?*

A high-speed home internet connection is no longer a luxury, it is a necessity. This is particularly the case as more and more services, from government forms and documents, to homework, and commerce, gravitate on-line only. For Americans living in rural communities and who might be separated from major cities by a lengthy drive, broadband can mean leveling the economic and academic playing fields. It allows people to telecommute/telework, allows for telemedicine, and for rural students to take college-prep and AP courses if not offered at their local high school.

There are 6 pillars of rural broadband:

- 1) **Economic development:** This includes broadband for business, employment, and real estate. Studies demonstrate that broadband is linked to income growth and slowed

¹ The Congressional Research Service (CRS) defines broadband as:
provided by a series of technologies (e.g. cable, telephone, wire, fiber, satellite, mobile, fixed wireless) that gives users the ability to send and receive data at volumes and speeds necessary to support a number of applications including voice communications, entertainment, telemedicine, distance education, telework, ecommerce, civic engagement, public safety, and energy conservation. (CRS, 2019)

² <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2019-broadband-deployment-report>

³ <https://www.speedtest.net/reports/united-states/2018/>

unemployment rates, and even higher salaries.⁴ Broadband is crucial in a firm's decision to locate or re-locate to a rural community.⁵ The Fiber to the Home (FTTH) Council also estimates that a fiber-optic connection can raise a home's value by 3.1%.⁶

- 2) **Rural Education:** Upwards of 70% of teachers assign homework online, but 15% of school-age children lack broadband access.⁷ FCC Commissioner Jessica Rosenworcel has called this "the new homework gap."⁸
- 3) **Telehealth:** Rural communities suffer from a lack of doctors and health centers. A high-speed broadband connection can mean the difference between driving to a health center or meeting with a healthcare professional virtually at home. This is particularly important during a health crisis such as COVID-19.⁹
- 4) **Civic Engagement:** Broadband access has been proven to improve civic engagement and voter turnout.¹⁰
- 5) **Public Safety:** First responders need access to broadband as much as civilians do. FirstNet is America's public safety broadband network and is exclusively managed and operated by AT&T. Unfortunately, FirstNet is not available everywhere.¹¹
- 6) **Quality of Life:** Broadband can improve quality of life and encourage young people to visit and stay in rural communities.¹²

3) *What is the problem?*

There are three major problems with broadband in rural America: many people do not have access, we do not know who has access, and it is expensive to roll out. In the first regard, the FCC estimates that 26.4% of rural America, or 16.9 million people, lack access to a broadband connection of 25/3.¹³ This has been proven to be a highly conservative estimate because of the way the FCC collects broadband data. The second point is that more accurate studies suggest the FCC's estimates could be off by upwards of 50%.¹⁴ A 2017 study by Microsoft, for instance, found that half of *all* Americans, or 162.8 million people, lack access to broadband.¹⁵ Third, many companies are hesitant to roll out broadband to rural America because of a perceived lack of return on investment.¹⁶

⁴<https://www.sciencedirect.com/science/article/abs/pii/S0308596114000949?via%3Dihub>;

<https://www.ers.usda.gov/publications/pub-details/?pubid=46215>

⁵ <https://business.unl.edu/outreach/bureau-of-business-research/academic-research/documents/kim/broadband.pdf>

⁶ <https://www.fiberbroadband.org/blog/study-shows-home-values-up-3.1-with-access-to-fiber>

⁷ <https://www.pewresearch.org/fact-tank/2018/10/26/nearly-one-in-five-teens-cant-always-finish-their-homework-because-of-the-digital-divide/>

⁸ <https://www.fcc.gov/document/commr-rosenworcel-new-homework-gap-data>

⁹ <https://www.reuters.com/article/us-health-telemedicine-rural-internet/until-broadband-access-improves-telemedicine-wont-help-rural-communities-idUSKCN1SQ29W>

¹⁰ <https://www.tandfonline.com/doi/abs/10.1080/15575330.2016.1212910>

¹¹ <https://muninetworks.org/content/nc-broadband-matters-public-safety-needs-broadband-maximum-effect>

¹² <https://connectednation.org/blog/2019/09/26/lack-of-internet-access-holds-rural-communities-students-back/>

¹³ <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2019-broadband-deployment-report>

¹⁴ <https://broadbandnow.com/research/fcc-underestimates-unserved-by-50-percent>;

https://www.rural.palegislatore.us/publications_broadband.html

¹⁵ <https://blogs.microsoft.com/on-the-issues/2019/04/08/its-time-for-a-new-approach-for-mapping-broadband-data-to-better-serve-americans/>

¹⁶ <https://fas.org/sgp/crs/misc/R46108.pdf>

4) *Can't I just use my phone?*

Not all broadband connections are created equal, and your phone's internet connection is not a replacement for a fixed connection. There are six ways Americans access the internet plus two technologies in development. Before we begin, it is important to note that even if you have wi-fi in your home, you probably still have a fixed, wired connection. There is an important difference between wi-fi and your cell phone, which we see below.

Digital Subscriber Line or **DSL** is the most common type of connection in rural America.¹⁷ This is the connection provided by a traditional telephone company like AT&T, Verizon, CenturyLink, Windstream or Frontier. While relatively ubiquitous, a DSL connection struggles with speed and network congestion. It has a median download and upload speed of 10/1, and the more people who use the network, the slower it will get.¹⁸ More than this, the signal degrades after about 3 miles, so the further away you live from an access point, the slower your connection will be.

Cable is the most prominent broadband technology in urban communities, along with most towns, and county seats. A cable broadband connection is available to 88.2% of American households.¹⁹ It is provided by a traditional cable company like Comcast (Xfinity), Charter, or Cox. It uses a **coaxial cable** to connect you to the internet. The benefit of cable is that it is pretty fast (a median of 400/20).²⁰ The problems are that it is only available in dense areas, and it suffers from network congestion (the more people online at the same time, the slower everyone's service will be).

Fiber is considered the "gold-standard" of broadband connections. It is incredibly fast (1000/1000 or 1gigabit per second/1 gigabit per second). A fiber optic cable is a glass filament that transmits data through light pulses. Fiber can be provided by any company, large and small, including AT&T and Verizon (Fios), and Ting. Many telephone and electric cooperatives, like Central Virginia Electric Cooperative (CVEC), are rolling out fiber to rural America.²¹ CVEC's fiber optic broadband is called "Firefly."²² Fiber can handle a near unlimited amount of data and users, but the problem is that it is expensive to lay down (about \$27,000 per mile), and as such many companies do not want to invest in its deployment without a guaranteed return on investment – something that is difficult to achieve in rural America.

Fixed wireless, provided by a **wireless internet service provider (WISP)** is a wireless internet connection that originates with a tower that transmits connectivity to the user using radio waves. Often times, the tower itself is connected to the network (or another tower) using a fiber or DSL wire, but sometimes through a microwave transmission. Fixed wireless has proven beneficial for rural and remote America because one tower can transmit a signal as far as 10

¹⁷ <https://pcrd.purdue.edu/files/media/008-A-Look-at-Broadband-Access-Providers-and-Technology.pdf>

¹⁸ <https://pcrd.purdue.edu/files/media/008-A-Look-at-Broadband-Access-Providers-and-Technology.pdf>

¹⁹ <https://pcrd.purdue.edu/files/media/008-A-Look-at-Broadband-Access-Providers-and-Technology.pdf>

²⁰ <https://pcrd.purdue.edu/files/media/008-A-Look-at-Broadband-Access-Providers-and-Technology.pdf>

²¹ <https://muninetworks.org/content/rural-cooperatives-page>

²² https://www.dailyprogress.com/news/local/million-grant-will-aid-rural-broadband-expansion/article_58771dd0-d8fa-512b-8eb3-e32acd503ac5.html

miles.²³ WISPs include Wisper, Rise, King Street, and Agile. Some WISPs, like MonkeyBrains in San Francisco, even operate in major cities. Many ISPs are using fixed wireless as an interim solution before complete fiber-to-the-home deployment because a fiber optic cable can be connected to a tower and the signal transmitted wirelessly. The drawbacks of fixed wireless include potentially slower service, the need for line-of-sight, network congestion, inclement weather, and equipment costs.²⁴

Satellite internet, provided by either ViaSat or Hughes, is available to roughly 99% of the American population. Many in rural America subscribe to satellite internet. The problem is that satellite connections are notoriously slow (around 2/1.3), and are plagued by high prices, low data caps (meaning that you cannot use a lot of data-intensive applications), high latency (meaning a lot of lag between transmission and reception) and weather disruptions.²⁵ Many have argued that satellite should not be included in the list of viable broadband technologies but the FCC has disagreed.²⁶

Mobile broadband is available to the 81% of the population who own a smartphone. This service is provided by any of the mobile providers such as AT&T, Verizon, T-Mobile/Sprint, US Cellular, Boost, etc... Only 71% of rural Americans have a smartphone, however.²⁷ While convenience is certainly a factor, mobile broadband is not a substitute for a fixed connection.²⁸ 4G availability (the speed necessary to stream video) is not universally available, and most phones come with either data caps or data throttling.²⁹ Data caps become more severe if trying to turn a phone into a “hotspot” to connect other devices. This is troubling with for the 20% of rural Americans who access the internet solely with their mobile device.

5G is the next generation of mobile connectivity, capable of supporting multiple devices and users with blazing fast upload and download speeds. The “G” in 5G refers to generation, with every generation of mobile connectivity we can do more, from texting (2G) to emails and text-based surfing (3G) to streaming video (4G LTE) to connecting our entire homes to the internet (5G). Currently, 5G is only being rolled out in selective areas – densely packed (and wealthy) urban centers.³⁰ In addition, not all 5G is equal.³¹ To access the high speeds mentioned in advertisements, one needs a 5G enabled phone and a provider using so called “high band” frequencies (also known as millimeter waves). These radio waves can handle an incredible amount of information at incredible speeds (1gig/1gig), but they cannot travel far (only 800-1500 feet).³² As such they require signal repeaters called “small cells.” Because so many small

²³ <https://broadbandnow.com/report/wisps-real-heroes-bridging-digital-divide/>

²⁴ <https://broadbandnow.com/report/wisps-real-heroes-bridging-digital-divide/>

²⁵ <https://www.dailyyonder.com/fccs-blurry-vision-satellite-broadband/2018/03/26/>

²⁶ <https://ilsr.org/wp-content/uploads/2018/09/fact-sheet-satellite-not-broadband.pdf>

²⁷ <https://www.pewresearch.org/internet/fact-sheet/mobile/>

²⁸ https://www.vice.com/en_us/article/mbpw3q/fcc-chair-cell-data-is-not-broadband-internet

²⁹ https://www.vice.com/en_us/article/pa77y9/fcc-says-wireless-carriers-lie-about-coverage-40-of-the-time

³⁰ <https://www.theverge.com/2020/1/10/21060133/verizon-5g-home-rollout-delay-again-equipment>

³¹ <https://arstechnica.com/information-technology/2019/12/t-mobile-touts-nationwide-5g-that-fails-to-cover-130-million-americans/>

³² <https://ilsr.org/wp-content/uploads/2019/08/fact-sheet-5G-pocket-guide.pdf>

cells need to be deployed and require a fiber optic connection, and because of their high cost and the sparse population, this type of 5G is not feasible for rural America. Low-band frequencies, such as those used by T-Mobile, are considered 5G, and travel further than high-band, but from the user's perspective, it will only be a small upgrade from their 4G connection.³³

Low Earth Orbital Satellites (LEOs) are being touted as the next generation of connectivity by companies like SpaceX and Amazon.³⁴ In theory, these satellites, which sit closer to earth than traditional satellites, can deliver fiber-like speeds with minimal latency, compared to their geostationary counterparts. This is all still in development, however, and its success and applicability to rural America is yet to be determined.

5) Why don't I have broadband?

According to the Pew Foundation, 24% of rural Americans say access to fast, reliable broadband is a major problem in their communities.³⁵ There are many reasons why rural Americans do not have broadband. The foremost of these is that broadband is simply unavailable where they live. This is because private providers refuse to connect these communities or to upgrade their connections because of a perceived lack of return on investment. Where broadband is available, many rural Americans do not have competition in providers.³⁶ Moreover, where broadband is available in rural areas, only 63% of people actually subscribe, suggesting a gap between access and adoption.³⁷ Cost is also major factor. The least dense areas of the United States pay upwards of 37% more for broadband than the densest centers.³⁸ The lowest income households tend not have a home broadband subscription³⁹ citing price as the problem.⁴⁰

6) How do I get broadband?

In the absence of a provider offering high-performance broadband in your area, many rural communities have turned to their electric or telephone cooperative.⁴¹ Almost all of the 260 telephone cooperatives across the country offer broadband, while over 100 of the 900+ electric cooperatives do so.⁴² Hundreds of communities have also started funding their own broadband projects. A few have also become ISPs in their own right, while other municipalities and counties have funded or partially funded their broadband networks and then let ISPs manage

³³ <https://arstechnica.com/information-technology/2019/12/t-mobile-touts-nationwide-5g-that-fails-to-cover-130-million-americans/>

³⁴ <https://www.theverge.com/2019/4/4/18295310/amazon-project-kuiper-satellite-internet-low-earth-orbit-facebook-spacex-starlink>

³⁵ <https://www.pewresearch.org/fact-tank/2018/09/10/about-a-quarter-of-rural-americans-say-access-to-high-speed-internet-is-a-major-problem/>

³⁶ <https://www.techdirt.com/articles/20180731/10103540335/report-highlights-how-us-telcos-abandoned-rural-american-broadband.shtml>

³⁷ <https://www.pewresearch.org/fact-tank/2019/05/31/digital-gap-between-rural-and-nonrural-america-persists/>

³⁸ <https://broadbandnow.com/research/digital-divide-broadband-pricing-state-zip-income-2019>

³⁹ <https://www.pewresearch.org/fact-tank/2019/05/07/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>

⁴⁰ <https://www.pewresearch.org/fact-tank/2019/04/22/some-americans-dont-use-the-internet-who-are-they/>

⁴¹ <https://muninetworks.org/content/rural-cooperatives-page>

⁴² <https://muninetworks.org/content/rural-cooperatives-page>

and operate the network.⁴³ Unfortunately, at least 19 states have either prohibited or inhibited municipalities from funding and operating broadband networks.⁴⁴

7) What's next?

In 2019, the FCC announced a \$20.4 billion fund for rural broadband deployment.⁴⁵ This program comes with some hurdles, including the prohibition of communities who have received state and/or USDA Re-connect grants and loans from participating.⁴⁶ Dozens of US senators are protesting this restrictive decision.⁴⁷ It also is not clear how much this fund will help in the deployment of next generation connectivity, like fiber.⁴⁸

The FCC has also announced the creation of a new \$5 billion rural 5G fund. This is in addition to the \$1.4 billion in loans and grants for rural broadband deployment offered by USDA. Communities, however, should first determine their local broadband needs and options before applying for these funds to make sure they are competitive. There are a number of terrific organizations that can help with these broadband plans and community assessments.⁴⁹

Members of rural communities and counties should also consider speaking with their Boards of Supervisors to encourage the development of a broadband plan, and to look into public-private partnerships with incumbent ISPs, cooperatives, and/or competitive network builders. Many states have begun to permit cooperatives to offer broadband, which expands the number of providers dramatically. Virginia is a state that has some inhibitions against municipalities funding broadband projects, but has no prohibitions or inhibitions against cooperatives doing so. Community members should also consider speaking with their state and federal representatives to make sure that their interests are being met in federal policies, such as broadband mapping.⁵⁰

There is no “cookie-cutter” solution to the rural-urban digital divide. Instead, it will take an all-hands-on-deck approach that must begin and end with communities themselves.

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⁴³ <https://muninetworks.org/communitymap>

⁴⁴ <https://broadbandnow.com/report/municipal-broadband-roadblocks/>

⁴⁵ <https://www.fcc.gov/auction/904>

⁴⁶ <https://www.publicknowledge.org/press-release/last-minute-change-to-fcc-rural-broadband-fund-may-ban-grants-for-millions-of-unconnected-americans/>

⁴⁷ https://www.gillibrand.senate.gov/imo/media/doc/3.9.2020_Gillibrand_Schumer_Letter_FCC_final.pdf

⁴⁸ <https://www.benton.org/blog/thoughts-rural-broadband-subsidies-new-decade>

⁴⁹ <https://nextcenturycities.org>

⁵⁰ https://www.multichannel.com/news/senate-passes-broadband-data-act?utm_source=sendgrid&utm_medium=email&utm_campaign=Newsletters