Lit Communities

Berks County **Broadband Plan** October 27, 2022

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Executive Summary

The COVID pandemic highlighted the vast broadband infrastructure gaps across the U.S.. As schools, businesses, and healthcare providers closed their doors, our homes became our new classrooms, offices, and healthcare facilities. Existing broadband infrastructure was not sufficiently robust to handle so much traffic and quickly became overburdened.

In June 2021, the Berks Alliance, in partnership with Berks County, released a Request for Proposals ("RFP") for a Broadband Consultant and Feasibility Study (the "Feasibility Study"). In early 2022, Berks County and the Berks Alliance engaged Lit Communities ("Lit Communities" or "Lit") to perform the Feasibility Study. Lit Communities and our partners, Ice Miller LLP ("Ice Miller") and Katapult Engineering ("Katapult"),[1] conducted the following study using Lit's Community Assessment Process and contributing our decades of collective experience and expertise in broadband.

The Project Team collaborated with community partners, including the United Way of Berks County, the Wyomissing Foundation, the Berks County Intermediate Unit, the Reading Public Library, and the Berks Alliance, as well as residents, businesses and community anchor institutions in its assessment. This report details our findings, and includes analysis, recommendations, and proposed next steps for Berks County.

Broadband services were assessed utilizing data from the Federal Communications Commission (FCC), the Purdue Center for Regional Development (PCRD), Fiber Locator, and BroadbandNow. Areas identified to have the ***highest density of underserved census blocks (less than 100 Mbps download and 20 Mbps upload) and/or low or no fiber network penetration were prioritized.***

Additional outreach through a community survey found that there is ***general satisfaction with speed (66%) and reliability (64%) of current internet services, yet dissatisfaction (67%) with price. Further, the comments left by survey respondents showed a heightened concern for the lack of competition and choice of options for internet services,*** as these were identified as the most common topics of reference.

We found that there is a significant cable broadband presence in Berks County, but a limited fiber footprint, which is primarily located in the Eastern and Southeastern portions of the county. Further, through targeted focus groups and meetings with community leaders, healthcare providers and businesses ***a critical need for digital***

[1] Collectively, the "Project Team."

literacy and access to broadband and devices at the individual consumer/residential level, particularly as it relates to workforce requirements and access to telehealth and related applications were identified.

We also found that there is ***heightened opportunity for economic advancement where fiber infrastructure is currently lacking in Berks County.*** According to the Economic Development Office, Berks County is currently experiencing a housing deficit of an estimated 45,000 units, while also experiencing commercial growth with new businesses opening in areas along I-78.

To address these gaps, Lit performed a preliminary design for a countywide middle mile network utilizing existing street rights-of-way. Last-mile designs were then created to show how service would reach each premise within Berks County. All designs provided a bill of materials that were incorporated into corresponding financial models for each network.

To help fund such networks, Lit's Grant Services team identified grant programs to consider, such as the US Treasury Capital Projects Fund, the US Department Of Agriculture ReConnect Program and the Department of Commerce (NTIA) Broadband Equity, Access and Deployment (BEAD). Information regarding the application process, due dates and requirements are provided in this report. The findings, data and recommendations below developed during the Community Assessment will allow the County to determine which of these programs it would like to pursue.

Key recommendations:

1. Planning:

- Prioritize future network deployments in the northern region where the greatest connectivity gaps exist, emphasizing fiber as the connectivity method of choice
- Meet with existing providers and issue an RFX to determine buildout plans in priority areas
- Incentivize existing last mile fiber providers to expand their networks, particularly the underserved areas, through RFPs for fiber builds and the implementation of digital inclusion programs
- Work with neighboring Counties to develop mutually beneficial strategies for servicing the unserved and underserved nearing bordering zones
- Urgent action to allocate existing and pending available funds for projects supporting broadband deployment and adoption, including pilot projects addressing the needs detailed in this report and programs promoting digital equity
- Be diligent in seeking grant funding with focus on the following programs:
  - U.S. Treasury - Capital Projects Fund
  - US Department of Agriculture - ReConnect Program
  - Department of Commerce (NTIA) - Broadband Equity, Access and Deployment (BEAD)

2. Implementation:

- Address accessibility gaps for at-risk populations through digital equity programs
- Communicate and solicit feedback on all broadband expansion plans to the Pennsylvania Broadband Development Authority
- Implement Dig Once/ Open Trench policies to encourage the above expansion

3. Ongoing Engagement:

- Continued support for and promotion of digital inclusion and digital equity programs
- Coordinate with public and private stakeholders at the public libraries and the education, healthcare, government and business sectors in Berks and neighboring communities to continue development of comprehensive digital programs and to share best practices on an ongoing basis
- Implement a channel to provide status updates on broadband projects to the community, and to intake

complaints of speed or lack of service from residents and businesses (in order to validate or dispute future FCC data)

- Make connectivity part of ongoing conversations and work with infrastructure and railroad service providers to overcome challenges related to the Tri-County Regional Rail Project

Of note was the majority of respondents (98%) to the survey conducted as part of this Community Assessment expressed the importance of the Berks County Broadband study.

The Project Team would like to thank Berks County and the Berks Alliance for their guidance and support throughout this process. We hope that this Feasibility Study sets a new vision for Berks County - one in which connectivity and services are readily available to all who need them, creating new opportunities for community advancement and economic development, health care, and education, and ensuring long-term vitality.

BERKS ALLIANCE
COMMUNITY DEVELOPMENT

VIRTUE · LIBERTY · INDEPENDENCE · BERKS · COUNTY

CITY OF READING PENNSYLVANIA

WYOMISSING FOUNDATION

READING PUBLIC LIBRARY

BERKS COUNTY COMMUNITY FOUNDATION

United Way
United Way of Berks County

UPMC *for You*
Affiliate of UPMC Health Plan

BCIU 14 Berks County Intermediate Unit
an educational service agency

We additionally would like to call attention to the incredible level of stakeholder participation from the Berks County community members, leaders and organizations who participated in the survey, focus groups, interviews and future planning discussions.

The commitment to ensuring the needs of Berks County residents are understood and addressed through digital equity has been profound throughout this process, exceeding our expectations. We are confident that this momentum, with the right support and resources, could position Berks County as a leader in Digital Equity and will create a positive impact for generations to come.

Project team

Lit Communities consults with communities across the county to assist with feasibility studies, connectivity planning, gap analysis and digital equity initiatives. The Lit team brings their diverse experiences in network design, GIS, data science, engineering, construction, municipal government, federal and state grants consulting, private and public financing, strategic planning, and smart cities. Our team has leveraged this collective experience to create the process that brings community broadband into the 21st century. In addition to consulting Lit builds and operates locally branded networks to underserved communities through private public partnerships.

Katapult Engineering has been a leading OSP engineering, software development, and consulting firm since 1991. Their work ranges from being the boots on the ground for local utilities and fiber companies to developing software solutions to make collecting and processing this information easier than ever before.

No matter the requirements of the project, Katapult leverages their existing software solutions and creates new ones to help get the job done safer, faster, and more precisely. Based in Dillsburg, Pennsylvania, Katapult is a valued partner with PPL Electric Utilities and local engineering firms specializing in broadband deployment. They are industry experts and Katapult Pro is a go-to solution for utilities and third-party attachers across the country.

Ice Miller LLP provides growth and development strategies to urban and rural clients in broadband telecommunications and network solutions; public-private partnerships; economic development; alternative financing solutions; and government relations and public policy. For over 20 years, Ice Miller's Broadband & Telecommunications team has offered insight and comprehensive solutions to broadband challenges facing government, non-profit, and private entities. Ice Miller's extensive legal practice includes deep experience in the areas of Public Finance, Real Estate, Construction, Transportation, Infrastructure, Utilities, Smart Cities, and others, should legal services in such areas become necessary for the project.

1 Trends Review

Overview of Broadband Technologies

The Federal Communications Commission (FCC) currently defines broadband as a minimum of 25 megabits per second (Mbps) download speed and 3 Mbps upload speed.[10]

Broadband is characterized and delivered by a range of technologies such as digital subscriber line (DSL), cable, fiber optics (fiber), fixed wireless, cellular/ mobile wireless, and satellite.

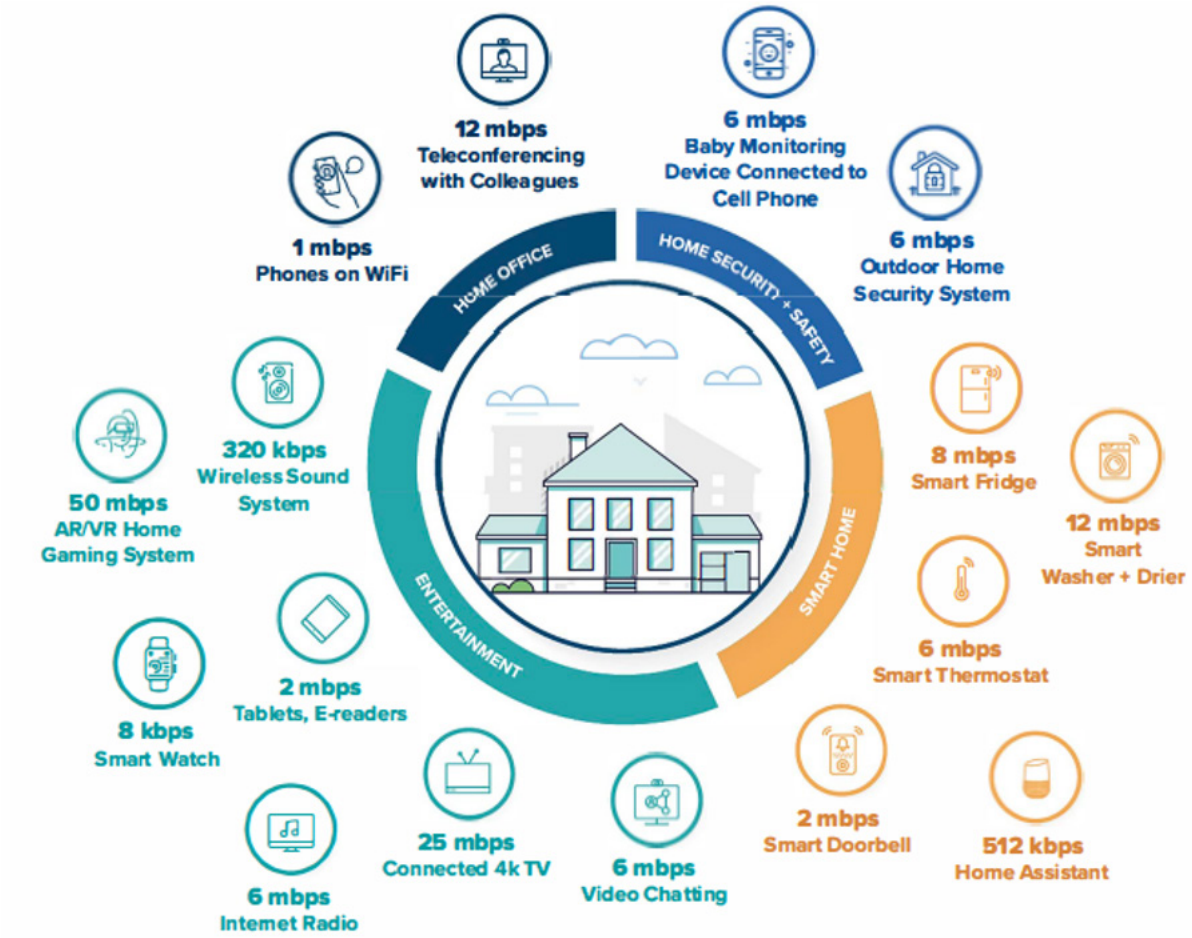
DSL and Cable Broadband

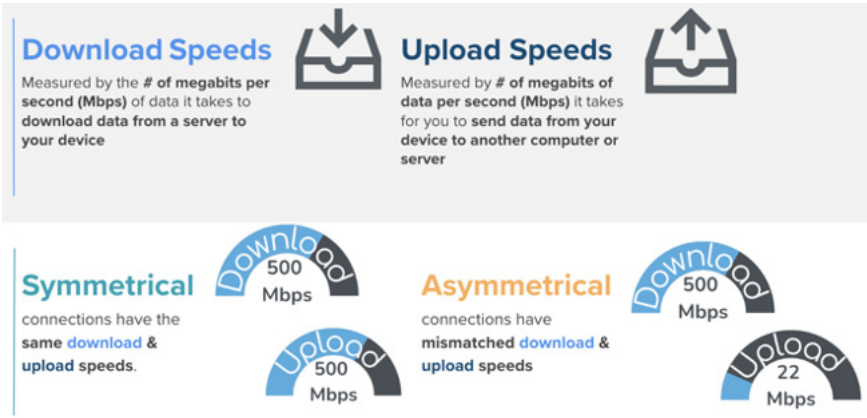
The early days of broadband were dominated by DSL, which leverages existing copper telephone lines with download speeds from 5 to 35 Mbps and upload speeds from 1 to 10 Mbps, and cable, which uses existing cable television lines and supports download speeds from 10 to 500 Mbps and upload speeds from 5 to 50 Mbps. The ability to leverage existing infrastructure made these technologies a cost- and time-effective broadband deployment solution. Both cable and DSL typically offer asymmetrical speeds (i.e., differing download and upload speeds) and are limited in bandwidth, and as such are quickly being replaced by fiber as communities' technology of choice.

Fiber Broadband

Marked increases in remote work, education, and healthcare and the expansive adoption of connected devices has heightened demand for higher bandwidth and internet speeds. Fiber offers download speed from 250 to 1,000 Mbps and upload speed from 250 to 1,000 Mbps. The graphic below shows the bandwidth needs of common in-home connected devices.

[10] Discussions are underway at the FCC to increase this definition.





Fiber broadband is able to deliver symmetrical (i.e., same download and same upload speed) gigabit (and higher) speeds, be upgraded to meet changing demands without additional construction (see below), and provide robust network redundancy.

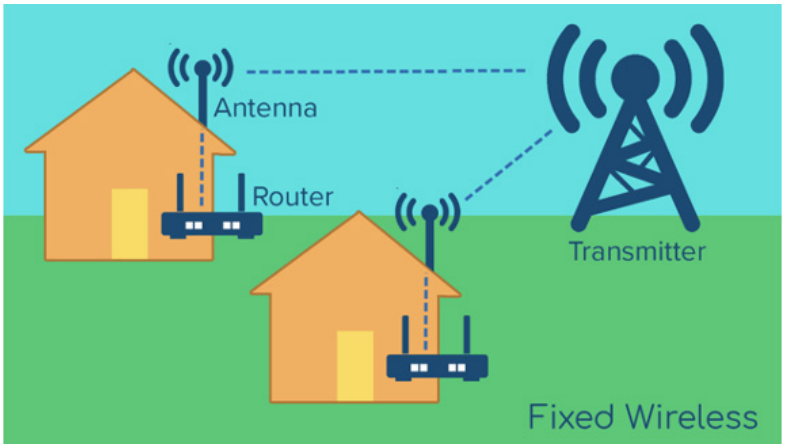
Fiber is “future-proof” in that, once buried or strung aerially, upgrading the speeds traveling over the network does not require additional construction. Instead, the electronics that send and receive data through the fiber network are swapped out in order to increase bandwidth. As a result, fiber infrastructure can last for decades with little-to-no maintenance and is not susceptible to corrosion or electrical interference. These qualities

differ significantly from predecessor broadband technologies.

A technology once limited to densely populated areas, federal dollars dedicated to broadband expansion have enabled fiber networks to be deployed in less populous, more rural communities. This will be discussed in more detail in our grants analysis.

Wireless - Fixed and Mobile

Fixed wireless networks provide broadband using a radio link to connect two fixed points. Unlike DSL, cable, and fiber, fixed wireless does not require a wired connection. As a result, it can be a great option for communities facing geographical or other challenges that have, to-date, been prohibitive for wired network deployment. Fixed wireless plans typically meet the FCC's broadband speed definition, but higher speed symmetrical service is not available via fixed wireless in the consumer market.



Mobile / cellular wireless is deployed on mobile devices such as cell phones, tablets and mobile hotspots. Although cellular availability is extensive across the country, many rural areas still struggle with coverage. Cellular internet has its place in our "on the go" society, but is not tenable as a primary source of broadband connectivity. Cellular internet often comes with data caps that limit total data usage per month or throttles data transfer speeds at a certain limit. Cellular networks can also become overburdened with high volume usage which can contribute to unreliability, causing speed variance depending on time of day. For example, we heard from many Berks County stakeholders during our Community Assessment and got mixed feedback on the reliability of mobile hotspots.

A Moment on 5G

The next generation of wireless technology, known as 5G, utilizes a different spectrum/ radio frequency than prior generations. mmWave 5G is an ultra-high frequency that can achieve download speeds in gigabits per second, and will provide remarkable bandwidth and speed. mmWave 5G allows for massive amounts of data to be transmitted, but can only travel short distances and is heavily impacted by obstructions. For example, it is projected that a mmWave 5G antenna signal can only travel approximately 1,500 feet without obstructions and must be backhauled by fiber. While 5G has its use cases, **successful deployment of 5G networks will still require significant investment in fiber.**

Satellite

A prominent option for those in highly rural areas with poor cellular coverage, satellite internet has traditionally been known for its many limitations. This includes monthly data caps and high latency (i.e., response time). The service is also subject to disruption by geographic challenges, such as dense tree cover, as well as inclement weather. Speed offerings range from 12 up to 100 Mbps in the near future.

Recent advancements in Low Earth Orbit (LEO) satellite technology, such as SpaceX's Starlink, are positioned

to dramatically improve the speed and reliability of satellite service. Whereas traditional satellite providers use a single satellite to provide service, LEO satellite providers deploy a constellation[11] of satellites that are much closer to the earth. This allows for better coverage and speeds. However, the service is still subject to speed limitations and variations. Another drawback of Starlink is that there is a long waitlist in most areas, including Berks County where residents have to put a downpayment on equipment that may take in excess of a year to receive.

Market Trends

Public safety

There are many emerging technologies designed for public safety including situational awareness for school campuses, police body and in-car cameras, gunshot detection microphones, and contact tracing and other disease prevention. These monitoring and prevention technologies are designed to create safe "smart cities" of the future and many of them are dependent on wireless broadband.

Healthcare

Telemedicine has grown in popularity since the onset of the COVID-19 pandemic. High-risk patients or those who live in remote areas far from treatment centers benefit greatly from telemedicine visits. Access to high-speed broadband is paramount for these virtual video conferencing appointments to work properly. These on-demand appointments also bring greater efficiency to healthcare and time-saving benefits.

Manufacturing

Manufacturing relies heavily on connectivity: tracking and monitoring shipped goods to estimate delivery times and manage production quotas; using GPS tracking devices in tractor trailers, shipping containers and/or pallets; and web-based asset management tools to monitor equipment health, maintenance cycles, and track depreciation.

Digital Commerce

Whether the internet is used to operate full-time online business or as an alternative selling channel, the ability to purchase items without the need for human intervention is a standard today. According to the US Census Bureau, e-commerce sales increased by $244.2 billion or 43% in 2020[12]. Much of this increase was likely brought on by the pandemic, but it shows that many Americans will use digital retail channels to purchase goods. Connectivity for online businesses such as coaches or personal trainers is also important for video conferencing to interact with their clients and the internet is the primary form of communication between most businesses and their customers.

Transportation

Intelligent transportation systems integrate advanced communication technologies into vehicles and infrastructure. Technologies such as traffic cameras and digital construction signage have been a daily part of life in the country for some time, and new technologies are advancing every day. Technologies such as connect-

[11] https://www.starlink.com/technology

[12] Annual Retail Trade Survey (ARTS) https://www.census.gov/programs-surveys/arts.html

ed & autonomous vehicles (CAVs) and smart parking systems aim to provide both convenience and enhanced safety. These systems all rely on high-speed connections to function properly.

Utilities

Advanced metering has also been implemented as a cost saving technology in many communities. This technology offers two-way communication between smart meters on customers' homes, which allows for remote monitoring and data management.

Connected solutions for electric and water utility monitoring are also prevalent. These technologies enable utility providers to become more efficient with supervisory control and data acquisition (SCADA) systems and real-time reporting. SCADA continues to grow across the country with market size exceeding $30 billion in 2019[13]. These systems reduce costs to provide residential utility services, which saves customers money.

Agriculture

Access to fast, affordable and reliable internet increases the sustainability of farms. Wireless soil and moisture sensors help farmers efficiently water their crops and anticipate ample harvest windows. Today's farming is done on tight margins and crop yield is crucial, and the use of software based solutions harnessing sensor monitoring of humidity, temperature, and soil quality help increase yield. Data collection allows farmers to analyze crop health and plan accordingly. Other advanced technologies such as drones are used to monitor crops and autonomous tractors also help reduce labor costs.

Case Study:

Connecting York County, Pennsylvania

York County, home to 448,000 residents in Pennsylvania, engaged in a feasibility study in late 2020 in conjunction with a CARES Act project leveraging existing conduit along the Heritage Rail Trail. York was able to build 16-miles of fiber into rural areas of the County with CARES funds. The County also purchased two mobile towers to bring immediate connectivity to the rail trail, offering free WiFi to trail-goers and those near the trail. As a direct result of the feasibility study and success of the CARES Act project, York allocated up to $25,000,000 of their ARPA funds for broadband. $5,000,000 was set aside for an urban wireless project and the remaining funds were allocated to build out a County owned middle mile network. The middle mile will be used to attract providers to build last mile networks in the Southern part of the County where the cost per household passed has been a challenge to getting high-speed internet. The County chose the southern part of the County to start their middle mile project based on survey and speed-test data collected during the feasibility study that showed the greatest need was there. Construction on the middle mile is set for the end of 2022. York also selected Lit Communities to become a last mile provider to ~3,000 residents along the Heritage Rail Trail at no cost to the County. This is being achieved through a private public partnership where the County will leverage their fiber and make revenue for every home Lit Communities passes in their build.

Case Study:

Closing the Digital Divide for Low-Income, Senior and Special Needs Residents Montgomery County, Maryland

Montgomery County, Maryland has proven to be a leader in digital equity and inclusion through the establishment of the Montgomery Connects program. According to their website, *Montgomery Connects is the County's digital equity program operated by the Department of Technology & Enterprise Business Solutions (TEBS), Office of Broadband*

[13] Global Market Insights Report- Report ID: GMI1925 Published: Jan 2020

Programs (OBP). The focus is (1) to ensure all households have access to robust and reliable home broadband, and (2) that everyone has access to a device to use the internet and (3) the skills to use technology and the internet for daily living, civic engagement, and participation in the digital economy. This focus on digital equity is evident in several services offered through Montgomery Connects[14].

Main Street Connect is an apartment complex that offers free or low cost symmetrical internet to special needs and low-income residents through MoCoNet (as detailed below), additionally providing digital training, 24/7 customer service, free wifi in public spaces, online security, and parental and access controls. This development is purpose-built to promote digital equity and independence for disadvantaged residents (and their families) through services and education[15].

As detailed in the County's Digital Inclusion summary, I*n 2021, Montgomery County Maryland, the Maryland Office of Statewide Broadband, and the University of Maryland Extension hosted the Maryland Digital Inclusion Education Summit bringing together libraries, schools, digital inclusion programs to discuss development of digital equity curriculum and programs across the state. The State of Maryland has provided $4 million in the FY22 budget to the University of Maryland Extension to create a new division to focus on supporting, training, developing curriculum, and disseminating awareness and educational opportunities to bridge the digital divide and support internet adoption statewide. Summit participants shared information about local on-going digital equity initiatives and programs, and talked about how to best meet future needs*[16].

Montgomery Connects

Services	Training & Resources
MoCoNet is the County owned 600-route-mile fiber network designed to provide an option for low income and special needs residents for their personal and family use to alleviate the burden of paying fees. This service is free for residents of select affordable housing developments that also have paid Verizon and Comcast service options. MoCoNet subscribers additionally benefit from free access to a smart home mesh WIFI system with 24/7 hour customer service, provided by Plume. Montgomery County also participates in the **Affordable Connectivity Program (ACP)** to help eligible low income households obtain discounts on their service packages and one time $100 discount for a laptop, tablet or desktop computer. The Montgomery Connects website also provides resources and information on other **low cost internet services provided by incumbent providers** such as Comcast's "Internet Essentials", RCN's "Internet First", and the Verizon "Federal Lifeline" Programs, including eligibility criteria and instructions on how to apply.	**The Computer 4 You** program is providing 40,000 Chromebooks to residents in need. Funded by two Federal grants totalling $15.9 million, the website gives detailed information on how to participate in the program and easy appointment scheduling. It also includes a ticker to inform the public of the progress of the program to date. **Senior Planet Montgomery** (Through the AARP) provides free digital literacy training and support to residents "60 years and better". This program includes digital and in-person training courses on digital literacy, digital finance, and online fitness and health courses. As 30% of Montgomery County land is used for agriculture, the **Rural Broadband initiative** focuses on educating rural residents on the broadband services available to them, and has an ongoing commitment to expanding wired broadband access to the underserved rural community. This initiative encourages rural residents to utilize their 311 line to file a cable complaint about lack of service, and provides a form for corrections to their rural broadband data findings as areas get connected.

[14] https://www.montgomerycountymd.gov/obp/digital-equity.html

[15] BroadbandCommunities Magazine, Published March/April 2021: https://www.bbcmag.com/property-of-the-month/closing-the-digital-divide-for-low-income-and-special-needs-residents-main-street-connect

[16] https://www.montgomerycountymd.gov/obp/Resources/Files/digitalequity/digi_inclusion_summit_1.pdf

2 Market Service and Incumbent Analysis

Objective

This Market Service & Incumbent Analysis evaluates the strength of the current broadband market in Berks County. This analysis will enable Berks County to target and prioritize areas that are most in need of broadband, and allow for strategic decision making to minimize risk and amplify success in bridging digital divides in such markets.

Methodology

Lit Communities used publicly available broadband data sources and subscription-based tools to thoroughly understand the existing internet service provider (ISP) landscape in Berks County and then coalesced these sources to:

- Evaluate current ISP service offerings and pricing;
- Identify unserved and underserved areas within Berks County by transmission type;
- Identify local fiber network ownership, including middle mile fiber networks and long haul fiber networks that may be leveraged for middle mile purposes, and their redundancy;
- Determine which of such areas are likely to experience broadband expansion through the FCC's Rural Digital Opportunity Fund (RDOF) program; and
- Evaluate broadband adoption and digital inclusion across Berks County.

Data Sources and Purpose:

Source Name	Source Type	Source Description	Data Collected & Analyzed	Purpose
National Telecommunications Information Administration (NTIA)	Public	Federal agency focused on creating programs and policies that increase access to broadband nationwide [1.1]	Broadband speed definitions for unserved and underserved locations [1.2]	Identifying unserved, underserved, and served areas
Federal Communications Commission (FCC)	Public	"Federal Agency responsible for implementing and enforcing America's communications law and regulations" [1.3]	FCC Form 477	Determine broadband incumbents and technology penetration
			RDOF (Rural Digital Opportunity Fund) Auction 904	Evaluate areas where broadband expansion may be expected
Purdue Center for Regional Development (PCRD)	Public	Purdue University research center that pursues socio economic progress of the different regions across the U.S. through collaborative innovation [1.4]	Digital Divide Index (DDI) and Digital Distress Rating	Guide communities on whether additional investment is needed in infrastructure and/ or digital literacy
BroadbandNow & BroadbandSearch	Public	Online databases of internet service options available in a given area [1.5] & [1.6]	Advertised internet service offerings including providers, speed, price, and technologies	Determine broadband speed and corresponding price

Data Sources and Purpose:				
Source Name	**Source Type**	**Source Description**	**Data Collected & Analyzed**	**Purpose**
FiberLocator	Subscription	Online telecommunications database of fiber infrastructure [1.7]	Existing fiber infrastructure in	Define metro fiber networks (regional level - middle mile; local level - last mile) to evaluate network redundancy. Define long haul fiber networks (national level) to be leveraged by the County to connected middle mile

Results

1. Broadband Internet Service Providers

There are several Internet Service Providers (ISPs) in Berks County. As further detailed in this report, many of these providers are limited to specific geographic areas and a significant number of them are for specific user types. As seen below, the majority of the fiber service providers found in Berks County serve commercial/ business customers only, implying that their footprint in Berks County has been established through contracting by school districts, the IU, the County, WSPs, and local businesses that have multiple locations (for the purpose of creating a private WAN and to consolidate internet and telecommunication services).

The FCC Form 477 Fixed Broadband Deployment Data (which is evaluated by census block) [1.8], identifies the following ISPs in Berks County[1]:

Internet Service Providers (FCC Form 477)[2]		
DBA Name	**Technology Code**	**Customer Type**
Armstrong Utilities, Inc.	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business & Residential
Atlantic Broadband Finance, LLC	Cable Modem – DOCSIS 3.1	Business & Residential
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Blue Ridge Communications	Cable Modem – DOCSIS 3.1	Business & Residential
BOB, LLC	Terrestrial Fixed Wireless	Business
Borough of Kutztown	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Residential
Broadview Networks Holdings, Inc.	Other Copper Wireline	Business
C Spire	Other Copper Wireline	Business
CenturyLink	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
	Other Copper Wireline	Business
Cogent Communications	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Comcast	Cable Modem – DOCSIS 3.0	Business
	Cable Modem – DOCSIS 3.1	Business & Residential

[1, 2] Lit has been made aware that some of the providers listed in the FCC dataset have since been acquired or are otherwise ‘defunct’; some may no longer be in service or could be consolidated by another business.

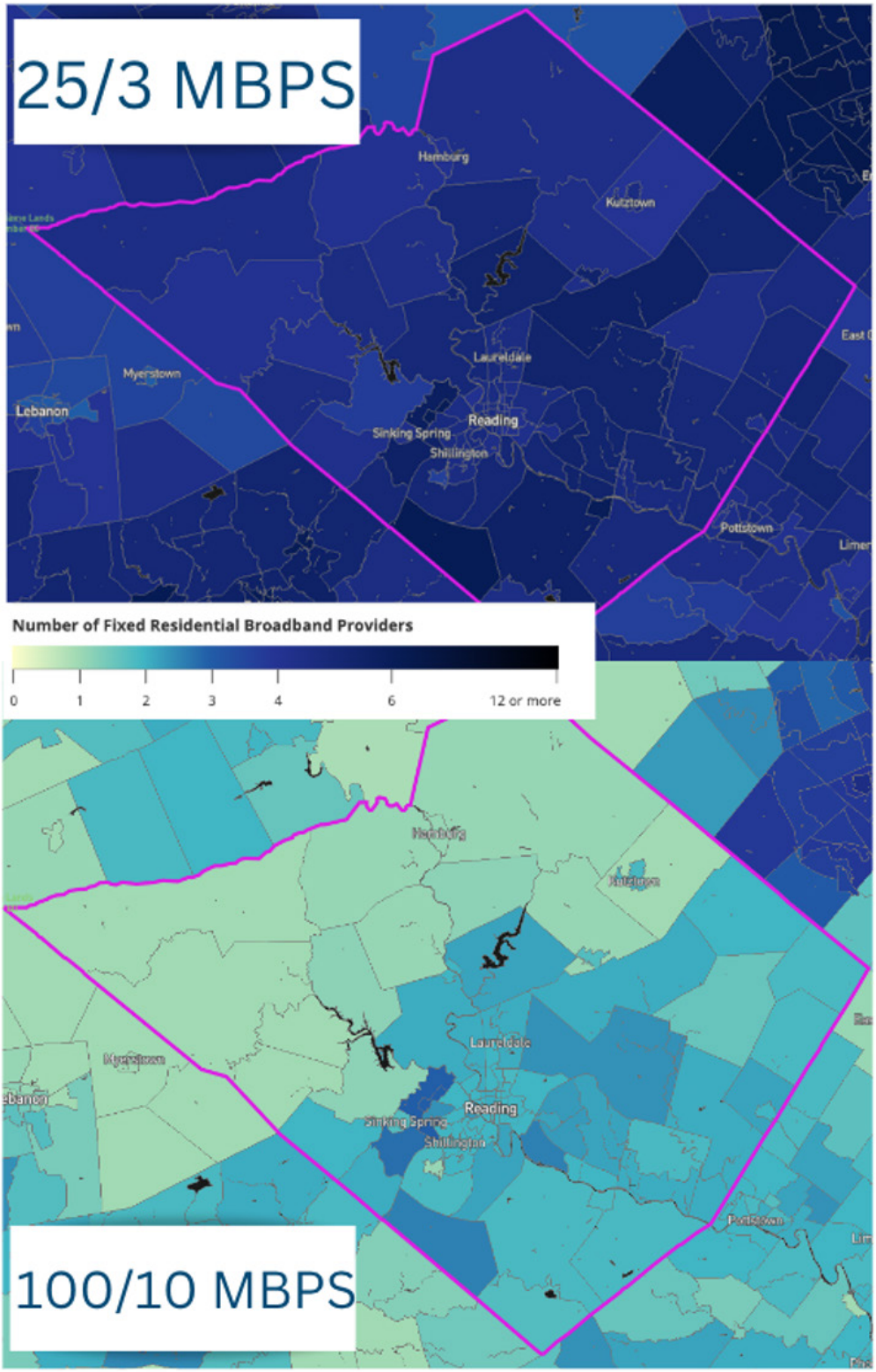
Internet Service Providers (FCC Form 477)[2]		
DBA Name	**Technology Code**	**Customer Type**
Consolidated Communications	Other Copper Wireline	Business
Crown Castle Fiber	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
EarthLink Business, LLC	Asymmetric xDSL	Business
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Eastern Time Inc	Terrestrial Fixed Wireless	Business & Residential
FirstLight	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Frontier Communications Corporation	ADSL2, ADSL2+	Business & Residential
	Asymmetric xDSL	Business & Residential
	VDSL	Business & Residential
Fusion	Other Copper Wireline	Business
Fusion Cloud Services, Inc.	Other Copper Wireline	Business
GCI Communication Corp.	Satellite	Business
HughesNet	Satellite	Business & Residential
Ironton Telephone Co	VDSL	Business & Residential
MAW Communications Inc.	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business & Residential
MCI	Other Copper Wireline	Business
NetCarrier Telecom, Inc.	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
	Other Copper Wireline	Business
PAETEC Business Services	ADSL2, ADSL2+	Business
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
PAETEC Communications, Inc	ADSL2, ADSL2+	Business
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
PenTeleData Limited Partnership I	Cable Modem – DOCSIS 3.0	Business
	Cable Modem – DOCSIS 3.1	Business
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
River Valley Internet	Terrestrial Fixed Wireless	Residential
Service Electric Cable TV	Cable Modem – DOCSIS 3.0	Business & Residential
Service Electric Cablevision, Inc.	Cable Modem – DOCSIS 1, 1.1 or 2.0	Business & Residential
	Cable Modem – DOCSIS 3.0	Business & Residential
	Cable Modem – DOCSIS 3.1	Business & Residential
T-Mobile	Terrestrial Fixed Wireless	Business & Residential
Tailwind Voice And Data	Cable Modem other than DOCSIS 1, 1.1, 2.0, 3.0, or 3.1	Business
Telefonica USA	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Telesystem	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
TPx Communications	Other Copper Wireline	Business

Internet Service Providers (FCC Form 477)[2]		
DBA Name	**Technology Code**	**Customer Type**
US LEC of Pennsylvania, LLC	ADSL2, ADSL2+	Business
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Verizon Pennsylvania LLC	Asymmetric xDSL	Business & Residential
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business & Residential
Viasat Inc	Satellite	Business & Residential
VSAT Systems, LLC.	Satellite	Business & Residential
Windstream Conestoga Inc.	ADSL2, ADSL2+	Residential
		Business & Residential
	Asymmetric xDSL	Residential
		Business
		Residential
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Residential
		Business
		Residential
	VDSL	Residential
		Business
		Residential
Windstream D&E Inc.	ADSL2, ADSL2+	Residential
		Business & Residential
	Asymmetric xDSL	Residential
		Business
	VDSL	Residential
		Business & Residential
Windstream D&E Systems Inc.	Asymmetric xDSL	Residential
		Business
Windstream Pennsylvania LLC.	ADSL2, ADSL2+	Residential
		Business & Residential
	Asymmetric xDSL	Residential
	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Residential
	VDSL	Residential
		Business & Residential
XO Communications	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
	Other Copper Wireline	Business
Xtel Communications	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
	Other Copper Wireline	Business
Zayo Group LLC	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Business
Zito Media	Cable Modem – DOCSIS 3.0	Residential

The following ISPS have advertised the following services on Broadbandnow as available to the zip codes within Berks County:

Internet Service Providers (Broadbandnow)		
Internet Service Provider	**Infrastructure Type**	**Customer Type**
Affiniti	Fiber	Business
Armstrong	Fiber	Residential & Business
	Not listed	Business
Astound Broadband Powered by RCN	Cable	Residential
	Copper	Business
Backwoods Wireless	Fixed Wireless	Residential
Blue Ridge	Cable	Residential & Business
Breezeline	Cable	Residential
	Fiber	Business
CenturyLink	Copper	Business
Cogent	Fiber	Business
Comcast	Cable	Residential & Business
Consolidated	Copper	Business
Crown Castle	Fiber	Business
GTT	Copper	Business
Eastern Time	Fixed Wireless	Residential
Evenlink	Fixed Wireless	Residential & Business
FirstLight	Fiber	Business
Frontier	DSL	Residential & Business
Home Net	Fiber	Residential
HughesNet	Satellite	Residential
Irontron Telephone Co	DSL	Residential & Business
Lantek	Fixed Wireless	Business
MAW Communications	Fiber	Residential
NetCarrier Telecom	Fiber	Business
Netlinx Internet	Fixed Wireless	Residential & Business
PenTelData	Fiber	Business
Service Electic Cablevision	Cable	Residential
Service Electric	Cable	Residential
Service Electric Cablevision	Cable	Residential
T-Mobile 5G Home Internet	5G Internet	Residential
Telefonia USA	Fiber	Business
Telesystem	Copper	Business
	Fiber	Business
Verizon	DSL	Residential & Business
	Fiber	Residential
	Copper	Business
Viasat Internet	Satellite	Residential
Windstream	DSL	Residential & Business
	Fiber	Residential & Business
Xtel	Fiber	Business
Zayo	Fiber	Business

Density of Internet Service Providers in Berks County by Speed (2021)



Most of the county is able to choose from 3-4 providers offering basic speeds of 25/3 Mbps.

ISPs offering speeds of 100/10 Mbps are less dense, particularly in the more rural northern areas. In the more populous areas, we notice that the options for high speed internet are limited to between 1-3 providers in many areas.

Map Source: https://broadbandmap.fcc.gov/#/

DSL, cable, fiber, fixed wireless, and satellite service are all currently available in Berks County, but the transmission type and the speed thereof are dependent on the location within the county.

1. Speed and Price

The following speeds and corresponding price ranges and maximum speeds are available in Berks County, according to data from BroadbandNow (see Appendix E).

Advertised Speeds and Prices - Incumbent Providers

Customer Type	Technology:	Max. Download Speed (Mbps):	Max Upload Speed (Mbps):	Min. Starting Price	Max. Starting Price
Residential	Cable	1500	150	$39.99	$144.95
	DSL	300	200	$35.99	$74.99
	Fiber	1000	880	$39.99	$154.99
	Fixed Wireless	100	25	$34.99	$75.00
	Satellite	100	3	$49.99	$159.99
	5G Internet	182	23	$50	Not Available
Business	Cable	Not Available	1000	$54.95	Not Available
	Copper	1.5	1000	$41.99	Not Available
	DSL	15	300	$35.00	$59.99
	Fiber	940	1000	$59.99	$109.95
	Fixed Wireless	4	300	$49.99	$60

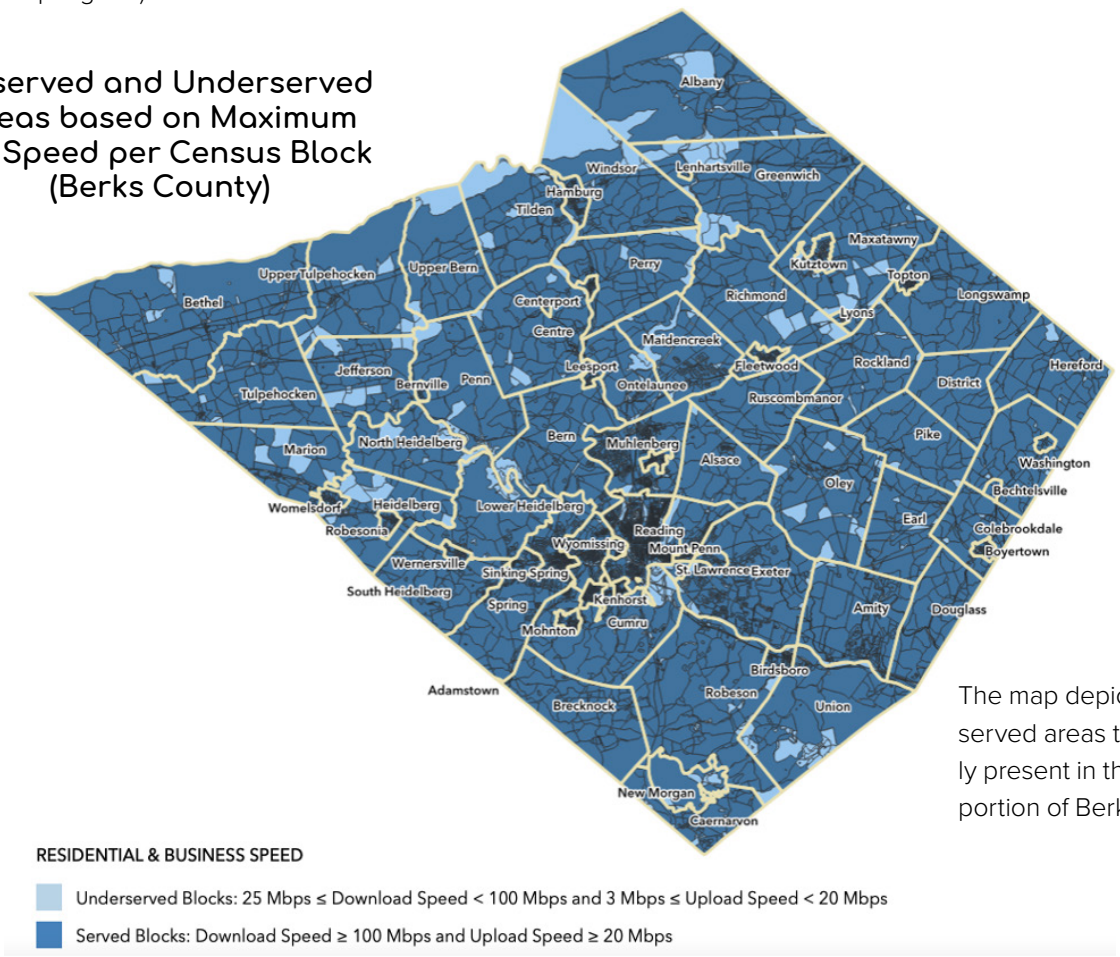
[3] FCC Form 477 data is cataloged as "Residential and Business", "Residential", and "Business'', depending on the type of customer. There is no speed data available for the "Business"-only category.

[4] National Telecommunications and Information Administration – NTIA (2022). Economics of Broadband Networks: An overview. Available at: https://broadbandusa.ntia.doc.gov/sites/default/files/2022-03/Economics%20of%20Broadband%20Networks%20PDF.pdf

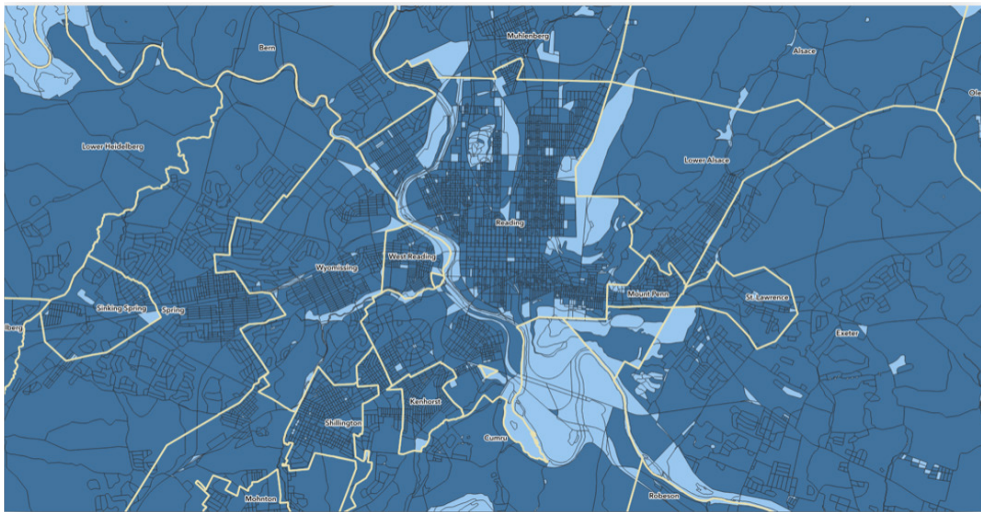
2. Unserved and Underserved Areas

The following broadband speed map is based on FCC Form 477 Fixed Broadband Deployment data [1.8][3], representing the highest ISP speed per census block and considering the definition of the NTIA concerning "served", "underserved", and "unserved" locations (see map legend)[4].

Unserved and Underserved areas based on Maximum ISP Speed per Census Block (Berks County)



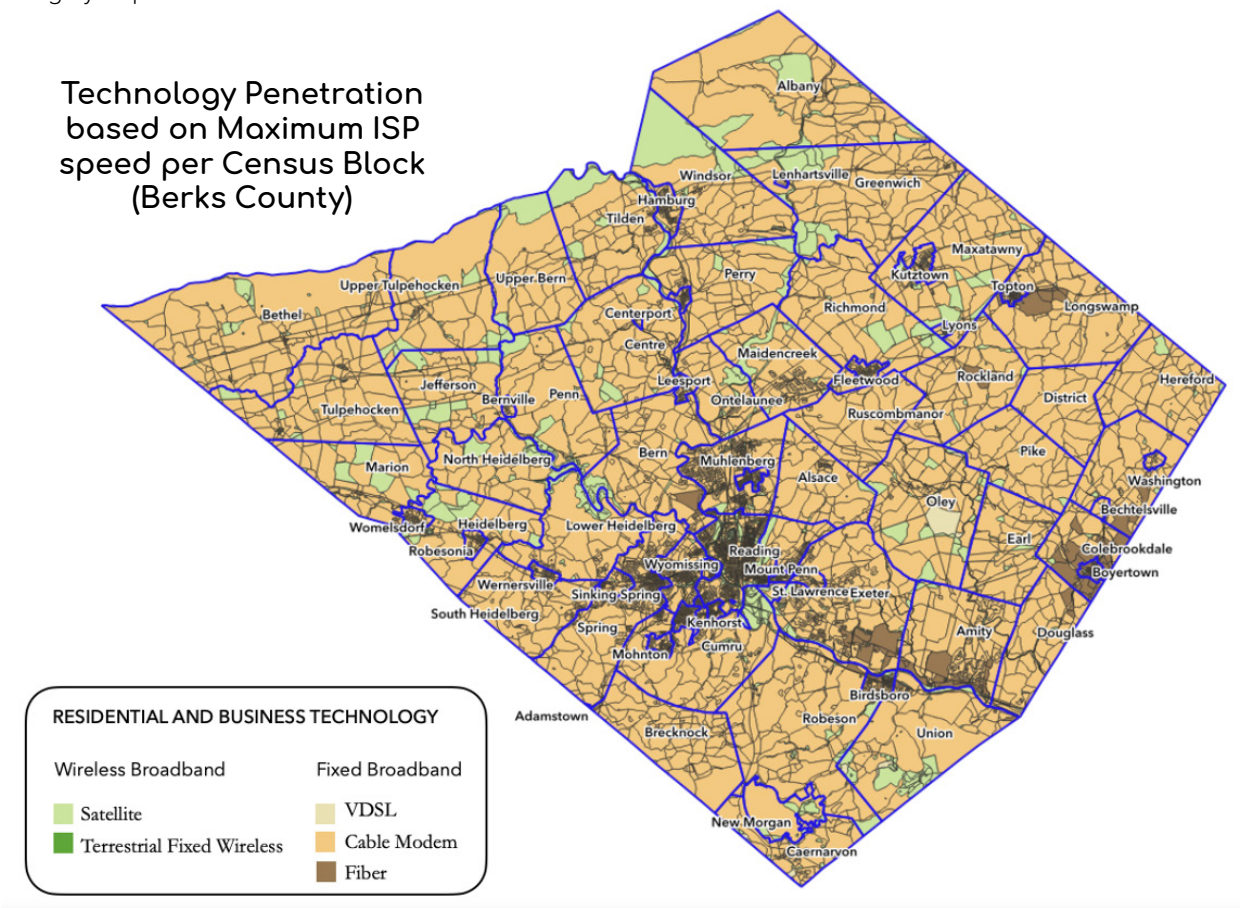
The map depicts underserved areas that are largely present in the northern portion of Berks County.[5]



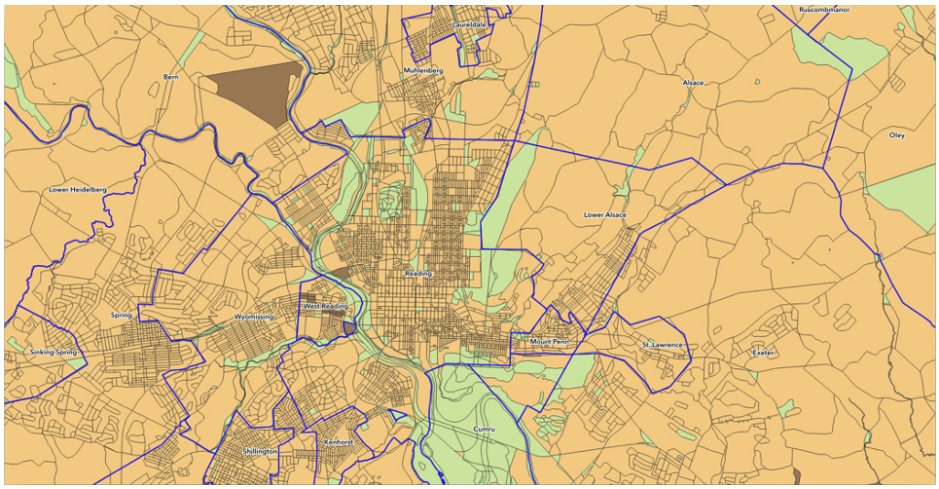
Unserved and Underserved areas based on Maximum ISP Speed per Census Block (Reading Area)

[5] Federal broadband coverage depictions can be inflated as a result of Form 477 filing requirements: in their submissions, so long as the reporting provider "does or could . . . without an extraordinary commitment of resources" serve at least one location within a census block, the provider can depict the entire census block as served by broadband at the reported speed.

As the following map indicates (and FCC penetration data supports), there is a significant cable broadband presence in Berks County, but a **limited fiber footprint,** which is primarily located in the eastern and south-eastern portions of the county. Further detail on the benefits and importance of prioritizing fiber can be found in the Trends Review of this report. Further, several areas in the northwestern region of the county remain highly dependent on satellite service.[6]



Technology Penetration based on Maximum ISP speed per Census Block (Reading Area)



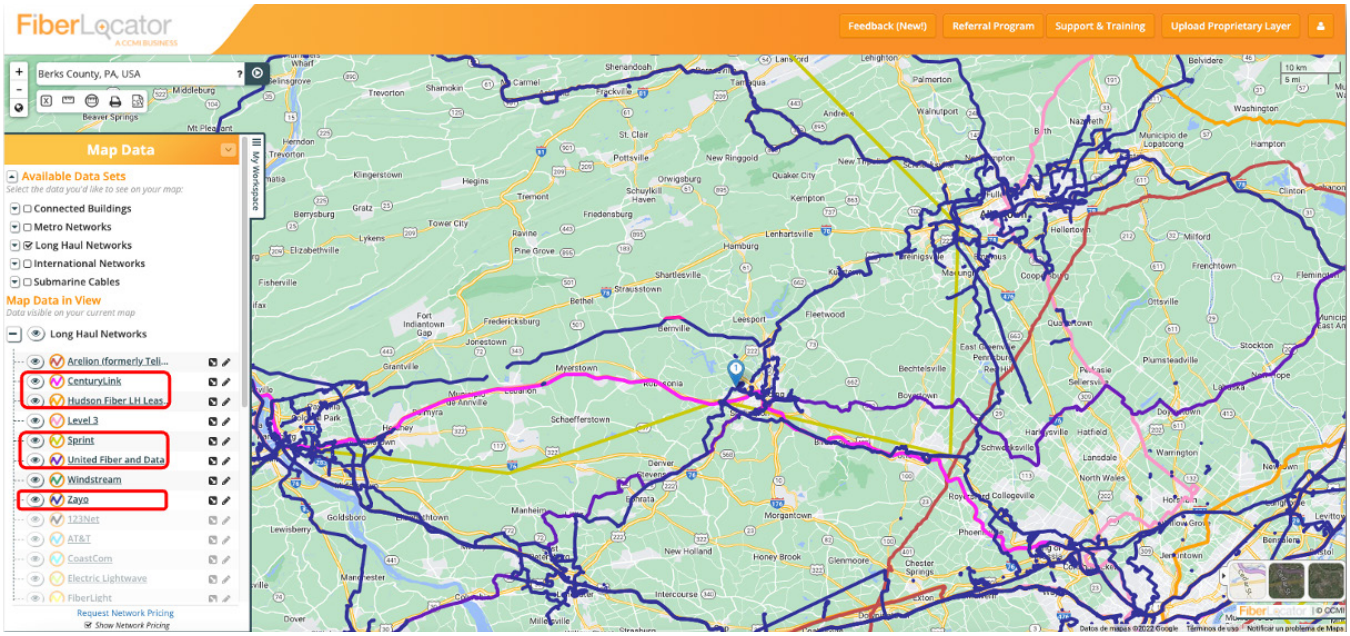
The areas in which satellite service is the predominant service option should be particularly targeted for broadband expansion, and are concentrated in the northern region of Berks County as depicted in the map at left. If the county pursues broadband expansion in the Reading area, Census Blocks with satellite as the predominant option should be the first targeted.

[6] Areas surrounding Reading that show satellite service on this map do not indicate the cable service is completely unavailable; however, satellite service is reporting the highest speeds in those census tracts.

3. Existing fiber infrastructure in the County and surrounding areas

There are several long haul fiber[7] networks running through Berks County, including those of CenturyLink, Hudson Fiber, Sprint, United Fiber and Data, and Zayo (see map legend below). While long-haul networks do not provide end-user services (and thus will not be reflected on the above business and residential service maps), evaluating these networks is an important step in the process because they could potentially be leveraged to build out additional middle mile networks, which ultimately facilitate more last-mile connectivity. Middle mile expansion is discussed further in the recommendations section.

FiberLocator - Long Haul Networks

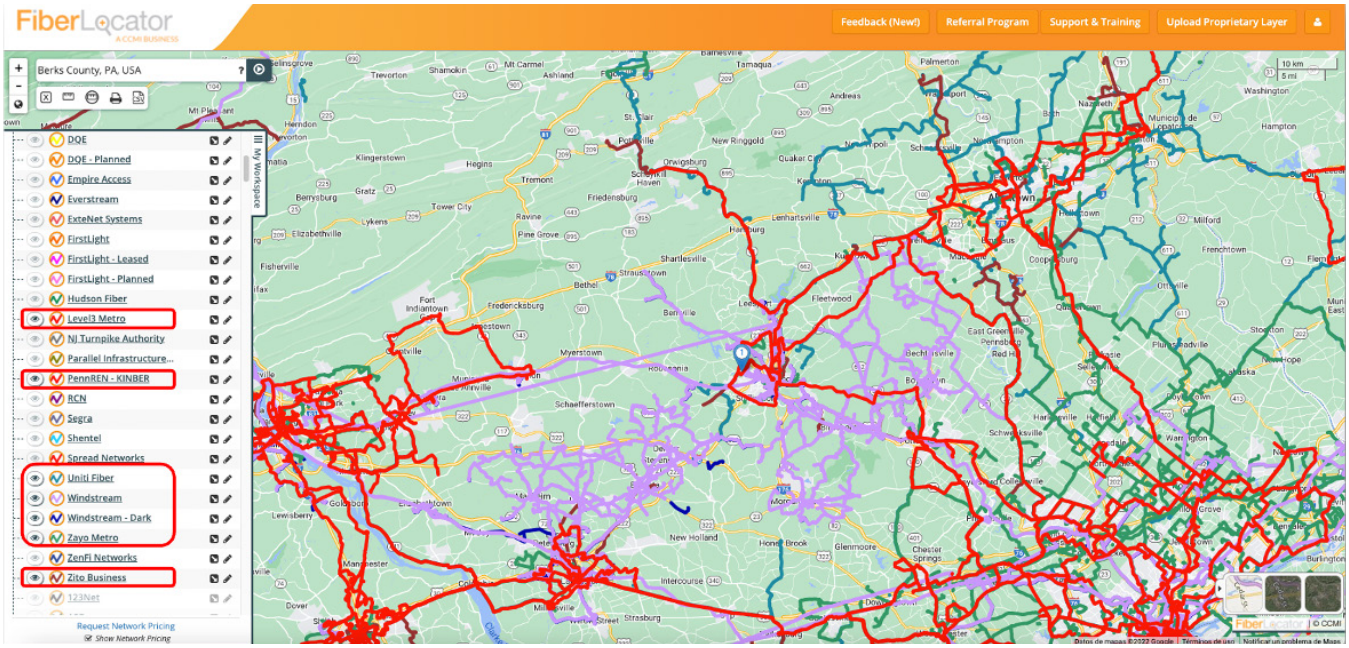


[7] **Long-haul** refers to the network connection over long distances, such as nationwide, between various towns, cities, and other political subdivisions. **Middle-mile** refers to the network connection between the last-mile and the internet. For example, in a rural area, the middle mile would connect the town's network to a larger metropolitan area where it interconnects with major broadband carriers' long-haul networks. **Last-mile** is the final leg of an internet connection between a service provider and the customer. For example, the last-mile is the connectivity (from a service provider) that passes a home or business that allows them to use the internet once connected through what is called a "lateral" connection.

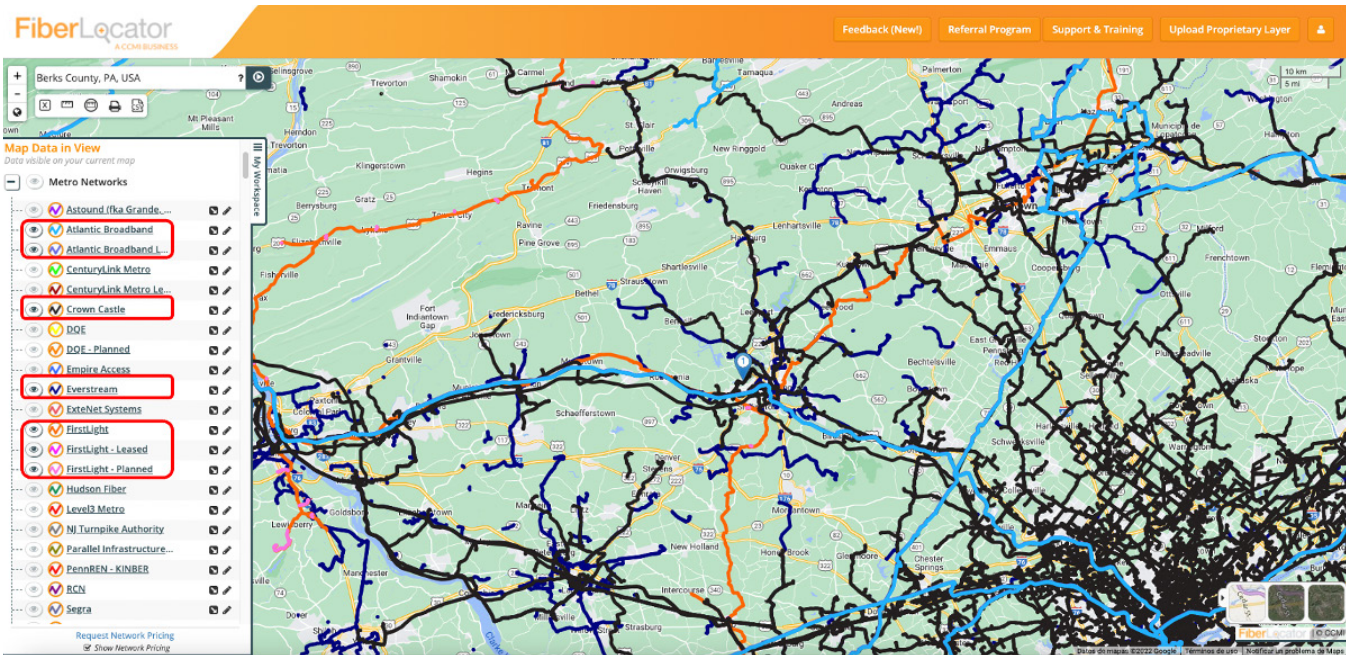
Robust middle mile fiber acts as the core broadband infrastructure from which ISPs provide last-mile services, and offers secure, redundant networks for anchor institutions (especially first responders such as emergency services, hospitals, fire stations, and police departments).

There are multiple ISPs middle mile networks present in Berks County (see map legend of the following two maps below) that could be leveraged for additional last-mile expansion. However, much of the existing middle mile fiber infrastructure in Berks County lacks network redundancy, making it more subject to disruption.

FiberLocator - Metro Networks to Facilitate Last Mile (Part I/II)



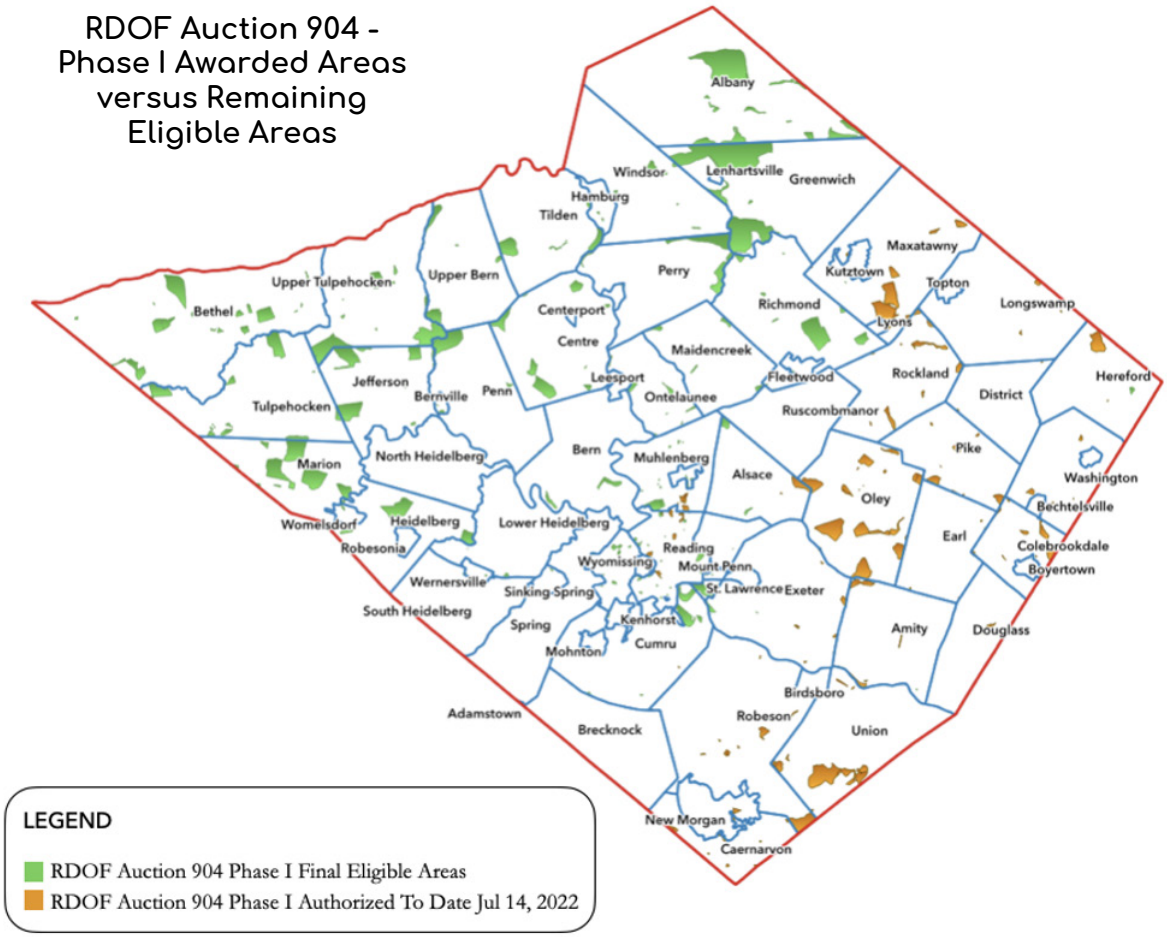
Fiber Locator - Metro Networks to Facilitate Last Mile (II/II)



4. Projected Broadband Expansion in Berks County

The FCC established the Rural Digital Opportunity Fund (RDOF) to provide $20.4 billion over the next ten (10) years to bring broadband service to rural areas [1.9]. The process to allocate this funding is through an auction (Auction 904) that consists of two phases [1.9].

RDOF-eligible census blocks demonstrate those in which the FCC has directly acknowledged that government intervention and investment will be needed for broadband expansion. As of July 24, 2022, Windstream Pennsylvania, LLC was the only authorized winning bidder in RDOF Phase I in Berks County and the corresponding awarded census blocks (approximately 500 locations) are shown on the following map in orange (see also Appendix C).[8] [1.10] These blocks should not be viewed as the only areas in which such intervention and investment are needed in Berks County, but those as particularly struggling with seeing private investment. Investment through the RDOF program alone will be insufficient to address the broadband gaps that persist in Berks County, nor is the County an eligible applicant to this program. Opportunities for Berks County to fill these gaps are discussed further below.



[8] The areas depicted in green are those that remain eligible for Phase II RDOF awards to private providers. There are several remaining unserved census blocks in Berks County that can benefit from RDOF Phase II, particularly in the northern part of Berks County.

5. Digital Inclusion in Berks County

The Purdue Center for Regional Development (PCRD) provides the following two metrics to inform broadband infrastructure investment in a community. As indicated below, the tools are not intended to be comprehensive, but instead to be utilized along with other data to better understand the digital inclusion landscape:

Digital Divide Index (DDI)

The **Digital Divide Index** or **DDI** primarily measures physical access/ adoption and socioeconomic characteristics that may limit motivation, skills, and usage of broadband. Due to data limitations, it was designed as a descriptive and pragmatic tool and is not intended to be comprehensive. Rather, it should help initiate important discussions among community leaders and residents - as is our purpose in including it here.

DDI scores range in value from 0 to 100, where 100 indicates the highest digital divide. It is composed of two scores, also ranging from 0 to 100: the **infrastructure/adoption (INFA)** score and the **socioeconomic (SE)** score. These two scores are combined to calculate the overall DDI score. If a particular geography has a higher INFA score than SE score, efforts should be made to improve broadband infrastructure. **If a particular geography has a higher SE score versus an INFA score, efforts should be made to increase digital literacy and exposure to the technology's benefits.**

The following table showcases the 30 census tracts with the highest digital divide scores in Berks County. A full list of DDI scores for all Berks County census tracts can be found in Appendix E.

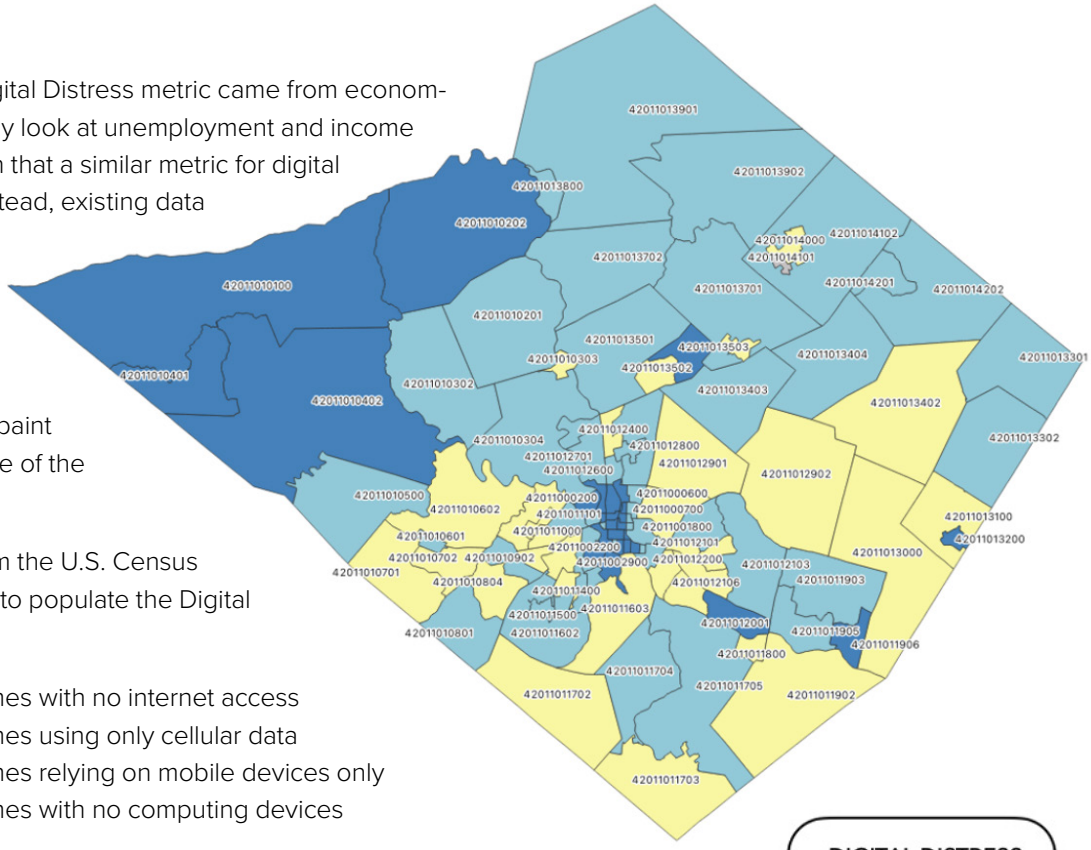
The mixture of both high SE scores and INFA scores of the census tracts with the highest Digital Divide further support our findings of a crucial need to address both infrastructure investment and improvement and increases in digital literacy and broadband adoption across Berks County.

Digital Divide Index
Top 30 Census Tracts with the Highest Digital Divide Scores in Berks County, PA

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
1	42011002500	149.1	15.4	97.80%	37.70%	33.00%	40.40%	52.50%	15.00%	28.60%	2.02	**47.52**	40.44	55.73
2	42011001900	146	11.3	100.00%	42.80%	25.40%	35.90%	35.90%	19.00%	31.50%	1.65	**45.83**	36.52	51.78
3	42011001200	140.5	11.2	100.00%	15.60%	9.40%	24.50%	45.60%	28.30%	41.30%	33.93	26.15	**49.23**	50.75
4	42011000100	144.9	16	58.00%	26.20%	19.90%	26.80%	47.20%	20.30%	33.80%	33.52	31.97	**44.45**	50.27
5	42011001400	153.5	11.7	100.00%	40.20%	25.70%	48.50%	29.40%	9.60%	26.50%	2.24	**44.79**	34.51	49.66
6	42011000900	157.2	12.4	100.00%	24.00%	17.50%	28.60%	28.30%	11.00%	19.90%	36.49	**33.67**	32.08	41.67
7	42011001700	144.4	10	100.00%	26.40%	17.00%	57.80%	16.70%	6.50%	19.80%	4.03	**34.62**	30.36	40.87
8	42011002600	153.4	13.2	91.60%	24.90%	13.30%	27.30%	46.00%	10.30%	21.90%	1.67	31	**31.08**	39.44
9	42011011601	147.6	14.3	98.60%	22.80%	19.20%	12.00%	5.70%	21.90%	20.00%	54.34	**34.08**	28.46	39.11
10	42011000200	176.6	15.3	100.00%	21.10%	18.80%	19.30%	41.80%	11.90%	21.20%	1.59	**32.87**	28.12	38.18
11	42011000400	142.3	11.3	100.00%	25.40%	21.10%	24.90%	23.30%	8.90%	17.80%	15.67	**36.47**	25	37.76
12	42011002100	158	12.7	100.00%	18.80%	16.10%	30.80%	29.40%	7.90%	16.50%	25.86	**30.81**	28.8	37.58
13	42011000800	143	10.6	100.00%	9.00%	18.00%	41.20%	43.90%	7.50%	14.00%	2.18	28.16	**30.01**	37.05
14	42011002200	148.3	11.6	100.00%	17.50%	8.50%	33.30%	42.00%	8.90%	20.90%	3.27	26.28	**31.08**	36.84
15	42011002700	152.3	12.8	93.60%	19.10%	14.50%	11.70%	9.80%	29.80%	27.20%	12.46	**29.5**	28.2	36.39
16	42011001300	142.6	11.9	100.00%	16.80%	9.80%	28.50%	39.50%	6.10%	15.90%	26.84	26.76	**29.97**	36.25
17	42011001600	143	10.9	100.00%	15.10%	9.90%	30.60%	32.50%	5.80%	17.60%	25.07	26.16	**29.24**	35.35
18	42011013200	162.6	14.3	97.60%	25.40%	22.10%	8.00%	6.10%	26.10%	17.40%	11.07	**36.4**	20.75	34.44
19	42011002300	155.4	14.2	100.00%	9.30%	6.20%	39.50%	29.20%	5.10%	19.80%	23.76	21.57	**31.31**	34.42
20	42011001500	153.7	11.7	100.00%	13.00%	7.00%	36.80%	39.00%	10.00%	14.90%	2.82	23.56	**28.94**	33.69
21	42011001800	153.1	13.2	92.80%	13.20%	15.70%	15.50%	19.30%	13.00%	19.70%	22.69	**27.71**	24.79	32.78
22	42011012001	99.8	18.6	90.90%	23.90%	20.00%	17.00%	9.30%	20.10%	13.90%	4.18	**34.82**	19.48	32.6
23	42011002900	163.6	13.4	100.00%	26.20%	10.80%	22.90%	13.50%	16.00%	17.60%	4.18	**30.78**	22.36	32.6
24	42011011101	171.4	19.1	76.2%	20.1%	18.5%	3.3%	15.4%	26.50%	22.20%	1.72	**29.99**	22.44	32.22
25	42011001000	153.5	12.1	100.00%	16.70%	7.20%	34.20%	30.90%	7.30%	15.60%	2.24	25.15	**25.72**	32.09
26	42011002002	159.6	13.7	100.00%	16.00%	13.50%	26.50%	25.50%	5.30%	19.60%	1.63	**28.16**	23.42	31.97
27	42011011906	125.9	19.9	80.80%	19.30%	17.90%	7.60%	18.80%	21.40%	17.90%	5.78	**30.45**	21.62	31.85
28	42011013302	177.6	13.9	85.9%	12.2%	10.8%	10.1%	4%	27.1%	15.7%	42.76	23.59	**25.91**	31.38
29	42011013901	122.6	10.3	98.30%	11.70%	10.40%	6.70%	5.70%	32.10%	24.00%	8.02	**25.2**	24.54	31.21
30	42011010601	175.4	14.6	100.00%	20.80%	20.90%	6.60%	5.80%	28.00%	12.90%	5.72	**33.95**	18.07	31.03

Digital Distress

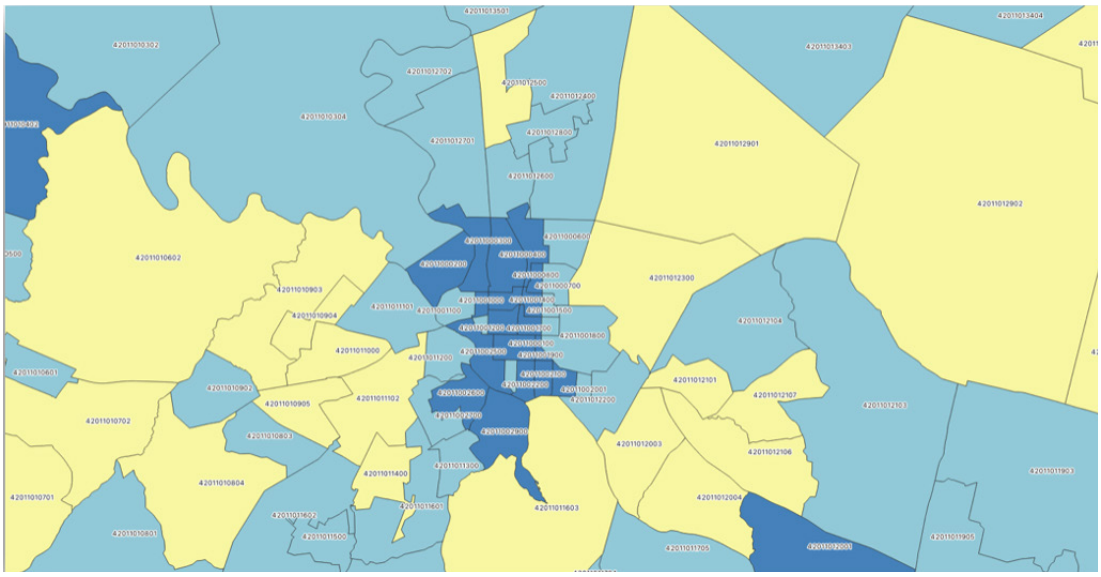
The inspiration for PCRD's Digital Distress metric came from economic distress metrics that typically look at unemployment and income levels and PCRD's recognition that a similar metric for digital distress was not available. Instead, existing data typically looks at broadband access and speed tests. While these have advantages and disadvantages, digital distress should be used alongside other data to paint a different, more robust picture of the digital inclusion landscape.



PCRD used four variables from the U.S. Census American Community Survey to populate the Digital Distress metric:

1. The percentage of homes with no internet access
2. The percentage of homes using only cellular data
3. The percentage of homes relying on mobile devices only
4. The percentage of homes with no computing devices

As seen on the above map, **northwestern Berks County through the central Reading area have the most concentrated areas of high and medium Digital Distress[9]. High Digital Distress indicates that internet adoption is low in these areas.** In the more rural areas this is potentially due to access to adequate infrastructure preventing subscription, whereas in more densely populated areas this is more likely to be a factor of increased reliance on mobile devices as a primary source of internet, socioeconomic factors preventing ability to purchase personal devices and/ or subscribe to internet services, and/ or low digital literacy. Other areas of high Digital Distress in Berks County include Bausmtown, Douglassville, Blandon, Boyertown (as further detailed in the table on the next page).



[9] Comparing the results of these two metrics (DDI and Digital Distress) against the data provided by the FCC highlights a discrepancy between the data: the DDI and Digital Distress highlights several areas that the FCC Form 477 claims are served and, in some cases, covered by fiber. This may be attributable to the census tracts versus census block unit of measurement, and incorporation of data from the U.S. Census in the PCRD tools.

Digital Distress
Census Tracts with High Digital Distress - Berks County, PA

Count	Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
1	42011010202	2239	15.9%	13.3%	18.3%	13.1%	High
2	42011010402	2403	16.1%	16.8%	11.7%	10.7%	High
3	42011013200	2012	13.0%	25.4%	17.9%	22.1%	High
4	42011000800	1241	15.5%	9.0%	31.3%	18.0%	High
5	42011000900	955	17.5%	24.0%	25.8%	17.5%	High
6	42011001000	951	15.8%	16.7%	31.1%	7.2%	High
7	42011001300	991	26.7%	16.8%	44.2%	9.8%	High
8	42011001400	1389	30.9%	40.2%	49.2%	25.7%	High
9	42011001700	1030	14.4%	26.4%	28.1%	17.0%	High
10	42011001900	1011	18.8%	42.8%	38.9%	25.4%	High
11	42011002200	647	27.0%	17.5%	38.6%	8.5%	High
12	42011002500	1159	17.0%	37.7%	35.7%	33.0%	High
13	42011002600	1207	16.7%	24.9%	26.0%	13.3%	High
14	42011000300	749	19.5%	17.2%	39.1%	6.9%	High
15	42011000500	1304	22.5%	15.3%	43.0%	9.9%	High
16	42011011906	1737	14.5%	19.3%	10.4%	17.9%	High
17	42011010401	52	16.9%	16.5%	16.3%	10.4%	High
18	42011002002	1152	42.2%	16.0%	49.4%	13.5%	High
19	42011013503	1616	14.6%	18.5%	10.6%	18.8%	High
20	42011000400	1270	14.6%	25.4%	36.6%	21.1%	High
21	42011010100	1937	14.2%	19.2%	10.8%	16.7%	High
22	42011012001	992	11.2%	23.9%	19.3%	20.0%	High
23	42011002100	856	19.4%	18.8%	41.6%	16.1%	High
24	42011000100	2180	24.7%	26.2%	36.8%	19.9%	High
25	42011000200	1685	18.6%	21.1%	28.7%	18.8%	High
26	42011002900	893	16.2%	26.2%	20.9%	10.8%	High

Conclusions

There is a clear need for digital literacy and improvement of broadband infrastructure in many areas of Berks County, but infrastructure enhancements are particularly needed in the north and spanning into the central area.

Taking a closer look at the Reading area specifically, the data shows that, although there is a high density of providers and various technologies serving the area in its entirety, there are pockets that seem to be lacking infrastructure and are considered underserved. Additionally, we see census tracts with high digital distress (a reliance on mobile devices and/or low subscription to internet services), and several census tracts with high Digital Divide Indexes (which points to the need for infrastructure improvements and socioeconomic factors that need to be addressed), despite higher population counts. As a result, **we recommend that addressing digital equity in Reading, particularly digital literacy and affordability programs, will influence and incentivize existing ISPs that surround but currently do not service these pockets to close these infrastructure gaps.** Please reference the Digital Inclusion section in the Recommendations chapter for further details.

DSL, cable, fiber, fixed wireless, and satellite service are all currently available in Berks County, but the transmission type and the speed thereof are dependent on the location within the county. Among these broadband connection types, cable and satellite are the two main technologies available in the business and residential segment, followed by fiber. In the residential service segment, fiber and DSL are the primary technologies. **Notwithstanding, fiber access in Berks County is very limited for residential use.**

Further, much of the existing middle mile fiber infrastructure in Berks County lacks network redundancy. Due to the importance of middle mile and last-mile fiber both now and in the future, we recommended that Berks County expand this technology throughout its geography wherever possible. **We will explore this further in the Recommendations section of the business plan.**

REFERENCE

[1.1] National Telecommunications and Information Administration – NTIA (2022). About NTIA. Available at: https://www.ntia.doc.gov/about

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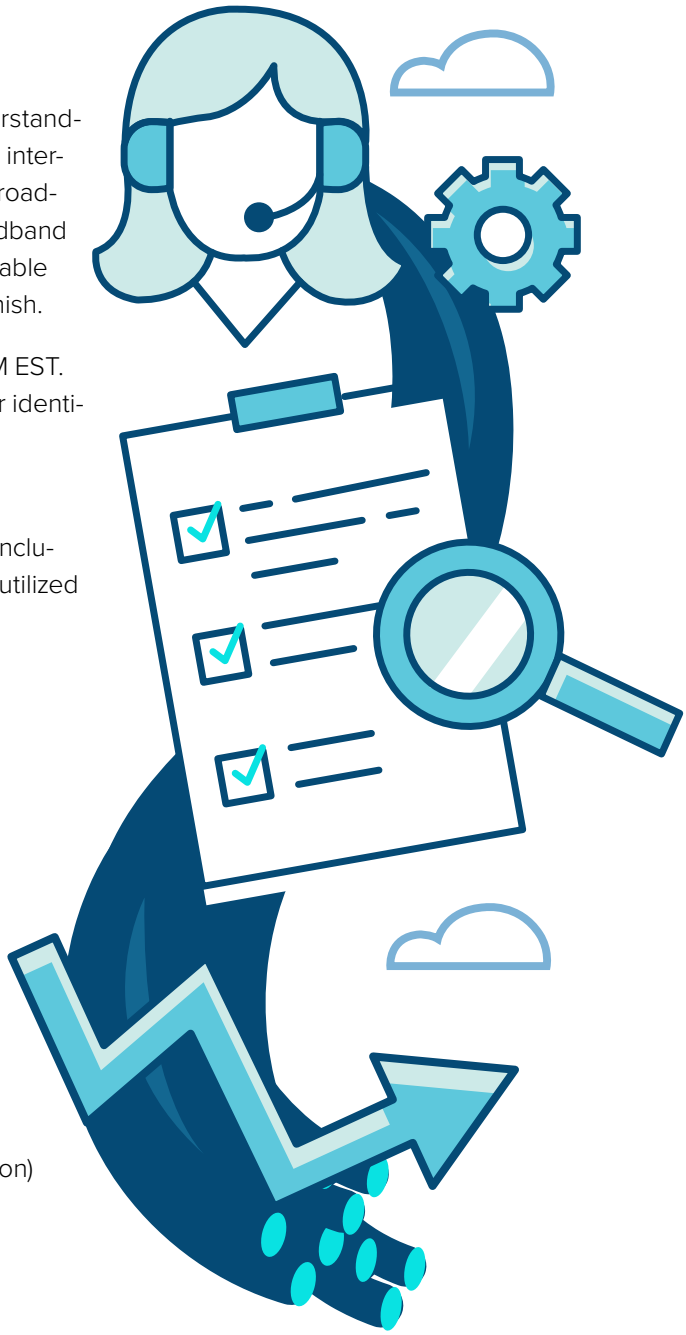
3 Community Survey

Summary

The objective of the community survey is to establish an understanding of the current availability of, usage of, and satisfaction with internet services, enabling more accurate, effective and efficient broadband development decision-making. The Berks County Broadband Survey was launched on April 25th, 2022 and was made available for residents and commercial entities in both English and Spanish.

Data was pulled from the survey on July 19th, 2022 at 9:35 AM EST. 2,509 responses were analyzed to detect patterns and further identify gaps in service.



Methodology

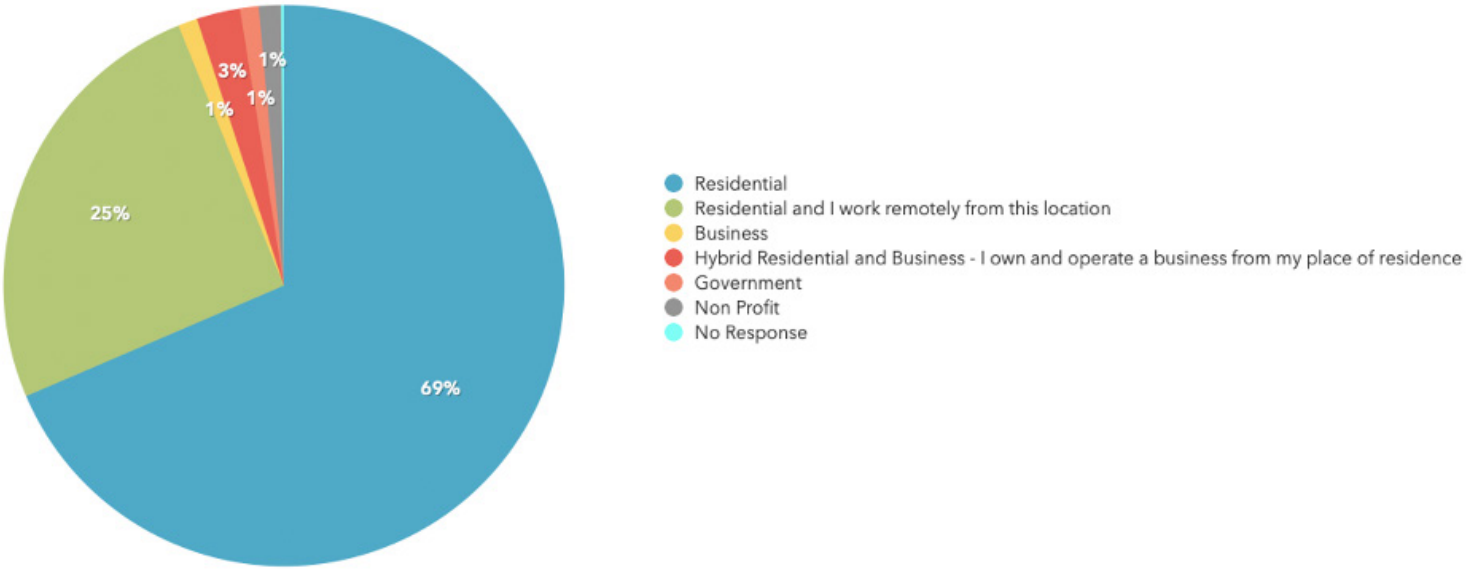
Both quantitative and qualitative data was used to develop conclusions based on the survey results. The following factors were utilized in the analysis:

1. Participation
2. Geographic location
   i. Address
   ii. School District
3. Analysis of current services:
   i. Provider and technology used
   ii. Price paid for service
   iii. Decision making indicators for current service
   iv. Number of employees/residents and devices utilizing the service
   v. Frequent use cases of the service
   vi. Satisfaction with current broadband service offerings in terms of speed, price and reliability
4. Speed Test (If taken from the address location in question)
5. Comments

Survey Results

1. Participation

A total of 2,509 responses were collected as of July 19th, 2022 at 9:35 AM EST. This quantity of answers enables statistical confidence in the identified patterns and trends of the data analyzed. Furthermore, it provides crucial data in identifying the unserved and underserved areas.



Commercial

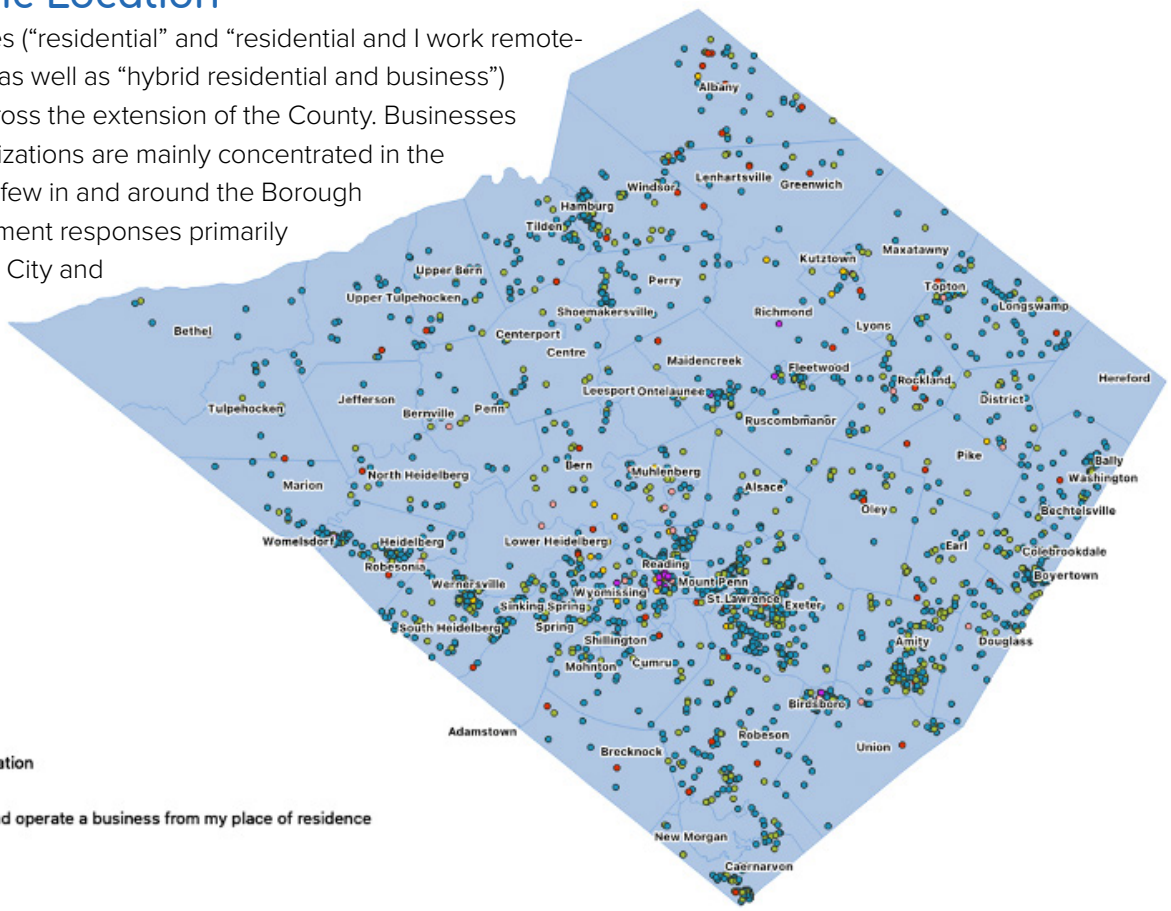
- 86% of Commercial respondents report having 50 or less employees that utilize their internet services
- Common use cases for these small organizations include emails (15%), wifi use (14%), research (13%) , multiple users and devices connected at the same time (13%) , downloading large files (11%) and frequent file sharing (10%)
- 5% of respondents report that their operations require extreme speed and zero interruptions (This could include banking, inventory management, accounting and other sensitive financial services)

Residential

- 92% of Residential responses report between 2-6 individuals utilize their home internet on a regular basis, 47% of which include households with 4-6 individuals
- Equally common primary use cases (15%) include streaming online content, multiple users and devices connected at the same time, social media, and online shopping, second to (10%) working from home and gaming
- 79% of residents report paying $80 or more per month for internet services, 55% of which pay more than $100. These prices may reflect bundled packages that include phone, television, etc.

2. Geographic Location

Residential categories ("residential" and "residential and I work remotely from this location" as well as "hybrid residential and business") are distributed all across the extension of the County. Businesses and non-profit organizations are mainly concentrated in the Reading area, with a few in and around the Borough of Kutztown. Government responses primarily span across Reading City and into the Eastern part of the County.

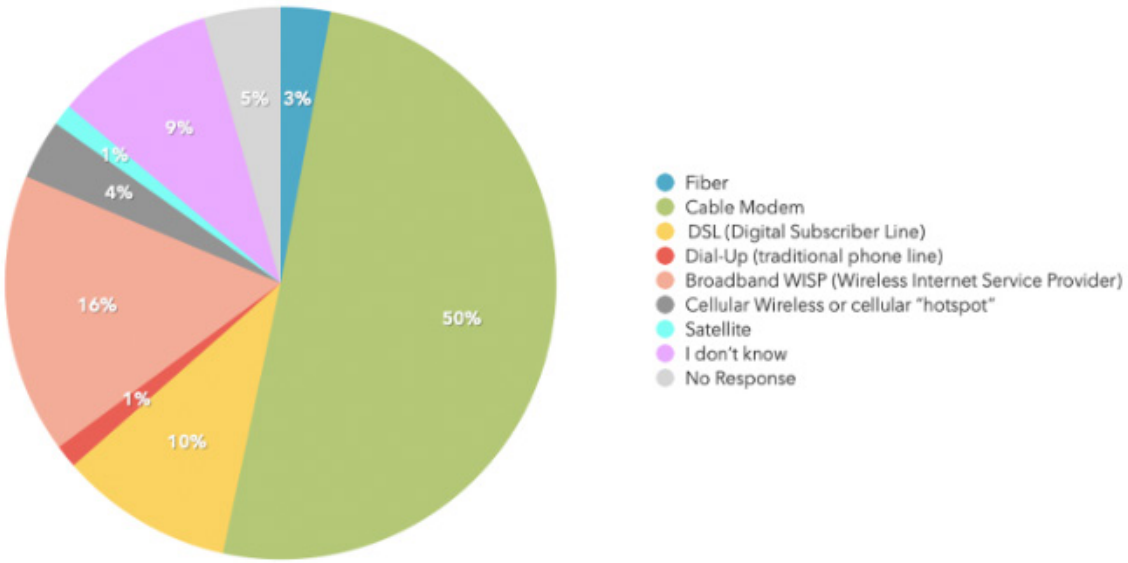


Legend

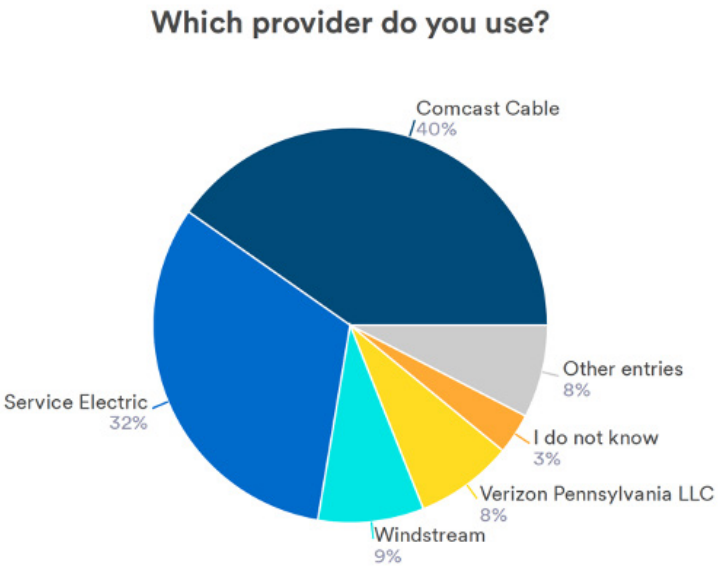
- Residential
- Residential & I work remotely from this location
- Business
- Hybrid Residential and Business - I own and operate a business from my place of residence
- Government
- Non-Profit

3. Analysis of current services

- 64% of respondents claim to have fixed internet services (fiber, cable modem, DSL, and dial-up) versus the 21% of respondents who have wireless internet services (fixed wireless, cellular wireless, and satellite)
- 14% of respondents either did not know what type of internet connection they have or did not respond



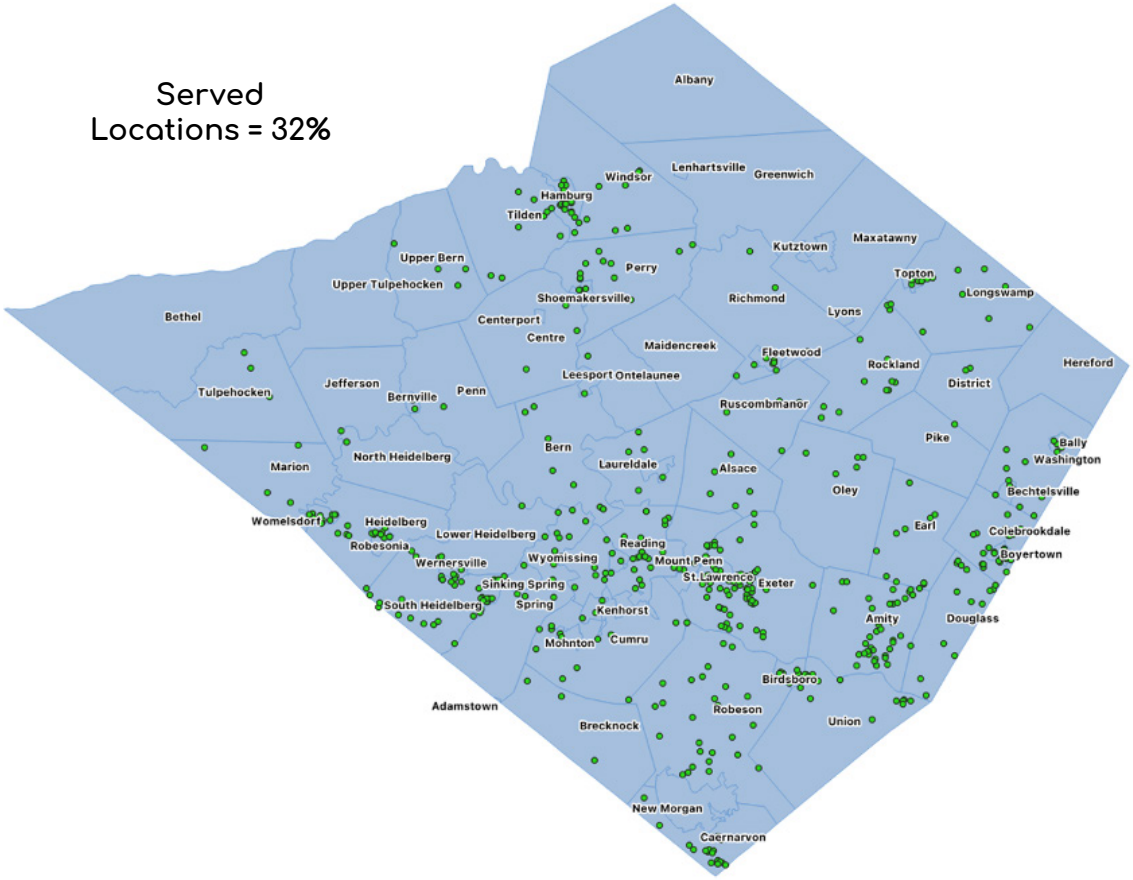
- Comcast Cable, Service Electric, Windstream, and Verizon Pennsylvania LLC are the primary carriers that respondents utilize
- Comcast Cable and Service Electric have the highest market share in Berks County with percentages of 40% and 32%, respectively



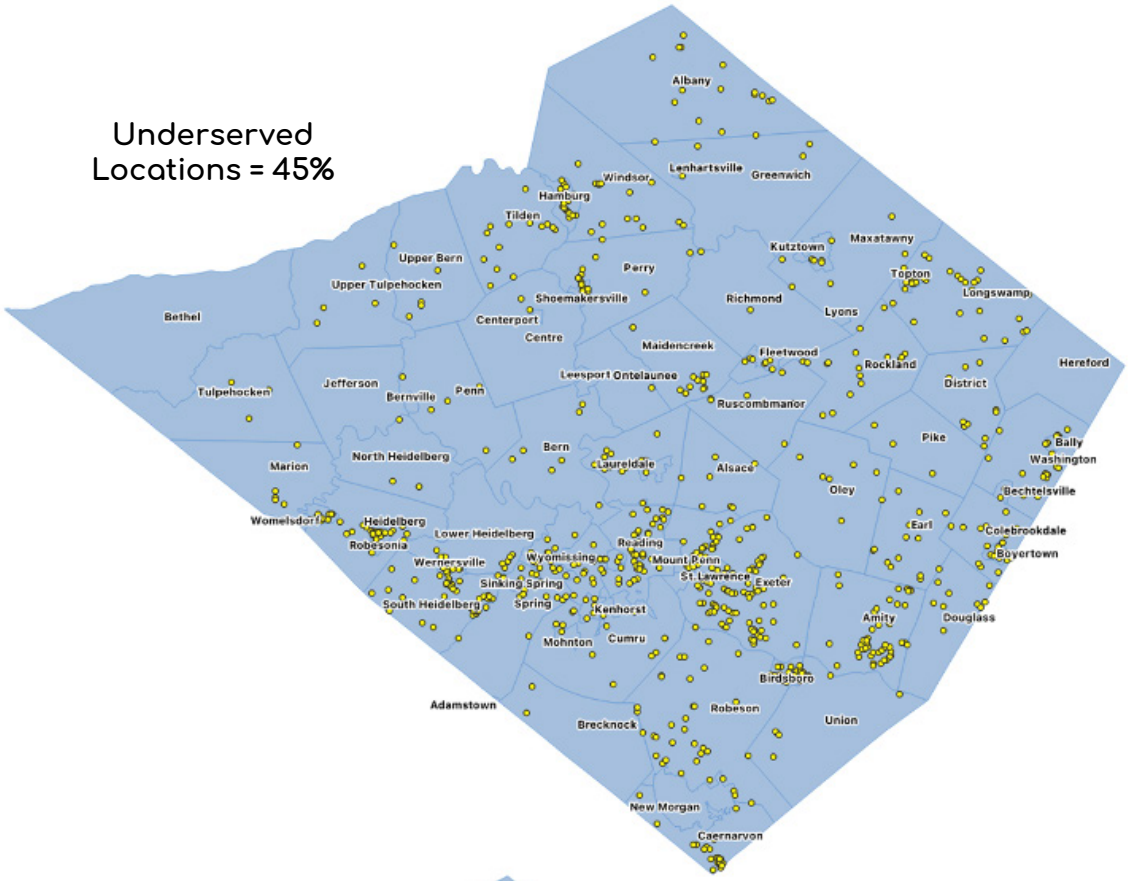
4. Speed Test

Results from 2,040 speed tests have been cataloged as seen in the following maps as “served”, “underserved” or “unserved”, as defined by the National Telecommunications and Information Administration (explained in the Chapter 2 “Market Service and Incumbent Analysis”):

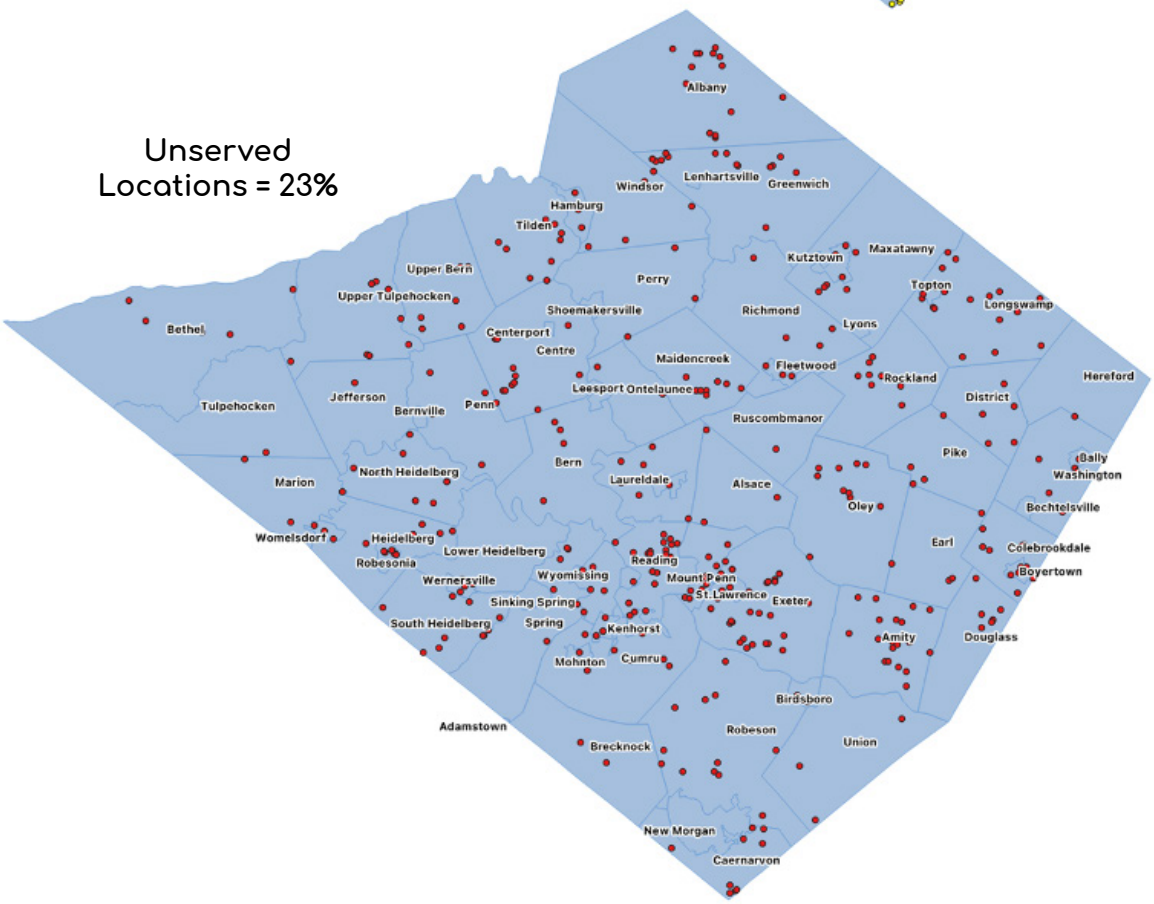
- 68% of survey locations are considered underserved or unserved
- 32% of survey locations are considered served



Underserved Locations = 45%



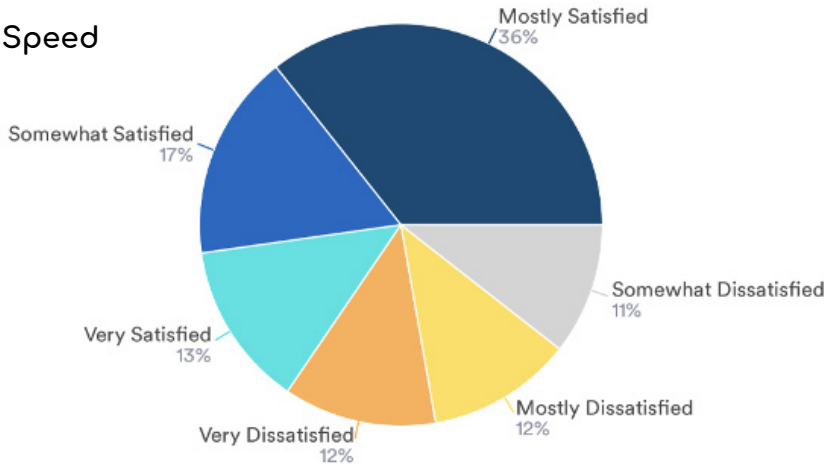
Unserved Locations = 23%



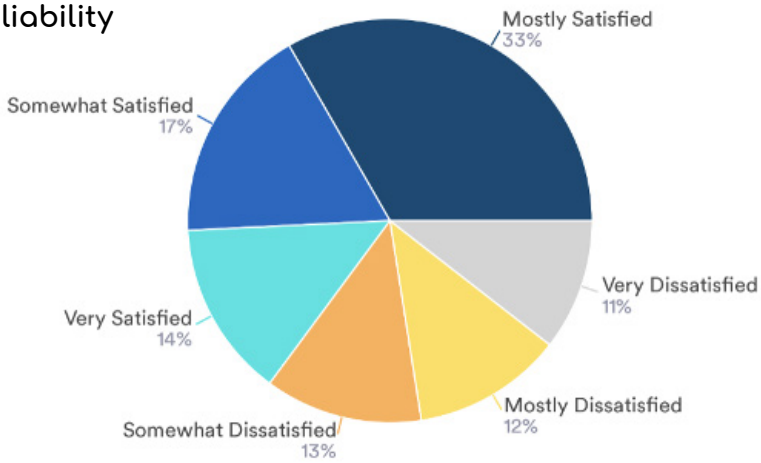
Satisfaction with Current Service Offerings

The majority of respondents are satisfied with the speed (66%) and reliability (64%) (as a sum of the categories "very satisfied", "mostly satisfied", and "somewhat satisfied") of current internet services. 67% of respondents are dissatisfied with the prices they pay for their current service package (as a sum of the categories "very dissatisfied", "mostly dissatisfied", and "somewhat dissatisfied").

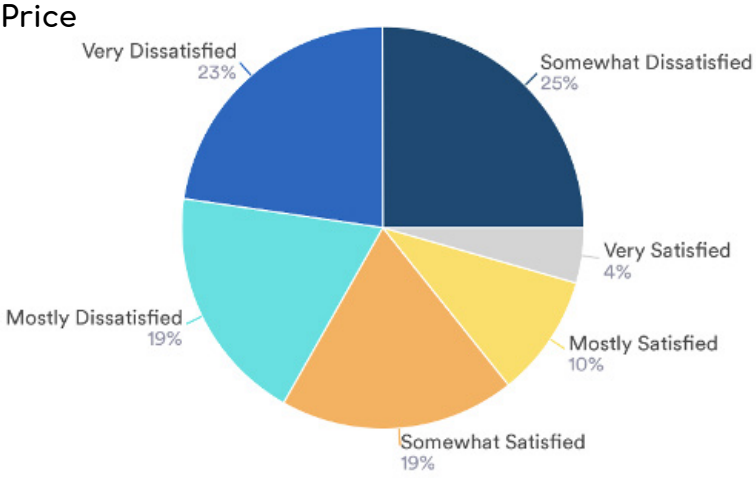
Service Speed



Service Reliability

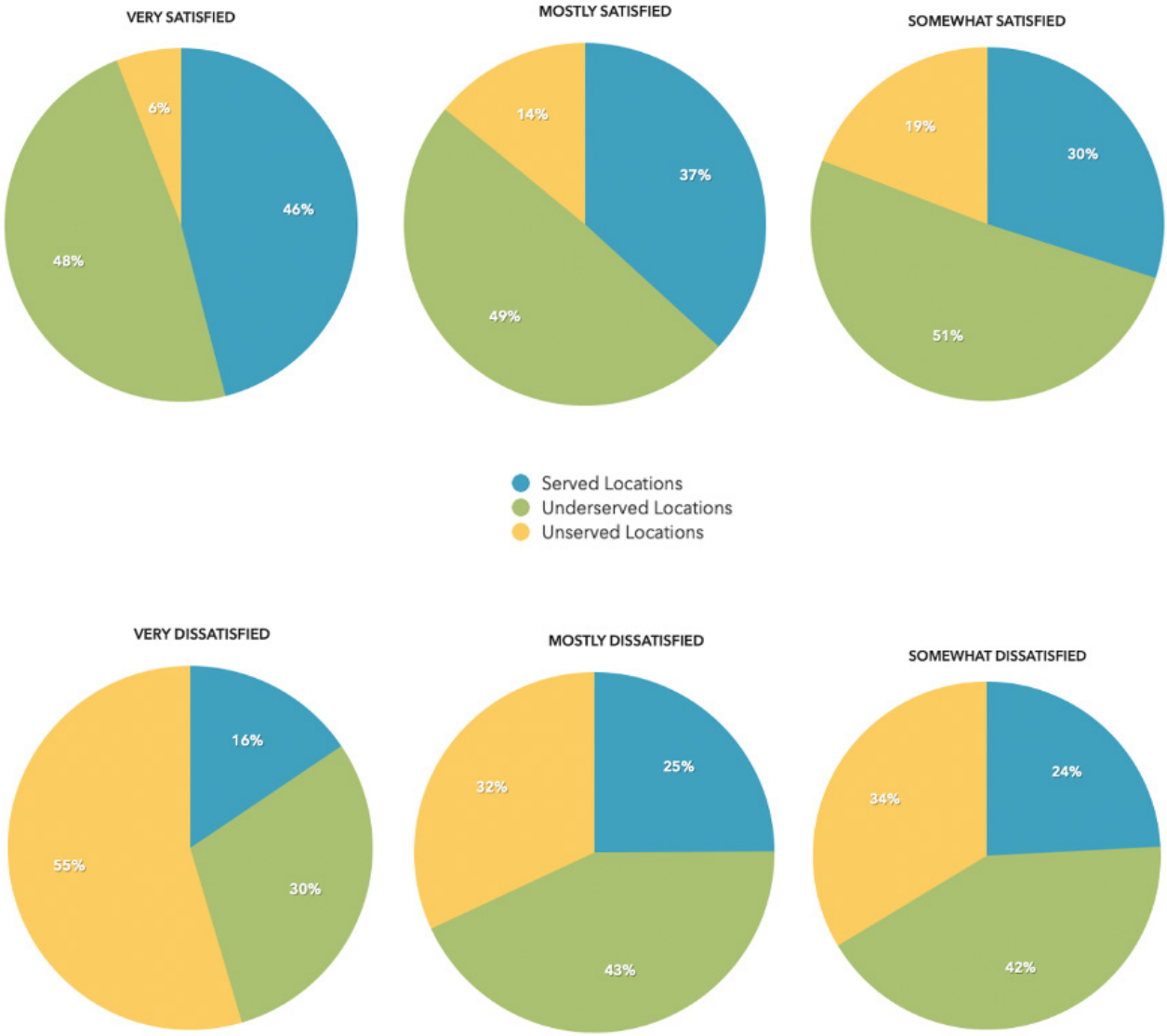


Service Price



Notwithstanding, isolating each speed satisfaction category of responses and by the level of speed service they are currently receiving (served, underserved, and unserved), the following charts are obtained:

Satisfaction of Current Speeds by Service Classification (Served, Underserved, Unserved)

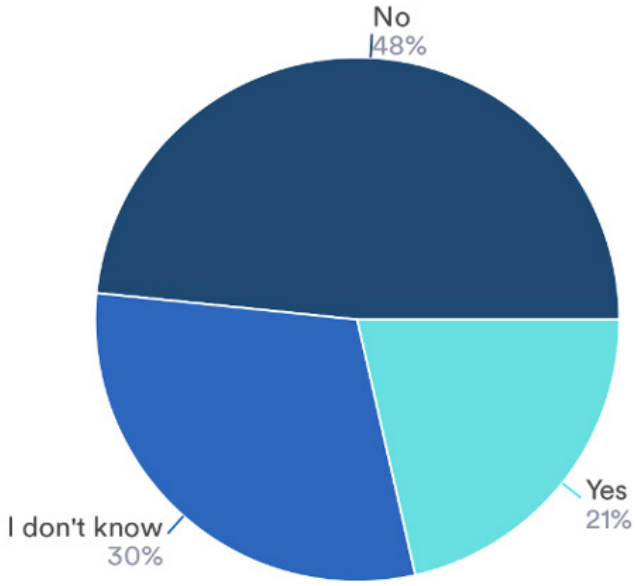


An important insight can be extracted from the above graphs in evaluating the seemingly high satisfaction of speed from respondents located in underserved areas. It could be considered contradictory that one who is satisfied with service speed is also considered unserved or underserved. The high digital distress scores found in the underserved areas indicating a high reliance on mobile wireless technology (which is commonly mistaken for internet services) could help explain this. Alternatively, lack of digital literacy is another limiting factor, often resulting in a lack of awareness of the transmission type subscribed to and the speeds that their subscription should yield.

Level of Interest in Enhanced Internet Services

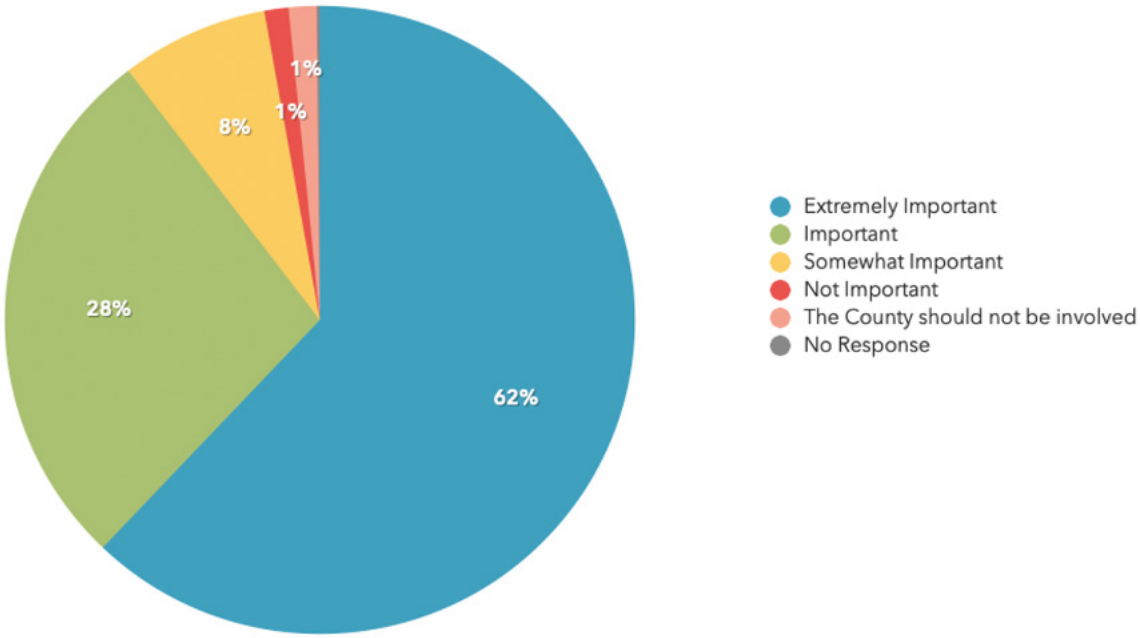
The aforementioned concern of respondents about the service price together with the potential need of digital literacy in terms of broadband internet technologies has an impact on the will to pay more for a faster, higher quality internet connection.

- 48% of respondents do not want to pay more for enhanced internet services versus the respondents who would (21%).
- 30% of respondents are unsure if they would pay more for faster, higher quality internet services.



Importance of the Berks County Broadband initiative

- 98% of respondents express the importance of the Berks County Broadband study.
- 1% do not consider this matter to be important and another 1% believe that the County should be involved



5. Comments

The 822 comments provided by respondents surfaced several key trends. **Nearly all comments discuss the lack of competition spanning throughout the County. Comments concerning affordability were often correlated with the lack of options available,** as seen below[17]:

"There is a general lack of competition for broadband options in Berks county. This raises prices and reduces service options offered."

"I think more options would be beneficial for our area. I only have one option for internet provider at my home. I have no choice but to work their price into my budget even though it's higher than I could afford. I need the internet for e ducation purposes and work purposes."

"I know that a lot of people in my town would like to have more options for internet. In this modern world it is almost a necessity to have internet but a lot of people cannot afford the option available to us"

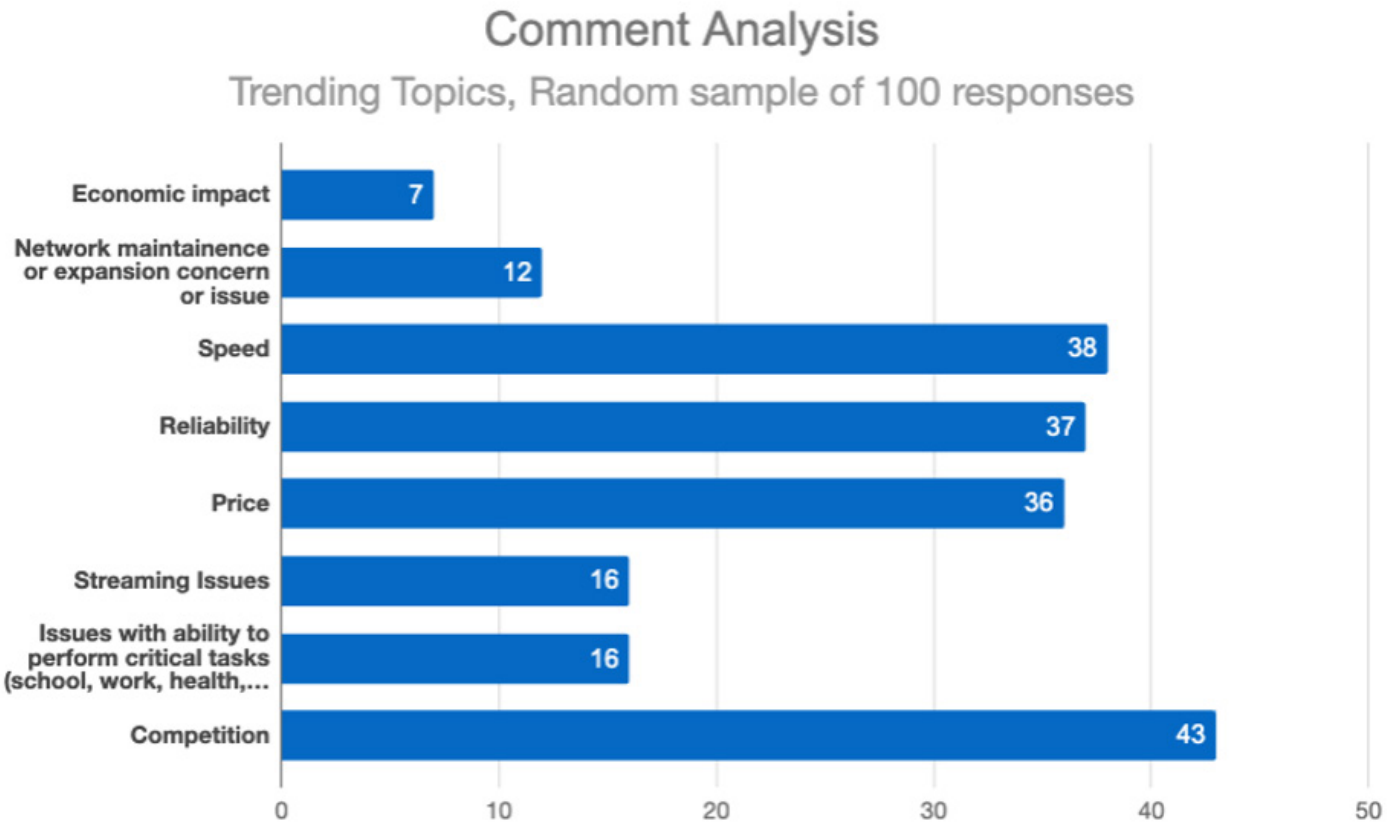
"Where I live we only have one provider Service Electric Cablevision. This unfortunately drives the price up for monthly broadband service which is not fair to the residents of Berks county. Verizon fios, Xfinity TV/Broadband service would be a great addition to the county as it would give the residents of berks county more affordable options rather then to just have one choice."

[17] The comments provided above were extracted from the broader data set, separate from the random sampling discussed below

"The lack of options in service providers allows for poor quality and high prices"

"It would be ideal to have more companies provide internet service in our area. I live in a well populated area in the City and I only have one option for WiFi internet service at this time. I recently canceled my Comcast cable subscription and downgraded the internet speed because the overall cost was too high but I have to stay with them for internet because I have no other option. They know there is no competition so I'm not saving much money and I'm still paying a very high rate for internet because I can't shop around for another company. In addition, I've had no issues with internet connection for my phone and computer but almost every day I have to reboot the modem because the WiFi will not connect to my smart TV to access streaming services. It would be nice to have other quality options."

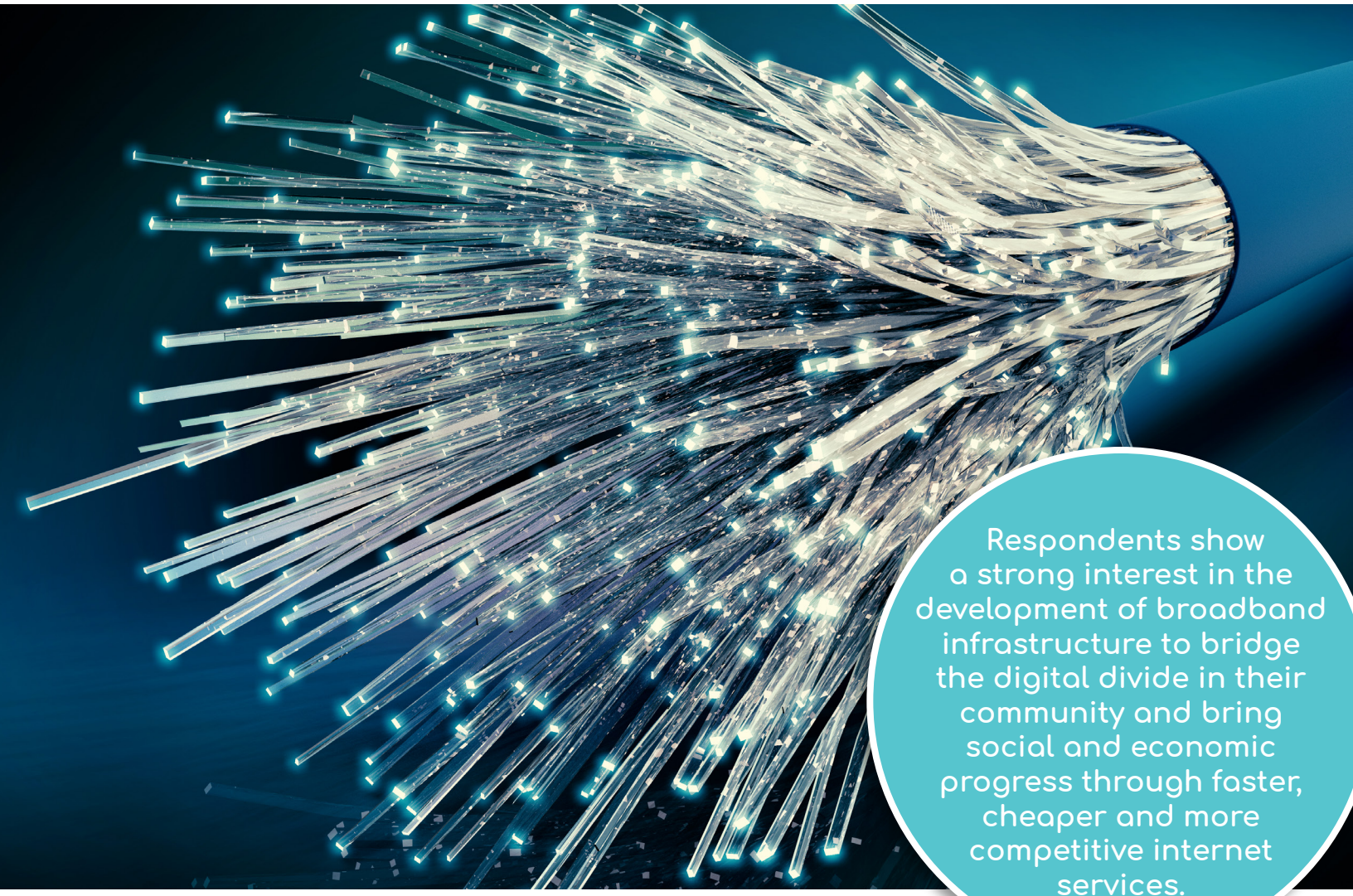
An analysis of a random sample of 100 responses further validated these findings, with the number one trending topic discussed being competition and lack of options, second to sentiments regarding price, reliability and speed:



A sample of comments from the data reflected above are as follows:

Topic:	Submission ID	Comment	Submission ID	Comment
Economic Impact	5304390843413620000	it is a decision making factor in real estate sales and directly or indirectly affects property values, i.e. tax base also leads to isolation, lack of access to information and opportunities	5304165267564120000	Frontier is the ONLY service provider offered for our address. I am extremely disappointed that we have no other option. During covid my business could only survive through live virtual events where I attempted to market my bags. Customers constantly complained about buffering, blurry screens and poor quality transmission. I lost business because of this. I attempted to jump onto the cable further up our road closer to Hamburg. Was told by Comcast that I would have to pay $2500 to have it extended down the road to our house. Why should my neighbors conveniently then have access to Comcast after I paid to have it installed? In my opinion high quality internet service should be a standard everywhere and not just in some areas while the rest of us are held prisoner in a monopoly from the Dark Ages. Please help us to obtain a decent service or at least a choice of providers. Would gladly pay more for good service.
Network maintenance or expansion concern or issue	5305139449618260000	In todays day reliable service is critical for the schooling of our children and the need to work from home. Currently the only provider option we have is Verizon and they have told me for 2-1/2 years they won't invest in our infrastructure because we don't have the population density to support the investment (I.e the earning potential isn't there). It is BEYOND frustrating how many hours I have spent on the phone with them only to get no where.	5291230296326120000	Comcast offered to run a line from Rt 183 which is the front of our property to our home for $65,000.00 this is outrageous. Verizon said we are 300 yards from the sub station, and a lineman told us no one outside of Bernville has high speed connections. We everything connected to the web the need for reliable internet is of the utmost importance.
Speed	5304584721415040000	Comcast has a broadband monopoly; no other competitors so we're at their mercy. They slow speeds dramatically, even when I pay for premium service, based on usage. I would shop around if there were more options.	5304476909359050000	The only options we have are Verizon DSL or Satellite, both of which are too slow for our needs in our household. We make it work because we have to, but it is frustrating that we cannot buy a faster service.
Reliability	5305975332211360000	Having reliable, faster internet is crucial to us being able to stay where we are. Windstream is terrible.	5285605637021840000	My internet is slow and a lot of times in one day drops out of service or loses connection

Topic:	Submission ID	Comment	Submission ID	Comment
Price	5305046552773290000	Comcast/Xfinity has a monopoly in my area and therefore we do not have the ability to choose between suppliers. The rates continue to go up and I have to get a triple package (internet, phone and cable) just to get a "discount" for the service. I no longer have a landline but have to include this in the package. I have the basic package however am paying almost $200 a month.	5298945448999030000	Comcast s just getting too expensive and looking at retiring in a year or two wondering if I'll be able to continue with my plan because of rising prices.
Streaming Issues	5305962132524590000	Cannot stream at all because of slow speed, even browsing is very slow, sometimes no connection at all. Have been getting the runaround from Verizon for at least 15 years - they keep promising better cell tower reception in our area but have done nothing! Had trouble just doing this form!	5305089592526940000	I find that Comcast internet service in my area is expensive and not reliable. The speed for uploading, in particular, is very slow. When I stream, I am often kicked out of the site I want to use and have to re-enter.
Issues with ability to perform critical tasks (school, work, health, etc.)	5305061526926470000	I am at the end of the phone line for Verizon and am the only household on our road with ANY internet service! No other service is available. My husband is handicapped and uses the internet for PT and I need it for business as well as personal. I feel it is terrible in this day and age that my neighbors have to have a hot spot for kids for remote learning and personal use! Verizon has said no to upgrading lines due to expense! Our phone lines are often down due to being old and just patch jobs when repaired. Such a shame that households here have to suffer...	5304209342814840000	We have struggled for years with internet. My daughter had only access to dialup all through high school. Finally we found Verizon DSL. It does not work well and often goes out of service. The last time this happened we were told no service repair was available for more than 3 weeks. As we are also cyberschooling my special needs grandson, this was terrible. I had to go out and purchase a T-Mobile hotspot to use when the DSL goes out. This adds $40 to the Verizon price of $100 plus taxes etc. I would like to get a job working from home, and my daughter would like to take classes, but we can't do it with this internet. Comcast stops about a mile away and refuses to provide service here. We can't get a clear satellite signal when the trees are in leaf. Please help.
Competition	5304974662917520000	There is only one high speed internet available in our area which leads to extremely high prices and the company unwilling to negotiate for better deals because they know we are stuck with their product.	5304666535666950000	We don't have options available and therefore our prices continue to go up with xfinity and they know we have to pay it to have internet.



Respondents show a strong interest in the development of broadband infrastructure to bridge the digital divide in their community and bring social and economic progress through faster, cheaper and more competitive internet services.

Conclusions

Due to the substantial survey participation, some compelling patterns have emerged based on consistency of respondents across several different survey questions: Respondents show a strong interest in the development of broadband infrastructure to bridge the digital divide in their community and bring social and economic progress through faster, cheaper and more competitive internet services.

The survey responses support the importance of increased competition and expansion of broadband into the County. A solid core broadband infrastructure is needed that can cover all areas of the County bridging the existing digital divide, as results have shown with 45% of locations underserved and 23% unserved[18], and taking into consideration that the predominant technology is cable modem versus a minority presence of fiber. Finding easy ways to help ISP's reduce costs to build or expand to underserved communities will be important. A higher number of broadband incumbents will bring more competitive service and price offerings. Additionally, fiber should be prioritized for these networks (middle and last mile).

[18] Broadband speed tests depict the level of service that a household is receiving based on their selected package. However, it is important to note that enhanced speed tiers may be available to a household, but the homeowner elects not to subscribe. In such circumstances, affordability programs, as opposed to infrastructure programs, may be most needed to bridge the digital divide.

4 Partner Engagement

Purpose and background:

Lit Communities conducted four focus groups with leaders from the public and private sectors in Berks County. The purpose of these sessions was to educate participants about the study, identify potential partnership opportunities, and discuss the impact that commercial and residential broadband has on their organizations in the near and long-term.

The focus group categories included Business, Healthcare, Education, and Government.

Broadband Focus Group Participating Entities	
Business	East Penn Manufacturing
	Teleflex
Healthcare	Tower Health
	Berks Community Health Center
Education	Antietam School District
	Berks County Intermediate Unit (BCIU)
	Wilson School District
	Twin Valley School District
	Oley Valley School District
	Reading Muhlenberg CTC
	Reading Area Community College
	Tulpehocken Area School District
	Literacy Council of Reading-Berks, Inc.
	Fleetwood Area School District
	Wyomissing Area School District
Government	Alsace Township
	Entech Engineering
	Bernville Borough
	Berks County

Conclusions & Takeaways:

- An overarching trend across all focus groups was **the critical need for digital literacy and access to broadband and devices at the individual consumer/residential level.** This need was acutely understood by healthcare providers, businesses, and educators through their experiences responding to the COVID-19 pandemic.
- While many businesses in Berks County have sufficient connectivity, **ongoing technology developments unlock opportunities for enhanced service offerings and increased operational efficiencies. This will require a workforce that is digitally literate,** as many employee services continue to be migrated to the cloud.
- **Government leaders expressed a need for education and resources to better enable them to understand and prioritize the current and future broadband needs of their constituents.** Prioritizing the education of these leaders will significantly increase the Task Force's impact in connecting with and providing continued support to the community.
- The focus groups identified 14 organizations that are interested in ongoing partnerships in Berks County to apply for secondary grants, such as the Distance Learning and Telemedicine Grant Opportunity (and others as identified in Section 1 of the Grants Services chapter) and participate in and support ongoing countywide broadband expansion.
- In addition to the Reading Public Library Digital Navigator initiative that has been proposed for ARPA funding allocation, there is significant opportunity to expand partnerships to support an ongoing community-centered broadband initiative to provide free or discounted devices and broadband service packages, and to continually engage with the public as their connectivity needs continue to grow and change.

Key Takeaways

Healthcare

COVID-19 highlighted residential broadband as a critical component in providing digital healthcare and slowing the spread of the illness

- Digital literacy and access to connectivity and devices are barriers
- Mandatory video conferencing for telehealth visits were lifted during the lockdown because many patients were unable to use video (most typically due to a skills or access gap) That mandate is speculated to be re-implemented as life goes "back to normal"

Telehealth and Remote Health Monitoring (RHM) are key initiatives for Berks County healthcare providers

- RHM and telemed/ telehealth reduce costs, increase capacity for providers, & can greatly benefit patients
- The ability to transmit data from the patient to the provider requires reliable and consistent residential upload speeds. This was a point of concern experienced by participating organizations.

Mobile Health Clinics are a critical resource for healthcare providers

- Patients in rural and low-income areas and those without transportation benefit from access to in-person, out-patient care
- These clinics utilize wireless "hotspots" and rely strong wireless availability in order to provide care

Education

The COVID-19 pandemic highlighted challenges for educators and students

- Remote learning was very difficult due to students having poor connectivity at home
- School-issued wireless "hotspots" worked well for some, but reliability was a major barrier for others. Hotspots are not considered a long term solution.
  - Specific barriers noted were overconsumption of data and bandwidth and inconsistent signal reliability
- Other challenges such as device maintenance were highlighted

Student equity necessitates access to affordable and reliable residential broadband & devices

- Concern was expressed that many families cannot afford higher speed packages and/ or devices, even in areas that have options
- Despite most schools being back in the classroom, educators want their students to have access to broadband and devices at home to ensure all students have equal access to resources and opportunities
- At-home broadband access could enable schools to utilize tools like virtual labs and allow for flexible instruction days, such as solutions to "snow days"

Residential education will help schools better prepare to support students remotely in the future

- As schools responded to the pandemic, it was realized by the schools that a student internet project survey given to parents prior to the pandemic inaccurately reflected the connectivity options students had at home

Government

Education and awareness of community needs are crucial next steps

- Government leaders need education on smart city applications and future-proofing in order to build the vision for connectivity in their communities
- Officials and residents both desire education on broadband and the use cases derived from its availability

- There was a lack of awareness but eagerness to become aware of and respond to community needs surrounding

Smaller townships and boroughs will rely on the County to take action

- Lack of resources and knowledge of community needs and prioritization of other more pressing matters highlighted
- Officials do not view broadband access as their responsibility; assume an outside entity will handle it
- Lack of education, communication and awareness have resulted in the inability to build a vision for connectivity locally

Hybrid work is still an option for public employees

- Participants did not remark on substandard at-home broadband connectivity, though those who remarked on their residential service did state that they do not live within County boundaries

Business

COVID-19 highlighted the impact that gaps in residential access have on business

- Participating businesses had employees who live within Berks County who were eligible to, but could not work remotely during the lockdown due to poor connectivity
  - East Penn Manufacturing deployed 180 wireless "hotspots"' in response. Unreliable connectivity impacted some employees' effectiveness
  - At Teleflex, ~7-10 eligible employees remain unable to work remotely due to poor connectivity
- East Penn Manufacturing (an employer of between ~7-8,000 Berks County residents) expressed concern for device and broadband service affordability

Businesses have experienced setbacks due to lack of or insufficient access

- Teleflex discussed struggles getting better internet to their Wyomissing location. Discussion with multiple ISPs to evaluate network expansion feasibility included permitting and construction barriers such as gas lines and railroad tracks

Demand for bandwidth will continue to increase

- Cloud-based technology has unlocked new enterprise services to improve employee relations, safety, productivity and other efficiencies
- Critical business needs such as audits and customer manufacturing site visits have increasingly become digital - upload speeds are of significant importance

Economic Development

In addition to formal partner engagement sessions Lit Communities was also able to meet with the Economic Development Coordinator for Berks County to learn about the state of economic development in the county and priorities related to broadband. Below are the highlights and takeaways from that conversation.

- Berks County currently has a large amount of agricultural preservation. Around 70% of the County is Agricultural easement or openspace which geographically limits the ability to commercially develop a large portion of the county.
- There is a major economic corridor along Interstate- 78 in the northern portion of Berks County. There is significant commercial development in this region, especially in the North West portion along 78. The businesses in this area there have incredible data needs and have a desire for fiber broadband but cannot currently contract that service.
- A lot of businesses looking to further develop in Berks County look for gigabit minimum internet speeds. These speeds are often not available and these businesses have to pay high prices to run cable to their locations.
- Most developers in Northern Berks are limited to one internet provider.
- With the large number of jobs being created along Interstate-78, the housing development hasn't caught up. The County is currently around 45,000 units short of equilibrium.

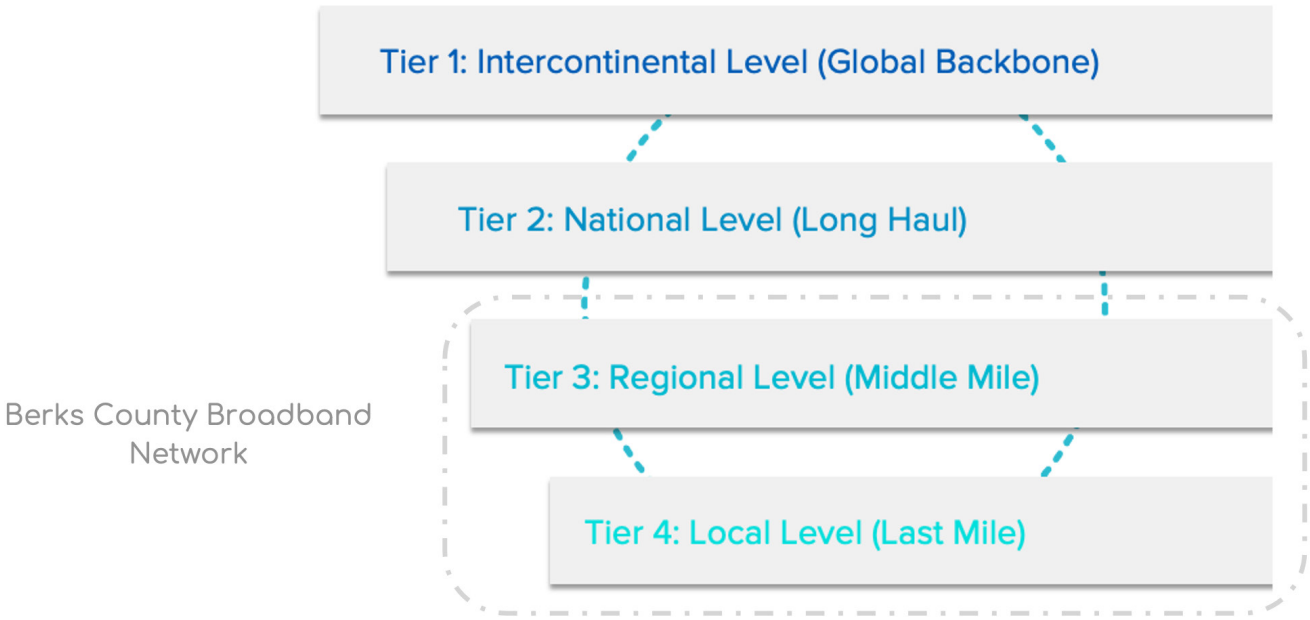
5 Preliminary Network Design

Objective

The high-level design of a potential Berks County broadband network is included herein.[19] This proposed network consists of two levels of connectivity based on pre-existing Berks County GIS (Geographic Information System) (GIS) data and further data collection performed by the Project Team:

(1) A middle mile network (connected to long haul networks currently available in and through Berks County) as the core network connecting anchor institutions whose connectivity and accessibility are crucial for Berks County's economic and social development; and

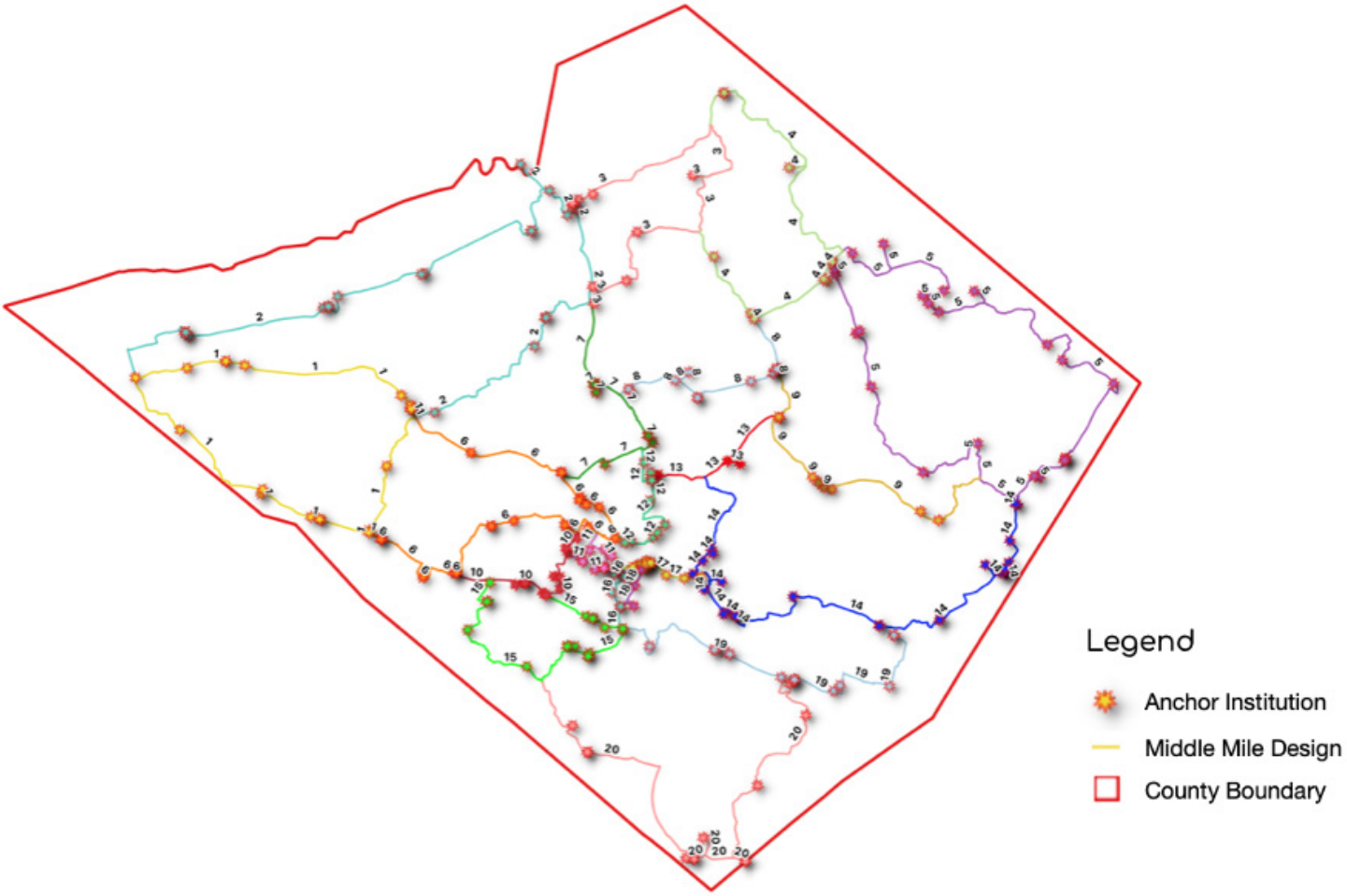
(2) A last-mile network (connected to the middle mile network), connecting residents and businesses.



[19] Estimating the full cost and investment required to construct the networks will require determining: (1) network paths using street centerlines; and (2) the network length and number of connected points.

Middle Mile Design

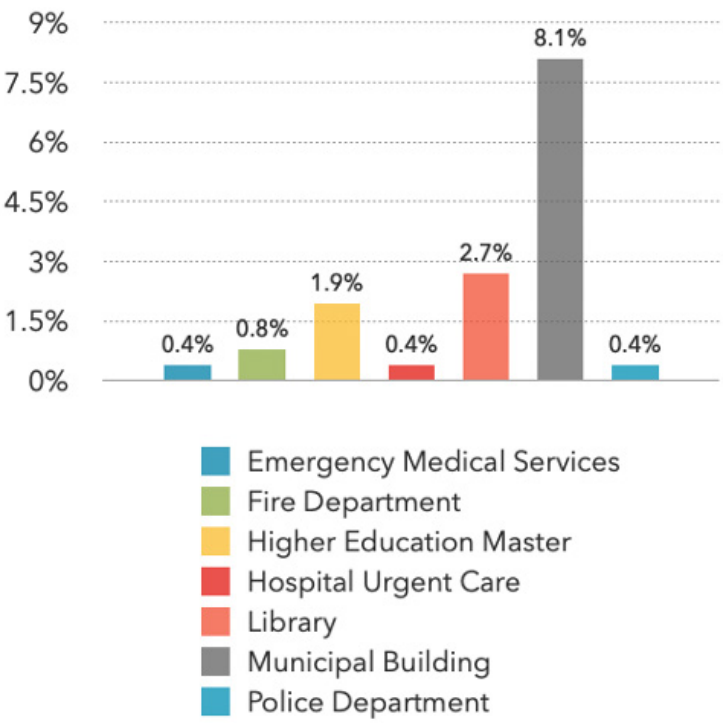
The preliminary middle mile design depicted in the map below would connect **260 anchor institutions** (each represented by a star icon on the map) through 20 closed network rings spanning Berks County.



The closed-ring middle mile network design enhances network redundancy to minimize the risk of signal interruption - i.e., should a network interruption occur on a closed-ring middle mile fiber network, the signal will seamlessly reroute itself in the opposite direction on the ring, ensuring ongoing connectivity. Such redundancy is highly important when connecting Berks County anchor institutions. [20]

[20] We encourage underground construction of this middle mile network as an additional security factor.

The categories of anchor institutions in Berks County are as follows:

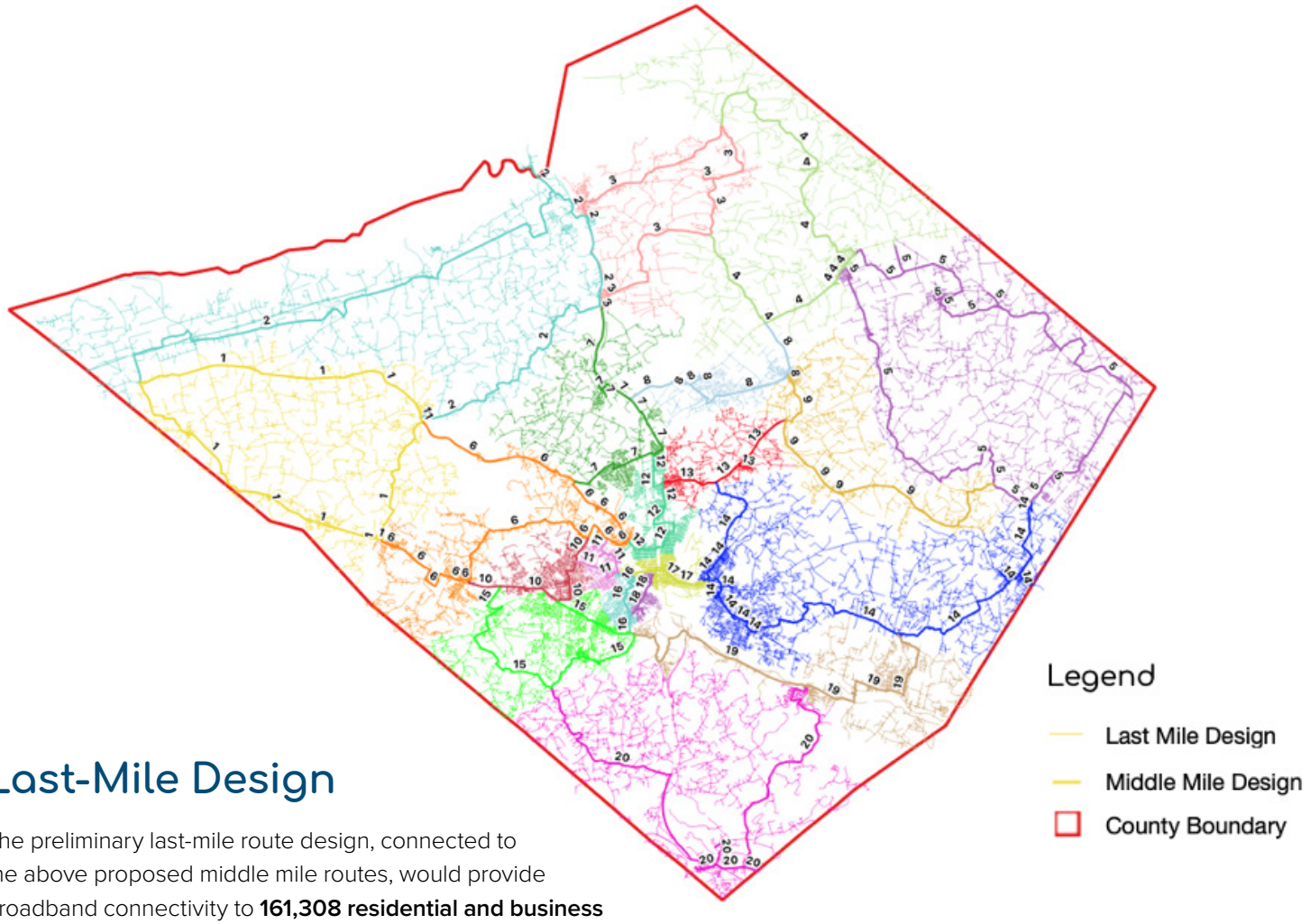


Together with the building type criteria, we further categorized the anchor institutions by their location along the proposed middle mile route. The preliminary middle mile design proposed for Berks County has 222 anchor institutions connected to a redundant path (i.e., the anchor institution is connected within the main middle mile route, ensuring redundancy) versus 38 anchor institutions connected through a lateral path (i.e., the anchor institution is connected to the middle mile route through a lateral path that is not in a ring configuration). This difference is due to optimal routing purposes based on the location of the anchor institution. However, less than 1% of Berks County anchor institutions on a lateral path correspond to first responders such as Emergency Medical Services (EMS), fire stations, and police departments, or urgent hospital buildings.

The following table shows the middle mile network length per ring with its corresponding anchor institutions:

Ring	Length (Feet)	Number of Anchor Institutions
1	176,685.99	20
2	231,716.70	19
3	121,558.19	11
4	126,161.99	10
5	253,260.27	23
6	143,516.67	21
7	69,732.83	8
8	59,081.61	12
9	82,451.33	8
10	44,838.40	12
11	26,964.06	9
12	46,604.18	11
13	37,211.42	3
14	165,750.61	26
15	97,079.08	17
16	23,927.15	8
17	27,318.55	13
18	13,680.48	3
19	99,845.10	13
20	148,422.22	13
Total	**1,995,806.83**	**260**

Further, the multiple ring design enables the areas with the greatest broadband needs to be first targeted. This provides construction and financial flexibility as Berks County prioritizes network deployment in accordance with the recommendations provided with this broadband study.



Last-Mile Design

The preliminary last-mile route design, connected to the above proposed middle mile routes, would provide broadband connectivity to **161,308 residential and business addresses in Berks County.** As depicted in the map below, every proposed middle mile ring has a corresponding last-mile design. Similar to above, this enables Berks County to identify and target areas most in need for last-mile network deployment. Further, the proposed preliminary last-mile designs include interconnectivity between rings to facilitate further network construction in the future, as needed. In addition, network construction can be completed in phases that correspond to any budgetary restraints and considerations.

The following table shows the number of residential and business addresses proposed to be connected in Berks County by the last-mile design contained herein, along with their corresponding last-mile network length from the applicable middle mile ring:

Ring	Length (Feet)	Number of Addresses
1	1,459,091.10	5,709
2	2,083,413.10	8,035
3	746,227.79	3,832
4	1,444,248.48	5,609
5	1,938,176.54	10,003
6	992,799.60	7,638
7	962,270.83	8,108
8	410,538.70	4,608
9	860,650.32	4,486
10	522,843.21	8,878
11	198,903.92	3,567
12	493,682.97	14,414
13	449,876.47	4,376
14	2,293,717.60	21,589
15	1,067,363.29	13,244
16	232,347.50	5,094
17	350,480.67	12,895
18	103,000.92	2,310
19	923,379.02	8,173
20	1,753,771.80	8,740
Total	**19,286,783.85**	**161,308**

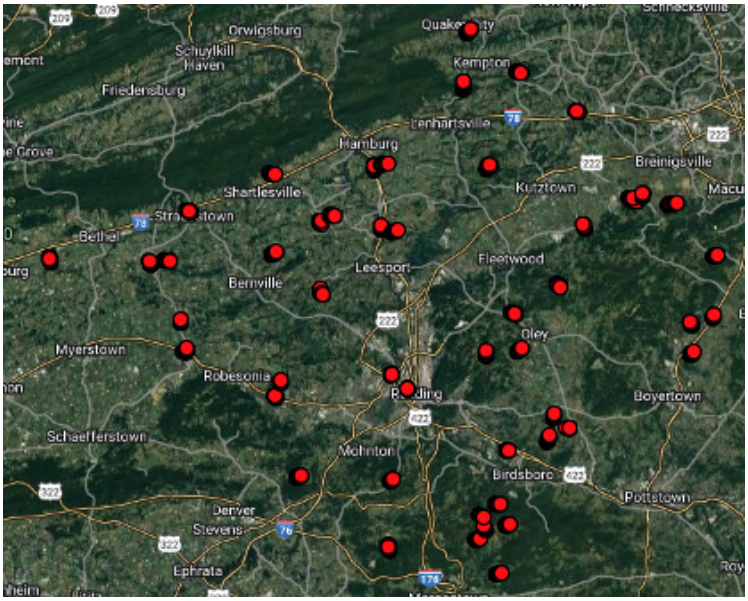
6 High-Level Construction Ride out/ Make Ready Engineering Assessment

Purpose:

The purpose of the CRO/MREA is to gain a better understanding of the costs associated with make-ready engineering and the environmental split. These findings factor into the financial model, specifically the costs of the network build-out.

Methodology:

Katapult Engineering utilized the Primary Design provided by Lit Communities to virtually assess a random sample of routes in urban, suburban and rural areas of the County.



During the desktop construction ride out, a high-level visual check of poles for usability was performed on these sample areas for the following criteria:

- Number of attachers: More than four attachers in the communication space
- Overall quality and condition of poles on the route
- Amount of make ready construction in the power space

The network routes that matched these criteria were examined in detail to further determine if an underground alternative is more feasible.

Results and Recommendations:

Like many other areas in Pennsylvania, Berks County is challenged with hard and hilly terrains. Typically, above ground aerial broadband construction is less expensive than underground construction. However, due to the County's hilly and hard landscape there is a high volume of above ground aerial construction which has overburdened many of the utility poles in the County.

Most suburban areas have pole lines delivering power, telephone and broadband. The high volume of traffic on these poles will, in many cases, precipitate higher make-ready costs in order to safely prepare the poles for additional lines.

Many rural areas of the County have shorter poles. Shorter poles tend to have less weight capacity, meaning that complete pole replacement may be necessary for construction. Although there is an elevated make ready cost due to overburdened poles, in many cases, it will still be less expensive than going underground.

The best way to control costs after project selection is to vet the best path in a detailed engineering design. Coordinating with utilities upfront to determine and negotiate any make-ready costs for aerial construction will help eliminate extemporaneous costs. Below are estimated make-ready costs based on Katapult's experience working throughout PA and conducting their virtual desktop review. These cost assumptions have been worked into Lit's financial modeling.

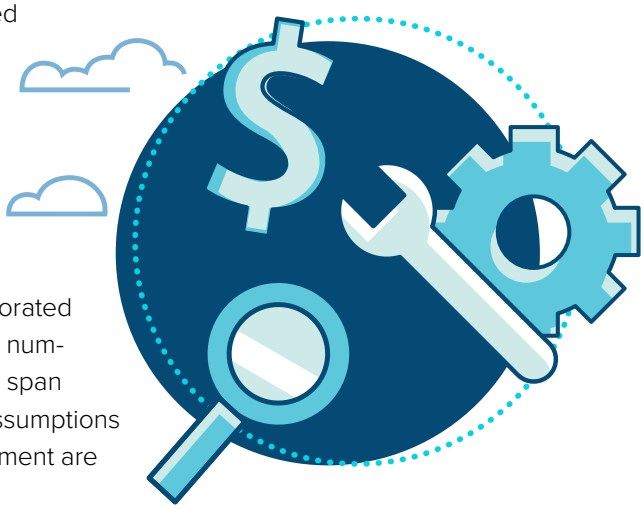
Estimated Make-Ready Averages			
	Avg. Cost per Mile (Estimated)	**Avg. Cost per Foot (Estimated)**	**Note:**
Residential	$36,000	$7.00	
Suburban	$34,000	$6.00	Most suburbs have pole line vs underground
Rural	$29,000	$5.00	Shorter poles in rural areas
Industrial	$19,000	$4.00	

7 Financial Model

Financial Model

Purpose

Lit Communities completed two 20-year cost estimates (financial models) for one middle and one last mile. The models are based on the results of the middle and last mile preliminary designs updated with CRO/MREA analysis. These estimates serve as the backdrop for this plan and factor into the recommendations as well as next steps the county can take to proceed into future projects. We anticipate the estimates to continue to evolve and become more refined as the project progresses through its multiple phases. The middle mile modeling can be used when examining costs to expand the regional middle mile and assess your approach. The last mile model helps the county to understand the costs for fiber connectivity to the entire county but also broken down into its individual components to understand cost considerations.



Methodology

Key metrics used from the designs to inform both financial models are aerial and underground lengths and number of road miles. Other data points incorporated into the financial models include area demographics (population, income, and number of households). Estimates are based on industry standards for pole count, span factor, and time duration for engineering and construction. Debt and equity assumptions with debt amounts, terms, interest rates, payments and required equity investment are included with equity returns provided for the last mile models.

Take rate assumptions of 45%, 55%, and 65% are built into the last mile models as a variable with a toggle that allows for the county to select a different take rate to see how the model would change. The take rate used for the middle mile financial model is 100% as it includes all 260 anchor institutions identified by the County during this project. The revenue estimates were built out using an Open Application Model where there is a single owner and operator of the infrastructure of the last mile network (fiber to the home/business). The middle mile network was designed as providing connectivity to the last mile network as well as service to the anchor institutions throughout the county. Service offerings including internet, voice, TV, telehealth, and smart home applications offered over the last mile network are reflected as revenue opportunities for the county on a per subscriber basis if the county should choose to build out the middle mile.

The cost per household passed in the Berks County Last Mile Financial Model is what most private Internet Service Providers ('ISP') use as a Key Performance Indicator ('KPI') to justify the capital investment to complete the network infrastructure built in a certain geography or service area. Some larger or national ISPs will only go to areas where the cost per household passed is between $700-$900. Other smaller or regional ISP's will go up to approximately $1,300 or higher: This was used to evaluate the gap that must be bridged financially to complete a full public, private, partnership for a fiber network that passes every address point in the County.

Middle Mile Financial Model

a) This table shows the key demographic and design assumptions that informed this middle mile preliminary design:

Berks County Assumptions	
Demographics	
Population	429,342
Median HH Income	$66,154
Median Age	40
Demand Points	
Residential Demand Points	0
Business Demand Points	0
Anchor Institutes/City Facilities	260
Total Demand Points	**260**
Right of Way Preliminary Design Results	
Aerial Length ROW	1,696,464
Underground Length ROW	299,376
Existing Aerial ROW	0
Existing Underground ROW	0
Total ROW Length (Feet)	**1,995,840**
Total ROW Length (Miles)	**378**
Additional Network Assumptions	
Span Factor	150
Estimated Pole Count	11,310
Cabinets or Shelters	0
Engineering Duration (months)	24
Make Ready Duration (months)	24
Construction Duration (months)	36
Financial Duration (months)	240
Take Rate Duration (months)	40
Instances (Each)	1

b) This table provides a summary of all capital expenditures required for the middle mile network, recurring expenses, and it shows the revenue potential as well as the total investment required to build:

Capital Expenditures	
Assessment	$0.0
Engineering	$3,227,478
Construction	$34,203,368
Operational Capital During Construction	$645,487
Recurring Expenses	
Operations and Maintenance - 20 years	$2,663,128
Technology Management - 20 years	$0.00
Potential Revenue	
FTTH Partner - 20 years	$58,108,976
Services - 20 years	$0
Dark Fiber Leases - 20 years	$11,839,422
Total Investment Required to Complete	$38,141,910
IRR over 20 years	9%

Last Mile Financial Model

a) This table shows the key demographic and design assumptions that informed this fiber to the home last mile preliminary design:

Berks County, PA Design Assumptions	
Demographics	
Population	429,342
Median HH Income	$66,154
Median Age	40
Demand Points	
Residential Demand Points	153,523
Business Demand Points	7,785
Total Demand Points	**161,308**
Right of Way Preliminary Design Results	
Aerial Length ROW	15,429,385
Underground Length ROW	3,857,346
Existing Aerial ROW	0
Existing Underground ROW	0
Total ROW Length (Feet)	**19,286,731**
Total ROW Length (Miles)	**3,653**
Additional Network Assumptions	
Span Factor	160
Estimated Pole Count	86,790
Cabinets or Shelters	81
Engineering Duration (months)	36
Make Ready Duration (months)	36
Construction Duration (months)	48
Financial Duration (months)	240
Take Rate Duration (months)	72
Instances (Each)	1

b) This table provides a summary of all capital expenditures required for the last mile network, recurring expenses, and it shows the revenue potential as well as the total investment required to build:

Capital Expenditures	
Assessment	$0
Engineering	$19,598,606
Construction	$318,019,778
Operational Capital During Construction	$18,688,086
Recurring Expenses	
Operations and Maintenance- Post Construction of Network	$108,863,113
ISP Maintenance	$28,666,045
Potential Revenue	
Internet and Phone - 20 years	$1,085,216,248
Additional Smart Home Services- 20 years	$12,155,686
Total Investment Required to Complete	$331,307,231
Cost Per Household Passed	$1,975
Equity KPI	$1,500
Gap Per Household Passed	$475
Total Gap Funding Needed	$72,923,425

8 Broadband Grant Development

Purpose and Scope

To support the Berks County CA findings and recommendations, we evaluated federal and state broadband funding programs to identify programs that can be pursued to support aspects of the network including, Middle Mile, Last Mile and support initiatives related to economic development, telehealth, and emergency response/preparedness.

Methodology and Terms

- Lit screened County specific criteria against our database of active federal grants for eligibility based on factors such as location, per capita income, unemployment rate, low to moderate income data, broadband access, and rural designation status.
- Programs deemed applicable are identified as “Primary Matches”.
- Programs that partner entities can apply for are identified as “Secondary Matches”.

Results and Recommendations

- Berks County is eligible for 12 Primary Matches and 12 Secondary matches (see attached Primary Grant matrix)
- Key programs to consider:
  - U.S. Treasury - Capital Projects Fund
  - US Department of Agriculture - ReConnect Program
  - Department of Commerce (NTIA) - Broadband Equity, Access and Deployment (BEAD)

Section I. Federal and State Broadband Grant Program Research

Federal Broadband Grant Program Eligibility

Lit Communities maintains a database of nearly 60 federal grant programs that fund aspects of broadband deployment across 15 federal agencies. Our team screens each of those programs for applicability to the County and identifies Primary Matches and programs that partner entities can apply for which are identified as Secondary Matches.

Federal Broadband Grant Program Matrix (Primary)

Specific to Berks County, there are 12 Primary Matches (see attached "Primary Matches Matrix").

Lit has prepared a matrix with high-level details on each program including;

- Maximum funding amount,
- Annual program capacity,
- Eligible applicants,
- Eligible activities and
- Matching requirements.

Federal Broadband Grant Program Synopses

For each Primary Match, Lit has prepared grant synopses with additional information including:

- Program purpose and overview
- Application deadlines
- Expanded list of eligible project activities
- Special requirements
- Agency contact information

Synopses were prepared for the following federal and state agencies and programs:

1. United States Department of Agriculture - Rural Development [8.1]

- Community Connect Grant Program [8.2]
- Distance Learning and Telemedicine Grant Program [8.3]
- ReConnect Program [8.4]
- Rural Broadband Access Loans and Loan Guarantees [8.5]
- Telecommunication Infrastructure Loans and Loan Guarantees [8.6]

2. United States Department of Housing and Urban Development [8.7]

- Community Development Block Grant (CDBG) – Non-Entitlement Communities [8.8]
- Choice Neighborhoods – Planning [8.9]
- Choice Neighborhoods – Implementation [8.10]

3. United States Department of Transportation [9.11]

- Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program [8.12]

4. United States Department of Homeland Security - Federal Emergency Management Agency [8.13]

- Building Resilient Infrastructure and Communities [8.14]

Federal Broadband Grant Programs (Secondary)

In addition to the federal broadband grant programs listed as Primary Matches, Berks County may consider seeking additional funding opportunities through the following agencies and programs with other eligible applicants:

1. United States Department of Education

- Governor's Emergency Education Relief Fund (GEER)
- Elementary and Secondary School Emergency Relief Fund (ESSER)
- Higher Education Emergency Relief Fund
- Impact Aid Programs
- Promise Neighborhoods Programs

- Rural, Low-Income School (RLIS) Program
- Small, Rural School Achievement (SRSA) Program
- Title I, Part A. Improving Basic Programs Operated by Local Education Agencies Program
- Title III, Part A. Strengthening Institutions Program
- Title IV, Part A. Student Support and Academic Enrichment Program

2. United States Department of Labor – Employment and Training Administration

- Workforce Development in Telecommunications Sector: Apprenticeship Investments in Support of Broadband and 5G

3. United States Department of Treasury – Office of the Comptroller of the Currency (OCC)

- Community Reinvestment Act (CRA) Program

4. Federal Communications Commission – Universal Service Administrative Company

- E-Rate (Schools and Libraries) Program
- High Cost Program (CAF, RDOF & 5G Fund)
- Rural Health Care Program

5. National Science Foundation (NSF)

- Campus Cyberinfrastructure (CC*) Program
- Smart and Connected Communities (S&CC) Program
- Spectrum and Wireless Innovation Enabled by Future Technologies (SWIFT) Program

SYNOPSES REFERENCES

[8.1] Rural Development, U.S. Department of Agriculture (2022). Available at: https://www.rd.usda.gov/

[8.2] Rural Development, U.S. Department of Agriculture (2022). Community Connect Grants. Available at: https://www.rd.usda.gov/programs-services/telecommunications-programs/community-connect-grants

[8.3] Rural Development, U.S. Department of Agriculture (2022). Distance Learning & Telemedicine Grants. Available at: https://www.rd.usda.gov/programs-services/telecommunications-programs/distance-learning-telemedicine-grants

[8.4] U.S. Department of Agriculture (2022). ReConnect Loan and Grant Program. Available at: https://www.usda.gov/reconnect

[8.5] Rural Development, U.S. Department of Agriculture (2022). Rural Broadband Loans, Loan/Grant Combinations, and Loan Guarantees. Available at: https://www.rd.usda.gov/programs-services/telecommunications-programs/rural-broadband-loans-loangrant-combinations-and-loan-guarantees

[8.6] Rural Development, U.S. Department of Agriculture (2022).Telecommunications Infrastructure Loans & Loan Guarantees. Available at: https://www.rd.usda.gov/programs-services/telecommunications-programs/telecommunications-infrastructure-loans-loan-guarantees

[8.7] U.S. Department of Housing and Urban Development (2022). Available at: https://www.hud.gov/

[8.8] U.S. Department of Housing and Urban Development (2022). CDBG Entitlement Program. Available at: https://www.hudexchange.info/programs/cdbg-entitlement/

[8.9] U.S. Department of Housing and Urban Development (2022). FY2022 Notice of Funding Availability (NOFA) Information. Available at: https://www.hud.gov/program_offices/public_indian_housing/programs/ph/cn/fy22funding

[8.10] U.S. Department of Housing and Urban Development (2022). FY2022 Notice of Funding Availability (NOFA) Information. Available at: https://www.hud.gov/program_offices/public_indian_housing/programs/ph/cn/fy22funding

[8.11] U.S. Department of Transportation (2022). Available at: https://www.transportation.gov/

[8.12] U.S. Department of Transportation (2022). RAISE Discretionary Grants. Available at: https://www.transportation.gov/RAISEgrants

[8.12] U.S. Department of Homeland Security (2022). Available at: https://www.fema.gov/

[8.13] U.S. Department of Homeland Security (2022). Building Resilient Infrastructure and Communities. Available at: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Section II. Evaluation of Project Opportunities

Lastly, Lit identified potential grant project opportunities ranging from the Middle Mile to Last Mile and related economic development, telehealth, and emergency response efforts and matched them with programs from the Primary Matches matrix. The grant research deliverable in the Appendix can be used as a guide and reference when pursuing grant opportunities and accompany this business plan as a separate attachment.

Project	Needs	Agency	Potential Funding Program(s)
Middle Mile (Backbone)	Planning, Design, Construction & Equipment	DHS-FEMA	• Building Resilient Infrastructure and Communities (BRIC)
		USDA-RD	• ReConnect Pilot Program
		USDOC-NTIA	• Rural Broadband Access Loan and Loan Guarantees • Broadband Equity, Access, and Deployment (BEAD) Program • Enabling Middle Mile Broadband Infrastructure Program
Last Mile (FTTP)	Planning, Design, Construction & Equipment	USDOC-NTIA	• Broadband Equity, Access, and Deployment (BEAD) Program
		USDA-RD	• ReConnect Pilot Program • Rural Broadband Access Loan and Loan Guarantees • Telecommunications Infrastructure Loans and Loan Guarantees
		USDHUD	• Community Development Block Program • Choice Neighborhoods - Implementation • Choice Neighborhoods - Planning

ACRONYMS:

DHS - FEMA	Department of Homeland Security - Federal Emergency Management Agency
FCC - USAC	Federal Communications Commission - Universal Service Administrative Company
USDA-RD	United States Department of Agriculture - Rural Development
USDOC-EDA	United States Department of Commerce - Economic Development Administration
USDOC-NTIA	National Telecommunications and Information Administration
USDHUD	United States Department of Housing and Urban Development

Project	Needs	Agency	Potential Funding Program(s)
• Telehealth • Economic Development • Emergency Response • Distance Learning	Planning, Design, Construction & Devices	FCC-USAC	• Rural Health Care Program • E-Rate (Schools and Libraries) Program
		USDA-RD	• Community Connect Grant Program • Distance Learning and Telemedicine Grant • ReConnect Pilot Program • Rural Broadband Access Loan and Loan Guarantees
		USDHUD	• Community Development Block Program • Choice Neighborhoods - Implementation
		DHS-FEMA	• Choice Neighborhoods - Planning • Building Resilient Infrastructure and Communities (BRIC)

Section III. Preparing for Grant Funding Opportunities

Through our experience applying for and obtaining financial assistance, we have consistently observed that communities who have the proper engineering and technical information required to apply completed ahead of time are most prepared, confident, and competitive when seeking grant funding. Often, federal agencies only provide between 45 - 60 days for application submission which leaves very little time to begin these studies and assessment while the application period is open.

Therefore, if Berks County is strongly interested in seeking grant funding to address its broadband infrastructure and accessibility gaps, we recommend that the County conduct these efforts as soon as possible so they are prepared and ready for future funding opportunities. Additionally, prior to applying for grant funding, it is strongly recommended that Berks County coordinate closely with the Pennsylvania Broadband Development Authority and other key stakeholders to ensure that the proposal is aligned with State planning efforts and to include the County's needs with respect to project costs to reach unserved and underserved areas. It is also important to note that partnerships with related stakeholders can possibly strengthen potential applications for funding, however more weight is given to partnerships that have been formally established prior to applying for funding. Lastly, due to the varying amount of local matching funding required to pursue these opportunities, we suggest that the County identify sources and amounts of matching funding to determine the respective capacity to secure grant funding.

Policy Research

This Policy and Funding Analysis identifies current and forthcoming federal and state legislative and regulatory action to ensure that the proposed broadband projects will account for existing and pending statutory limitations. The analysis also describes available funding opportunities including the American Rescue Plan ("ARP") funding, Infrastructure Innovation and Jobs Act ("IIJA") funding, Federal and State grant opportunities, and other public and private funding sources that can be obtained and utilized for broadband projects.

Leveraging federal and state funding and newly allowed funding tools like private activity bonds for qualified broadband projects will be critical as billions in additional funding has been made available in the last year.

These Federal sources of funding include:

- Infrastructure Innovation and Jobs Act (IIJA) **$65 Billion**
  - BEAD **$42.45 Billion**
  - Middle Mile **$1 Billion**
  - Affordable Connectivity Program (ACP) **$14.2 Billion**
  - Qualified Broadband Private Activity Bonds (PABs) **$600 Million**
- American Rescue Plan Act (ARPA) **$360 Billion**
  - State and Local Fiscal Recovery Fund **$350 Billion**
  - Coronavirus Capital Projects Fund **$10 Billion**
- Universal Service Fund
  - RDOF **$20.4 Billion**

At the state level, the Commonwealth of Pennsylvania recently established the Pennsylvania Broadband Authority to oversee and implement a state-wide strategy and oversee a minimum of $100 million funding for eligible projects through federal funds provided by IIJA. Other State programs include:

- Unserved High-Speed Broadband ("USHB") Funding Program **$10 Million**
- Pennsylvania Broadband Investment Incentive Program **$35 Million**

The Commonwealth of Pennsylvania prohibits a municipality from providing broadband services for a fee unless a private sector provider declines to provide service. However, there are incentives in the law that invite collaboration with electric co-ops to connect homes that are unserved. The Commonwealth of Pennsylvania also has a "call before you dig" policy that may facilitate dig once policies in the future.

The COVID-19 pandemic has highlighted more than ever the need for, and in many locations persisting lack of, broadband access and digital inclusion to support remote work, telehealth, distance learning, e-government, entertainment, and more. Given the demand, need, and unprecedented funds, Berks County has a unique opportunity to enhance, and in some instances, start investing in digital infrastructure in order to ensure that robust, affordable connectivity is available in all corners of the County.

10 Recommendations and Next Steps

Broadband access has shifted from a perceived luxury to a necessity for communication, business, education, health care, service delivery, and countless other everyday activities. Areas that have not experienced broadband deployment and/ or expansion to-date likely are perceived to lack the economic return on investment necessary for the traditional providers. Underserved communities are a clear priority for stakeholders for broadband expansion in Berks County. We discuss such areas below and provide our recommendations to address their local connectivity and digital inclusion challenges.

Identifying and Addressing the Underserved Areas in Berks County

Northern Berks County

There are extensive connectivity needs in the northern part of Berks County. This was continually confirmed by the survey, FCC data and the RDOF-eligible census blocks (nearly all of which are located in the northern portion of Berks County) as provided in other sections of this report.[21]

Further, the Bethel/ Tulpehocken area, including upper Tulpehocken and Albany Township, was repeatedly highlighted as underserved throughout the compilation of this project. Taking into account the data found in the Market Service and Incumbent Analysis and factors such as population, lack of internet connectivity and/ or computer devices, associated affordability implications, and need for improved broadband infrastructure, as included in the table below, demonstrate the clear need for focus on the northern area. We recommend that Berks County prioritize future network deployments to this northern region and these communities.

These northern communities border neighboring Schuylkill County, which has underserved areas along its southern border. We recommend that Berks County work with Schuylkill County to connect the underserved areas in the southern portion of their county in conjunction with underserved areas in the northern part of Berks County. This would likely further entice providers as it provides a larger coverage area with multiple county jurisdictions, and demonstrates to state and federal planners that you are making their priorities your priorities.[22]

It is important to note that, while our data does show evidence of underserved areas in and around the Reading region, this is less likely due to a lack of infrastructure, but instead a need for heightened digital inclusion programming to ensure broadband adoption and solidify a return on investment for existing providers to upgrade their infrastructure and technologies. As a result, our recommendations as to broadband infrastructure deployment remain focused on the northern region where Berks County is also more likely to be eligible for state and federal grant funding.

Our comprehensive prioritization list for northern Berks County is as detailed on the next page.

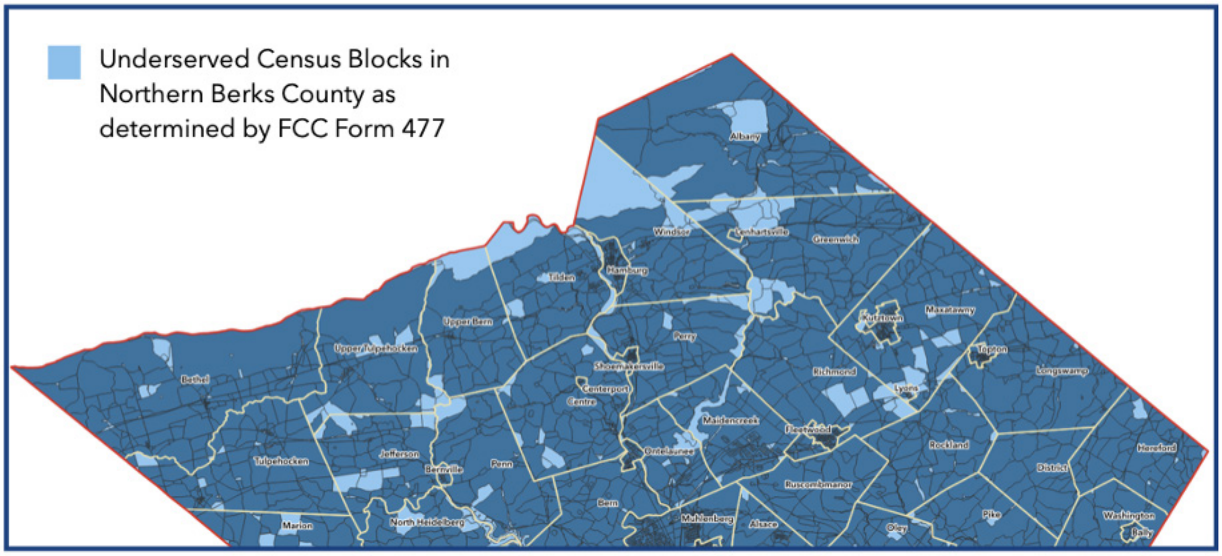
[21] Rural Digital Opportunity Fund (RDOF) data is highly vetted and therefore more reliable than other broadband data sources as an accurate reflection of local connectivity needs.

[22] BEAD NOFO https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf

Factors contributing to prioritization of Northern Berks County as the primary area of focus for broadband expansion

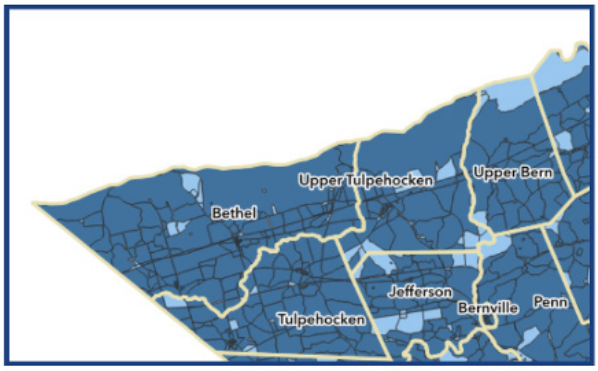
Priority	Municipalities	Digital Distress					Digital Divide Index												
							INFA Variables					SE Variables					Digital Divide Index		
		Census Tract	Households	No Internet Access	No Computer Device	Digital Distress	Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
1	Bethel, Upper Tuplehocken	42011010100	**1937**	**19.2%**	**16.7%**	**High**	53.2	7.3	93.30%	19.20%	16.70%	18.60%	5.30%	15.50%	8.70%	2.07	**32.31**	14.96	27.73
2	Tulpehocken	42011010401	52	**16.5%**	**10.4%**	**High**	173.3	12.6	86.10%	16.50%	10.40%	25.60%	1.80%	12.70%	13.30%	2.26	**25.18**	17.09	25.46
3	Greenwich, Lenhartsville	42011013902	1445	**19.4%**	**9.9%**	Moderate	64.1	7.6	96.70%	19.40%	9.90%	11.00%	7.80%	20.00%	18.00%	4.02	**28.84**	19.23	29.11
4	Richmond	42011013701	1464	**18.2%**	**13.0%**	Moderate	75.5	13.4	92.0%	18.2%	13.0%	17.5%	4.5%	19.8%	11.8%	3.88	**29.29**	17.4	27.95
5	Windsor, Hamburg	42011013800	1942	**17.3%**	**12.2%**	Moderate	176.7	13.9	95.50%	17.30%	12.20%	11.70%	8.00%	17.80%	15.00%	9.25	**27.31**	18.32	27.57
6	Tulpehocken, Jefferson, Marion, North	42011010402	2403	**16.8%**	**10.7%**	**High**	166.2	15.3	84.6%	16.8%	10.7%	16.6%	9.5%	19.4%	12.7%	4.04	**25.39**	18.68	26.8
7	Perry	42011013702	1547	**17.1%**	**13.6%**	Moderate	139.8	11.6	94.90%	17.10%	13.60%	11.30%	6.20%	18.80%	14.90%	9.06	**28.55**	18.03	28.03
8	Heidelberg	42011010500	2354	**14.3%**	**10.1%**	Moderate	176.3	16.2	90.30%	14.30%	10.10%	9.90%	8.20%	14.40%	13.60%	7.14	**24.43**	15.95	24.17
9	Upper Bern, Tilden	42011010202	2239	**13.3%**	**13.1%**	**High**	142.6	14.5	87.5%	13.3%	13.10%	17.0%	4.4%	22.5%	15.8%	4.41	**25.92**	19.86	27.99
10	Centre	42011010201	1790	**13.4%**	**11.4%**	Moderate	160.1	13.6	77.50%	13.40%	11.40%	11.30%	6.30%	17.70%	12.70%	46.65	**23.81**	22.79	29.09
11	Penn	42011010302	1114	**17.7%**	**7.4%**	Moderate	161.8	14.2	83.40%	17.70%	7.40%	8.10%	2.80%	19.00%	14.10%	5.37	**23.9**	15.5	23.53
12	Albany, Hamburg, Lenhartsville	42011013901	1617	**11.7%**	**10.4%**	Moderate	122.6	10.3	98.30%	11.70%	10.40%	6.70%	5.70%	32.10%	24.00%	8.02	**25.2**	24.54	31.21
13	Kutztown	42011014000	2204	**9.9%**	**7.9%**	Low	56.4	11.2	75.50%	9.90%	7.90%	4.20%	14.30%	16.10%	14.00%	13.05	**21.9**	17.54	24

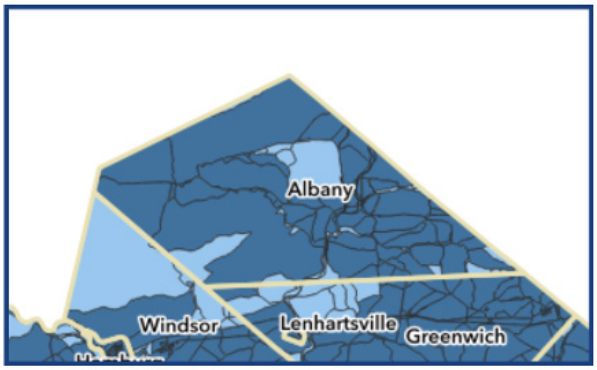
Other factors that have led to these areas remaining underserved are challenging terrain and a limited middle mile footprint, which creates cost barriers and disincentivizes last-mile construction



Specific Areas of need in Northern Berks County

Underserved Census Blocks in Albany, Bethel & Upper Tulpehocken as determined by FCC Form 477



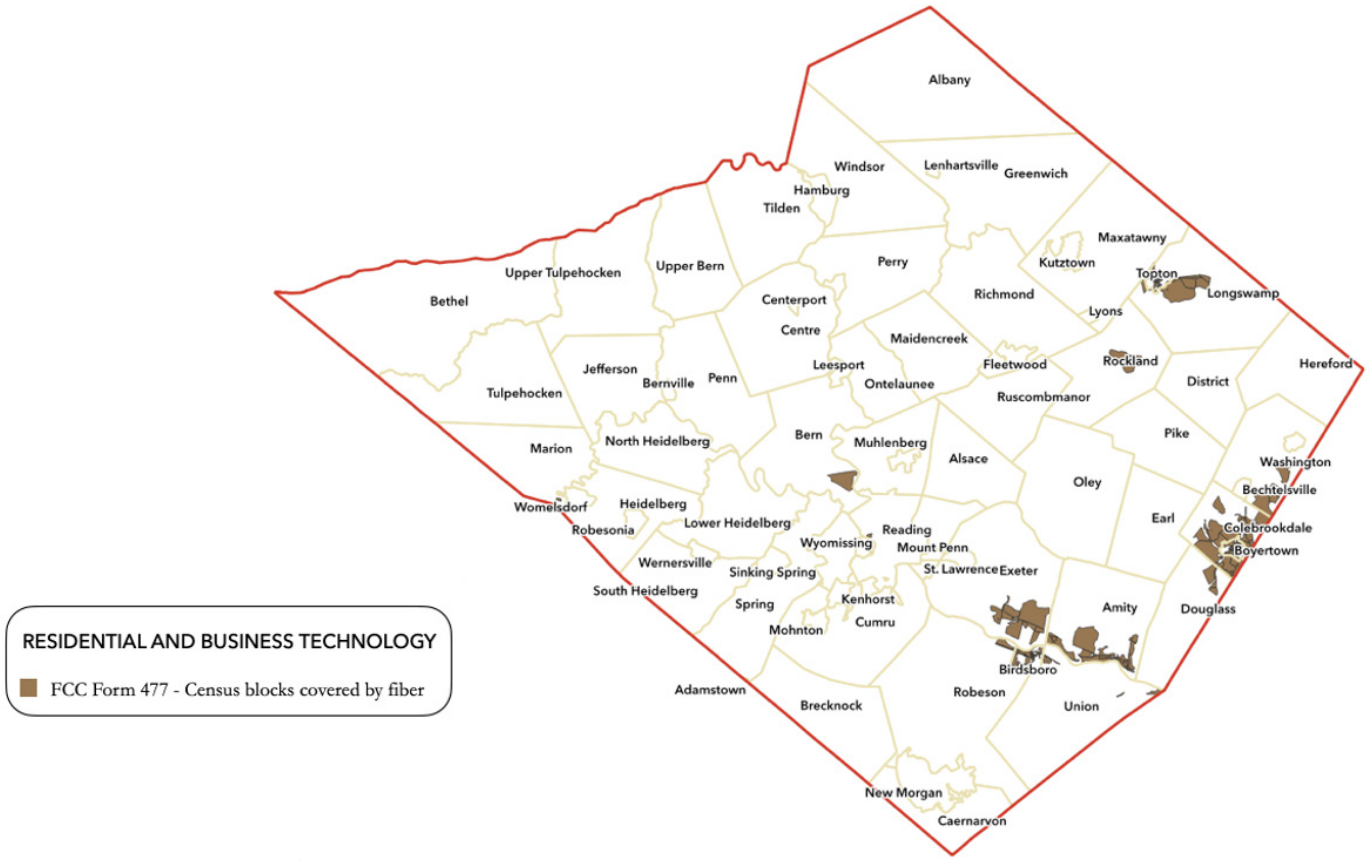


The majority of those who took the survey in Bethel either do not currently have home broadband service or use cellular or satellite networks as their primary connectivity source. The FCC data shows several underserved locations in this area and large swaths of residences that only have access to satellite service. We also heard direct feedback specifically from residents on Gravel Pit Rd. who have been “waiting for ten years for internet service” and have received “quotes as high as $28,000” to bring service to their residence.

Survey participants from the Tulpehocken area indicated similar experiences including dissatisfaction with their current providers, desire for more competition and choice, and one resident who claimed they were told it would cost $30,000 to get at-home service.

Albany Township too is in a similar situation in that the nearest last-mile provider only offers business services.

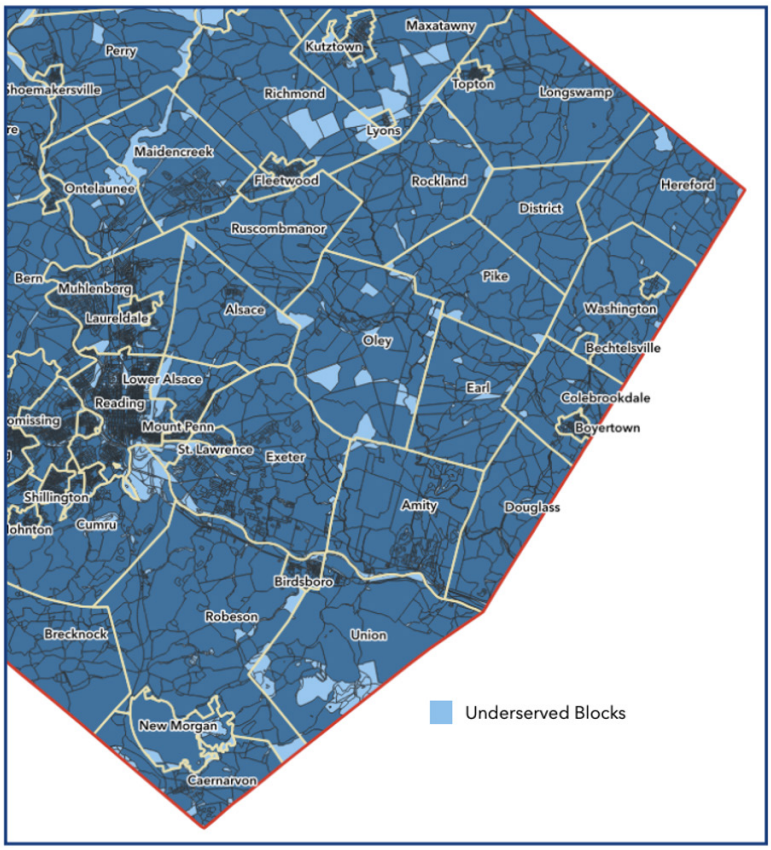
Kempton is described by residents as an “internet and cellular desert” where they “live on the wrong side of the digital divide”. Residents here too are typically limited to satellite service or wireless hotspots, both of which suffer from rural challenges (satellite by the dense tree cover and topography and hotspots by the lack of cellular service).



Beyond Northern Berks County

As a dichotomy of the northern region, nearly all existing fiber is located in the southern portion of Berks County. However, there are still opportunities to expand coverage in this region to areas that are still underserved, as well as extend the fiber footprint northward. There is also opportunity to work with neighboring Chester and Montgomery Counties.

Though we recommend prioritizing working with Schuylkill, Chester and Montgomery Counties due to their adjacency to areas that could be of the most impact for Berks County, we further recommend opening up dialogue with all nearby counties in the region for potential partnering. Lebanon, Lancaster, and Lehigh Counties' proximity to Berks County may make them good partners, depending on where they are at in the process of exploring broadband expansion.

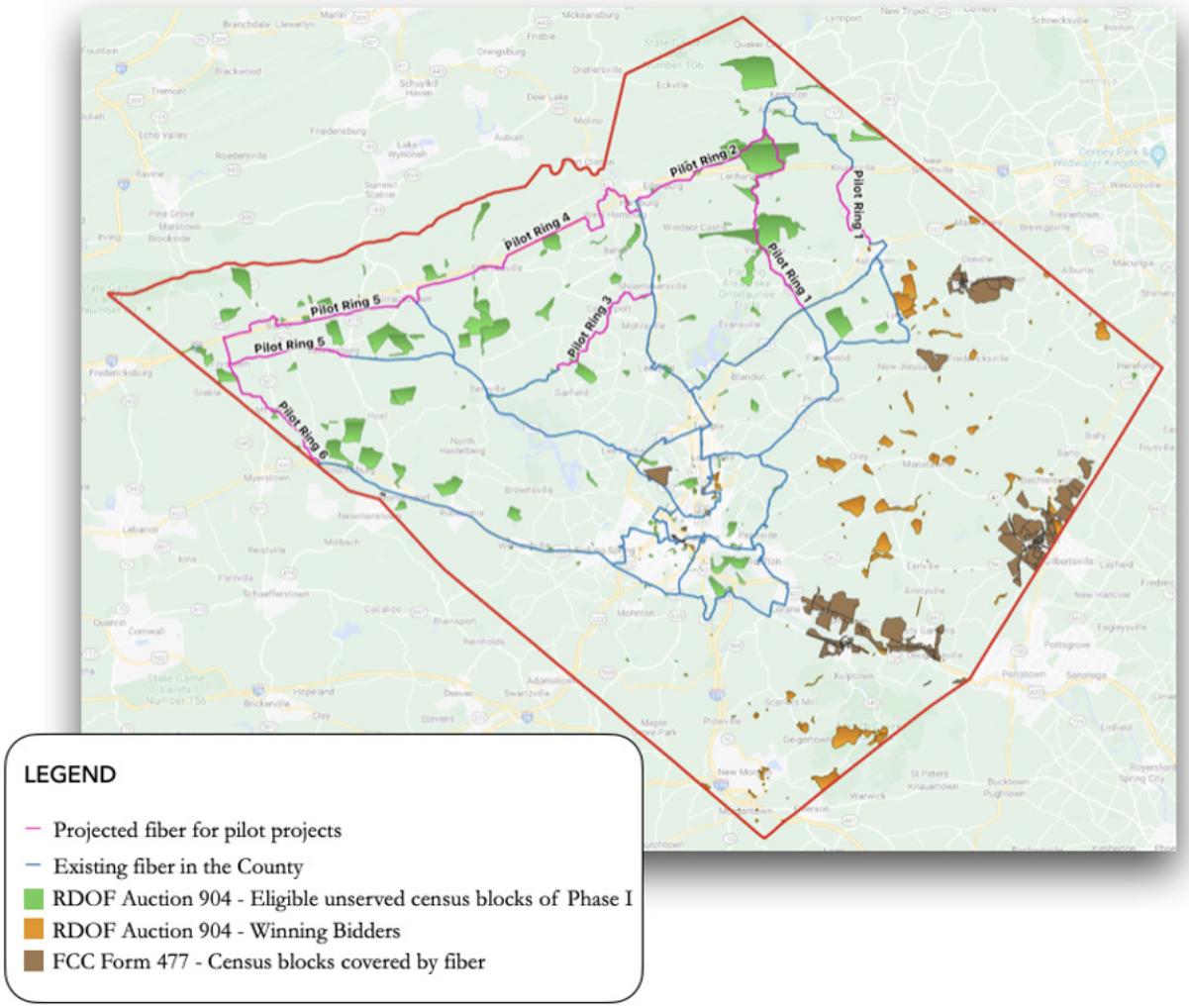


Incentivizing Broadband Network Deployment

Procurement Recommendations for Underserved Areas

The quickest approach for Berks County to address areas of need is to leverage the existing middle mile. The map below overlays existing fiber that could be leveraged for this purpose. Berks County could quickly close middle mile gaps by strategically expanding fiber to attract last-mile providers to areas that, to-date, have been cost-prohibitive. Bringing the middle mile network closer to these areas reduces the cost to connect last-mile networks into the middle mile, ultimately reducing last-mile providers' construction costs.

The "projected fiber for pilot projects" indicated in pink in the map below are where additional fiber would close existing gaps and create robust middle mile fiber rings. Closing these rings will provide network redundancy, also reducing service interruptions.



Given the challenges in the northern region, Berks County is likely going to need to financially incentivize fiber providers to build-out that portion of the county. Before determining how much should be allocated to middle and last-mile fiber expansion in the region, or identifying the specific funding source(s), Lit recommends the following:

- **Berks County meets with existing middle and last-mile providers identified through this report and receive their high-level cost estimates to expand existing footprints to address the underserved areas identified herein.23**
  - This also could be performed through a Request for Information (RFI) or Request for Quote (RFQ) to the middle and last-mile provider community.
  - For middle mile network needs, each proposed ring in the map above could be addressed as an individual phase with its own cost projections.
- Berks County should meet with potential Anchor Institutions along or near the projected fiber routes for pilot project areas such as 911 towers, healthcare facilities, schools, and emergency services to reduce risk and further justify additional middle mile build-out.
- Berks County compares the provided cost estimates with the network deployment estimates provided in this report to compare cost options.
- Berks County issues a Request for Proposals (RFP) to the middle and last-mile provider community to address gaps in network availability, with clear details as to the financial or in-kind contributions (see the following section on reducing barriers to build-out) that Berks County is offering.
  - The RFP should also seek to identify what partnerships are possible or if the County should build-out portions of the middle mile network itself.

Alternative Deployment Models

Should the aforementioned method of encouraging network expansion with existing providers be found to be infeasible or unsatisfactory, Lit recommends that the County consider the potential of a County-owned Middle Mile, exploring a Public-Private Partnership (P3) model to do so.

The P3 model between a local government and a private provider can provide potential access to private capital sources and funding for broadband projects at low, long-term interest rates that are not otherwise available to private entities using public bonding (See the Grants Services chapter for details on eligible grants). This can make the network more affordable to taxpayers and to the partners.

The P3 model also provides the County with more control - network ownership remains with the public entity, while construction, customer and network service, and maintenance are the responsibility of the private entity, with clearly defined metrics tied to lease and availability payments.

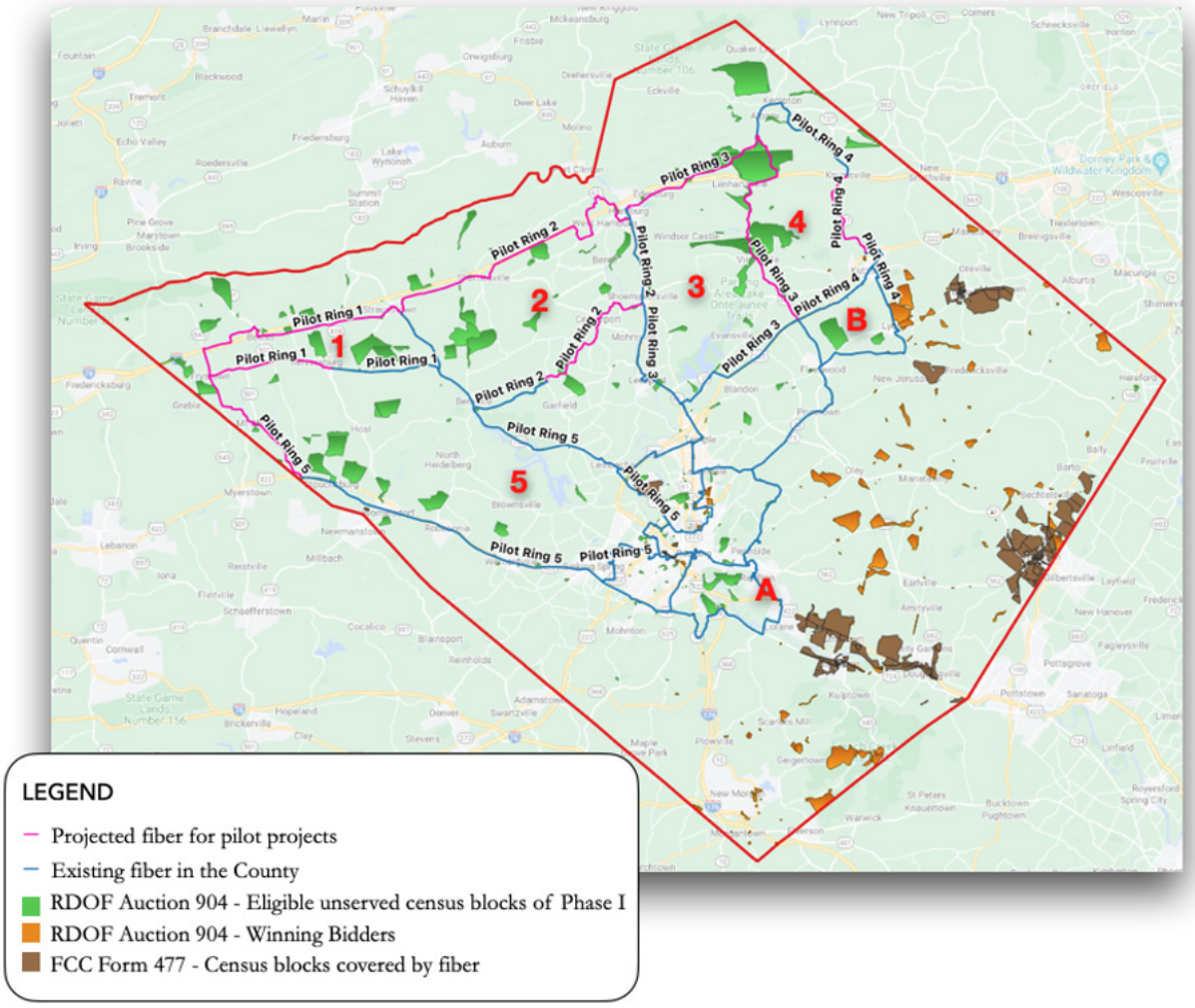
The distribution of risk and control between the public and private sector entities in a P3 is vital to its success.

Structuring agreements in a P3 Partnership to manage risk:

- Design, Build, Finance, Operate, Maintain (DBFOM) - Just as the name indicates, the private partner designs, builds, finances, operates, and maintains the network infrastructure under strict adherence to agreed upon controls, metrics, benchmarks, and other targets tied to the compensation received by the private entity.
- Design, Build, Finance (DBF) - The private partner designs, builds, and provides funding for the network infrastructure and would own the broadband network, leasing it to the County for a defined period of time (usually for the duration of the financing of the project). After an agreed upon timeline, the ownership of the network is transferred to the public entity. Importantly, this option imposes network operation and maintenance as the responsibility of the public entity, though is most typically done so through a third party.

[23] For example, Albany Township is in the heart of an existing, large middle mile ring owned by Crown Castle, who expressed interest in working with Berks County.

Project Prioritization



For the purpose of selecting a strong demonstration project, Lit has further prioritized the areas below. Priorities A & B currently have sufficient middle mile broadband to facilitate additional last-mile service and could be considered first to demonstrate an early "win" for Berks County. Whereas, priorities 1-5 (with 1 showing the greatest need) are areas that will require an expanded middle mile network in order to facilitate enhanced last-mile service, thus may take longer and have a greater expense associated with their build-out, but are targeting areas of higher need. Priorities 1-5 and the associated rings align with the other northern Berks County priorities that are provided in this report. RDOF eligibility is listed not for the purpose of indicating the County should pursue RDOF funding (as they are not even an eligible applicant) but listed to further show the need in that particular area based on well vetted data.

A

The Reiffton, Kenhorst, Ridgewood area around U.S. Route 422 should be prioritized as there is an existing middle mile encompassing the area, contains underserved and RDOF eligible census blocks and already has fiber near the Southern portion. Berks should engage last mile providers to find out what their current challenges are to build out the area and what it will take to do so.

B

The Fleetwood, Lyons area should be equally prioritized as there is an existing middle mile encompassing the area, contains underserved and RDOF eligible census blocks and already has fiber in the north. Berks should engage last mile providers to find out what their current challenges are to build out the area and what it will take to do so.

1

Priority 1 is well positioned along Interstate-78 which is a major economic corridor for the county with the most significant development. Current commercial development in this area has no access to fiber and high bandwidth requirements. This area also has underserved and RDOF eligible census blocks and is also well positioned near Schuylkill and Lebanon Counties for potential collaboration. Extending the existing middle mile in this area will help attract last mile providers by making it more cost effective to build out. Priorities 2-4 will expand upon this along the economic corridor on Interstate-78.

2

Priority 2 is also well positioned along Interstate-78 and is the logical next priority after Priority 1 as it is directly adjacent. This area also has underserved and RDOF eligible census blocks. Extending the existing middle mile in this area will help attract last mile providers by making it more cost effective to build out.

3

Priority 3 is also well positioned along Interstate-78 and is the logical next priority after Priority 2 as it is directly adjacent. This area also has underserved and RDOF eligible census blocks. Extending the existing middle mile in this area will help attract last mile providers by making it more cost effective to build out.

4

Priority 4 is also well positioned along Interstate-78 and is the logical next priority after Priority 3 as it is directly adjacent. This area also has underserved and RDOF eligible census blocks. Extending the existing middle mile in this area will help attract last mile providers by making it more cost effective to build out.

5

Priority 5 contains major pockets of underserved and RDOF eligible areas and can expand directly off of priority areas 1 and 2. It is also well situated next to Lebanon County for potential collaboration.

Grants

We identify State and Federal broadband grant opportunities in the Grants/ Policy section. These can be used to supplement any local contributions to the above projects. Moving forward, Berks County must be proactive, or seek outside assistance, in monitoring current and upcoming state and federal grant funding opportunities, particularly the Pennsylvania Broadband Development Authority's forthcoming implementation of the NTIA BEAD funding.

Several of these grants may be contributable to projects identified herein. Over the next 18 months, we recommend that Berks County target the following funding programs:

U.S. Treasury - Capital Projects Fund

- Pennsylvania's allocation is $278.7 million

USDA - ReConnect Program

- Round 5 - Anticipated in Spring 2023

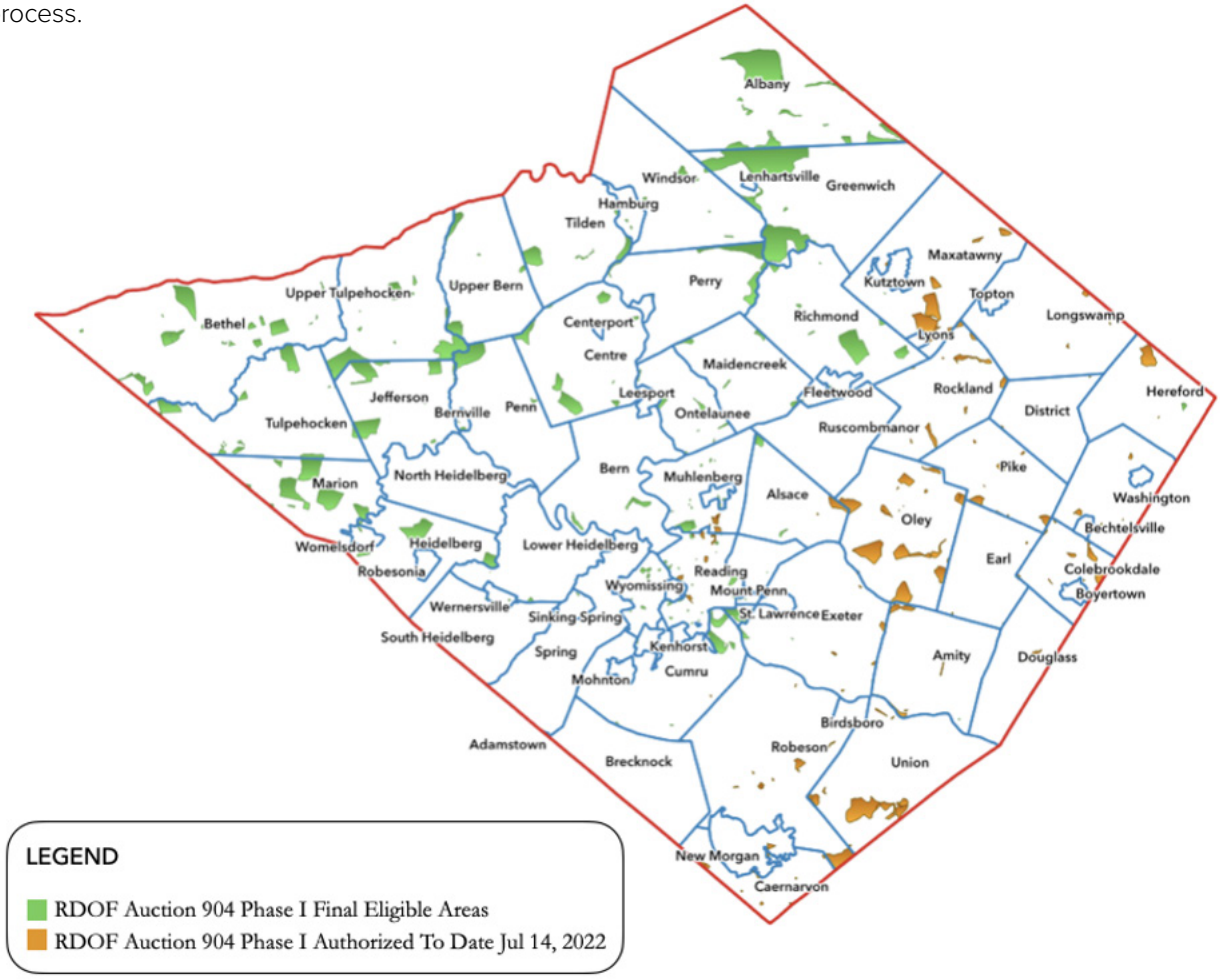
NTIA - BEAD

- Round 2 - Underserved Locations below 100/20

RDOF (northern Berks County)[24]

- Phase II - over $2 billion in RDOF funds were recently denied to LTD and StarLink, increasing the chance of an RDOF phase II.

Lit recommends that Berks County apportion funds directly for the purpose of broadband efforts. Many grant programs require a match percentage and having those funds allocated ahead of time will streamline the process.



Partnerships and Coordination

Various projects and priorities can be leveraged for federal and state funding by building a coalition of partners. The NTIA and the Pennsylvania Broadband Development Authority have been clear that partnerships and coordination will be prioritized in funding decisions. Lit recommends that Berks County continue to coordinate with stakeholders in the education, healthcare, government and business sectors across the county, as well as other counties in the region, to increase its likelihood of award through the grant programs included herein. Lit also recommends all future broadband expansion efforts in Berks County be communicated to the Pennsylvania Broadband Development Authority to keep them up-to-date and to solicit their feedback. The BEAD Statewide Plan is developed by the Pennsylvania Broadband Development Authority and it is critical

[24] There is a clustering of RDOF-eligible areas in northern Berks County, making RDOF another potential funding option, along with our other grant program recommendations, for that area. However, it is important to note that RDOF is generally thought of as supplemental funding due to how it is bid out; therefore, it may not be as attractive to private providers (which are the eligible applicants) as other funding options. Further, if RDOF funds are pursued, Berks County may be limited in other funding programs.

that Berks County's connectivity needs and costs are included.

To prepare for the plethora of grant opportunities that may be available for the projects identified herein, we recommend the following for Berks County:

- Many grant programs require local match funds, in some cases up to 25% of the total request. It is imperative that Berks County earmark funding for this purpose.
- Beyond local match, Berks County must coordinate with financial institutions and partners to be prepared to meet any additional financial security requirements, such as letters of credit.
- Berks County will further need to coordinate with the applicable state and federal agencies and elected officials in order to obtain letters of support for applications.

However, due to the finite and competitive nature of state and federal broadband grants, Lit also recommends tracking the following alternative funding options and consider long-term financing:

Revenue Bonds

- Use revenue generated from the project to make interest and principal payments.

General Obligation Bonds

- Obligate the taxpayers and government directly as opposed to utilizing project-generated revenue.

Private Activity Bonds

- Enable private entities to access tax-exempt bond financing for qualifying projects that have a public benefit, subject to a volume cap. The Infrastructure Investment and Jobs Act introduced a "qualified broadband projects" category for census tracts where a majority of households lack broadband access to 25 Mbps download/ 3 Mbps upload.

Private Financing/ Public-Private Partnerships

- Private Public Partnerships (P3s) foster collaboration between a unit of government and a private entity. P3s typically include one or more elements of a "DBFOM" model: Design, Build, Finance, Operate, and Maintain; however, network ownership, particularly middle mile network ownership, usually remains with the public partner. Last-mile services would then be provided by the private partner, or multiple private providers, and revenue benefits are often shared between the public and private entities.

Based on past experience, having a funding contingency plan is essential because grant funding may take several attempts to secure and may not cover the full project scope.

Removing Barriers to Broadband Deployment

Policy

Dig Once/ Open Trench Policy

A major cost barrier to broadband expansion, particularly wired broadband, is the cost of excavating existing roadways or otherwise digging, boring, or trenching into the ground. Street excavation represents 70-80% of the cost of an underground fiber deployment. A Dig Once/ Open Trench policy is a commonsense, economic method to reduce these costs.

A Dig Once/ Open Trench policy encourages conduit to be installed when public rights-of-way are excavated or otherwise opened. The concept is straightforward: when public land, such as a street, is opened or a trench is cut, a private entity installs conduit underground. Such policies can reduce network construction costs, while ensuring efficient, non-duplicative street cuts. Further, installation need not be limited to infrastructure for private sector use – Berks County could pursue dedicated conduit for its own connectivity needs.

Lit recommends the following guidelines for a Dig Once / Open Trench policy in Berks County:

- The Dig Once/ Open Trench policy requires broadband providers that apply for an excavation permit to notify other providers, utilities, and relevant entities identified by the County of its upcoming excavation and allow them reasonable access (i.e., so as not to delay the permittee) to the open land/ trench to install conduit.
  - The broadband providers referenced in the Market Service & Incumbent Analysis section should be among those notified.
- The Dig Once/ Open Trench policy requires the excavating entity/ permittee to install conduit for its future use concurrently with the permitted project in order to minimize future street excavations.
- The Dig Once/ Open Trench policy requires the excavating entity/ permittee to coordinate with Berks County to install fiber and/or conduit for County-government's exclusive use. **Lit recommends a minimum of one 2" conduit.** This will enable Berks County to install up to 864 strands of fiber for a robust fiber network.

The Dig Once/ Open Trench policy avoids overly restrictive technical details.

Dig Once / Open Trench programs can be codified or enacted through local rules and regulations. Establishing a Dig Once / Open Trench policy via municipal ordinance ensures it is carried over from one local administration to the next; however, a local rule is more easily adjusted, as needed, as the County's infrastructure needs change. Berks County will need to determine which approach best aligns with their current Code and policies; however, **Lit recommends a codified ordinance that is broad enough to adapt to technological advances without requiring ongoing amendments.** This same principle applies to the "One Touch Make-Ready" concept covered in a later section.

It is not uncommon for utilities to protest the enactment of Dig Once / Open Trench policies. While Dig Once / Open Trench policies reduce the number of pavement cuts and physical and monetary costs associated with those cuts for governments, the requirements to coordinate with multiple utilities may increase the time needed to complete a project (which may lead to additional costs for the private entities). Berks County could

incentivize compliance by reducing permitting fees for participating utilities. We further address permitting processes in the section that follows.

Streamline Permitting Processes

Government permitting processes, and the ease or challenges thereof, impact fiber deployment. Broadband network providers prefer to supply all required data and information as part of their initial submission to the government entity. Uncommunicative staff, confusing or lengthy franchise/ permitting processes, and complicated fee structures make it difficult for network deployers to understand and comply with local requirements. To alleviate these challenges:

- It is imperative that staff are communicative and willing to assist entities in complying with franchise and permit processes, saving time and money for all.
- Processes should be streamlined and sufficiently documented to prevent the submission of duplicative information. For example, by establishing a single department/ individual within a department as the designated point of contact.
- Fee structures too should be streamlined and sufficiently documented to ensure that permittees can anticipate their costs, understand when and how to pay any required fees.

These measures are crucial to reducing the time and money providers must expend to navigate permitting processes, and may encourage new or additional deployment. Berks County should also engage power providers/ pole owners and solicit their input regarding opportunities to further streamline the process and make it less costly.

Facilitating Digital Equity, Inclusion and Literacy

The National Digital Inclusion Alliance (NDIA) defines digital equity as a condition in which all individuals and communities have the[25] information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.

Digital Inclusion

Digital equity is achieved through digital inclusion, which the NDIA refers to as the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs)[26]. This includes five elements:

1. Affordable, robust broadband internet service (including free and low-cost broadband);
2. Internet-enabled devices that meet the needs of the user;
3. Access to digital literacy training;
4. Quality technical support; and
5. Applications and online content designed to enable and encourage self-sufficiency, participation and collaboration.

Digital inclusion must be treated as a continuing, essential service to the community (rather than a short-term need or issue to be addressed periodically) in order to be successful. Technology is perpetually advancing, and in order to ensure equal opportunity for all, individuals must readily have access to the resources that allow and support them in advancing along with it. **This requires an ongoing commitment of dedicated resources, purposeful investment and policy development.**

[25] Source: https://www.digitalinclusion.org/definitions/#:~:text=Digital%20Literacy%20is%20the%20ability,both%20cognitive%20and%20technical%20skills.

[26] Source: https://www.digitalinclusion.org/definitions/#:~:text=Digital%20Literacy%20is%20the%20ability,both%20cognitive%20and%20technical%20skills.

Digital Literacy

Berks County has already taken steps towards digital literacy and digital inclusion through a proposed "tech educator" program, public wifi-boost program provided through the Reading Public Library, and the formation of a telehealth and healthcare focused sub-committee focused on inclusion.

The digital navigator initiative proposed will provide ongoing basic computer classes to adults to help individuals obtain the necessary computer literacy skills to sign up for services, pay utilities, use telehealth services, and/or apply for jobs. This program will commit to supporting low-income residents and otherwise disadvantaged/ at-risk members of the community.

A note on accessibility

Access to internet-enabled devices aligned with users' needs requires a broad scope of initiatives, with special consideration for the needs of at-risk individuals. In addition to basic network access across the County along with free or low-cost personal device programs, accessibility programs should focus on making devices available in public spaces at no-cost for critical uses, such as telehealth kiosks, mobile telehealth equipment, and inventoried devices that can be issued to individuals for specific use cases, such as remote patient monitoring (including Wi-Fi hotspots for those without internet access at home). It must also take into consideration those with physical and cognitive disabilities, and address language barriers.

Lit Communities recommends continued emphasis on and expansion of these initiatives through the creation of a Digital Equity Office or Coalition (or an equivalently organized entity). The entity should focus on educating the community on topics related to online programs and digital training related to education, employment, telehealth, government benefits and other assistance programs. This could be scaled from a few individuals, such as the tech educator position, and grow as necessary or by funding priority.

The City of Reading has been identified as a strong candidate for starting digital equity activities through a Digital Equity Office. Socioeconomic factors suggest Reading would benefit from education on the availability of programs such as the Affordable Connectivity Program which subsidizes internet costs from participating carriers. Targeting Reading to enhance digital literacy will provide the community with the skills required to use technology effectively which will lead to higher broadband adoption rates.

Tri-county regional rail

As Berks County participates in the Schuylkill River Passenger Rail Authority, Lit Communities recommends coordinating with rail providers to ensure that connectivity is part of ongoing conversations. Broadband connectivity is often challenging on passenger trains. Most trains that do have Wi-Fi connections suffer when passing through rural areas due to lack of infrastructure and inhibiting terrain. Urban areas can also be a challenge due to tunnels and large obstructions. When a large number of passengers use a train's Wi-Fi, the systems can also get overburdened.

Further, rail lines typically have access to significant rights-of-way/ public lands. With the appropriate approvals, these lands could also be used to expand broadband in otherwise difficult-to-serve locations. We recommend taking these factors into consideration when further engaging on the Tri-county rail project by bringing internet and passenger railroad service providers to the table to discuss these issues and how to overcome them for everyone's benefit.

Appendix A

Business Focus Group

Jul 13, 2022

Attendees:

Michael Conley, VP of IT, East Penn Manufacturing, mconley@dekabatteries.com

Fran Kiedeish, Director of Technical Services, Teleflex, fran.kiedeisch@teleflex.com

Justin Loose, CIO, Berks County

Introductions:

Michael: Lots of employees live in Berks County and this conversation is relevant to initiatives we're looking at over the next few years.

Fran: This is an R&D location. We have our own broadband but I see this benefitting employees in scenarios like what happened with the Covid pandemic and accommodating folks working from home

Discussion:

Does your organization own and or operate broadband infrastructure?

Michael: Yes - Own and operate

Fran: Yes - Own and operate

On a scale of 1-10, what is your need for higher speed broadband?

Michael: 9

Fran: 8

Does current internet availability affect the organization's short or long term strategic plans or goals?

Fran: Our main facility is in Wyomissing with a 12,000 sq. ft. warehouse in Berks (corporate center). The challenge has been trying to get a better internet connection to the location. We've worked with Comcast, Verizon, etc. and it seems there are challenges in running cable in the ground out there. Is there a wireless solution that we could apply for in this process?

Are the limitations of this expansion due to cost / the investment needed to be made?

Fran: There is a gas line that cannot be crossed by Comcast or Verizon. Not sure if the gas line is on the property or not, but they can't go over it aerially with poles, either. *(Fran agrees to send more detailed information in a follow up email)*

Michael: We ran something similar in Lancaster where we hit a railroad that we couldn't go through. We have a number of locations within Berks and surrounding counties. No one will go over or under the rail tracks and no one will go through the permitting process. We're stuck. We employ about 8,500 in our Berks facility. About 7-8k reside in Berks County but I don't have an exact number because Covid caused a changeover. We're one of the largest employers in the County. We want to utilize apps for HR stuff like time off requests, and budget is an issue for a lot of our workers who have set budgets for things like this and have other utilities like water bill, gas, electricity that are more important than the internet. We try to provide a fair wage, and yeah maybe some folks have cell phones but maybe not smartphones, maybe they don't have computers, it's about availability.

Looking at metro, wireless would be fantastic, but fiber would be even better. We partner with PenTeleData and Verizon, and there is a significant cost. If service isn't available, we may have to make concessions for what services we offer our employees. All of payroll and HR is cloud based, and we're starting to wonder how to handle the employee who can't utilize that. It's a real stopping block for us

Michael: We have a hard time getting applications filled out electronically when we moved away from a paper system. Even getting a headcount of this is hard. HR is taking the brunt of it. We're using an IVR menu because we can't just totally move it over to an app or a site because we may shun a portion of the population. We also have a kiosk available for people to use on-site. Folks up in Allen dont have the issues, it's more Reading and obviously we're in rural Pennsylvania so there are lists of challenges.

Justin: If the available services aren't affordable, we have interest in lowering the cost of broadband

What goals (educational, economic, public health, civic engagement or otherwise) would members of your organization wish to address with wider broadband access and/ or adoption?

Michael: About 300 people who work in our back office are permanently remote, as teams grow we need reliable services - if their internet is down we're still paying them. More reliable service is really important. Their back up is their cell phone and cell coverage from rural areas is never great, either.

Fran: We use a service that I am forgetting the name of, but we have 1 person on the 1st shift and 1 on the second shift. They help us use a device that people carry when they are in the building that tracks their motion, so it detects when there is a lack of motion and has an emergency button for "man down'' situations with an automated escalation pathway. It's only available in that one building, but having a more robust system would be beneficial, and with peoples cell phones not working in some areas, it's crucial that emergency response is able to be contacted and we'd like to be able to expand that service.

What technology initiatives is your organization most focused on? Does increased broadband help to accelerate those initiatives?

Michael: We're moving a bit to the cloud, and we've got data centers. Internet access is paramount. We run Microsoft Office 365. We are starting to run SB WAN. The costs keep going up, not down. We're looking at a situation where we're either stuck with one provider or 5G and we have safety-critical systems hooked up to this, we're not comfortable with brand new 5G services for those.

Have you had any challenges with data centers?

Michael We're about 20% in the cloud right now. Traditional manufacturers do not want to put IP into the cloud and it's a big cost to switch over. There is a growth to that as we add new technologies . The services that are offered put us on a dependency path for broadband and it's critical. We've got world-wide operations including China, Canada, and across the USA all the way to California.

Are existing speeds sufficient to meet business needs in Berks County?

Fran: Yes. When our primary ISP is working, yes. Our backup is Comcast which has much lower speed/bandwidth. We're an FDA regulated company and with that means we get lots of audits. Covid made it so the auditors are not always in the building and we're sending a lot of data back and forth. The auditors have tight schedules and deadlines to meet and can't be delayed due to poor upload speeds slowing their ability to get our data. When we lose our primary connection, it reflects poorly on us as a business. When we first moved into the facility, we were losing it weekly but we troubleshooted with the provider and it improved within the first 6 months. We've been in the facility for 2 years and it's worked well since then.

Michael: To follow up on Fran's comments, we're the only automotive presence in the area. It's a business requirement for us to be able to do VR tours and inspections for 3 out of 7 of our OE customers. My pipelines to the internet are significantly larger now.

Do members of the organization work from home/hybrid? Has inadequate speeds impacted their ability to do so?

Both: Yes

Fran : About 7-10 employees could not work from home during the lockdown because they did not have adequate bandwidth, so we had to make accommodaions for them to come into the office. Thankfully, we already had people here, so it worked out. That has still not been solved for those 7-10 people.

Michael: There were several. As in, probably over 100 people working remotely who had connectivity issues. We had to deploy "pucks" AKA 5G hotspots...about 180 of them were sent out to employees over Covid because video conferencing was out the window as an option, and voice was even an issue to get consistency with. It got almost to the point where it became a real problem for the business. The providers aren't doing enough to remedy the situation and folks aren't getting the quality of service they expect. It was choppy and unreliable even with the hotspots.

Build more towers! We provide battery back ups for those.

On a scale of 1-10, what is your employees' need for higher speed broadband residentially?

Michael: 9

Fran: 8

Who does your organization serve & what do you provide them?

Fran: We provide medical products, specifically vascular system catheters. We are an R&D supporting our various locations throughout the US Mexico and the Czec Republic.

Michael: Our bread and butter is lithium acids, we make batteries that go into anything from wheelchairs to automotive. We're considered an energy company and provide backup batteries that help the grid, cellphones, gas lines...a number of utility providers leverage Dekka batteries to provide their services to their customers. We do things local, state and worldwide. We touch pretty much every business. Even at Fran's facility, their skids are probably fueled by Dekka batteries. (Fran nods)

Are there services you struggle to or cannot provide to customers due to limited access?

Both : No

Non-Profit Focus Group

Jun 20, 2022

CANCELED DUE TO LACK OF REGISTRANTS

Healthcare Focus Group

Jun 21, 2022

Attendees:

Tom Bartiromo, Chief Technical Officer, Tower Health

Eric Farrely, Enterprise Architect, Tower Health

Michael Rossi, Chief Financial Officer, Berks Community Health Center

**Eric and Tom joined the call from the same meeting room.*

Introductions:

Tom: I onboarded into this role about 1 month ago. Moved to Pennsylvania in January and live outside of Berks in Northampton County. Encouraged that the country is being progressive and engaging with the community and industry to get insights and data.

Eric: As Enterprise Architect, I touch anything from infrastructure to applications at our company.

Michael: Been in Pennsylvania for 9 years, excited to help the community by participating in this focus group.

Discussion:

1. Does your organization own and/or operate broadband infrastructure?

Tom: Yes - own but not operate

Michael: Yes - own but not operate

Distance Learning & Telemedicine Grant Program:

1. Do you feel that your organization could benefit from this grant opportunity?

Tom: Yes

Michael: Yes

Do you have Grant services in-house?

Tom: I am going to follow up internally on that. I'm fairly new to the company so I don't know that yet.

Eric: We do apply for grants and I know we have personnel but I'm not sure how it works.

Mike: We do have grant services in-house.

Does current internet availability affect the organizations short or long term strategic plans or goals?

Eric: Absolutely. With Covid, we saw a surge in remote work and doing business remotely. We think much of it is here to stay. There is definitely an impact on the future. A benefit of us being a part of the survey is that right now, we might not have a good understanding of the needs of the community, but we'd like to.

Tom: The 422 corridor is an important double down part of our strategy, we're looking at more monitoring.

Mike: Telehealth was a part of the Covid emergency. Video was a mandate for telehealth, but not everyone had adequate access to do video, so we did sometimes allow dial in using voice only, but as things go back to normal, visual (video) is going to be mandatory again. During lockdown, only about 10% of people did telehealth visits using their camera. Our patients and appointments are a bit different from Tower Health's, but it's a concern for sure.

What about Telemed primary care?

Mike: That's all we do.

Eric: Some are primary, and some are building out on other capabilities and services.

What goals (educational, economic, public health, civic engagement or otherwise) would members of your organization wish to address with wider broadband access and/ or adoption?

Eric: Expansion of our Telehealth services. Remote monitoring, speciality visits, education material, etc..

Tom: A broader overarching theme is the more broad and convenient it [the technology] is, the more important it becomes. The reimbursement or return needs to be there to support that.

Mike: We just purchased a mobile van and we'll go up into the rural communities like the I-788 corridor to travel to patients.Connectivity is a little tough when you're mobile, we have a verizon hotspot that we use in the vans.

Every place in Berks County is covered at least by 4G, is what they told me. I don't 100% believe it because when you go out west it gets pretty rural and it tends to get spotty.

What technology initiatives is your organization most focused on? Does increased broadband help to accelerate those initiatives?

Tom: Overall Telehealth is the most nearterm initiative. Tower is transforming investitures and moving to the 422 corridor, there is also continued focus on health monitoring, as well.

Devices vs. Applications? Looking to expand the number of devices that go home with patients?

Eric: Remote telemetry systems,

Tom: Your typical cast, blood cuff, weight management, device, remote blood monitoring behavioral health therapy. When I lived in New Jersey, the New Jersey Institute worked with an innovation incubator to develop wearables made into the threading of your clothes.

Are existing speeds sufficient to meet Healthcare needs within the County?

Tom: Personally, I don't know enough about the Pennsylvania region yet [as I just moved here in January]. The maps that you develop will be very helpful to evaluate what the needs are.

Eric: Agreed. I think this will be helpful because we don't know what we don't know, and we won't hear about the community needs without an effort like this.

Mike: I don't think there's a problem in Reading, but as things become remote and people work outside of the city it's important.

1. On a scale of 1-10, what is your need for higher speed

Tom: 10 - Extremely need

Michael: 5

2. On a scale of 1-10, what is the need for higher speed broadband for your patients and other

Tom: 10 - Extremely needed

Michael: 10 - Extremely needed

Do members of the organization work from home/hybrid? Has inadequate speeds impacted the ability to do so?

Eric: We have a large remote workforce team. If you're able to do your job remotely, you're allowed to. This increased 10x over pandemic. We had to get internal infrastructure to handle that. We don't usually have reports from employees about connectivity issues. We think they have sufficient access. That doesn't imply that there aren't employees who could work remotely but don't because of poor connectivity at home - that's something we don't know about.

Mike: Everyone is all back on-site now, We've been losing talent because they get offered hybrid and remote positions and want the balance it allows.

Tom: We're mindful of the same in that could we? Yes. But should we? What's the downside implication?

Mike: They have to have access to a fax machine, scanner, etc..

(In reference to poll question # 2):

Eric: Demand is only going to increase for broadband.

(In reference to poll question # 1):

Mike: I am the one who answered 5. When we first started things were fine, but then when the pandemic started, we had to redo the entire infrastructure to try to get our speeds up. Once a month we do a Friday "all staff" meeting where everyone logs onto a ring central meeting and that gets tough. We really reacted differently. We're obviously a smaller company, so it's a bit easier for us to make those changes.

(In reference to poll question # 1):

Eric: Our needs were met . We started using Microsoft Teams organizationally right before it hit and it ended up being good timing.

(In reference to poll question # 1):

Mike: We made our change through Azure in October. I had it in my head to do something like this before the pandemic, but it pushed it up on the list of priorities.

Are you interested in partnering with the County for next steps?

All: Yes

Education Focus Group

Jun 9, 2022

Attendees:

Anthony DiSarro, Supervisor of Technology, Antietam School District, adisarro@antietamsd.org

Cherie Zimmerman, IT Assistant Director, Berks County IU #14

Ryan Fitterling, Director of Technology, Wilson School District, fitrya@wilsonsd.org

Kimberly Andersen, Director of Curriculum, Instruction and IT, Twin Valley School District, kandersen@tvsd.org

Michael Nappi, Asst. Director of Technology, Twin Valley School District, mnappi@tvsd.info

James Rothenberger, Director of Technology, Oley Valley School District, jrothenberger@ovsdpa.org

Justin Work, Director of Information Technology, Reading Muhlenberg CTC, jwork@rmctc.org

Anderson Forrest , CIO, Reading Area Community College, AForrest@racc.edu

Matthew Shirk, Director of Technology, Tulpehocken Area School District, mshirk@tulpehocken.org

Ryan Breisch, Executive Director, Literacy Council of Reading-Berks, Inc., ryan@lcrb.org

Tom DeAngelo, Fleetwood Area School District, Fleetwood Area School District, tdeangelo@fleetwoodasd.org

Scott Major, CIO, BCIU, scomaj@berksiu.org

Scott Arnst, Director of Technology, Wyomissing Area School District, sarnst@wyoarea.org

1. Does your organization own and/or operate broadband infrastructure?

Ryan B: No

Justin: Yes - Own and Operate

Kimberly: Yes - Own and OperateRyan F: No

James: Yes - Own and Operate

Anderson: I'm not sure

Anthony: No

Scott M: Yes - Own and Operate

Tom: Yes - Own and Operate

Scott A: Yes - Own and Operate

Matthew: Yes - Own and Operate

1. On a scale of 1-10, what is your organization's need for higher speed broadband?

Ryan B: 10 - Extremely needed

Justin: 8

Kimberly: 6

Ryan F: 7

Michael: 9

James: 1 - Not needed

Anderson: 1 - Not needed

Anthony: 4

Scott M: 1 - Not needed

Tom: 1 - Not needed

Scott A: 5

Matthew: 5

Distance Learning & Telemedicine Grant Program:

Ryan F: The first 5-6 bullets are always interesting to us, I'm not sure if it applies specifically to distance learning but I'm interested in seeing if there are avenues for us to get more of those resources.

James R.: Same. We're always looking for more equipment and updated equipment.

1. Do you feel that your organization could benefit from this grant opportunity?

Kimberly: Yes
Ryan F: Yes
James: Yes
Anderson: Yes
Anthony: Yes
Scott M: Yes
Tom: I'm not sure
Scott A: Yes
Matthew: Yes

Does current internet availability affect the organizations short or long term strategic plans or goals?

Mike N: Our students, definitely. We've had to make a lot of adjustments to assure both students and teachers have continuity, sometimes it's an issue of a bad router. We go as far as offering wireless hotspots and other service options to accommodate students who don't have the means of purchasing internet. It's a big consideration of ours.

Connectivity & logistics on devices is a huge priority. We've talked about the benefit of instead of snow days, you could actually work and learn from home, but connectivity is always something that that conversation goes back to.

What goals (educational, economic, public health, civic engagement or otherwise) would members of your organization wish to address with wider broadband access and/ or adoption?

Scott A: A longer term goal is more equity across the County. Some students don't have the ability to get access and having County-wide broadband gives equity for us all to get things done. Students are especially important. Lots of schools were providing laptops and hotspots, now that we're back in school, students don't always have that at home.

Mike N: Are you also talking about public spaces like libraries? Yes.

The library and sharing of books has been a big thing and our library has basically no offering to use what we have. I'd love to be able to provide internet in public spaces - we can't provide each person internet to their houses but [support] having options.

I believe that all libraries have public wifi options, are you aware?

Mike N: We do have public wifi, but there is one computer. I'd love to see a more expanded version that would get the service to be more widely used.

Scott A: From Wyomissing, especially when you talk about education, when you're establishing goals and learning what exists and doesn't . . . a couple of years ago, a vendor that a lot of us in the room used. As part of the engagement, we told kids to contact their parents and ask them "Do you have broadband?" The missing element was the education from a parent-prospective. The parents didn't know. Based on the results that we got back, you'd think that we were fully prepared for Covid, but they didn't answer properly and we were misinformed. Cell Phone service isn't the same as broadband. There has to be an element of education for the sake of education.

In parallel to that, our State issues assessment tests that districts get evaluated on all are administered online. High stakes assessments like that require the best broadband we can provide. If you look into the future, SATs are going online soon. I got contacted to see if we wanted to be involved in the pilot for it.

What technology initiatives is your organization most focused on? Does increased broadband help to accelerate those initiatives?

Mike N: Having 1:1 [1 device for every 1 student] is important. A lot of the school-issued devices are the only computer that many students have, at home or at school. More devices, more consistent connectivity. Parents want reliable devices that we can maintain for their students and they want connectivity.

How do institutions look at devices? Is it mainly chromebooks?

Mike N: We can't get away from chromebooks. They are durable, have a keyboard and a good price-point. iPads are interesting but we haven't gone there. We're looking at replenishment cycles and getting devices maintained and back to students quickly.

Ryan B: Hello - my microphone isn't working. We are exploring Chromebooks, but our students use their smartphones and tablets. We do not currently have Chromebooks available for our students. 1:1?

Scott A.: Wyomissing Area is K-12 iPad (1:1).

Tom D: Fleetwood ASD is iPad K-2 and Chromebooks 3-12, with Windows laptops for staff.

James R: Oley Valley is iPad K-8, Macbook Air 9-12.

Are existing speeds sufficient to meet Education needs within the County?

Kimberly: At the premise, yes, but in the community, no. A lot of the families are using cell service, so even when we give them a device it's not able to operate.

Tom D: A lot of this depends on the availability of options. We have areas in our school district (Borough of Fleetwood, Richmond Township) that don't have good options from telcos. For whatever reason, they don't seem to have the infrastructure to offer the bandwidth needed, even taking the economics out of it.

Mike N: Cost is important as well. $80+ for decent service is tricky, and in some areas I see better speeds for half the price. A lot of folks know $50 could get you a lot further in some areas than others.

1. On a scale of 1-10, what is the need for higher speed broadband for your students?

Ryan B: 10 - Extremely needed
Justin: 10 - Extremely needed
Kimberly: 9
Ryan F: 8
Michael: 10 - Extremely needed
James: 7
Anderson: 3
Anthony: 7
Scott M: 10 - Extremely needed
Tom: 7
Scott A: 10 - Extremely needed
Matthew: 8

Do members of your org work from home/hybrid? Has inadequate speeds impacted the ability to do so?

Mike N: Hybrid was tricky. Getting cameras to work consistently with some of the calls was very hard. Sometimes, it works out well in the beginning but as the call progresses not so much. We've mostly moved away from hybrid, where a student dials into an active classroom setting remotely.

Ryan F: We also don't do much of that anymore. The upload speeds were a real factor when we were. Parents paying $80/90 a month for cable and have 800Mbps down but nothing good up. Upload speeds were a bottleneck when you have multiple kids schooling from home and parents also working from home.

What measures were taken during Covid to increase connectivity? Did it meet your needs?

James R: Lots of the hotspots we used did not have a good enough signal. We noticed bottlenecks with multiple folks overloading hotspots, in addition to poorly performing hotspots.

Tom: Echoing what James said. 90% of the time it [the hotspots] was adequate but it was a big problem when it wasn't.

Anthony: I think everyone in Antietam has Comcast access and they had a good deal going but the speeds were not always working well, especially when there are multiple users doing zoom calls at the same time.

Are there services you struggle to provide due to limited access?

Mike N: I'd like to explore virtual lab services through AWS. I think we could really expand some of these windows-intensive platforms to allow students to work from home but it does require a consistent stream. We'd never be able to put that into a curriculum based on the options that our community currently has without providing lab time on a computer with a designated connection.

Ryan: Anything we can do to make connectivity faster, more affordable and reliable for our community, we want to do.

Mike N: I'm interested to hear if anyone has startlink experience? Is it a viable option?

Justin L: I just heard from someone in Albany township about this. A number of them recently got it delivered and they've said their experience is pretty darn good when it's connected. Leaves are coming up now, so they are finding some issues with spottiness due to where they did the install. \

Government Focus Group

Jun 9, 2022

Attendees:

Jan Moore, Business Manager/ Treasurer / Secretary, Alsace Township, Janm@alsacetownship.org

H David Miller, Sr. Project Manager, Entech Engineering, hdmiller@entecheng.com

Mary Himmerlberger , Councilwoman, Bernville Borough, mhimmelberger@barryisett.com

Justin Loose, CIO, Berks County, jloose@countyofberks.com

1. Does your organization own and/or operate broadband infrastructure?

Justin: No

Mary: No

H David: No

Jan: No

Jan: We live in a rural area. Being able to expand would be a positive.

Mary: Not a big issue in mine, but in surrounding townships it is. One of the libraries (Bernville) rents out hotspots. A big question is, is it because they don't have access or because they can't afford it? The hotspots are through T-mobile and there are hundreds. T-mobile's hotspot 5g program, it's supposed to be $50 a month, but it's a concern that it's going to impact feasibility depending on funding.

Justin: One of our partners is the CIO of public reading, libraries have become a center for internet first aid. People coming to reach schooling and telemedicine. Some of the libraries worked deals with carriers to deploy mobile broadband vans in certain areas to create hotspots, and then some that are anchored. Some of the issues with the public library catalyzed the counties interest and involvement. We were previously concerned w/ medical services,

Does current internet availability affect the organizations short or long term strategic plans or goals?

H. David: Maybe. I think there was a deadline for which you needed to establish small cell regulations. I'm not sure that this assessment addresses this, but if part of what you're asking is "Does the local Government want to get into the delivery of the service?", I'd say probably not.

Mary: We're an extremely small burrough, so bluntly, it's the last thing on our mind. We're just trying to get by. We see this as someone else's problem or thing to do. Does a developer help with this? A lot of us don't have the resources to even submit for the grants, so I don't think we think about that, we think more about things like how to fix our roads.

H. David: Broadly, yes. When we developed the 911 system in place now, the overarching goal was to provide coverage in 95-99% of the geographic area of the County by virtue of a portable radio. To my knowledge, our 911 system is working very well. Locally, the worst cellular coverage in our burrough is at the corner of my house.

How would this replace the firstnet system?

Justin: This is not a competitor for FirstNet, which is exclusive to AT&T's network. Verizon has an option that offers similar without the increased spectrum. One thing we're focusing on is wired connectivity, which is more residential and business. We want folks that require wired connectivity to have reliable and affordable broadband.

What goals (educational, economic, public health, civic engagement or otherwise) would members of your organization wish to address with wider broadband access and/ or adoption?

Mary: Blanket statement: I didn't understand what broadband was, I'm in my early 30's and had to research it. I feel like if you approach organizations, they might kind of say "I don't know". Is there an educational component to help us understand what it is and what it could mean? The County could distribute a one-pager, perhaps?

H. David: Are you doing an online survey? Could we put that on our websites and promote it at a local level?

Jan: This is not on our radar, as Mary mentioned, but anything we can do to provide a higher level of service to the community, we want to do . It's not in our 5 year plans but if we learn more about it, it could pop up into our goals.

What technology initiatives is your organization most focused on? Does increased broadband help to accelerate those initiatives?

H. David: Video surveillance of certain facilities and SCADA control of water/wastewater facilities. We currently have cameras to monitor this.

Jan: We currently have video surveillance for our township playground and wastewater facilities, etc.

Does it have pressure monitoring, etc?

Jan: We have critical level monitoring, but everything else is video surveillance.

Mary: Video surveillance is a big one. We're also talking about building a new borough hall. There could be options with that project. A conference room, if they ever allow virtual meetings again, maybe some add-on tech for the police. When you talk about bringing in business, that's important. I hadn't thought of surveillance, but that's a good one.

Who normally pays for something like this?

Are existing speeds sufficient to meet needs within the County?

Jan: Yes. Nobody has brought any deficiencies in a certain area to our attention.

Mary: Same. I've never heard complaints and just sent a text to Council. That's how I learned about the library program, so I'm guessing they might have information about lower speed options that didn't work well for when they were doing things virtually.

Justin L: At the County level, we've got a lot of feedback from Albany, especially with small businesses, one of which was sitting out in a fire hall parking lot to do business. Also in Upper Tulpehocken, they believe Comcast is only serving about 12% of the population.

Mary: You'd think with the new developments in Bethel they'd have that installed, that's interesting. I guess sometimes if it doesn't affect you, you don't know about it. That's right up the road from me and I didn't know.

Do members of your org work from home/hybrid? Has inadequate speeds impacted the ability to do so?

Jan: We used to during the pandemic. I do not live in the township, so when I work remotely, I have good coverage. When we were doing a lot of virtual meetings I never heard of an issue. I think we are okay.

H David: Entech engineering employs people all over the place. We opened branches all over the place basically overnight by going remote. I know some people had to go to their garages and other spots to get better connectivity. Could you send me the presentation so I could reach out to my clients in Berks County (Amity Township, St. Lawrence, Leesport, etc., etc.) I can share this with them and get their feedback?

1. On a scale of 1-10, what is your organizations need for higher speed broadband?

Justin: 10 - Extremely needed

Mary: 3

H. David: 6

Jan: 3

Who does your organization serve? What do you provide?

Mary: Municipalities, Police Department, Emergency Services. I'm trying to think of other civic groups or non profit partners that could benefit in some way.

1. On a scale of 1-10, what is the need for higher speed broadband for those you serve?

Justin: 10 - Extremely needed

Mary: 3

H. David: 7

Jan: 3

Are there services you struggle to provide due to limited access?

All: No.

1. Do you feel that your organization could benefit from this grant opportunity?

Justin: I'm not sure

Mary: I'm not sure

H. David: Yes

Jan: I'm not sure

H. David: I played conservative on the survey questions, but what I want to know is do we know what is next? Technology flies by and what is the next big need going tobe? That's why I put higher marks on the "needs" question, because we don't know what to anticipate.

Appendix B

Anchor Institutions Included in Preliminary Network Design

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
ALBANY TOWNSHIP MUNICIPAL BUILDING	2451 ROUTE 143	KEMPTON	19529	40.623	-75.863	MUNICIPAL BUILDING	4	Redundant Path	No
Albright College	1621 N 13th St, Reading, PA 19604	READING	19604	40.360	-75.910	HIGHER EDUCATION MASTER	12	Redundant Path	No
ALSACE MANOR FIRE CO	1 ANTIETAM RD	TEMPLE	19560	40.399	-75.860	FIRE DEPARTMENT	13	Redundant Path	Yes
ALSACE TOWNSHIP MUNICIPAL BUILDING	65 WOODSIDE AVE	TEMPLE	19560	40.398	-75.850	MUNICIPAL BUILDING	13	Lateral Path	No
Alvernia University	400 St Bernardine St, Reading, PA 19607	READING	19607	40.311	-75.935	HIGHER EDUCATION MASTER	18	Lateral Path	No
Alvernia University - College Towne	401 Penn St, Read-ing, PA 19601	READING	19601	40.336	-75.929	HIGHER EDUCATION MASTER	17	Redundant Path	No
AMITY FIRE CO	47 PINE FORGE RD	DOUGLASS-VILLE	19518	40.293	-75.727	FIRE DEPARTMENT	19	Redundant Path	Yes
AMITY TOWNSHIP MUNICIPAL BUILDING	2004 WEAVER-TOWN RD	DOUGLASS-VILLE	19518	40.299	-75.738	MUNICIPAL BUILDING	14	Redundant Path	No
AMITY TWP POLICE	2004 WEAVER-TOWN RD	DOUGLASS-VILLE	19518	40.299	-75.738	POLICE DEPARTMENT	14	Redundant Path	Yes
BALLY BOROUGH MUNICIPAL BUILDING	425 CHESTNUT ST	BALLY	19503	40.400	-75.590	MUNICIPAL BUILDING	5	Redundant Path	No
BALLY EMS	537 CHESTNUT ST	BALLY	19503	40.401	-75.589	EMS DEPARTMENT	5	Redundant Path	Yes
BALLY POLICE	425 CHESTNUT ST	BALLY	19503	40.400	-75.590	POLICE DEPARTMENT	5	Redundant Path	Yes
BECHTELSVILLE BOR-OUGH MUNICIPAL BUILDING	16 RAILROAD ST	BECHTELS-VILLE	19505	40.372	-75.628	MUNICIPAL BUILDING	14	Lateral Path	No
BERKS COUNTY SHERIFF	605 COURT ST 3RD FLR	READING	19601	40.336	-75.925	POLICE DEPARTMENT	17	Redundant Path	Yes
Berks Technical Institute	2205 Ridgewood Rd, Wyomissing, PA 19610	WYOMISS-ING	19610	40.345	-75.971	HIGHER EDUCATION MASTER	11	Lateral Path	No
BERKSHIRE HEIGHTS FIRE COX	808 PARK RD N	READING	19610	40.345	-75.958	FIRE DEPARTMENT	11	Redundant Path	Yes
BERN TOWNSHIP MU-NICIPAL BUILDING	1069 OLD BERN-VILLE RD	READING	19605	40.392	-75.993	MUNICIPAL BUILDING	6	Redundant Path	No
BERN TWP POLICE	1069 OLD BERN-VILLE RD	READING	19605	40.392	-75.993	POLICE DEPARTMENT	6	Redundant Path	Yes
BERNVILLE AREA COMMUNITY LI-BRARY	6721 BERNVILLE ROAD	BERNVILLE	19506	40.433	-76.114	LIBRARY	1	Redundant Path	No

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
BERNVILLE BOR-OUGH MUNICIPAL BUILDING	6602 BERNVILLE RD	BERNVILLE	19506	40.431	-76.113	MUNICIPAL BUILDING	1	Redundant Path	No
BERNVILLE FIRE CO	6701 BERNVILLE RD	BERNVILLE	19506	40.432	-76.113	FIRE DEPARTMENT	1	Redundant Path	Yes
BERNVILLE POLICE	6602 BERNVILLE RD	BERNVILLE	19506	40.431	-76.113	POLICE DEPARTMENT	1	Redundant Path	Yes
BETHEL COMMUNITY EMS STATION 1	8170 LANCASTER AVE	BETHEL	19507	40.456	-76.292	EMS DEPARTMENT	1	Redundant Path	Yes
BETHEL COMMUNITY EMS STATION 2	6606 BERNVILLE RD	BERNVILLE	19506	40.431	-76.113	EMS DEPARTMENT	1	Redundant Path	Yes
BETHEL FIRE CO	9675 OLD ROUTE 22	BETHEL	19507	40.476	-76.291	FIRE DEPARTMENT	2	Redundant Path	Yes
BETHEL TOWNSHIP MUNICIPAL BUILDING	60 KLAHR RD	BETHEL	19507	40.478	-76.294	MUNICIPAL BUILDING	2	Redundant Path	No
BETHEL TWP POLICE	60 KLAHR RD	BETHEL	19507	40.478	-76.294	POLICE DEPARTMENT	2	Redundant Path	Yes
BETHEL-TULPEHOCK-EN PUBLIC LIBRARY	8601 LANCASTER AVENUE	BETHEL	19507	40.478	-76.295	LIBRARY	2	Redundant Path	No
BIRDSBORO BOR-OUGH MUNICIPAL BUILDING	202 E MAIN ST	BIRDSBORO	19508	40.266	-75.806	MUNICIPAL BUILDING	19	Redundant Path	No
BIRDSBORO POLICE	200 MAIN ST E	BIRDSBORO	19508	40.266	-75.807	POLICE DEPARTMENT	19	Redundant Path	Yes
BIRDSBORO UNION FIRE DEPT STA 1	214 1 ST W	BIRDSBORO	19508	40.263	-75.810	FIRE DEPARTMENT	20	Redundant Path	Yes
BIRDSBORO UNION FIRE DEPT STA 2	1082 CHESTNUT ST	BIRDSBORO	19508	40.244	-75.797	FIRE DEPARTMENT	20	Redundant Path	Yes
BLANDON FIRE CO	30 WESNER RD W	BLANDON	19510	40.438	-75.884	FIRE DEPARTMENT	8	Redundant Path	Yes
BOONE AREA LIBRARY	129 N. MILL STREET	BIRDSBORO	19508	40.265	-75.806	LIBRARY	20	Redundant Path	No
BOYERTOWN AREA FIRE & RESCUE - STA 1	962 READING AV N	NEW BERL-INVILLE	19545	40.351	-75.634	FIRE DEPARTMENT	14	Redundant Path	Yes
BOYERTOWN AREA FIRE & RESCUE - STA 2	10 WARWICK ST	BOYER-TOWN	19512	40.332	-75.639	FIRE DEPARTMENT	14	Redundant Path	Yes
BOYERTOWN AREA FIRE & RESCUE - STA 3	240 WALNUT ST N	BOYER-TOWN	19512	40.338	-75.635	FIRE DEPARTMENT	14	Redundant Path	Yes
BOYERTOWN BOR-OUGH MUNICPAL BUILDING	100 S WASHING-TON ST	BOYER-TOWN	19512	40.330	-75.636	MUNICIPAL BUILDING	14	Lateral Path	No
BOYERTOWN COM-MUNITY LIBRARY	24 N. READING AVENUE	BOYER-TOWN	19512	40.333	-75.637	LIBRARY	14	Lateral Path	No
BOYERTOWN EMS	2 E 2ND ST	BOYER-TOWN	19512	40.331	-75.641	EMS DEPARTMENT	14	Redundant Path	Yes
BRANDYWINE COM-MUNITY LIBRARY	60 TOWER DRIVE	TOPTON	19562	40.495	-75.699	LIBRARY	5	Lateral Path	No
BRECKNOCK FIRE CO	1153 KURTZ MILL RD	MOHNTON	19540	40.238	-75.984	FIRE DEPARTMENT	20	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
BRECKNOCK TOW-HSHIP MUNICIPAL BUILDING	889 ALLEGH-ENYVILLE RD	MOHNTON	19540	40.221	-75.972	MUNICIPAL BUILDING	20	Redundant Path	No
BRECKNOCK TWP POLICE	889 ALLEGH-ENYVILLE RD	MOHNTON	19540	40.221	-75.972	POLICE DEPARTMENT	20	Redundant Path	Yes
CAERNARVON POLICE	3307 MAIN ST	MORGAN-TOWN	19543	40.156	-75.887	POLICE DEPARTMENT	20	Redundant Path	Yes
CAERNARVON TOWNSHIP MUNICI-PAL BUILDING	3307 MAIN ST	MORGAN-TOWN	19543	40.156	-75.887	MUNICIPAL BUILDING	20	Redundant Path	No
CENTERPORT BOR-OUGH MUNICIPAL BUILDING	110 CALLOWHILL RD	CENTER-PORT	19516	40.487	-76.006	MUNICIPAL BUILDING	2	Redundant Path	No
CENTRAL BERKS FIRE CO	111 CALLOWHILL RD	CENTER-PORT	19516	40.487	-76.005	FIRE DEPARTMENT	2	Redundant Path	Yes
CENTRAL BERKS REG POLICE	2147 PERKIOMEN AV	READING	19606	40.328	-75.894	POLICE DEPARTMENT	17	Redundant Path	Yes
CENTRAL FIRE CO LAURELDALE	1409 PARK PLACE	READING	19605	40.391	-75.915	FIRE DEPARTMENT	13	Redundant Path	Yes
CENTRE TOWNSHIP MUNICIPAL BUILDING	449 BUCKS HILL RD	MOHRSVILLE	19541	40.469	-76.014	MUNICIPAL BUILDING	2	Redundant Path	No
CITY OF READING CITY HALL	815 WASHING-TON ST	READING	19601	40.337	-75.921	MUNICIPAL BUILDING	17	Redundant Path	No
COLEBROOKDALE TOWNSHIP MUNICI-PAL BUILDING	765 W PHILADEL-PHIA AVE	BOYER-TOWN	19512	40.336	-75.654	MUNICIPAL BUILDING	14	Lateral Path	No
CUMRU TOWNSHIP MUNICIPAL BUILDING	1775 WELSH RD	MOHNTON	19540	40.280	-75.971	MUNICIPAL BUILDING	15	Redundant Path	No
CUMRU TWP FIRE DEPT STA 1	475 MOHNS HILL RD	READING	19608	40.274	-76.021	FIRE DEPARTMENT	15	Redundant Path	Yes
CUMRU TWP FIRE DEPT STA 2	453 CHURCH RD	MOHNTON	19540	40.282	-75.970	FIRE DEPARTMENT	15	Redundant Path	Yes
CUMRU TWP FIRE DEPT STA 3	743 MOUNTAIN VIEW RD	READING	19607	40.297	-75.944	FIRE DEPARTMENT	15	Redundant Path	Yes
CUMRU TWP POLICE	1775 WELSH RD	MOHNTON	19540	40.280	-75.972	POLICE DEPARTMENT	15	Redundant Path	Yes
DISTRICT TOWNSHIP MUNICIPAL BUILDING	202 WEIL RD	BOYER-TOWN	19512	40.410	-75.660	MUNICIPAL BUILDING	5	Lateral Path	No
DOUGLASS TOWN-SHIP MUNICIPAL BUILDING	1068 DOUGLASS DR	BOYER-TOWN	19512	40.302	-75.690	MUNICIPAL BUILDING	14	Redundant Path	No
DOUGLASS TWP POLICE	1068 DOUGLASS DR	BOYER-TOWN	19512	40.302	-75.690	POLICE DEPARTMENT	14	Redundant Path	Yes
Drexel University College of Medicine - West Readng Campus	50 Innovation Way, Wyomissing, Penn-sylvania 19610	WYOMISS-ING	19610	40.341	-75.953	HIGHER EDUCATION MASTER	11	Lateral Path	No
EARL TOWNSHIP MU-NICIPAL BUILDING	19 SCHOOL HOUSE RD	BOYER-TOWN	19512	40.369	-75.705	MUNICIPAL BUILDING	9	Redundant Path	No
EARL TWP FIRE CO	1340 IRONSTONE DR	BOYER-TOWN	19512	40.363	-75.691	FIRE DEPARTMENT	9	Redundant Path	Yes
EASTERN BERKS FIRE DEPT STA 1	2243 OLD ROUTE 100	BARTO	19504	40.390	-75.615	FIRE DEPARTMENT	5	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
EASTERN BERKS FIRE DEPT STA 2	537 CHESTNUT ST	BALLY	19503	40.401	-75.589	FIRE DEPARTMENT	5	Redundant Path	Yes
EASTERN BERKS FIRE DEPT STA 3	1817 MAIN ST N	READING	19605	40.373	-75.630	FIRE DEPARTMENT	14	Redundant Path	Yes
EASTERN BERKS REGIONAL POLICE	16 W PHILADEL-PHIA AVE	BOYER-TOWN	19512	40.334	-75.638	POLICE DEPARTMENT	14	Redundant Path	Yes
ELVERSON - HONEY BROOK EMS	4458 MAIN ST	ELVERSON	19520	40.155	-75.846	EMS DEPARTMENT	20	Lateral Path	Yes
ENCOMPASS HEALTH REHABILITATION HOSPITAL READING	1623 MORGAN-TOWN RD	READING	19607	40.286	-75.923	HOSPITAL URGENT CARE	19	Redundant Path	Yes
EXETER COMMUNITY LIBRARY	4569 PRESTWICK DRIVE	READING	19606	40.306	-75.863	LIBRARY	14	Lateral Path	No
EXETER POLICE	4975 DEMOSS RD	READING	19606	40.305	-75.854	POLICE DEPARTMENT	14	Redundant Path	Yes
EXETER TOWNSHIP MUNICIPAL BUILDING	4975 DEMOSS RD	READING	19606	40.305	-75.854	MUNICIPAL BUILDING	14	Redundant Path	No
EXETER TWP FIRE DEPT STA 2	46 33 ST W	READING	19606	40.321	-75.878	FIRE DEPARTMENT	14	Redundant Path	Yes
EXETER TWP FIRE DEPT STA 3	5580 BOYER-TOWN PKE	BIRDSBORO	19508	40.317	-75.808	FIRE DEPARTMENT	14	Redundant Path	Yes
FLEETWOOD AREA PUBLIC LIBRARY	110 W. ARCH STREET	FLEETWOOD	19522	40.456	-75.820	LIBRARY	8	Redundant Path	No
FLEETWOOD BOR-OUGH MUNICIPAL BUILDING	110 W ARCH ST	FLEETWOOD	19522	40.456	-75.820	MUNICIPAL BUILDING	8	Redundant Path	No
FLEETWOOD FIRE CO	16 CHESTNUT ST N	FLEETWOOD	19522	40.453	-75.823	FIRE DEPARTMENT	8	Redundant Path	Yes
FLEETWOOD POLICE	110 ARCH ST W	FLEETWOOD	19522	40.455	-75.821	POLICE DEPARTMENT	8	Redundant Path	Yes
FRYSTOWN FIRE CO	485 FRYSTOWN RD	MT AETNA	19544	40.450	-76.334	FIRE DEPARTMENT	1	Redundant Path	Yes
GEIGERTOWN FIRE CO	3433 HAY CREEK RD	BIRDSBORO	19508	40.201	-75.836	FIRE DEPARTMENT	20	Redundant Path	Yes
GIBRALTAR FIRE CO	3351 MAIN ST	BIRDSBORO	19508	40.284	-75.870	FIRE DEPARTMENT	19	Redundant Path	Yes
GREENFIELDS FIRE CO	2339 BERNVILLE RD	READING	19601	40.371	-75.963	FIRE DEPARTMENT	6	Redundant Path	Yes
GREENWICH TOWN-SHIP MUNICIPAL BUILDING	775 OLD ROUTE 22	LENHARTS-VILLE	19534	40.578	-75.811	MUNICIPAL BUILDING	4	Lateral Path	No
HAMBURG BOROUGH MUNICIPAL BUILDING	61 N 3RD ST	HAMBURG	19526	40.556	-75.984	MUNICIPAL BUILDING	3	Redundant Path	No
HAMBURG CENTER	3560 OLD ROUTE 22	HAMBURG	19526	40.562	-75.968	HOSPITAL URGENT CARE	3	Redundant Path	Yes
HAMBURG EMS	564 FRANKLIN ST	HAMBURG	19526	40.559	-75.980	EMS DEPARTMENT	3	Redundant Path	Yes
HAMBURG FIRE CO	127 4 ST S	HAMBURG	19526	40.553	-75.981	FIRE DEPARTMENT	3	Redundant Path	Yes
HAMBURG POLICE	61 3 ST N	HAMBURG	19526	40.556	-75.984	POLICE DEPARTMENT	3	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
HAMBURG PUBLIC LIBRARY	35 N. THIRD STREET	HAMBURG	19526	40.556	-75.984	LIBRARY	3	Redundant Path	No
HAVEN BEHAVIORAL HOSPITAL OF EAST-ERN PA	145 N 6TH ST	READING	19601	40.338	-75.925	HOSPITAL URGENT CARE	17	Redundant Path	Yes
HEIDELBERG TOWN-SHIP MUNICIPAL BUILDING	11 TULPEHOCKEN FORGE RD	ROBESONIA	19551	40.357	-76.147	MUNICIPAL BUILDING	1	Lateral Path	No
HEREFORD FIRE CO	1153 GRAVEL PKE	HEREFORD	18056	40.447	-75.551	FIRE DEPARTMENT	5	Redundant Path	Yes
HEREFORD TOWN-SHIP MUNICIPAL BUILDING	3131 SEISHOLTZ-VILLE RD	HEREFORD	18056	40.461	-75.592	MUNICIPAL BUILDING	5	Redundant Path	No
JEFFERSON TOWN-SHIP MUNICIPAL BUILDING	5 SOLLY LN	BERNVILLE	19506	40.439	-76.121	MUNICIPAL BUILDING	1	Redundant Path	No
KEMPTON FIRE CO	2465 ROUTE 143	KEMPTON	19529	40.623	-75.863	FIRE DEPARTMENT	4	Redundant Path	Yes
KENHORST BOR-OUGH MUNICIPAL BUILDING	339 S KENHORST BLVD S	KENHORST	19607	40.310	-75.946	MUNICIPAL BUILDING	16	Redundant Path	No
KENHORST FIRE CO	305 KENHORST BLVD S	READING	19607	40.311	-75.946	FIRE DEPARTMENT	16	Redundant Path	Yes
KU PUBLIC SAFETY OFC	OLD MAIN CIR	KUTZTOWN	19530	40.510	-75.783	POLICE DEPARTMENT	4	Redundant Path	Yes
KUTZTOWN BOR-OUGH MUNICIPAL BUILDING	45 RAILROAD ST	KUTZTOWN	19530	40.521	-75.776	MUNICIPAL BUILDING	4	Redundant Path	No
KUTZTOWN COMMU-NITY LIBRARY	70 BIEBER ALLEY	KUTZTOWN	19530	40.516	-75.775	LIBRARY	5	Redundant Path	No
KUTZTOWN EMS	87 S KEMP RD	KUTZTOWN	19530	40.526	-75.760	EMS DEPARTMENT	5	Redundant Path	Yes
KUTZTOWN FIRE CO	310 NOBLE ST	KUTZTOWN	19530	40.513	-75.773	FIRE DEPARTMENT	5	Redundant Path	Yes
KUTZTOWN POLICE	45 RAILROAD ST	KUTZTOWN	19530	40.521	-75.776	POLICE DEPARTMENT	4	Redundant Path	Yes
Kutztown University	15200 Kutztown Rd, Kutztown, PA 19530	KUTZTOWN	19530	40.509	-75.781	HIGHER EDUCATION MASTER	4	Lateral Path	No
LAURELDALE BOR-OUGH MUNICIPAL BUILDING	3406 KUTZTOWN RD	LAURELDALE	19605	40.388	-75.921	MUNICIPAL BUILDING	12	Redundant Path	No
LAURELDALE POLICE	3406 KUTZTOWN RD	READING	19605	40.388	-75.921	POLICE DEPARTMENT	12	Redundant Path	Yes
LEESPORT BOROUGH MUNICIPAL BUILDING	27 S CANAL ST	LEESPORT	19533	40.446	-75.965	MUNICIPAL BUILDING	7	Lateral Path	No
LEESPORT FIRE CO	18 WALL ST E	LEESPORT	19533	40.446	-75.967	FIRE DEPARTMENT	7	Redundant Path	Yes
LENHARTSVILLE BOR-OUGH MUNICIPAL BUILDING	18 WILLOW ST	LENHARTS-VILLE	19534	40.574	-75.888	MUNICIPAL BUILDING	3	Lateral Path	No

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
LIFE LION EMS STATION 1	2500 BERNVILLE RD	READING	19605	40.377	-75.977	EMS DEPARTMENT	6	Redundant Path	Yes
LIFE LION EMS STATION 2	16 N CHESTNUT ST	FLEETWOOD	19522	40.453	-75.823	EMS DEPARTMENT	8	Redundant Path	Yes
LIFE LION EMS STATION 3	30 FAIRLANE RD	READING	19606	40.305	-75.853	EMS DEPARTMENT	14	Redundant Path	Yes
LONGSWAMP TOWNSHIP MUNICIPAL BUILDING	1112 STATE ST	MERTZTOWN	19539	40.503	-75.662	MUNICIPAL BUILDING	5	Lateral Path	No
LOWER ALSACE EMS	750 N 25 ST	READING	19606	40.338	-75.880	EMS DEPARTMENT	14	Redundant Path	Yes
LOWER ALSACE FIRE CO	100 COLUMBIA AVE	READING	19606	40.343	-75.871	FIRE DEPARTMENT	14	Redundant Path	Yes
LOWER ALSACE TOWNSHIP MUNICIPAL BUILDING	1200 CARSONIA AVE	READING	19606	40.346	-75.873	MUNICIPAL BUILDING	14	Redundant Path	No
LOWER HEIDELBERG POLICE	720 BROWNSVILLE RD	READING	19608	40.360	-76.049	POLICE DEPARTMENT	6	Redundant Path	Yes
LOWER HEIDELBERG TOWNSHIP MUNICIPAL BUILDING	720 BROWNSVILLE RD	SINKING SPRING	19608	40.360	-76.049	MUNICIPAL BUILDING	6	Redundant Path	No
LVHN EXPRESS CARE - MOSELEM SPRINGS	14351 KUTZTOWN RD	FLEETWOOD	19522	40.486	-75.839	HOSPITAL URGENT CARE	4	Redundant Path	Yes
LYONS BOROUGH MUNICIPAL BUILDING	316 S KEMP ST	LYONS STATION	19536	40.477	-75.757	MUNICIPAL BUILDING	5	Redundant Path	No
LYONS FIRE CO	110 PARK AVE	LYONS	19536	40.479	-75.754	FIRE DEPARTMENT	5	Redundant Path	Yes
MAIDENCREEK TOWNSHIP MUNICIPAL BUILDING	1 QUARRY RD	BLANDON	19510	40.449	-75.902	MUNICIPAL BUILDING	8	Lateral Path	No
MARION FIRE CO	4127 CONRAD WEISER PRKWY	WOMELSDORF	19567	40.382	-76.232	FIRE DEPARTMENT	1	Redundant Path	Yes
MARION TOWNSHIP MUNICIPAL BUILDING	420 WATER ST	STOUCHSBURG	19567	40.379	-76.233	MUNICIPAL BUILDING	1	Lateral Path	No
MAXATAWNY TOWNSHIP MUNICIPAL BUILDING	127 QUARRY RD	KUTZTOWN	19530	40.532	-75.735	MUNICIPAL BUILDING	5	Lateral Path	No
MIFFLIN COMMUNITY LIBRARY	6 PHILADELPHIA AVENUE	READING	19607	40.303	-75.968	LIBRARY	15	Redundant Path	No
MOHNTON BOROUGH MUNICIPAL BUILDING	21 N ONEIL ST	MOHNTON	19540	40.287	-75.988	MUNICIPAL BUILDING	15	Redundant Path	No
MOHNTON FIRE CO	100 SUMMIT ST E	MOHNTON	19540	40.286	-75.982	FIRE DEPARTMENT	15	Redundant Path	Yes
MOHNTON POLICE	21 ONEIL ST N	MOHNTON	19540	40.287	-75.988	POLICE DEPARTMENT	15	Redundant Path	Yes
MONARCH FIRE CO	50 PENNSYLVANIA AV	DOUGLASSVILLE	19518	40.262	-75.770	FIRE DEPARTMENT	19	Redundant Path	Yes
MOUNT PENN BOROUGH MUNICIPAL BUILDING	200 N 25TH ST	MOUNT PENN	19606	40.330	-75.888	MUNICIPAL BUILDING	14	Lateral Path	No

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
MT AETNA FIRE CO	14 TANNER ST W	MT AETNA	19544	40.418	-76.298	FIRE DEPARTMENT	1	Redundant Path	Yes
MT PENN FIRE CO	2711 GRANT ST	READING	19606	40.328	-75.881	FIRE DEPARTMENT	17	Redundant Path	Yes
MT PLEASANT FIRE CO	5664 MOUNT PLEASANT RD	BERNVILLE	19506	40.405	-76.065	FIRE DEPARTMENT	6	Redundant Path	Yes
MUHLENBERG COM-MUNITY LIBRARY	3612 KUTZTOWN ROAD	READING	19605	40.392	-75.921	LIBRARY	12	Lateral Path	No
MUHLENBERG EMS	835 BELLEVUE AVE	READING	19605	40.390	-75.921	EMS DEPARTMENT	12	Redundant Path	Yes
MUHLENBERG TOWN-SHIP FIRE & RESCUE STATION 1	115 MADISON AVE	READING	19605	40.375	-75.922	FIRE DEPARTMENT	12	Redundant Path	Yes
MUHLENBERG TOWN-SHIP FIRE & RESCUE STATION 2	800 TUCKERTON RD	READING	19605	40.397	-75.958	FIRE DEPARTMENT	7	Redundant Path	Yes
MUHLENBERG TOWN-SHIP FIRE & RESCUE STATION 3	4963 KUTZTOWN RD	TEMPLE	19560	40.410	-75.920	FIRE DEPARTMENT	7	Redundant Path	Yes
MUHLENBERG TOWN-SHIP MUNICIPAL BUILDING	5401 LEESPORT AVE	TEMPLE	19560	40.415	-75.924	MUNICIPAL BUILDING	7	Redundant Path	No
MUHLENBERG TWP POLICE	5401 LEESPORT AV	TEMPLE	19560	40.415	-75.924	POLICE DEPARTMENT	7	Redundant Path	Yes
NEW MORGAN BOR-OUGH MUNICIPAL BUILDING	75 GRACE BLVD	MORGAN-TOWN	19543	40.169	-75.879	MUNICIPAL BUILDING	20	Lateral Path	No
NORTH HEIDELBERG TOWNSHIP MUNICI-PAL BUILDING	928 CHARMING FORGE RD	ROBESONIA	19551	40.396	-76.133	MUNICIPAL BUILDING	1	Redundant Path	No
NORTHERN BERKS EMS STATION 1	26 E WALL ST	LEESPORT	19533	40.446	-75.967	EMS DEPARTMENT	7	Redundant Path	Yes
NORTHERN BERKS EMS STATION 2	28 W WESNER RD	BLANDON	19510	40.438	-75.884	EMS DEPARTMENT	8	Redundant Path	Yes
NORTHERN BERKS REG POLICE	37 ONTELAUNEE DR	READING	19605	40.443	-75.939	POLICE DEPARTMENT	8	Redundant Path	Yes
OLEY COMMUNITY LIBRARY	339 MAIN ST	OLEY	19547	40.389	-75.792	LIBRARY	9	Redundant Path	No
OLEY EMS	11 LYNX DR	OLEY	19547	40.383	-75.783	EMS DEPARTMENT	9	Redundant Path	Yes
OLEY FIRE CO	477 MAIN ST	OLEY	19547	40.386	-75.787	FIRE DEPARTMENT	9	Redundant Path	Yes
OLEY TOWNSHIP MU-NICIPAL BUILDING	1 ROSE VIRGINIA RD	OLEY	19547	40.382	-75.777	MUNICIPAL BUILDING	9	Lateral Path	No
ONTELAUNEE TOWN-SHIP MUNICIPAL BUILDING	35 ONTELAUNEE DR	READING	19605	40.443	-75.939	MUNICIPAL BUILDING	8	Redundant Path	No
PATIENT FIRST PRIMARY & URGENT CARE	2600 PAPER MILL RD	WYOMISS-ING	19610	40.352	-75.981	HOSPITAL URGENT CARE	10	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
PENN ST HEALTH MEDCIAL URGENT CARE MUHLENBERG	4301 N 5 STREET HWY	TEMPLE	19560	40.399	-75.927	HOSPITAL URGENT CARE	12	Redundant Path	Yes
PENN ST HEALTH ST JOSEPHS SPRING RIDGE	2605 KEISER BLVD STE 200	WYOMISS-ING	19610	40.343	-75.987	HOSPITAL URGENT CARE	10	Redundant Path	Yes
PENN ST HEALTH ST JOSEPHS URGENT CARE MAIDENCREEK	108 PLAZA DR STE101	BLANDON	19510	40.454	-75.891	HOSPITAL URGENT CARE	8	Lateral Path	Yes
PENN ST HEALTH STRAUSSTOWN URGENT CARE	44 EAST AVE	BERNVILLE	19506	40.494	-76.180	HOSPITAL URGENT CARE	2	Redundant Path	Yes
PENN STATE BERKS POLICE	2080 TULPE-HOCKEN RD	READING	19610	40.359	-75.971	POLICE DEPARTMENT	6	Lateral Path	Yes
PENN TOWNSHIP MU-NICIPAL BUILDING	840 N GARFIELD RD	BERNVILLE	19506	40.429	-76.094	MUNICIPAL BUILDING	2	Redundant Path	No
PERRY TOWNSHIP MUNICIPAL BUILDING	680 MOSELEM SPRINGS RD	SHOEMAK-ERSVILLE	19555	40.509	-75.941	MUNICIPAL BUILDING	3	Redundant Path	No
PIKE TOWNSHIP MU-NICIPAL BUILDING	810 HILL CHURCH RD	BOYER-TOWN	19512	40.393	-75.703	MUNICIPAL BUILDING	5	Redundant Path	No
PORT CLINTON FIRE CO	15 BROAD ST	PORT CLIN-TON	19549	40.580	-76.025	FIRE DEPARTMENT	2	Lateral Path	Yes
PSP HAMBURG	90 INDUSTRIAL DR	HAMBURG	19526	40.564	-76.002	POLICE DEPARTMENT	2	Redundant Path	Yes
PSP READING	600 KENHORST BLVD	READING	19611	40.319	-75.952	POLICE DEPARTMENT	16	Redundant Path	Yes
Reading Area Commu-nity College	10 S 2nd St, Read-ing, PA 19602	READING	19602	40.335	-75.936	HIGHER EDUCATION MASTER	17	Redundant Path	No
READING BUREAU OF POLICE	815 WASHING-TON ST	READING	19601	40.337	-75.921	POLICE DEPARTMENT	17	Redundant Path	Yes
READING FIRE DEPT EMS	638 WALNUT ST	READING	19601	40.338	-75.925	EMS DEPARTMENT	17	Redundant Path	Yes
READING HOSPITAL & MEDICAL CENTER	600 SPRUCE ST	WEST READ-ING	19611	40.331	-75.951	HOSPITAL URGENT CARE	16	Redundant Path	Yes
Reading Institute of Higher Education	1216 Carbon Street, Reading, PA, 19601	READING	19601	40.352	-75.950	HIGHER EDUCATION MASTER	6	Lateral Path	No
READING PUBLIC LIBRARY - MAIN BRANCH	100 SOUTH 5TH STREET,	READING	19602	40.334	-75.928	LIBRARY	18	Redundant Path	No
READING PUBLIC LI-BRARY - NORTHEAST BRANCH	1348 N. 11TH STREET	READING	19604	40.356	-75.916	LIBRARY	12	Redundant Path	No
READING PUBLIC LI-BRARY - NORTHWEST BRANCH	901 SCHUYLKILL AVENUE	READING	19601	40.349	-75.942	LIBRARY	12	Redundant Path	No
READING PUBLIC LI-BRARY - SOUTHEAST BRANCH	1426 PERKIOMEN AVENUE	READING	19602	40.330	-75.909	LIBRARY	17	Redundant Path	No
REHRERSBURG FIRE CO	250 GODFREY ST	REHRERS-BURG	19550	40.458	-76.246	FIRE DEPARTMENT	1	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
RFD HAMPDEN MARI-ON FIRE STA	1155 9 ST N	READING	19601	40.353	-75.919	FIRE DEPARTMENT	12	Redundant Path	Yes
RFD KEYSTONE NEV-ERSINK FIRE STA	23 3 ST N	READING	19601	40.336	-75.931	FIRE DEPARTMENT	17	Redundant Path	Yes
RFD RAINBOW JR FIRE STA	27 8 ST N	READING	19601	40.336	-75.922	FIRE DEPARTMENT	17	Redundant Path	Yes
RFD READING HOSE FIRE STA	614 FRANKLIN ST	READING	19601	40.333	-75.925	FIRE DEPARTMENT	17	Redundant Path	Yes
RFD SCHUYLKILL RIVERSIDE FIRE STA	950 MCKNIGHT ST	READING	19601	40.350	-75.937	FIRE DEPARTMENT	12	Redundant Path	Yes
RFD SOUTHWEST FIRE STA	101 LANCASTER AVE	READING	19611	40.323	-75.934	FIRE DEPARTMENT	18	Redundant Path	Yes
RICHMOND TOWN-SHIP MUNICIPAL BUILDING	11 KEHL DR	FLEETWOOD	19522	40.489	-75.841	MUNICIPAL BUILDING	4	Lateral Path	No
ROBESON TOWNSHIP MUNICIPAL BUILDING	8 BOONETOWN RD	BIRDSBORO	19508	40.283	-75.862	MUNICIPAL BUILDING	19	Redundant Path	No
ROBESON TWP POLICE	2689 MAIN ST	BIRDSBORO	19508	40.282	-75.858	POLICE DEPARTMENT	19	Redundant Path	Yes
ROBESONIA BOR-OUGH MUNICIPAL BUILDING	75 S BROOKE ST	ROBESONIA	19551	40.352	-76.137	MUNICIPAL BUILDING	6	Redundant Path	No
ROBESONIA COMMU-NITY LIBRARY	75-A SOUTH BROOKE STREET	ROBESONIA	19551	40.352	-76.137	LIBRARY	6	Redundant Path	No
ROBESONIA FIRE CO	32 PENN AV W	ROBESONIA	19551	40.352	-76.136	FIRE DEPARTMENT	6	Redundant Path	Yes
ROCKLAND TOWN-SHIP MUNICIPAL BUILDING	41 DEYSHER RD	FLEETWOOD	19522	40.445	-75.745	MUNICIPAL BUILDING	5	Redundant Path	No
RUSCOMBMANOR FIRE CO	3721 PRICETOWN RD	FLEETWOOD	19522	40.426	-75.819	FIRE DEPARTMENT	9	Redundant Path	Yes
RUSCOMBMANOR TOWNSHIP MUNICI-PAL BUILDING	204 OAK LN	FLEETWOOD	19522	40.425	-75.818	MUNICIPAL BUILDING	9	Redundant Path	No
SAFE CARE EXPRESS URGENT CARE	1802 STATE HILL RD	WYOMISS-ING	19610	40.338	-75.976	HOSPITAL URGENT CARE	11	Redundant Path	Yes
SAINT LAWRENCE BOROUGH MUNICI-PAL BUILDING	3540 SAINT LAW-RENCE AVE	READING	19606	40.326	-75.865	MUNICIPAL BUILDING	14	Lateral Path	No
SCHUYLKILL VAL-LEY COMMUNITY LIBRARY	1310 WASHING-TON ROAD	LEESPORT	19533	40.441	-75.966	LIBRARY	7	Lateral Path	No
SEISHOLTZVILLE COMM FIRE CO	24 SAINT PETERS RD	HEREFORD	18056	40.470	-75.604	FIRE DEPARTMENT	5	Redundant Path	Yes
SHARTLESVILLE FIRE CO	5637 OLD ROUTE 22	SHARTLES-VILLE	19554	40.513	-76.105	FIRE DEPARTMENT	2	Redundant Path	Yes
SHILLINGTON BOR-OUGH MUNICIPAL BUILDING	2 E LANCASTER AVE	SHILLING-TON	19607	40.303	-75.967	MUNICIPAL BUILDING	15	Redundant Path	No
SHILLINGTON FIRE CO	221 CATHERINE ST	READING	19607	40.304	-75.973	FIRE DEPARTMENT	15	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
SHILLINGTON POLICE	999 BROAD ST E	READING	19607	40.298	-75.958	POLICE DEPARTMENT	15	Redundant Path	Yes
SHOEMAKERSVILLE BOROUGH MUNICI-PAL BUILDING	115 E 9TH ST	SHOEMAK-ERSVILLE	19555	40.506	-75.967	MUNICIPAL BUILDING	3	Lateral Path	No
SHOEMAKERSVILLE FIRE CO	300 CHURCH AV	SHOEMAK-ERSVILLE	19555	40.495	-75.967	FIRE DEPARTMENT	3	Redundant Path	Yes
SINKING SPRING BOROUGH MUNICI-PAL BUILDING	3940 PENN AVE	SINKING SPRING	19608	40.325	-76.022	MUNICIPAL BUILDING	10	Redundant Path	No
SINKING SPRING LIBRARY	3940 PENN AVENUE	READING	19608	40.325	-76.022	LIBRARY	10	Redundant Path	No
SINKING SPRING POLICE	3940 PENN AV REAR	READING	19608	40.325	-76.022	POLICE DEPARTMENT	10	Redundant Path	Yes
SOUTH HEIDELBERG TOWNSHIP MUNICI-PAL BUILDING	555 MOUNTAIN HOME RD	READING	19608	40.314	-76.052	MUNICIPAL BUILDING	15	Redundant Path	No
SOUTH HEIDELBERG TWP POLICE	555 MOUNTAIN HOME RD	READING	19608	40.314	-76.052	POLICE DEPARTMENT	15	Redundant Path	Yes
SPRING TOWNSHIP LIBRARY	78C COMMERCE DRIVE	WYOMISS-ING	19610	40.346	-75.990	LIBRARY	10	Redundant Path	No
SPRING TOWNSHIP MUNICIPAL BUILDING	2850 WINDMILL RD	READING	19608	40.319	-76.008	MUNICIPAL BUILDING	10	Redundant Path	No
SPRING TWP POLICE	2800 SHILLING-TON RD	READING	19608	40.318	-76.005	POLICE DEPARTMENT	10	Redundant Path	Yes
ST JOSEPHS MEDI-CAL CENTER	2500 BERNVILLE RD	READING	19605	40.376	-75.979	HOSPITAL URGENT CARE	6	Redundant Path	Yes
STRAUSSTOWN BOR-OUGH MUNICIPAL BUILDING	108 MAIN ST	STRAUSS-TOWN	19559	40.493	-76.183	MUNICIPAL BUILDING	2	Redundant Path	No
STRAUSSTOWN FIRE CO	50 EAST AVE	STRAUSS-TOWN	19559	40.493	-76.179	FIRE DEPARTMENT	2	Redundant Path	Yes
SURGICAL INSTITUTE OF READING	2752 CENTURY BLVD	WYOMISS-ING	19610	40.358	-75.988	HOSPITAL URGENT CARE	6	Redundant Path	Yes
TILDEN TOWNSHIP MUNICIPAL BUILDING	874 HEX HWY	HAMBURG	19526	40.539	-76.017	MUNICIPAL BUILDING	2	Redundant Path	No
TILDEN TWP POLICE	870 HEX HWY	HAMBURG	19526	40.540	-76.017	POLICE DEPARTMENT	2	Redundant Path	Yes
TOPTON AMBU-LANCE	205 HOME RD	MERTZ-TOWN	19539	40.490	-75.691	EMS DEPARTMENT	5	Redundant Path	Yes
TOPTON BOROUGH MUNICIPAL BUILDING	205 S CALLOW-HILL ST	TOPTON	19562	40.500	-75.704	MUNICIPAL BUILDING	5	Lateral Path	No
TOPTON FIRE CO	600 STATE ST	TOPTON	19562	40.503	-75.687	FIRE DEPARTMENT	5	Redundant Path	Yes
TOWER BEHAVIORAL HEALTH HOSPITAL	200 WELLNESS WAY	READING	19605	40.373	-75.973	HOSPITAL URGENT CARE	6	Redundant Path	Yes
TOWER HEALTH DI-RECT EMS STATION 1	3351 MAIN ST	BIRDSBORO	19508	40.284	-75.870	EMS DEPARTMENT	19	Redundant Path	Yes
TOWER HEALTH DI-RECT EMS STATION 2	769 MOUNTAIN VIEW RD	READING	19607	40.296	-75.943	EMS DEPARTMENT	15	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
TOWER HEALTH MED GROUP PHYSICAL MED & REHAB	2802 PAPER MILL RD	WYOMISS-ING	19610	40.361	-75.990	HOSPITAL URGENT CARE	6	Redundant Path	Yes
TOWER HEALTH URGENT CARE DOU-GLASSVILLE	1139 BENJAMIN FRANKLIN HWY W	DOUGLASS-VILLE	19518	40.262	-75.730	HOSPITAL URGENT CARE	19	Redundant Path	Yes
TOWER HEALTH UR-GENT CARE EXETER	4603 PERKIOMEN AVE	READING	19606	40.307	-75.860	HOSPITAL URGENT CARE	14	Redundant Path	Yes
TOWER HEALTH URGENT CARE HAM-BURG	101 GRAND ST	HAMBURG	19526	40.549	-75.988	HOSPITAL URGENT CARE	2	Redundant Path	Yes
TOWER HEALTH UR-GENT CARE SINKING SPRING	4860 PENN AVE	READING	19608	40.325	-76.050	HOSPITAL URGENT CARE	15	Redundant Path	Yes
TOWER HEALTH URGENT CARE WYO-MISSING	2101 STATE HILL RD STE 5	WYOMISS-ING	19610	40.340	-75.978	HOSPITAL URGENT CARE	11	Redundant Path	Yes
TULPEHOCKEN TOWNSHIP MUNICI-PAL BUILDING	22 REHRERS-BURG RD	REHRERS-BURG	19550	40.460	-76.261	MUNICIPAL BUILDING	1	Redundant Path	No
TULPEHOCKEN TWP POLICE	22 REHRERS-BURG RD	REHRERS-BURG	19550	40.460	-76.262	POLICE DEPARTMENT	1	Redundant Path	Yes
TWIN VALLEY FIRE DEPT	4456 MAIN ST	ELVERSON	19520	40.155	-75.845	FIRE DEPARTMENT	20	Lateral Path	Yes
TWP OF SPRING FIRE DEPT	2301 MONROE AV	READING	19609	40.322	-75.994	FIRE DEPARTMENT	10	Redundant Path	Yes
UNION TOWNSHIP MUNICIPAL BUILDING	1445 E MAIN ST	DOUGLASS-VILLE	19518	40.259	-75.775	MUNICIPAL BUILDING	19	Redundant Path	No
UPPER BERN TOWN-SHIP MUNICIPAL BUILDING	25 N 5TH ST	SHARTLES-VILLE	19554	40.514	-76.103	MUNICIPAL BUILDING	2	Redundant Path	No
UPPER TULPEHOCK-EN TOWNSHIP MU-NICIPAL BUILDING	6501 OLD ROUTE 22	BERNVILLE	19506	40.500	-76.172	MUNICIPAL BUILDING	2	Redundant Path	No
VILLAGE LIBRARY	207 NORTH WAL-NUT STREET	MORGAN-TOWN	19543	40.157	-75.893	LIBRARY	20	Lateral Path	No
VIRGINVILLE FIRE CO	20 FIRST ST	LENHARTS-VILLE	19534	40.524	-75.871	FIRE DEPARTMENT	4	Redundant Path	Yes
WALNUTTOWN FIRE CO	535 PARK RD	FLEETWOOD	19522	40.448	-75.841	FIRE DEPARTMENT	8	Redundant Path	Yes
WASHINGTON TOWN-SHIP MUNICIPAL BUILDING	120 BARTO RD	BARTO	19504	40.389	-75.610	MUNICIPAL BUILDING	5	Lateral Path	No
WERNERSVILLE BOR-OUGH MUNICIPAL BUILDING	100 N REBER ST	WERNERS-VILLE	19565	40.331	-76.077	MUNICIPAL BUILDING	6	Redundant Path	No
WERNERSVILLE PUB-LIC LIBRARY	100 N. REBER STREET	WERNERS-VILLE	19565	40.331	-76.077	LIBRARY	6	Redundant Path	No
WERNERSVILLE STATE HOSPITAL	350 SPORTSMAN RD	WERNERS-VILLE	19565	40.328	-76.104	HOSPITAL URGENT CARE	6	Redundant Path	Yes

Name	Address	City	Zip Code	Latitude	Longi-tude	Building Type	Middle Mile Ring	Path Type	First Responders
WEST LAWN-WY-OMISSING HILLS LIBRARY	101 WOODSIDE AVENUE	READING	19609	40.328	-75.994	LIBRARY	10	Redundant Path	No
WEST READING BOR-OUGH MUNICIPAL BUILDING	500 CHESTNUT ST	WEST READ-ING	19611	40.333	-75.948	MUNICIPAL BUILDING	16	Redundant Path	No
WEST READING FIRE CO	223 PLAY-GROUND DR	READING	19611	40.329	-75.943	FIRE DEPARTMENT	16	Redundant Path	Yes
WEST READING POLICE	502 CHESTNUT ST	READING	19611	40.333	-75.948	POLICE DEPARTMENT	16	Redundant Path	Yes
WESTERN BERKS EMS STATION 1	2506 BELMONT AVE	READING	19609	40.329	-75.999	EMS DEPARTMENT	10	Redundant Path	Yes
WESTERN BERKS EMS STATION 2	223 PLAY-GROUND DR	READING	19611	40.329	-75.943	EMS DEPARTMENT	16	Redundant Path	Yes
WESTERN BERKS EMS STATION 3	551 W PENN AVE	ROBESONIA	19551	40.356	-76.147	EMS DEPARTMENT	1	Redundant Path	Yes
WESTERN BERKS EMS STATION 4	320 W MAIN ST	BIRDSBORO	19508	40.267	-75.817	EMS DEPARTMENT	19	Redundant Path	Yes
WESTERN BERKS EMS STATION 5	47 PINE FORGE RD	DOUGLASS-VILLE	19518	40.293	-75.727	EMS DEPARTMENT	19	Redundant Path	Yes
WESTERN BERKS FIRE DEPT STATION 1	111 STITZER AV	WERNERS-VILLE	19565	40.331	-76.079	FIRE DEPARTMENT	6	Redundant Path	Yes
WESTERN BERKS FIRE DEPT STATION 2	836 RUTH ST	READING	19608	40.324	-76.030	FIRE DEPARTMENT	10	Redundant Path	Yes
WESTERN BERKS FIRE DEPT STATION 3	1060 FRITZTOWN RD	READING	19608	40.296	-76.068	FIRE DEPARTMENT	15	Redundant Path	Yes
WESTERN BERKS FIRE DEPT STATION 4	505 BROWNS-VILLE RD	READING	19608	40.363	-76.031	FIRE DEPARTMENT	6	Redundant Path	Yes
WINDSOR TOWNSHIP MUNICIPAL BUILDING	110 HAAS RD	HAMBURG	19526	40.539	-75.932	MUNICIPAL BUILDING	3	Redundant Path	No
WOMELSDORF BOR-OUGH MUNICIPAL BUILDING	101 W HIGH ST	WOMELS-DORF	19567	40.363	-76.185	MUNICIPAL BUILDING	1	Redundant Path	No
WOMELSDORF COM-MUNITY LIBRARY	203 W. HIGH STREET	WOMELS-DORF	19567	40.364	-76.187	LIBRARY	1	Redundant Path	No
WOMELSDORF FIRE CO	501 HIGH ST W	WOMELS-DORF	19567	40.365	-76.193	FIRE DEPARTMENT	1	Redundant Path	Yes
WYOMISSING BOR-OUGH MUNICIPAL BUILDING	22 READING BLVD	WYOMISS-ING	19610	40.334	-75.959	MUNICIPAL BUILDING	11	Redundant Path	No
WYOMISSING FIRE DEPT	1259 PENN AV	READING	19610	40.333	-75.966	FIRE DEPARTMENT	11	Redundant Path	Yes
WYOMISSING PD	22 READING BLVD	READING	19610	40.334	-75.959	POLICE DEPARTMENT	11	Redundant Path	Yes
WYOMISSING PUBLIC LIBRARY	9 READING BLVD	WYOMISS-ING	19610	40.335	-75.958	LIBRARY	11	Lateral Path	No

Appendix

Broadband Grant Development
Berks County, Pennsylvania

Section I. Federal and State Broadband Grant Research

Federal Broadband Grant Program Eligibility

Federal Agency	Grant Program	Eligibility Status	Notes
Appalachian Regional Commission (ARC)	Area Development & Distressed Counties Programs	No	Not located in ARC footprint
	Central Appalachia & North Central/North Appalachia Broadband	No	Not located in ARC footprint
	Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Program	No	Not located in ARC footprint
Delta Regional Authority (DRA)	States Economic Development Assistance Program & Community Infrastructure Fund Program	No	Not located in DRA footprint
Department of Agriculture - Rural Development (USDA-RD)	Community Connect Grant Program	Yes (Select Areas)	Rural and must have 90 to 100% unserved at 10 Mbps / 1 Mbps
	Distance Learning and Telemedicine Grants	Yes (Select Areas)	Rural and must have 90 to 100% unserved at 10 Mbps / 1 Mbps
	ReConnect Program	Yes (Select Areas)	Rural and must have 90 to 100% unserved at 100 Mbps / 20 Mbps
	Rural Broadband Access Loans and Loan Guarantees	Yes (Select Areas)	Rural and must have 90 to 100% unserved at 10 Mbps / 1 Mbps
	Rural Economic Development Loan and Grant (REDLG) Program	No	Not an eligible applicant
	Rural Housing Service (RHS) Community Facilities (CF) Direct Loan and Grant Program	No	Not an eligible applicant
	Telecommunication Infrastructure Loans and Loan Guarantees	Yes	Population cap is 5,000
Department of Commerce - Economic Development Administration (EDA)	FY 2021 Public Works and Economic Adjustment Assistance Program	No	Not eligible based on per capita income or unemployment rate
Department of Commerce - National Telecommunications and Information Administration (NTIA)	Broadband Equity, Access, and Deployment (BEAD) Program	Yes	County is an eligible applicant
	Enabling Middle Mile Broadband Infrastructure Program	Yes	County is an eligible applicant
	Tribal Broadband Connectivity Program	No	Not a Tribal Entity

Federal Agency	Grant Program	Eligibility Status	Notes
Department of Education (DOEd)	Alaska Native and Native Hawaiian-Serving Institutions Program	No	Not an eligible applicant
	American Indian Tribally Controlled Colleges and Universities Program	No	Not an eligible applicant
	Asian American and Native American Pacific Islander-Servicing Institutions Program	No	Not an eligible applicant
	Governor's Emergency Education Relief Fund (GEER)	Yes (Secondary)	Local education agencies who recieve funding from the State of PA can utilize program for broadband infrastructure deployment
	Elementary and Secondary School Emergency Relief Fund (ESSER)	Yes (Secondary)	Local education agencies who recieve funding from the Department of Education can utilize program for broadband infrastructure d eployment
	Higher Education Emergency Relief Fund	Yes (Secondary)	Eligible IHEs can apply for assistance to support educational technology needs
	Impact Aid Programs	Yes (Secondary)	Eligible local education agencies can apply for assistance to support educational technology needs
	Native American-Serving Non-Tribal Institutions Program	No	Not an eligible applicant
	Promise Neighborhoods Program	Yes (Secondary)	Eligible local education agencies can apply for assistance to support educational technology needs
	Rural, Low-Income School (RLIS) Program	Yes (Secondary)	Eligible local education agencies can apply for assistance to support educational technology needs
	Small, Rural School Achievement (SRSA) Program	Yes (Secondary)	Eligible local education agencies can apply for assistance to support educational technology needs
	Title I, Part A. Improving Basic Programs Operated by Local Education Agencies Program	Yes (Secondary)	Eligible local education agencies can apply for assistance to support educational technology needs
	Title III, Part A. Strengthening Institutions Program	Yes (Secondary)	Eligible IHEs can apply for assistance to support educational technology needs
	Title III, Part B. Strengthening Historically Black Colleges and Universities Program	No	Not an eligible applicant
	Title IV, Part A. Student Support and Academic Enrichment Program	Yes (Secondary)	State education agencies can apply for funding to support the use of technology in order to improve the academic achievement and digital literacy for all students.
Department of Housing and Urban Development (HUD)	Community Development Block Grant (CDBG)	Yes	Berks County can utilize the CDBG program for broadband connectivity efforts in Low to Moderate Income areas
	Choice Neighborhoods - Planning	Yes	In Low to Moderate Income eligible areas in Berks County
	Choice Neighborhoods - Implementation	Yes	In Low to Moderate Income eligible areas in Berks County
	Indian Community Development Block Grant	No	Not an eligible applicant
	Indian Housing Block Grant	No	Not an eligible applicant
	Title VI Loan Guarantee (IHBG)	No	Not an eligible applicant

Federal Agency	Grant Program	Eligibility Status	Notes
Department of Labor - Employment and Training Administration (ETA)	Workforce Development in Telecommunications Sector: Apprenticeship Investments in Support of Broadband and 5G	Yes (Secondary)	In partnership with an eligible community college
Department of Transportation	Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program	Yes	Innovative technologies are eligible funding activities as part of a transportation infrastructure project
Department of Treasury	Community Reinvestment Act (CRA) Program	Yes (Secondary)	In partnership with a CDE in eligible areas designated by the U.S. Treasury in predominant Low to Moderate Income areas
Federal Communications Commission (FCC) - Universal Service Administrative Co.	E-Rate (Schools and Libraries) Program	Yes (Secondary)	Local education agencies can apply for subsidies to reduce internet connectivity and devices for students on campus only.
	5G Fund for Rural America	Yes (Secondary)	ISPs can apply to the FCC and USAC for subsidies in certain eligible areas
	Rural Health Care Program	Yes (Secondary)	Rural public health authorities can apply to the FCC and USAC for subsidies to enhance connectivity to support telehealth in select census tracts.
Department of Homeland Security - Federal Emergency Management Agency	Building Resilient Infrastructure and Communities	Yes	Project must be tied to resiliency, support enhanced connectivity for emergency responders and be included in a FEMA approved Hazard Mitigation Action Plan.
Office of Library Services - Institute of Museum and Library Services (IMLS)	Native American Library Services: Basic Grants	No	Not an eligible applicant
	Native American Library Services: Enhancement Grants	No	Not an eligible applicant
National Science Foundation (NSF)	Campus Cyberinfrastructure (CC*) Program	Yes (Secondary)	In partnership with an IHE
	Smart and Connected Communities (S&CC) Program	Yes (Secondary)	In partnership with an IHE
	Spectrum and Wireless Innovation Enabled by Future Technologies (SWIFT) Program	Yes (Secondary)	In partnership with an IHE
Northern Border Regional Commission	Economic and Infrastructure Development (EID) Program	No	Not located in the NBRC footprint

Federal Broadband Grant Program Matrix (Primary)

Federal Agency	Grant Program	Max. Grant	FY 22 Program Capacity	Funding Type	Eligible Project Activities	Eligible Entities	Match Required
Department of Agriculture - Rural Development (USDA-RD)	Community Connect Grant Program	$3,000,000	$35,000,000	Grants	Infrastructure Development, Adoption & Digital Literacy and Public Computer Access	State and Local Government, Tribal Entities, Non-Profits, Private Corporations, LLCs	15%
	Distance Learning and Telemedicine Grants	$1,000,000	$60,000,000	Grants	Infrastructure Development, Adoption & Digital Literacy and Distance Learning & Telemedicine Equipment	State and Local Government, Tribal Entities, Non-Profits, Private Corporations, LLCs	15%
	ReConnect Program	$25,000,000 (Grant) / $50,000,000 (Loan)	$400,000,000	Grants, Combination Grant/Loan and Loans Only	Infrastructure Development, Acqusition of Facilities, Equipment and Professional Services	State and Local Government, Tribal Entities, Non-Profits, Private Corporations, LLCs	25%
	Rural Broadband Access Loans and Loan Guarantees	N/A	$11,500,000	Loan and Loan Guarantees	Infrastructure Development	State and Local Government, Tribal Entities, Private Corporations, LLCs	N/A
	Telecommunication Infrastructure Loans and Loan Guarantees	N/A	$690,000,000	Loan and Loan Guarantees	Infrastructure Development	State and Local Government, Tribal Entities, Private Corporations, LLCs	N/A
Department of Commerce - National Telecommunications and Information Administration (NTIA)	Broadband Equity, Access, and Deployment (BEAD) Program	Not Specified	$42,450,000,000	Grants	Planning & Broadband Infrastructure	States (Formula Allocation), Subgrantees: Local Government, Utility Company, Non-Profits, Co-Ops, For-Profits, Regional Planning Commissions	25%
	Enabling Middle Mile Broadband Infrastructure Program	Not Specified	$1,000,000,000 (over 5 years)	Grants	Middle Mile Broadband Infrastructure	States (Formula Allocation), Subgrantees: Local Government, Utility Company, Non-Profits, Co-Ops, For-Profits, Regional Planning Commissions	30%
Department of Housing and Urban Development (HUD)	Community Development Block Grant (CDBG)	Amounts Vary (Typical Award is <$500,000)	$3,300,000,000	Grants & Loan Guarantees (Sec. 108)	Infrastructure Development, Adoption & Digital Literacy, Planning and Public Computer Access	Local Government	0% (Entitlement Communities)
	Choice Neighborhoods - Planning	$450,000	$10,000,000	Grants	Planning	Local Government	0%
	Choice Neighborhoods - Implementation	$35,000,000	$350,000,000 (over 5 years)	Grants	Infrastructure Development, Adoption & Digital Literacy	Local Government	5%

Federal Agency	Grant Program	Max. Grant	FY 22 Program Capacity	Funding Type	Eligible Project Activities	Eligible Entities	Match Required
Department of Transportation	Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program	$1,000,000 (Rural) $5,000,000 (Urban)	$1,500,000,000	Grants	Planning, Capital Projects (Surface transportation projects), Innovative Technologies	State and Local Government, Transit Agencies, Port Authorities, and MPOs	20%
Department of Homeland Security - Federal Emergency Management Agency	Building Resilient Infrastructure and Communities	$600,000 (State) $50,000,000 (Competitive)	$500,000,000	Grants	Infrastructure Development and Planning	State and Local Government	25%

Federal Broadband Grant Program Synopses

United States Department of Agriculture - Rural Development

Community Connect Grant Program

CFDA Number: 10.863

Application Deadline: Fall 2022 (Anticipated)

Overview: The Community Connect Grant Program is authorized by the Consolidated Appropriations Acts of 2004 (P.L. 108-199), 2017 (P.L. 115-31) and 2018 (P.L. 115-141) to finance broadband transmission infrastructure in rural areas.

Purpose: The purpose of this grant program is to provide funding for broadband service in rural, economically-challenged communities where service does not currently exist.

Description: The program funds the following eligible project categories:

- Infrastructure Development
- Adoption and Digital Literacy and
- Public Computer Access

Eligible Project Activities:

- Construction, acquisition or leasing of facilities, including spectrum, land, towers or building used to deploy service to all residential and business customers in the proposed service area,
- Improvement, expansion, construction or acquisition of a Community Center to provide free access to broadband for public access 7 days a week. Grant funds provided for the Community Center cannot exceed the lesser of 10% of the total grant amount requested or $150,000,
- Funding for at least two but no more than ten Computer Access Points to be used in the Community Center and
- Cost of providing the necessary bandwidth to provide service free of charge to the Critical Community Facilities for two years.

Eligible Applicants: Eligible applicants include:

- Incorporated organization,
- Indian Tribe or Tribal Organization, as defined in 25 U.S.C. 450b(e),
- State or Local unit of Government
- Cooperative, private corporation or limited liability company organized on a for-profit or non-profit basis.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- A project must also be located in rural areas with a population of 20,000 or less (map),
- Serve a Proposed Funded Service Area where broadband services (10 Mbps / 1 Mbps) do not currently exist (map),
- The applicant must agree to offer service at 25 Mbps / 3 Mbps to all residential and business customers within the service area,
- Provide broadband service at no charge for at least two years for each Critical Community Facility located within the service area,
- Provide a Community Center in the service area with at least two Computer Access Points and wireless access at 25 Mbps / 3 Mbps at no charge for at least two years and
- Not overlap with the service areas of current USDA Rural Utilities Service borrowers and grantees.

Total Funding Available (Based on FY 2022 Appropriations):

- $35 Million

Award Floor: $100,000

Award Ceiling: $3,000,000

Grant Match: Grant recipients are required to provide matching contributions in cash or in-kind equal to 15% of the grant amount requested.

Period of Performance: Not specified

Special Requirements: The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of USDA – RD State Offices can be found here.

Distance Learning and Telemedicine Grant Program

CFDA Number: 10.855

Application Deadline: Fall 2022 (Anticipated)

Overview: Since 1994, the Distance Learning and Telemedicine (DLT) Grant program has helped to establish hundreds of distance learning and telemedicine systems improving the quality of life for thousands of residents in rural communities across the United States.

Purpose: The purpose of this grant program is to assist rural communities in acquiring distance learning and telemedicinal technologies to provide the link between local teachers and medical service providers who serve rural residents and other professionals located at distances too far to access otherwise.

Description: The program funds the following eligible project categories:

- Acquiring, by lease or purchase, eligible equipment,
- Acquiring instructional programming, and
- Providing technical assistance and instruction for using eligible equipment.

Eligible Project Activities:

- Computer hardware and software
- Site licenses and maintenance contracts
- Extended warranties (up to 3 years)
- Audio and video equipment
- Computer network components
- Telecommunications terminal equipment
- Data terminal equipment
- Interactive audio/visual equipment
- Inside wiring
- Broadband facilities, if owned by the applicant (20% of project budget limit)
- Instructional programming that is a capital asset, including the purchase or lease of instructional programming already on the market,
- Related software,
- Providing engineering and environmental studies relating to the establishment or expansion of the phase of the project to be financed with the grant (not to exceed 10% of the grant amount requested)

Eligible Applicants: Eligible applicants include:

- An Indian Tribe or Tribal Organization
- State or Local unit of Government
- Consortium
- Other legal entity, including a private corporation organized on a for-profit or non-profit basis

A project must also be located in rural areas with a population of 20,000 or less (map).

Total Funding Available (Based on FY 2022 Appropriations):

- $60 Million

Award Floor: $50,000

Award Ceiling: $1,000,000

Grant Match: Grant recipients are required to provide matching contributions in cash or in-kind equal to 15% of the grant amount requested.

Period of Performance: Not specified

Special Requirements: The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of USDA – RD State offices can be found here.

ReConnect Program

CFDA Number: 10.752

Application Deadline: November 2, 2022

Overview: The ReConnect Grant Program is authorized by the Consolidated Appropriations Acts of 2018 (P.L. 115-141) and the Rural Electrification Act of 1936, 7 U.S.C. 901 et seq. to finance broadband transmission infrastructure in rural areas.

Purpose: The purpose of this grant program is to expand broadband service in rural areas without sufficient access to broadband, defined as 100 megabits per second (Mbps) downstream and 20 Mbps upstream.

Description: The ReConnect Program furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas.

Eligible Project Activities:

- Construction, acquisition or leasing of facilities, including spectrum, land, towers or building used to deploy service to all residential and business customers in the proposed service area,
- Pre-application expenses (up to 5% of the award amount),
- Acquisition and improvement of an existing system that is currently providing insufficient broadband service (100% Loan option only) and
- Terrestrial based facilities that support the provision of satellite broadband service.

Eligible Applicants: Eligible applicants include:

- Cooperatives, non-profits or mutual associations,
- For-profit corporations or limited liability companies,
- States, local governments or any agency, subdivision, or political subdivision thereof,
- A territory or possession of the U.S. and
- An Indian Tribe or Tribal Organization, as defined in 25 U.S.C. 450b.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- A project must also be located in rural areas with a population of 20,000 or less (map),
- Serve a Proposed Funded Service Area where broadband services (100 Mbps / 20 Mbps) do not currently exist (map):
  - 90% of the service area (50% Grant / 50% Loan Option and 100% Loan Option)
  - 100% of the service area (100% Grant Option)
- The applicant must agree to offer service at a minimum of 25 Mbps / 3 Mbps to all residential and business customers within the service area and
- Not overlap with the service areas of current USDA Rural Utilities Service borrowers and grantees.

Total Funding Available (Based on FY 2022 Appropriations):

- $565 Million

Award Floor: $100,000

Award Ceiling:$25 Million (100% Grant Option); $50 Million (50% Grant / 50% Loan Option); $50 Million (100% Loan Option)

Grant Match: Recipients of the 100% Grant Option are required to provide matching contributions in cash or in-kind equal to 25% of the grant amount requested.

Period of Performance: 60 Months

Special Requirements: The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of USDA – RD State offices can be found here.

Rural Broadband Access Loans and Loan Guarantees

CFDA Number: 10.886

Application Deadline: Applications are accepted on a rolling basis through September 30, 2022.

Overview: The Rural Broadband Access Loan and Loan Guarantee Program is authorized by the Rural Electrification Act (7 U.S.C. 901 et seq.), as amended by the Agricultural Act of 2014 (Pub. L. 113– 79), also referred to as the 2014 Farm Bill. The program was also reauthorized in the 2018 Farm Bill, through fiscal year 2023.

Purpose: The purpose of this grant program is to provide funding for projects that offer broadband service at or beyond specific broadband lending speeds, which are determined by the RUS in the respective publication in the Federal Register. RUS established the minimum rate-of-data transmission of 25 megabits downstream and 3 megabits upstream for both mobile and fixed service.

Description: The program funds the following eligible loan types:

- Cost-of-Money Loans in the form of direct loans from the USDA Rural Utilities Service,
- Direct 4-Percent Loans which bear interest at 4 percent on each advance made to the borrower and
- Other Loan Guarantees provided by third party lenders, of which the RUS will guarantee up to 80 percent of the principal amount of the loan.

Eligible Project Activities:

- Construction, improvement and acquisition of all facilities required to provide service at the minimum speed established by the USDA,
- Cost of leasing facilities required to provide service is the lease qualifies as a capital lease under Generally Acceptable Accounting Procedures (GAAP),
- Acquisition of facilities, portions of an existing system and/or another company (up to 50% of the requested loan amount),
- Refinancing of an outstanding obligation from another telecommunications loan made by the USDA (up to 40% of the requested amount) and
- Pre-loan expenses including market surveys, consultant costs and fees (up to 5% of the requested amount).

Eligible Applicants: Eligible applicants include:

- Corporation,
- Limited Liability Company,
- Cooperative or mutual organization,
- Indian Tribe or Tribal Organization, as defined in 25 U.S.C. 450b and
- State or Local unit of Government.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- A project must also be located in rural areas with a population of 20,000 or less (map),
- At least 15% of the households in the Proposed Funded Service Area do not have access to broadband service (map),
- No part of the Proposed Funded Service Area has three or more incumbent service providers and
- Non-duplicative of other borrowers or service areas funded by the RUS Telecommunications Program.

Total Funding Available (Based on FY 2021 Appropriations):

- $11.2 Million

Award Floor: $100,000

Award Ceiling: $25,000,000

Grant Match: As a condition to financing, an applicant must demonstrate an equity contribution in an amount that is at least 10% of the requested loan amount at the time of application submission.

Period of Performance: Loan terms are based upon the USDA's determination of the project's useful life plus three years.

Special Requirements: The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of USDA – RD State offices can be found here.

Telecommunication Infrastructure Loans and Loan Guarantees

CFDA Number: 10.851

Application Deadline: Applications are accepted on a rolling basis through September 30, 2022.

Overview: The Telecommunications Infrastructure Loan and Loan Guarantee Program is authorized by the Rural Electrification Act (7 U.S.C. 901 et seq.), Titles II and III, 7 U.S.C. 921, 922-924, and 930-940.

Purpose: The purpose of this grant program is to provide financing for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas.

Description: The program funds the following eligible loan types:

- Cost-of-Money Loans in the form of direct loans from the USDA Rural Utilities Service,
- Loan Guarantees through the Federal Financing Bank (FFB), and
- Hardship Loans in the form of direct loans from the USDA Rural Utilities Service.

Eligible Project Activities:

- Construction, improvement and acquisition of all facilities required to provide service at the minimum speed established by the USDA,
- Acquisition of facilities, portions of an existing system and/or another company (up to 50% of the requested loan amount), and
- Refinancing of an outstanding obligation from another telecommunications loan made by the USDA (up to 40% of the requested amount).

Eligible Applicants: Eligible applicants include:

- Corporation,
- Limited Liability Company,
- Cooperative or mutual organization,
- Indian Tribe or Tribal Organization, as defined in 25 U.S.C. 450b and
- State or Local unit of Government.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- A project must also be located in rural areas with a population of 5,000 or less (map),
- Non-duplicative of other borrowers or service areas funded by the RUS Telecommunications Program.

Total Funding Available (Based on FY 2021 Appropriations):

- $690 Million

Award Floor: $50,000

Award Ceiling: No limit has been specified by the USDA for this program.

Grant Match: As a condition to financing, an applicant must demonstrate an equity contribution in an amount that is at least 10% of the requested loan amount at the time of application submission.

Period of Performance: Loan terms are based upon the USDA's determination of the project's useful life plus three years.

Special Requirements: The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of USDA – RD State offices can be found here.

United States Department of Housing and Urban Development

Community Development Block Grant (CDBG) – Entitlement Communities

CFDA Number: 14.218

Application Deadline: Summer 2022 (Anticipated)

Overview: The Community Development Block Grant (CDBG) Program provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons. The program is authorized under Title 1 of the Housing and Community Development Act of 1974, Public Law 93-383, as amended 42 U.S.C. 5301 et seq.

Purpose: The purpose of this grant program is to assist in the development of communities with respect the development of housing, suitable living environments and economic opportunities primarily for persons with low and moderate incomes.

Description: The program funds the following eligible project categories:

- Economic Development,
- Homeownership Assistance,
- House Rehabilitation,
- Housing Acquisition,
- Land Acquisition to Support New Housing
- Microenterprise Programs,
- New Housing Construction or
- Public Facilities and Improvements

Eligible Project Activities:

- Acquisition of real property,
- Disposition of real property,
- Acquisition, construction, reconstruction, rehabilitation or installation of public facilities and improvements,
- Clearance, demolition and removal of buildings and improvements,
- Provision of public services which are directed toward improving the community's public services and facilities,
- Privately owned utilities including the acquisition, construction, reconstruction, rehabilitation or installation of distribution lines and facilities of privately-owned utilities,
- Assistance to facilitate economic development,
- Technical assistance,
- Digital literacy classes as a public service under 24 CFR 570.201(e),
- Assistance to institutions of Higher Education and
- Homeownership assistance.

Eligible Applicants: Eligible Entitlement applicants include:

- Principal cities of Metropolitan Statistical Areas (MSAs)
- Other metropolitan cities with populations of at least 50,000
- Qualified urban counties with populations of at least 200,000 (excluding the population of entitled cities)

Eligibility for participation as an entitlement community is based on population data provided by the U.S. Census Bureau and metropolitan area delineations published by the Office of Management and Budget. HUD determines the amount of each entitlement grantee's annual funding allocation by a statutory dual formula which uses several objective measures of community needs, including the extent of poverty, population, housing overcrowding, age of housing and population growth lag in relationship to other metropolitan areas.

Total Funding Available (Based on FY 2022 Appropriations):

- $3.475 Billion

Award Floor: Not specified

Award Ceiling: Limit determined by formula-based allocation

Grant Match: No match or cost share is required for this program, however applicants who leverage other funds.

Period of Performance: The length of the project period is generally based on the implementation schedule submitted by the applicant and approved by HUD.

Special Requirements: It is required that the applicant demonstrate that at least 70% of the grant funding will be utilized for activities that benefit Low-to-Moderate Income persons in accordance with 24 CFR 1003.208. Low-to-Moderate Income means a family, household or individual whose income does not exceed 80% of the median income for the area.

The program requires Grant recipients to comply with various federal statutes and regulations including,

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services

Program Point of Contact(s): A listing of U.S. Department of Housing and Urban Development offices can be found here.

Choice Neighborhoods – Planning

CFDA Number: 14.892

Application Deadline: July 28, 2022

Overview: This program helps communities transform neighborhoods by redeveloping severely distressed public and/or HUD assisted housing and catalyzing improvements in the neighborhood, property, housing, businesses, services and schools.

Purpose: The purpose of this grant program is to leverage public and private investment to support locally driven strategies that address struggling neighborhoods through a comprehensive approach for transformation.

Description: The program funds the following eligible project categories:

- Planning and
- Action Activities

Eligible Project Activities (Planning Category):

- Performing comprehensive needs assessments to inform the development of the Transformation Plan,
- Performing comprehensive and integrated planning that addresses the challenges and gaps in services and assets identified through the needs assessments,
- Conducting technical planning studies concerning local development issues, priorities or suggested approaches,
- Developing Transformation Plans, including governance strategy that will provide long-term accountability and secure commitments to collaborate long-term to ensure successful implementation,
- Conducting public hearings, meetings, websites, etc. for stakeholder involvement regarding the Transformation Plan,
- Data collection and analysis to track impacts and
- Conducting site visits, research or participating in community of practice.

Eligible Project Activities (Action Activities Category):

- Reclaiming and recycling vacant property into community gardens, pocket parks, farmers markets or land banking (with maintenance),
- Beautification, placemaking and community arts projects, such as creative signage to enhance neighborhood branding, murals and sculptures, specialty streetscaping or garden tool loan programs,
- Owner-occupied home or business façade improvement programs,
- Neighborhood broadband/WiFi infrastructure and installation (service not eligible through the grant),
- Fresh food initiatives, such as farmers markets and mobile fresh food vendors and
- Gap financing for economic development projects that are ready for implementation.

Eligible Applicants: Eligible applicants include:

- Public Housing Authorities,
- Local governments,
- Tribal entities and
- Non-profits who hold a 501(c) status.

Regarding Public Housing Authorities in Troubled Status, HUD will determine whether the entity is eligible to apply for the grant.

Total Funding Available (Based on FY 2022 Appropriations):

- $5 Million

Award Floor: Not specified

Award Ceiling: $450,000

Grant Match: 5%

Period of Performance: 24 Months (Planning Grant)

42 Months (Planning and Action Grant)

Special Requirements: The program requires Grant recipients to comply with the following special statutes and regulations including:

- Resolution of Civil Rights Matters,
- Outstanding Delinquent Federal Debts,
- Debarments and/or Suspensions,
- Pre-selection Review of Performance,
- Sufficient of Financial Management System,
- False Statements,
- Mandatory Disclosure Requirement,
- Prohibition Against Lobbying Activities and
- Equal Participation of Faith-Based Organizations in HUD Programs and Activities

The program also requires Grant recipients to comply with the following additional requirements:

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services.

Program Point of Contact(s): The Choice Neighborhoods Program Office can be contacted by E-mail here.

Choice Neighborhoods – Implementation

CFDA Number: 14.889

Application Deadline: Spring 2023 (Anticipated)

Overview: This program helps communities transform neighborhoods by redeveloping severely distressed public and/or HUD assisted housing and catalyzing improvements in the neighborhood, property, housing, businesses, services and schools.

Purpose: The purpose of this grant program is to leverage public and private investment to support locally driven strategies that address struggling neighborhoods through a comprehensive approach for transformation.

Description: The Choice Neighborhoods is focused on three core goals:

1. Housing: Replace severely distressed public and assisted housing with high-quality mixed-income housing that is well-managed and responsive to the needs of the surrounding neighborhood;

2. People: Improve outcomes of households living in the target housing related to employment and income, health, and children's education; and

3. Neighborhood: Create the conditions necessary for public and private reinvestment in distressed neighborhoods to offer the kinds of amenities and assets, including safety, good schools, and commercial activity, that are important to families' choices about their community.

Eligible Project Activities:

- Construction, acquisition or rehabilitation of public, assisted, and affordable housing (available to households earning 80 -120 percent of AMI) that incorporates sustainable design principles, including energy efficiency,
- Acquisition, demolition or disposition of properties, including Federal Housing Administration-Real Estate Owned properties,
- Providing supportive supports for residents,
- Partnering with employers and for-profit and non-profit organizations to create jobs and job training opportunities,
- Relocation assistance under Section 8 of the United States Housing Act of 1937,
- Activities that promote sustainable neighborhoods and incorporate principles of sustainable design and development,
- Critical community improvements as define further below,
- Endowments,
- Conversion of vacant or foreclosed properties,

- Architectural and engineering work,
- Administrative costs and
- Legal fees.

The program also allows for up to 15% of funding to be utilized for Critical Community Improvements for the following activities:

- Financing for commercial and economic development projects,
- Neighborhood business façade improvement programs,
- Place-making projects,
- Neighborhood broadband,
- Revolving loan funds for business attraction and retention,
- Streetscape improvements above and beyond the locality's norm,
- Programs to improve housing in the neighborhood surrounding the target housing subject of this application and
- Acquisition of underutilized land for new parks, community gardens, community facilities or other uses approved by HUD.

Eligible Applicants: Eligible applicants include:

- Public Housing Authorities,
- Local governments,
- Tribal entities and
- Non-profits who hold a 501(c) status.

Total Funding Available (Based on FY 2022 Appropriations):

- $195 Million

Award Floor: Not specified

Award Ceiling: $35 Million

Grant Match: 5%

Period of Performance: 72 Months

Special Requirements: The program requires Grant recipients to comply with the following special statutes and regulations including:

- Resolution of Civil Rights Matters,
- Outstanding Delinquent Federal Debts,
- Debarments and/or Suspensions,
- Pre-selection Review of Performance,
- Sufficient of Financial Management System,
- False Statements,
- Mandatory Disclosure Requirement,
- Prohibition Against Lobbying Activities and
- Equal Participation of Faith-Based Organizations in HUD Programs and Activities

The program also requires Grant recipients to comply with the following additional requirements:

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services.

Program Point of Contact(s): The Choice Neighborhoods Program Office can be contacted by E-mail here.

United States Department of Transportation

Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program

CFDA Number: 20.933

Application Deadline: April 14, 2022

Overview: The Consolidated Appropriations Act, 2021 (Pub. L. 116-260) appropriated $1 billion to be awarded by the U.S. Department of Transportation ("DOT") for National Infrastructure Investments (now known as Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants.) RAISE Grants (formerly known as the BUILD grant) are for capital investments in surface transportation that will have a significant local or regional impact.

Purpose: The focus of this program is to fund critical improvements to local, state, and federal transportation infrastructure that result in good-paying jobs, improve safety, apply transformative technology, and explicitly address climate change and racial equity.

Description: The program funds the following eligible broadband related project aspects:

- Innovative Technologies including:
  - Conflict detection and mitigation technologies (e.g., intersection alerts and signal prioritization);
  - Dynamic signaling, smart traffic signals, or pricing systems to reduce congestion;
  - Traveler information systems, to include work zone data exchanges;
  - Signage and design features that facilitate autonomous or semi-autonomous vehicle technologies;
  - Applications to automatically capture and report safety-related issues (e.g., identifying and documenting near-miss incidents);
  - Vehicle-to-Everything V2X Technologies (e.g. technology that facilitates passing of information between a vehicle and any entity that may affect the vehicle);
  - Vehicle-to-Infrastructure (V2I) Technologies (e.g., digital, physical, coordination, and other infrastructure technologies and systems that allow vehicles to interact with transportation infrastructure in ways that improve their mutual performance);
  - Vehicle-to-Grid Technologies (e.g., technologies and infrastructure that encourage electric vehicle charging, and broader sustainability of the power grid);
  - Cybersecurity elements to protect safety-critical systems;

- Broadband deployment and the installation of high-speed networks concurrent with the transportation project construction;
- Technology at land and sea ports of entry that reduces congestion, wait times, and delays, while maintaining or enhancing the integrity of our border;
- Work Zone data exchanges or related data exchanges; or
- Other Intelligent Transportation Systems (ITS) that directly benefit the project's users.

Eligible Project Activities:

- Planning

Activities eligible for funding under RAISE planning grants are related to the planning, feasibility, preparation, or design of eligible surface transportation capital projects.

- Capital Projects

Eligible projects for RAISE grants are surface transportation capital projects within the United States or any territory or possession of the United States that include, but are not limited to:

1. highway, bridge, or other road projects eligible under title 23, United States Code;
2. public transportation projects eligible under chapter 53 of title 49, United States Code;
3. passenger and freight rail transportation projects;
4. port infrastructure investments (including inland port infrastructure and land ports of entry);
5. intermodal projects; and
6. projects investing in surface transportation facilities that are located on Tribal land and for which title or maintenance responsibility is vested in the Federal Government.

Eligible Applicants: Eligible applicants include:

- State, local, Tribal and U.S. territories' governments
- Transit agencies
- Port Authorities
- Metropolitan Planning Organizations (MPOs)
- Other political subdivisions of State or local governments

Total Funding Available: $1.5 Billion

Award Floor:

- Capital Projects: $5 Million/$1 Million (Rural Areas)
- Planning: There is no minimum award size for RAISE planning grants, regardless of location.

Award Ceiling: $25 Million

Grant Match: 20%

Period of Performance: All FY 2022 RAISE funds must be expended by September 30, 2030.

Special Requirements:

The primary selection criteria are:

- safety,
- environmental sustainability,
- quality of life,
- economic competitiveness, and
- state of good repair.

The secondary selection criteria are:

- partnership and
- innovation.

If an applicant is proposing to adopt innovative technology, the application should demonstrate the applicant's capacity to implement those innovations and understanding of applicable Federal requirements, including permitting, approvals, exemptions, waivers, or other procedural actions, and the effects of those innovations on the project delivery timeline. Additionally, each applicant selected for RAISE grant funding must demonstrate effort to consider climate change and environmental justice impacts and improve racial equity and reduce barriers to opportunity.

The program also requires Grant recipients to comply with the following additional requirements:

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Americans with Disabilities Act and
- Non-Duplication of Services.

Program Point of Contact(s): The RAISE Grant Program Office can be contacted by E-mail here.

United States Department of Homeland Security - Federal Emergency Management Agency

Building Resilient Infrastructure and Communities

CFDA Number: 97.047

Application Deadline: Winter 2023 (Anticipated)

Overview: The Building Resilient Infrastructure and Communities (BRIC) program makes federal funds available to states, U.S territories, Indian tribal governments, and local communities for pre-disaster mitigation activities.

Purpose: The guiding principles of the program are to:

1. (support state and local governments, tribes, and territories through capability- and capacity-building to enable them to identify mitigation actions and implement projects that educe risks posed by natural hazards;
2. encourage and enable innovation while allowing flexibility, consistency, and effectiveness;
3. promote partnerships and enable high-impact investments to reduce risk from natural hazards with a focus on critical services and facilities, public infrastructure, public safety, public health, and communities;
4. provide a significant opportunity to reduce future losses and minimize impacts on the Disaster Relief Fund; and

5. support the adoption and enforcement of building codes, standards, and policies that will protect the health, safety, and general welfare of the public, take into account future conditions, and have long-lasting impacts on community risk reduction, including for critical services and facilities and for future disaster costs.

Description: The program funds the following eligible project categories:

- Capacity and Capacity-Building (C&CB)
  - Activities which enhance the knowledge, skills, expertise, etc., of the current workforce to expand or improve the administration of mitigation assistance.
  - This includes activities in the following sub-categories:
  - building codes activities,
  - partnerships,
  - project scoping,
  - mitigation planning and planning-related activities,
  - and other activities
- Mitigation Projects
  - Cost-effective projects designed to increase resilience and public safety; reduce injuries and loss of life; and reduce damage and destruction to property, critical services, facilities, and infrastructure.
- Management Costs
  - Financial assistance to reimburse the Recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs, and other administrative expenses associated with a specific mitigation measure or project
- Direct Technical Assistance
  - Assistance to build a community's capacity and capability to improve its resiliency to natural hazards and to ensure stakeholders are capable of building and sustaining successful mitigation programs, submitting high-quality applications, and implementing new and innovative projects that reduce risk from a wide range of natural hazards.

Eligible Applicants: Eligible applicants include:

- States,
- District of Colombia,
- U.S. Territories and
- Indian Tribal Governments, as defined in 25 U.S.C. 450b

According to the Notice of Funding Opportunity, local governments, including cities, townships, counties, special district governments, and Indian tribal governments (including federally recognized tribes who choose to apply as subapplicants) are considered subapplicants and must submit subapplications for financial assistance or letters of interest for non-financial Direct Technical Assistance to their state/territory/tribal Applicant agency.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- Subapplicants are required to have a FEMA-approved Local or Tribal Hazard Mitigation Plan in accordance with 44 CFR Part 201 by the Application deadline and at the time of obligation of grant funds for mitigation projects and C&CB activities (with the exception of mitigation planning).
- States and territories that have had a major disaster declaration under the Stafford Act in the 7 years prior to the annual Application period start date are eligible to apply to FEMA for federal assistance under BRIC (Applicants). As a result of numerous major disaster declarations, all states, territories, and the District of Columbia are eligible to apply in FY2020.

Total Funding Available (Based on FY 2022 Appropriations):

- $500 Million

Award Floor: Not specified

Award Ceiling: $600,000 (State Allocation); $50,000,000 (National Competition)

Grant Match: 25%

Period of Performance: 36 Months

Special Requirements: The program requires Grant recipients to comply with the following special statutes and regulations including:

- Resolution of Civil Rights Matters,
- Outstanding Delinquent Federal Debts,
- Debarments and/or Suspensions,
- Pre-selection Review of Performance,
- Sufficient of Financial Management System,
- False Statements,
- Mandatory Disclosure Requirement,
- Prohibition Against Lobbying Activities and

The program also requires Grant recipients to comply with the following additional requirements:

- NEPA Environmental Requirements,
- Flood Hazard Area Precautions,
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,
- Buy American
- Americans with Disabilities Act and
- Non-Duplication of Services.

Mitigation projects must be cost-effective and designed to increase resilience and reduce risk of injuries, loss of life, and damage and destruction of property, including critical services and facilities. This means the project, as documented by the Applicant, achieves the following goals:

- Addresses a problem that has been repetitive or that poses a risk to public health and safety and improved property if left unresolved;
- Satisfies applicable cost-effectiveness requirements through completion of a Benefits-to-Cost Analysis (BCA) conducted in compliance with OMB Circular A-94 as discussed in Section A.10, Performance Metrics;
- Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address; and
- Accounts for long-term changes to the areas and entities it protects and has manageable future maintenance and modification requirements.

Program Point of Contact(s): A listing of State Hazard Mitigation Officers (SHMOs) can be found here.

Federal Broadband Grant Programs (Secondary)

In addition to the federal broadband grant programs listed as primary matches, Berks County may consider seeking additional funding opportunities through the following agencies and programs with other eligible applicants:

United States Department of Education

- Governor's Emergency Education Relief Fund (GEER)
- Elementary and Secondary School Emergency Relief Fund (ESSER)
- Higher Education Emergency Relief Fund
- Impact Aid Programs
- Promise Neighborhoods Programs
- Rural, Low-Income School (RLIS) Program
- Small, Rural School Achievement (SRSA) Program
- Title I, Part A. Improving Basic Programs Operated by Local Education Agencies Program
- Title III, Part A. Strengthening Institutions Program
- Title IV, Part A. Student Support and Academic Enrichment Program

United States Department of Labor – Employment and Training Administration

- Workforce Development in Telecommunications Sector: Apprenticeship Investments in Support of Broadband and 5G

United States Department of Treasury – Office of the Comptroller of the Currency (OCC)

Community Reinvestment Act (CRA) Program

Federal Communications Commission – Universal Service Administrative Company

- E-Rate (Schools and Libraries) Program
- High Cost Program (CAF, RDOF & 5G Fund)
- Rural Health Care Program

National Science Foundation (NSF)

Campus Cyberinfrastructure (CC*) Program

Smart and Connected Communities (S&CC) Program

Spectrum and Wireless Innovation Enabled by Future Technologies (SWIFT) Program

State Broadband Grant Program Eligibility

Pennsylvania Department of Community and Economic Development

Keystone Communities Program – Development Grant

Application Deadline: Not specified in the guidelines or program website.

Overview: Through the Keystone Communities program ,the Department of Community and Economic Development (DCED) provides support and opportunity for every neighborhood and community in the commonwealth.

Purpose: The Keystone Communities program is designed to encourage the creation of partnerships between the public and private sectors that jointly support local initiatives

such as the growth and stability of neighborhoods and communities; social and economic diversity; and a strong and secure quality of life. The program allows communities to tailor the assistance to meet the needs of its specific revitalization effort.

Description: Development grants are available to fund a variety of physical improvements, including public infrastructure improvements.

Public improvement grants are available to assist communities in a variety of development projects to help eliminate decline, provide gap financing for proposed projects, and assist in emergency efforts to recover from a natural disaster. Communities recovering from a natural disaster will receive priority consideration for funding.

Eligible Applicants: Eligible applicants include:

- Units of local government (counties, cities, boroughs, townships, towns, and home rule municipalities),
- Redevelopment and/or housing authorities,
- Nonprofit organizations to include economic development organizations, housing corporations, etc.
- Community development corporations
- Business improvement districts, neighborhood improvement districts, downtown improvement districts and similar organizations incorporated as authorities

Total Funding Available: $6 Million

Award Floor: Not specified

Award Ceiling: Development grants may not exceed $500,000 or 30% of project costs, whichever is less.

Grant Match: 50%, however the remaining project funding must come from other sources.

Period of Performance: Not specified

Special Requirements: The ultimate owner/user of public improvement grants must be a public entity, a charitable nonprofit, or an income-eligible homeowner or renter. Income-eligible homeowners/renters include low, moderate, and middle income homeowners whose income does not exceed 120% of the area median income.

Additionally, the Pennsylvania Prevailing Wage Act (43 P.S. § 165-1 et seq.; 34 Pa. Code § 9.101 et

seq.) may be applicable to a project funded under this program. Prevailing Wage requirements are generally applicable to grants for construction, demolition, reconstruction, alteration, repair work, renovations, buildout and installation of machinery and equipment in excess of $25,000. If applicable, the grantee is responsible for including prevailing wage rates in all bid documents, specifications, and construction contracts pertaining to the Project. The Department of Labor and Industry (L&I) has final authority to make prevailing wage applicability determinations.

Program Point of Contact(s): A listing of Pennsylvania Department of Community & Economic Development regional offices can be found here.

Section II. Evaluation of Project Opportunities

Funding Needs Matrix

Opportunity	Planning	Design	Construction	Equipment / Devices
Middle Mile (Backbone)	X	X	X	X
Last Mile (FTTP)	X	X	X	X
Wireless	X	X	X	X
Telehealth	X	X	X	X
Economic Development	X	X	X	X
Emergency Response	X	X	X	X
Distance Learning	X	X	X	X

Eligible Project Activities

Project	Needs	Agency	Potential Funding Program(s)
Middle Mile (Backbone)	Planning, Design, Construction & Equipment	DHS-FEMA USDA-RD USDOC-NTIA	• Building Resilient Infrastructure and Communities (BRIC) • ReConnect Pilot Program • Rural Broadband Access Loan and Loan Guarantees • Broadband Equity, Access, and Deployment (BEAD) Program • Enabling Middle Mile Broadband Infrastructure Program

Project	Needs	Agency	Potential Funding Program(s)
Last Mile (FTTP)	Planning, Design, Construction & Equipment	USDOC-NTIA USDA-RD USDHUD	• Broadband Equity, Access, and Deployment (BEAD) Program • ReConnect Pilot Program • Rural Broadband Access Loan and Loan Guarantees • Telecommunications Infrastructure Loans and Loan Guarantees • Community Development Block Program • Choice Neighborhoods - Implementation • Choice Neighborhoods - Planning
Telehealth Economic Development Emergency Response Distance Learning	Planning, Design, Construction & Devices	FCC-USAC USDA-RD USDHUD DHS-FEMA	• Rural Health Care Program • E-Rate (Schools and Libraries) Program • Community Connect Grant Program • Distance Learning and Telemedicine Grant • ReConnect Pilot Program • Rural Broadband Access Loan and Loan Guarantees • Community Development Block Program • Choice Neighborhoods - Implementation • Choice Neighborhoods - Planning • Building Resilient Infrastructure and Communities (BRIC)

ACRONYMS:

DHS - FEMA Department of Homeland Security - Federal Emergency Management Agency
FCC - USAC Federal Communications Commission - Universal Service Administrative Company
USDA-RD United States Department of Agriculture - Rural Development
USDOC-EDA United States Department of Commerce - Economic Development Administration
USDOC-NTIA National Telecommunications and Information Administration
USDHUD United States Department of Housing and Urban Development

Project Opportunities

Middle Mile (Backbone)

Description of Project: In order to establish a foundation for last mile connectivity for the County, a backbone network will need to be constructed first. Backbone networks typically consist of a ring (or rings) of fiber optic cable connecting different areas of a municipality or region. The ring topology has the advantage to be resilient (redundancy network) against single fiber cuts or other faults. One business opportunity for the County with the backbone ring is connecting local large and mid-sized businesses with internet connectivity. Lit analyzed GIS data to create an initial design for the County's backbone network. From this data, Lit created a financial model to quantify the cost of building the Middle Mile network and the potential revenue opportunities for the County. Lit is proposing the development of 378 miles of middle mile backbone infrastructure throughout Berks County and connecting 260 community anchor institutions.

Scope of Work: The backbone network deployment is broken up into four major phases including Assessment, Engineering, Construction, and Operations as shown on the 'Expenses' tab of the Financial Model.

1. Assessment

The total costs for the Assessment Phase are assumed to be $0 since the County will have already paid for the cost of the Broadband Community Assessment.

2. Engineering

The total costs for the Engineering Phase are $3,227,478 and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost shown below. These tasks will all be completed during months 1-12.

3. Construction

The total costs for the Construction Phase are $33,466,173 (less material waste) and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost. The final pricing for this phase will be established during the Engineering Phase, and the Financial Model will be reflected accordingly.

4. Operations & Maintenance

The total costs for the Operations Phase during the construction period is $914,585 and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost. The recurring monthly costs for O&M are estimated to be $11,750 for the majority of the 20-year period.

Potential Grant Funding Sources:

Department of Homeland Security - Federal Emergency Management Agency

- Building Resilient Infrastructure and Communities

United States Department of Agriculture - Rural Development

- ReConnect Program
- Rural Broadband Access Loan and Loan Guarantees

United States Department of Commerce – National Telecommunications and Information Administration

- Broadband Equity, Access, and Deployment (BEAD) Program
- Enabling Middle Mile Broadband Infrastructure Program

Last Mile (FTTP)

Description of Project: The County contracted Lit to perform a preliminary design for a defined a preliminary service area - deriving 153,523 potential residential customers and 7,785 potential small business customers, for a grand total of 161,308 total customers or demand points. Using the Preliminary Design and pole digitization, we've assumed 80% aerial and 20% underground build in the Right of Way ("ROW") for the County's FTTH Partner network. Aerial deployment typically is one of the most cost-effective methods of deploying fiber to customers, because of the ability to leverage existing pole lines and avoiding additional costs of digging up roads or burying cables.

Scope of Work: The last mile network deployment for 161,308 demand points are broken up into four major phases including Assessment, Engineering, Construction, and Operations as shown on the 'Expenses' tab of the Financial Model.

1. Assessment

The total costs for the Assessment Phase are assumed to be $0 since the County will have already paid for the cost of the Broadband Community Assessment.

2. Engineering

The total costs for the Engineering Phase are $19,598,606 and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost. These tasks will all be completed during months 1-6.

3. Construction

The total costs for the Construction Phase are $310,787,253 (less material waste) and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost. The final pricing for this phase will be established during the Engineering Phase, and the Financial Model will be reflected accordingly.

4. Operations & Maintenance

The total costs for the Operations Phase during the construction period is $101,488,823 and includes the Tasks, Unit of Measure, Volume, Unit Cost, and Total Cost shown below. The recurring monthly costs for O&M are estimated to between $125,000 - $130,000 for the majority of the 20-year period as shown on the financial model.

Potential Grant Funding Sources:

United States Department of Commerce – National Telecommunications and Information Administration

- Broadband Equity, Access, and Deployment (BEAD) Program

United States Department of Agriculture - Rural Development

- ReConnect Program
- Rural Broadband Access Loan and Loan Guarantees
- Telecommunications Infrastructure Loans and Loan Guarantees

United States Department of Housing and Urban Development

- Community Development Block Program
- Choice Neighborhoods – Planning
- Choice Neighborhoods - Implementation

Telehealth

Description of Need:

If Berks County is interested in seeking grant funding opportunities outside of the Rural Healthcare Program, there are no federal broadband grants that provide funding for Operational Expenses. However, there are opportunities to pursue funding for infrastructure development, connectivity and equipment.

Example Projects:

The programs listed below can be utilized to fund various aspects of healthcare, telemedicine and connectivity for commercial, residential and institutional users. Outside of the FCC & USAC's Rural Health Care Program which subsidizes the cost of broadband connectivity for Rural Healthcare providers and the USDA-RD's Distance Learning and Telemedicine Grant which provides funding for telemedicine equipment and broadband connectivity to eligible rural sites, the remaining programs can be utilized to fund broadband infrastructure and connectivity to enable enhanced healthcare and telemedicine capabilities.

For example, funding from the federal grant programs below can be utilized to:

- Plan, design and construct fixed wireless and broadband middle mile, backhaul and FTTP infrastructure for:
  - Local hospitals, healthcare facilities and clinics,
  - Private healthcare corporations that manufacture and produce healthcare and telemedicine equipment and
  - Eligible public housing areas where residents can participate in telemedicine and enhanced connectivity to healthcare providers,
- Provide and enhance broadband connectivity to local Institutions of Higher Education and Workforce Development agencies for remote learning, job training, apprenticeships, and technical support careers within the healthcare industry and
- Provide and enhance broadband connectivity to libraries to provide devices and connectivity to foster wellness and health literacy.

Potential Grant Funding Sources:

United States Department of Agriculture - Rural Development

- Distance Learning and Telemedicine Program
- Community Connect Grant Program
- ReConnect Program
- Rural Broadband Access Loan and Loan Guarantees

United States Department of Housing and Urban Development

- Community Development Block Program
- Choice Neighborhoods - Planning
- Choice Neighborhoods - Implementation

Economic Development

Description of Need: If Berks County is interested in seeking grant funding opportunities that support broadband infrastructure development for economic development projects that are strategically aligned within their existing network, funding is available to support those initiatives.

Example Projects:

The programs listed below can be utilized to fund various aspects of economic development in existing and future broadband and fixed wireless service areas to enable job creation, private investment and economic resiliency. While Berks County is not eligible for EDA Public Works and Economic Adjustment Assistance funding, efforts to fund broadband and fixed wireless infrastructure is likely to be supported due to it serving as a catalyst to attract investment from private corporations that require the greatest speeds available for data centers, software development, manufacturing, etc. Through the addition of economic development aspects in the County's projects, these areas will have the greatest potential to stimulate local entrepreneurship, job creation, skills training and workforce opportunities.

For example, funding from the federal grant programs below can be utilized to:

- Plan, design and construct fixed wireless and broadband middle mile, backhaul and FTTP infrastructure for:
  - Innovation districts,
  - Private industry in area downtown and business districts,
  - Industrial parks, data centers and major ports of entry that require broadband fiber infrastructure for operations.
  - Provide and enhance broadband connectivity to local Institutions of Higher Education and Workforce Development agencies for remote learning, job training, apprenticeships, and technical support careers.

Potential Grant Funding Sources:

United States Department of Agriculture - Rural Development

- Community Connect Grant Program
- ReConnect Program
- Rural Broadband Access Loan and Loan Guarantees

Emergency Response

Description of Need: If Berks County is interested in seeking grant funding to harden its telecommunications and emergency response infrastructure, opportunities are available to assist with meeting those needs.

Example Projects: The program listed below can be utilized to fund various aspects of broadband and wireless network infrastructure with regards to enhancing local, state and federal emergency response capabilities and preparedness. The County has the potential to coordinate with respective first responder, law enforcement authorities and public safety entities to evaluate opportunities to upgrade the quality and capabilities of existing communications and network infrastructure to accommodate the next generation of equipment, software and tools being utilized to reduce response time, detect gun fire weapon use and location and save lives during emergencies and natural disaster situations. By working closely with these agencies, Berks County can play a significant role in the communities they serve, increase safety and resiliency during and after emergencies.

For example, funding from the federal grant programs below can be utilized to:

- Plan, design and construct fixed wireless and broadband middle mile, backhaul and FTTP infrastructure for:
  - First responders,
  - Emergency operations centers,
  - Local law enforcement authorities,
  - State emergency management agencies,
  - Federal law enforcement and disaster response agencies,
  - Shelters and

- Community-wide capabilities to disseminate emergency notifications, announcements, etc.

Potential Grant Funding Sources:

Department of Homeland Security - Federal Emergency Management Agency

- Building Resilient Infrastructure and Communities

Distance Learning

Description of Need: If Berks County is interested in seeking grant funding to expand capacity of existing and planned broadband and wireless infrastructure, opportunities are available to support distance learning and provide a high-end mobile device that will acquire cellular networks and provide limited broadband services on school buses and bookmobiles. **Example Projects:** The programs listed below can be utilized to fund various aspects of enhanced broadband and wireless infrastructure for School Bus / Bookmobiles to allow students to connect to the internet while commuting to and from school. While the E-Rate Schools and Libraries Program currently does not allow for wireless connectivity to School Bus / Bookmobiles, there are proponents of this technology advocating to the Federal Communications Commission and the Universal Service Administrative Company to modify the current eligible uses of E-Rate funding to allow for wireless connectivity to buses. Enhancing broadband and wireless connectivity for students who commute on school buses will be instrumental in closing the digital divide for families who cannot afford to subscribe to internet service for their residences. Until the E-Rate program can be utilized for this connectivity, there are a variety of other programs that can support the wireless and broadband fiber network infrastructure along bus routes leading to and from school facilities.

For example, funding from the federal grant programs below can be utilized to:

- Plan, design and construct fixed wireless and broadband middle mile, backhaul and FTTP infrastructure along bus routes leading to Elementary, Intermediate and High Schools and priority areas of interest where distance learning gaps are prevalent.

Potential Grant Funding Sources:

United States Department of Agriculture - Rural Development

- Community Connect Grant Program
- Distance Learning and Telemedicine Grant
- ReConnect Program
- Rural Broadband Access Loan and Loan Guarantees

United States Department of Housing and Urban Development

- Community Development Block Program
- Choice Neighborhoods - Planning
- Choice Neighborhoods - Implementation

Section III. Preparing for Grant Funding Opportunities

Based on our previous experience working with other communities regarding the development of funding applications, we would like to propose several studies that we recommend completing prior to applying for federal grant funding opportunities. Each of these documents are required by the funding agencies in order to satisfy various programmatic and federal requirements and their completion ahead of time provides greater flexibility for the County when considering multiple avenues of funding the proposed network solution.

Below are several studies that are uniform requirements for seeking federal funding:

- Preliminary and Final Engineering Feasibility Report (EFR)
  - The Preliminary and Final EFR is the document that is utilized by the funding agencies to understand the needs and existing conditions of the community and the proposed solution to address those needs. The EFR includes an overview of the project's scope, size, cost and alignment with the communities' priorities (i.e. closing the Digital Divide, economic development, workforce development, etc.). Typically, funders will accept a Preliminary EFR during the grant application phase and once funding is awarded, the agency will provide comments based on their review to finalize the document. Prior to the release of funding for construction, most funding agencies will require the EFR to be approved to ensure project feasibility.
- General Application Information
  - Depending on the nature of the grant, applicants are required to provide some general application information including a project description, stakeholders involved, documenting public and business support, anticipated economic impact, alignment with the agency and grant programs goals and objectives, project schedule, and proposed equipment.
- Proforma
  - Federal agencies typically request a proforma that projects fiscal expenditures (planning/design, construction, and operations) and revenue over a long-term period, 10 - 20 years, etc., to understand the financial sustainability of the project.
- Environmental Narrative
  - To satisfy National Environmental Policy Act requirements, applicants seeking federal funding must provide information to the funding agency regarding the project's potential impact on the environment. Since a variety of federal regulations exist, Clean Water Act, Clean Air Act, Endangered Species Act, etc. it is important for the applicant to document how the proposed project impacts the environment. For projects that are located in environmentally sensitive areas such as wetlands, brownfields, preservation areas, etc. it is critical that the applicant document how the project will not negatively impact the environment. Typically, the federal funding agency will review the Environmental Narrative/Questionnaire to determine if any additional studies are required prior to issuing a Finding of No Significant Impact (FONSI). If additional studies are required such as Archeological, Air Quality, or Geotechnical surveys, the federal funding agency will require that these be completed prior to issuing a FONSI and beginning construction activities. Additionally, the federal funding agency may require coordination with other federal agencies (i.e. United States Army Corps of Engineers, Fish and Wildlife, Department of Interior, etc.) for their respective reviews prior to issuing a FONSI.

Through our team's past experience applying and obtaining financial assistance, we have consistently observed that communities who have the proper engineering and technical information required to apply completed ahead of time are most prepared, confident, and competitive when seeking grant funding. Often, federal agencies only provide between 45 - 60 days for application submission which leaves very little time to begin these studies and assessment while the application period is open. Therefore, if Berks County is strongly interested in seeking grant funding to address its broadband infrastructure and accessibility gaps, we recommend that the County conduct these efforts as soon as possible so they are prepared and ready for future funding opportunities. Lastly, due to the varying amount of local matching funding required to pursue these opportunities, we suggest that the County identify sources and amounts of matching funding to determine the respective capacity to secure grant funding.

Appendix D

Policy Analysis

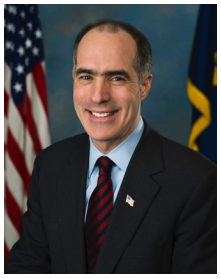
FEDERAL GOVERNMENT

Federal Legislation

Since the start of the COVID-19 pandemic, the federal government has passed and implemented once-in-a-generation investments in broadband infrastructure and adoption. Extending affordable and reliable internet access to all Americans has become a priority of many federal legislators, especially those representing unserved and underserved communities, like Berks County.

Federal Congressional Representatives

Sen. Pat Toomey



Sen. Bob Casey

Rep. Madeleine Dean

Rep. Dan Meuser

Rep. Chrissy Houlahan

CARES Act

On March 27, 2020, Congress passed the CARES Act to provide various forms of relief from the ongoing coronavirus pandemic. Title V of the CARES Act appropriated $150 billion "for [] payments to States, Tribal governments, and units of local governments [to cover] necessary expenditures incurred due to the public health emergency."[1]

In May 2020, Governor Tom Wolf signed into law Act 24 of 2020, which provided $625 million in CARES Act funding to counties. Sixty Pennsylvania counties received varying amounts of funding. Although broadband access was among the eligible uses, the December 30, 2020 deadline to use this funding made it difficult for counties to implement broadband infrastructure projects.

COVID Relief Act

On December 27, 2020, as part of the Consolidated Appropriations Act of 2021, Congress enacted the Coronavirus Response and Relief Supplemental Appropriations Act ("COVID Relief Act").[i] The COVID Relief Act included $7 billion for broadband initiatives and established or re-appropriated numerous, significant broadband-related support programs, summarized below.[ii]

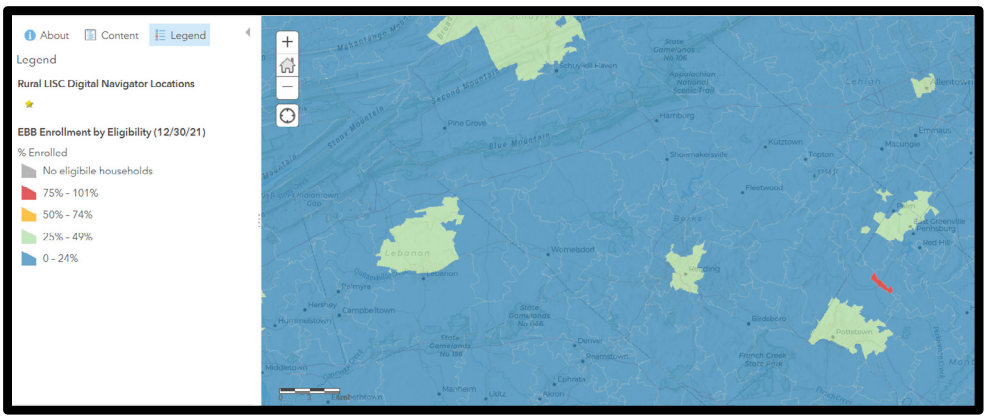
- **$300 million** for the new NTIA Broadband Infrastructure Program to establish partnerships between state/ local governments and fixed broadband providers to fund broadband in rural areas. Under the program, priority for the funding was for projects proposing 100 Mbps download/ 20 Mbps upload service level. Eligible service areas under the program included any census block where broadband service was not available to 1/+ households or businesses.
    - On February 25, 2022 NTIA announced $277 million in funding to 13 awardees including Huntingdon County, PA. These grants will be used to connect more than 133,000 unserved households.
- **$3.2 billion** in emergency funds for low-income families impacted by the coronavirus pandemic to access broadband through an FCC fund separate from the Lifeline program (the "Emergency Broadband Benefit (EBB) Program"). The EBB Program covered up to $50 per month for broadband service for households that were Lifeline eligible; were eligible for existing discount broadband programs; have children eligible for free and reduced school lunches; have a household member who is a Pell Grant recipient; or have a household member who is unemployed.

A participating provider could also seek reimbursement of up to $100 for a connected device that it provided to an eligible household, if it charged the household between $10 to $50 for the connected device, such as a laptop or desktop computer.[iii] The provider was required to certify that an eligible household was not required to pay an early termination fee (if the household enters into a service contract), and would not be subject to a mandatory waiting period.

Participating in the Emergency Broadband Benefit was voluntary for Internet Service Providers. There were two categories of broadband providers who are eligible to participate in the EBB Program: (1) eligible telecommunications carriers ("ETCs"), which did not need to seek approval from the FCC in order to participate in the EBB; and (2) non-ETCs, (i.e., all other broadband providers), which were required FCC approval in order to participate.[iv]

As of January 2022, there were 9,353 subscribers enrolled in the EBB program in Berks County. EBB participation in Berks County is reflected in the following map.

Berks County EBB Participation



- **$250 million** in renewed funding for the FCC's COVID-19 Telehealth program, discussed previously.
- **$65 million** appropriated to the FCC to complete the broadband maps in order for the government to effectively disperse funding to the areas that need it most.
- **$1.9 billion** to small telecommunication providers to rip out Huawei/ZTE equipment to replace it with secure equipment, as directed by recent FCC regulation.

[1] *Id*. § 801(d)(1).

- **$1 billion** Tribal broadband fund, which requires a minimum of 25 Mbps download/ 3 Mbps upload service. Under the fund, tribes can also contract with non-Tribal entities.

- **$285 million** for NTIA Office of Minority Broadband Initiatives for a pilot project to connect Historically Black Colleges and Universities ("HBCUs") and surrounding communities to broadband service.

Separately, Congress approved a $1.4 trillion omnibus appropriations legislation, which included several telecommunications-related provisions, including appropriating $33 million for broadband mapping. The bill also increased the USDA's broadband infrastructure program by $80M. This program is discussed in more detail in **Exhibit C**.

The America Rescue Plan Act of 2021 ("ARP")[v]

The $1.9 trillion American Rescue Plan Act, H.R 1319 ("ARP" or the "Rescue Act"), signed into law in March 2021, made substantial funding available for broadband programs, including broadband mapping, deployment, adoption, and affordability.[vi] The following six initiatives, in particular, reflect ARP's broadband funding priorities:

1. **$7.17 billion for the Emergency Connectivity Fund (ECF)** to help schools and libraries provide the tools and services needed for remote learning during the COVID-19 pandemic. For eligible schools and libraries, the Emergency Connectivity Fund will cover reasonable costs of laptop and tablet computers; Wi-Fi hotspots; modems; routers; and broadband connectivity purchases for off-campus use by students, school staff, and library patrons. This program is discussed in further detail in the Programming and Finance Evaluation.

   To date, the FCC has awarded $77,664,721.72 in ECF funding to Pennsylvania.

2. **Coronavirus State and Local Fiscal Recovery Funds:**

   Coronavirus State Fiscal Recovery Funds — Through December 2024, $219.8 billion will be made available for states, territories, and tribal governments to mitigate the fiscal effects caused by COVID-19.

   Coronavirus Local Fiscal Recovery Funds — Through December 2024, $130.2 billion will be made available for metropolitan cities, local governments, and counties to mitigate the fiscal effects caused by COVID-19.

   Counties and cities have until December 31, 2024 to expend the funds, which can be used for investments in broadband infrastructure. Per the U.S. Treasury's Final Rule, eligible broadband projects are those designed to deliver service to unserved or underserved areas, defined as those with an identified need for additional broadband investment, that reliably meets or exceeds equal download and upload (i.e., "symmetrical") speeds of 100 Mbps. In areas where such speeds are impracticable because of geography, topography, or excessive costs, projects must reliably deliver at least 100 Mbps download, at least 20 Mbps upload, and be scalable to a minimum of 100 Mbps symmetrical service.

   Funding will be distributed in two tranches — 50% within 60 days of the enactment of the legislation and 50% no earlier than one year later. The period of performance will run until December 31, 2026, providing a reasonable amount of time to complete funded projects.

   Berks County was allotted over $81 million from the COVID-19 State and Local Fiscal Recovery Funds. To-date, Berks County has expended $7,438,518.00 in funding, with no funds yet expended for broadband or other infrastructure projects.

3. **Coronavirus Capital Projects Fund** provides $10 billion for states, territories and Tribal governments "to carry out critical capital projects directly enabling work, education, and health monitoring, including remote options, in response to the public health emergency."

   Capital projects include investments in depreciable assets and the ancillary costs needed to put those assets into use, including investment in high-quality broadband and other connectivity infrastructure, devices, and equipment.

   The Commonwealth of Pennsylvania is to receive $278,793,641.00 for capital projects and must submit an application and plan showing how they intend to use the funds in a manner consistent with the Rescue Act and the U.S. Treasury's guidance.

4. **$3 billion** to the Economic Development Administration ("EDA"), for which broadband projects in economically distressed communities.

5. **~$10 billion** for the Homeowners Assistance Fund, under which states may provide payment assistance for household "qualified expenses" for, among other things, "broadband internet access service." This will remain through September 30, 2025. Information on this program in Pennsylvania is available through the Pennsylvania Housing Finance Agency: https://pahaf.org/ .

The Infrastructure Investment and Jobs Act ("IIJA")

President Biden announced the American Jobs Plan in Pittsburgh, Pennsylvania on March 31, 2021 seeking to, in part, bring "affordable, reliable, high-speed broadband to every American, including the more than 35% of rural Americans who lack access to broadband at minimally acceptable speeds." On July 28, 2021, the President and bipartisan members of Congress announced agreement on the Infrastructure Investment and Jobs Act (H.R. 3684), which included approximately $550 billion in new federal investment in various infrastructure, including broadband. The Infrastructure Investment and Jobs Act passed the U.S. Senate in late August 2021 and passed the House in November 2021. On Monday, November 15, President Biden signed the bill into law. The Infrastructure Investment and Jobs Act includes $65 billion for broadband, which is detailed in **Exhibit D**.

On Dec. 22, 2021, Governor Tom Wolf signed H.B. 2071 into law, which created the Pennsylvania Broadband Development Authority (PBDA). The PBDA is an independent agency that is charged with creating a statewide broadband plan and distributing Federal and State monies for broadband expansion projects in unserved and underserved areas of the commonwealth. The PBDA will manage a minimum of $100 million in IIJA funding the state will receive for broadband deployment.

Below is a summary from the White House on the impact of the IIJA on broadband in Pennsylvania:

> Broadband internet is necessary for Americans to do their jobs, to participate equally in school learning, health care, and to stay connected. Yet 14% of Pennsylvania households do not have an internet subscription, and 3.1% of Pennsylvanians live in areas where, under the FCC's benchmark, there is no broadband infrastructure. Even where infrastructure is available, broadband may be too expensive to be within reach. Under the Infrastructure Investment and Jobs Act, Pennsylvania will receive a minimum allocation of $100 million to help provide broadband coverage across the state, including providing access to the at least 394,000 Pennsylvanians who currently lack it. And, under the Infrastructure Investment and Jobs Act, 2,917,000 or 23% of people in Pennsylvania will be eligible for the Affordability Connectivity Benefit, which will help low-income families afford internet access.

A comprehensive chart of broadband-specific federal legislation under review in the current Congress is provided in **Exhibit C**.

The Federal Communications Commission

The Federal Communications Commission ("FCC") plays a central role in federal broadband policy. Section 706 of the Telecommunications Act of 1996 states that the FCC must "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans."[vii]

The FCC currently defines "broadband" as high-speed internet at speeds of 25 Mbps download/ 3 Mbps upload, or higher. However, policymakers have periodically revised the definition of "broadband" to reflect improvements in technology and changes in customer demand.[viii] Historically, these revisions have taken place under Democrat FCC Chairs,[ix] and we will likely see another increase in the definition of "broadband" under the Biden Administration. **The federal definition of broadband has significant policy implications as it is often used to determine eligibility for federal and state broadband funding sources.**

In addition to potential changes to the federal broadband definition, we have started to see changes to Universal Service Fund ("USF") programs and pushes to increase subsidies available under such programs; all of which are explored in more detail below.

Universal Service Fund

Policies aimed at expanding broadband access have roots in the Communications Act of 1934. This legislation established the FCC and its policies to support universal telephone access ("universal service"). The Telecommunications Act of 1996 expanded the traditional universal service policies to include emerging telecommunications technologies, such as mobile phones and high-speed internet.

"Developing policies that support universal broadband access presents some unique challenges. Telephone service was largely based on a single technology, copper wires. This made it easier to develop policies that supported the provision of this single technology. As broadband emerged, it quickly became a multi-modal technology, delivered to customers by copper telephone wire, coaxial cable used in cable television, wireless receivers, and satellite. Multiple technology options can offer advantages by increasing competition and by offering several solutions for delivering service to customers in a variety of circumstances. Yet, the complexity that this variety introduces can pose challenges to crafting and evaluating broadband expansion policies."

Source: Combini and Jang (2009)[x]

There are four Universal Service Fund programs: (1) the Schools and Libraries Program or "E-Rate"; (2) the High Cost program; (3) Rural Health Care; and (4) Lifeline. Each of these programs is further detailed below.

E-Rate

The E-Rate program provides financial support to schools and libraries to make critical telecommunications investments, including broadband. The program prioritizes libraries and schools in rural or high poverty areas by tying the subsidy/ discount level, ranging from 20% to 90% of the cost of E-rate eligible services, to the percentage of students who are eligible for the National School Lunch Program ("NSLP") and the urban/ rural status at the school district level.[xi]

Historically, E-Rate program funding was limited to use for on-campus connectivity at the school or library. On March 23, 2020, in response to the COVID-19 pandemic, the FCC released a public notice permitting schools and libraries to allow the general public to use E-rate–supported Wi-Fi networks while on the school campus or library property, even if the school or library is closed.[xii] As previously noted, The American Rescue Plan Act of 2021 ("ARPA"), allocated roughly $7.2 billion to expand the E-rate program to better address students' *off-campus* or at-home internet needs.

To help demonstrate the magnitude of the program, since its founding in 1996, Pennsylvania's 1000+ public and non-public schools and libraries have received more than $1.5 billion in funding through the E-rate program.[xiii]

Program Contact Info

Cherie Zimmerman
610-987-8567
chezim@berksiu.org

The Berk's County Intermediate Unit (BCIU) provides E-Rate consulting services to help schools and libraries apply for E-Rate Funding.

High Cost Program

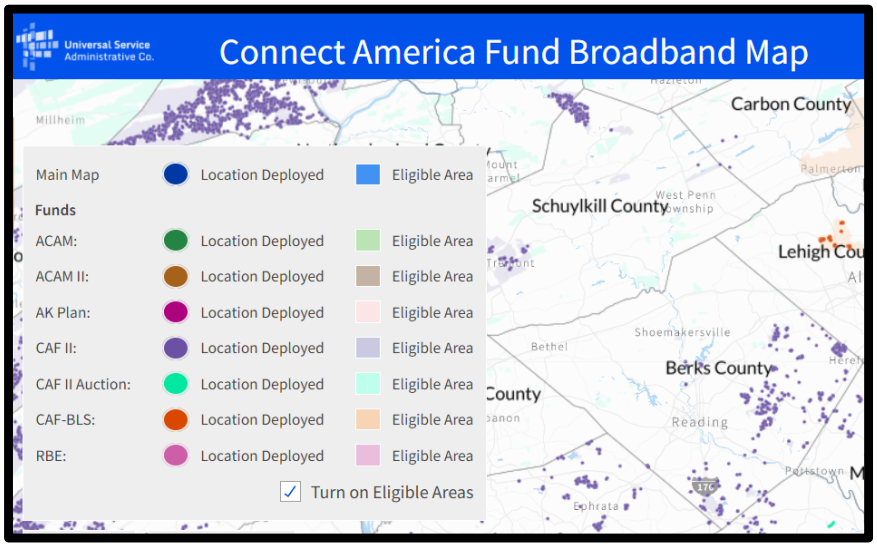
Connect America Fund

Under USAC's High-Cost Support Program, the Connect America Fund ("CAF") is the USF program targeted to support broadband deployment in rural areas. The FCC has taken numerous steps in recent years to reform this program to focus on ensuring fixed and mobile broadband access for unserved Americans.

Under the CAF program, support was provided to certain qualifying companies to build out broadband coverage to rural areas that were considered "high-cost" to serve. On April 29, 2015, the FCC announced details of CAF Phase II and offered $1.7 billion in subsidies to larger, price cap carriers (the incumbent local exchange carriers or "ILECs") to build-out at least 10 Mbps download/ 1 Mbps upload broadband service in select areas on a state-by-state basis (which is a lesser speed than the FCC's definition of broadband service).The FCC's objective under its later CAF Phase II auction was to "distribute the funds it ha[d] available for price cap areas where the incumbent ETC decline[d] to make a state-level commitment in such a way as to bring advanced services to as many consumers as possible in areas where there is no economic business case for the private sector to do so."[2]

Further, the Alternative Connect America Cost Model ("ACAM") provided funding to rate-of-return carriers that voluntarily elected to transition to a new cost model for calculating high-cost support, in exchange for meeting certain build-out obligations. Carriers that elected ACAM funding are required to deploy at least 10 Mbps download/ 1 Mbps upload service to the identified eligible area by the close of 2026, in addition to various build-out milestones in the interim years.

The following map details the projected impacts of CAF Phase II on Berks County:



It is particularly important to note that the required 10 Mbps download/ 1 Mbps upload build-out requirement under the aforementioned CAF programs does not meet the current federal definition of broadband.

Rural Digital Opportunity Fund

Building off the CAF Phase II Auction, in 2019-2020, the FCC established the $20.4 billion Rural Digital Opportunity Fund ("RDOF") to bring high-speed fixed broadband service to rural homes and small businesses. RDOF is a two-round reverse action for $20.4 billion in subsidies that will be allocated over the next 10 years in equal monthly installments.

- **Phase I** of RDOF offers $16 billion to target areas that are "wholly unserved" by broadband at 25 Mbps download/ 3 Mbps upload.

[2] *In the Matter of Connect Am. Fund*, 64 Communications Reg. (P&F) 1565 (F.C.C. May 26, 2016).

- **Phase II** of RDOF offers the remaining funds to target areas that are "partially unserved" and any areas not won in Phase I, after the FCC updates its availability data through the Digital Opportunity Data Collection, as detailed in **Exhibit B**.[xiv]

Recipients of RDOF funds must:[xv]

- offer commercially at least one voice and one broadband service meeting the relevant service requirements to all locations within the awarded area within a specified timeframe;
- accept the deployment schedule to be determined by the carrier and not the FCC;
- file annual reports, build-out milestone certifications, and data on the locations receiving service with the Universal Service Administrative Company ("USAC"); and
- offer at least one broadband and voice service at rates that are reasonably comparable to the rates for similar service in urban areas.

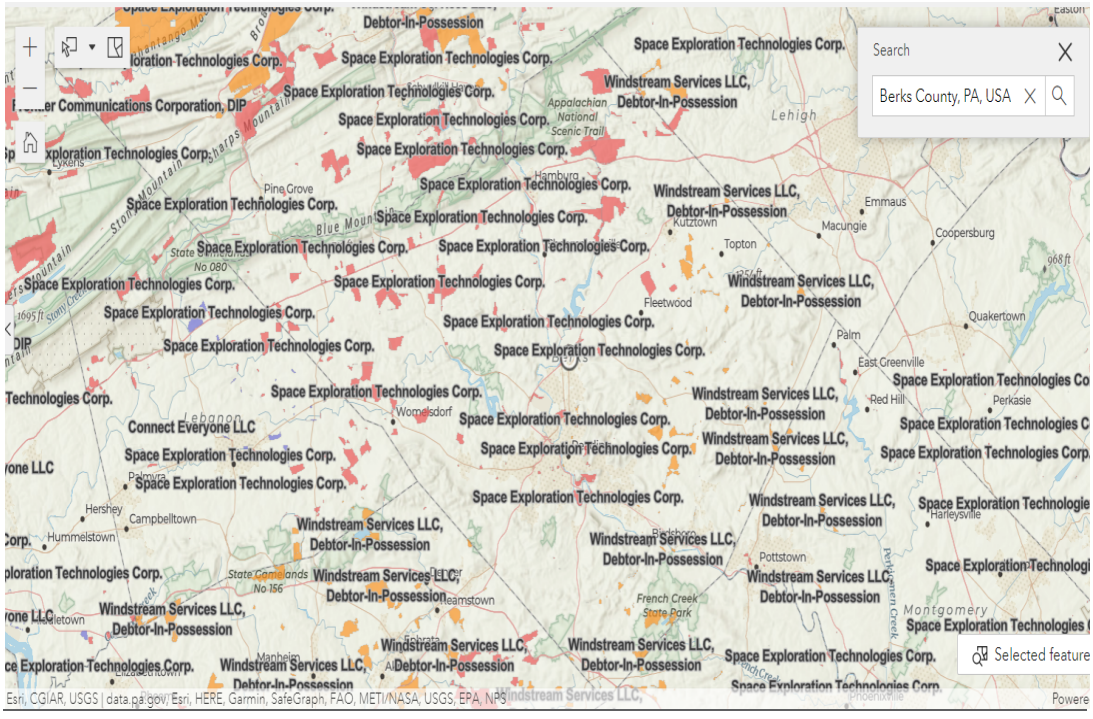
Bidding to the RDOF program was conducted by census block and the weighting system favored bids for higher-speed, lower-latency service.[xvi] RDOF recipients can use any fixed broadband service (i.e., fixed wireless, fiber, etc.), but will need to deploy at least 25 Mbps download/ 3 Mbps upload service and complete and offer such service to 40% of the required locations in a state by the end of the third year; an additional 20% of locations in subsequent years; and 100% of locations by the end of the sixth year. According to the FCC, there will be auditing and penalties for failing to meet build-out requirements.

RDOF Phase I ended on November 25, 2020, and $9.2 billion in support was awarded to 180 bidders. The remaining $11.2 billion will be auctioned in Phase II once the Broadband Data Collection and new broadband map are completed.

The RDOF awards in Berks County are provided below:

Berks County	Locations	Award
Space Exploration Technologies Corp.	1,239	$1,464,002.10
Windstream Services LLC, Debtor-In-Possession	529	$765,486.00

RDOF Map



Although RDOF will heighten connectivity in the region, **we recommend that Berks County does not delay any efforts to address additional broadband expansion locally in anticipation of the RDOF build-out.**

Rural Health Care

The Rural Health Care Program offers a sixty-five percent (65%) discount on eligible broadband connectivity expenses for eligible rural health care providers ("HCPs").[xvii] Generally, the program is limited to rural, non-profit or public HCPs that are: (1) post-secondary educational institutions offering health care instruction, teaching hospitals, and medical schools; (2) community health centers or health centers providing health care to migrants; (3) local health departments or agencies; (4) community mental health centers; (5) not-for-profit hospitals; (6) rural health clinics; (7) skilled nursing facilities (as defined in section 395i–3(a) of title 42 and (8) consortium of health care providers consisting of one or more entities falling into the first seven categories[3].

In addition to the Rural Health Care Program, the FCC's COVID-19 Telehealth Program was established on April 2, 2020. The Program provided $200 million (approximately $1 million per applicant) in immediate funding to eligible HCPs responding to the pandemic by fully funding (i.e., reimbursing) the telecommunications services, information services, and devices necessary to provide critical connected care services and prevent, prepare for, and respond to COVID-19.

- Telecommunications Services and Broadband Connectivity Services: Voice services and internet connectivity for health care provider or their patients.
- Information Services: Remote patient monitoring platforms and services; patient-reported outcome platforms; store and forward services, such as asynchronous transfer of patient images and data for interpretation by a physician; platforms and services to provide synchronous video consult.
- Internet-Connected Devices/Equipment: tablets, smart phones, or connected devices to receive connected care services at home (e.g., broadband-enabled blood pressure monitors; pulse-ox) for patient or health care provider use; telemedicine kiosks/carts for provider sites.

As discussed above, Congress added approximately $250 million in funding for this program in the Consolidated Appropriations Act of 2021.

Lifeline

In 1985, the FCC created a subsidy program to help low-income Americans gain access to affordable communications services, known as the "Lifeline" program. As technology shifted from landline to mobile telephone service, the Lifeline program evolved to subsidize plans that include mobile broadband. Currently, the Lifeline program offers qualifying low-income consumers a discount of up to $9.25 per month on voice, broadband internet access service, or bundled services that meet the program's minimum service standards.

"The COVID-19 pandemic has shown us the importance of staying connected in this day and age, and there are programs available to help," "Lifeline and the Emergency Broadband Initiative help ensure income-eligible consumers continue to have access to affordable communications services needed for telemedicine, telework and online learning during the ongoing COVID-19 pandemic."

- PAPUC Chairman Gladys Brown Dutrieuille.
Source https://www.puc.pa.gov/press-release/2021/puc-encourages-consumers-to-stay-connected-with-lifeline-and-emergency-broadband-initiative

Recently, some providers have sought to withdraw from the Lifeline program. However, for those eligible, low-cost options are available through the FCC's Affordable Connectivity Program under the Infrastructure Investment and Jobs Act, discussed above.

There are two main programs available for phone bills in Pennsylvania. The first, which is Lifeline 135, is a discount supported by the Lifeline program that has been enhanced by the Commonwealth. Another option is the Universal Telephone Assistance Program, and this is more limited to Verizon customers but may be able to offer direct financial assistance for paying bills or assist with preventing disconnections.

COMMONWEALTH OF PENNSYLVANIA

State Agencies

In December, 2021, Governor Tom Wolf signed H.B. 2071 into law, which created the Pennsylvania Broadband Development Authority ("PBDA"). The PBDA is an independent agency that is charged with creating a statewide broadband plan and distributing Federal and State monies for broadband expansion projects in unserved and underserved areas of the commonwealth. The PBDA will manage a minimum of $100 million in IIJA funding the state will receive for broadband deployment.[xviii]

The PBDA is governed by 12 members, including five individuals representing both political parties of the Senate and House, as well as the governor. Subcommittees consisting of experts within the field may also be created.[xix]

The current members of the PBDA are:

- Honorable Carl Metzgar
  Pennsylvania House of Representatives, District 69
- Honorable Curt Topper – Secretary
  General Services
- Honorable Gladys Brown-Dutrieuille – Chairman
  Pennsylvania Public Utility Commission
- Honorable Greg Thall – Acting Secretary and Chair
  Office of the Budget
- Honorable John Kane
  Pennsylvania Senate, District 9
- Dr. Kyle Kopko, Executive Director

[3] *See* 47 USC § 254(h)(7).

The Center for Rural Pennsylvania

- Honorable Kristin Phillips-Hill
  Pennsylvania Senate, District 28
- Honorable Neil Weaver – Secretary
  Department of Community and Economic Development
- Honorable Noe Ortega – Secretary
  Department of Education
- Honorable Pam Snyder
  Pennsylvania House of Representatives, District 50
- Honorable Russell Redding – Secretary
  Department of Agriculture
- Sheri R. Collins – (Interim) Executive Director
  Department of Community and Economic Development

The priority for the PBDA is to create a broadband plan that allows the state to apply for competitively awarded federal infrastructure money. The PBDA will also create a database to monitor all broadband deployment activities across the state. Entities that are eligible for funding must have technical, managerial, and financial expertise to design, build and operate high-speed service infrastructure. Furthermore, contractors that have defaulted on prior projects or have been convicted of a misdemeanor or felony in the last 10 years due to their past performance will not be eligible for funding.

Under the plan, the PBDA will dissolve within 10 years or when all federal funds are exhausted.

Prior to the creation of the Pennsylvania Broadband Development Authority, Governor Wolf created the Office of Broadband Initiatives. The Pennsylvania Office of Broadband Initiatives, which was housed within, the Department of Community and Economic Development ("DCED"), was previously responsible for developing and executing a statewide strategy to expand access to every Pennsylvania by the end of 2022. The Office of Broadband Initiatives was also charged with spearheading the $35 million Pennsylvania Broadband Investment Incentive Program which was funded by PennDOT. This office is not funded in the state budget.

Case Study

In 2018, Gov. Wolf announced the $35 Pennsylvania Broadband Investment Incentive Program providing incentives to private providers bidding on service areas within the state in the Federal Communications Commission's Connect America Fund Phase II project. Of that, $17 million went to three entities that were awarded CAF II funds: Tri-County Rural Electric Cooperative, Armstrong Telephone Company and Erie-based Velocity.Net.

- **Department of Community and Economic Development:** The DCED oversees several programs that allow grant funding for broadband projects including:
  - Unserved High-Speed Broadband ("USHB") Funding Program
  - Business in Our Sites Grants/Loans
  - Fay-Penn Program
  - Keystone Communities Program
  - Pennsylvania First Program ("PA First")
  - Pennsylvania Economic Development Financing Authority ("PEDFA") Tax Exempt Bond Program
  - Pennsylvania Economic Development Financing Authority ("PEDFA") Taxable Bond Program
  - Pennsylvania Industrial Development Authority ("PIDA")
- **Commonwealth Financing Authority ("CFA"):** The CFA was established in 2004 as an independent agency of the DCED to administer Pennsylvania's economic stimulus packages. In 2021, Pennsylvania launched the USHB Funding Program to further support the deployment of high-speed broadband infrastructure to unserved areas with $10 million in funding. The UHSB authorized CFA to award grants to nongovernmental entities which have the technical, managerial, and financial expertise to design, build, and operate a high-speed broadband service infrastructure in unserved areas.
- **Pennsylvania Department of Transportation ("PennDOT"):** PennDot funded the $35 million Pennsylvania Broadband Investment Incentive Program administered by CFA.
- **Pennsylvania Public Utilities Commission ("PAPUC"):** The PAPUC is a state agency that has authority over and regulates certain aspects of services provided by telecommunications providers in the Commonwealth of Pennsylvania, namely those that also provide local exchange telephone service.

State Laws and County Codes

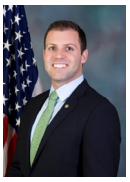
Berks County's State delegation is presented below:


Sen. Judith L. Schwank


Sen. David J. Argall


Sen. Katie J. Muth


Sen. Bob Mensch


Rep. Ryan E. Mackenzie


Rep. Manuel Guzman Jr.


Rep. Gary Day


Rep. Jerry Knowles


Rep. Barry J. Jozwiak


Rep. David M. Maloney, Sr.


Rep. Mark M. Gillen


Rep. Jim Cox


Rep. Mark Rozzi

Berks County

Cost-effective approaches for communities to encourage and facilitate broadband expansion include effectively managing local rights-of-way and seeking opportunities to reduce build-out costs and permitting delays. There are several opportunities to curb such costs and delays via local policy enactment.

> **"It often takes five to ten days for tower work crews to add the necessary equipment to a tower, but it frequently takes months to obtain the proper permits from local regulators"**
>
> Source: https://www.lightreading.com/5g/t-mobile-lays-out-$60b-five-year-buildout-plan-for-5g/d/d-id/759586

Rights-of-Way Ordinances

Pursuant to 71 Pa. Cons. State. 194, municipalities may not grant easements or rights-of-way without the express authority from the General Assembly. However, municipalities may grant licenses to public service companies to construct lines if those lines will give State buildings better service, or if such line is necessary to serve the public. Licenses are revocable for cause, as long as six month notice is given.

Permitting and Zoning Ordinances

In Berks County, permit authority rests with the individual municipalities. Permits for building, electrical, plumbing, occupancy, zoning, health, etc. are all issued locally, not by the County. However, Gov. Tom Wolf signed Act 50 of 2021 (Small Wireless Facilities Deployment Act). Effective Aug. 29, 2021, the Act standardized the local permitting process for small cell facilities located within municipal rights-of-way.[xx]

Dig-Once Policy

A major cost barrier to broadband expansion, particularly wired broadband, is the cost of excavating existing roadways or otherwise digging, boring, or trenching into the ground. Dig-once policies typically require that broadband providers be notified when public rights-of-ways are excavated/ opened so that they can have the opportunity to install broadband infrastructure, including conduit and/ or fiber optics.

In Pennsylvania, there is already a "call before you dig" policy that requires executors to contact PAPUC at least three days before breaking ground. PAPUC can notify broadband providers when they receive this notification.[xxi] Such policies also often require that dedicated internet conduit be laid in the right-of-way during new construction to prepare for future broadband needs."[xxii]

> **" . . . local governments should treat broadband like other types of critical infrastructure such as roads, water, and sewer, and integrate broadband into the comprehensive planning process."**
>
> Source: https://aede.osu.edu/sites/aede/files/publication_filesA/Connecting%20the%20Dots%20of%20Ohio%20Broadband_0.pdf

A dig-once policy is a common-sense method of reducing the cost of communications infrastructure deployment. However, communities should think broadly when implementing dig-once policies, knowing that broadband infrastructure does not simply have to be buried alongside a roadway project or in coordination with a telecommunications project. More details on Pennsylvania and Berks County's relevant laws and codes can be found at **Exhibit A**.

Funding Analysis

Historically, many communities interested in launching and/or encouraging broadband initiatives were unprepared to fund such projects. However, a silver lining of the COVID-19 pandemic is it solidified that access to robust, reliable, affordable broadband is imperative, and, as a result, we are seeing unprecedented amounts of federal and state dollars for its expansion. Below, we provide an analysis of these dollars, as well as traditional financing tools.

State Broadband Funding

Pennsylvania Broadband Development Authority Grants

On December 22, 2021, Governor Tom Wolf signed Act 96 of 2021 (Act 96), which created the Pennsylvania Broadband Development Authority (PBDA). The PBDA consists of 12 members and will serve as the single point of contact for entities wishing to engage in broadband development and deployment in Pennsylvania, including coordination of public and private efforts.[xxiii] Under the authority granted in Act 96, the Pennsylvania Broadband Development Authority will:

- Adopt a Statewide broadband plan.
- Award grants under one or more programs established by the Authority to fund projects, and the amount of the grants shall be limited to the money available to the Authority.
    - Applicants must have the technical, managerial and financial expertise to design, build and operate high-speed broadband service infrastructure.
- Provide a centralized database of all broadband deployment activities occurring within Pennsylvania's agencies and departments.
- Provide educational materials to engage the public and encourage broadband adoption.

The PBDA may also provide best practices to municipalities to expedite broadband development and deployment.

The Unserved High-Speed Broadband Funding Program

The USHB is administered by the CFA and provides grants to deploy middle-mile and last-mile high-speed broadband infrastructure to unserved areas in Pennsylvania. An unserved area is defined as a designated geographic area in which households or businesses do not have access to at least 25 Mbps download/
3 Mbps upload speeds.

Uses: Funds may be used for acquisition, construction, equipment, and site preparation costs associated with the deployment of middle-mile and last-mile high-speed broadband infrastructure.

Eligibility: Any nongovernmental entity with the technical, managerial, and financial expertise to design, build and operate a high-speed broadband service infrastructure within Pennsylvania.

Funding: The maximum grant amount of any Unserved High-Speed Broadband Funding Program project shall not exceed $1 million or 75% of the total project costs, whichever is less.

The following entities were awarded USHB Funding:

Armstrong County: $32,885 to Windstream Services, LLC to construct wired infrastructure for unserved areas in Plumcreek Township.

Bradford County: $955,762 to Claverack Communications, LLC to construct wired infrastructure for unserved areas of Asylum, Standing Stone, and Wyalusing Townships.

Cambria County: $449,103 to In The Stix Broadband, LLC to construct wired infrastructure for unserved areas in Allegheny Township.

Centre County: $975,109 to Centre WISP Venture Company, LLC to construct wired infrastructure for unserved areas in Potter Township; $578,235 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas in Curtin and Liberty Townships; $750,000 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas in Rush Township.

Erie County: $111,084 to Spectrum Northeast, LLC to construct wired infrastructure for unserved areas in Girard Township; $32,577 to Spectrum Northeast, LLC to install hybrid fiber-coaxial wireline to serve 17 residents in North East Township.

Franklin County: $838,974 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas of Metal and Peters Townships.

Fulton County: $818,962 to Frontier Communications of Breezewood, LLC to construct wired infrastructure for unserved areas in Brush Creek Township, as well as East Providence Township in Bedford County.

Indiana County: $36,840 to Windstream Services, LLC to construct wired infrastructure for unserved areas in Armstrong and Washington Townships; $204,134 to Windstream Services, LLC to construct wired infrastructure for unserved areas in Smicksburg Borough and West Mahoning Township.

Lycoming County: $607,494 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas in Armstrong, Bastress, and Limestone Townships.

McKean County: $530,248 to SkyPacket Networks, Inc., to install fixed wireless broadband infrastructure in Hamlin, Keating, and Sergeant Townships.

Mercer County: $69,891 to Spectrum Northeast, LLC to construct wired infrastructure for unserved areas in Wayne Township; $266,455 to Windstream Services, LLC to construct wired infrastructure for unserved areas in Perry Township.

Schuylkill County: $825,546 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas in Cass Township; $916,701 to Comcast Cable Communications, LLC to construct wired infrastructure for unserved areas in Reilly Township.

Wayne County: $1,000,000 to Spectrum Northeast, LLC to construct wired infrastructure for unserved areas in Damascus Township.

Federal Broadband Funding

There are a variety of federal broadband programs available, many of which are relatively new given the onset of COVID-19.

The Infrastructure Investment and Jobs Act

As previewed in the Policy Analysis section, the IIJA includes $65 billion for broadband. NTIA will administer $48.2 billion through six programs:

Grants to States for Deployment (BEAD Program) (~$42.45 billion)

- This funding supports a formula-based grant program through NTIA, the Broadband Equity, Access, and Deployment ("BEAD") Program, to provide funding to states, territories, the District of Columbia, and Puerto Rico for broadband deployment.
- The program does not favor particular technologies or providers.
- Projects will have to meet a minimum speed of 100 Mbps download/ 20 Mbps upload.
- Includes a 10% set-aside for high-cost areas and each state and territory receives an initial minimum allocation, a portion of which could be used for technical assistance and supporting or establishing a state broadband office.
- States are required to have enforceable plans to address all of their unserved areas before they are able to fund deployment projects in such areas. After both unserved and underserved areas are addressed, states may use funds for anchor institution projects.
- A more comprehensive summary of the BEAD Program and its Notice of Funding Opportunity (NOFO) can be found at **Exhibit E**.

Inclusion (Digital Equity Act Program) (~$2.75 billion)

- This includes the Digital Equity Act, which establishes three NTIA-administered grant programs (two formula-based programs and one competitive grant program) to promote digital inclusion and equity for communities that lack the skills, technologies, and support needed to take advantage of broadband connections. These programs are:
- **State Digital Equity Planning Grant Program ($60 million) -** This is a formula grant program for states and territories to develop digital equity plans.
- **State Digital Equity Capacity Grant Program ($1.44 billion)** - This is a formula grant program for states and territories to implement digital equity projects and support the implementation of digital equity plans.
- **Digital Equity Competitive Grant Program ($1.25 billion)** - is a discretionary grant program for specific types of political subdivisions to implement digital equity projects.
- The legislation also tasks NTIA with evaluating digital inclusion projects and providing policymakers at the local, state, and federal levels with detailed information about which projects are most cost-effective.

Middle Mile (Enabling Middle Mile Broadband Infrastructure Program) ($1 billion)

- This provision creates a state grant program for the construction, improvement, or acquisition of middle-mile infrastructure.
- Eligible entities include telecommunications companies, technology companies, electric utilities, utility cooperatives, and more.
- A more comprehensive summary of the Middle Mile Program and its Notice of Funding Opportunity (NOFO) can be found at **Exhibit E**.

Tribal Grants (Tribal Broadband Connectivity Program) (~$2 billion)

- This provision provides additional funding to the Tribal Broadband Connectivity Program, which was established by the December COVID-19 relief package and is administered by NTIA. Grants from this program will be made available to eligible Native American, Alaska Native, and Native Hawaiian entities for broadband deployment, digital inclusion, workforce development, telehealth, and distance learning.

Affordability (Affordable Connectivity Program)($14.2 billion)

- This provision devotes additional funds to the FCC's Emergency Broadband Benefit Program, now called the Affordable Connectivity Program ("ACP"), which subsidizes broadband service for eligible households—defined as those that suffered income loss during the pandemic or meet other need-based criteria, such as eligibility for school lunch programs. The subsidy will be provided at a lower rate (down to $30 from an original of $50 per month) to extend its longevity across the 5-year budget window.

Support for Rural Areas (~$2 billion)

- This provision includes support for programs administered by the U.S. Department of Agriculture, including the ReConnect Program, that provide loans and grants (or a combination thereof) to fund the construction, acquisition, or improvement of facilities and equipment that provide broadband service in rural areas. Recipients are required to utilize $5 million of their award for the establishment and growth of cooperatives to offer broadband.

Private Activity Bonds ($600 million)

- Based on the Rural Broadband Financing Flexibility Act, this provision allows states to issue Private Activity Bonds to finance broadband deployment, specifically for projects in rural areas where a majority of households lack such access.

American Rescue Plan Act of 2021

The $350 billion American Rescue Plan ("ARP") provides funds to state, local, territorial, and Tribal governments to provide foundation for a strong economic recovery from the pandemic.

From a broadband access perspective, the ARP Fiscal Recovery Funds (sec. 602 & 603) and the Coronavirus Capital Projects Fund (CCPF) (sec. 604)[4] are most pertinent. Applicants must request funds to the State and Local Fiscal Recovery Fund through the U.S. Treasury (Treasury) Submission Portal.[5]

ARP Fiscal Recovery Funds (Sections 602 & 603)

While sections 602 and 603 contain the same eligible uses, section 602 applies to states, territories, and tribal governments and section 603 establishes a fund for metropolitan cities, counties, and non-entitlement units of local government (generally those with populations of less than 50,000). Thus, section 603 is most applicable to Berks County.

As provided in the Policy Analysis, counties and cities have until December 31, 2024 to incumber the funds and until December 31, 2026 to complete construction, which can include investments in broadband infrastructure. Per the U.S. Treasury's Final Rule, eligible broadband projects are those designed to deliver service to unserved or underserved areas, defined as those with an identified need for additional broadband investment, that reliably meets or exceeds equal download and upload (i.e., "symmetrical") speeds of 100 Mbps. In areas where such speeds are impracticable because of geography, topography, or excessive costs, projects must reliably deliver at least 100 Mbps download, at least 20 Mbps upload, and be scalable to a minimum of 100 Mbps symmetrical service. Funds can also be used for middle mile networks to provide reliable last-mile service. Recipients are encouraged to prioritize use of fiber optic infrastructure, where feasible, and to incorporate affordability options into their projects.

- Other Eligible Uses:
    - Digital Literacy: Under section 603(c)(1)(A), funds can also be used to provide internet access or digital literacy assistance to populations facing negative economic impacts from COVID-19.
    - Pre-project Costs: Pre-project costs for broadband infrastructure planning and engineering are also eligible uses of the funds, as are technical assistance and evaluations that are directly tied to or reasonably expected to lead to commencement of an eligible project.[xxiv]

The Coronavirus Capital Projects Fund (Section 604)

The second fund eligible for broadband projects under ARP is the Coronavirus Capital Projects Fund ("CCPF").[xxv] CCPF provides $10 billion for states, territories, and Tribal governments to invest in broadband and other critical community hubs or capital assets that directly enable work, education, and health monitoring in response to COVID-19. As a result of the aforementioned criteria, Berks County is not directly eligible for this program. However, eligible applicants, including the Commonwealth of Pennsylvania, must provide a plan detailing how they intend to use the allocated funds and why the communities they have identified have a critical need for access, affordability, reliability, and/ or consistency.

As a CCPF recipient, the Commonwealth of Pennsylvania is encouraged to address broadband affordability challenges when developing their programs and ensure that the service provider in a CCPF-funded project participate in federal programs that provide low-income consumers with subsidized broadband services, such as the ACP referenced earlier in this section. Once the State's full plan is determined, eligible project costs under CCPF include, but are not limited to, the following:

[4] 31 C.F.R. § 35 (2021).
[5] The submission portal is available at: https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-fund/request-funding.

- Construction;
- Improvements and repairs to buildings;
- Pre-project development costs and uses, including data collection and feasibility studies;
- Community engagement and public feedback processes, equity assessments and planning, and needs assessments;
- Permitting, planning, architectural design, engineering design, and work related to environmental, historical, and cultural reviews;
- Costs of repair, rehabilitation, construction, improvement, and acquisition of real property, equipment (e.g., devices and office equipment), and facilities (e.g., telecommunications equipment, including infrastructure for backhaul, middle, and last mile networks);
- Cost of leases for terms greater than one year of facilities required to provide qualifying broadband service, including indefeasible right-of-use (IRU) agreements;
- Personnel costs including salaries and fringe benefits for staff and consultants (such as project managers, program directors, subject matter experts, equity consultants, grant administrators, financial analysts, accountants, and attorneys);
- Ancillary costs necessary to operationalize and put the capital assets to full use, including costs to increase broadband adoption and improve digital literacy;
- Costs associated with monitoring of and reporting in accordance with Treasury requirements, including award closeout costs; and
- Costs for collecting and measuring performance data and conducting activities needed to establish and maintain a performance management and evaluation system.

Federal Broadband Grants

The following Federal broadband grant programs are fully detailed in **Exhibit D** and included, as applicable, in the Project Identification section:

Federal Grant Name	Programs Offered
Department of Agriculture Rural Development	Community Connect Grant Program
	Distance Learning and Telemedicine Grants
	ReConnect Program
	Rural Broadband Access Loans and Loan Guarantees
	Telecommunication Infrastructure Loans and Loan Guarantees
Department of Commerce Economic Development Administration	Public Works and Economic Adjustment Assistance Programs
Department of Housing and Urban Development	Community Development Block Grant
Department of Housing and Urban Development	Choice Neighborhoods – Planning
	Choice Neighborhoods - Implementation
Department of Transportation	Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program
Department of Homeland Security - Federal Emergency Management Agency	Building Resilient Infrastructure and Communities

Exhibit A

Pennsylvania and Berks County Relevant Laws and County Codes

Regulations		
Name	**Description**	**Link**
Prohibition against political subdivision advanced and broadband services deployment	Pennsylvania prohibits municipalities from providing broadband services to the public for a fee unless services are not provided by the local telephone company and the company refuses services within 14 months of a request.	66 Pa. Cons. State. Ann. 3014(h)
Network Modernization Plan (Broadband Deployment Requirements)	Requires all regulated carriers to make broadband/internet service available within 10 business days of a request for service.	66 Pa. C.S. §3014(b)(5)
Tech Neutral Construction	Incumbent local exchange carrier ("ILEC") may make the requested broadband service available using any technology. The ILEC remains the only provider responsible to make available the requested broadband access even if it partners with an affiliated or non-affiliated entity.	66 Pa. C.S. §3014(n)(1)(2)
Alternative Forms of Regulation of Local Exchange Telecoms	This section of Pennsylvania statute includes inflation offset, rate changes for rural carriers, broadband outreach and aggregation fund, education tech fund, report filings, and rate change limitations.	66 Pa. C.S. §3015
Competitive Services	This section of state code contains information addressing competitive services and the pricing and prohibitions related to it.	66 Pa. C.S. §3016
Access Charges for Local Exchange Telecoms	This section of state code states that the commission may not require a local exchange telecommunications company to reduce access rates except on a revenue basis.	66 Pa. C.S. §3017

Electric Co-ops Provision of Service	An electric co-op or an affiliate may provide service or construct, operate and maintain facilities through an existing easement, owned, held, or used by the electric co-op.	68 Pa. C.S. §8202(a)(1)
Electric Co-ops Broadband Provider Access	A broadband provider that is not an electric co-op may access and attach broadband facilities within an electric co-op's easement if there are existing facilities to provide retail or wholesale, or if the co-op gives express written permission.	68 Pa. C.S. §8202(a)(3)
Electric Co-ops Non-exclusive Affiliate Access	An electric cooperative corporation that elects to provide retail broadband services, through an affiliate, as a broadband service supplier shall permit other suppliers of such services nondiscriminatory access to attach to electric infrastructure, owned or controlled by the electric cooperative corporation, pursuant to the rates, terms and conditions comparable to and no less favorable than those offered to an affiliate of an electric cooperative corporation engaged in the provision of retail broadband services. To	68 Pa. C.S. §8202(a)(4)
Electric Co-ops Cross-subsidization	An electric co-op that provides retail broadband through an affiliate shall ensure that rates charged for the provision of electric service do not include any of its affiliates broadband service costs.	68 Pa. C.S. §8202(c)

Electric Co-ops Broadband Supplier Easements	A Broadband service supplier may secure its own easements for construction or installation of broadband facilities or services or to negotiate separate terms or agreements for attachments owned by an electric co-op.	68 Pa. C.S. §8202(d)
Easement	A recorded or unrecorded ROW, easement or similar property right acquired by eminent domain, prescription or conveyance that is used or may be used for transmitting, distributing or providing electric service by utilizing electric infrastructure.	68 Pa. C.S. §8201
Eminent Domain	A unit of local government shall have the power to acquire by purchase or eminent domain proceedings either the fee or the rights, title, interest, or easement in such lands. However, eminent domain does not apply to land owned by the state, any of its political subdivisions, or an agency in addition to land owned by a public service company.	56 Pa. C.S. §5615(a)
Easements/ROW	Municipalities may not grant easements or ROW without the express authority from the state legislature. However, municipalities may grant licenses to public service companies to construct lines if such lines will give State buildings better service, or if line is necessary to serve the public. Licenses are revocable for cause, as long as six months of notice is given.	71 Pa. Cons. State. 194

Home Rule	A county which has adopted a home rule charter shall not at any time thereafter exercise within any municipality in the county a power or function being exercised by that municipality, except as the conditions listed under section 2963.	53 Pa. Cons. State. 2963
Local Permits	Permit authority in Berks County rests with the municipalities. Permits such as building, electrical, plumbing, zoning, etc.	Local Permits

Exhibit B
The FCC's Digital Opportunity Data Collection

The FCC adopted the Digital Opportunity Data Collection ("DODC") in August 2019, which Congress largely codified in the Broadband Deployment Accuracy and Technological Availability Act ("DATA ACT") in March 2020, to improve federal broadband data.[6] The DODC was later renamed the Broadband Data Collection ("BDC").

> ***". . . it has become increasingly clear that the fixed and obile broadband deployment data collected on the Form 477 are not sufficient to understanding where universal service support should be targeted and supporting the mperative of our broadband-deployment policy goals."***
>
> (https://docs.fcc.gov/public/attachments/DOC-358433A1.pdf)

In accordance with the DATA Act, in July 2020, the FCC took further steps to improve broadband availability data by adopting broadband coverage and availability reporting requirements for fixed and mobile broadband service providers. In particular, the FCC will require providers to submit: (1) where the providers have actually built out broadband infrastructure such that they are able to provide service; and (2) where the providers could perform a standard broadband installation.[7] Among other requirements, all fixed and satellite service providers must report either polygon shapefiles or lists of addresses or locations that constitute their service areas.

On January 19, 2021, the FCC adopted additional rules for the BDC to ensure that it collects precise and accurate broadband deployment data.[8] The FCC specified which fixed and mobile broadband internet access service providers are required to report availability and/ or coverage data and adopted speed and latency reporting requirements for fixed service providers. The FCC also now requires fixed broadband internet access providers to report whether broadband services are offered to residential and/ or business customers (they do not have to submit community anchor institution coverage) and created a process whereby providers submit and respond to challenges to fixed and mobile coverage data. The FCC also now requires mobile service providers to submit, on a case-by-case basis, infrastructure information or on-the-ground test data to verify the provider's coverage data. Additionally, mobile providers are now required to submit, for each 4G LTE or 5G new radio ("NR") propagation map that they submit, heat maps showing the signal levels from each active cell site, and terrestrial fixed wireless services providers must report their base station coordinates.

On March 22, 2021, the FCC announced efforts to also collect consumer broadband experiences. A webpage on the FCC's site (www.fcc.gov/BroadbandData) now includes a "share your broadband experience" form for consumers.[9] The submitted experiences will inform the FCC's Broadband Data Task Force, established in February 2021 by Acting Chairwoman Jessica Rosenworcel, to "implement long-overdue improvements to the

[6] FCC website, (October 25, 2021), *Broadband Data Collection*, Federal Communications Commission, Retrieved from Digital Opportunity Data Collection | Federal Communications Commission (fcc.gov).
[7] FCC website, (July 16, 2020), *Second report and order and third further notice of proposed rulemaking*, Federal Communications Commission, Retrieved from https://docs.fcc.gov/public/attachments/FCC-20-94A1.pdf
[8] FCC website, (January 19, 2021), *FCC Takes Next Step to Collect More Precise Broadband Mapping Data,* Federal Communications Commission, Retrieved from https://www.fcc.gov/document/fcc-takes-next-step-collect-more-precise-broadband-mapping-data?utm_source=sendgrid&utm_medium=email&utm_campaign=Newsletters.
[9] Veigle, Anne (March 22, 2021), *FCC Reaches Out to Collect Consumer Broadband Availability Experiences,* Federal Communications Commission, Retrieved from https://www.fcc.gov/document/fcc-reaches-out-collect-consumer-broadband-availability-experiences

agency's broadband data and mapping tools."[10] Further, the FCC has released a speed test app ("FCC Speed Test App") to measure speeds through Android and iOS devices in order to further aid in its broadband data collection and deployment efforts.[11]

In July 2021, the FCC adopted rules to improve broadband mapping through the BDC to better identify connectivity gaps across the country.[12] In the future, the FCC's broadband maps will include additional layers and functions, including where fixed broadband service is available, or could be connected within ten (10) business days using standard installation methods, on a house-by-house and location-by-location basis. The FCC will also standardize the location data using a "Broadband Serviceable Location Fabric," i.e., a common dataset of all structures where mass market fixed broadband internet access service can be installed. Lastly, the FCC will incorporate systems and processes to validate and verify provider-submitted data, in addition to offering a challenge process that will allow parties to dispute the data contained on the maps.[13]

In August 2021, the FCC also released new mobile coverage data for the country's largest cellular providers. This map allows consumers to search by address to better determine whether they should be able to make and receive voice calls or use wireless data. The FCC will use the data in this map to assist its ongoing efforts to develop and test the BDC systems and platforms.[14]

Exhibit C

Federal Legislation

Bill	Sponsors / Co-Sponsors	Summary	Status
H.R. 205 -Accelerating Broadband Connectivity Act of 2021	Rep. Trent Kelly (R-MS)	This bill establishes the Accelerating Broadband Connectivity Fund from which the Federal Communications Commission (FCC) shall offer additional funding to certain terrestrial telecommunications carriers for specified broadband projects. Specifically, the FCC shall make one-time funding offers from the Accelerating Broadband Connectivity Fund to certain terrestrial telecommunications carriers that receive support from the Rural Digital Opportunity Fund. The Rural Digital Opportunity Fund is a mechanism through which the FCC finances high-speed broadband networks in unserved rural areas. Recipients of amounts from the Accelerating Broadband Connectivity Fund shall use such funds to (1) begin construction of a broadband network, (2) make broadband available from the network deployed using Rural Digital Opportunity Fund support, and (3) meet all build-out obligations pursuant to receiving amounts from the Rural Digital Opportunity Fund.	Introduced in House and referred to the Subcommittee on Communications and Technology[15]
S. 745 – Accessible, Affordable Internet for All Act	Sen. Amy Klobuchar (D-MN)	A bill to provide $94 billion for the expansion of the nation's high-speed broadband infrastructure in unserved and underserved communities. The bill directs $80 billion to implement high-speed broadband infrastructure nationwide, particularly in rural areas. The bill directs $5 billion for low-interest financing of broadband deployment through the Broadband Infrastructure Financing Innovation (BIFIA) that is administered by NTIA and would provide local governments, public-private partnerships financial assistance. The bill further directs $60 million for grants to states to develop their digital equity plans and an additional $625 million for a state digital equity capacity grant program. $6 billion is also allocated for the extension of The Emergency Broadband Benefit Program	Introduced in Senate and referred to the Committee on Commerce, Science, and Transportation[16]
S. 436 - American Broadband Buildout Act of 2021	Sen. Susan Collins (R-ME) (Co-Sponsor Jacky Rosen (D-NV))	A bill to provide Federal matching funding for State-level broadband programs.	Introduced in Senate and referred to the Committee on Commerce, Science, and Transportation[17]

[10] Wiquist, Will (February 17, 2021), *Acting Chairwoman Rosenworcel establishes Broadband data task force*, Federal Communications Commission, Retrieved from https://docs.fcc.gov/public/attachments/DOC-370049A1.pdf

[11] Kelly, Makena (April 12, 2021), *The FCC wants you to test your internet speeds with its new app,* The Verge.com, Retrieved from https://www.theverge.com/2021/4/12/22379848/fcc-speed-test-app-google-apple-download-broadband-maps-coverage

[12] Veigle, Anne (July 16, 2020), *FCC Adopts Rules for more Granular, Precise Broadband Availability Map Data Collection*, Federal Communications Commission, Retrieved from https://docs.fcc.gov/public/attachments/DOC-365573A1.pdf

[13] FCC website (August 6, 2021), *Mobile Broadband Maps,* Federal Communications Commission, Retrieved from https://www.fcc.gov/BroadbandData/MobileMaps

[14] Veigle, Anne (August 6, 2021), *FCC launches new mobile broadband map,* Federal Communications Commission, Retrieved from https://www.fcc.gov/document/fcc-launches-new-mobile-broadband-map

[15] Congress.gov, *H.R.205 - 117th Congress (2021-2022): Accelerating Broadband Connectivity Act of 2021*, Library of Congress. Retrieved from H.R.205 - 117th Congress (2021-2022): Accelerating Broadband Connectivity Act of 2021 | Congress.gov | Library of Congress

[16] Congress.gov, *S.745-117th Congress (2021-2022): A bill to provide Accessible, Affordable Internet for All Act, Library* of Congress, Retrieved from S. 745 – 117th Congress (2021-2022): A bill to provide Accessible, Affordable Internet for All Act. | Congress.gov | Library of Congress

[17] Congress.gov, *S.436 – 117th Congress (2021-2022): A bill to provide Federal matching funding for State-level broadband programs*, Library of Congress, Retrieved from S.436 - 117th Congress (2021-2022): A bill to provide Federal matching funding for State-level broadband programs. | Congress.gov | Library of Congress.

H.R. 870- National Broadband Plan for the Future Act of 2021	Sen. Anna Eshoo (D-CA) (Co-Sponsors Eleanor Norton (D-D-C), Ed Case (D-HI), Bennie Thompson (D-MS), Mike Thompson (D-CA), Jared Huffman (D-CA), Steven Horsford (D-NV), Michael San Nicholas (D-GU), Gregory Meeks (D-NY))	To require the FCC to update the national broadband plan, and for other purposes.	Introduced in House and referred to the Subcommittee on Communications and Technology [18]
H.R. 1046 - Federal Broadband Deployment in Unserved Areas Act	Rep. John Curtis (R-UT) (Co-Sponsor Virginia Foxx (R-NC))	To require the FCC to provide broadband availability data to the Department of the Interior.	Introduced in House and referred to the Subcommittee on Conservation and Forestry[19]
H.R. 1218 - Data Mapping to Save Moms' Lives Act	G.K. Butterfield (D-NC) (Co-Sponsors Gus Bilirakis (R-FL), Lisa Blunt Rochester))	To require the FCC to incorporate data on maternal health outcomes into its broadband health maps.	Introduced in House and forwarded by Subcommittee to Full Committee (Amended) by Voice Vote[20]
H.R. 1047 - Rural Broadband Permitting Efficiency Act of 2021	Rep. John Curtis (R-UT) (Co-Sponsor Virginia Foxx (R-NC))	To allow certain State and Tribal permitting authority to encourage expansion of broadband service to rural and Tribal communities, and for other purposes.	Introduced in House and referred to the Subcommittee on Conservation and Forestry [21]
H.R. 1149 - CONNECT Act	Rep. Billy Long (R-MO)	To prohibit a State or political subdivision thereof from providing or offering for sale to the public retail or wholesale broadband internet access service, and for other purposes. It further limits such networks from being constructed or extended beyond the geographic area of the state or political subdivision in which it currently operates. The bill provides that "a State or political subdivision thereof may not provide or offer for sale to the public, a telecommunications provider, or to a commercial provider of broadband internet access service, retail or wholesale broadband internet access service."[xxvi] While the Act includes an exception for existing government networks, such networks may only continue if there is no more than one other commercial provider of broadband internet that provides competition for that service in a particular area.	Introduced in House and referred to the Subcommittee on Communications and Technology[22]
S. 326 - Measuring the Economic Impact of Broadband Act of 2021	Sen. Amy Klobuchar (D-MN) (Co-Sponsors Shelley Moore Capito (R-WV), Catherine Cortez Masto (D-NV), Angus King Jr. (I-ME), John Boozman (R-AR), Dan Sullivan (R-AK))	A bill to require the Secretary of Commerce to conduct an assessment and analysis of the effects of broadband deployment and adoption on the economy of the United States, and for other purposes.	Introduced in Senate and referred to the Committee on Commerce, Science, and Transportation[23]
H.R. 1362 - BOOST Act	Rep. John Moolenaar (R-MI) (Co-Sponsors Sanford Bishop Jr. (D-GA), Jimmy Panetta (D-CA), Lisa	To amend the Internal Revenue Code of 1986 to allow a refundable credit against tax for the purchase of communications signal boosters in areas with inadequate broadband internet access service, and for other purposes.	Introduced in House and referred to the Subcommittee on Communications and Technology [24]

[18] Congress.gov, *H.R. 870 – 117th Congress (2021-2022): To require the Federal Communications Commission to update the national broadband plan, and for other purposes*, Library of Congress, Retrieved from H.R.870 - 117th Congress (2021-2022): To require the Federal Communications Commission to update the national broadband plan, and for other purposes. | Congress.gov | Library of Congress.

[19] Congress.gov, *H.R. 1046 – 117th Congress (2021-2022): To require the Federal Communications Commission to provide broadband availability data to the Department of the Interior, Library of Congress*, Retrieved from H.R.1046 - 117th Congress (2021-2022): To require the Federal Communications Commission to provide broadband availability data to the Department of the Interior. | Congress.gov | Library of Congress.

[20] Congress.gov, *H.R. 1218 – 117th Congress (2021-2022): To require the Federal Communications Commission to incorporate data on maternal health outcomes into its broadband health maps*, Library of Congress, Retrieved from H.R.1218 - 117th Congress (2021-2022): To require the Federal Communications Commission to incorporate data on maternal health outcomes into its broadband health maps. | Congress.gov | Library of Congress.

[21] Congress.gov, *H.R. 1047 – 117th Congress (2021-2022): To allow certain State and Tribal permitting authority to encourage expansion of broadband service to rural and Tribal communities, and for other purposes,* Library of Congress, Retrieved from H.R.1047 - 117th Congress (2021-2022): To allow certain State and Tribal permitting authority to encourage expansion of broadband service to rural and Tribal communities, and for other purposes. | Congress.gov | Library of Congress.

[22] Congress.gov, *H.R. 1149 – 117th Congress (2021-2022): To prohibit a State or political subdivision thereof from providing or offering for sale to the public retail or wholesale broadband internet access service, and for other purposes*, Library of Congress, Retrieved from H.R.1149 - 117th Congress (2021-2022): To prohibit a State or political subdivision thereof from providing or offering for sale to the public retail or wholesale broadband internet access service, and for other purposes. | Congress.gov | Library of Congress.

[23] Congress.gov, *S.326 – 117th Congress (2021-2022): A bill to require the Secretary of Commerce to conduct an assessment and analysis of the effects of broadband deployment and adoption on the economy of the United States, and for other purposes,* Library of Congress, Retrieved from S.326 - 117th Congress (2021-2022): A bill to require the Secretary of Commerce to conduct an assessment and analysis of the effects of broadband deployment and adoption on the economy of the United States, and for other purposes. | Congress.gov | Library of Congress.

[24] Congress.gov, *H.R. 1362- 117th Congress (2021-2022): To amend the Internal Revenue Code of 1986 to allow a refundable credit against tax for the purchase of communications signal boosters in areas with inadequate broadband internet access service, and for other purposes*, Library of Congress, Retrieved from H.R.1362 - 117th Congress (2021-2022): To amend the Internal Revenue Code of 1986 to allow a refundable credit against tax for the purchase of communications signal boosters in areas with inadequate broadband internet access service, and for other purposes. | Congress.gov | Library of Congress.

	McClain (R-MI), Bill Huizenga (R-MI), Jack Bergman (R-MI))		
S.922 - Eliminate the Digital Divide Act	John Cornyn (R-Texas)	The Eliminate Digital Divide Act aims to address the rural digital divide by creating a $10 billion State Broadband Program where governors receive funds based on the number of unserved individuals in their state.[25] The Act also seeks to build out broadband infrastructure in unserved areas, create a process to deliver funds directly to states based on their proportion of unserved areas and include a $1 billion set-aside for high-cost areas. The bill will also require the FCC to update their coverage maps to reflect the Broadband Data Act and allow local and state governments to challenge the FCC maps.	Introduced in House and referred to the Subcommittee on Communications and Technology

Exhibit D
Federal Grant Opportunities

There are a variety of broadband funds available at the federal level. To ensure readiness for current and future federal grant applications, **we recommend Berks County secure a System of Awards Management (SAM) number, a Data Universal Numbering System (DUNS) number**, and an **Application for Federal Assistance (SF424)**, if it has not done so already. This is a required step for any organization to secure federal grant funding and can be done through https://www.sam.gov/SAM/.

U.S. Department of Agriculture Rural Utilities Service

Housed within the U.S. Department of Agriculture (USDA), the Rural Utilities Service (RUS) provides infrastructure improvements to rural communities, ranging from water and waste treatment to electric power and telecommunications services, collectively improving the quality of life for rural residents. Programs within USDA, each further detailed below, include:

- Community Connect Grants,
- Distance Learning & Telemedicine Grants,
- ReConnect Grant Program,
- Rural Broadband Access Loan and Loan Guarantee Program, and
- Telecommunications Infrastructure Loans & Guarantees

Pennsylvania's USDA State Office contact:

Heidi Secord, State Director
359 East Park Dr., Suite 1
Harrisburg, PA 17111
Voice: (717) 237-2113

Community Connect Grants[xxvii]

USDA Community Connect Grants provide financial assistance to facilitate broadband service expansion in rural, economically challenged communities where service does not currently exist at speeds of 10 Mbps download/ 1 Mbps upload. Eligible applicants to the Community Connect Grant include:

- incorporated organizations,
- federally recognized tribes,
- state and local government,
- and any other legal entity including cooperatives, private corporations, or limited liability companies.

The program funds the following eligible project categories:

- Infrastructure Development
- Adoption and Digital Literacy and
- Public Computer Access

Funds under Community Connect may be used for a variety of purposes including:

- the construction, acquisition, or leasing of facilities, spectrum, land, or buildings used to deploy broadband service.
- funding for at least two but no more than 10 Computer Access Points to be used in a Community Center, defined as a building within the proposed service area that provides access to the public, or a section of a public building with at least two (2) computer access points and

[25] Cornyn, John and Manchin, Joe, *Eliminate the Digital Divide Act*, Retrieved from https://www.manchin.senate.gov/imo/media/doc/One-Pager%20Eliminate%20the%20Digital%20Divide%20Act.pdf?cb.

wireless access, that is used for the purposes of providing free access to and/or instruction in the use of broadband internet service, and is of the appropriate size to accommodate this purpose. The Community Center must be open and accessible to area residents before, during, and after normal working hours and on Saturday and Sunday.

- the cost of providing free broadband service to community facilities, which have the same meaning as critical community facilities under the 1961 Consolidated Farm and Rural Development Act, section 306(a), for two years.
- the improvement, expansion, construction, or acquisition of a community center to provide online access to the public (less than 10% of the grant amount—or up to $150,000—may be used for this purpose).

Beyond eligibility baselines and acceptable uses of funding, other grant considerations include, but are not limited to:

- the awardee must locate buildings constructed with Community Connect funds on property owned by the awardee.
- leasing expenses will only be covered through the "advance of funds period" included in the award documents.
- grantees must have the legal authority to provide, construct, operate, and maintain the proposed facilities or services.
- project located in rural areas with a population of 20,000 of less.
- serve a proposed funded service area where broadband services (10 Mbps / 1 Mbps) do not currently exist.
- applicant must agree to offer service at 25 Mbps / 3 Mbps to all residential and business customers within the service area.
- provide a community center in the service area with at least two Computer Access Points and wireless access at 25 Mbps / 3 Mbps at no charge for at least two years.
- partnerships with federal, state, local, private, or non-profit entities are encouraged.
- matching funds of at least 15% from non-federal sources are required.

Total funding available for the FY2021 program was $35 Million with a maximum award of $3 Million to each selected recipient. Grant recipients are required to provide matching contributions in cash or in-kind equal to 15% of the grant amount requested.

Application requirements:

- ✓ Application for Federal Assistance
  - Completed Standard Form 424
  - SAM Registration and Supporting Documentation
- ✓ Executive Summary of the Project
- ✓ Scoring Criteria Documentation
  - In ranking applications, the agency will consider the following criteria based on a scale of 100 possible points:
    - Proposed Funded Service Area Needs (up to 50 points)
      - The economic characteristics
      - Educational challenges
      - Health care needs
      - Public safety issues
    - Stakeholder Involvement (up to 40 points)
      - Documents that demonstrate the participation and support by local residents
    - Management Experience of Key Personnel (10 points)
- ✓ System Design
  - Network Diagram

- Environmental Questionnaire provided in the Notice of Funding Opportunity

✓ Service Area Demographics

✓ Scope of Work

- Construction Build-out/Project Milestones
- Project Budget

✓ Community-Oriented Connectivity Plan

✓ Financial Information and Sustainability

- Historical Financial Statements
- Pro Forma Financial Statement – Single Application
- Pro Forma Financial Statement Assumptions

✓ Statement of Experience

✓ Evidence of Funding Commitments from Other Sources

✓ Compliance with Other Federal Statutes and Regulations

- Assurance Agreement[xxviii]
- Certificate Regarding Flood Hazard Area Precautions
- Applicant Certification Federal Collection policies for Commercial Debt
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Certification
- Certificate Regarding Architectural Barriers

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

Together, America Prospers

Community Connect Grants

What does this program do?

The grant program offers financial assistance to eligible applicants that will construct broadband networks that provide service on a community-oriented connectivity basis in rural areas.

Who may apply for this program?

Eligible applicants include:

- **State and local governments**
- **Federally recognized Tribes**
- **Nonprofits**
- **For-profit corporations**
- **Limited liability companies**

What is an eligible area?

Rural areas that lack broadband service as defined in the most recent funding announcement are eligible.

How may the funds be used?

- The construction, acquisition, or leasing of facilities, spectrum, land or buildings used to deploy broadband service for:
  - all residential and business customers located within the Proposed Funded Service Area
  - all participating essential community facilities (such as public schools, fire stations, public libraries, and public safety stations)
- The cost of providing broadband service free of charge to the essential community facilities for 2 years
- Up to 10 percent of the grant may be used for the improvement, expansion, construction, or acquisition of a community center that provides online access to the public

Are there other requirements?

Other program requirements include:

- Documentation supporting the scoring criteria
- An executive summary of the proposed project
- Grantees must have legal authority to provide, construct, operate and maintain the proposed facilities or services
- Partnerships with other federal, state, local, private, and nonprofit entities are encouraged
- For additional details, see 7 CFR, 1739

Matching funds of at least 15 percent from non-federal sources are required and can be used for operating costs.

How do we get started?

- Application windows for this program are announced through the national office on a periodic basis.
- Program Resources are available online at rd.usda.gov (includes forms, guidance, certifications, etc.)

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

Community Connect Grants

Who can answer questions about this program?

- Email us at community.connect@usda.gov
- Contact our Loan Origination and Approval Division at (202) 720-0800
- Contact your General Field Representative

What governs this program?

- 7 CFR, Part 1739

Why does USDA Rural Development do this?

The Community Connect program helps rural communities receive access where broadband service is least likely to be commercially available, but where it can make a tremendous difference in the quality of life for people and businesses. The projects funded by these grants help rural residents tap into the enormous potential of the Internet for jobs, education, healthcare, public safety and community development.

NOTE: Because citations and other information may be subject to change, please always consult the program instructions listed in the section above titled "*What Governs This Program?*" You may also contact your local office for assistance. You will find additional forms, resources, and program information at rd.usda.gov. *USDA is an equal opportunity provider, employer, and lender.*

Last Updated December 2019

Distance Learning and Telemedicine Grants[xxix]

The USDA Distance Learning and Telemedicine ("DLT") program helps rural communities use telecommunications to connect and overcome remoteness and low population density. In FY2021, Congress allocated $57 million in DLT funding. After applying $18 million to award projects from the prior fiscal year, approximately $44.5 million was available—a combination of funds not allocated from the previous year, in addition to the new funds allocated for FY2021. The award ceiling for this program is $1M with an award floor of $50,000.

The purpose of this grant program is to assist rural communities in acquiring distance learning and telemedicine technologies to provide the link between local teachers and medical service providers who serve rural residents and other professionals located at distances too far to access otherwise.

For both the distance learning and telemedicine programs, eligible applicants include most state and local government entities, federally recognized tribes, non-profits, for-profit businesses, and a variety of other entities. A minimum 15% match is required for grant-only awards and **it cannot be supplied by another federal source**. Although matching contributions generally are required to be in the form of cash, matches can be in-kind in the form of a grant-eligible contribution.

Eligible uses of DLT grant funds include:

- Acquisition and legal ownership of eligible capital assets such as:
    - broadband facilities (limited to 20% of the grant) - broadband facilities must undergo substantial environmental review
    - audio, video, and interactive video equipment
    - terminal and data terminal equipment
    - computer hardware, network components, and software
    - inside wiring and other infrastructure to further distance learning and telemedicine services
- Acquisition of instructional programming that is a capital asset
- Acquisition of technical assistance and instruction for using eligible equipment

In scoring applications, "rurality" based on 2010 census population is 40 of the total possible 120 points (i.e., the applicant area cannot be too close in proximity to a non-rural area). Funded applications must receive a score of at least 20 on rurality. Projects must also be located in rural areas with a population of 20,000 or less. Applicants can confirm the "rurality" of the community using 2010 Census population data from the Census website, while the determination of the proximity of urban areas should be made using the DLT Map included in the application materials, which is also based on the 2010 Census.[xxx]

Ultimately, through its DLT program, USDA is seeking projects that are sustainable and meet the long-term needs of a rural area.

Application requirements:

- ✓ Completed Standard Form 424
- ✓ Site Worksheet[26]
- ✓ Executive Summary of the Project, including Publicly Releasable Project Description
- ✓ Scoring Criteria Documentation
    - Rurality
    - Economic Need
    - Special Consideration
    - Need for Services and Benefits
- ✓ Matching Requirements
    - Minimum matching requirement must equal 15% of the grant amount requested and generally must be in the form of cash and may not be from federal funds unless specifically authorized by federal statute
- ✓ Scope of Work
    - Specific activities to be performed
    - Who will carry out activities
    - Timeframes for accomplishing objectives
    - Budget for all capital expenditures
- ✓ Financial Information and Sustainability

[26] https://www.rd.usda.gov/sites/default/files/dltworksheetsfy2021.xlsx.

- ✓ Statement of Experience
- ✓ Telecommunications Systems Plan
    - Capabilities and Description of Telecommunications Equipment
    - Complete Listing of all Telecommunications Equipment
    - Description of the consultations with telecommunications carriers
    - A diagram or map of the proposed system overlaid with a geographic map of the service area
    - Sites (hub, hub/end-users, or end-users) that will participate in the project and where equipment is located
- ✓ Evidence of Legal Existence and Authority to Contract with the Federal Government
    - Evidence of Legal Existence
- ✓ Environmental Impact and Historic Preservation (indicate which document was provided)
    - Environmental Impact Survey
    - Environmental Questionnaire

Evidence of Consultation with USDA State Director for Rural Development

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USDA Distance Learning & Telemedicine Grant Program (DLT)

Opportunity to Apply for Funding

The USDA begins accepting applications for funding under the DLT program on April 5, 2021. Applications must be received no later than June 4, 2021, to be eligible for funding under this grant opportunity.

- **The Agency encourages applicants to consider projects that will promote equity and economic opportunity in rural America, specifically those that advance the following key priorities:**
  - **Containing the COVID-19 pandemic**
  - **Ensuring racial equity**
  - **Rebuilding our rural economy and**
  - **Addressing the climate crisis.**
- **Congress provided USDA Rural Development $57 million in DLT funding in Fiscal Year (FY) 2021. As it was authorized to do, the Agency applied $18 million from FY 2021 to award projects from the prior fiscal year. Approximately $44.5 million is available. This amount includes $39.2 million in funds appropriated for FY 2021 as well as funds totaling $5.3 million which were not awarded during FY 2020.**
- **The Agency also reserves the right to increase funding for applications should additional appropriations become available for the same purposes.**

What does this program do?
This grant program helps rural communities acquire the technology and training necessary to connect educational and medical professionals with students, teachers, and patients in rural areas.

Who may apply for this program?
Eligible applicants that provide education or health care services through telecommunications facilities, include:

- State and local governmental entities
- Federally recognized Tribes
- Nonprofit organizations
- For-profit businesses
- Consortia of eligible entities

What is an eligible area?
The intent of the DLT program is to benefit rural areas with populations of 20,000 or less.

How may funds be used?
Grant funds may be used for:

- Audio, video and interactive video equipment
- Broadband facilities that support distance learning or telemedicine
- Computer hardware, network components and software
- Acquisition of instructional programming
- Acquisition of technical assistance and instruction for using eligible equipment

What kinds of funding are available?
Grants funds are awarded through a nationally competitive process. Funding is not currently available for DLT loans or loan / grant combinations.

What are some grant requirements?

- Awards can range from $50,000 to $1 million
- A minimum 15 percent match is required and cannot be from another federal source

How do we get started?

- Application windows for this program are announced through the national office on a periodic basis
- Program Resources are available online at rd.usda.gov (includes forms, guidance, certifications, etc.)
- Check back here or contact your General Field Representative for additional information

Who can answer questions?
Contact a General Field Representative that serves your area. Call (202) 720-0800 or email dltinfo@usda.gov.

What governs this program?

- Code of Federal Regulation: 7 CFR Part 1734

Why does USDA Rural Development do this?
The DLT program helps rural residents tap into the enormous potential of modern telecommunications and the Internet for education and health care, two of the keys to economic and community development.

NOTE: Because citations and other information may be subject to change, please always consult the program instructions listed in the section above titled *"What Governs This Program?"* You may also contact your local office for assistance. You will find additional forms, resources, and program information at rd.usda.gov. *USDA is an equal opportunity provider, employer, and lender.*

Last Updated April 2021

ReConnect Loan and Grant Program[xxxi]

The USDA ReConnect Loan and Grant program offers loans, grants, and loan/ grant combinations to facilitate broadband deployment in rural areas.[xxxii]

Funds under the ReConnect program are awarded to projects with a financially stable business model to bring high-speed broadband to rural homes, businesses, farms, ranches, and community facilities such as first responders, health care, and schools. For purposes of the program, rural areas are those *not* located within:

- a city, town, or incorporated area that has a population of greater than 20,000; or

- an urbanized area adjacent to a city or town that has a population greater than 50,000.

In order to be eligible for the ReConnect Program funding in the latest round, an applicant must propose to serve an area that is currently without fixed broadband service at speeds of 100 Mbps download and 20 Mbps upload, and a commit to building facilities capable of providing broadband at speeds of 100 Mbps download and upload (symmetrical) to every location in its proposed service area.

Applicants are required to build their proposed network within five (5) years of award and provide broadband service to every household, farm, and business located in the proposed service area.

Eligible applicants include states and local governments, including any agency, subdivision, instrumentality, or political subdivision thereof; corporations; limited liability companies and limited liability partnerships; cooperative organizations; and others less applicable to the Berks County region. The entity that applies for the funding must own the resultant infrastructure.

Awards are to be used to fund:

- the construction or improvement of facilities required to provide fixed broadband service, including fixed wireless;
- reasonable preapplication expenses in an amount not to exceed 5% of the award; or
- the acquisition of an existing system that does not currently provide sufficient access to broadband for upgrading that system to meet the requirements of this regulation.

USDA is to provide up to $1.15 billion in loans and grants to continue to expand broadband availability in rural areas. An applicant may request funding from one of the following categories:

- 100% Grant: Up to $350 million is available for grants with a max amount of $25 million and at least a 25 percent match of the cost of the overall project;
- 100% Grant for Tribal Governments and Socially Vulnerable Communities: Up to $350 million is available for grants with a max amount of $25 million;
    - Socially vulnerable community means a community or area identified in the Center for Disease Control's Social Vulnerability Index with a score of .75 or higher.
- 50% Loan / 50% Grant: Up to $250 million is available for loan-grant combinations. The max amount that can be requested is $25 million for the loan and also for the grant. The interest rate for the loan will be set at the Treasury rate; or
- 100% loan: Up to $200 million is available for loans. The max amount requested is set at $50 million with a minimum of $100,000. The interest rate for a 100% loan will be set at a fixed 2%.

In making its funding decisions, the USDA will also consider, among other things, the economic needs of the community to be served; the extent which a provider will offer affordable service options; a project's commitment to strong labor standards; and whether a project is serving tribal lands or is submitted by a local government, Tribal Government, non-profit or cooperative.

Application requirements:

- ✓ Information on the applicant and the project including the estimated dollar amount of the funding request.
- ✓ An executive summary that includes, but is not be limited to, a detailed description of existing operations; key management; the applicant's workforce; interactions between any parent, affiliated or subsidiary operation; the proposed project; and the source of the matching and other funds;
- ✓ A description of the Proposed Funded Service Area ("PFSA") including the number of premises passed;
- ✓ Subscriber projections for broadband, video and voice services and any other service that may be offered.
- ✓ A description of the proposed service offerings and the associated pricing plan that the applicant proposes to offer;
- ✓ A map, utilizing the RUS mapping tool,[xxxiii] of the PFSAs identifying the areas without sufficient access to broadband and any Non-Funded Service Area ("NFSA") of the applicant. If an applicant has multiple NFSAs, they can elect to submit each NFSA individually or as a single file through the mapping tool;
- ✓ A description of the advertised prices by competitors in the same area;
- ✓ A network design and all supporting information as detailed in § 1740.64, which includes:
    - Description of the proposed technology used to deliver broadband;

- Demonstrate that all areas in the PFSA can be offered service;
- Network diagram, identify cable routes, wireless access points;
- Any other equipment required to operate the network;
- A buildout timeline and milestones for implementation of project; and
- A capital investment schedule showing that the system can be built in five (5) years.

✓ Resumes of key management personnel, a description of the organization's readiness to manage a broadband services network, and an organizational chart showing all parent organizations and/ or holding companies (including parents of parents, etc.), and all subsidiaries and affiliates;

✓ A legal opinion that:

- Addresses the applicant's ability to enter into the award documents;
- Describes all material pending litigation matters;
- Addresses the applicant's ability to pledge security as required by the award documents; and
- Addresses the applicant's ability to provide broadband service under state or tribal law.

✓ Summary and itemized budgets of the infrastructure costs of the proposed project, including, if applicable, the ratio of loans to grants and any other sources of outside funding. The summary must also detail the amount of matching and other funds and the source of these funds. If the matching and other funds are coming from a third party, a commitment letter and support that the funds are available must also be submitted.

✓ A detailed description of working capital requirements and the sources of those funds;

✓ Unqualified, comparative audited financial statements for the previous calendar year from the date the application is submitted;

✓ The historical and projected financial information required in § 1740.63;

✓ All information and attachments required in the RUS Online application system;

✓ A scoring sheet, analyzing any scoring criteria set forth in the funding announcement opening the application window;

✓ A list of all the applicant's outstanding and contingent obligations as required in § 1740.63;

✓ All environmental information as required by § 1740.27;

- Requirements listed in 7 CFR part 1970
- Complete an Environmental questionnaire
- Provide a description of program activities
- Submit all other environmental documentation as requested in the application system or by the Agency after application is submitted

✓ Certification from the applicant that agreements with or obligations to investors do not breach the obligations to the government under the standard Award Documents located on the Agency's web page, especially distribution requirements, and that any such agreements will be amended so that such obligations are made contingent to compliance with the Award Documents. Such certification should also specifically identify which, if any, provisions would need to be amended;

Rural Broadband Access Loan and Loan Guarantee Program[xxxiv]

The USDA Rural Broadband Access Loan and Loan Guarantee Program furnishes loans and loan guarantees for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service to eligible rural areas.

The purpose of this grant program is to provide funding for projects that offer broadband service at or beyond specific broadband lending speeds, which RUS determines in the respective publication in the Federal Register. RUS established the minimum rate-of-data transmission of 25 megabits downstream and 3 megabits upstream for both mobile and fixed service.

Eligible applicants to the Loan and Loan Guarantee Program include corporations, limited liability companies, cooperatives or mutual organizations, state or local governments, and federally recognized tribes. However, the proposed funded service areas must be completely contained within a rural area or composed of multiple rural areas where at least 15% of the households are unserved; no part of the proposed funded service area has three or more incumbent service providers; and no part of the area overlaps with the service area of current RUS borrowers.

The program funds the following eligible loan types:

- Cost-of-Money Loans in the form of direct loans from the USDA RUS, Direct 4-Percent Loans which bear interest at 4% on each advance made to the borrower and
- Other Loan Guarantees provided by third party lenders, of which the RUS will guarantee up to 80% of the principal amount of the loan.

Eligible uses of loan and loan guarantee funds include:

- the construction, improvement, and acquisition of facilities required to provide service at the broadband lending speed including facilities required for providing other services through the same facilities.
- Refinancing of an outstanding obligation from another telecommunications loan made by the USDA (up to 40% of the requested amount).
- Pre-loan expenses including market surveys, consultant costs and fees (up to 5% of the requested amount).
- the cost of leasing facilities required to provide service at the broadband lending speed.
- acquisition, depending on the circumstances.

In addition to eligibility requirements listed above, applicants must also meet the following eligibility requirements:

- A project must also be located in rural areas with a population of 20,000 or less (map).
- At least 15% of the households in the Proposed Funded Service Area do not have access to broadband service (map).
- No part of the Proposed Funded Service Area has three or more incumbent service providers.
- Non-duplicative of other borrowers or service areas funded by the RUS Telecommunications Program.

As a condition to financing, an applicant must demonstrate an equity contribution in an amount that is at least 10% of the requested loan amount at the of application submitted.

New application periods for the Rural Broadband Access Loan and Loan Guarantee Program are announced on a regular basis.

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Rural Broadband Access Loan & Loan Guarantee

What does this program do?

This loan and loan guarantee program offers financial assistance to eligible applicants that will construct, improve, or acquire facilities and equipment needed to provide service at the broadband lending speed as defined in the most recent funding announcement in eligible rural areas.

Who may apply for this program?

Eligible applicants that may be organized on a for-profit or nonprofit basis, include:

- **Corporation**
- **Limited Liability Company (LLC)**
- **Cooperative or mutual organization**
- **A state or local unit of government**
- **Federally recognized Tribes**

What is an eligible area?

Eligible areas must be completely contained within a rural area or composed of multiple rural areas.

- At least 15 percent of the households in the proposed area must not have access to broadband service as defined in the most recent funding announcement
- No part of the proposed area may have three or more incumbent service providers
- No part of the proposed area may overlap with the service area of current RUS borrowers or grantees

How may funds be used?

This program provides funding for:

- The construction, improvement, and acquisition of facilities required to provide service at the broadband lending speed as defined in the latest funding announcement
- Refinancing of existing RUS debt with certain restrictions
- An acquisition, under certain circumstances and with restrictions
- For additional details, see 7 CFR 1738

What kind of funding is available?

- **Direct loans:** Cost-of-Money Loans

What are the loan terms?

- In general Loan Terms are limited to the expected composite economic life of the assets to be financed plus 3 years
- Interest rates are set at the time funds are advanced

How do we get started?

- Application periods for this program are announced through the national office on a periodic basis
- Program Resources are available online at rd.usda.gov (includes forms, guidance, certifications, etc.)

In addition to the application requirements listed above in the ReConnect Loan and Grant Program, the following requirements are also required for a complete application under this program:

- Complete copies of audited financial statements for the two years preceding the application submission.
- Scoring sheet, analyzing the scoring criteria set forth in the most recent NOFO.
- Additional items that may be required by the Administrator through a notice in the Federal Register.

Telecommunications Infrastructure Loans & Loan Guarantees[xxxv]

The USDA Telecommunications Infrastructure Loans & Loan Guarantees program provides financing for the construction, maintenance, improvement, and expansion of telephone service and broadband in rural areas. Cost-of-money loans from RUS are available, as are hardship loans and loan guarantees of up to 80%, which allow private lenders to extend credit to qualified borrowers in rural areas.

The program funds the following eligible loan types:

- Cost-of-Money Loans in the form of direct loans from the USDA Rural Utilities Service,
- Loan Guarantees through the Federal Financing Bank (FFB), and
- Hardship Loans in the form of direct loans from the USDA Rural Utilities Service.

Eligible entities include state and local governments; federally recognized tribes; non-profits including cooperatives and limited dividend or mutual associations; and for-profit businesses that are corporations or limited liability companies. An eligible area for the Telecommunications Infrastructure Loans and Loan Guarantees is a rural area or town with 5,000 or less residents; an area without telecommunications facilities; or an area where the applicant is the recognized telecommunications provider.

Additional eligibility requirements include:

- borrowers must have legal authority to provide, construct, operate, and maintain the proposed facilities or services.
- all facilities financed with the aid of federal dollars must be used for a public purpose.
- recipients may not duplicate similar services available in the same area.

Partnerships with other federal, state, local, private, and non-profit entities are also encouraged.

Eligible uses of Telecommunications Infrastructure Loan and Loan Guarantee funds include improvements; expansions; construction; acquisitions, in certain cases; and refinancing, in certain cases.

Applications for the program are accepted year-round.[xxxvi]

Application requirements:

- ✓ Completed RUS Form 490
- ✓ An Area Coverage Survey ("ACS") specified in 7 CFR 1737.31 to determine the location, number and telephone service requirements of subscribers in a service area;
- ✓ The Loan Design plan and associated costs for the proposed construction
- ✓ Various supplementary information specified in 7 CFR 1737.22:
- ✓ Names of attorney and manager, and certified copies of board resolutions selecting them
- ✓ Certified copy of articles of incorporation showing evidence of filing with the Secretary of State and in county records.
- ✓ Certified copies of bylaws and board minutes showing their adoption.
- ✓ Certified sample stock certificates.
- ✓ Amounts of common and preferred stock issued and outstanding.
- ✓ Names, addresses, business affiliations, and stockholdings of the manager, officers, directors, and other principal stockholders (those owning at least 20 percent of borrower's voting stock).
- ✓ Certified copies of real estate deeds showing all recording information.
- ✓ Service agreements, such as for management or system maintenance.
- ✓ Certified copies of existing leases, except those for vehicles, furniture and office equipment, and computer equipment.
- ✓ Certified copies of existing franchises.
- ✓ Information on any franchises required as a result of the proposed loan project.
- ✓ FCC authorizations.
- ✓ For toll, operator office, traffic, and Emergency Alert System("EAS") agreements, the names of all parties to the agreement, the type of agreement, and the effective and termination dates of the agreement and annexes, and the exchanges involved.
- ✓ Copies of rate schedules. (A copy of the tariff must be available for review by the RUS field representative.)

- ✓ Executed copy of RUS Form 291, "Certification of Nonsegregated Facilities".
- ✓ A sketch or map showing the existing and proposed service areas.
- ✓ (A certification (which is included on RUS Form 490, "Application for Telephone Loan or Guarantee") that the borrower has been informed of the collection options listed below that the Federal government may use to collect delinquent debt.
- ✓ A certification, signed by the president of the borrower, that the borrower is participating in the State's telecommunications modernization plan.[27] This certification is not required if the borrower is seeking a guaranteed loan.
- ✓ The following must be submitted by borrowers seeking subsequent loans:
    - Certified financial statements for the last 3 years.
    - Toll settlement statements and related data.
    - Present exchange rates and any pending changes.
    - Environmental review documentation in accordance with 7 CFR part 1970.
    - A "Certification Regarding Lobbying" for loans, or a "Statement for Loan Guarantees and Loan Insurance" for loan guarantees, and when required, an executed Standard Form LLL, "Disclosure of Lobbying Activities."[28]
    - Executed copy of Form AD-1047, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions."
        - Borrower's determination of loan maturity, including information noted in § 1735.43(a), as required, which states that approved RUS loans must be repaid with interest within a period that, rounded to the nearest whole year, equals the expected composite economic life of the facilities to be financed, as calculated by RUS.
    - In states in which the borrow mush obtain state regulatory commission approval, approved depreciation rates for items under the regulatory authority's jurisdiction.
    - A statement that the borrower is or is not delinquent on any Federal debt, such as income tax obligations or a loan or loan guarantee from another Federal agency. If delinquent, the reasons for the delinquency must be explained and RUS will take such explanation into consideration in deciding whether to approve the loan. RUS Form 490, "Application for Telephone Loan or Guarantee," contains a section for providing the required statement and any appropriate explanation.
    - Any other supporting data required by the Administrator.
- ✓ For borrowers requesting funds for construction or refinancing, the following must be submitted:
    - Copies of all bonds, notes, mortgages, and contracts covering outstanding indebtedness proposed to be refinanced.
    - (2) For each note or bond, the name of the creditor, original amount of debt and amount as of last year-end, purpose of debt, dates incurred and due, interest rates, and repayment terms.
    - (3) Justification for refinancing and evidence that the underlying loan to be refinanced would have been eligible for RUS financing under the RE Act.
- ✓ For all applications that request funding for retail broadband, the application must include:
    - The identity of the applicant
    - A project description
    - A map of the areas to be served including the identification of the associated census blocks
    - The amount and type of funding requested
    - The status of the application
    - The estimated number and proportion of households and businesses in the proposed funded service area without fixed retail broadband service, whether terrestrial or wireless, excluding mobile and satellite service.

[27] For additional information concerning the plan, see 7 CFR part 1751, subpart B.
[28] See section 319, Public Law 101-121, 31 U.S.C. 1352.

Department of Commerce, Economic Development Administration

The U.S. Economic Development Administration ("EDA"), a bureau within the U.S. Department of Commerce, leads the federal economic development agenda by promoting innovation and competitiveness, and preparing American regions for growth and success in the global economy.[xxxvii] EDA has multiple programs that can be utilized for broadband, which are further detailed below.

Before applying for EDA funds, we recommend contacting the following individual who represents Pennsylvania:

Christopher Casper
Philadelphia Regional Office
Robert N.C. Nix Federal Building
900 Market Street, Room 602
Philadelphia, PA 19107
P: 215-597-1074
E: CCasper1@eda.gov

The following provides a complete list of documents required for a complete application based on the type of EDA assistance: construction, design and engineering (without a construction component), non-construction, and Revolving Loan Fund ("RLF").

- ✓ One Form 424 (Application for Federal Assistance) from each co-applicant, as applicable.
- ✓ One Budget Narrative that clearly identifies and justifies how funds in each line item of the budget (Form SF-424A) will be used to support the proposed project.
- ✓ Documentation of Matching Share for each matching share source, such as a commitment letter, board resolution, proof of bonding authority, or similar document, as applicable. This should be attached to Form ED-900 (Section B.10.d of the form).
- ✓ One Form CD-511 (Certification Regarding Lobbying) from each co-applicant, as applicable.
- ✓ One Form SF-LLL (Disclosure of Lobbying Activities) from each co-applicant, as applicable.

Applications for construction assistance (including applications for design and engineering with construction activities) must include:

- ✓ One Form SF-424C (Budget Information—Construction Programs) per project.
- ✓ One Budget Narrative that clearly identifies and justifies how funds in each line item of the budget (Form SF-424C) will be used to support the proposed project. *Please note: In lieu of a separate Budget Narrative, this information may be included in the Preliminary Engineering Report as required by Section C of the ED-900C.
- ✓ One Form SF-424D (Assurances—Construction Programs) from each co-applicant, as applicable.
- ✓ One Form ED-900 (General Application for EDA Programs). Applicants seeking ACC funding should note this information as a part of their response to Section B.1 of the form.
- ✓ One Form ED-900A (Additional EDA Assurances for Construction or Non-Construction Investments) from each co-applicant, as applicable.
- ✓ One Form ED-900B (Beneficiary Information Form) from each beneficiary of the proposed project, as applicable.
- ✓ One Form ED-900C (EDA Application Supplement for Construction Programs) and accompanying supporting documentation, e.g., Preliminary Engineering Report. Form ED-900C requires, among other things, a description of real property acquisition, which should include any past or proposed use of eminent domain.
- ✓ One Form ED-900E (Calculation of Estimated Relocation and Land Acquisition Expenses).
- ✓ One Environmental Narrative that will enable EDA to comply with its NEPA responsibilities. A narrative outline that details required components may be accessed in EDA's website at: http://www.eda.gov/files/ 012_Environmental_Narrative_Template.zip. Page 21 of 45
- ✓ One Applicant's Certification Clause (see Appendix A to the environmental narrative noted above) completed separately and signed by each co-applicant, as applicable.
- ✓ Map of project site.

Applications for design and engineering assistance only (without a construction component) must include:

- ✓ One Form SF-424C (Budget Information—Construction Programs).
- ✓ One Form SF-424D (Assurances—Construction Programs) from each co-applicant, as applicable.
- ✓ One Form ED-900 (General Application for EDA Programs). Applicants seeking ACC funding should note this information as a part of their response to Section B.1 of the form.
- ✓ One Form ED-900A (Additional EDA Assurances for Construction or Non— Construction Investments) from each co-applicant, as applicable.
- ✓ One Form ED-900D (Requirements for Design and Engineering Assistance).

- ✓ An Environmental Narrative that will enable EDA to comply with its NEPA responsibilities. A narrative outline that details required components may be accessed in EDA's website at: http://www.eda.gov/files/ 012_Environmental_Narrative_Template.zip.
- ✓ One Applicant's Certification Clause (see Appendix A to the Environmental Narrative noted above) completed separately and signed by each co-applicant, as applicable.

Applications for non-construction assistance must include:

- ✓ One Form SF-424A (Budget Information—Non-Construction Programs).
- ✓ One Form SF-424B (Assurances—Non-Construction Programs) from each co-applicant, as applicable, unless as part of the registration process for SAM each co-applicant has already completed the assurances for non-construction programs. In that case, each co-applicant must inform EDA that this was completed in SAM.
- ✓ One Form ED-900 (General Application for EDA Programs). Applicants seeking ACC funding should note this information as a part of their response to Section B.1 of the form. Page 23 of 45
- ✓ One Form ED-900A (Additional EDA Assurances for Construction or Non— Construction Investments) from each co-applicant, as applicable.

Applications for RLF assistance must include:

- ✓ One Form SF-424A (Budget Information—Non-Construction Programs).
- ✓ One Form SF-424B (Assurances—Non-Construction Programs) from each co-applicant, as applicable, unless as part of the registration process for SAM each co-applicant has already completed the assurances for non-construction programs. In that case, each co-applicant must inform EDA that this was completed in SAM.
- ✓ One Form ED-900 (General Application for EDA Programs).
- ✓ One Form ED-900A (Additional EDA Assurances for Construction or Non— Construction Investments) from each co-applicant, as applicable.
- ✓ One Form ED-900F (Supplement for Revolving Loan Fund Applications).
- ✓ One Draft RLF plan that addresses all components required by EDA's regulation at 13 C.F.R. § 307.9.

Public Works[xxxviii]

The EDA Public Works program helps revitalize, expand, and upgrade physical infrastructure in distressed communities to enable the community to attract new industry, encourage business expansion, diversify their economies, and generate jobs and investment. Program investments are attributed to a variety of projects, such as technology-based facilities that utilize distance learning networks, smart rooms, and smart buildings; multitenant manufacturing; business and industrial parks with fiber optic cable; and telecommunications and development facilities.

To be eligible for funding under the program, a project must demonstrate:

- alignment with at least one of the EDA's investment priorities,
- the potential to increase the capacity of the community to promote job creation and private investment in the area,
- the likelihood that the project will achieve its anticipated outcomes, and
- financial and management capacity to successfully implement the proposed project.

There are no submission deadlines for the Public Works program. EDA will accept applications on an ongoing basis until the publication of a new Notice of Funding Opportunity, cancellation of the current NOFO, or all available funds have been expended. EDA intends to review applications within 60 days of receipt.

Economic Adjustment Assistance[xxxix]

The EDA Economic Adjustment Assistance ("EAA") program provides technical, planning, public works, and infrastructure assistance to regions experiencing adverse economic impacts from a decline in manufacturing, changing trade patterns, natural disaster, environmental changes, and regulations, and more. The program provides state and local entities with either:

- strategy grants to support the development, updating, or refinement of a Comprehensive Economic Development Strategy ("CEDS"); or
- implementation grants to support the execution of activities identified in a CEDS.

Specific activities can be funded as separate investments or as multiple elements of a single investment. As the most flexible program within the EDA, the EAA uses the following criteria in determining grant recipients:

- ability to achieve the desired results,
- ability to quickly create jobs,
- extent to which the project would enable the region to become more prosperous,
- the relative economic distress of the region,
- the applicant's performance under previous federal financial assistance awards, and
- the comparative feasibility of the applicant to achieve its intended outcomes.

As part of ARP, Congress also provided EDA approximately $3 billion for economic development assistance programs to help communities "prevent, prepare for, and respond to coronavirus."[xl] Communities can use EDA ARP funding to construct public works and facilities that will support economic recovery, including the deployment of broadband for purposes including supporting telehealth and job skills remote learning. All political subdivision are eligible to apply for EDA ARP funding regardless of per capita income or unemployment rate statistics. The performance period varies depending on the proposed project, but generally is 24 months.

Department of Housing and Urban Development ("HUD")

Community Development Block Grants

The HUD Community Development Block Grant ("CDBG") program provides annual grants on a formula basis to states, cities, and counties to develop housing and expand economic opportunities, primarily for low - and moderate-income people.[xli] Authorized under the Housing and Community Development Act of 1974, the CDBG program was designed to:

- empower communities to design and implement strategies tailored to their needs,
- emphasize consolidated planning to strengthen partnerships between government of all levels and the private sector, and
- provide technical assistance activities.

Eligible CDBG grantees include cities of Metropolitan Statistical Areas (MSAs); metropolitan cities with populations of 50,000+ people; qualified urban counties with populations of at least 200,000; and states and insular areas.

States also have the opportunity to administer CDBG funds for non-entitlement areas that do not receive CDBG funds directly from HUD. Non-entitlement areas are cities with populations of less than 50,000 (except cities that are designated principal cities of Metropolitan Statistical Areas), and counties with populations of less than 200,000.

CDBG funds can be used in the following eligible project categories:

- Economic Development,
- Homeownership Assistance,
- House Rehabilitation,
- Housing Acquisition,
- Land Acquisition to Support New Housing
- Microenterprise Programs,
- New Housing Construction or
- Public Facilities and Improvements

CDBG funds can be used for a variety of activities including, but not limited to:

- acquisition of real property,
- relocation and demolition,
- rehabilitation of residential and non-residential structures,
- construction of public facilities and improvements,

- public services,
- homeownership assistance,
- activities relating to energy conservation and renewable energy resources; and
- provision of assistance to profit-motivated businesses to carry out economic development and job creation/retention activities.

CDBG funds may also be used to install wiring, fiber optic cables, and permanently affixed equipment such as receivers for areas to receive broadband/internet access.[xlii]

Within the CARES Act, Congress provided $5 billion for the CDBG Program to go to states, metropolitan cities, urban counties, and insular areas. At least 70% of every grant must be expended for activities that benefit low- and moderate-income people by providing housing; a permanent job; a public service, including digital skills classes; or access to new or significantly improved infrastructure. The remaining 30% may be used to eliminate blighted conditions or address an urgent need for which the grantee has no other funding.

Choice Neighborhoods

The HUD Choice Neighborhoods program helps communities transform neighborhoods by redeveloping severely distressed public and/or HUD assisted housing and catalyzing improvements in the neighborhood, property, housing, businesses, services and schools.

The purpose of this grant program is to leverage public and private investment to support locally driven strategies that address struggling neighborhoods through a comprehensive approach for transformation. Eligible applicants include public housing authorities, local governments, tribal entities, and non-profits who hold a 501(c) status.

The Choice Neighborhoods program is focused on three core goals:

1. **Housing:** Replace severely distressed public and assisted housing with high-quality mixed-income housing that is well-managed and responsive to the needs of the surrounding neighborhood;

2. **People:** Improve outcomes of households living in the target housing related to employment and income, health, and children's education; and

3. **Neighborhood:** Create the conditions necessary for public and private reinvestment in distressed neighborhoods to offer the kinds of amenities and assets, including safety, good schools, and commercial activity, that are important to families' choices about their community.

Eligible project activities within the *planning* category include:

- Performing comprehensive needs assessments to inform the development of the Transformation Plan,
- Performing comprehensive and integrated planning that addresses the challenges and gaps in services and assets identified through the needs assessments,
- Conducting technical planning studies concerning local development issues, priorities or suggested approaches,
- Developing Transformation Plans, including governance strategy that will provide long-term accountability and secure commitments to collaborate long-term to ensure successful implementation,
- Conducting public hearings, meetings, websites, etc. for stakeholder involvement regarding the Transformation Plan,
- Data collection and analysis to track impacts and
- Conducting site visits, research or participating in community of practice.

Eligible project activities within the *action activities* category include:

- Reclaiming and recycling vacant property into community gardens, pocket parks, farmers markets or land banking (with maintenance),
- Beautification, placemaking and community arts projects, such as creative signage to enhance neighborhood branding, murals and sculptures, specialty streetscaping or garden tool loan programs,
- Owner-occupied home or business façade improvement programs,
- Neighborhood broadband/Wi-Fi infrastructure and installation (service not eligible through the grant),
- Fresh food initiatives, such as farmers markets and mobile fresh food vendors and
- Gap financing for economic development projects that are ready for implementation.

Eligible Project Activities under the *implementation* category include:

- Construction, acquisition or rehabilitation of public, assisted, and affordable housing (available to households earning 80 -120 percent of AMI) that incorporates sustainable design principles, including energy efficiency,
- Acquisition, demolition or disposition of properties, including Federal Housing Administration-Real Estate Owned properties,
- Providing supportive supports for residents,
- Partnering with employers and for-profit and non-profit organizations to create jobs and job training opportunities,
- Relocation assistance under Section 8 of the United States Housing Act of 1937,
- Activities that promote sustainable neighborhoods and incorporate principles of sustainable design and development,
- Critical community improvements as define further below,
- Endowments,
- Conversion of vacant or foreclosed properties,
- Architectural and engineering work,
- Administrative costs and
- Legal fees.

The program also allows for up to 15% of funding to be utilized for Critical Community Improvements for the following activities:

- Financing for commercial and economic development projects,
- Neighborhood business façade improvement programs,
- Place-making projects,
- Neighborhood broadband,
- Revolving loan funds for business attraction and retention,
- Streetscape improvements above and beyond the locality's norm,
- Programs to improve housing in the neighborhood surrounding the target housing subject of this application and
- Acquisition of underutilized land for new parks, community gardens, community facilities or other uses approved by HUD.

The period of performance is 24 months for a planning grant, 42 months for a planning and action grant, and 72 months for an implementation grant.

Program Point of Contact(s): The Choice Neighborhoods Program Office can be contacted by email at: choiceneighborhoods@hud.gov.

Application requirements:

- ✓ Disclosure of Lobbying Activities
- ✓ HUD Applicant Recipient Disclosure Report
- ✓ Planning Grants Table of Contents
- ✓ Key Eligibility Data form
- ✓ Certification of Severe Physical Distress
- ✓ Leverage documentation cover sheet
- ✓ Choice Neighborhoods Planning Grant Application Certification
- ✓ Previous Participation Certification[xliii]

- ✓ Certification of Consistency with the Consolidated Plan[29]
- ✓ Opportunity Zone Certification
- ✓ Promise Zone Certification Form (HUD Form 501533),[30] which is used by Federal agencies to document that an application or proposal should receive preference for certain federal programs

Department of Transportation

RAISE Grant

The Consolidated Appropriations Act of 2021 appropriated $1 billion for the U.S. Department of Transportation ("US DOT") to award for Rebuilding American Infrastructure with Sustainability and Equity ("RAISE") Grants.[xliv] The grants are capital investments that will have a substantial impact at the local or regional level.[31] The focus of this program is to fund critical improvements to local, state, and federal transportation infrastructure that result in good-paying jobs, improve safety, apply transformative technology, and explicitly address climate change and racial equity. Additionally, when awarding this money, DOT will not award more than $30 million for eligible planning, preparation or design of eligible projects that don't result in construction with FY 2021 RAISE funding, of which they will award a minimum of $10 million to projects located in or directly benefiting areas of persistent poverty.[32]

The FY 2021 Appropriations Act states that RAISE grants may not be less than $5 million unless located in a rural area, then it's a $1 million floor with a stipulation of grants not being greater than $25 million.[33] A grant match of 20% is required as well. Additionally, a single state cannot be awarded more than 10% ($100M) of the funds made available for RAISE grants and no more than 50% shall be awarded to rural and urban projects.[34] Funds will be available for obligation (starts when applicant and DOT enter into a written agreement) through September 30, 2024.[35] Further, all RAISE funds must be used by September 30, 2029 or they will no longer be available for the dedicated project.[36]

Eligible applicants for RAISE grants are local, state, tribal and U.S. territories, governments, including port authorities, transit agencies, metropolitan planning organizations, and other various state or local subdivisions.[xlv] Additionally, more than one state or jurisdiction can submit a joint application as long as an applicant is identified as the primary point of contact and primary recipient.[xlvi]

Eligible projects for RAISE grants are surface transportation capital projects that include but are not limited to:

- highway, bridge, or other road projects eligible under title 23, United States Code,
- public transportation projects eligible under chapter 53 of title 49, United States Code,
- 11 passenger and freight rail transportation projects,
- port infrastructure investments,
- intermodal projects, and
- projects investing in surface transportation facilities located on Tribal land and for which title or maintenance responsibility is vested in the Federal Government.[37]

DOT will evaluate such projects on safety, environmental sustainability, quality of life, economic competitiveness, state of good pair, innovation, and partnership.[38] Additionally DOT will assess/ prioritize transportation projects that are coordinated with economic development, affordable housing, water and waste infrastructure, power and electric infrastructure, land use plans, and broadband.[39]

Out of the factors DOT will use to evaluate the project applications, innovation is of high importance as it deals with broadband. When assessing such projects, DOT will consider the extent to which the applicant uses innovative strategies including, innovative technologies, project delivery, or financing.[40] Within innovative technologies is the deployment of broadband and the installation of high-speed networks concurrent with the transportation project construction (i.e., dig-once implementations, as discussed in the Policy Analysis section of this Assessment).[41]

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[29] Certification of Consistency with the Consolidated Plan, U.S. Department of Housing and Urban Development, https://www.hud.gov/sites/documents/2991.PDF (last visited Mar 15, 2022).

[30] Certification of Consistency with Promise Zone Goals and Implementation , U.S. DEPARTMENT OF HOUSING AND URBAN (2014), https://www.hud.gov/sites/dfiles/OCHCO/documents/50153.pdf (last visited Mar 15, 2022).

[31] Notice of Funding Opportunity for the Department of Transportation's National Infrastructure Investments (i.e., the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program) under the Consolidated Appropriations Act, 2021. (April 13, 2021.). Retrieved from U.S. Department of Transportation: https://www.transportation.gov/sites/dot.gov/ files/2021-04/FY%202021%20RAISE%20grants%20NOFO%20%28Final%29.pdf.

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] *Id.*

[36] *Id.*

[37] *Id.*

[38] *Id.*

[39] *Id.*

[40] *Id.*

[41] *Id.*

If an applicant is proposing to adopt innovative technology, the application should demonstrate the applicant's capacity to implement those innovations and understanding of applicable Federal requirements, including permitting, approvals, exemptions, waivers, or other procedural actions, and the effects of those innovations on the project delivery timeline. Additionally, each applicant selected for RAISE grant funding must demonstrate effort to consider climate change and environmental justice impacts and improve racial equity and reduce barriers to opportunity.

Activities that are eligible under RAISE planning grants are the planning, preparation, or design of eligible capital projects.[42] In addition, activities related to multidisciplinary projects or regional planning may include:

- development of master, comprehensive, or corridor plans,
- planning activities related to the development of a multimodal freight corridor,
- development of port and regional port planning grants, including State-wide or multi-port planning within a single jurisdiction or region, and
- risk assessments and planning to identify weaknesses and address the transportation system's ability to withstand probable occurrence or recurrence of an emergency or major disaster.[43] Under the NOFO, a project is designated as urban if located within an urbanized area with a population greater than 200,000 in the 2010 census; if a project is located outside an urbanized area with the same population standards, it is designated as a rural project.[44]

Broadband deployment as a standalone project is not eligible, however, if the construction of transportation project will allow concurrent installation of high-speed broadband networks, the applicant should such activities and how they support the innovative selection criteria.[xlvii]

Additionally, areas of persistent poverty in any county that has consistently had greater than or equal to 20% of the population living in poverty during the preceding 30 years as measured by the 1990 and 2000 decennial census; any census tract with a poverty rate of at least 20%; or any territory of the U.S.[xlviii] Under the RAISE grants, there is no minimum grant size for planning projects relating to poverty areas and the secretary of DOT may increase the federal share of 80% to pay for certain costs.[45]

A proposed project may contain multiple components that may be carried out by other parties besides the applicant. Each applicant is limited to three applications.[46] Instructions for the submission, content and form of submission can be found at: www.transportation.gov/RAISEgrants. The project narrative should be clear and entail information necessary for DOT to determine the project satisfies the requirements set forth by DOT as well as provide a detailed statement of work, project schedule, budget, and include a table of contents including maps and project location.[47]

DOT recommends that the project narrative follow the basic outline below to address the program requirements and assist evaluators in locating relevant information:

- ✓ Project Description
- ✓ Project Location
- ✓ Grant Funds, Sources and Uses of all Project Funding
- ✓ Selection Criteria
- ✓ Environmental Risk Review
- ✓ Benefit Cost Analysis

Program Point of Contact(s): The RAISE Grant Program Office can be contacted by email at: BUILDgrants@dot.gov.

DOT further recommends applications include the following sections:

- ✓ Project Description
- ✓ Project Location
- ✓ Grant Funds, Sources and Uses of Project Funds
- ✓ Selection Criteria
- ✓ Primary Selection Criteria
- ✓ Benefit Cost Analysis

[42] *Id.*
[43] *Id.*
[44] *Id.*
[45] *Id.*
[46] *Id.*
[47] *Id.*

Department of Homeland Security – Federal Emergency Management Agency

Building Resilient Infrastructure and Communities

The Federal Emergency Management Agency ("FEMA") Building Resilient Infrastructure and Communities ("BRIC") program makes federal funds available to states, U.S territories, Indian tribal governments, and local communities for pre-disaster mitigation activities. Total funding available for the FY 2020 program was $500 Million with a max award of $600,000 for state allocation and $50 Million for national competition. The fund requires a 25% grant match with a period of performance of 36 months. FEMA anticipates the applications for the next program cycle to be due by January 2022.

The guiding principles of the program are to:

- support state and local governments, tribes, and territories through capability- and capacity-building to enable them to identify mitigation actions and implement projects that reduce risks posed by natural hazards.
- encourage and enable innovation while allowing flexibility, consistency, and effectiveness.
- promote partnerships and enable high-impact investments to reduce risk from natural hazards with a focus on critical services and facilities, public infrastructure, public safety, public health, and communities.
- provide a significant opportunity to reduce future losses and minimize impacts on the Disaster Relief Fund.
- support the adoption and enforcement of building codes, standards, and policies that will protect the health, safety, and general welfare of the public, take into account future conditions, and have long-lasting impacts on community risk reduction, including for critical services and facilities and for future disaster costs.

The program funds the following eligible project categories:

Capacity and Capacity-Building (C&CB): activities which enhance the current workforce to expand or improve the administration of mitigation assistance, building cost activities, partnerships, project scoping, mitigation planning and planning related activities, and other activities.

Mitigation projects are cost-effective projects designed to increase resilience and public safety; reduce injuries and loss of life; and reduce damage and destruction to property, critical services, facilities, and infrastructure.

Management costs are those associated with financial assistance to reimburse the Recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs, and other administrative expenses associated with a specific mitigation measure or project.

Direct technical assistance is assistance to build a community's capacity and capability to improve its resiliency to natural hazards and to ensure stakeholders are capable of building and sustaining successful mitigation programs, submitting high-quality applications, and implementing new and innovative projects that reduce risk from a wide range of natural hazards.

Eligible applicants under the program include States, District of Columbia, U.S. territories, Indiana tribal governments. According to the Notice of Funding Opportunity, local governments, including cities, townships, counties, special district governments, and Indian tribal governments (including federally recognized tribes who choose to apply as sub-applicants) are considered sub-applicants and must submit sub-applications for financial assistance or letters of interest for non-financial Direct Technical Assistance to their state/territory/tribal Applicant agency.

In addition to eligibility requirements listed above, applicants must meet the following eligibility requirements:

- Sub-applicants are required to have a FEMA-approved Local or Tribal Hazard Mitigation Plan in accordance with 44 CFR Part 201 by the Application deadline and at the time of obligation of grant funds for mitigation projects and C&CB activities (with the exception of mitigation planning).
- States and territories that have had a major disaster declaration under the Stafford Act in the 7 years prior to the annual Application period start date are eligible to apply to FEMA for federal assistance under BRIC (Applicants). As a result of numerous major disaster declarations, all states, territories, and the District of Columbia were eligible to apply in FY2020.

Mitigation projects must be cost-effective and designed to increase resilience and reduce risk of injuries, loss of life, and damage and destruction of property, including critical services and facilities. This means the project, as documented by the Applicant, achieves the following goals:

- Addresses a problem that has been repetitive or poses a risk to public health and safety and improved property if left unresolved;
- Satisfies applicable cost-effectiveness requirements through completion of a Benefits-to-Cost Analysis (BCA) conducted in compliance with OMB Circular A-94 as discussed in Section A.10, Performance Metrics;
- Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address; and
- Accounts for long-term changes to the areas and entities it protects and has manageable future maintenance and modification requirements.

Application requirements:

- ✓ Application for Federal Assistance

- ✓ Grants.gov Lobbying Form
- ✓ SF-424A, Budget Information (Non-Construction)
    - Construction – SF-424C
- ✓ SF-424B, Standard Assurances (Non-Construction)
    - Construction – in addition to or instead of SF-424B
- ✓ SF-LLL, Disclosure of Lobbying Activities
- ✓ Indirect Cost Agreement or Proposal

Additional requirements based on program type include:

- ✓ Non-financial Direct Technical Assistance Letter of Interest
- ✓ Management Costs
- ✓ Benefit-Cost Analysis for Mitigation Projects
- ✓ Go/No-Go Milestones
- ✓ National Environmental Policy Act Requirements for Mitigation Projects
- ✓ Acquisition Project Requirements for subrecipients

Program Point of Contact(s):

Pennsylvania's State Hazard Mitigation Officer
Tom Hughes
Pennsylvania Emergency Management Agency
1310 Elmerton Avenue
Harrisburg, PA 17110
Phone: 717-651-2726
RA-shazmitoff@pa.gov

✓ Exhibit E

IIJA Notices of Funding Opportunity

NTIA released two Notices of Funding Opportunity for the Middle Mile Program and Broadband Equity, Access, and Deployment (BEAD) program in 2022.

NTIA

Housed within the U.S. Department of Commerce, the National Telecommunications and Information Association (NTIA) NTIA is the Executive Branch agency principally responsible by law for advising the President on telecommunications and information policy issues. NTIA's programs and policymaking focus largely on expanding broadband Internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the Internet remains an engine for continued innovation and economic growth.

NTIA Contact:

1401 Constitution Ave. NW Washington, DC 20230
Phone: 202-482-2048
Email:Broadbandforall@ntia.gov

Middle Mile NOFO[xlix]

The Middle Mile Broadband Infrastructure Grant (MMG) Program provides funding for the construction, improvement, or acquisition of middle mile infrastructure. The purpose of the grant program is to expand and extend middle mile infrastructure to reduce the cost of connecting areas that are unserved or underserved to the internet backbone.

To apply for the MMG Program, an entity must be a State, political subdivision of a State, Tribal government, technology company, electric utility, utility cooperative, public utility district, telecommunications company, telecommunications cooperative, nonprofit foundation, nonprofit corporation, nonprofit institution, nonprofit association, regional planning council, Native entity, economic development authority, or any partnership of two or more of these entities.

NTIA will make up to $980,000,000 available for federal assistance under the MMG Program ($1,000,000,000 minus two percent set aside to cover NTIA's administrative costs). NTIA expects to make awards under this program within the following funding range: $5,000,000 to $100,000,000. The period of performance for grants issued pursuant to this program ends five years from the date on which the grant funds are made available to the eligible entity. The amount of a middle mile grant awarded to an eligible entity through this program may not exceed 70 percent of the total project cost.

Complete applications must be received by NTIA no later than 11:59 p.m. Eastern Daylight Time (EDT) on September 30, 2022. NTIA expects to complete its review, selection of successful applicants, and award processing by February 16, 2023. NTIA expects that the start date for awards under this NOFO will be no earlier than March 1, 2023.

Per NTIA's Notice of Funding Opportunity (NOFO), this summary lays out the most pertinent details from the following buckets:

- Eligible Information and Program Details;
- Application and Submission Information.

Eligible Information and Program Details

MMB Program Applicant Qualifications
The Assistant Secretary shall ensure that any award recipient (1) is capable of carrying out the proposed project in a competent manner, including a plan to attract, train, or retain an appropriately skilled and credentialed workforce; and (2) has the financial, managerial, technical, and operational capability to carry out the proposed project and operate the resulting middle mile broadband network. To ensure this, the Assistant Secretary will look at the following factors.

1. Financial Capability

    1. *Certifications*

        Each applicant must supply a certification from an officer-level employee (or individual of comparable rank) attesting that it is financially qualified to meet the obligations associated with a project, that they will have available funds for all project costs that exceed the amount of the grant, and that they will comply with all MMG Program requirements, including service milestones. To the extent the Grants Officer disburses funding only upon completion of the associated tasks, each applicant must also certify that it has and will continue to have sufficient financial resources to cover its eligible costs for the project until such time as the Grants Officer authorizes additional disbursements.

    b. *Letter of Credit*

        During the application process, each applicant must submit a letter from a bank committing to issue an irrevocable standby letter of credit, in the required form, to the applicant. The letter shall at a minimum provide the dollar amount of credit offered and the issuing bank's agreement to follow the terms and conditions of NTIA's model letter of credit. NTIA shall establish a model letter of credit substantially similar to the model letter of credit established by the Federal Communications Commission in connection with the Rural Digital Opportunity Fund (RDOF).

        NTIA will ensure, prior to issuing a middle mile grant award, that each eligible entity obtains an acceptable, irrevocable standby letter of credit in a value of no less than 25 percent of the award amount.

        Each eligible entity shall provide with its letter of credit an opinion letter from its legal counsel clearly stating, subject only to customary assumptions, limitations, and qualifications, that in a proceeding under Title 11 of the United States Code, 11 U.S.C. § 101 et seq. (the "Bankruptcy Code"), the bankruptcy court would not treat the letter of credit or proceeds of the letter of credit as property of the winning bidder's bankruptcy estate under Section 541 of the Bankruptcy Code.

    c. *Financial Statements*

        Each applicant shall submit financial statements from the three prior fiscal years that are audited by an independent certified public accountant. If the applicant is not audited in the ordinary course of business, in lieu of submitting audited financial statements it must submit unaudited financial statements from the three prior fiscal years and certify that it will provide financial statements from the three prior fiscal years that are audited by an independent certified public accountant by an NTIA specified deadline.

2. Managerial Capability

    Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using MMG Program funding. In addition, each applicant shall submit any necessary organizational chart(s) detailing all of its parent companies, subsidiaries, and affiliates. Each applicant must also provide a narrative describing the applicant's

readiness to manage a middle mile broadband network. This narrative should describe the experience and qualifications of key management set to undertake this project, the applicant's experience undertaking projects of similar size and scope, recent and upcoming organizational changes including mergers and acquisitions, and relevant organizational policies.

3. Technical Capability

Each applicant must certify that it is technically qualified to complete and operate the proposed project and that it is capable of carrying out the funded activities in a competent manner, including that it will use an appropriately skilled and credentialed workforce.

Each applicant must submit a network design diagram, project costs, build-out timeline and milestones for project implementation, and a capital investment schedule evidencing that the applicant will complete build-out and the initiation of service within five years from the date on which the grant funds are made available to the eligible entity and will meet interim buildout requirements set forth herein and in any other binding document.

1. Compliance with Laws

Each applicant must demonstrate that it is capable of carrying out funded activities in a competent manner in compliance with all applicable federal, State, and local laws.

2. Operational Capacity

Each applicant must supply a certification from an officer-level employee (or individual of comparable rank) attesting to the applicant's operational capability to complete and operate the proposed project. If applicable, the applicant must submit a certification from an officer-level employee (or individual of comparable rank) that it has operated a middle mile broadband network for at least two years or that it is a wholly owned subsidiary of such an entity and must specify the number of years the applicant or its parent company has been operating.

If the applicant has provided a voice and/or broadband service, it must certify that it has timely filed Commission Form 477s and the Broadband DATA Act submission, if applicable, as required during this time period, and otherwise has complied with the Commission's rules and regulations. Alternatively, it must explain any pending or completed enforcement action, civil litigation, or other matter in which it failed to comply or was alleged to have failed to comply with Commission rules or regulations.

If the applicant has operated only an electric transmission or distribution service, it must submit qualified operating or financial reports that it has filed with the relevant financial institution for the relevant time period along with a certification that the submission is a true and accurate copy of the reports that were provided to the relevant financial institution.

3. Ownership

Each applicant shall provide ownership information.

Buildout Benchmarks

Buildout benchmarks will be established as a condition of any middle mile grant. An eligible entity that receives a middle mile grant shall demonstrate to the satisfaction of the Assistant Secretary that it has completed the buildout of 40 percent of project miles by the end of the second year after the award date, 60 percent of project miles by the end of the third year, 80 percent of project miles by the end of the fourth year, and 100 percent of project miles by the end of the fifth year. For the sake of clarity, the project must be completed, lit, and operating no later than five years from the date on which the grant funds are made available to the eligible entity.

Prioritization of Applications Meeting Statutory Criteria

The MMG Program will prioritize applications that meet at least two of the following five criteria:

1. The eligible entity adopts fiscally sustainable middle mile strategies.

2. The eligible entity commits to offering non-discriminatory interconnection to terrestrial and wireless last mile broadband providers and any other party making a bona fide request.
3. The eligible entity identifies specific terrestrial and wireless last mile broadband providers that have (i) expressed written interest in interconnecting with middle mile infrastructure planned to be deployed by the eligible entity; and (ii) demonstrated sustainable business plans or adequate funding sources with respect to such interconnection described in (i).
4. The eligible entity has identified supplemental investments or in-kind support (such as waived franchise or permitting fees) that will accelerate the completion of the planned project.
5. The eligible entity has demonstrated that the middle mile infrastructure will benefit national security interests of the United States and the Department of Defense.

Connections to Anchor Institutions
Each applicant seeking an award to build middle mile infrastructure using fiber-optic technology shall certify that the proposed project, upon completion, will include direct interconnection facilities that will facilitate the provision of broadband service, at speeds not less than 1 Gigabit per second for downloads and 1 Gigabit per second for uploads to anchor institutions located within 1,000 feet of the middle mile infrastructure.

Highly Skilled Workforce
To ensure that applicants have the technical and operational capacity to carry out the project, applicants must submit a plan for ensuring that the project workforce will be an appropriately skilled and credentialed workforce (including by the applicant and each of its contractors and subcontractors).

The plan for a highly skilled workforce should include the following information:

- The ways in which the applicant will ensure the use of an appropriately skilled workforce, e.g., through Registered Apprenticeships or other joint labor-management training programs that serve all workers;
- The steps that will be taken to ensure that all members of the project workforce will have appropriate credentials, e.g., appropriate and relevant pre-existing occupational training, certification, and licensure;
- Whether the workforce is unionized;
- Whether the workforce will be directly employed or whether work will be performed by a subcontracted workforce; and
- The entities that the applicant plans to contract and subcontract with in carrying out the proposed work.

Advancing Equitable Workforce Development and Job Qualifications
To meet the workforce needs of the MMG Program, applicants must make appropriate investments to develop a skilled, diverse workforce for the jobs that the applicants need to fill. Each applicant must provide the information described below as part of its application:

1. A description of how it will support the development and use of a highly skilled workforce capable of carrying out MMG Program work in a manner that is safe and effective.

2. A description of the applicant's participation in sector-based partnerships among employers, education and training providers, unions and any other labor-management organizations, the public workforce system, unions, and worker organizations, and community-based organizations that provide relevant training and provide wraparound services to support workers to access and complete training to attract, train, retain, or transition to meet local workforce needs and increase high-quality job opportunities.

3. A description of how the applicant will plan to create equitable on-ramps into broadband related jobs; maintain job quality for new and incumbent workers engaged in the sector; and continually engage with labor organizations and community-based organizations to maintain worker voice throughout the planning and implementation process.

4. A description of how the applicant will ensure that the job opportunities created by the MMG Program and other broadband funding programs are available to a diverse pool of workers, including by engaging in targeted outreach to populations that have traditionally been underrepresented in broadband and information technology jobs, including but not limited to women and people of color. Applicants should be prepared to report on the demographics of the workforce (including contractors and subcontractors) that is engaged on a project utilizing MMG Program grant funding (this will be aggregate workforce data only, not personally identifiable information), and should expect that this data will be made public.

5. A description of other equitable workforce development and job quality activities the applicant participates in.

Climate Resilience
Applicants should make use of available tools and resources from the National Oceanic and Atmospheric Administration (NOAA) and other federal agencies, as well as applicant-level resources and centers of expertise, in drawing up their MMG Program applications.

Each applicant should clearly demonstrate, at a minimum, that it is conducting each of the following:

1. Identify the geographic areas that should be subject to an initial hazard screening for current and future weather- and climate-related risks and the time scales for performing such screenings;

2. Identify which weather and climate hazards may be most important to account for and respond to in these areas and over the relevant time horizons, utilizing the tools and resources recommended below or other resources available to the applicant;

3. Characterize any weather and climate risks to new middle mile infrastructure deployed using MMG Program funds for the 20 years following deployment;

4. Identify how the proposed plan will avoid and/or mitigate the weather and climate risks identified; and

5. Detail the applicant's plans for periodically repeating this process over the life of the project to ensure that evolving risks are understood, characterized, and addressed, and that the most up-to-date tools and information resources are utilized.

Civil Rights and Nondiscrimination Law Compliance
Prior to distributing any MMG Program funding to a prospective awardee, NTIA will require the prospective awardee to agree, by contract or other binding commitment, to abide by the non-discrimination requirements set forth in the following legal authorities, to the extent applicable, and to acknowledge that failure to do so may result in cancellation of any award and/or recoupment of funds already disbursed:

- Title VI of the Civil Rights Act of 1964;
- Title IX of the Education Amendments of 1972;
- The Americans with Disabilities Act of 1990;
- Section 504 of the Rehabilitation Act of 1973;
- The Age Discrimination Act of 1975;
- Title VII of the Civil Rights Act of 1964; and
- Any other applicable non-discrimination law(s).

Other
Prospective non-State and non-Tribal Government applicants must, prior to submitting an application, coordinate and consult with the State Broadband Office or other coordinating body Notice of Funding Opportunity – 23 located in the jurisdiction in which the eligible entity proposes to deploy middle mile infrastructure to ensure that the proposal is consistent with the State's broadband plan and priorities.

Application and Submission Information

Address to Request Application Package
Application forms and instructions are available at https://grants.ntia.gov/. Applications will be accepted until the deadline and will be processed as received. Application packages, or portions thereof, submitted by email, paper, or facsimile will not be accepted.

Content and Form of Applications
A complete application packet consists of the information that will be required by the Application Portal at https://grants.ntia.gov/. Required information will include (but not necessarily be limited to) the following:

1. Standard Form 424: Application for Federal Assistance
2. Standard Form 424C: Budget Information for Construction Programs (SF-424C)
3. CD–511 Certification Regarding Lobbying
4. Standard Form LLL, Disclosure of Lobbying Activities (if applicable)
5. Detailed Budget
6. Budget Narrative
7. Project Details and Narrative
8. Negotiated Indirect Cost Rate Agreement (if applicable)
9. Any materials on which the applicant seeks to rely in demonstrating its satisfaction of the eligibility criteria, merit review criteria, and programmatic review criteria.

The Project Details and Narrative, along with the above forms, shall be filled out by the applicant in NTIA's Grant Application Portal. Applications will include the following:

1. An Executive Summary
   The executive summary is not to exceed two pages (approximately 1,000 words).

2. Project Purpose/Need Beneficiaries
   a. A description of how the applicant's proposal will advance the objectives of the MMG Program.
   b. An overview of the proposed route or service area(s), including information regarding rurality and socio-economic indicators in the area to be served by the proposed project;
   c. A description of need in the proposed service area(s), including communities considered unserved and/or underserved in the proposed service area(s);
   d. Target last mile service objectives, including last mile service provider letters of commitment, agreements, or contracts;
   e. Letters of intent, agreements, or contracts pertaining to other expected users of the proposed middle mile facilities;
   f. Information on existing middle mile offerings in the area, if any, including competitor data if applicable; and
   g. A list of anchor institutions (and types) within 1,000 feet of the proposed route (for fiber projects only).

3. Proposed Project – Technical Approach / Service Area / Build Out Plan
   1. Network route map(s);
   2. Network diagram and system design;
   3. Technical details of the proposed project, e.g., technology type;
   4. List of all proposed interconnection points and point-of-interest locations along the proposed route;
   5. A description of the proposed service offerings, including the pricing of the services to be offered over the proposed facility;
   6. A description of the applicant's nondiscrimination, interconnection, and network management plans;
   7. A timeline for the build-out/implementation of the project with critical path, including key milestones for implementation of the project, preparations, and risk factors;
   8. A plan for using an appropriately skilled and credentialed project workforce
   9. Description of the applicant's efforts to ensure climate resilience for the project and demonstration that the applicant has sufficiently accounted for current and future weather- and climate-related risks to new middle mile infrastructure projects;
   10. A service-area environmental description that describes the physical project area and its surroundings including site photographs and aerial photographs if the project includes construction and/or ground disturbing activities.

4. Project Financials and Organization Financial Capacity

a. Details regarding the federal grant request and non-federal cost share;
b. Details on the project budget and funding, including the level of need for federal funding and details on other federal broadband deployment funding received by the applicant;
c. Non-federal cost share sources, including the proposed percentage of cash vs. in-kind contribution and the source of any contribution (if not the applicant itself);
d. Historical financials for the last three years;
e. Historical CPA audits for the last one year;
f. The Letter of Credit referenced earlier; and
g. Pro forma financial projection and analysis related to the project's sustainability, inclusive of subscriber, across an eight-year forecast period.

5. Project Implementation Team and Organizational Capacity

a. Information regarding the organization's capacity and readiness;
b. Project and organizational chart;
c. Management team and key project personnel resumes, including resumes of key personnel of partner organizations or third parties that will be performing a significant role in the project's completion;
d. Project governance documents and a description of key partnerships;
e. List of all funded and unfunded project collaborators, including partners, consultants, subrecipients, match providers, major contractors/suppliers, details on role/scope of work for project;
f. A description of whether and, if so, how the project will incorporate strong labor standards, including project labor agreements and community benefit agreements that offer wages at or above the prevailing rate and include local hire provisions, and a description of the applicant's workforce plans and practices; and;
g. A description of how the applicant will support equitable workforce development and job quality objectives.

6. Government and Community Involvement

1. Information on the applicant's coordination with applicable State, Tribal, and local governments, including their awareness of the proposed project and any potential impact to respective service areas; and
2. Information regarding the applicant's involvement and coordination with community organizations, unions and worker organizations, or other relevant partners in the proposed service area.

Intergovernmental Review

Applications from a State or a political subdivision of the State under this program are subject to Executive Order 12372, "Intergovernmental Review of Federal Programs," which requires intergovernmental consultation with State and local officials. All State applicants are required to submit a copy of their applications to their designated Single Point of Contact (SPOC) offices to the extent they utilize a SPOC.

Funding Restrictions

Based on the scope of the MMG Program, below are non-exclusive examples of eligible uses of MMG Program funds:

- Construction, improvement, and/or acquisition of facilities and telecommunications equipment required to deploy middle mile broadband facilities;
- Engineering design, permitting and work related to environmental, historical and cultural reviews;
- Personnel costs, including salaries and fringe benefits for staff and consultants required for the implementation of the MMG Program (such as project managers, program directors, subject matter experts, grant administrators, financial analysts, accountants, and attorneys);
- Reasonable, post-NOFO, pre-application expenses in an amount not to exceed $50,000. Pre-application expenses, which include expenses related to preparing an application, may be reimbursed if they are incurred after the publication date of this NOFO and prior to the date of issuance of the grant award from NTIA, except that lobbying costs and contingency fees are not reimbursable from grant funds. These costs should be clearly identified in the proposed project budget and must be approved by NTIA and the Grants Officer in writing to be considered allowable. Additionally, pre-application costs are incurred at the sole risk of the applicant and will not be reimbursed by NTIA if the proposed project does not receive an award pursuant to this program; and
- Other costs necessary to carrying out programmatic activities of an award, not to include ineligible costs described below.

There is a prohibition on the use of grant funds for:

- Covered communications equipment or services under the Secure and Trusted Communications Networks Act;
- Profit and fees;
- To support or oppose union organizing;
- For non-middle mile infrastructure; and
- As collateral for a loan or pre-application administrative costs.

BEAD NOFO[i]

NTIA's Notice of Funding Opportunity (NOFO) for the Broadband Equity, Access and Deployment (BEAD) Program lays out the allocation of funds, program requirements, eligible uses of funds, and the nine-stage funding distribution process for the $41.9 billion in funding approved in the IIJA.

Allocation of Funds: States will receive the initial funding and will allocate funds to eligible subgrantees which will consist of both public and private entities who will be responsible for broadband deployment and ongoing operations. Each of the 50 states, along with the District of Columbia and Puerto Rico, is entitled to a minimum grant of $100 million. The remainder of the funding will be allocated based on a formula according which states have more unserved areas. The level of unserved areas will be determined by the updated maps that the FCC is in the process of developing.

- ***Initial Planning Funding:*** The minimum $100 million includes initial planning funds of up to $5 million that may be used to develop the jurisdiction's BEAD Program. Initial planning funds may be spent on research and data collection, community outreach, technical assistance to potential subgrantees (the entities that will actually deploy broadband), employee training and related functions to support the States' BEAD Program.

- ***Formula Funding****:* An additional $4.245 billion in BEAD Program funds will be allocated among each State according to its proportion of unserved locations in high-cost areas, compared to the nationwide total of unserved high-cost locations, as determined by the Federal Communications Commission's (FCC) in-development broadband coverage maps.

For example, if one State has 10 percent of the nation's total unserved locations in high-cost areas, it will receive $424.5 million, or one-tenth of the high-cost allocation.

- ***High Cost Areas****:* The remaining $37.1 billion in funds will be divided among the States in a manner similar to the allocation of high-cost funds. Each State will receive an amount determined by its total number of unserved locations relative to the national total.

For example, if one State has 10 percent of the nation's total unserved locations, it will receive $3.71 billion, or one-tenth of the unserved-location allocation.

Matching Funds: States must require not less than 25% of matching funds for a broadband projects costs. However, NTIA allows a broad selection of eligible funding sources and the flexibility to combine source to meet the 25% minimum. This requirement also does not apply to high cost areas and NTIA has the authority to grant waivers.

- ***Allowable Funding Sources*:** These matching funds can come from a variety of sources, including funding from a federal regional commission or authority, the Families First Coronavirus Response Act, the CARES Act, the Consolidated Appropriations Act, 2021, or the American Rescue Plan Act, which all contained funding for infrastructure and/or broadband. However, funding from other federal programs, such as the Universal Service Fund, may not be used as a source of matching funds.

  States may accept matching funding in the form of in-kind contributions that minimize BEAD Program outlays such as property, equipment, supplies, hardware or software, and even potentially employee or volunteer services. And while there is a preference that matching contributions come from the subgrantees themselves, the matching funds may come from a variety of sources including the State itself, a local government, a utility company, a cooperative, a nonprofit or philanthropic organization, a for-profit company, a regional planning or governmental organization, a federal regional commission or authority, or any combination thereof.

Program Requirements: NTIA has set minimum requirements for participation in the BEAD Program for both States and subgrantees.

State Requirements

- ***Administrative Entity****:* The governor of each State participating in the BEAD Program (and the D.C. Mayor) must select a single administrative entity to serve as the applicant for and recipient of any awarded BEAD Program funds. Most States are likely to select existing entities such as state broadband offices. The selected entities will act as the administering entity for all of the State's grant application materials.

However, if a State fails to submit a required application at any stage of the process by the applicable deadline or fails to cure any identified deficiencies with an application, NTIA will issue a public notice inviting a political subdivision or consortium of political subdivisions in the State to submit the applicable type of covered application in place of the State.

- ***Eligible Subgrantees**:* States must ensure the broadest possible participation in the Program by considering a wide range of potential broadband provider types. This means they may not exclude cooperatives, nonprofit organizations, public-private partnerships, public or private utilities, public utility districts or local governments from participation. If a State has laws that prohibit participation by a particular type of entity (e.g., municipal broadband), it must explain to NTIA whether it will waive such laws, and how they will impact the State's application review.

- ***Eligible Areas**:* States may provide subgrantees with funds for projects to primarily deploy broadband to locations that are currently deemed "unserved," which is defined as lacking broadband service providing at least 25 Mbps downlink and 3 Mbps uplink. So long as all unserved areas will be covered, subgrantees may also use funding for projects to primarily deploy broadband to "underserved" locations, which have service of at least 25/3 Mbps, but lack at least 100/20 Mbps service. A broadband project targeting unserved areas must contain at least 80 percent unserved locations while a broadband project targeting underserved areas must contain at least 80 percent underserved locations. Thus, funded broadband deployment projects can include some already served locations. Subgrantees may also deploy broadband to "community anchor institutions" which lack access to gigabit-speed broadband service. States will be afforded an opportunity to define "community anchor institutions" themselves, but they must include institutions like schools, libraries and hospitals.

  Areas served solely by satellite and/or by wireless broadband provided exclusively over unlicensed spectrum must also be considered "unserved" for purposes of the BEAD Program, regardless of claimed service speeds.

  However, locations that are currently unserved or underserved by broadband but are subject to an enforceable federal, state or local commitment though a federal, state or local grant, loan, loan guarantee or support program for the deployment of at least 100/20 Mbps broadband with latency less than or equal to 100 milliseconds using an acceptable technology will not be considered unserved or underserved for purposes of the BEAD Program absent a waiver from NTIA.

- ***Accountability***: States must ensure that subgrantees are held accountable for the funding they receive through the BEAD Program. This involves the distribution of funds on a reimbursable basis that allows funds to be withheld if the subgrantee fails to deploy; the inclusion of claw back provisions in any agreements with subgrantees allowing the recoupment of any funds disbursed; the imposition of regular reporting mandates on subgrantees; and the development of robust subgrantee monitoring practices.

- ***Affordability***: Apart from requiring subgrantees to offer a low-cost broadband plan to eligible subscribers, an obligation which is discussed in more detail below, States must develop a middle-class affordability plan to ensure that all middle-class consumers have access to affordable high-speed broadband in a BEAD-funded network's service area.

- ***Local Coordination**:* Each State must develop its plans and proposals with the input of various stakeholders and must coordinate with political subdivisions, Tribal Governments, local and community-based organizations, and unions and worker organizations within its territory. These efforts must be documented and included in the State's submissions to NTIA.

- ***Small and Minority-Owned Businesses**:* States must take all necessary affirmative steps to ensure that minority businesses, women's business enterprises and labor surplus area firms are used when possible. These steps must include: placing qualified small, minority and women's businesses on bid solicitation lists and ensuring they are solicited whenever they are potential sources of equipment or services; dividing requirements into smaller tasks or quantities and establishing delivery schedules that permit maximum participation of small, minority and women businesses where economically feasible; seeking assistance from the Small Business Administration and Minority Business Development Agency; and requiring subgrantees to employ these steps with respect to subcontractors.

- ***Equitable Workforce Development:*** States must design their programs to promote the equitable development of the workforce. This will require States to work with unions and worker organizations, education and training providers, as well as community- based organizations. States must also have a plan to create equitable on-ramps

to broadband-related jobs that maintain their quality over time. States should require subgrantees to hire from a diverse pool of workers by targeting outreach to populations that have traditionally been underrepresented in broadband and information technology.

Subgrantee Requirements

- ***Networks****:* Subgrantees must meet minimum network and service requirements in order to be eligible to receive funding. For example, all networks funded through the BEAD Program must provide speeds of at least 100/20 Mbps with latency less than 100 milliseconds to residential subscribers. Subgrantees providing service to community anchor institutions must provide symmetrical 1 Gbps service. BEAD-funded networks must demonstrate an ability to achieve these speed results in accordance with the FCC's Performance Measures Order. That requires 80 percent of a subgrantee's upload and download measurements to be at or above 80 percent of the required speed. Additionally, 95 percent of latency measurements must be at or below 100 milliseconds. Further, networks must be resilient, and must not experience more than 48 hours of outages within a 365-day period, except in rare circumstances like natural disasters.

  Subgrantees must also develop cybersecurity and supply chain risk management plans based on established best practices.

- ***Deployment****:* Subgrantees must be able to provide service to any customer that requests service in the project area within four years of receiving the subgrant, though States must establish interim buildout milestones to ensure regular progress. NTIA may extend the four-year deadline to complete buildout under certain conditions: namely, if the subgrantee has a specific plan for the funds, which will be completed within a year of the deadline; construction is underway; or extenuating circumstances warrant an extension.

  Subgrantees laying optical fiber or conduit underground must also include conduit access points at regular intervals for interconnection by unaffiliated entities. Where a subgrantee proposes to lay conduit, States must require subgrantees to propose to deploy a reasonable amount of excess conduit capacity and to propose a conduit access-point interval as part of the grant application process and must consider the adequacy of the subgrantee's proposed excess conduit capacity and access points when evaluating the application. Additionally, any subgrantee that receives funds to deploy middle-mile infrastructure in connection with deployment to unserved or underserved locations must permit other providers to interconnect with that middle mile infrastructure on a just, reasonable and nondiscriminatory basis.

- ***Low-Cost Plan*****:** Subgrantees receiving BEAD funding must offer a low-cost broadband plan to eligible subscribers in their project area. States will determine the features of the low-cost option, such as speed and monthly cost, and may impose additional requirements on subgrantees, such as participation in the FCC's Affordable Connectivity Program (ACP). In the NOFO, NTIA provides an example of a low-cost broadband plan that States might require, which would be offered to qualifying customers for no more than $30 per month (or $75 if on Tribal lands), allows the ACP subsidy to be applied to cover the cost of the plan, provides service at 100/20 Mbps with latency below 100 milliseconds, and does not include data caps. Additionally, NTIA suggests that if a provider were to later introduce a low-cost plan with higher speeds, it should upgrade existing low-cost subscribers' service.

- ***Service*****:** Subgrantees may not impose data caps on any subscriber using BEAD- funded networks, or implement any unjust or unreasonable network management practices in such networks. Subgrantees also must provide access to broadband service to each customer served by the project that wants broadband service on terms and conditions that are reasonable and nondiscriminatory.
- ***Promotion***: Subgrantees must carry out public awareness campaigns in their service areas that are designed to highlight the value and benefits of broadband service in order to increase the adoption of broadband service by consumers. Awareness campaigns must include information about low-cost service plans and any federal subsidies for low-income households such as the Lifeline Program and the ACP. Once a BEAD-funded network has been deployed, each subgrantee must provide public notice, online and through other means, of that fact to individuals residing in the locations for which broadband service is available and share the public notice with the State that awarded the subgrant.
- ***Continuity of Project***: If a subgrantee, at any time, is no longer able to provide broadband service on a retail basis to the end-user locations covered by the subgrant, the State, in consultation with NTIA, shall require the subgrantee to sell the network capacity at a reasonable, wholesale rate on a nondiscriminatory basis to one or more other broadband service providers or public-sector entities, or sell the network in its entirety to a new provider that commits to providing services under the terms of the BEAD Program.

- ***Reporting Requirements****:* All subgrantees must report, at least semiannually during the term of the subgrant, to the State on the status of the project and the effectiveness of the funds provided.

Use of Funds: BEAD funds can be used to deploy and/or upgrade broadband network facilities in connection with a project to primarily provide service to unserved locations or a project to primarily provide service to underserved locations. BEAD funds can also be used to deploy and/or upgrade broadband network facilities to provide or improve service to an eligible community anchor institution as well as for data collection, broadband mapping and planning to facilitate the goals and deliverables of the BEAD Program. Funds may also be used for Internet and Wi-Fi infrastructure or providing reduced-cost broadband within a multi-family residential building, with priority given to residential buildings that have a substantial share of unserved households or are in a location in which the percentage of individuals with a household income that is at or below 150 percent of the poverty line is higher than the national percentage of such individuals.

- ***Middle Mile*:** Funding may be used for middle-mile infrastructure if it is technically or financially required to support service to an unserved location, underserved location or eligible community anchor institution.

- ***Adoption***: BEAD funds may also be used for broadband adoption, including programs to provide affordable Internet-capable devices, and other non-deployment activities that support the goals of the BEAD Program, such as digital literacy, broadband sign-up assistance, and remote learning or telehealth services and facilities. However, a State is only allowed to use funding for non-deployment purposes if it can first demonstrate to NTIA that it has a plan to bring affordable, high-speed broadband service to all unserved and underserved locations in its jurisdiction. If a State chooses to award funds to subgrantees to carry out a non-deployment activity rather than carrying out an activity itself, a State must still use a competitive process to select those subgrantees.

- ***Unsecure Vendors***: No BEAD funding may be used to purchase any communications equipment or services on the FCC's list of covered communications equipment under the Secure and Trusted Communications Networks Act of 2019.

- ***Profits and Fees***: BEAD funds may not be used to pay any profit, fee, or charge above actual cost incurred by the State or subgrantee under the Program.

- ***Collective Bargaining*:** BEAD funds may not be used to either support or oppose collective bargaining.

- ***Administrative Expenses***: States may not use more than two percent of the BEAD Program funds they receive for direct and indirect administrative expenses.

- ***Restrictions on Matching Funds:*** The limitations on eligible costs apply both to BEAD funds directly and to non-federal matching funds, whether from the States directly or otherwise. In other words, in making subgrants, States are expressly prohibited from allowing any non-federal matching funds that are committed as part of an award to pay costs that could not otherwise be paid through BEAD funding.

- ***Buy American:*** BEAD Program funds must be expended in compliance with the Build America, Buy America Act. Under that law, all manufactured products and constructions materials, including communications equipment and building materials such as fiber-optic cable, iron, and steel, must be produced in the United States. Subgrantees may request a waiver of the Build America, Buy America Act requirements from the Secretary of Commerce in certain cases. For example, waivers are available where products or materials are not produced within the United States in necessary qualities or quality, or where using domestically produced products and materials would increase the overall cost of the project by 25 percent compared to using foreign-sourced materials. In addition, BEAD funding may not be used to purchase fiber made in China, unless a waiver is granted under the same standard as the Build America, Buy America requirements, and NTIA is satisfied that national security concerns are satisfied.

State Application Process: There is a nine part application process. The nine parts include the following:

1. **Letter of Intent**: The first step will be an initial Letter of Intent from the State broadband office (or equivalent) to NTIA expressing the State's intent to participate in the BEAD Program, which is due to NTIA by July 18, 2022. Upon receipt of the Letter of Intent, NTIA will assign each State a designated contact at NTIA to guide the State through the process.

2. **Planning Funds**: With the Letter of Intent, a State may request the aforementioned planning funds to which it is entitled. Alternatively, planning funds may be requested as late as August 15, 2022.

3. **Five Year Action Plan**: States must all submit Five Year Action Plans ("Five Year Plans") to NTIA detailing their broadband goals and priorities for the coming years, including how broadband will be aligned with economic and workforce development, telehealth, digital equity, and other initiatives. The Five Year Plan must be developed through collaboration with state, local, and Tribal entities (if applicable), as well as unions and other worker organizations. The Five Year Plan must be submitted to NTIA within 270 days of receipt of the initial planning funds.

The Five Year Plan shall detail the organization of the State broadband office, existing funding and efforts for broadband deployment, and potential obstacles that may be encountered. It should incorporate all existing data on broadband availability, affordability, and adoption to identify gaps and needs, and develop a comprehensive program to address these needs. The Five Year Plan must include a timeline and cost estimate for universal service, potential funding sources, technical assistance that might be needed, areas selected for priority, an assessment of how public-private partnerships might aid deployment, and strategies to address affordability and workforce issues. Each Five Year Plan must also address the State's digital equity and inclusion needs, although this requirement may be satisfied by the completion of a State Digital Equity Plan under the Digital Equity Act, also administered by NTIA.

4. **Available Funding:** Once the FCC releases the new broadband maps currently under development pursuant to the Broadband DATA Act, NTIA will use those maps to determine the amount of high-cost and remaining funding available to each State. According to the most recent public statements by government officials, it appears as though the earliest that these maps will be ready is November.

5. **Initial Proposal**: Once the State is informed of its available funding, it will have 180 days to submit an Initial Proposal to NTIA, which is a comprehensive plan to ensure universal service within its jurisdiction. States must again work with local and Tribal governments, as well as community organizations and worker organizations, to develop the Initial Proposal. The Initial Proposal must identify all unserved and underserved locations in the State, as well as all community-anchor institutions (and must set forth the State's own definition of "community-anchor institution").

   Each State must also explain its plan for a challenge process and the criteria it will rely upon when selecting projects for BEAD funding. States must also identify any projects the State may choose to implement itself rather than delegate through a subgrant. States are also required to assess climate threats and detail how the State will ensure the infrastructure to be deployed will survive through various weather events; describe the low-cost plans that subgrantees will be required to offer; describe how the State will use its initial 20 percent of funds, which may be released upon approval of the Initial Proposal (the remaining 80 percent must generally wait until approval of the Final Proposal); describe all laws the State plans to waive regarding barriers to municipal broadband; and describe policy changes the State will take to accelerate broadband deployment, such as dig-once policies, streamlined permitting, and cost- effective access to poles.

   States must also certify their commitment to requiring strong labor standards as well as supporting a diverse workforce and minority- and women-owned businesses. Prior to submitting an Initial Proposal to NTIA, a State must put it out for public comment and incorporate feedback received through local coordination.

   NTIA may immediately approve a State's Initial Proposal, or it may provide feedback and ask the State to revise and resubmit the Initial Proposal. Once approved, NTIA will release 20 percent of the State's funding, or a higher amount at the discretion of the NTIA Administrator.

6. **Challenge Process**: After submitting its Initial Proposal, each State must carry out a challenge process designed to allow local and Tribal governments, nonprofit organizations, and broadband providers the opportunity to challenge whether particular locations in a State should be considered unserved, underserved, or served. A State's challenge process will be included in its Initial Proposal and must be approved by NTIA. After each challenge is resolved, and at least 60 days before allocating grant funds to a project, the State must provide public notice of the classification of each unserved location, underserved location, or community anchor institution. If the challenge process necessitates any changes to the Initial Proposal, the State must inform NTIA.

NTIA retains the power to overrule any State decision regarding the eligibility of any location or community anchor institution.

7. **Subgrantee Selection Process**: States must select subgrantees pursuant to the competitive process described in their approved Initial Proposals. The process must safeguard against bias, collusion, conflicts of interest, and arbitrary decisions, while incorporating the priorities of the BEAD Program. The priorities include complete coverage of unserved and underserved locations, followed by community anchor institutions, as well as the use of end-to-end fiber optic architecture.

   States may solicit proposals from subgrantees at the geographic level of the State's choosing—for example, on a per-location basis, per-census block basis, per-town, per- county or another geographic unit. A State may alternatively solicit proposals for project areas it defines or ask subgrantees to define their own proposed project areas.

   - *Priority Broadband Projects*: Priority must be given to projects using end-to-end fiber architecture. Unless the per-location BEAD subsidy for a proposed fiber project would exceed a per-location cost threshold set by a State ("Extremely High Cost Per Location Threshold"), a waiver is obtained from NTIA for a particular project, or a proposed fiber project does not meet all of the requirements set forth in the NOFO, a State must select a fiber project if one is proposed for a location or set of locations as opposed to a non-fiber project.

   When selecting among competing Priority Broadband Projects, States must weight (e.g., give substantial points or credits in the scoring mechanism the State develops) certain criteria higher than others.

   The most weight must be given to three primary criteria, which together must account for at least 75 percent of the points or credits available in the process.
   - The first primary criterion is the minimization of BEAD Program outlays, meaning projects that are able to reduce the funding required on a per-location basis—either through increased matching funds or lower overall cost—must be given greater points or credits.
   - The second primary criterion is the affordability of the final consumer product, as measured by the subgrantee's commitment to provide symmetrical 1 Gbps service at the most affordable price.
   - The third primary criterion is the subgrantee's demonstrated record of and commitment to fair labor standards. New entrants without records of compliance must be permitted to mitigate this fact by making specific, forward-looking commitments to strong labor and employment standards.

   The only secondary criterion is speed to deployment, which must receive some amount of points or credits less than the amount awarded for the primary criteria. While all subgrantees must begin providing service to all locations within four years (absent a waiver), States must award points or credits to those subgrantees that make binding commitments enforceable through contractual penalties to deploy broadband States may choose additional criteria for which to award points and make selections among competing Priority Broadband Projects, but NTIA offers a few recommendations. The first recommendation is the adoption of selection criteria regarding a subgrantee's enforceable commitments to advance equitable workforce development and job quality objectives. To score well on workforce development objectives, subgrantees would have to demonstrate they will draw employees from a diverse pool, adequately train employees and build partnerships with educational and training organizations, and create equitable on-ramps to broadband-related jobs that give workers a voice. The second recommendation is that subgrantees be awarded additional points or credits if they agree to provide open access to their BEAD-funded networks on fair, equal, and neutral terms. The last recommendation is that subgrantees be scored according to the support received from Tribal and local governments, and whether Tribal and local governments will have an oversight role in the project.

   - *Non-Priority Broadband Projects:* For competing Non-Priority Broadband Projects, NTIA requires use of a similar weighting and scoring rubric as with Priority Broadband Projects, but with slightly different criteria, given the underlying differences. The first primary criterion must still be the minimization of BEAD Program outlays, meaning projects that reduce the funding required on a per location basis—either through increased matching funds or lower overall cost—should be given greater points or credits. The second primary criterion is the affordability of the final consumer product, meaning the subgrantee's commitment to provide 100/20 Mbps service at the most affordable price. The third primary criterion is the subgrantee's demonstrated record of and commitment to fair labor standards. Again, new entrants without a record of compliance must be permitted to mitigate this fact by making specific, forward-looking commitments to strong labor and employment standards.

There are two secondary criteria for Non-Priority Broadband Projects. The first is speed to deployment, with greater weight going to subgrantees that make enforceable commitments to deploy earlier than required. The second is the speed of the network and other technical capabilities. States must not only weight the speed and latency of the service to be offered, but also score for other factors like scalability and the use of capital assets with longer usable lives.

NTIA makes the same recommendations for additional criteria to score Non-Priority Broadband Projects as Priority Broadband Projects, namely, commitments to advancing equitable workforce development and job quality objectives, providing open access to BEAD-funded networks, and the level of support and involvement of Tribal Governments.

8. **Use of the 20 Percent Funding Release**: Upon the approval of the Initial Proposal and completion of the challenge process, States may receive 20 percent of their funding allocations from NTIA (or more at the sole discretion of NTIA). The funds may be spent to fully fund deployment projects that consist of at least 80 percent unserved locations and are in areas where a greater than average number of individuals are living below 150 percent of the poverty line. Use of these funds for other purposes will require a waiver from NTIA.

9. **Final Proposal and Release of Remaining Funds:** The Final Proposal must be submitted to NTIA within 12 months of NTIA's approval of the Initial Proposal. Upon approval of the Final Proposal, NTIA will release to a State its remaining allocated funds. A Final Proposal must contain a detailed plan for service, including a timeline for deployment and the results of the challenge process. Additionally, States must detail how they selected the subgrantees for individual buildout projects pursuant to the competitive selection process, and detail all uses of BEAD Program funding that go to purposes other than last-mile broadband deployment.

   The Final Proposal must also list each application that was denied or affected by State laws concerning broadband or utility services (e.g., municipal broadband restrictions), and explain why those laws were not waived. States will need to explain whether those laws predated the The Final Proposal must also list each application that was denied or affected by State laws concerning broadband or utility services (e.g., municipal broadband restrictions), and explain why those laws were not waived. States will need to explain whether those laws predated the Infrastructure Investment and Jobs Act, and how they impacted the individual decisions to deny applications.

Key Dates and Program Sequencing

Key Dates
May 13, 2022
July 18, 2022, by 11:59 p.m. EDT
August 15, 2022, by 11:59 p.m. EDT
Within 270 days of receipt of Initial Planning Funds
On or after the date on which the FCC Broadband DATA Maps are made public
180 days to submit after issuance of their Notice of Available Amounts
Challenge: Begin after submission of Initial Proposal and before allocating BEAD funds Final Classification: After resolving each challenge and at least 60 days before allocating grant funds for network deployment
Assistant Secretary shall make available to the Eligible Entity 20% of the grant funds
No later than twelve (12) months after the date upon which the Assistant Secretary approves the Eligible Entity's Initial Proposal

Section Endnotes

[i] Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, div. N, tit. IX, § 904, 134 Stat. 1182, 2130 (2020), available at https://www.congress.gov/bill/116th-congress/house-bill/133/text (*Consolidated Appropriations Act*).
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Appendix E

Digital Divide Index

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
1	42011002500	149.1	15.4	97.80%	37.70%	33.00%	40.40%	52.50%	15.00%	28.60%	2.02	47.52	40.44	55.73
2	42011001900	146	11.3	100.00%	42.80%	25.40%	35.90%	35.90%	19.00%	31.50%	1.65	45.83	36.52	51.78
3	42011001200	140.5	11.2	100.00%	15.60%	9.40%	24.50%	45.60%	28.30%	41.30%	33.93	26.15	49.23	50.75
4	42011000100	144.9	16	58.00%	26.20%	19.90%	26.80%	47.20%	20.30%	33.80%	33.52	31.97	44.45	50.27
5	42011001400	153.5	11.7	100.00%	40.20%	25.70%	48.50%	29.40%	9.60%	26.50%	2.24	44.79	34.51	49.66
6	42011000900	157.2	12.4	100.00%	24.00%	17.50%	28.60%	28.30%	11.00%	19.90%	36.49	33.67	32.08	41.67
7	42011001700	144.4	10	100.00%	26.40%	17.00%	57.80%	16.70%	6.50%	19.80%	4.03	34.62	30.36	40.87
8	42011002600	153.4	13.2	91.60%	24.90%	13.30%	27.30%	46.00%	10.30%	21.90%	1.67	31	31.08	39.44
9	42011011601	147.6	14.3	98.60%	22.80%	19.20%	12.00%	5.70%	21.90%	20.00%	54.34	34.08	28.46	39.11
10	42011000200	176.6	15.3	100.00%	21.10%	18.80%	19.30%	41.80%	11.90%	21.20%	1.59	32.87	28.12	38.18
11	42011000400	142.3	11.3	100.00%	25.40%	21.10%	24.90%	23.30%	8.90%	17.80%	15.67	36.47	25	37.76
12	42011002100	158	12.7	100.00%	18.80%	16.10%	30.80%	29.40%	7.90%	16.50%	25.86	30.81	28.8	37.58
13	42011000800	143	10.6	100.00%	9.00%	18.00%	41.20%	43.90%	7.50%	14.00%	2.18	28.16	30.01	37.05
14	42011002200	148.3	11.6	100.00%	17.50%	8.50%	33.30%	42.00%	8.90%	20.90%	3.27	26.28	31.08	36.84
15	42011002700	152.3	12.8	93.60%	19.10%	14.50%	11.70%	9.80%	29.80%	27.20%	12.46	29.5	28.2	36.39
16	42011001300	142.6	11.9	100.00%	16.80%	9.80%	28.50%	39.50%	6.10%	15.90%	26.84	26.76	29.97	36.25
17	42011001600	143	10.9	100.00%	15.10%	9.90%	30.60%	32.50%	5.80%	17.60%	25.07	26.16	29.24	35.35
18	42011013200	162.6	14.3	97.60%	25.40%	22.10%	8.00%	6.10%	26.10%	17.40%	11.07	36.4	20.75	34.44
19	42011002300	155.4	14.2	100.00%	9.30%	6.20%	39.50%	29.20%	5.10%	19.80%	23.76	21.57	31.31	34.42

Digital Divide Index

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
20	42011001500	153.7	11.7	100.00%	13.00%	7.00%	36.80%	39.00%	10.00%	14.90%	2.82	23.56	28.94	33.69
21	42011001800	153.1	13.2	92.80%	13.20%	15.70%	15.50%	19.30%	13.00%	19.70%	22.69	27.71	24.79	32.78
22	42011012001	99.8	18.6	90.90%	23.90%	20.00%	17.00%	9.30%	20.10%	13.90%	4.18	34.82	19.48	32.6
23	42011002900	163.6	13.4	100.00%	26.20%	10.80%	22.90%	13.50%	16.00%	17.60%	4.18	30.78	22.36	32.6
24	42011011101	171.4	19.1	76.2%	20.1%	18.5%	3.3%	15.4%	26.50%	22.20%	1.72	29.99	22.44	32.22
25	42011001000	153.5	12.1	100.00%	16.70%	7.20%	34.20%	30.90%	7.30%	15.60%	2.24	25.15	25.72	32.09
26	42011002002	159.6	13.7	100.00%	16.00%	13.50%	26.50%	25.50%	5.30%	19.60%	1.63	28.16	23.42	31.97
27	42011011906	125.9	19.9	80.80%	19.30%	17.90%	7.60%	18.80%	21.40%	17.90%	5.78	30.45	21.62	31.85
28	42011013302	177.6	13.9	85.9%	12.2%	10.8%	10.1%	4%	27.1%	15.7%	42.76	23.59	25.91	31.38
29	42011013901	122.6	10.3	98.30%	11.70%	10.40%	6.70%	5.70%	32.10%	24.00%	8.02	25.2	24.54	31.21
30	42011010601	175.4	14.6	100.00%	20.80%	20.90%	6.60%	5.80%	28.00%	12.90%	5.72	33.95	18.07	31.03
31	42011014202	74.4	13.5	92.7%	13.1%	$12	13.4%	11.5%	16.5%	15.8%	30.15	26.78	22.92	30.83
32	42011014201	78.7	15.8	94.5%	16.4%	15.3%	13.50%	4.5%	27.30%	13.5%	6.2	29.95	19.67	30.07
33	42011012701	165.3	11.5	100.0%	12.5%	12.6%	9.4%	3.9%	23.3%	17.0%	23.91	26.27	21.62	29.55
34	42011000700	140.4	11.3	100.00%	13.80%	8.20%	24.60%	22.10%	7.60%	9.80%	24.94	24.76	22.28	29.23
35	42011013902	64.1	7.6	96.70%	19.40%	9.90%	11.00%	7.80%	20.00%	18.00%	4.02	28.84	19.23	29.11
36	42011010201	160.1	13.6	77.50%	13.40%	11.40%	11.30%	6.30%	17.70%	12.70%	46.65	23.81	22.79	29.09
37	42011000300	150.9	13.5	100.00%	17.20%	6.90%	21.90%	24.50%	7.70%	17.20%	0.72	25.25	21.54	28.92
38	42011002001	158.6	13.70%	100.00%	12.40%	4.30%	22.10%	14.30%	7.30%	27.90%	2.36	21.76	23.9	28.82
39	42011012200	187.8	15.7	88.90%	19.40%	13.40%	12.90%	15.20%	16.90%	13.20%	7.06	28.02	18.99	28.48
40	42011000500	144.2	10.9	100.00%	15.30%	9.90%	30.40%	20.40%	7.60%	11.10%	1.53	26.25	20.25	28.48
41	42011014102	52.5	11.8	94.6%	16.0%	12.0%	17.6%	11.70%	18.8%	11.2%	3.53	28.45	18.52	28.36
42	42011012500	153.2	14.4	89.20%	7.20%	5.60%	14.50%	10.90%	26.90%	16.20%	19.23	19.36	24.64	28.07

Digital Divide Index

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
43	42011013702	139.8	11.6	94.90%	17.10%	13.60%	11.30%	6.20%	18.80%	14.90%	9.06	28.55	18.03	28.03
44	42011010202	142.6	14.5	87.5%	13.3%	13.10%	17.0%	4.4%	22.5%	15.8%	4.41	25.92	19.86	27.99
45	42011013301	80.3	10.8	99.10%	11.00%	11.10%	7.20%	3.20%	18.10%	11.80%	41.21	25.99	19.79	27.98
46	42011013701	75.5	13.4	92.0%	18.2%	13.0%	17.5%	4.5%	19.8%	11.8%	3.88	29.29	17.4	27.95
47	42011011500	177.2	15.1	96.90%	13.10%	13.50%	7.50%	9.20%	10.70%	10.10%	47.74	26.43	19.38	27.9
48	42011001100	152.9	13.4	100.00%	13.30%	5.20%	32.80%	25.20%	5.90%	11.30%	3.74	22.67	21.93	27.8
49	42011010100	53.2	7.3	93.30%	19.20%	16.70%	18.60%	5.30%	15.50%	8.70%	2.07	32.31	14.96	27.73
50	42011013800	176.7	13.9	95.50%	17.30%	12.20%	11.70%	8.00%	17.80%	15.00%	9.25	27.31	18.32	27.57
51	42011010902	182.7	14.9	87.50%	15.80%	12.00%	14.70%	17.70%	17.40%	12.10%	3.25	25.75	19.12	27.34
52	42011011905	109.2	18.2	66.50%	13.2%	10.6%	6.0%	7.4%	15.9%	8.7%	55.33	22.88	20.75	27.01
53	42011010304	159.8	0.15	89.20%	6.80%	10.60%	12.60%	2.90%	26.30%	13.80%	22.02	21.81	21.42	26.94
54	42011011200	163	17.2	96.30%	14.30%	5.10%	9.70%	27.10%	15.80%	13.50%	7.92	22.45	20.93	26.91
55	42011010402	166.2	15.3	84.6%	16.8%	10.7%	16.6%	9.5%	19.4%	12.7%	4.04	25.39	18.68	26.8
56	42011012600	181	15.4	56.70%	12.10%	12.10%	26.20%	6.70%	15.10%	16.50%	1.42	21.39	20.45	25.96
57	42011010801	135.2	13.0	95.8%	10.7%	10.3%	10.4%	3.1%	20.9%	12.7%	16.89	24.28	17.970	25.64
58	42011013600	98.5	15.7	93.60%	10.60%	7.20%	6.40%	9.70%	18.80%	8.20%	35.72	22.82	18.95	25.59
59	42011000600	144.1	13.2	100.00%	13.50%	9.30%	17.90%	14.50%	11.30%	12.70%	0.78	25.12	17.21	25.52
60	42011011000	151.4	14.7	98.80%	12.90%	9.80%	5.20%	6.20%	23.40%	11.50%	15.2	24.92	17.35	25.51
61	42011011102	150.2	17.0	84.0%	10.3%	7.2%	5.0%	1.4%	26.4%	9.9%	38.86	21	20.110	25.49
62	42011010401	173.3	12.6	86.10%	16.50%	10.40%	25.60%	1.80%	12.70%	13.30%	2.26	25.18	17.09	25.46
63	42011012800	164	14.4	85.80%	13.80%	10.30%	10.60%	6.00%	17.30%	18.60%	1.89	24.09	17.83	25.42
64	42011013403	110.1	18.5	57.50%	13.60%	13.60%	6.00%	4.10%	18.20%	17.40%	11.03	23.81	17.39	24.93
65	42011013404	66.6	12.6	98.30%	13.50%	13.50%	9.10%	3.20%	16.10%	8.80%	11.59	28.41	13.68	24.6

Digital Divide Index

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
66	42011010500	176.3	16.2	90.30%	14.30%	10.10%	9.90%	8.20%	14.40%	13.60%	7.14	24.43	15.95	24.17
67	42011014000	56.4	11.2	75.50%	9.90%	7.90%	4.20%	14.30%	16.10%	14.00%	13.05	21.9	17.54	24
68	42011010903	155.7	15.1	79.70%	10.10%	9.00%	2.70%	2.10%	24.50%	13.60%	20.83	21.47	17.82	23.98
69	42011011705	90.9	17.3	72.60%	16.30%	7.10%	14.00%	2.60%	16.90%	12.70%	10.11	23.13	16.49	23.87
70	42011012300	196.7	15.2	80.00%	10.60%	9.70%	9.00%	13.30%	18.60%	13.30%	4.33	21.47	17.65	23.85
71	42011011602	142.6	17.7	84.90%	14.40%	12.10%	7.40%	5.20%	17.90%	11.40%	7.42	25.52	14.71	23.81
72	42011013503	86.1	15.2	94.60%	18.50%	18.80%	5.20%	0.60%	13.70%	5.80%	9.31	32.6	9.64	23.8
73	42011013402	64.3	9.6	89.70%	8.20%	6.60%	8.00%	3.20%	24.70%	10.30%	15.5	21.75	17.28	23.72
74	42011011603	129.3	23	87.20%	10.00%	6.60%	5.80%	4.90%	27.90%	12.60%	3.21	21.01	17.09	23.71
75	42011012400	166.6	14.9	96.0%	6.7%	4.0%	14.1%	9.1%	16.7%	16.2%	8.83	18.73	19.34	23.64
76	42011010302	161.8	14.2	83.40%	17.70%	7.40%	8.10%	2.80%	19.00%	14.10%	5.37	23.9	15.5	23.53
77	42011012101	157.8	14.1	100.00%	10.50%	8.80%	6.70%	11.30%	15.10%	11.30%	7.64	23.42	15.14	22.99
78	42011011702	103.5	17.4	79.20%	10.20%	9.80%	5.70%	3.70%	20.10%	11.00%	15.52	22.58	15.7	22.96
79	42011011800	87.7	21.2	87.30%	14.60%	5.70%	7.80%	8.60%	16.00%	12.90%	3.16	23.06	15.04	22.72
80	42011010905	163.8	15.5	94.60%	9.50%	8.20%	8.50%	2.50%	21.50%	13.50%	2.47	22.08	15.59	22.59
81	42011013501	154.4	15.2	88.6%	12.2%	11.0%	3.8%	1.6%	15.5%	10.1%	22.27	24.25	13.96	22.53
82	42011013000	143	27.6	70.80%	11.20%	9.10%	9.80%	2.10%	22.50%	12.70%	4.62	21	16.1	22.4
83	42011010702	171.3	15.2	86.30%	8.00%	5.80%	8.90%	6.50%	18.80%	11.90%	16.4	19.21	17.37	22.39
84	42011010701	104.3	12.2	78.00%	5.30%	5.30%	12.30%	7.30%	24.90%	12.20%	2.01	18.07	18.12	22.34
85	42011012702	168.8	14.4	95.1%	7.8%	10.9%	7.1%	5.3%	21.1%	9.8%	4.35	22.88	14.44	22.15
86	42011011300	163.8	12.5	96.80%	12.90%	10.50%	4.10%	6.00%	14.50%	10.80%	6.12	24.95	12.54	21.83
87	42011012103	117.4	15.6	78.10%	11.30%	7.40%	7.60%	4.50%	19.80%	11.30%	6.14	21.45	14.93	21.74
88	42011012003	120.8	18.8	61.90%	7.40%	7.40%	9.70%	4.80%	21.00%	13.20%	7.41	18.16	16.95	21.48

Digital Divide Index

Ranking	Census Tract	INFA Variables					SE Variables					Digital Divide Index		
		Average Download Speed (Mbps)	Average Upload Speed (Mbps)	Population Without Access to 100/20 Mbps	No Internet Access	No Computer Device	Less than HS degree	Poverty Rate	Age 65+	Disability Rate	Internet Income Ratio (IRR)	INFA	SE	DDI
89	42011012106	98.7	15.1	92.2%	3.7%	4.7%	8.10%	1.1%	19.2%	7.3%	32.28	18.55	16.51	21.36
90	42011010804	155.1	13.5	97.60%	5.70%	6.50%	6.90%	0.00%	17.20%	6.60%	33.87	20.07	15.29	21.26
91	42011010904	142.2	15.1	98.90%	4.40%	4.00%	7.90%	2.20%	21.50%	9.80%	19.2	18.45	16.4	21.22
92	42011012901	182.7	17.1	76.70%	12.00%	4.70%	7.00%	6.70%	24.90%	10.50%	2.43	19.16	15.89	21.22
93	42011013100	151.7	14	88.80%	8.50%	10.00%	6.60%	1.80%	17.80%	8.70%	12.8	22.32	13.34	20.99
94	42011012104	156.7	16.9	63.40%	6.20%	6.50%	9.90%	5.40%	15.10%	17.00%	2.41	16.86	16.21	20.2
95	42011012107	94.9	14.7	100.0%	2.1%	2.1%	4.80%	0.60%	22.8%	12.9%	11.95	17.28	15.76	20.08
96	42011011902	139.8	22	66.90%	5.10%	3.30%	2.90%	5.70%	21.10%	15.60%	8.41	15.14	16.61	19.56
97	42011011400	163.9	13.20%	96.00%	5.60%	2.80%	7.00%	12.00%	14.60%	10.90%	4.62	17.75	14.61	19.46
98	42011012902	148.7	15.8	86.90%	7.7%	8.4%	3.4%	3.6%	19.4%	7.9%	6.71	20.88	12.12	19.26
99	42011010602	162.7	15.8	91.90%	7.8%	2.8%	3.8%	3.7%	17.8%	9.1%	13.56	18.11	13.34	18.68
100	42011010803	169	13.1	100.00%	3.30%	2.90%	4.00%	8.60%	15.00%	10.40%	10.76	17.14	13.85	18.54
101	42011010303	190.7	13.1	90.80%	7.60%	5.20%	8.80%	7.60%	9.00%	9.90%	8.26	18.94	12.48	18.47
102	42011012004	105.4	15.6	97.5%	1.0%	0.6%	4.7%	9.1%	11.1%	9.3%	16.11	15.59	13.35	17.30
103	42011011704	80.5	14.5	91.40%	4.00%	4.00%	4.70%	2.20%	17.00%	9.90%	0	18.46	11.2	17.22
104	42011011703	97.1	18.7	87.10%	7.90%	3.10%	6.80%	2.30%	14.50%	7.30%	3.59	18.83	10.48	16.87
105	42011011903	115.4	17.7	69.6%	4.9%	1.6%	3.4%	9.2%	9.9%	5.9%	6.75	14.84	9.7	14.08
106	42011013502	110.5	18.6	81.40%	1.30%	1.30%	4.20%	6.20%	10.80%	5.00%	8.76	14.38	9.41	13.6
N/A	42011014101	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data

Digital Distress

All Census Tracts - Berks County, PA

Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
42011010202	2239	15.9%	13.3%	18.3%	13.1%	High
42011010402	2403	16.1%	16.8%	11.7%	10.7%	High
42011013200	2012	13.0%	25.4%	17.9%	22.1%	High
42011000800	1241	15.5%	9.0%	31.3%	18.0%	High
42011000900	955	17.5%	24.0%	25.8%	17.5%	High
42011001000	951	15.8%	16.7%	31.1%	7.2%	High
42011001300	991	26.7%	16.8%	44.2%	9.8%	High
42011001400	1389	30.9%	40.2%	49.2%	25.7%	High
42011001700	1030	14.4%	26.4%	28.1%	17.0%	High
42011001900	1011	18.8%	42.8%	38.9%	25.4%	High
42011002200	647	27.0%	17.5%	38.6%	8.5%	High
42011002500	1159	17.0%	37.7%	35.7%	33.0%	High
42011002600	1207	16.7%	24.9%	26.0%	13.3%	High
42011000300	749	19.5%	17.2%	39.1%	6.9%	High
42011000500	1304	22.5%	15.3%	43.0%	9.9%	High
42011011906	1737	14.5%	19.3%	10.4%	17.9%	High
42011010401	52	16.9%	16.5%	16.3%	10.4%	High
42011002002	1152	42.2%	16.0%	49.4%	13.5%	High
42011013503	1616	14.6%	18.5%	10.6%	18.8%	High
42011000400	1270	14.6%	25.4%	36.6%	21.1%	High
42011010100	1937	14.2%	19.2%	10.8%	16.7%	High
42011012001	992	11.2%	23.9%	19.3%	20.0%	High
42011002100	856	19.4%	18.8%	41.6%	16.1%	High
42011000100	2180	24.7%	26.2%	36.8%	19.9%	High

Digital Distress

All Census Tracts - Berks County, PA

Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
42011000200	1685	18.6%	21.1%	28.7%	18.8%	High
42011002900	893	16.2%	26.2%	20.9%	10.8%	High
42011012400	2838	12.0%	6.7%	18.7%	4.0%	Moderate
42011011101	1206	9.0%	20.1%	11.0%	18.5%	Moderate
42011013701	1464	12.0%	18.2%	16.3%	13.0%	Moderate
42011011903	1668	15.7%	4.9%	5.5%	1.6%	Moderate
42011010801	766	5.6%	10.7%	5.0%	10.3%	Moderate
42011013302	2608	5.8%	12.2%	16.6%	10.8%	Moderate
42011014202	1690	6.3%	13.1%	14.4%	12.0%	Moderate
42011014102	1556	9.1%	16.0%	14.8%	12.0%	Moderate
42011014201	1388	10.8%	16.4%	10.2%	15.3%	Moderate
42011013501	1339	7.2%	12.2%	6.4%	11.0%	Moderate
42011012702	1443	8.3%	7.8%	11.3%	10.9%	Moderate
42011012701	1921	7.8%	12.5%	8.1%	12.6%	Moderate
42011011905	1052	6.9%	13.2%	8.0%	10.6%	Moderate
42011013902	1445	3.6%	19.4%	8.8%	9.9%	Moderate
42011002001	484	8.7%	12.4%	25.4%	4.3%	Moderate
42011011300	1129	6.9%	12.9%	7.7%	10.5%	Moderate
42011012600	782	4.9%	12.1%	11.5%	12.1%	Moderate
42011012800	1519	9.0%	13.8%	17.1%	10.3%	Moderate
42011011704	954	15.3%	4.0%	10.5%	4.0%	Moderate
42011001100	1154	19.3%	13.3%	29.9%	5.2%	Moderate
42011001500	1020	16.3%	13.0%	31.7%	7.0%	Moderate
42011001800	1067	8.5%	13.2%	25.6%	15.7%	Moderate

Digital Distress

All Census Tracts - Berks County, PA

Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
42011002300	721	14.8%	9.3%	24.0%	6.2%	Moderate
42011002700	897	5.6%	19.1%	12.9%	14.5%	Moderate
42011010902	1577	9.5%	15.8%	14.1%	12.0%	Moderate
42011011200	1656	17.9%	14.3%	18.7%	5.1%	Moderate
42011011500	1140	11.2%	13.1%	11.9%	13.5%	Moderate
42011012200	1398	9.4%	19.4%	15.8%	13.4%	Moderate
42011000700	1507	27.4%	13.8%	34.7%	8.2%	Moderate
42011013702	1547	10.1%	17.1%	9.9%	13.6%	Moderate
42011010201	1790	5.3%	13.4%	8.9%	11.4%	Moderate
42011012104	1284	16.6%	6.2%	18.5%	6.5%	Moderate
42011013301	1001	10.2%	11.0%	10.7%	11.1%	Moderate
42011010803	2372	21.3%	3.3%	6.3%	2.9%	Moderate
42011013404	1455	3.5%	13.5%	4.3%	13.5%	Moderate
42011011705	1773	6.9%	16.3%	2.5%	7.1%	Moderate
42011013403	1582	7.8%	13.6%	9.6%	13.6%	Moderate
42011013901	1617	10.4%	11.7%	9.0%	10.4%	Moderate
42011010601	1179	7.2%	20.8%	7.5%	20.9%	Moderate
42011011602	1608	5.0%	14.4%	6.0%	12.1%	Moderate
42011011601	2201	7.1%	22.8%	9.8%	19.2%	Moderate
42011012103	823	13.1%	11.3%	8.7%	7.4%	Moderate
42011000600	961	15.5%	13.5%	13.8%	9.3%	Moderate
42011001200	703	9.8%	15.6%	30.4%	9.4%	Moderate
42011010302	1114	9.1%	17.7%	13.5%	7.4%	Moderate
42011001600	869	11.4%	15.1%	36.0%	9.9%	Moderate

Digital Distress

All Census Tracts - Berks County, PA

Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
42011013800	1942	5.0%	17.3%	8.9%	12.2%	Moderate
42011010500	2354	13.9%	14.3%	9.6%	10.1%	Moderate
42011010304	2101	16.0%	6.8%	8.0%	10.6%	Moderate
42011011102	2204	3.9%	10.3%	7.5%	7.2%	Low
42011012106	1527	6.2%	3.7%	8.6%	4.7%	Low
42011012004	2674	8.8%	1.0%	11.7%	0.6	Low
42011012107	1331	2.2%	2.1%	0.0%	2.1%	Low
42011012902	1564	6.2%	7.7%	13.6%	8.4%	Low
42011010602	2216	3.2%	7.8%	9.7%	2.8%	Low
42011010804	1226	6.9%	5.7%	3.8%	6.5%	Low
42011011400	2108	7.4%	5.6%	15.3%	2.8%	Low
42011013100	2025	2.1%	8.5%	4.6%	10.0%	Low
42011010904	1423	8.3%	4.4%	10.7%	4.0%	Low
42011010905	1932	9.7%	9.5%	4.3%	8.2%	Low
42011011000	1858	6.5%	12.9%	8.6%	9.8%	Low
42011012101	741	10.3%	10.5%	14.6%	8.8%	Low
42011013000	2640	11.0%	11.2%	7.5%	9.1%	Low
42011011702	1827	4.7%	10.2%	11.3%	9.8%	Low
42011011800	2220	5.7%	14.6%	14.7%	5.7%	Low
42011012300	1881	8.6%	10.6%	11.6%	9.7%	Low
42011012500	820	11.7%	7.2%	5.1%	5.6%	Low
42011013402	1225	7.6%	8.2%	7.2%	6.6%	Low
42011013600	1723	10.6%	10.6%	16.1%	7.2%	Low
42011014000	2204	3.3%	9.9%	5.2%	7.9%	Low

Digital Distress

All Census Tracts - Berks County, PA

Census Tract	Households	Cellular Data Only	No Internet Access	Mobile Only	No Computer Device	Digital Distress
42011010303	766	5.7%	7.6%	14.9%	5.2%	Low
42011013502	1505	2.7%	1.3%	0.0%	1.3%	Low
42011012003	841	6.2%	7.4%	2.6%	7.4%	Low
42011010701	1180	5.0%	5.3%	1.8%	5.3%	Low
42011012901	1729	8.5%	12.0%	11.3%	4.7%	Low
42011010702	1658	8.0%	8.0%	5.9%	5.8%	Low
42011011703	1415	6.9%	7.9%	5.1%	3.1%	Low
42011011902	1444	5.6%	5.1%	5.8%	3.3%	Low
42011010903	2288	4.6%	10.1%	7.9%	9.0%	Low
42011011603	2402	7.5%	10.0%	8.5%	6.6%	Low
42011014101	No data	No data	No data	No data	No data	No data

Services as Advertised on Broadband Now (Residential)

Zip Codes	Internet Service Provider	Coverage Percentage	Max Download Speed (Mbps) (Up To)	Infrastructure Type	Max Upload Speed (Mbps) (Up To)	Pricing	Service Type (Residential/Business)
17026	Comcast	98.60%	1200	Cable	Not Listed	$50-80	Residential
	T-Mobile 5G Home Internet	39.70%	182	5G Internet	23	$50.00	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	29.30%	15	DSL	Not Listed	$40-74.99	Residential
	Evenlink	96.00%	7	Fixed Wireless	0.769	$49.99-57.99	Residential
17067	Comcast	98.20%	1200	Cable	Not Listed	$50-80	Residential
	T-Mobile 5G Home Internet	56.10%	182	5G Internet	23	$50.00	Residential
	Verizon	78.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Evenlink	99.60%	3	Fixed Wireless	0.769	$49.99-57.99	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
17087	Comcast	98.00%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	64.10%	182	5G Internet	23	$50.00	Residential
	Verizon	31.00%	940	Fiber	880	$39.99-154.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Evenlink	100.00%	4	Fixed Wireless	Not listed	$39.95	Residential
	Armstrong	2.60%	1000	Fiber	20	$90	Residential
17569	Windstream	93.20%	1,000	Fiber	Not listed	$69.99-89.99	Residential
	T-Mobile 5G Home Internet	58.00%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	19.00%	1200	Cable	Not Listed	$50-80	Residential
	Verizon	16.00%	15	DSL	Not Listed	$40-74.99	Residential
	Frontier	2.10%	Not listed	DSL	Not Listed	$50	Residential
	Blue Ridge	99.70%	1,000	Cable	40	$87.95-119.95	Residential
	Service Electric	2.30%	1500	Cable	150	$134.95-144.95	Residential
18011	Verizon	56.00%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	29.50%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	17.90%	182	5G Internet	23	$50	Residential
	Service Electric	85.60%	1,000	Cable	150	$134.95-144.95	Residential
	Astound Broadband Powered by RCN	68.00%	1,000	Cable	20	$14.99-40.99	Residential
	Eastern Time	63.20%	100	Fixed Wireless	25	$34.99-74.99	Residential
	Service Electric	43.10%	1500	Cable		$134.95-144.95	Residential
18031	Verizon	45.80%	940	Fiber	880	$39.99-154.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	20.00%	200	DSL	Not listed	$59.99-69.99	Residential
	T-Mobile 5G Home Internet	1.30%	182	5G Internet	23	$50	Residential
	Service Electric	100.00%	1,000	Cable	150	$134.95-144.95	Residential
	Eastern Time	82.90%	100	Fixed Wireless	25	$34.99-74.99	Residential
	Astound Broadband Powered by RCN	67.40%	1,000	Cable	20	$14.99-40.99	Residential
	Service Electric Cablevision	7.40%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
18041	Comcast	93.20%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	95.50%	182	5G Internet	23	$50	Residential
	Verizon	92.80%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	10.30%	200	DSL	200	$59.99-69.99	Residential
	Service Electric	10.10%	1,000	Cable	150	$134.95-144.95	Residential
18056	Comcast	83.70%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	54.30%	182	5G Internet	23	$50	Residential
	Verizon	98.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric	96.80%	1,000	Cable	150	$134.95-144.95	Residential
18062	Verizon	88.80%	940	Fiber	880	$39.99-154.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	T-Mobile 5G Home Internet	20.20%	182	5G Internet	23	$50	Residential
	Windstream	7.80%	200	DSL	200	$59.99-69.99	Residential
	Service Electric	99.80%	1,000	Cable	150	$134.95-144.95	Residential
	Astound Broadband Powered by RCN	84.60%	1,000	Cable	20	$14.99-40.99	Residential
	Eastern Time	76.20%	100	Fixed Wireless	25	$34.99-74.99	Residential
	Backwoods Wireless	69.10%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Irontron Telephone Co	2.80%	55	DSL	Not listed	$35.99-45.99	Residential
	Service Electric Cablevision	2.00%	1500	Cable	150	$134.95-144.95	Residential
18070	Comcast	100.00%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	98.10%	182	5G Internet	23	$50	Residential
	Verizon	80.00%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
18092	T-Mobile 5G Home Internet	95.60%	182	5G Internet	23	$50	Residential
	Verizon	94.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	2.10%	1200	Cable	Not listed	$50-80	Residential
	Service Electric	100.00%	1,000	Cable	150	$134.95-144.95	Residential
	Eastern Time	53.20%	100	Fixed Wireless	25	$34.99-74.99	Residential
19501	Windstream	99.90%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	51.90%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Blue Ridge	100.00%	1,000	Cable	40	$87.95-119.95	Residential
19503	Comcast	99.60%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	99.60%	182	5G Internet	23	$50	Residential
	Windstream	99.60%	1,000	Fiber	Not listed	$70	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
19504	Comcast	93.30%	1200	Cable	Not listed	$50-80	Residential
	Windstream	95.20%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	61.00%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	9.60%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric	20.30%	1,000	Cable	150	$134.95-144.95	Residential
	Service Electric Cablevision	7.30%	1500	Cable	150	$134.95-144.95	Residential
19505	Comcast	95.40%	1200	Cable	Not listed	$50-80	Residential
	Windstream	98.30%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	49.80%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric	12.90%	1,000	Cable	150	$134.95-144.95	Residential
	Service Electric Cablevision	7.10%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19506	Comcast	94.70%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	85.10%	182	5G Internet	23	$50	Residential
	Verizon	56.50%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Frontier	9.80%	Not listed	DSL	Not Listed	$50	Residential
	Evenlink	18.80%	3	Fixed Wireless	0.769	$49.99-57.99	Residential
19507	Comcast	95.50%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	88.10%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	100	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	29.20%	15	DSL	Not Listed	$40-74.99	Residential
	Evenlink	99.50%	3	Fixed Wireless	0.769	$49.99-57.99	Residential
19508	Windstream	95.90%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	55.20%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	6.50%	1200	Cable	Not listed	$50-80	Residential
	Verizon	9.40%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	97.50%	1500	Cable	150	$134.95-144.95	Residential
	Backwoods Wireless	55.90%	1.5	Fixed Wireless	Not listed	Not listed	Residential
19510	Frontier	89.70%	Not listed	DSL	Not Listed	$50	Residential
	T-Mobile 5G Home Internet	47.90%	182	5G Internet	23	$50	Residential
	Verizon	36.10%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	26.50%	1200	Cable	Not listed	$50-80	Residential
	Windstream	4.40%	1,000	Fiber	Not listed	$70	Residential
	Service Electric Cablevision	97.80%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19511	Windstream	100.00%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	56.70%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	72.60%	1500	Cable	150	$134.95-144.95	Residential
19512	Comcast	84.80%	1200	Cable	Not listed	$50-80	Residential
	Windstream	98.40%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	43.60%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	2.30%	940	Fiber	880	$39.99-154.99	Residential
	Service Electric Cablevision	35.40%	1500	Cable	150	$134.95-144.95	Residential
19516	Comcast	99.20%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	64.10%	182	5G Internet	23	$50	Residential
	Frontier	100.00%	Not listed	DSL	Not Listed	$50	Residential
	Viasat Internet	100.00%	100	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
19518	Windstream	92.90%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	63.90%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	19.00%	1200	Cable	Not listed	$50-80	Residential
	Verizon	12.00%	940	Fiber	880	$39.99-154.99	Residential
	Service Electric Cablevision	95.30%	1500	Cable	150	$134.95-144.95	Residential
	Backwoods Wireless	7.10%	1.5	Fixed Wireless	Not listed	Not listed	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19520	Comcast	42.90%	1200	Cable	Not listed	$50-80	Residential
	Windstream	95.90%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	42.60%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	7.80%	940	Fiber	880	$39.99-154.99	Residential
	Service Electric Cablevision	88.40%	1500	Cable	150	$134.95-144.95	Residential
19522	Comcast	32.70%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	73.70%	182	5G Internet	23	$50	Residential
	Verizon	86.00%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	28.70%	300	DSL	200	$59.99-69.99	Residential
	Frontier	2.80%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	93.30%	1500	Cable	150	$134.95-144.95	Residential
19523	T-Mobile 5G Home Internet	85.20%	182	5G Internet	23	$50	Residential
	Windstream	100.00%	200	DSL	200	$59.99-69.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	63.20%	1500	Cable	150	$134.95-144.95	Residential
19526	Comcast	95.60%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	93.30%	182	5G Internet	23	$50	Residential
	Verizon	97.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Frontier	3.50%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	15.10%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19529	Verizon	92.90%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	T-Mobile 5G Home Internet	6.70%	182	5G Internet	23	$50	Residential
	Blue Ridge	75.60%	1,000	Cable	40	$87.95-119.95	Residential
	Service Electric	12.50%	1,000	Cable	150	$134.95-144.95	Residential
	Service Electric Cablevision	7.60%	1500	Cable	150	$134.95-144.95	Residential
19530	T-Mobile 5G Home Internet	42.40%	182	5G Internet	23	$50	Residential
	Verizon	87.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	5.20%	300	DSL	200	$59.99-69.99	Residential
	Service Electric Cablevision	72.20%	1500	Cable	150	$134.95-144.95	Residential
	Home Net	47.50%	150	Fiber	150	$80-95	Residential
	Service Electric	19.40%	1,000	Cable	150	$134.95-144.95	Residential
19533	Comcast	99.40%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	47.80%	182	5G Internet	23	$50	Residential
	Frontier	74.70%	Not listed	DSL	Not Listed	$50	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	18.40%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	1.30%	1500	Cable	150	$134.95-144.95	Residential
19534	Comcast	57.20%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	73.90%	182	5G Internet	23	$50	Residential
	Verizon	97.50%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric	31.70%	1,000	Cable	150	$134.95-144.95	Residential
	Service Electric Cablevision	13.20%	1500	Cable	150	$134.95-144.95	Residential
19535	Windstream	100.00%	200	DSL	200	$59.99-69.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	87.00%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19536	Windstream	98.00%	1,000	Fiber	Not listed	$70	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	16.70%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	57.80%	1500	Cable	150	$134.95-144.95	Residential
19538	T-Mobile 5G Home Internet	100.00%	182	5G Internet	23	$50	Residential
	Verizon	79.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	10.90%	1500	Cable	150	$134.95-144.95	Residential
	Eastern Time	10.90%	100	Fixed Wireless	25	$34.99-74.99	Residential
19539	Windstream	98.00%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	50.40%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	6.90%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	94.90%	1500	Cable	150	$134.95-144.95	Residential
	Eastern Time	11.60%	100	Fixed Wireless	25	$34.99-74.99	Residential
	Service Electric	7.00%	1,000	Cable	150	$134.95-144.95	Residential
19540	Comcast	53.70%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	94.70%	182	5G Internet	23	$50	Residential
	Windstream	36.40%	1,000	Fiber	Not listed	$70	Residential
	Verizon	67.90%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Frontier	13.30%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	63.2	1500	Cable	150	$134.95-144.95	Residential
	Blue Ridge	43.60%	1,000	Cable	40	$87.95-119.95	Residential
	Backwoods Wire-less	38.30%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Breezeline	1.20%	1000	Cable	Not listed	$39.99-59.99	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19541	Comcast	97.80%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	86.50%	182	5G Internet	23	$50	Residential
	Frontier	79.50%	Not listed	DSL	Not Listed	$50	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	20.20%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	3.20%	1500	Cable	150	$134.95-144.95	Residential
19543	Windstream	99.60%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	61.20%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Comcast	6.10%	1200	Cable	Not listed	$50-80	Residential
	Frontier	4.60%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	97.50%	1500	Cable	150	$134.95-144.95	Residential
	Netlinx Internet	13.10%	100	Fixed Wireless	Not listed	$65-75	Residential
19544	Comcast	94.40%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	36.20%	182	5G Internet	23	$50	Residential
	Verizon	54.60%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Evenlink	87.80%	3	Fixed Wireless	Not listed	$39.95	Residential
19545	Comcast	98.40%	1200	Cable	Not listed	$50-80	Residential
	Windstream	98.40%	1,000	Fiber	Not listed	$70	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	T-Mobile 5G Home Internet	25.90%	182	5G Internet	23	$50	Residential
19547	Comcast	74.10%	1200	Cable	Not listed	$50-80	Residential
	Windstream	94.90%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	58.20%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Verizon	8.60%	15	DSL	Not Listed	$40-74.99	Residential
	Service Electric Cablevision	53.80%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19550	Comcast	95.60%	1200	Cable	Not listed	$50-80	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	T-Mobile 5G Home Internet	16.70%	182	5G Internet	23	$50	Residential
	Evenlink	91.40%	3	Fixed Wireless	Not listed	$39.95	Residential
19551	Comcast	97.30%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	79.80%	182	5G Internet	23	$50	Residential
	Verizon	100.00%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	9.80%	25	Satellite	3	$64.99-159.99	Residential
	Backwoods Wireless	67.30%	3	Fixed Wireless	Not listed	Not listed	Residential
	Evenlink	31.50%	3	Fixed Wireless	Not listed	$39.95	Residential
	Blue Ridge	13.90%	1,000	Cable	40	$87.95-119.95	Residential
	Service Electric Cablevision	1.20%	1500	Cable	150	$134.95-144.95	Residential
19554	Comcast	97.30%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	30.20%	182	5G Internet	23	$50	Residential
	Verizon	48.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
19555	Comcast	99.60%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	98.20%	182	5G Internet	23	$50	Residential
	Verizon	87.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Frontier	21.00%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	19.90%	1500	Cable	150	$134.95-144.95	Residential
19559	Comcast	100.00%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	97.80%	182	5G Internet	23	$50	Residential
	Verizon	49.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Evenlink	100.00%	3	Fixed Wireless	Not listed	$39.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19560	Comcast	99.90%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	43.40%	182	5G Internet	23	$50	Residential
	Verizon	99.10%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	7.70%	1500	Cable	150	$134.95-144.95	Residential
19562	Windstream	100.00%	1,000	Fiber	Not listed	$70	Residential
	T-Mobile 5G Home Internet	59.40%	182	5G Internet	23	$50	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	95.40%	1500	Cable	150	$134.95-144.95	Residential
19564	Verizon	82.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	11.10%	1500	Cable	150	$134.95-144.95	Residential
19565	Comcast	90.20%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	41.20%	182	5G Internet	23	$50	Residential
	Verizon	95.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	4.90%	200	DSL	Not listed	$59.99-69.99	Residential
	Backwoods Wire-less	46.90%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Blue Ridge	39.70%	1,000	Cable	40	$87.95-119.95	Residential
19567	Comcast	95.50%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	94.80%	182	5G Internet	23	$50	Residential
	Verizon	75.10%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	100	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Evenlink	94.20%	3	Fixed Wireless	Not listed	$39.95	Residential
	Service Electic Cablevision	1.90%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19601	Comcast	99.40%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	69.80%	182	5G Internet	23	$50	Residential
	Verizon	99.50%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	4.80%	1500	Cable	150	$134.95-144.95	Residential
19602	Comcast	99.80%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	66.80%	182	5G Internet	23	$50	Residential
	Verizon	98.50%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	1.40%	1500	Cable	150	$134.95-144.95	Residential
19604	Comcast	98.00%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	55.60%	182	5G Internet	23	$50	Residential
	Verizon	99.60%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Service Electric Cablevision	3.00%	1500	Cable	150	$134.95-144.95	Residential
19605	Comcast	99.80%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	70.40%	182	5G Internet	23	$50	Residential
	Verizon	78.20%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Frontier	28.80%	Not listed	DSL	Not Listed	$50	Residential
	Service Electric Cablevision	7.50%	1500	Cable	150	$134.95-144.95	Residential
19606	Comcast	60.90%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	48.60%	182	5G Internet	23	$50	Residential
	Verizon	94.60%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	19.80%	1,000	Fiber	Not listed	$70	Residential
	Service Electric Cablevision	63.30%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residential/Business)**
19607	Comcast	94.50%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	66.40%	182	5G Internet	23	$50	Residential
	Verizon	96.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	2.90%	200	DSL	Not listed	$59.99-69.99	Residential
	Backwoods Wire-less	56.80%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Service Electric Cablevision	23.70%	1500	Cable	150	$134.95-144.95	Residential
	Blue Ridge	2.30%	1,000	Cable	40	$87.95-119.95	Residential
19608	Comcast	99.40%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	89.90%	182	5G Internet	23	$50	Residential
	Verizon	98.00%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Windstream	5.30%	200	DSL	Not listed	$59.99-69.99	Residential
	Backwoods Wire-less	80.00%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Blue Ridge	63.90%	1,000	Cable	40	$87.95-119.95	Residential
	Service Electric Cablevision	8.40%	1500	Cable	150	$134.95-144.95	Residential
19609	Comcast	99.90%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	69.90%	182	5G Internet	23	$50	Residential
	Verizon	98.30%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Backwoods Wire-less	99.90%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Blue Ridge	92.60%	1,000	Cable	40	$87.95-119.95	Residential
19610	Comcast	99.90%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	77.50%	182	5G Internet	23	$50	Residential
	Verizon	98.30%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	Backwoods Wire-less	47.30%	1.5	Fixed Wireless	Not listed	Not listed	Residential
	Blue Ridge	36.00%	1,000	Cable	40	$87.95-119.95	Residential
	Service Electric Cablevision	2.20%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Residential)

Zip Codes	Internet Service Provider	Coverage Percentage	Max Download Speed (Mbps) (Up To)	Infrastructure Type	Max Upload Speed (Mbps) (Up To)	Pricing	Service Type (Residential/Business)
19611	Comcast	100.00%	1200	Cable	Not listed	$50-80	Residential
	T-Mobile 5G Home Internet	67.80%	182	5G Internet	23	$50	Residential
	Verizon	98.70%	15	DSL	Not Listed	$40-74.99	Residential
	Viasat Internet	100.00%	50	Satellite	Not Listed	$49.99-149.99	Residential
	HughesNet	100.00%	25	Satellite	3	$64.99-159.99	Residential
	MAW Communica-tions	9.20%	1,000	Fiber	Not listed	Not listed	Residential
	Service Electric Cablevision	1.20%	1500	Cable	150	$134.95-144.95	Residential

Services as Advertised on Broadband Now (Commercial)

Zip Codes	Internet Service Provider	Coverage Per-centage	Max Download Speed (Mbps) (Up To)	Infrastructure Type	Max Upload Speed (Mbps) (Up To)	Pricing	Service Type (Residental/Business)
17026	Comcast	100.00%	1000	Cable	Not listed	Not listed	Business
	Verizon	20.10%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
	Crown Castle	3.80%	Not listed	Fiber	Not listed	Not listed	Business
17067	Comcast	100.00%	1000	Cable	Not listed	Not listed	Business
	Verizon	79.70%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
	Crown Castle	9.10%	Not listed	Fiber	Not listed	Not listed	Business
17087	Comcast	100.00%	1000	Cable	Not listed	Not listed	Business
	Verizon	42.80%	15	DSL	Not listed	$64.99	Business
	Evenlink	100.00%	4	Fixed Wireless	Not listed	$60.00	Business
	Armstrong	1.10%	1000	Fiber	20	$109.95	Business
	Verizon	0.70%	Not listed	Copper	Not listed	Not listed	Business
17569	Windstream	70.10%	1,000	Fiber	Not listed	$69.99	Business
	Comcast	32.10%	1,000	Cable	Not listed	Not listed	Business
	Verizon	24.20%	15	DSL	15	$40-74.99	Business
	Frontier	3.80%	Not listed	DSL	Not listed	$49.99	Business
	Blue Ridge	98.80%	1,000	Cable	40	$54.95	Business
	PenTelData	100.00%	1,000	Fiber	40	Not listed	Business
	Crown Castle	1.10%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Per-centage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
18011	Verizon	20.70%	15	DSL	15	$40-74.99	Business
	Windstream	67.10%	1,000	Fiber	Not listed	$69.99	Business
	PenTelData	100.00%	1,000	Fiber	40	Not listed	Business
	Lantek	20.20%	10	Fixed Wireless	Not listed	Not listed	Business
	Astound Broadband Powered by RCN	0.30%	1,000	Copper	Not listed	$41.99	Business
	Crown Castle	12.10%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	7.50%	Not listed	Copper	Not listed	Not listed	Business
	Telesystem	1.00%	Not listed	Fiber	Not listed	Not listed	Business
18031	Verizon	67.80%	15	DSL	Not listed	$40-74.99	Business
	Windstream	3.10%	100	DSL	Not listed	$59.99	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Lantek	91.00%	10	Fixed Wireless	Not listed	Not listed	Business
	Crown Castle	35.50%	Not listed	Fiber	Not listed	Not listed	Business
	NetCarrier Telecom	3.40%	Not listed	Fiber	Not listed	Not listed	Business
	Astound Broadband Powered by RCN	3.60%	1,000	Not listed	Not listed	$41.99	Business
18041	Comcast	96.70%	1,000	Cable	Not listed	Not listed	Business
	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Windstream	1.50%	100	DSL	Not listed	$59.99	Business
	Crown Castle	48.40%	Not listed	Fiber	Not listed	Not listed	Business
	PenTelData	Not listed	Not listed	Fiber	40	Not listed	Business
18056	Comcast	80.40%	1,000	Cable	Not listed	Not listed	Business
	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	77.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	40.60%	Not listed	Fiber	Not listed	Not listed	Business
18062	Verizon	72.20%	15	DSL	Not listed	$40-74.99	Business
	Windstream	28.20%	200	DSL	Not listed	$59.99	Business
	Irontron Telephone Co.	2.40%	55	DSL	Not listed	$35.99-45.99	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	34.10%	Not listed	Fiber	Not listed	Not listed	Business
	Astound Broadband Powered by RCN	5.50%	1,000	Copper	Not listed	$41.99	Business
18070	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	75.10%	15	DSL	Not listed	$40-74.99	Business
	Crown Castle	24.50%	Not listed	Fiber	Not listed	Not listed	Business
18092	Verizon	86.90%	15	DSL	Not listed	$40-74.99	Business
	Comcast	1.20%	1,000	Cable	Not listed	Not listed	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	50.30%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Per-centage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19501	Windstream	93.40%	1,000	Fiber	Not listed	$59.99	Business
	Blue Ridge	99.80%	1,000	Cable	40	$54.95	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
19503	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Windstream	92.20%	1,000	Fiber	Not listed	$59.99	Business
19504	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Windstream	83.90%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	20.10%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	8.60%	Not listed	Fiber	Not listed	Not listed	Business
19505	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Windstream	99.60%	1,000	Fiber	Not listed	$59.99	Business
	PenTelData	37.00%	Not listed	Fiber	40	Not listed	Business
	Verizon	0.10%	Not listed	Copper	Not listed	Not listed	Business
19506	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	20.10%	15	DSL	Not listed	$40-74.99	Business
	Frontier	3.80%	Not listed	DSL	Not listed	$49.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
	Crown Castle	8.60%	Not listed	Fiber	Not listed	Not listed	Business
19507	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	56.30%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
	Verizon	4.60%	Not listed	Copper	Not listed	Not listed	Business
19508	Windstream	84.40%	1,000	Fiber	Not listed	$59.99	Business
	Comcast	1.70%	1,000	Cable	Not listed	Not listed	Business
	Verizon	9.20%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	99.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	9.80%	Not listed	Fiber	Not listed	Not listed	Business
19510	Frontier	98.60%	Not listed	DSL	Not listed	$49.99	Business
	Verizon	63.20%	15	DSL	Not listed	$40-74.99	Business
	Comcast	40.40%	1,000	Cable	Not listed	Not listed	Business
	Windstream	20.80%	1,000	Fiber	Not listed	$59.99	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	50.40%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	21.70%	Not listed	Copper	Not listed	Not listed	Business
19511	Windstream	91.50%	1,000	Fiber	Not listed	$59.99	Business
	PenTelData	74.70%	Not listed	Fiber	40	Not listed	Business
	Lantek	100.00%	10	Fixed Wireless	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19512	Comcast	80.50%	1,000	Cable	Not listed	Not listed	Business
	Windstream	100.00%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	3.90%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	65.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	19.30%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	1.10%	Not listed	Copper	Not listed	Not listed	Business
19516	Comcast	95.90%	1,000	Cable	Not listed	Not listed	Business
	Frontier	98.00%	Not listed	DSL	Not listed	$49.99	Business
19518	Windstream	78.00%	1,000	Fiber	Not listed	$59.99	Business
	Comcast	21.70%	1,000	Cable	Not listed	Not listed	Business
	Verizon	10.80%	15	DSL	Not listed	$40-74.99	Business
	CenturyLink	0.30%	940	Fiber	Not listed	$50	Business
	PenTelData	96.60%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	11.20%	Not listed	Fiber	Not listed	Not listed	Business
	Telesystem	0.50%	Not listed	Copper	Not listed	Not listed	Business
	Verizon	0.80%	Not listed	Copper	Not listed	Not listed	Business
19520	Comcast	33.20%	1,000	Cable	Not listed	Not listed	Business
	Windstream	74.60%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	8.50%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	88.90%	Not listed	Fiber	40	Not listed	Business
	Verizon	0.60%	Not listed	Copper	Not listed	Not listed	Business
19522	Comcast	40.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	87.60%	15	DSL	Not listed	$40-74.99	Business
	Windstream	19.00%	300	DSL	Not listed	$59.99	Business
	Frontier	13.50%	Not listed	DSL	Not listed	$49.99	Business
	PenTelData	90.10%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	16.10%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	3.20%	Not listed	Copper	Not listed	Not listed	Business
19523	Windstream	100.00%	100	DSL	Not listed	$59.99	Business
	PenTelData	91.60%	Not listed	Fiber	40	Not listed	Business
19526	Comcast	92.30%	1,000	Cable	Not listed	Not listed	Business
	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Frontier	8.00%	Not listed	DSL	Not listed	$49.99	Business
	Windstream	0.50%	100	DSL	Not listed	$59.99	Business
	Crown Castle	10.20%	Not listed	Fiber	Not listed	Not listed	Business
	PenTelData	3.80%	Not listed	Fiber	40	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19529	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Blue Ridge	93.30%	1,000	Cable	40	$54.95	Business
	PenTelData	99.30%	Not listed	Fiber	40	Not listed	Business
	Verizon	1.40%	Not listed	Copper	Not listed	Not listed	Business
19530	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Windstream	3.20%	300	DSL	Not listed	$59.99	Business
	CenturyLink	0.10%	940	Fiber	Not listed	$50	Business
	Lantek	62.20%	10	Fixed Wireless	Not listed	Not listed	Business
	PenTelData	90.70%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	18.20%	Not listed	Fiber	Not listed	Not listed	Business
19533	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Frontier	90.50%	Not listed	DSL	Not listed	$49.99	Business
	Verizon	3.40%	15	DSL	Not listed	$40-74.99	Business
	Crown Castle	26.00%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	3.60%	Not listed	Copper	Not listed	Not listed	Business
	Xtel	4.20%	Not listed	Fiber	Not listed	Not listed	Business
19534	Comcast	51.70%	1,000	Cable	Not listed	Not listed	Business
	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	28.70%	Not listed	Fiber	40	Not listed	Business
19535	Windstream	100.00%	100	DSL	Not listed	$59.99	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
19536	Windstream	76.00%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	63.90%	15	DSL	Not listed	$40-74.99	Business
	Lantek	64.60%	10	Fixed Wireless	Not listed	Not listed	Business
	PenTelData	45.50%	Not listed	Fiber	40	Not listed	Business
19538	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Lantek	100.00%	10	Fixed Wireless	Not listed	Not listed	Business
	Crown Castle	72.10%	Not listed	Fiber	Not listed	Not listed	Business
	PenTelData	68.80%	Not listed	Fiber	40	Not listed	Business
19539	Windstream	73.90%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	9.10%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Lantek	30.80%	10	Fixed Wireless	Not listed	Not listed	Business
	Crown Castle	19.20%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19540	Comcast	36.60%	1,000	Cable	Not listed	Not listed	Business
	Windstream	43.50%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	53.40%	15	DSL	Not listed	$40-74.99	Business
	Frontier	28.80%	Not listed	DSL	Not listed	$49.99	Business
	Blue Ridge	62.50%	1,000	Cable	40	$54.95	Business
	PenTelData	100.00%	Not listed	Fiber	40	Not listed	Business
	Verizon	2.20%	Not listed	Copper	Not listed	Not listed	Business
	Crown Castle	1.70%	Not listed	Fiber	Not listed	Not listed	Business
	FirstLight	2.80%	Not listed	Fiber	Not listed	Not listed	Business
	Breezeline	2.80%	Not listed	Fiber	Not listed	Not listed	Business
19541	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Frontier	84.20%	Not listed	DSL	Not listed	$49.99	Business
	Verizon	31.40%	15	DSL	Not listed	$40-74.99	Business
	Crown Castle	4.50%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	0.40%	Not listed	Copper	Not listed	Not listed	Business
19543	Windstream	88.30%	1,000	Fiber	Not listed	$59.99	Business
	Comcast	9.90%	1,000	Cable	Not listed	Not listed	Business
	CenturyLink	0.90%	940	Fiber	Not listed	$50	Business
	Frontier	4.10%	Not listed	DSL	Not listed	$49.99	Business
	Netlinx Internet	23.30%	300	Fixed Wireless	Not listed	Not listed	Business
	PenTelData	94.50%	Not listed	Fiber	40	Not listed	Business
19544	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	88.00%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	80.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
19545	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Windstream	92.90%	1,000	Fiber	Not listed	$59.99	Business
19547	Comcast	78.80%	1,000	Cable	Not listed	Not listed	Business
	Windstream	100.00%	1,000	Fiber	Not listed	$59.99	Business
	Verizon	9.80%	15	DSL	Not listed	$40-74.99	Business
	PenTelData	51.60%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	17.50%	Not listed	Fiber	Not listed	Not listed	Business
19550	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Evenlink	98.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19551	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	70.30%	15	DSL	Not listed	$40-74.99	Business
	Windstream	8.50%	1000	Fiber	Not listed	$59.99	Business
	Evenlink	50.50%	4	Fixed Wireless	0.768	$49.99-57.99	Business
	Blue Ridge	11.70%	1,000	Cable	40	$54.95	Business
	CenturyLink	7.40%	Not listed	Copper	Not listed	Not listed	Business
	PenTelData	12.70%	Not listed	Fiber	40	Not listed	Business
19554	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	44.00%	15	DSL	Not listed	$40-74.99	Business
19555	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	71.50%	15	DSL	Not listed	$40-74.99	Business
	Frontier	40.90%	Not listed	DSL	Not listed	$49.99	Business
	Crown Castle	16.00%	Not listed	Fiber	Not listed	Not listed	Business
19559	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	21.20%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business
19560	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	99.00%	15	DSL	Not listed	$40-74.99	Business
	Crown Castle	19.30%	Not listed	Fiber	Not listed	Not listed	Business
19562	Windstream	73.20%	1000	Fiber	Not listed	$59.99	Business
	CenturyLink	1.10%	Not listed	Copper	Not listed	Not listed	Business
	PenTelData	97.80%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Lantek	47.70%	10	Fixed Wireless	Not listed	Not listed	Business
19564	Verizon	100.00%	15	DSL	Not listed	$40-74.99	Business
	Telesystem	60.90%	Not listed	Fiber	Not listed	Not listed	Business
	PenTelData	60.90%	Not listed	Fiber	40	Not listed	Business
19565	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	91.70%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.60%	100	DSL	Not listed	$59.99	Business
	Blue Ridge	40.30%	1,000	Cable	40	$54.95	Business
	PenTelData	40.30%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	9.20%	Not listed	Fiber	Not listed	Not listed	Business
19567	Comcast	100.00%	1,000	Cable	Not listed	Not listed	Business
	Verizon	73.50%	15	DSL	Not listed	$40-74.99	Business
	Evenlink	100.00%	4	Fixed Wireless	0.768	$49.99-57.99	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19601	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
19602	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
19604	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19605	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
19606	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
	Telesystem	1.80%	4	Copper	Not listed	Not listed	Business
	Cogent	0.40%	Not listed	Fiber	Not listed	Not listed	Business
	Affiniti	0.40%	1,000	Fiber	Not listed	Not listed	Business
	FirstLight	0.50%	Not listed	Fiber	Not listed	Not listed	Business
	NetCarrier Telecom	1.00%	Not listed	Fiber	Not listed	Not listed	Business
	Consolidated	0.40%	Not listed	Copper	Not listed	Not listed	Business
	Telefonia USA	0.40%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19607	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
	Telesystem	1.80%	4	Copper	Not listed	Not listed	Business
	Cogent	0.40%	Not listed	Fiber	Not listed	Not listed	Business
	Affiniti	0.40%	1,000	Fiber	Not listed	Not listed	Business
	FirstLight	0.50%	Not listed	Fiber	Not listed	Not listed	Business
	NetCarrier Telecom	1.00%	Not listed	Fiber	Not listed	Not listed	Business
	Consolidated	0.40%	Not listed	Copper	Not listed	Not listed	Business
	Telefonia USA	0.40%	Not listed	Fiber	Not listed	Not listed	Business
19608	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
	Telesystem	1.80%	4	Copper	Not listed	Not listed	Business
	Cogent	0.40%	Not listed	Fiber	Not listed	Not listed	Business
	Affiniti	0.40%	1,000	Fiber	Not listed	Not listed	Business
	FirstLight	0.50%	Not listed	Fiber	Not listed	Not listed	Business
	NetCarrier Telecom	1.00%	Not listed	Fiber	Not listed	Not listed	Business
	Consolidated	0.40%	Not listed	Copper	Not listed	Not listed	Business
	Telefonia USA	0.40%	Not listed	Fiber	Not listed	Not listed	Business

Services as Advertised on Broadband Now (Commercial)							
Zip Codes	**Internet Service Provider**	**Coverage Percentage**	**Max Download Speed (Mbps) (Up To)**	**Infrastructure Type**	**Max Upload Speed (Mbps) (Up To)**	**Pricing**	**Service Type (Residental/Business)**
19609	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
19610	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business
	Cogent	0.40%	Not listed	Fiber	Not listed	Not listed	Business
	Affiniti	0.40%	1,000	Fiber	Not listed	Not listed	Business
	FirstLight	0.50%	Not listed	Fiber	Not listed	Not listed	Business
	NetCarrier Telecom	1.00%	Not listed	Fiber	Not listed	Not listed	Business
	Consolidated	0.40%	Not listed	Copper	Not listed	Not listed	Business
	Telefonia USA	0.40%	Not listed	Fiber	Not listed	Not listed	Business
19611	Comcast	95.20%	1,000	Cable	Not listed	Not listed	Business
	Verizon	92.50%	15	DSL	Not listed	$40-74.99	Business
	Windstream	7.40%	1000	Fiber	Not listed	$59.99	Business
	Frontier	8.30%	Not listed	DSL	Not listed	$49.99	Business
	CenturyLink	7.40%	940	Fiber	Not listed	$50	Business
	Blue Ridge	16.90%	1,000	Cable	40	$54.95	Business
	PenTelData	29.20%	Not listed	Fiber	40	Not listed	Business
	Crown Castle	32.60%	Not listed	Fiber	Not listed	Not listed	Business
	Verizon	9.10%	Not listed	Copper	Not listed	Not listed	Business
	GTT	4.40%	1.5	Copper	Not listed	Not listed	Business
	Zayo	3.10%	Not listed	Fiber	Not listed	Not listed	Business