CARBON COUNTY

Broadband Feasibility Study
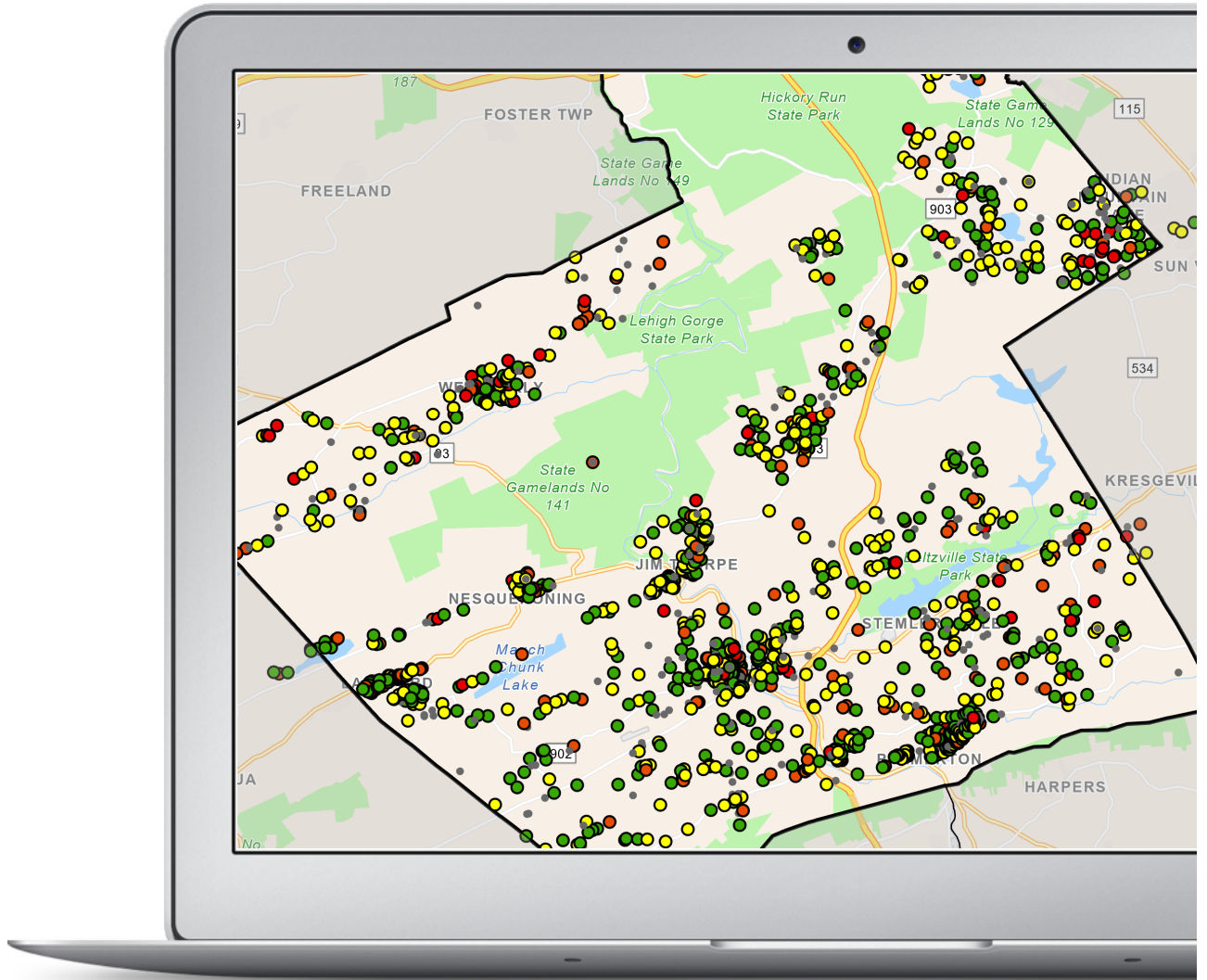

DESIGN NINE
broadband planners

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1 EXECUTIVE SUMMARY

A broadband study of Carbon County began in the winter of 2022 and was completed in the spring of 2022. The study included meetings with stakeholders and interested parties in the county, interviews and meetings with businesses, meetings with County officials, and residential and business broadband surveys. The report has several key sections:

- **Telecom Environment Analysis** – Demographic data, tower and fiber assets in the county, underserved and unserved areas of the county, and types of technology used to deliver Internet in the county..

- **Market, Current and Future Demand Analysis** – A review of current service provider service offerings, speeds, and prices for those services and what bandwidth is available.

- **Residential and Business Market Studies** – In Carbon County, both a residential broadband survey and a business broadband survey was distributed. A strong response was received.

- **Technology options** – This section provides an overview of various technologies, including both broadband fiber and broadband wireless.

- **Financial Projections and Cost Estimates** – Estimates of the costs of various levels of broadband infrastructure improvements in the county..

- **Infrastructure Financing Opportunities** – A discussion of a variety of grant and funding strategies.

The survey data collected as part of this study indicates that residents and businesses are anxious for better Internet service. Because a very large number of often passionate comments were received, they have been included in a separate document.

- 31% of respondents are interested in having access to Gigabit fiber Internet, and 59% would like to have more information about fiber Internet service.

- 88% believe that the County government should help facilitate better Internet access.

- 30% of residents report the quality of Internet service is affecting where they choose to live.

- 96% of businesses indicated that the Internet is important to the success of their business.

- 66% of businesses reported that they need employees able to work from home.

1.1 FUTURE-ORIENTED INFRASTRUCTURE

Affordable high speed Internet is essential to the future growth and prosperity of Carbon County. Over the past twenty years, Internet access has evolved from a luxury to a necessity. School students need Internet access to complete homework and to study. Online shopping can save energy and make it easier for the elderly and homebound to obtain the needs of every day life. Telemedicine and telehealth services and applications is revolutionizing health care, reducing costs, and allowing older citizens to live independently longer.

More and more workers and business people are working from home, either on a part time or a full time basis, and the Covid crisis has highlighted the critical need for reliable high performance Internet service for work, learning, and access to health services.   New work from home job

opportunities are growing rapidly, but most of those jobs require reliable, symmetric Internet service to qualify.

Many business employees are already trying to work more from home more often (e.g. one or two days per week) to reduce travel costs. Some major businesses in other parts of the U.S. are actively planning to have 20% of their workforce work full time from home to reduce employee travel costs and office energy costs. Corporate employees working from home require high bandwidth services to be connected to the office network and to use corporate videoconferencing systems.

66% of businesses responding to the broadband survey indicated that they need their employees to work from home—neighborhoods have become business districts.

Just as communities had to take on the task of building and maintaining roads in the early twentieth century, communities must now have robust digital road systems as a matter of community and business survival.

The communities of Carbon County, with the right broadband infrastructure, can be attractive to an emerging new group of workers, families, and businesspeople who are making choices about where they lived based on family needs and interests, rather than business interests.

This new breed of businesspeople and workers place a high value on the kinds of amenities that contribute to a good quality of life–traditional neighborhoods, vibrant downtown areas, a wide range of cultural and recreation opportunities, good schools, and a sense of place. These businesspeople and their families make relocation decisions based on quality of life only where there is abundant and affordable broadband, because broadband is the enabler of this new approach to personal and work life.

The Pennsylvania Broadband Development Authority, formed in late 2021, will be creating a statewide broadband plan, and Federal authorities charged with distributing Federal funds have now set aggressive broadband infrastructure improvement goals that are focused on fiber-delivered broadband Internet:

- The recommended minimum broadband infrastructure should support 100 Megabits/second download speeds and 20 Megabits/second upload speeds.
- Any infrastructure improvements should be able to be upgraded at minimal cost to 100 Megabits/second download speeds and 100 Megabits/second upload speeds.

Given that the Covid crisis has created increased attention to fiber Internet service, these goals are modest–off the shelf fiber to the home network equipment can deliver Gigabit upload and download speeds today. If Carbon County uses Federal and state funds to develop constructive relationships with existing incumbent service providers, and if necessary, new service providers, most homes and businesses in the county could have Gigabit fiber service within the next four to six years.

1.2 RECOMMENDATIONS

Recommendation	Description	Expected Outcomes
Advocate for improved Internet in the county	The County government can be an influential voice for improved Internet in Carbon County.	Faster expansion of high performance broadband services when the local government speaks out about the needs of businesses and residents in unserved and underserved areas. Service provider investments should be encouraged to be aligned with County community and economic development goals.
Dig Once policies	The County should encourage joint trenching and and shared conduit construction where feasible and practical.	Better use of public right of way (a scarce resource). Lower costs for construction for new broadband infrastructure.
Grant funding	2022 and 2023 represent a significant one time opportunity for Carbon County to leverage ARPA, BEAD, and other state and Federal funds for broadband.	Well-planned collaboration with ISPs on grant opportunities should provide substantial improvements in broadband service in under-served and unserved parts of the county.
Focus on better connectivity for county libraries	There are wide disparities in the cost and Internet speeds available to county libraries.	The County should work with the libraries to pool broadband Internet needs to help facilitate better service at lower prices.

Internet Advocacy

Telecom has always been needed time and attention from local governments; in the twentieth century, local governments gave private companies access to right of way to deploy telecom infrastructure. Throughout the U.S., many ISPs and WISPs are aggressively pursuing collaboration with county governments. Ideally, a such a collaboration combines government oversight, some public funding, and private sector expertise to improve broadband infrastructure in a locality.

These partnerships may include a variety of strategies:

- Collaboration on a grant opportunity,
- Upgrades to existing ISP infrastructure with the assistance of grant funding,
- New fiber infrastructure assistance in unserved and underserved areas of the county.

Selected providers should be evaluated carefully. Providers who want assistance from the County must be able to show technical competency and have a demonstrable track record of managing substantial fiber and/or wireless builds on time and within budget.

Any agreements involving the transfer of grant funds to a private sector provider should have a claw-back agreement. When public funds are transferred to a private company, the County should have the ability to "claw back" the built infrastructure for a minimum of five to ten years.

Conditions for a claw back could include bankruptcy of the ISP, sale to a third party (where substantial profit taking leverages the public funds), poor service, unreasonably high cost of service, and/or poor service reliability.

Recommendation: Carbon County should be a strong and forceful advocate for improved and *affordable* broadband infrastructure and services in Carbon County. A Broadband Advisory Board should be considered, which would meet quarterly and include stakeholders from the broadband providers, healthcare providers, schools and libraries, and County officials.

Recommendation: If a Broadband Advisory Board is formed, a primary responsibility should be encouraging Internet providers to make broadband infrastructure investments that help further the community and economic development goals of Carbon County.

Recommendation: Any collaboration on grant funding should have a well-defined claw back section that provides protection of the public funds from mis-use, business failure, or early asset sale.

Recommendation: If existing incumbent providers in the County are reluctant to work with the County to procure grant funds for improvements in unserved and underserved areas, the County should aggressively seek new ISP entrants to the Carbon County Internet market.

Recommendation: Both health care providers and libraries in the county indicated that senior citizens often struggled to use online services like telehealth. The County should seek Federal and state funding for digital literacy classes and training.

Dig Once Policies

According to the Federal Highway Administration, "90 percent of the cost of deploying broadband is when the work requires significant excavation of the roadway."

The National Broadband Plan has recommended that Congress consider creating "dig once" legislation applying to all future federally funded projects along rights-of-way (including sewers, power transmission facilities, rail, pipelines, bridges, tunnels and roads).

Deploying a mile of fiber can easily cost more than $100,000. The largest portion of construction costs is not the fiber cable itself, but the labor costs associated with burying the fiber in the ground (or attaching it to poles in an aerial network design). These construction costs can account for up to 75% of the total cost of fiber deployment.

Local governments improve the efficient use of public rights-of-way by creating Dig Once ordinances and/or encouraging shared trenching and shared conduit. Running a fiber cable through an existing conduit is 3–4 times cheaper than constructing a new aerial build.

Similarly, it can be extremely expensive to add telecom conduit to a bridge after it has been built. It is much less costly to plan to install a conduit bank on a new or refurbished bridge project, with enough conduit installed to support access and use by multiple broadband providers.

Dig Once ordinances facilitate the laying of necessary infrastructure, namely fiber and conduit, to expand broadband service. On the local level, Dig Once would work as follows: whenever there is street construction planned on locally owned roads and/or highways, the County would inform all private providers in the area in an effort to coordinate the laying of fiber and conduit as part of the construction project. That is, once there is a plan for street construction, there would be a second plan to incorporate the laying of fiber and conduit before the construction begins.

In addition to reducing the cost of broadband deployment, the strategic investment in broadband infrastructure at the time of construction also reduces the damage and disruption to rights-of-way in the future.

Recommendation: County departments that deal with right of way and infrastructure should receive training and information on telecom conduit and fiber installation and management best practices.

Recommendation: County departments should be directed to evaluate all new road and road improvement projects for suitability for coordinated installation of telecom conduit.

Grant Funding

The Federal government has been steadily increasing the amount of grant funding available for broadband infrastructure, with USDA and HUD both having programs that are designed to help underserved and unserved areas construct new broadband infrastructure.

Some Federal grant applications will be due in early fall of 2023, so planning for submitting grant proposals should begin immediately. The County should pay close attention to the statewide broadband plan being developed by the Pennsylvania Broadband Development Authority (PBDA), which has been given an initial allocation of $100 million for local broadband infrastructure improvements. It is very likely that the PBDA will receive additional funds in 2023.

Many of the Federal infrastructure grant programs require a private sector ISP partner. The County should continue to work with the existing providers in the County to develop grant applications where there is a 'best fit' to improve service in unserved and underserved areas of the county. The NTIA IIJA BEAD (Broadband Equity Access Deployment) program represents an additional and substantial funding opportunity.

Grants may not provide sufficient funds to reach the County's long-term goals. Evaluate longer term funding strategies, understanding that Carbon County broadband initiatives will be most successful by recognizing that funding will come from a range of funding sources rather than a single source. Grants, some local funds, and other sources may all be needed to achieve success.

Grants should be used carefully as one-time cash injections to support very specific goals, and private partners receiving the funds should be required to commit to meeting specific spending and service milestones in writing.

Recommendation: Assemble a broadband grant team. Some grants, like the Federal BEAD (Broadband Equity, Access, and Deployment) program, require a significant effort to assemble the required forms, letters, and supporting information needed for the grant application. All grants will require a well-structured technical and operational plan. Team members should have grant-writing experience and should also have a good understanding of the basics of broadband infrastructure.

Recommendation: For grant requests that are focused on a transfer of grant funds to a private sector company, coordination with the private sector recipient is critical. While the recipient may be responsible for developing some or most of the technical detail, many service providers have little or no experience writing grant applications and managing the paperwork required by a grant program. The broadband grant team should be careful not to delegate too much responsibility for developing the grant application to the recipient.

Better Connectivity for County Libraries

Interviews with the various libraries in the county revealed that different facilities have a wide range of Internet speeds and a wide range of costs for Internet service. Librarians characterized bandwidth and speeds in a range from grossly inadequate to barely adequate.

There was a time, in the early Internet days, that some argued the Internet would do away with the need for libraries. Instead, just the opposite is true. Libraries provide critical and essential services to the students, parents, and citizens of Carbon County. These services include access to computers in the library, which are extremely important for low and moderate income households. The computers are frequently used for job searches, filling out job applications, and for online job training. Most of the libraries also provide WiFi Internet access both inside the building and outside the building. During the COVID lockdowns, the WiFi outside access was an important resource.

Recommendation: The libraries should form an Internet Access Task Force to identify current and future Internet needs, compare pricing and speeds from current providers, and as needed, negotiate new contracts with existing providers or alternative providers to get uniformly excellent pricing and adequate bandwidth at all locations.

2 BROADBAND AS ESSENTIAL INFRASTRUCTURE

Governments build and manage roads, but don't own or manage the businesses that use those roads to deliver goods and services. There is true competitive pricing between competing service providers, and little or no government regulation is required.

The tremendous versatility of the Internet and the underlying technology bases now allows services that used to require their own, separate (analog) road system (voice telephony and TV services) to be delivered alongside other services like Internet access on a single, integrated digital road system.

If we managed overnight package delivery the way we manage telecom, UPS and Fedex would only deliver packages to residences and businesses where each delivery firm had built a private road for their exclusive use. We recognize immediately the limitations of such a business model–few of us would have overnight package delivery to our homes because the small number of packages delivered would not justify the expense of building a private paved road.

Before the rise of the automobile, most roads were built largely by the private sector. After cars became important to commerce and economic development, communities began building and maintaining roads because it became an economic development imperative to have a modern transportation system in communities.

Before the rise of the Internet, digital networks were built largely by the private sector. As broadband has become critical to commerce and economic development, communities with digital roads are more competitive globally.

The time has come to recognize that it is inefficient and wasteful to build full duplicated digital road systems, which only raise the cost of telecom services to all public and private users. Networks that share capacity among a wide variety of public and private users have a lower cost of construction and a lower cost of operation–benefiting all users.
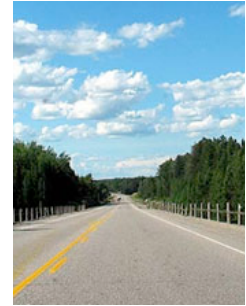
A UTILITY COMPARISON		
SHARED ROADS	**SHARED AIRPORTS**	**SHARED TELECOM**
Historically, roads have been built and maintained by the community for the use of all, especially private firms that want to use them to deliver goods and services.	Airports are built and maintained by a community or region as an economic and community development asset. Both public and private users benefit from the shared use of a single, well-designed airport	Duct and fiber may be installed and maintained by the community and/or a neutral owner/operator for the use of all, including private firms that want to use them to deliver goods and services.
Access to the community road system is provided by parking lots and driveways, built by property owners, developers and builders.	Airport assets like departure gates, ticket areas, and runways provide access to the airline services.	In the digital road system, access across private property to the community–wide network in the public right of way is provided by duct and fiber built by property owners and/or developers and builders.
The local government uses roads only to deliver government services. Local government does not offer services like overnight package delivery.	While the local government or a consortium of local governments typically own the airport facility, the local governments do not offer flight services.	Local government uses the digital transport system only to deliver government services. Government does not offer services like Internet access or Voice over IP.
Private sector businesses use roads so that their own cars and trucks can deliver goods and services to customers. Because businesses do not have to build and maintain roads, all businesses benefit directly by being able to reach more customers at less expense.	Private sector airlines are able to offer competitively priced airfares because of the shared cost of the airport terminal facilities. Each airline does not build its own airport (which would sharply increase the cost of airfare).	Private sector businesses use the digital transport system to deliver goods and services to customers. Because businesses do not have to build and maintain a digital road system, all service providers benefit directly by being able to reach more customers at less expense.
There are no road connection fees, and anyone may connect to the road system for free. Governments pay for the cost of maintaining roads largely from those that use the roads . Fees are proportional to use, from taxes on tires and gasoline.	Businesses and citizens do not pay a fee to access the airport facility. The cost of maintaining the airport facility is paid by the airlines, which bundle that cost into the price of airfare. Fees are proportional to actual use by flying customers. Airlines benefit because they do not have to build, own, and operate the airport directly. Those costs are shared across all users.	Any qualified service provider may connect to the digital road system for a nominal fee and begin to offer services, without any significant capital expense. Network capital and operating costs are recovered by charging service providers a small fee that is based on a percentage of their income from services offered over the system.

2.1 WHAT IS GOVERNMENT'S ROLE?

Successful improvements in broadband access, affordability, and reliability for Carbon County involves several decision points, as outlined in the illustration below. Government has several "first choice" options.

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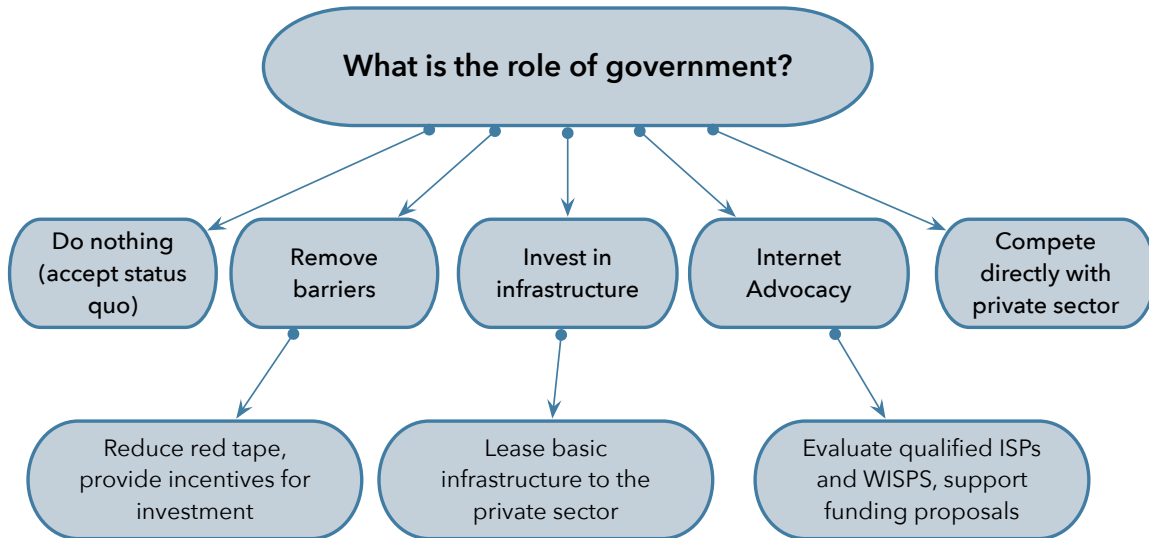
Do nothing is to accept that businesses and residents in the county will have to continue to use whatever is available, despite the cost and bandwidth limitations that limit what many are able to do online.

Government can **remove barriers** to private sector investment. This can be an effective and low cost strategy. Possibilities include reducing permit fees for fiber construction and tower installation, incentives to developers to install conduit and meet-me boxes in new residential and commercial construction, simplified permit requirements for utility pole installation on private property, and identifying areas of residential and business demand and sharing that information with providers.

The County can choose to **make investments in basic infrastructure** (e.g. a fiber network) and make that infrastructure available to the private sector via revenue-generating lease agreements.

The County can **advocate for better Internet infrastructure** and improved pricing with technically qualified and financially stable ISPs and WISPs. Where appropriate, the County can channel grant funds to providers while will use the funds to build and manage new broadband infrastructure. Selected providers should be able to show technical competency and have a demonstrable track record of managing substantial fiber and/or wireless builds on time and within budget.

When communities have chosen the option to **compete directly with the private sector** by offering retail Internet, phone, and TV services lawsuits from incumbents often create difficulty moving forward as well as expensive legal fees (this is not a recommended strategy).

2.2 BUSINESS MODEL TYPES

Traditionally, the telecom services market has been vertically integrated, with telephone and cable companies owning the cable infrastructure (i.e. twisted pair copper cable for telephone, and coaxial copper cable for TV). These companies bundled analog services with their own infrastructure, which made sense when only one service could be delivered over the cable.

American residents and businesses needed two networks: one for voice telephone service, and one for television. The rise of the Internet and associated changes in technology led to digital services (voice, video, Internet) that could be delivered simultaneously over a single cable or wireless connection.

By the early 2000s, it was becoming apparent that it was inefficient and costly to have two competing "retail" cable systems (e.g. telephone, cable) delivering the same content and services—it was only creating higher costs for residents and businesses.

A new business model became possible: wholesale leasing of the cable/wireless infrastructure to private sector service providers, which unbundles the infrastructure from the services. A side effect of this unbundling is that it becomes much easier to determine what a customer is actually paying for a given service: in the vertically integrated 20th century model, with the cost of infrastructure maintenance bundled together with the services, it is much more difficult to determine what a service actually costs.

While a few communities have pursued the retail business model (typically building fiber to the home and business and selling retail Internet and other services directly to customers), most of these retail efforts have been by local governments that are also providing electric service—owning the utility poles is a significant cost advantage not available in most communities.

Within the wholesale business model, there are several different ways to generate revenue.

Public Sector Retail – In this approach, the County builds and owns broadband infrastructure, sells services directly to retail businesses and residents, and competes directly with the private sector. In many states, this is difficult to do because of state statutes that create barriers to municipal ownership. While a few localities have done this successfully, most are electric cities that provide municipal electric service, and own their utility poles, and have bucket trucks and line crews trained to install and maintain cable infrastructure. This is not a recommended strategy for Carbon County.

Internet Advocacy– Many localities in the U.S. have become advocates for improved Internet infrastructure and services on behalf of their businesses and residents.. This advocacy can take a variety of forms, but two of the most common approaches are the leasing of government-owned passive infrastructure like conduit, dark fiber, and/or tower space, or collaboration on grant funding to assist private providers with capital funding for broadband infrastructure improvements.

Features	Municipal Retail	Internet Advocacy
Basic Concept	Generally more difficult to because of possible legal challenges from incumbent providers.	Local government provides access to county-owned infrastructure (e.g. fiber strands, conduit, vertical tower space) and/or assists with grant funding of ISP infrastructure.
Government Involvement	Local government competes directly with the private sector for Internet service.	County involvement is limited to encouraging ISPs to provide better infrastructure and services and/or assistance with funding.
Management	Local government is responsible for management and operations. Most functions could be outsourced to a qualified third party entity.	ISPs responsible for virtually all day to day customer services and support.
Competition	The incumbent telephone and cable providers would compete vigorously against local government service offerings.	Funding to smaller ISPs and WISPs could provide valuable competition to improve customer service, better Internet speeds, and improved affordability.
Service Options	Local government would sell only Internet. Businesses and residents could get TV and voice using their Internet connections.	Providers should be able to improve both service options and offer better pricing for services.
Risks	The primary risk would be lawsuits from incumbent providers.	Grant funds passed directly to providers must include claw back provisions in contracts that give the county access/ownership reversion in the event of a sale or financial difficulties by the ISP or WISP.

3 TELECOM ENVIRONMENT ANALYSIS

A wide variety of assets in Carbon County are identified in the following pages.

The included maps provide detail on the following:

Points of Interest – This information is used to identify key users of Internet services that could benefit from improved broadband infrastructure in the county. K12 schools, public safety facilities, fire and rescue locations, health facilities, and County facilities are included.

LMI/HUD Areas – Low and Moderate Income (LMI) and HUD-eligible areas often qualify for certain kinds of grants not available to other areas.

Towers – Of particular importance are towers, which can be divided approximately into two categories: publicly owned towers and privately owned towers. As a general rule, WISPs (Wireless Internet Service Providers) have found that the lease fees to obtain space on cellular towers is too high to justify the expected revenue from broadband Internet customers in the area around that tower. To improve broadband Internet coverage in rural areas of the county, some fixed point broadband Internet service may be important while construction of fiber to the home infrastructure is underway over the next two to three years..

Fiber Routes – In most areas of the county, fiber routes are typically long haul routes passing through the county to other major metro areas and/or connecting only a few institutional and enterprise customers.

Service Levels – This map illustrates information on served, underserved, and unserved areas in the county obtained from FCC 477 reports. The data is self-reported by the service providers.

Cellular Coverage in the County – This data has been developed from data provided to the FCC by the cellular companies.

3.1 POINTS OF INTEREST

County facilities, municipal facilities, libraries, K12 and higher education facilities, fire and rescue stations, and public safety locations are all candidates to be anchor tenants for fixed point wireless and/or fiber services.
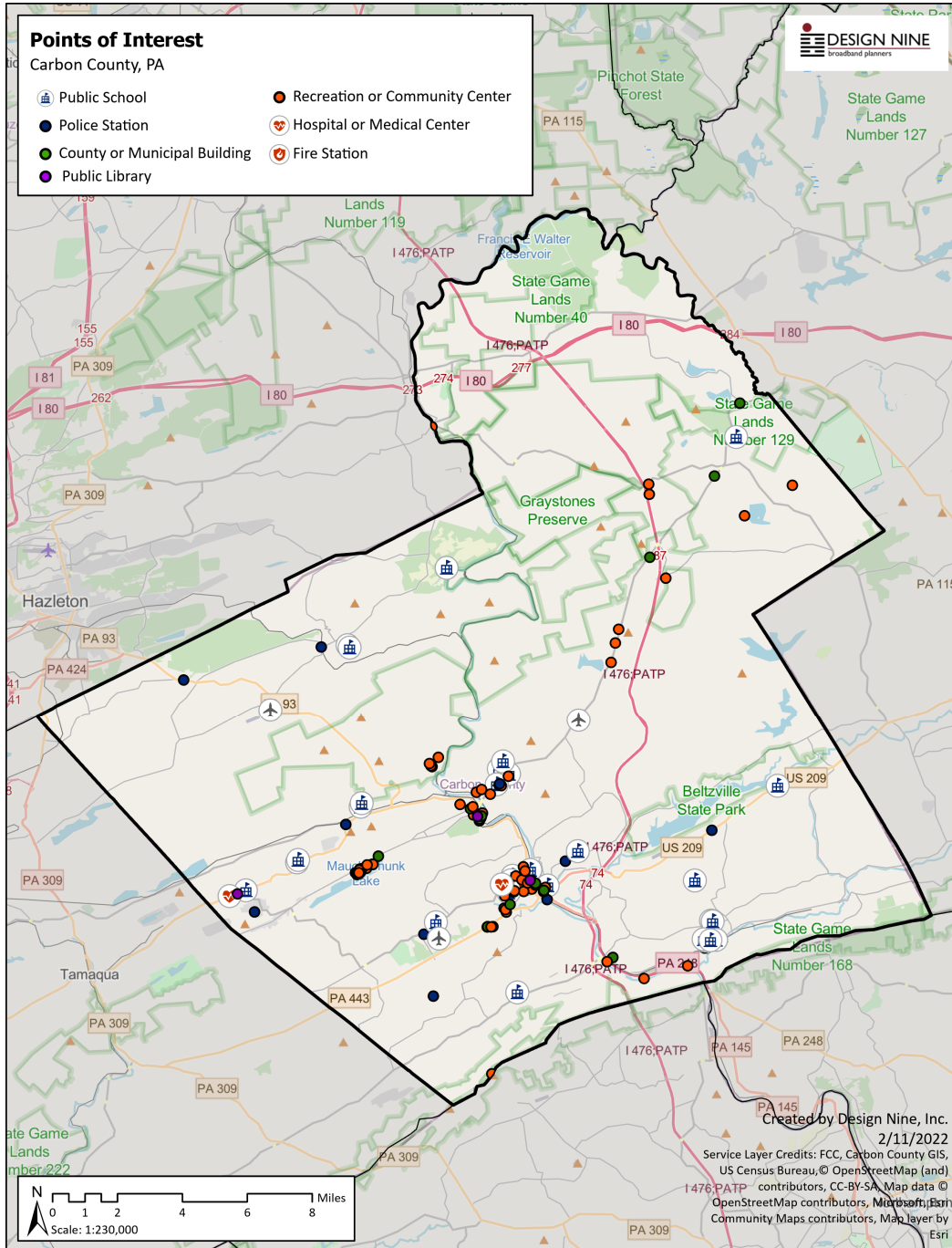
3.2 POPULATION AND DENSITY DISTRIBUTION

This map shows the population and density distribution in the county, by census block. This information can be helpful when working with service providers and when trying to identify what technologies are most appropriate for various areas of the county.

Total Population and Population Density by Census Block Groups (2019 ACS Estimates)
Carbon County, PA

Total Population per Census Block Group (Proportional Symbol)

- 3,418 people
- 569 people

Population Density in people/square mile

- 22 - 150
- 151 - 350
- 351 - 1,500
- 1,501 - 11,351

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Service Layer Credits: US Census Bureau,©
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Microsoft, Esri Community Maps contributors,
Map layer by Esri

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Scale: 1:230,000

3.3 LMI AND HUD ELIGIBLE AREAS

HUD-eligible areas are determined by LMI (Low and Moderate Income) statistics—but can be different from census blocks in the county that meet LMI thresholds.

HUD-eligible census blocks can qualify for CDBG funding for telecom infrastructure projects.

HUD Grant Eligible Census Block Groups
(2011-2015 ACS)

Carbon County, PA

Not HUD Grant Eligible
Could be HUD Grant Eligible
HUD Grant Eligible

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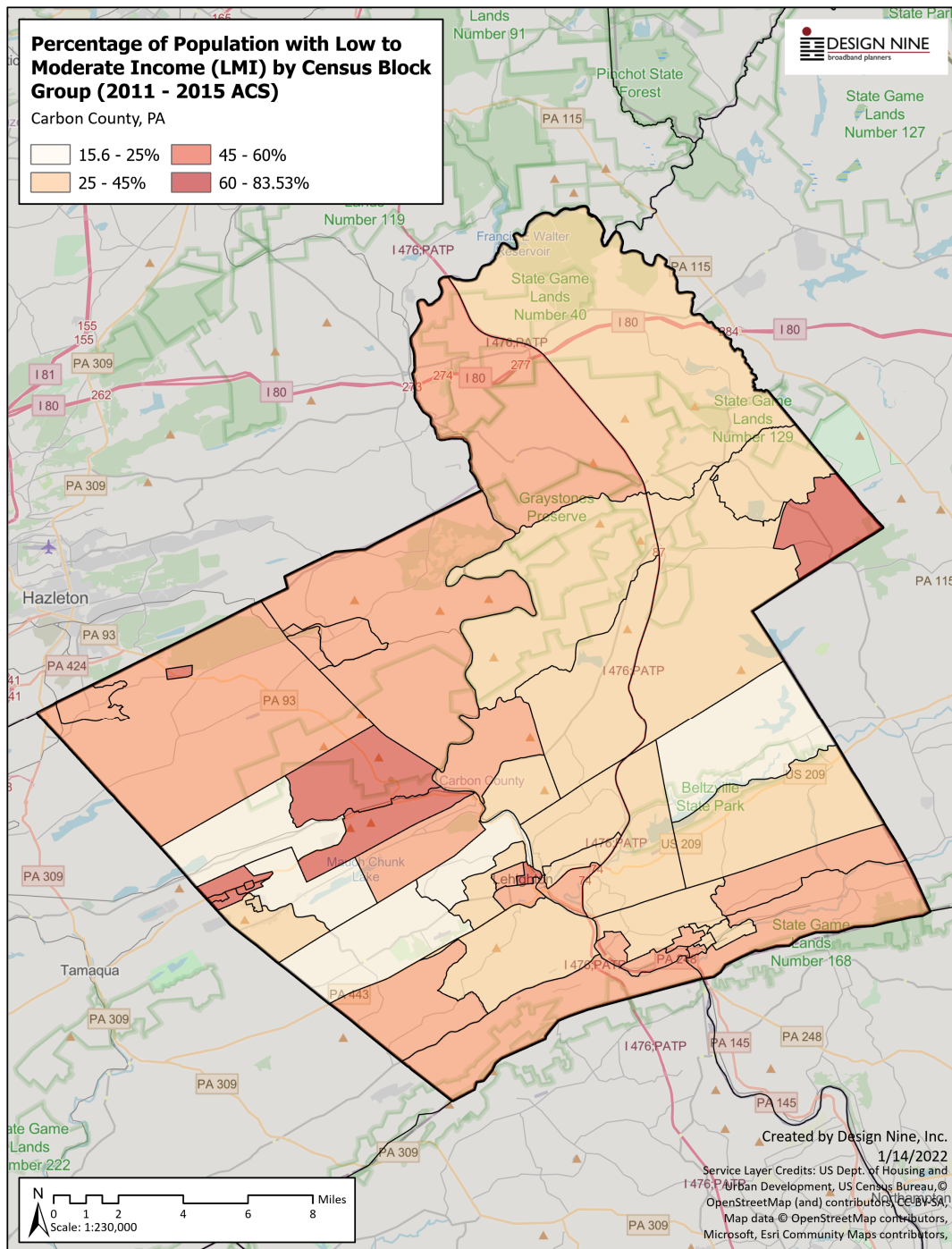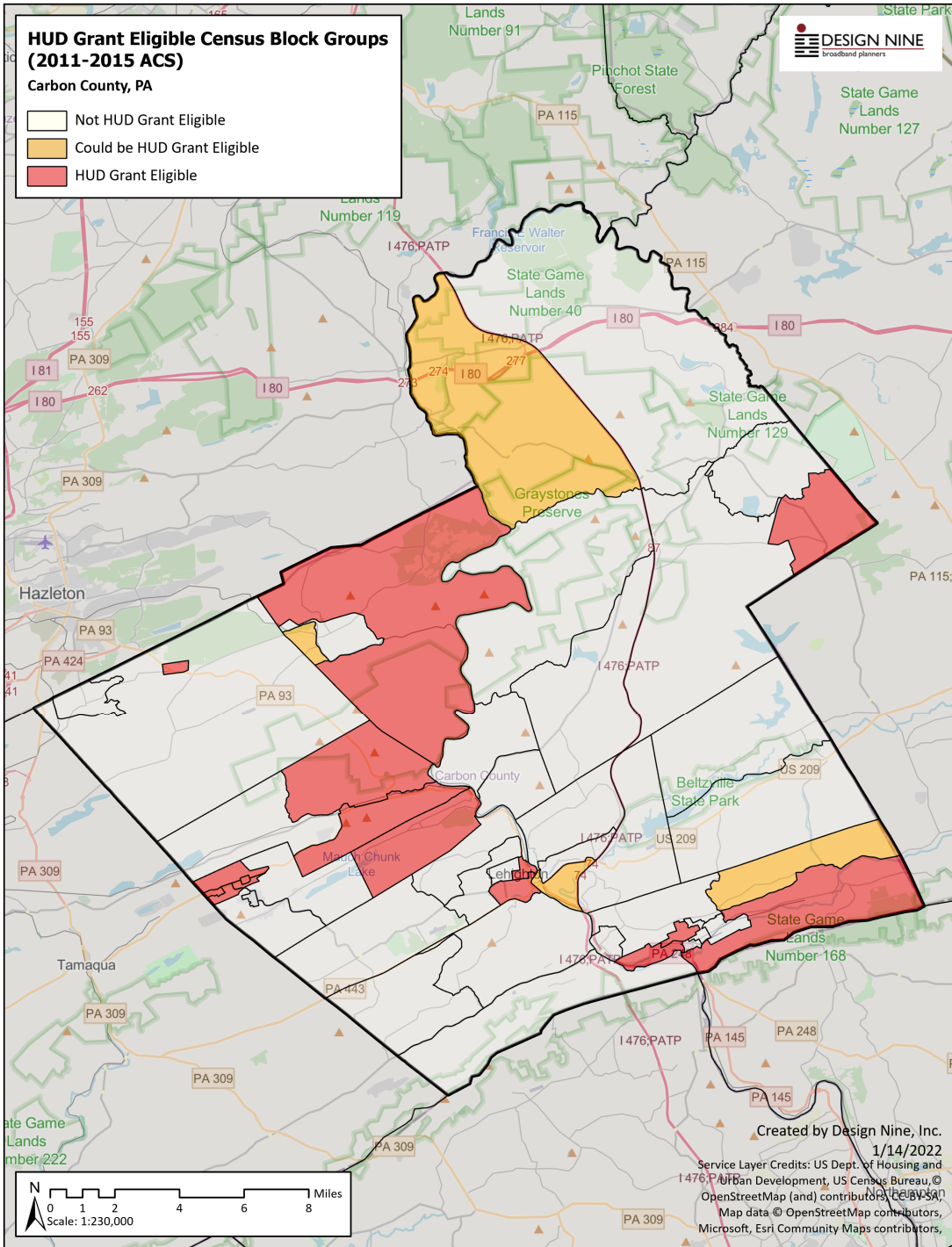
3.4 TOWERS IN THE COUNTY

A variety of publicly-owned and privately owned towers are shown here. Tower data is collected from an FCC database, Carbon County data, and other public and commercial data sources. The FCC database usually includes most towers that are in a locality, and generally includes all or nearly
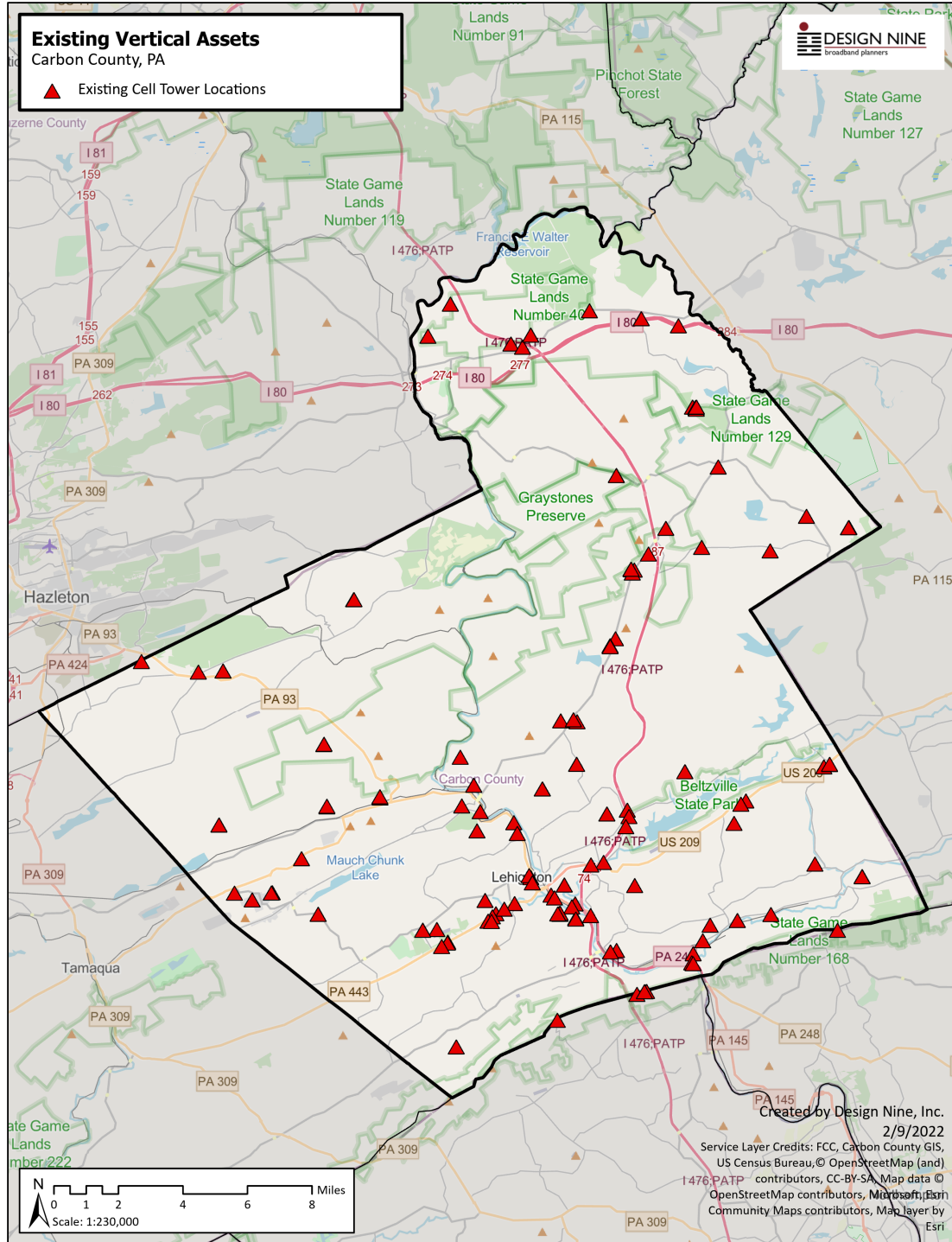
all cellular towers. Tower ownership data is not always updated in a timely manner in the FCC database.

Towers can be divided approximately into two categories: publicly owned towers and privately owned towers. Publicly owned towers can be owned by local government, by regional authorities, or by the state. In the county, privately owned cellular towers are the most common type of tower, and are generally clustered along major roadways and higher density population areas.

Many commercial towers, especially cellular towers, may have tower lease fees that are too high for a WISP (Wireless Internet Service Provider) to make a business case for putting fixed point broadband equipment on the tower. The cost to a WISP for getting on a privately owned tower often has to be checked on a case by case (tower by tower) basis.

This table provides additional detail on tower owners and tower locations. Height of the towers is in meters, as that is the way the Federal Communications Commission requires towers to be registered in their database. Not all companies provide the height of their tower when registering it. Towers that do not have FCC registration numbers are not listed in the FCC database. Information collected on those towers have come from state and/or local sources.

FCC Registration Number	Tower Owner	Height (meters)	Street Address	Latitude	Longitude
Not Listed	Cingular Blue	Not Listed	1020 Blakeslee Blvd. East	40.49086	-75.43762
Not Listed	Verizon	39.6	Off Strohls Valley Road	40.51212	-75.35149
Not Listed	Verizon	39.6	Off FireHouse Rd.	40.52495	-75.31592
Not Listed	County911-EMA	Not Listed	Not Listed	40.54205	-75.40724
10065499	Cingular Wireless	Not Listed	Off Rt93 on PPL ROW	40.55805	-75.53254
10141713	New Cingular Wireless PCS, LLC	48.8	99 Kaysea Ln.- Schleicher's	40.75872	-75.75461
Not Listed	Turnpike	6.1	Lehigh Co.	40.76958	-75.69423
1044370	Crown Castle	1.0	Blue Mtn.- I-476	40.78037	-75.64713
Not Listed	American Tower	45.7	Blue Mtn. I-476	40.78143	-75.64224
Not Listed	Allentown Smsa Limited Partnership	Not Listed	On Blue Mountain, At The Intersection With The Ne Extension Of The Pa Twp., Palmerton, PA 18235	40.78147	-75.64269
Not Listed	Allentown State Police	1.0	Blue Mountain	40.78155	-75.64138
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 0.8 Mi W/O Sr 873 Ss, Palmerton, PA 18071	40.79350	-75.61350
Not Listed	T-Mobile	54.9	On water tower	40.79373	-75.61102
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 0.9 Mi W/O Sr 873 Ss, Palmerton, PA 18071	40.79390	-75.61430
Not Listed	American Tower	Not Listed	600 Rr St, Bowmanstown, PA 18030	40.79970	-75.66220
Not Listed	CellCo Partnership	41.2	321 Lime Street	40.80029	-75.65857
Not Listed	Gregory Aaron	9.8	426 Franklin Ave	40.80368	-75.60746
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 0.3 Mi E/O Seneca Rd Ss, Lehighton, PA 18235	40.80390	-75.76190
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 0.5 Mi E/O Seneca Rd Ss, Lehighton, PA 18235	40.80540	-75.75840

FCC Registration Number	Tower Owner	Height (meters)	Street Address	Latitude	Longitude
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 0.5 Mi E/O Seneca Rd Ns, Lehighton, PA 18235	40.80580	-75.75820
Not Listed	PENCOR	36.9	1660 Blue Mountain Drive	40.80685	-75.52767
1300532	Allentown Smsa Limited Partnership	12.5	380 Sand Quarry Rd, Palmerton, PA 18071	40.81060	-75.60290
1257343	Verizon Wireless Personal Communications Lp	30.8	2685 Mahoning Dr, Lehighton, PA 18235	40.81140	-75.77290
1243771	Carbon County Airport Authority	9.1	Jake Arner Memorial Airport, Lehighton, PA 18235	40.81160	-75.76450
Not Listed	Vertical Bridge Towers	Not Listed	Little Gap Road 0.1 Mi N/O Lower St Es, Kunkletown, PA 18071	40.81240	-75.58670
Not Listed	Capital Telecom	Not Listed	1241 Blakeslee Blvd (Store : 320), Lehighton, PA 18235	40.81460	-75.73210
Not Listed	Vertical Bridge Towers	Not Listed	Little Gap Road 1.1 Mi N/O Lower St Es, Palmerton, PA 18071	40.81470	-75.56680
Not Listed	Zayo	Not Listed	1257 Blakeslee Blvd, Lehighton, PA 18235	40.81480	-75.73410
1237736	SBA Communications Corp	57.9	394 Dieters Hill Road	40.81518	-75.68225
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 10 W/O Centre St Ss, Palmerton, PA 18244	40.81620	-75.67340
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 10 W/O Mall Rd Ns, Lehighton, PA 18235	40.81670	-75.73150
Not Listed	Hpc Development	Not Listed	308 Upper Nis Hollow Dr, Lehighton, PA 18235	40.81710	-75.69150
Not Listed	Hpc Development	Not Listed	308 Upper Nis Hollow Dr, Lehighton, PA 18235	40.81730	-75.69280
1026938	Global Signal Acquisitions	19.0	3 Towers - 308 Upper Nis Hollow Dr, Lehighton, PA 18235	40.81750	-75.69190
Not Listed	Crown Castle	Not Listed	308 Upper Nis Hollow, Lehighton, PA 18235	40.81759	-75.69141
Not Listed	Hpc Development	Not Listed	308 Upper Nis Hollow, Lehighton, PA 18235	40.81760	-75.69140
Not Listed	Allentown SMSA/ Verizon Wireless	46.3	East Mountain Top Road	40.81958	-75.83443
Not Listed	New Cingular Wireless Pcs, Llc	Not Listed	East Mountaintop Road, Summit Hill, PA 18250	40.81961	-75.83450
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 0.3 Mi W/O Ninth Street Ns, Lehighton, PA 18235	40.82000	-75.72440
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 0.3 Mi E/O State Rd Ss, Lehighton, PA 18235	40.82030	-75.68440
Not Listed	Spectrasite	57.9	Rte.#248- Hoffman Salvage	40.82160	-75.68240
Not Listed	Vertical Bridge Towers	Not Listed	Sr 443 0.1 Mi E/O Ninth Street Ns, Lehighton, PA 18235	40.82240	-75.71820
Not Listed	Capital Telecom	Not Listed	457 Mahoning Dr, E, Lehighton, PA 18235	40.82410	-75.73560
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 0.3 Mi W/O State Rd Ss, Lehighton, PA 18235	40.82450	-75.69450
Not Listed	Vertical Bridge Towers	Not Listed	Sr 248 0.4 Mi W/O State Rd Ss, Lehighton, PA 18235	40.82580	-75.69650
Not Listed	American Tower	Not Listed	200 N Market St, Summit Hill, PA 18250	40.82670	-75.87330
1025982	Blue Ridge Cable Technologies	23.2	936 Elm St, Lehighton, PA 18235	40.82920	-75.64690
1241420	Atlas Tower Network	76.2	E. Hazard Street	40.82971	-75.86133
Not Listed	American Tower	Not Listed	14 Tunnel St, Lansford, PA 18232	40.82990	-75.88370

FCC Registration Number	Tower Owner	Height (meters)	Street Address	Latitude	Longitude
1237140	American Tower Corp.	45.7	475 Rock Street	40.83021	-75.68853
1302882	Vertical Bridge Towers	17.3	Covered Bridge Rd / Us-Pa-5091, Palmerton, PA 18058	40.83060	-75.51230
Not Listed		Not Listed	Not Listed	40.83068	-75.51226
Not Listed	Vertical Bridge Towers	Not Listed	Covered Bridge Road, Palmerton, PA 18058	40.83070	-75.51230
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 10 N/O S.Main Lane Ws, Lehighton, PA 18235	40.83150	-75.70740
Not Listed	Cingular Pennnsylvania	37.8	Roof of Lehighton Eld. Housing	40.83409	-75.70824
Not Listed	American Tower	Not Listed	118 N St, Lehighton, PA 18235	40.83480	-75.70920
Not Listed	PTI US Towers I LLC	56.4	2970 Hahn's Dairy Road	40.83679	-75.54000
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 0.1 Mi S/O I-476 Ws, Lehighton, PA 18235	40.83890	-75.67250
Not Listed	Vertical Bridge Towers	Not Listed	I-476 0.5 Mi N/O Us 209 Es, Lehighton, PA 18235	40.83990	-75.66500
1026591	East Penn Broadcasting	18.6	Twr 1 Route 209 Highway, Nesquehoning, PA 18240	40.84470	-75.84360
1026592	East Penn Broadcasting	18.6	Twr 2 Route 209 Highway, Nesquehoning, PA 18240	40.84470	-75.84360
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 0.3 Mi S/O Packerton Dam Dr Ws, Lehighton, PA 18235	40.85380	-75.71560
1264373	Jordan Realty	9.3	Flagstaff Mountain, Jim Thorpe, PA 18229	40.85540	-75.73940
Not Listed	Vertical Bridge Towers	Not Listed	I-476 1.8 Mi N/O Us 209 Es, Lehighton, PA 18235	40.85570	-75.65130
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 10 N/O Oak Dr Es, Lehighton, PA 18235	40.85870	-75.71750
Not Listed	Vertical Bridge Towers	Not Listed	I-476 2.1 Mi N/O Us 209 Es, Lehighton, PA 18235	40.86020	-75.64930
Not Listed	Crown Castle	Not Listed	1252 N. Dennison Road, Nesquehoning, PA 0	40.86058	-75.89203
Not Listed	Allentown Smsa Limited Partnership	Not Listed	0.9 Mi N Of The Industrial Park Blvd./ Route 54 Intersection, Nesquehoning, PA 18240	40.86064	-75.89200
920607	Crown Castle	54.9	Dennison Road	40.86065	-75.89196
1231637	American Tower	60.0	295 Evergreen Road	40.86156	-75.66235
Not Listed	Vertical Bridge Towers	Not Listed	I-476 2.3 Mi N/O Us 209 Es, Lehighton, PA 18235	40.86310	-75.65020
Not Listed	Verizon	Not Listed	Annex Roof	40.86399	-75.73725
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 0.3 Mi N/O Strohls Valley Rd Es, Lehighton, PA 18235	40.86450	-75.58290
Not Listed	Vertical Bridge Towers	Not Listed	Us 209 0.5 Mi N/O Strohls Valley Rd Ws, Lehighton, PA 18235	40.86590	-75.57990
Not Listed	American Tower (Adrian Ferko)	59.4	North Ave.	40.86666	-75.74795
1231629	SBA	76.2	Kovatch Ent.	40.86772	-75.82770
1217435	Spectrasite	40.2	101 Adventure Lane	40.87118	-75.79624

| FCC Registration Number	Tower Owner	Height (meters)	Street Address	Latitude	Longitude
1025759	New Cingular Wireless PCS, LLC	89.0	Bear Mtn. Lookout Tower	40.87349	-75.70011
Not Listed	Kgi Wireless	Not Listed	Maury Rd Bear Mtn Lookout Tower, Jim Thorpe, PA 18229	40.87350	-75.70020
Not Listed	SBA	57.9	1 Adventure Lane	40.87585	-75.74067
1236367	Sba Towers	17.7	1 Adventure Lane, Jim Thorpe, PA 18229	40.87590	-75.74070
1213069	SBA Network	76.2	1255 Deer Lane	40.87962	-75.61545
Not Listed	Firstlight	Not Listed	105 Firehouse Rd, Palmerton, PA 18235	40.88130	-75.52980
Not Listed	PA. Cellular Telephone Corp.	49.4	Firehouse Road	40.88138	-75.52980
Not Listed	Crown Castle	Not Listed	105 Firehouse Road, Palmerton, PA 18071	40.88139	-75.52982
Not Listed	Kgi Wireless	Not Listed	Maury Rd, Penn Forest Township, PA 18229	40.88420	-75.67950
Not Listed	Crown Castle	54.9	Maury Road- Penns Peak	40.88421	-75.67956
Not Listed	American Tower	Not Listed	3 Lehigh Ave, Jim Thorpe, PA 18229	40.88860	-75.74830
Not Listed	Comm. of Pennsylvania - DCNR	Not Listed	State Game Lands-Broad Mtn.	40.89565	-75.82892
Not Listed	Kgi Wireless	Not Listed	Gps Coordinates, Nesquehoning, PA 18255	40.89580	-75.82880
Not Listed	Comm. of Pennsylvania	61.0	State Game Lands-Broad Mtn.	40.89586	-75.82895
Not Listed	American Tower	53.3	Wargo Sub-Div Off T520	40.90367	-75.68818
1025086	Pennsylvania State Police	9.3	Lehighton Remote, Jim Thorpe, PA 18229	40.90420	-75.68080
Not Listed	Spectrasite Communications	58.5	Off Rte. #93	40.92977	-75.90227
Not Listed	New Cingular Wireless Pcs, Llc	Not Listed	State Highway Route 93, Beaver Meadows, PA 18255	40.93006	-75.88764
10140653	New Cingular Wireless PCS	36.6	11 Centtown Road	40.93504	-75.93582
Not Listed	New Cingular Wireless Pcs, Llc	Not Listed	Rr#1 Box 189 E, Beaver Meadows, PA 18201	40.93506	-75.93583
Not Listed	Kgi Wireless	Not Listed	Penn Forest / Vol. Fire Dept., Jim Thorpe, PA 18229	40.93700	-75.65800
878929	Sprint Spectrum	59.4	PennForest Fire Co.	40.93731	-75.65794
Not Listed	American Tower Corp	45.7	Off Rt903- PennForest Streams	40.94075	-75.65476
92719	American Tower	92.1	Off Buck Mtn. Rd.	40.96074	-75.80935
1026840	American Tower	28.0	Sr 4010 & Stage Coach Rd (092719), Weatherly, PA 18255	40.96080	-75.80910
Not Listed	Vertical Bridge Towers	Not Listed	Sr903 300 S/O Smith Road Ws, Kidder, PA 18229	40.96980	-75.64380
Not Listed	Vertical Bridge Towers	Not Listed	Sr903 4.1 Mi S/O Sr534, Kidder, PA 18229	40.97110	-75.64260
1016203	Ccatt	26.5	1.12 Miles Southwest From The Intersection Of Sr 903 And Tell Rd, Christmans, PA 18229	40.97130	-75.64430
Not Listed	PA Cellular Telephone Corp.	85.0	SR0903 and Transfer Rd.	40.97139	-75.64434
Not Listed	Crown Castle	Not Listed	903R Smith Road, Jim Thorpe, PA 18229	40.97153	-75.64450

FCC Registration Number	Tower Owner	Height (meters)	Street Address	Latitude	Longitude
Not Listed		Not Listed	2010 State Route 903	40.97813	-75.63398
Not Listed	MT Pocahontas P.O.A.	42.7	386 Old Stage Road	40.97820	-75.56179
Not Listed	SBA Towers	57.0	Off Stoney Mtn. Road	40.98048	-75.60247
Not Listed	Walters, Stephen M. & Mistu I.	10.1	478 Patten Circle	40.98768	-75.51499
Not Listed	Walters, Stephen M. & Mistu I.	Not Listed	478 Patten Circle	40.98775	-75.51498
Not Listed	Walters, Stephen M. & Mistu I.	Not Listed	478 Patten Circle	40.98778	-75.51472
Not Listed	Vertical Bridge Towers	Not Listed	Sr903 300 N/O Butterwood Drive Es, Kidder, PA 18229	40.98950	-75.62330
Not Listed	American Tower	55.8	Off SR0534 and Navajo Trail	40.99327	-75.53974
1232191	Jeras Corp.	85.3	Jeras Corp.- Off Rte#534	41.01376	-75.65186
Not Listed	Vertical Bridge Towers	Not Listed	Sr903 0.1 Mi S/O Sr534 Es, Kidder, PA 18210	41.01640	-75.59130
Not Listed	Beyond Reach	Not Listed	1 Jordan Rd, Albrightsville, PA 18210	41.01645	-75.59134
1200416	Pa. Turnpike- County EMS	100.6	Big Boulder Mtn.	41.04298	-75.60361
Not Listed	Kgi Wireless	Not Listed	Big Boulder Ski Area, Blakeslee, PA 18624	41.04340	-75.60390
839181	Crown Castle	54.9	Big Boulder Mtn.	41.04341	-75.60386
Not Listed	Allentown Smsa Limited Partnership	Not Listed	5 Mi Ese I-80 & Pa Turnpike, Lake Mountain, PA 18624	41.04342	-75.60353
1026284	American Tower	91.4	Big Boulder Mtn.	41.04355	-75.60572
1208694	Crown Castle	94.5	Big Boulder Mtn.	41.04355	-75.60339
1219239	Pennsylvania Turnpike Commission	18.6	Pocono Maintenace, Ext 35 Off Pa Turnpike, White Haven, PA 18661	41.07230	-75.70570
Not Listed	American Tower	45.7	Mt. Laurel Resort	41.07385	-75.71258
Not Listed	Crown Castle	Not Listed	99 Hospitality Way, White Haven, PA 18661	41.07766	-75.70070
Not Listed	Kgi Wireless	Not Listed	State Rt 940 @ I 476, White Haven, PA 18661	41.07770	-75.70070
Not Listed	Crown Castle	60.7	99 Hospitality Way	41.07780	-75.70049
Not Listed	Commonwealth of PA	42.7	242 Springhill Road	41.07822	-75.76170
Not Listed	American Tower	56.4	Beechcrest	41.08019	-75.61289
1236237	Sba Towers	17.7	Carbon County, Blakeslee, PA 18610	41.08380	-75.63480
Not Listed	SBA Properties	57.9	Moseywood Road	41.08382	-75.63499
Not Listed	Crown Castle	Not Listed	981 State Route 940, White Haven, PA 18661	41.08792	-75.66545
Not Listed	New Cingular Wireless Pcs, Llc	Not Listed	Spring Hill Road Route 940 Road 1, White Haven, PA 18624	41.09239	-75.74797
Not Listed	American Tower	58.5	Spring Hill Road	41.55470	-75.44873

3.5 FIBER ROUTES IN THE COUNTY

Fiber route data is compiled from publicly available sources. Some telecom providers do not share their route data. Most fiber routes, not only in the county but throughout the country have been designed as long haul point to point fiber routes between population centers. This means that even if a fiber cable passes down a rural road or a residential area, it has not been designed for residential or small business fiber to the premises.

Carbon County has mostly north-south long haul fiber routes, with some other shorter routes on in other parts of the county. There is a limited amount of fiber to the home (FTTH) fiber in the county (primarily Kinetic/Windstream), which is not shown on this map. Providers are reluctant to share that information.

Large areas of the county have no long haul fiber availability, which creates a challenge for local and regional WISPs (wireless Internet providers) who need affordable transport and Internet backhaul fees.
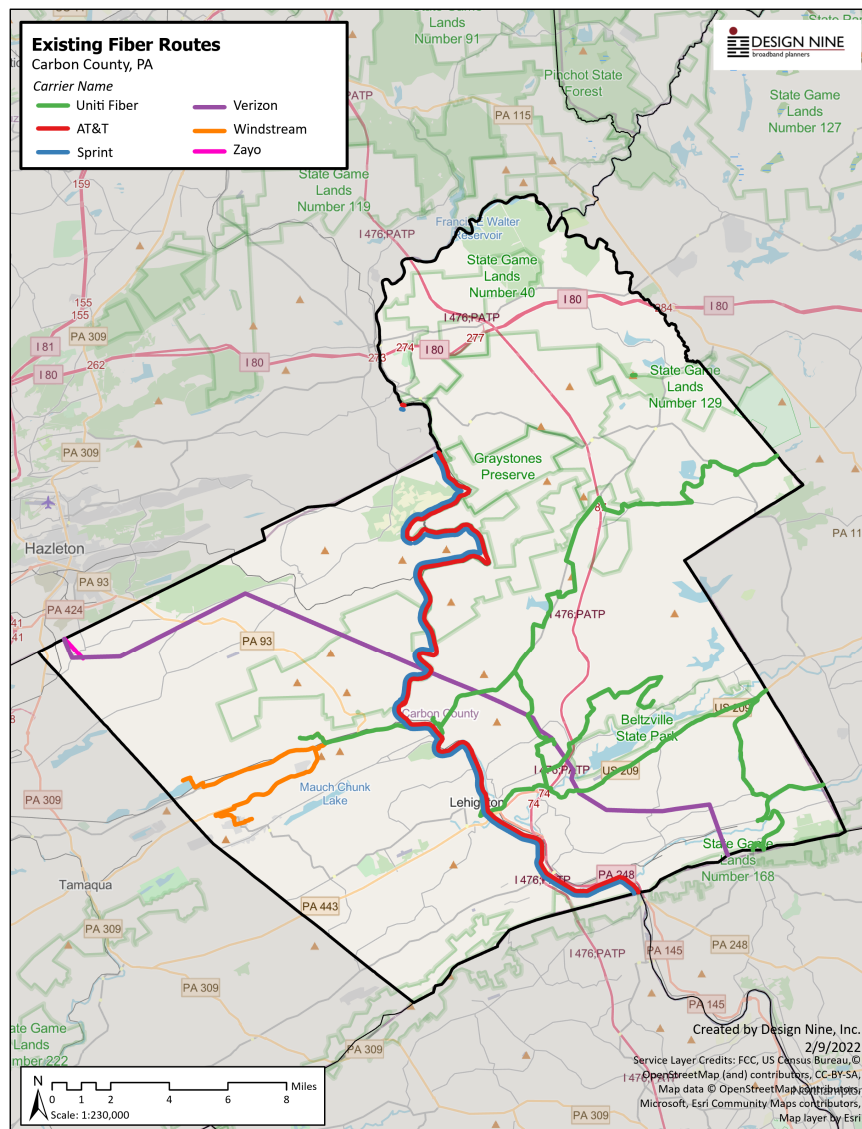
3.6 SERVED, UNDERSERVED, AND UNSERVED AREAS

The areas on the map below have been identified using FCC (Federal Communications Commission) 477 data. The map also shows the three areas (outlined in red) where fiber pilot studies were done as part of this work (see Section 7). Service providers, including incumbent telephone and cable companies, file a 477 report with the FCC to identify where their service is available and at what speed, using the FCC designations :

Unserved – Less than 10 Megabits down/1 Megabit up

Underserved – At least 10 Megabits down/1 Megabit up and less than 25 Megabits down/3 Megabits up

Served – Equal to or better than 25 Megabits down/3 Megabits up

There are two problems with the 477 data:

- The data is self-reported by the providers, who typically report their most optimistic Internet speeds. In practice, customers may not always get the reported speeds.

- A single customer receiving service in a census block means that the provider can indicate that the entire census block is counted. So if one household receives 25/3 service, all households in that census block are counted as receiving that level of service.

Internet Service Level by US Census Blocks (FCC Form 477 June 2020)
Carbon County, PA

- Unserved Blocks (<10/1Mbps)
- Underserved Blocks (>10/1Mbps & <25/3Mbps)
- Fully Served Blocks (>25/3Mbps)

Created by Design Nine, Inc.
1/14/2022
Service Layer Credits: FCC 477, US Census Bureau, © OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, Map layer by Esri

The FCC data shows that there is wide variance in the kind and type of service available to households in the county. Fixed point wireless Internet is not widely available, and in most areas, residents and businesses have access to DSL or cable Internet, or both.

Internet Service Technology Types by US Census Blocks (FCC Form 477 June 2020)
Carbon County, PA

Unserved	DSL and Fiber
Cable Only	DSL, Cable, and Fiber
Cable and Fiber	DSL and Fiber
DSL Only	Fiber Only
DSL and Wireless	DSL and Fiber

Created by Design Nine, Inc.
1/14/2022
Service Layer Credits: FCC 477, US Census Bureau,© OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, Map layer by Esri

3.7 RDOF FUNDING AWARDS

Only a few RDOF funding requests were made in the county. RDOF funds have to be used in underserved and unserved areas of the county, and the awards made cover only a portion of those underserved and unserved areas.
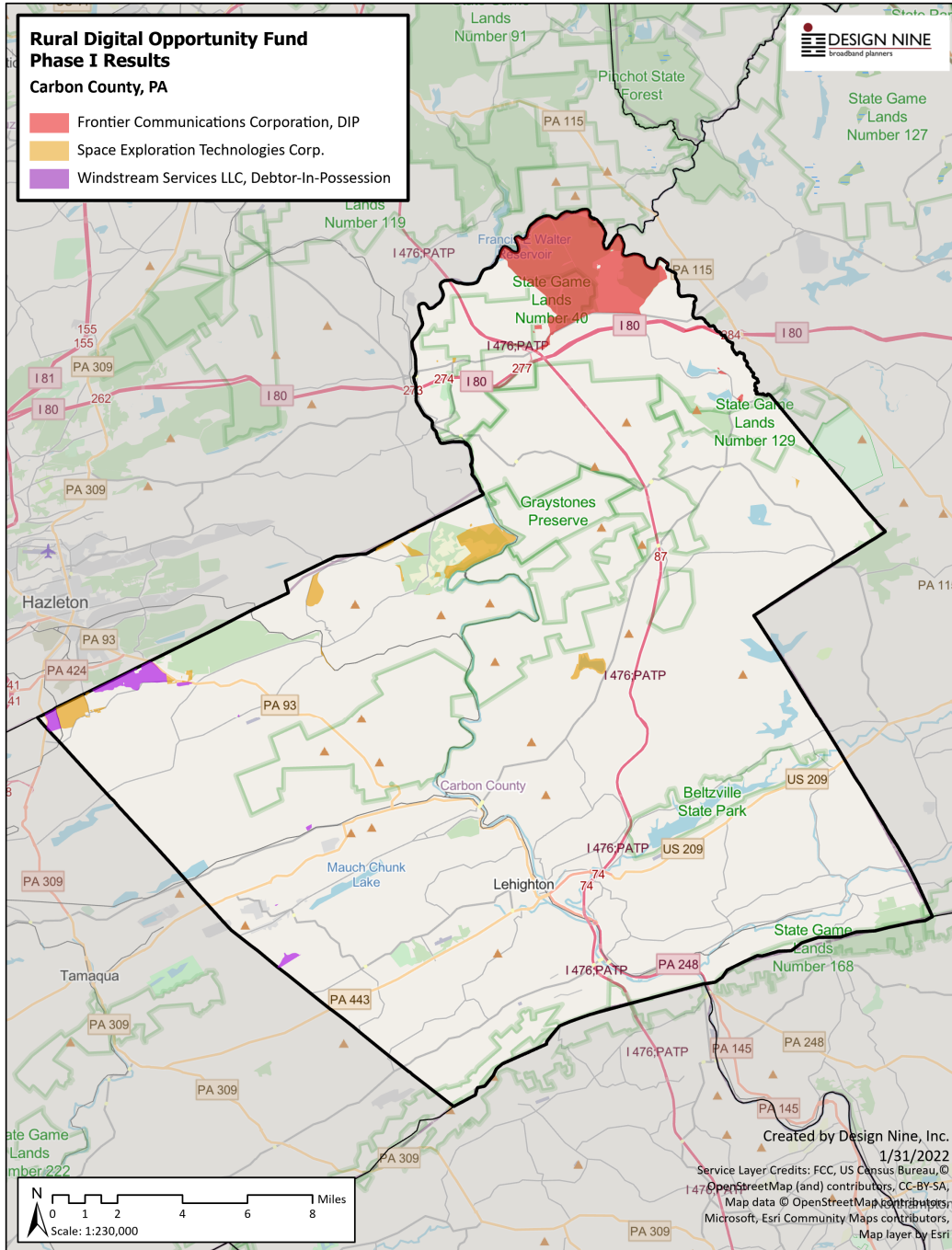
3.8 CELLULAR COVERAGE IN THE COUNTY

The maps below and on the following pages show the cellular voice and data coverage in the county from the four largest providers. The data is taken from the FCC, and the cellular providers self report their coverage– which is often optimistic, especially in rural areas of the county. Cellular data coverage is nearly identical to the voice coverage.

FCC Form 477 Mobile Voice Coverage: AT&T

Carbon County, PA

AT&T Mobile Broadband - GSM-Based Technology
AT&T Mobile Broadband - LTE Technology

**FCC Form 477 Mobile Voice
Coverage: Sprint**
Carbon County, PA

Sprint Mobile Broadband - LTE Technology

N 0   1.5   3   6 Miles

Scale: 1:240,000

Created by Design Nine: 2/07/2022
Credits: FCC,data.pa.gov, Esri, HERE, Garmin,
SafeGraph, METI/NASA, USGS, EPA, NPS,
USDA, Esri, NASA, NGA, USGS

FCC Form 477 Mobile Voice
Coverage: T-Mobile
Carbon County, PA

T-Mobile Broadband - CMDA-Based Technology
T-Mobile Broadband - LTE Technology

FCC Form 477 Mobile Voice Coverage: Verizon Wireless

Carbon County, PA

Verizon Wireless Mobile Broadband - LTE Technology

Scale: 1:240,000

N 0 1.5 3 6 Miles

Created by Design Nine: 2/07/2022
Credits: FCC,data.pa.gov, Esri, HERE, Garmin,
SafeGraph, METI/NASA, USGS, EPA, NPS,
USDA, Esri, NASA, NGA, USGS

FCC Form 477 Mobile
Broadband Coverage: AT&T

AT&T Mobile Broadband - LTE Technology

AT&T Mobile Broadband - GSM Technology

**FCC Form 477 Mobile
Broadband Coverage: Sprint**

■ Sprint Mobile Broadband - CMDA-Based Technology
■ Sprint Mobile Broadband - LTE Technology

DESIGN NINE
broadband planners

N 0   1.5   3   6 Miles
Scale: 1:240,000

Created by Design Nine: 2/07/2022
Credits: FCC,data.pa.gov, Esri, HERE, Garmin,
SafeGraph, METI/NASA, USGS, EPA, NPS,
USDA, Esri, NASA, NGA, USGS

FCC Form 477 Mobile Broadband Coverage: T-Mobile

- T-Mobile Mobile Broadband - CMDA-Based
- T-Mobile Mobile Broadband - LTE Technology

Created by Design Nine: 2/07/2022
Credits: FCC,data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, Esri, NASA, NGA, USGS

**FCC Form 477 Mobile
Broadband Coverage: Verizon Wireless**

Verizon Wireless Mobile Broadband - CMDA-Based Technology

Verizon Wireless Mobile Broadband - LTE Technology

Scale: 1:240,000

Created by Design Nine: 2/07/2022
Credits: FCC,data.pa.gov, Esri, HERE, Garmin,
SafeGraph, METI/NASA, USGS, EPA, NPS,
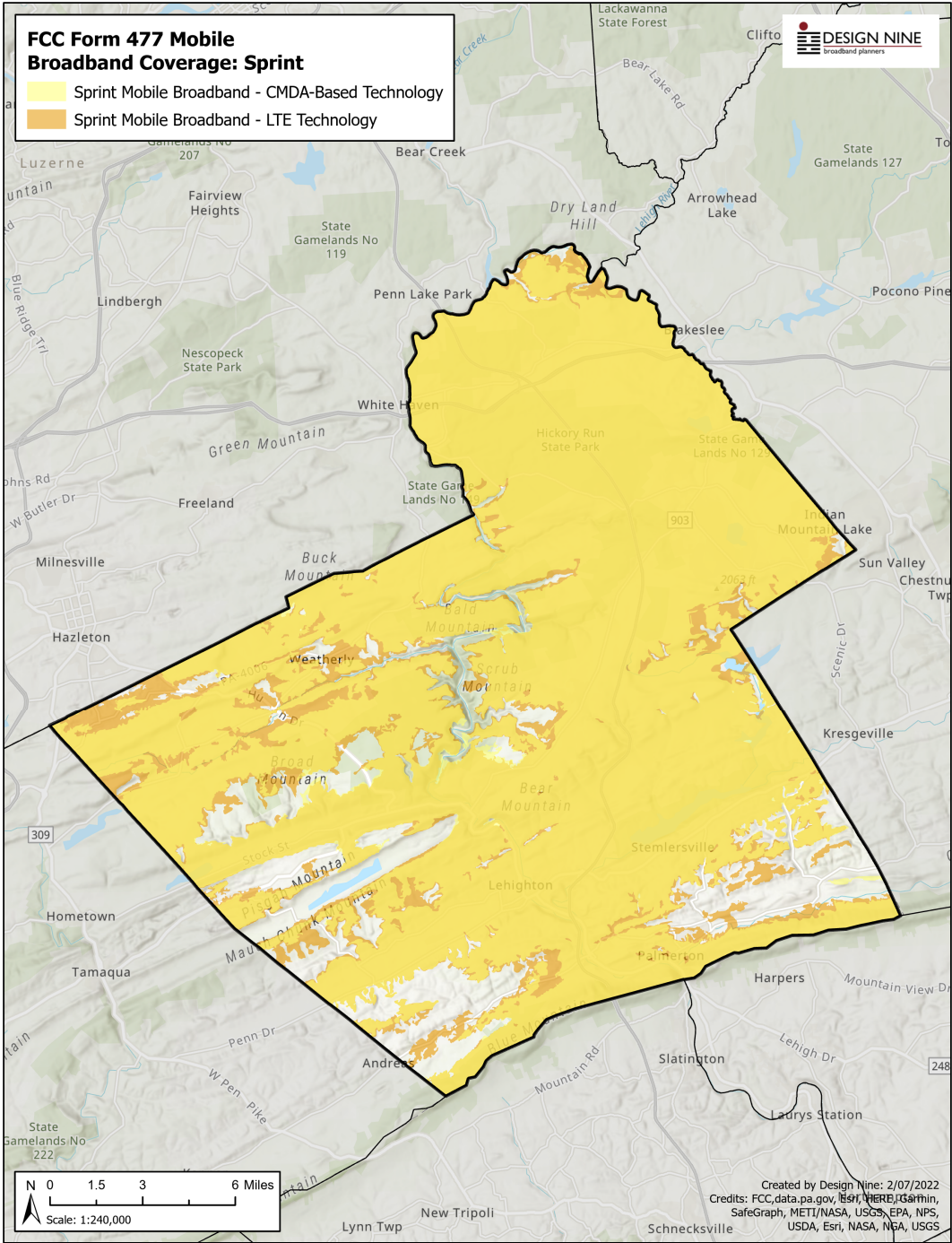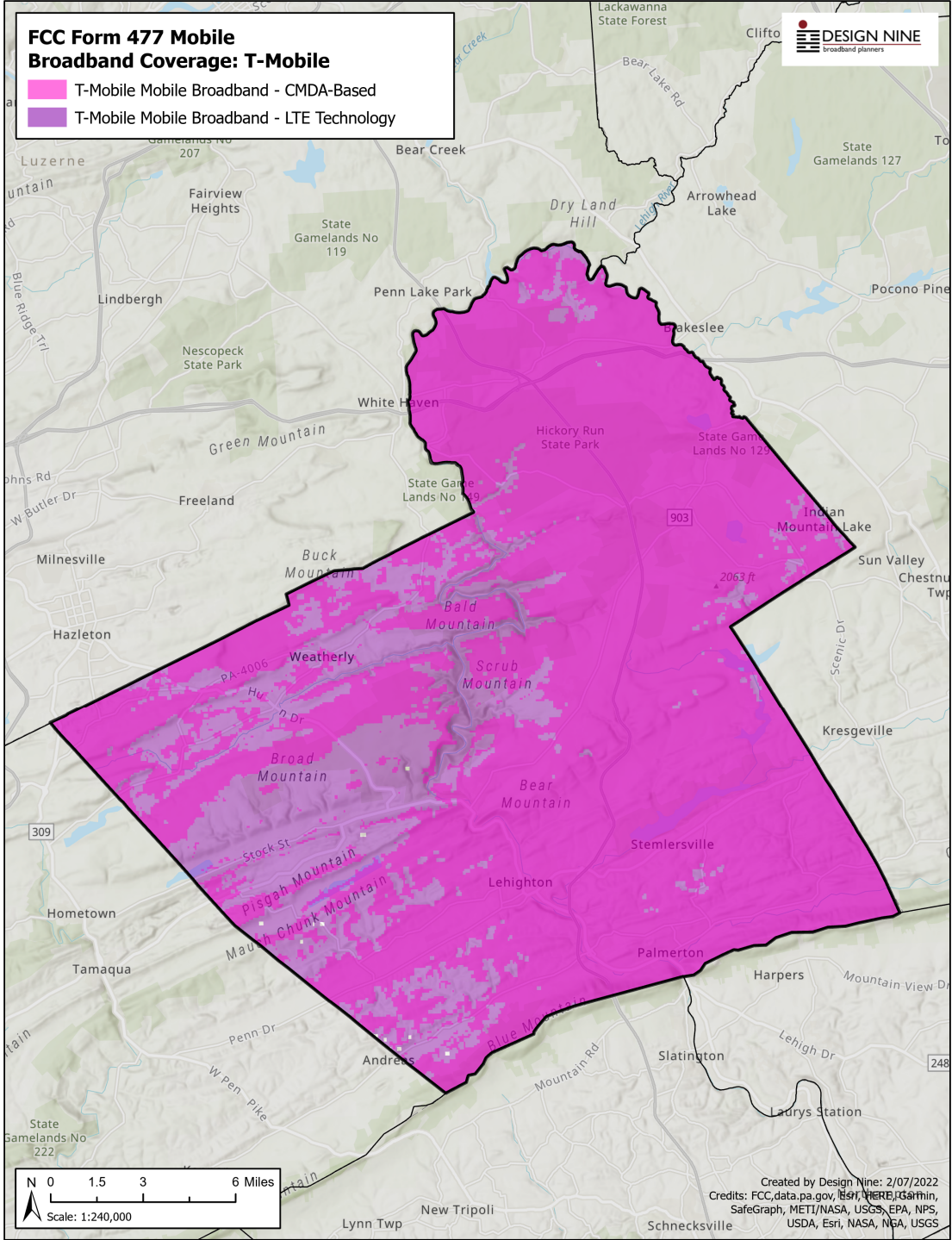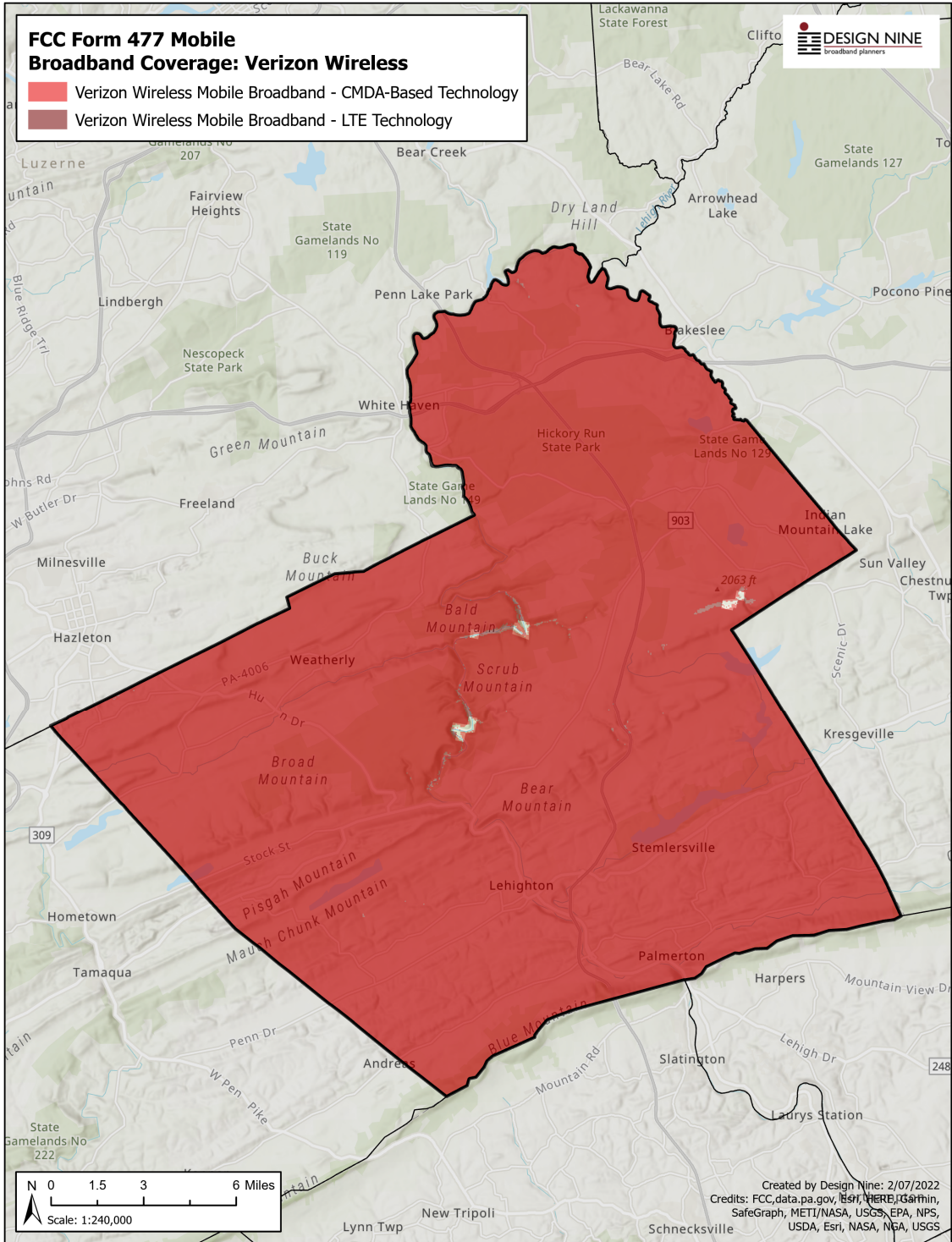USDA, Esri, NASA, NGA, USGS

4 CURRENT AND FUTURE DEMAND ANALYSIS

4.1 COMMUNITY OUTREACH AND DEMAND ASSESSMENT

As part of this study, numerous meetings were held with stakeholders, interested parties, Internet providers, and schools and libraries. Participants in the meetings included:

- Internet Service providers and phone and TV providers
- Health care providers
- Libraries and schools
- County, town, and township officials
- Interested citizens and business people

Findings from those meetings included:

- Some fiber to the home is being deployed in a few areas of the county, but it is not widely available.
- A recommendation was made that the County should consider convening a Broadband Advisory Board that included representatives from both the public and private sector.
- Hospitals in the county indicated they had adequate service today but indicated that more middle mile fiber that offered diverse path routing would enable them to obtain Internet from multiple providers, giving them improved resiliency and redundancy for critical online health systems.
- The hospitals would like to do offer more telehealth services, but indicated that some patients did not have an Internet connection that supported the needed two way video at sufficient quality. Health care officials said improved home broadband was a critical need.
- A related telehealth concern was that between 18% and 20% of Carbon County residents are senior citizens, and many of them have digital literacy challenges (i.e. need help learning to use telehealth and telemedicine services).
- Overall, Carbon County had a high percentage of health care patients using online health portals offered by health care providers.
- Librarians echoed the concerns of health care providers that senior citizens in the county needed assistance with digital literacy training so that seniors could take better advantage of online services of various kinds.
- An interesting data point emerged in the meeting with libraries—many citizens relied on the library for printing material obtained from the Internet, and the cost of providing printing services was often a strain on library budgets.
- Librarians also indicated that many library visitors did not have Internet connections at their place of residence, and relied heavily on the computers and Internet access at the library.

- There are wide disparities in what the individual libraries pay for Internet service and how much bandwidth each library has. Bandwidth among the libraries ranged from entirely inadequate to barely adequate. There is a need for better communications and coordination of Internet costs for the libraries. Given the small number of libraries in the county, the incumbent providers could easily provide superior service and subsidize the entire cost as a corporate charitable contribution.
- Ebook lending is very popular at the libraries, and many patrons take advantage of the service. None of the libraries lend ebook devices (e.g. a Kindle or similar device).
- Younger patrons of the libraries are heavy users of the WiFi services at the libraries for homework and distance learning.
- ISPs in the county were generally satisfied with the services that they offer, but the comments collected from residential and business surveys indicate that there is some dissatisfaction among some of their customers, with numerous comments about cost, poor service, and slow Internet speeds.

4.2 HOW MUCH BROADBAND IS ENOUGH?

Bandwidth needs for the past several years have been growing by an estimated 30% per year and show no sign of slowing.

This means residential and business bandwidth needs are doubling every three years.

As computers and associated hardware (e.g. video cameras, audio equipment, and VoIP phones) become more powerful and less expensive, new applications and services are continually emerging that drive demand for more bandwidth.

"Next generation" is the term used to describe future planning for network connectivity and infrastructure. Next-generation broadband reaps substantial benefits. There are several key benefits of Next-generation broadband:

- Dramatically faster file transfer speeds for both uploads and downloads.
- The ability to transmit streaming video, transforming the Internet into a more visual medium.
- The means to engage in true-real time collaboration.
- The ability to use many applications simultaneously.
- The ability to maintain flexible work schedules by being able to work from home on a part-time or full-time basis.
- The ability to obtain health-related services for an occasional illness and/or long term medical services for chronic illnesses.

Clearly, consumers have a strong interest in a visual medium from when and wherever they are. YouTube is the second most popular search engine after Google, which demonstrates the need to support the infrastructure to transmit streaming video. In addition to video streaming, true real-time collaboration also provides an effective way for people to interact from wherever they are. People can engage in a two-way real-time collaboration so that fruitful, visual conversations can be held between friends, family, business associates from the state, country, or internationally.

Because of fiber networks, employees have the capability of working from home. Findings suggest that if all Americans had fiber to the home, this would lead to a 5% reduction in gasoline use, a 4% reduction in carbon dioxide emissions, $5 billion in lower road expenditures, and 1.5 billion commute hours recaptured.

In Carbon County today, many residents and businesses are still relying on copper-based services. The bandwidth tables on the following pages show what is likely to be needed over the the next several years in terms of bandwidth. The existing copper infrastructure is going to become a limiting factor in economic development.

4.3 JOB AND WORKFORCE CHALLENGES

There are many areas and communities in the county that can be attractive to an emerging new group of businesspeople and entrepreneurs that typically are well-educated, own their own businesses or work for large global corporations, and are making choices about where they lived based on family needs and interests rather than business interests.

This new breed of entrepreneurs and workers places a high value on the kinds of amenities that contribute to a good quality of life, such as traditional neighborhoods, vibrant downtown areas, a wide range of cultural and recreation opportunities, good schools, and a sense of place.

These businesspeople and their families make relocation decisions based on quality of life only where there is abundant and affordable broadband, because broadband enables this new approach to personal and work life.Most residents and businesses in the county currently have, at best, Internet service that meets the FCC definition of "fully served," which is 25 Megabits down/3 Megabits up bandwidth. Some more recent grant programs are finally pushing higher speeds, with 100 Mbps down, 20 Mbps up as a more realistic target (and now virtually required to obtain Federal grant funds).

However, what has become painfully clear during the Covid pandemic is that this definition of "fully served" is not adequate to support many kinds of work from home activities. During the Covid lockdown, it was common to have both spouses trying to work from home while K12 and/or college age children were also trying to use video-heavy distance learning resources.

When home-based workers need to connect to a corporate VPN (Virtual Private Network), bandwidth requirements can increase even more.   Work from home and business from home activities should have, at a minimum, a symmetric service of at least 10 Megabits download and 10 Megabits upload speeds.   Higher speed service could include service levels like 25 Megabits down/10 Megabits up. The critical requirement is an upload speed that supports work from home.

If the goal is to enhance business access to broadband, there can be no upper limit on the definition of broadband.   Saying that broadband (as an example) is 5 Megabits/second of bandwidth or 10 Megabits/second is to tell the residents and businesses in the county that there will be limits on their work and job opportunities.

Broadband is a community and economic development issue, not a technology issue.   The essential question is not, "What system should we buy?" or "Is 5G wireless better or cheaper than fiber?" Instead, the question is:

"What do businesses of and home-based workers of Carbon County need to be able to compete globally over the next thirty years?"

In short, the county today has "little broadband" in the form of DSL limited cable modem service, along with a very limited amount of "big broadband" in the form of fiber to some businesses and residents. To close that gap between the FCC definitions and what the county needs to support future work opportunities and to support K12 and higher education school work, the county will need to work closely with existing and new Internet providers to reach the following goals:

Broadband Services, Technologies, and Needs

BROADBAND SERVICE	TARGET DATE	TECHNOLOGY	WHERE NEEDED
25 Mbps download 3 Mbps upload	2023	Copper wireline and some wireless	As much of the county as possible, given funding constraints. Large areas of the county that have cable Internet meet this as of mid-2022.
100 Mbps download 20 Mbps upload	2024	Copper wireline, some fiber	In many locations in the county. This is the new Federal minimum standard for grant funding, and grant scoring prefers new fiber deployments.
1 Gbps download 1 Gbps upload	2023	Fiber	In most business and commercial areas
100 Mbps download 100 Mbps upload	2024	Fiber	Available to a minimum of 50% of residents and businesses in the county
1 Gbps download 1 Gbps upload	2025	Fiber	In nearly all areas of the county.

Two key concepts are important to consider:

"Broadband" is not the Internet

Bandwidth is not a fixed number

Broadband and "the Internet" are often used interchangeably, but this has led to much confusion. Broadband refers to a delivery system, while "the Internet" is just one of many services that can be carried on a broadband network. The challenge for the County is to ensure that businesses and homes have a broadband network with sufficient bandwidth to deliver all the services that will be needed and expected within the next three to four years, including but not limited to "the Internet."

The economic impact can include the following effects:

- Difficulty retaining some existing businesses. As business bandwidth needs continue to increase over the next several years, some businesses may need to move out of the area to ensure that they have the right bandwidth to support their business operations.
- Difficulty attracting new businesses. New businesses interested in some of the advantages of the county, like low cost of living, good recreational opportunities, and good workforce ethic, may be deterred by the cost and limited bandwidth available, and therefore choose other areas to locate.

- Difficulty keeping younger workers and families in the county. Younger workers and families tend to be heavy users of Internet services, and real-estate agents are reporting that younger house buyers are reluctant to live in areas with poor Internet service. **Note that a significant percentage of respondents to the residential survey (30%) indicated that Internet availability or lack of it was affecting where they choose to live.**
- Reductions in real estate value. Homes with poor Internet service are more difficult to sell, leading to lower prices, negatively impacting County revenue from property taxes.

4.4 BUSINESS BANDWIDTH NEEDS

The table below shows bandwidth consumption for several types of businesses and a projection of the bandwidth needed 5 and 10 years out. The Covid pandemic has had the effect of dramatically increasing the number of home-based works and has also affected business travel decisions. More and more businesses will invest in high definition (HD) quality business videoconference systems to reduce the need for travel and to maintain high quality communications with a dispersed workforce.   These HD systems require substantial bandwidth; a two-way HD video conference requires 20-25 Mbps during the conference, and a three-way conference requires 30-35 Mbps during the conference.

Business Bandwidth Needs

	LARGE BUSINESS		SMALL BUSINESS		HOME BASED WORKER	
DESCRIPTION	A larger business with about 50 workstations.		A small business with 10 to 15 employees, and 7-10 workstations.		One or two people working from home.	
	Concurrent Use	Mbps	Concurrent Use	Mbps	Concurrent Use	Mbps
Telephone	20	5	5	1.5	2	0.5
Credit Card Validation	4	4	1	1		0
Security System	1	5	1	2	2	2
Internet	50	500	7	10.5	2	20
VPN Connection	20	100	5	50	2	5
Data Backup	5	7.5	1	10	2	10
Web Hosting	1	2		0		0
Workforce Training (online classes)	5	20	1	10	2	10
HD Video-conferencing	20	125	2	20	2	10
Totals		**768.5**		**105.0**		**57.5**
5 YEARS FROM NOW	3-10 Gbps		250-500 Mbps		100-200 Mbps	
10 YEARS FROM NOW	10 + Gbps		2-4 Gbps		500-750 Mbps	

As more workers are moved to home-based offices, the business location must provide network access (Virtual Private Network (VPN)) to employees working from home.   These home-based workers will make extensive use of videoconferencing to attend routine office meetings remotely and to enhance communications with co-workers, including videoconferences with other home-based workers in the company. A VPN network providing remote access to just two or three home-based employees could require 50 Mbps of bandwidth during normal work hours.

4.5 RESIDENTIAL BANDWIDTH NEEDS

The table below depicts the bandwidth needed for typical residential services which are available now or will be available in the near future. The Covid pandemic has illustrated the shortcomings of cable Internet services, in which the upload and download speeds are highly asymmetric.

For home-based workers, upload speeds need to be equal to or nearly equal to download speeds. Current cable Internet systems are not able to deliver symmetric or near symmetric service. Today's shared networks (cable and wireless in particular) rely on the "bursty" nature of traffic to provide services to end users. If all end users were consuming their advertised maximum bandwidth, today's cable and DSL networks would grind to a halt.

Residential Bandwidth Needs

	RESIDENTIAL DAYTIME		EARLY EVENING		EVENING & LATE NIGHT	
DESCRIPTION	Work from home, K12 distance learning and home schooling, telemedicine, streaming video		Increased Internet use as children arrive home from school and employees from work.		Peak television and Internet use. Multiple TV's are on, phone and computer being used.	
	Concurrent Use	Mbps	Concurrent Use	Mbps	Concurrent Use	Mbps
Telephone	1	0.25	1	0.25	1	0.25
Work From Home	1	10	1	10	1	10
HD TV	1	4	2	8	2	8
Security System	1	2	1	2	1	2
Internet	1	1.5	1	1.5	2	3
Online Gaming	0	0.25	1	5	2	10
VPN Connection	0	0	1	2	1	2
Data Backup		0	1	5	1	5
Telehealth	1	4	1	4	1	4
Distance Learning/ home schooling		0	1	10	1	10
Videoconferencing		0		0		0
Average needed bandwidth		**15-25**		**25-35**		**20-35**
Five years from now	50-75 Mbps		60-90 Mbps		50-100 Mbps	
Ten years from now	150-300 Mbps		200-350 Mbps		175-250 Mbps	

Existing cable modem network users are overwhelming the digital cable networks that were upgraded as little as three or four years ago, and the firms have had to artificially reduce the bandwidth available for certain kinds of high bandwidth services (e.g. peer to peer file sharing). Some cable providers have even run into capacity issues with the TV portion of their networks, and some consumers have observed that some HD TV channels have been so highly compressed that picture quality has been noticeably degraded.

4.6 CURRENT AND FUTURE USES AND SERVICES

When analyzing future service needs, it is important to take into account ALL services that may be delivered over a broadband connection. Broadband is not a service – it is a delivery medium. Using roads as an analogy, broadband is the road, not the trucks that use the road. Internet access is a service delivered by a broadband "road," and that Internet service is just one of many services that are in demand. Today, congestion on broadband networks is not due just to increased use of email and Web surfing, but many other services.

This means that current DSL, wireless, and cable modem services are completely inadequate for future needs. Current DSL offerings are in the range of one Mbps to three Mbps for most residential users, three Mbps to five Mbps for business DSL users, and there are severe distance limitations on DSL. Higher bandwidth is possible, but as the DSL bandwidth goes up, the distance it can be delivered goes down.

Typical wireless broadband (not cellular data service) offerings are in the range of 5 Mbps to 20 Mbps download speeds, and some providers do advertise higher speeds. In practice the actual upload and download speeds can vary substantially, depending on tree cover, terrain, and distance from the tower. Some wireless providers are rolling out advertised 20-40 Mbps services (download) and 3-5 Mbps upload to meet the required FCC 25/3 minimums.

Across the U.S., current average download bandwidth for cable modem services is typically 25-80 Mbps, with cable companies promising much more using the phrase "up to..." to obscure actual bandwidth being delivered. Download speeds on cable Internet systems continue to much lower, with speed tests regularly showing highly asymmetric upload speeds as much as 10-20 times lower than the download speeds.

The highly asymmetric bandwidth (unequal download/upload speeds) of copper-based cable and DSL as well as fixed point wireless continues to highlight the long term superiority of fiber connections, which can and do deliver symmetric bandwidth (equal upload/download speeds). Another key advantage of fiber networks is the ability to upgrade capacity simply by replacing the equipment–properly installed fiber has a useful life span of fifty years or more.

The challenge for the area is to ensure that the businesses, residents, and institutions have a telecommunications infrastructure in place that will meet future needs.

Distance learning, entertainment, and video conferencing are three major applications of internet video. Distance learning from home with live video feeds requires high-performance two to five Mbps connections in the near term, the next two to four years. Over the next four to seven years, there will be many distance-learning courses that will incorporate live HD two-way video feeds, enabling students to participate in classroom discussions at a much higher quality level. Distance learning could be an important home-based application for workforce training and retraining.

U.S. homes now have more than half a billion devices connected to the Internet, according to a study by the NPD Group. Furthermore, the average number of connected devices per household is 10 and growing rapidly. This is more than three times the average number of people per household.
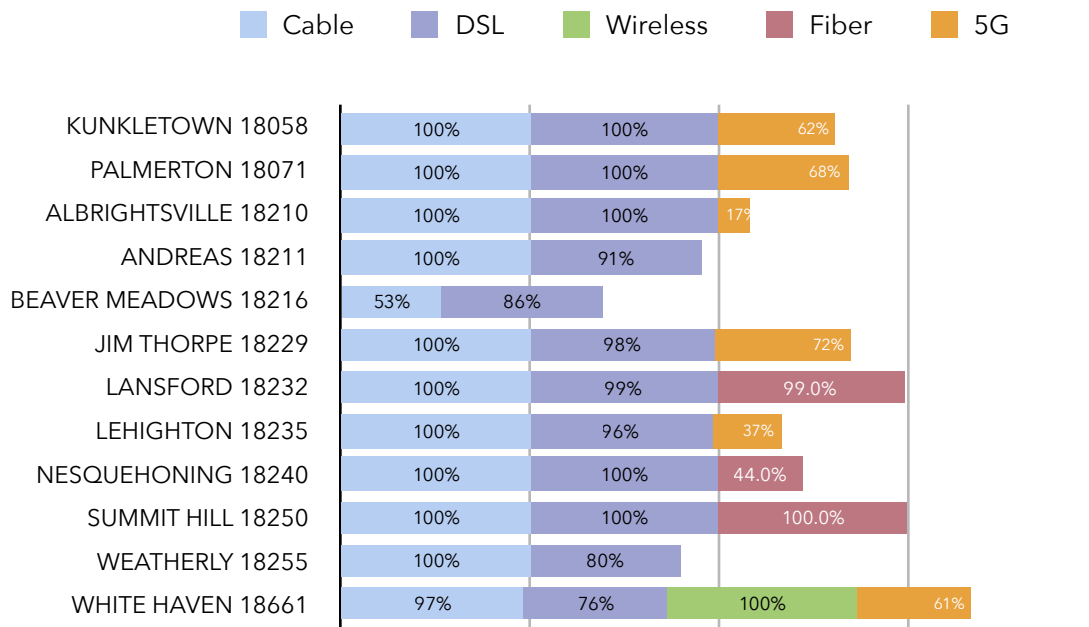
5 COMPETITIVE ENVIRONMENT REVIEW

In a February 2021, Consumer Reports Survey, 75% of Americans said they need uninterrupted access to the Internet seven days a week[1]. Pew Reach Center recently reported that during the pandemic, "connection quality has been important for school assignments, meetings and virtual social encounters alike. The new survey highlights difficulties for some: Roughly half of those who have a high-speed internet connection at home (48%) say they have problems with the speed, reliability or quality of their home connection often or sometimes.[2]"

Nationally, Consumer Reports found in their Summer 2021 Broadband Survey, "Fifteen percent of American households only have access to the internet through their smartphone data plan and one in 20 use DSL or dial-up to access the internet. Three percent of Americans say their household does not have access to the internet."[3]

Our first chart shows estimates of available broadband technology types in Carbon County. Additional information shows how much Carbon County citizens pay for those services. Pricing information is often deliberately difficult to obtain because many providers do not want consumers doing comparison shopping. Real pricing is often hidden behind promotional pricing that is hard to decipher.

Estimates of available broadband technology type in the county

Legend: Cable — DSL — Wireless — Fiber — 5G

Location	Cable	DSL	Wireless	Fiber	5G
KUNKLETOWN 18058	100%	100%			62%
PALMERTON 18071	100%	100%			68%
ALBRIGHTSVILLE 18210	100%	100%			17%
ANDREAS 18211	100%	91%			
BEAVER MEADOWS 18216	53%	86%			
JIM THORPE 18229	100%	98%			72%
LANSFORD 18232	100%	99%		99.0%	
LEHIGHTON 18235	100%	96%			37%
NESQUEHONING 18240	100%	100%		44.0%	
SUMMIT HILL 18250	100%	100%		100.0%	
WEATHERLY 18255	100%	80%			
WHITE HAVEN 18661	97%	76%	100%		61%

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[1] Consumer Reports- Research Snapshot February 2021, The Importance of Broadband Internet

[2] The Internet and the Pandemic, Page 1 https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/

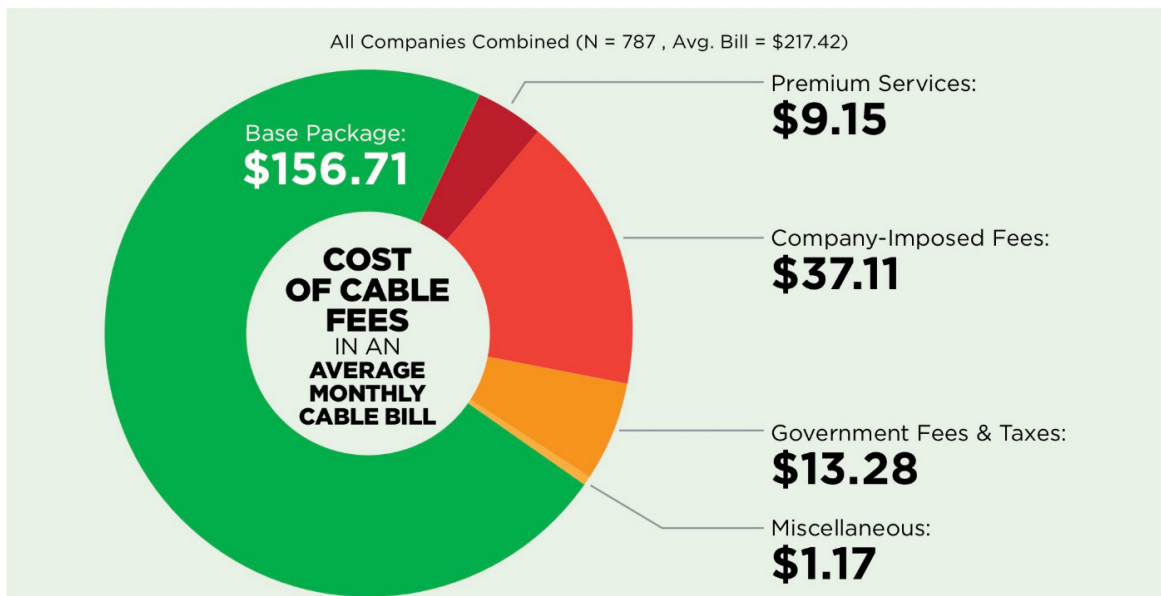[3] Broadband Survey, Consumer Reports, July 2021

Our data is assembled from several public sources that provide data on Internet use, including FCC data, data from social media, and commercial Web sites that provide Internet use data. Zip code boundaries are not aligned with local government jurisdictions, and some zip code data may include areas outside the county. The information in these charts and tables is current as of June 2022.

Percentages of customers receiving different kinds of service can change. Our pricing information includes all the service providers that have been discovered with services to 5% or more residents living in zip codes with at least 5% or more of their population in Carbon County. Information available online in maps and tables often to does not match what has been uncovered through signup attempts. One provider's online information indicates a lot of fiber in the county, but conversations with sales agents indicate otherwise. Another company's fiber product is available at number of addresses which are not shown on coverage maps. The information in this report has been verified by getting as far through the signup process as possible without actually signing up.

Pricing for services offered to small numbers of households in a particular zip code are more discoverable in survey responses.

Traditional Fixed Wireless Coverage has only been discovered in one zip code -18661 in Carbon County. Most of this wireless coverage appears to be in a small part of Carbon County that is surrounded on three sides by Luzerne County. It is rare for us to find this little wireless coverage in a County. The coverage percentages for T-Mobile 5-G Internet should be viewed somewhat cautiously and more with an eye to future availability. Six address checks across in areas of supposed high coverage by T-Mobile returned no verifiable service location. The other addresses brought a message suggesting that we join a waiting list. Even in other counties where we have verified a 5G address, T-Mobile 5G Home Internet Service is advertised as "first come, first served!," hinting at limited availability.

Figure A: Cost of Cable Fees in an Average Monthly Cable Bill (2018)

All Companies Combined (N = 787 , Avg. Bill = $217.42)

Base Package: **$156.71**

Premium Services: **$9.15**

Company-Imposed Fees: **$37.11**

COST OF CABLE FEES IN AN AVERAGE MONTHLY CABLE BILL

Government Fees & Taxes: **$13.28**

Miscellaneous: **$1.17**

According to a 2019 Consumer Reports study[4], the national average advertised price for standard triple play services of Internet, television, and telephone across the country is $156.17. Because of fees and taxes, the actual national average bill is $217.42. Nationally, consumers get an average of 24% added to their bill. Data caps which were turned off early in the pandemic are back[5] and will increase prices for heavy users. Fees hidden behind promo rates are spreading across many broadband services and are common in Carbon County.

It has become normal to find a statement such as this in fine print terms and conditions, "Equipment, installation, taxes and fees, including regulatory recovery fees, Broadcast TV Fee (up to $19.45/mo.), Regional Sports Fee (up to $14.45/mo.) and other applicable charges extra, and subject to change during and after the term agreement."[6] The Broadcast TV Fee was $14.95 a year ago. The Regional Sports Fee was $8.75 per month at the same time. These fee increases continue to push broadband packages higher.

"Nearly half (47 percent) of U.S. TV viewers state they do not subscribe to "traditional cable," and among those that do, 44 percent are planning to drop cable or cut back services over the next year."

This chart from Innovative Systems' study of rural broadband users[7] shows how streaming is becoming an important delivery mechanism even in rural areas. Streaming is just one of the factors that increases the demand for greater bandwidth across the full spectrum of broadband users.

How Are You Receiving TV Service?
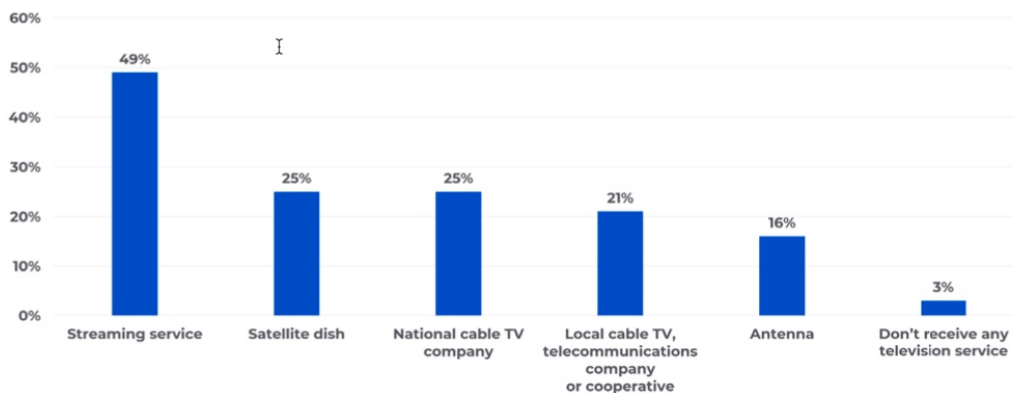
- Just about half of rural residents identify streaming as a source for video.
- DBS satellite accounts for 25% of rural TV subscribers, and another 25% subscribe to a national cable TV provider.
- Just about 1 in 5 households (21%) get TV from a local provider or cooperative.
- Local broadcast television via an antenna reaches 16% of rural residents.

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[4] Cord Cutting Continues, Fueled By High Cable Pricing, Consumer Reports' Survey Finds 9/17/2019

[5] Consumer Reports -Get Ready for Cable TV and Internet Price Hikes and Data Caps in the New Year 12/21/20

[6] Xfinity terms and conditions- Manitowoc County, WI, 10/21/21

[7] Rural Video and Broadband Industry Study - 2021, page 4, by Innovative Systems

OpenVault recently reported "Average North American bandwidth consumption surpassed 512 GB, or over half a terabyte (TB), for the first time… The monthly weighted average data consumed by subscribers in Q421 was 563.3 GB up 11.1% from Q420's weighted average and 23.3% from Q321. "[8]

The Pandemic has also had a major impact on the amount of work done from home even in rural areas.[9] See chart below.

The Pandemic has also had a major impact on the amount of work done from home even in rural areas.[10] See chart on the next page. Recent survey results presented by Kyle Rosner, Deputy Broadband Advisor for the Commonwealth of Virginia indicate that the number of people working from home (among those who can) has jumped from a pre-pandemic level of 20% to 71% who are currently working from home. Those who would like to work from home after the pandemic now stand at 54%.[11]
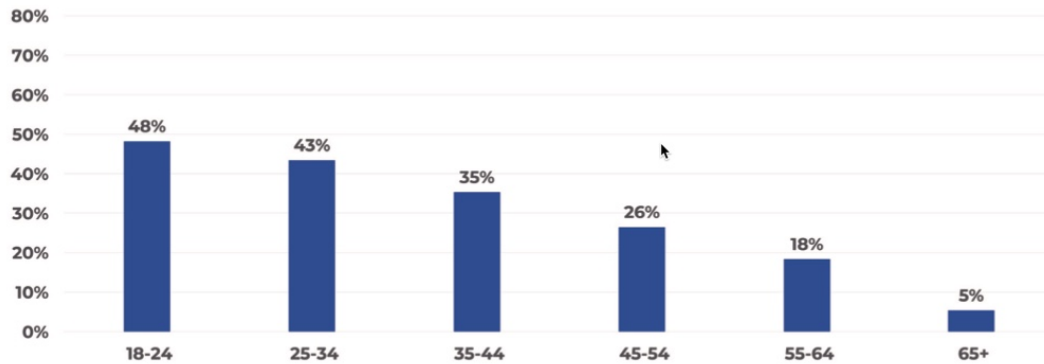

Pandemic Impact

The pandemic impacted just about every aspect of life, including video and internet usage. The following data reveals some of that impact on rural consumers.

Does someone in your household work from home who did not prior to the pandemic? (n=726)
Note: Represents those answering yes.

Growth in Working From Home by Age

- For rural consumers, the younger you are, the more apt you are to have been working from home as a direct result of the pandemic.

[8]OpenVault, Broadband Insights Report (OVBI) 4Q21, page 1, February 2022

[9] Rural Video and Broadband Industry Study - 2021, page 13, by Innovative Systems

[10] Rural Video and Broadband Industry Study - 2021, page 13, by Innovative Systems

[11] Connect Commonwealth Presentation by Kyle Rosner to NC Broadband Matters, November 15, 2021, slide 16

Fiber is increasingly a popular delivery vehicle for broadband services in rural areas across the country[12]. DSL continues to lose favor with consumers and companies. Almost no company advertises DSL service on their website. Even if DSL service is available, it is often difficult identify the service before you buy it.

Broadband Access and Satisfaction
The following data explores how rural subscribers receive internet service and their overall satisfaction with it.

Which of the following best describes how internet is delivered to your home? (n=756)

Broadband Access Technology
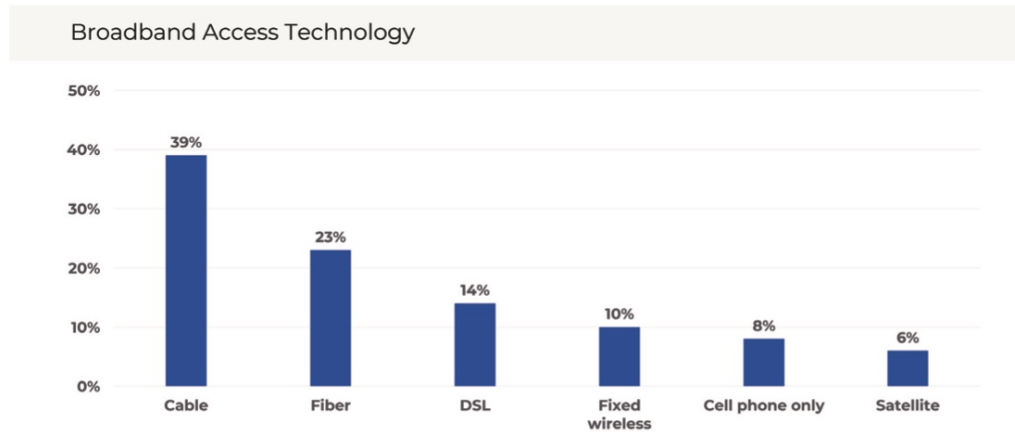
- Cable broadband takes the lead for rural broadband access at 39%.
- Fiber broadband penetration for rural America stands at 23%.

It is important to understand how significant broadband bills have been become for all households. When faced with limited broadband choices driven by lack of competition there are few ways for a household even a small one to lower broadband costs significantly. The increasing dependence of households on broadband services makes this even more critical.

Those houses purchasing a traditional cable package at or above average national costs now find that their cable package costs more than all their other utilities put together.
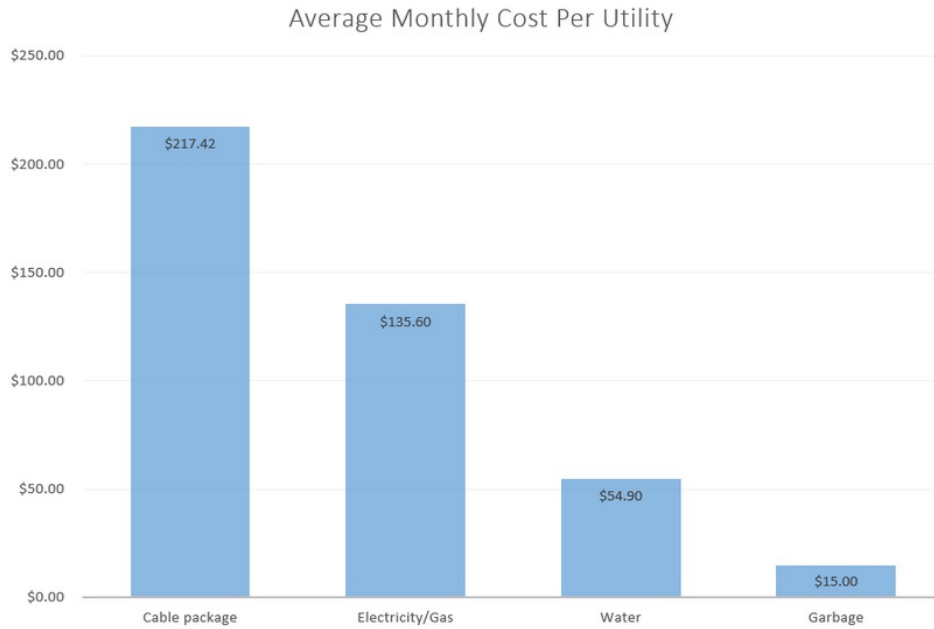
"One important thing we found in our research was how relatively expensive a cable bill is compared to other utilities for smaller households. The average cable bill stays relatively similar across household sizes, whether it's one person living in a small apartment or a family of ten living in a large house. This is not true of utilities like electricity or water, with much wider scales for their average bill size depending on household size."[13]

In comparing Internet pricing meeting the minimum of 25/3 speeds, the average cost in Carbon County is 10% less than a similar bundle in Anoka County, Minnesota. However, the average cost of the same 25/3 package in Carbon County is 13% more than the average cost of one in Clarion County, Pennsylvania. In comparing triple play bundles, Carbon County's average one is 7% more

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[12] Rural Video and Broadband Industry Study - 2021, page 10, by Innovative Systems

[13] Report: The average cable bill now exceeds all other household utility bills combined, AllConnect 6/22/2020

Average Monthly Cost Per Utility

Bar chart showing: Cable package $217.42; Electricity/Gas $135.60; Water $54.90; Garbage $15.00

expensive than Clarion's average bundle and 15% more expensive than similar average bundles in Carbon County. Potential suggestions to help lower costs are found in other parts of our report.

The table below illustrates the estimated telecom expenditures, public and private, over the next thirty years. Over that time period, **over $2.27 Billion** will be put in envelopes and mailed to service providers. Much of it leaves both the county and the state in monthly household payments that average just over $200. Redirecting as little as 5% of those funds could build fiber to every home and business in Carbon County.

Telecom Expenditures - Carbon County, PA

Total	26,545				
Businesses	1,138				
Estimated Internet Access Type	Households using Cell Phone for Internet/5G	Households with "little" broadband DSL	Households with Cable Modems	Households with no Internet	Households with fiber
Household Percentage	10%	16%	50%	17%	8%
Number of households	2,522	4,221	13,273	4,486	2,044
Average monthly telecom expenditures	Cell Phone for Voice/Internet $120 Cable/satellite TV: $65 bundle	Cell Phone $70 Phone: $15 Satellite TV: $60, DSL Broadband Internet $55	Cell Phone $70 Phone $20 TV $70 Broadband Internet $65	Cell Phone $70, no Internet, Cable/ satellite TV $65	Cell Phone $70, Fiber Internet $65,Streaming TV $45
Monthly cost of Services	$185	$200	$225	$135	$180
Annual household cost	$2,220	$2,400	$2,700	$1,620	$2,160
Annual cost all households	$5,598,341	$10,129,572	$35,835,750	$7,267,490	$4,414,964
30 year expenditure	$167,950,215	$303,887,160	$1,075,072,500	$218,024,703	$132,448,932
Total residential expenditures	$2,029,832,442				
Total Estimated Hidden Fees	$162,980,991				
Total Business Costs	$81,936,000				
Total expenditures	**$2,274,749,433**				

5.1 LOCAL PRICING DATA

This information provides pricing data and services available from providers in Carbon County. Prices, availability and promotional offers change frequently and sometimes vary depending on street address. Exact availability often requires customer names and specific street addresses. Pricing for Internet Service Providers showing less than 1% coverage or ones that cannot be verified are not shown in the following data

Summary of Service Provider Data - Carbon County, PA

	Least Expensive Internet Only Service	Least Expensive Internet Only Service Meeting 25/3	Least Expensive Triple Pay Package Meeting 25/3
Frontier DSL	$44.39	NA	NA
Palmerton Telephone DSL	$29.95	NA	NA
Verizon DSL	Available only at $74.99 with phone	NA	NA
Windstream DSL	$65	$65	N/A
Blue Ridge Communications Cable	$49.95	$55.95	$161.27
Breezeline Cable	$59.99	$79.99	$109.97
Service Electric Cable	$36.95	$47.95	$167.49
Windstream Kinetic Fiber	$75	$75	$109.99
T-Mobile 5G Internet	$50	$50	N/A
ICON Fixed Wireless	NA	NA	NA
Skypacket Fixed Wireless	$37.95	NA	NA
HughesNet	$64.99	$64.99	N/A
Viasat	$69.99	$99.99	N/A
Starlink	$110	$110	N/A

All the information available at the time of the report is included in the table. If a table cell has no information, that information was not found. However, if there is no information in the "One-time Fees," it does not necessarily mean there are no one-time fees. It just means that information on the one-time fees could not be found on the company's public website.

NOTE: Many ISPs do not provide upload speeds. This table indicates that no upload speed was discoverable by the abbreviation 'NA' (Not Available)

5.2 WIRELINE PROVIDER ANALYSIS

Business Service Provider Data - Carbon County, PA

Blue Ridge Communications Cable-Business			300/25 $159.95 3TB Data Cap	600/30 $199.95	100/40 $259.95
Breezeline Fiber-Business	25/10 $79.99	100/20 $109.99	200/30 $179.99	500/40 $259.99	1000/50 $339.99
Frontier DSL	NA	NA	NA	NA	NA
PenTeleData Fiber- Business	NA	NA	NA	NA	NA
Telesystem Fiber-Business	1-10 No pricing	25 No pricing	50 No pricing	100+ No pricing	
Verizon DSL	NA	NA	NA	NA	NA
Verizon Copper	NA	NA	NA	NA	NA
Windstream Fiber to Business				400/400 $99.99	1000/1000 $198.99
Windstream DSL	NA	NA	NA	NA	NA

Wireline Internet residential service provider comparison for Carbon County, PA

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Palmerton Telephone DSL	$29.95			1.5/265 Kbps	Unknown	Unknown	Internet Only
Palmerton Telephone DSL	$32.95			3/320 Kbps	Unknown	Unknown	Internet Only
Palmerton Telephone DSL	$39.95			5/1	Unknown	Unknown	Internet Only
Palmerton Telephone DSL	$49.95			1010	Unknown	Unknown	Internet Only
	Unlimited Local and Long Distance Calling for ONLY $39.49* per month-discount of $10 per month on Internet services when bundled with phone						

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Frontier DSL	$44.39						$5 discount for Autopay
Verizon DSL	$74.99	No Contract	$16.67 per month to cover router/modem	3.1-7/NA	Unkno wn	Unknown	Phone service required for DSL Internet
Windstream DSL							
Blue Ridge Communications Phone + Internet (Likely DSL)	$49.95	Months 1-12 $39.95, Months 13-24 $49.95 Month 25 Regular rate		Up to 50/ NA		Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet & Phone. Likely DSL Services but not labeled as such on the website.. If phone service is disconnecte d, a modem lease fee of $5.95 per month will apply
Blue Ridge Communications Cable	$55.95	$34.95 for first twelve months. if BR cable equipment is not replaced, month 13 rate $68.85 which is a 23% price rise above standard rate or a 97% increase above the promo rate	Modem & eero secure WiFi included fist 12 months, then $5.95 for modem $6.95 for eero Secure WiFi	200/4	1.1 TB	Internet Only Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet Only
Blue Ridge Communications Cable	$60.95	$44.95 for first twelve months, if BR cable equipment is not replaced, month 13 rate $73.85 which is a 21% price rise above standard rate or a 64% increase above the promo rate	Modem & eero secure WiFi included fist 12 months, then $5.95 for modem $6.95 for eero Secure WiFi	300/8	1.3 TB	Internet Only Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet Only

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Blue Ridge Communications Cable	$70.95	$59.95 for first twelve months for first twelve months, if BR cable equipment is not replaced, month 13 rate $83.85 which is a 18% price rise above standard rate or a 40% increase above the promo rate	Modem & eero secure WiFi included first 12 months, then $5.95 for modem $6.95 for eero Secure WiFi	400/10	1.3 TB	Internet Only Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet Only
Blue Ridge Communications Cable	$87.95	$79.95 for first twelve months for first twelve months, if BR cable equipment not replaced and services canceled, month 13 rate $116.75 which is a 33% price rise above standard rate or a 46 % increase above the promo rate	Modem & 2 eero WiFi units, 25 hours Cloud DVR and Blue Ridge Stream box included fist 12 months, then $5.95 each device except $5.00 for Cloud DVR, total added to regular bill $28.80 unless you replace BR equipment	500/12	Unlimited	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet, Streaming TV
Blue Ridge Communications Cable	$109.95	$89.95 Promotional rate is valid for months 1-12. If BR cable equipment not replaced and/or additional services canceled, the monthly bill would be $146.70 which is a 33% price rise above standard rate or a 63 % increase above the promo rate	Modem & 2 eero secure WiFi units, 25 hours Cloud DVR and Blue Ridge Stream box for 12 months, then $6.95 for each eero secure device, $5.95 for Blue Ridge Stream $5.95 for modem, $5.95 for EPIX streaming and $5.00 for Cloud DVR, total added to regular bill $36.75 unless you replace BR equipment and cancel services	600/15	Unlimited	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet & Streaming TV

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Blue Ridge Communications Cable	$119.95	$99.95 Promotional rate is valid for months 1-12. If BR cable equipment not replaced and/or additional services canceled, the monthly bill would be $160.74 which is a 34% price rise above standard rate or a 41% increase above the promo rate	Modem & 2 eero secure WiFi units, and Blue Ridge Stream box for 12 months, then $6.95 for each eero secure device, $5.95 for Blue Ridge Stream $5.95 for modem, and $14.99 for HBOMax streaming for a total of $40.79 added to regular bill unless you replace BR equipment and cancel services	1000/40	Unlimited	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet & Streaming TV
	All BR services with cable include a statement similar to this in the 1 Gig Services statement. "Blue Ridge cabled territories only. Promotional rate of $189.95 per month is valid for months 1-12. Months 13-24, price will increase to $199.95 per month for 12 months. Starting month 25 customers will be billed at regular service rate. " **The current regular rate is the price we have listed in our report.**						
Blue Ridge Communications Cable	$161.27	$109.95 ($144.90 including phone service) is valid for months 1-12. Months 13-24, price will increase to $119.95 ($154.90 including phone service) per month for 12 months. Starting month 25 customers will be billed at regular service rate, if BR cable equipment not replaced and services canceled, month 25 rate will be $209.64 which is a 30% price rise above standard rate or a 45% increase above the original adjusted promo rate of $144.90	Modem & 1 eero pro secure WiFi unit, 25 hours Cloud DVR and Blue Ridge Stream+ box with Live TV included fist 12 months, then $5.95 each device except $5.00 for Cloud DVR and $9.95 for Stream plus, monthly for total of $27,.85 added to regular bill unless you replace BR equipment/ cancel services. Blue Ridge Stream+ w/Live TV also requires Basic TV service $48.37	500/12	Unlimited	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet, Streaming+ TV, requires Basic TV services, Digital Phone at $34.95 per month ($1.23 per directory assist.)

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Blue Ridge Communications Cable	$193.27	$149.95 ($184.90 including phone service) is valid for months 1-12. Months 13-24, price will increase to $159.95 ($194.90 including phone service) per month for 12 months. Starting month 25 customers will be billed at regular service rate, if BR cable equipment not replaced and services canceled, month 25 rate will be $221.12 which is a 14% price rise above standard rate or a 20% increase above the original adjusted promo rate of $184.90	Modem & 1 eero pro secure WiFi unit, 25 hours Cloud DVR and Blue Ridge Stream+ box with Live TV included fist 12 months, then $5.95 each device except $5.00 for Cloud DVR and $9.95 for Stream plus, monthly for total of $27,.85 added to regular bill unless you replace BR equipment/ cancel services. Blue Ridge Stream+ w/Live TV also requires Basic TV service $48.37	600/15	Unlimited	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet, Streaming+ TV, requires Basic TV services, Digital Phone at $34.95 per month ($1.23 per directory assist.)

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Blue Ridge Communicati ons Cable	$279.61	$189.95 ($224.90 including phone service) is valid for months 1-12. Months 13-24, price will increase to $199.95 ($234.90 including phone service) per month for 12 months. Starting month 25 customers will be billed at regular service rate, if BR cable equipment not replaced and services canceled, month 25 rate will be $307.46 which is a 10% price rise above standard rate or a 37% increase above the original adjusted promo rate of $224.90	Modem & 1 eero pro secure WiFi unit, 25 hours Cloud DVR and Blue Ridge Stream+ box with Live TV included fist 12 months, then $5.95 each device except $5.00 for Cloud DVR and $9.95 for Stream plus, monthly for total of $27,.85 added to regular bill unless you replace BR equipment/ cancel services. Blue Ridge Stream+ w/Live TV and 221 channels also requires Basic+ TV service $124.71 monthly	1000/40	Unlimit ed	Professional Installation $54.95 Tech Assisted Self-Install (restrictions apply) $24.95	Internet, Streaming+ TV, requires Basic TV services, Digital Phone at $34.95 per month ($1.23 per directory assist.)
Breezeline Cable	$59.99	12 months promo at $19.99 at end of 12 months the rate increases 200%		100/10	None		Internet Only - Promo rate includes $10 Autopay & Ecosave discount (Paperless) $100 Gift Card currently offered

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Breezeline Cable	$79.99	Twelve months promo at $39.99 at end of 12 months the rate increases 100%		200/20	None		Internet Only - Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered
Breezeline Cable	$99.99	Twelve months promo at $39.99 at end of 12 months the rate increases 150%		500/50	None		Internet Only - Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered
Breezeline Cable	$119.99	12 months promo at $59.99 at end of 12 months the rate increases 100%		1000/50	None		Internet Only- Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Breezeline Cable	$109.97	12 months promo at $49.97+$20 estimated voice charge		100/10	None		Internet and TV & Phone ($20 Phone price needs verifying) Promo rate includes $10 Autopay & Ecosave discount (Paperless) $100 Gift Card currently offered
Breezeline Cable	$129.97	12 months promo at $69.97+$20 estimated voice charge		200/20	None		Internet and TV & Phone ($20 Phone price needs verifying) -Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered
Breezeline Cable	$149.97	12 months promo at $69.97+$20 estimated voice charge		500/50	None		Internet and TV & Phone ($20 Phone price needs verifying) -Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Breezeline Cable	$169.97	12 months promo at $89.97+$20 estimated voice charge		1000/50	None		Internet and TV & Phone ($20 Phone price needs verifying) -Promo rate includes $10 Autopay & Ecosave discount (Paperless) $150 Gift Card currently offered
Service Electric Cable	$36.95			10/5			Internet Only
Service Electric Cable	$47.95			25/5			Internet Only
Service Electric Cable	$57.95			50/5			Internet Only
Service Electric Cable	$73.95			100/10			Internet Only
Service Electric Cable	$94.95			150/10			Internet Only
Service Electric Cable	$110.95			285/10			Internet Only
Service Electric Cable	$125.95			350/15			Internet Only

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Service Electric Cable	$157.49			10/5			Internet, TV, and Phone
Service Electric Cable	$167.49			25/5			Internet, TV, and Phone
Service Electric Cable	$183.49			50/5			Internet, TV, and Phone
Service Electric Cable	$204.49			100/10			Internet, TV, and Phone
Service Electric Cable	$220.49			150/10			Internet, TV, and Phone
Service Electric Cable	$235.49			285/10			Internet, TV, and Phone
Service Electric Cable	$256.49			350/15			Internet, TV, and Phone
Windstream Kinetic Fiber	$75	Free for first 3 months then $59.99 for balance of first year	$6.99 Modem/ WiFi free for first three months	400/400	None	$50	Internet Only
Windstream Kinetic Fiber	$105	Free for first 3 months then $89.99 for balance of first year	$6.99 Modem/ WiFi free for first three months	1000/100 0	None	$50	Internet Only
Windstream Kinetic Fiber	$109.99	Free for first 3 months then $59.99 for balance of first year- If modem is not replaced rate becomes $116.98 or at end of first year an increase of 95% over last nine months of promo rate	$6.99 Modem/ WiFi free for first three months	400/400	None	$50 $19.95 Television Activation	Internet, Direct TV, minimum service $29.99 & Phone for $5, $100 bill credit for Internet Order

Provider	Monthly Cost	Promo Rate & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Services & Incentives
Windstream Kinetic Fiber	$129.99	Free for first 3 months then $59.99 for balance of first year- If modem is not replaced rate becomes $136.98 or at end of first year an increase of 128% over last nine months of promo rate	$6.99 Modem/ WiFi free for first three months	400/400	None	$50 $19.95 Television Activation	Internet, YouTubr TV, minimum service $49.99 & Phone for $5, $100 bill credit for Internet Order
Windstream Kinetic Fiber	$139.99	Free for first 3 months then $89.99 for balance of first year. If modem is not replaced rate becomes $146.98 or at end of first year an increase of 63% over last nine months of promo rate	$6.99 Modem/ WiFi free for first three months	1000/1000	None	$50	Internet, YouTube TV $49.99 & Phone, $100 bill credit for Internet Order

5.3 WIRELESS PROVIDER ANALYSIS

Wireless Internet service provider comparison for Carbon County, PA

Provider	Monthly Cost	Promo & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Incentives & Notes
ICON Fixed Wireless	N/A			N/A			
Skypacket Fixed Wireless	$37.95	2 years		N/A		$150 collected at installation	$50 of $150 installation fee credited towards bill
Skypacket Fixed Wireless	$48.95	2 years		N/A		$150 collected at installation	$50 of $150 installation fee credited towards bill
Skypacket Fixed Wireless	$59.95	2 years		N/A		$150 collected at installation	$50 of $150 installation fee credited towards bill

Provider	Monthly Cost	Promo & Contract Length	Other Monthly Fees	Download /Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees	Incentives & Notes
T-Mobile 5G Home Internet	$50			182/33			Prepaid required

5.4 SATELLITE PROVIDER ANALYSIS

Satellite Internet service provider comparison for Carbon County, PA

Provider	Monthly Cost	Promo & Contract Length	Other Monthly Fees	Download/Upload Speed (Mbps)	Data Cap (GB/ Month)	One-Time Fees
HughesNet	$59.99	$39.99 for first six months. 24 month commitment required. Up to $400 ETF	$14.99 equipment lease it you don't purchase	25/3	After 10 GB (speeds drop to 1-3 Mbps)	Purchase pricing is $249.99 to purchase or $99 lease activation- instant lease savings of $99- limited time $100 instant savings if equipment Is purchased
HughesNet	$64.99	$44.99 for first six months. 24 month commitment required. modem lease $9.99 for six month. Up to $400 ETF	$14.99 equipment lease it you don't purchase	25/3	After 15 GB (speeds drop to 1-3 Mbps)	$100 Gift Card Purchase pricing is $349.99 to purchase or $99 lease activation- waived currently
HughesNet	$74.99	$54.99 for first six months. 24 month commitment required. modem lease $9.99 for six month. Up to $400 ETF	$14.99 equipment lease it you don't purchase	25/3	After 30 GB (speeds drop to 1-3 Mbps)	$100 Gift Card Purchase pricing is $349.99 to purchase or $99 lease activation- waived currently
HughesNet	$109.99	$89.99 for first six months. 24 month commitment required. modem lease $9.99 for six month. Up to $400 ETF	$14.99 equipment lease it you don't purchase	25/3	After 45 GB (speeds drop to 1-3 Mbps)	$100 Gift Card Purchase pricing is $349.99 to purchase or $99 lease activation- waived currently
Viasat	$69.99	$49.99 for first three months 24 month contract	$12.99/ month (modem)	12/3	40 GB priority data	Setup Fee- Unknown- equipment purchase instead of lease $299.99- Setup Fee- Unknown

Provider	Monthly Cost	Promo & Contract Length	Other Monthly Fees	Download/Upload Speed (Mbps)	Data Cap (GB/Month)	One-Time Fees
Viasat	$99.99	$69.99 for first three months 24 month contract	$12.99/month (modem)	25/3	60 GB priority data	Setup Fee- Unknown- equipment purchase instead of lease $299.99- Setup Fee- Unknown
Viasat	$149.99	$99.99 for first three months 24 month contract	$12.99/month (modem)	50/3	100 GB priority data	Setup Fee- Unknown- equipment purchase instead of lease $299.99- Setup Fee- Unknown
Viasat	$199.99	$149.99 for first three months 24 month contract	$12.99/month (modem)	100/3	150 GB priority data	Setup Fee- Unknown- equipment purchase instead of lease $299.99- Setup Fee- Unknown
Viasat	$299.99	$199.99 for first three months 24 month contract	$12.99/month (modem)	100/3	300 GB priority data	Setup Fee- Unknown- equipment purchase instead of lease $299.99- Setup Fee- Unknown
Starlink*	$110	Not available in all areas of Carbon County, those areas targeted for service in 2023	$50 shipping cost and $38.94 estimated tax for equipment	100/40	None	$599 for Hardware

* Starlink service availability is determined by address. Starlink is not currently available in all areas of Carbon County. Early reports from beta testers have been generally positive. Reported speed test results vary, but many users are reporting 10 to 50 Megabit download speeds and upload speeds of 5 to 20 Megabits. Some users have seen higher speed test results. Latency is much lower than traditional geostationary satellite services like HughesNet and Viasat, but latency is still much higher than terrestrial fiber Internet connections. If pricing remains similar to what is being charged for early users, Starlink could be a very significant improvement for rural residents and businesses. It is targeted for the balance of the Carbon County in 2023.

5 RESIDENTIAL MARKET STUDY

During the winter of 2022, a broadband survey was conducted in Carbon County as part of a county-wide study in broadband needs. The online (Web) version of the survey was publicized on social media, the County web site, and a Postal Service mailing to all households. Residents were encouraged to complete the survey online or fill out and return the paper version by surface mail. Businesses were encouraged to complete a separate business-focused survey, and the results of that are included later in this report.

A total of 1806 responses were collected in the residential survey—roughly 14% of all households in Carbon County responded to the survey. Not all responders answered every question. Note that because of rounding, not all percentages sum exactly to 100%. Many comments were received and are included in the appendices.

Some of the key findings from the results are listed below.

63% of respondents are interested in faster and more reliable Internet service	31% of residents are "dissatisfied" or "very dissatisfied" with current Internet speeds
88% of respondents said that they believe the County government should help facilitate better broadband	52% of residents have 7 or more Internet-connected devices in their home
51% of respondents have no other options for their Internet service	30% indicate that availability of broadband Internet is affecting where they choose to live

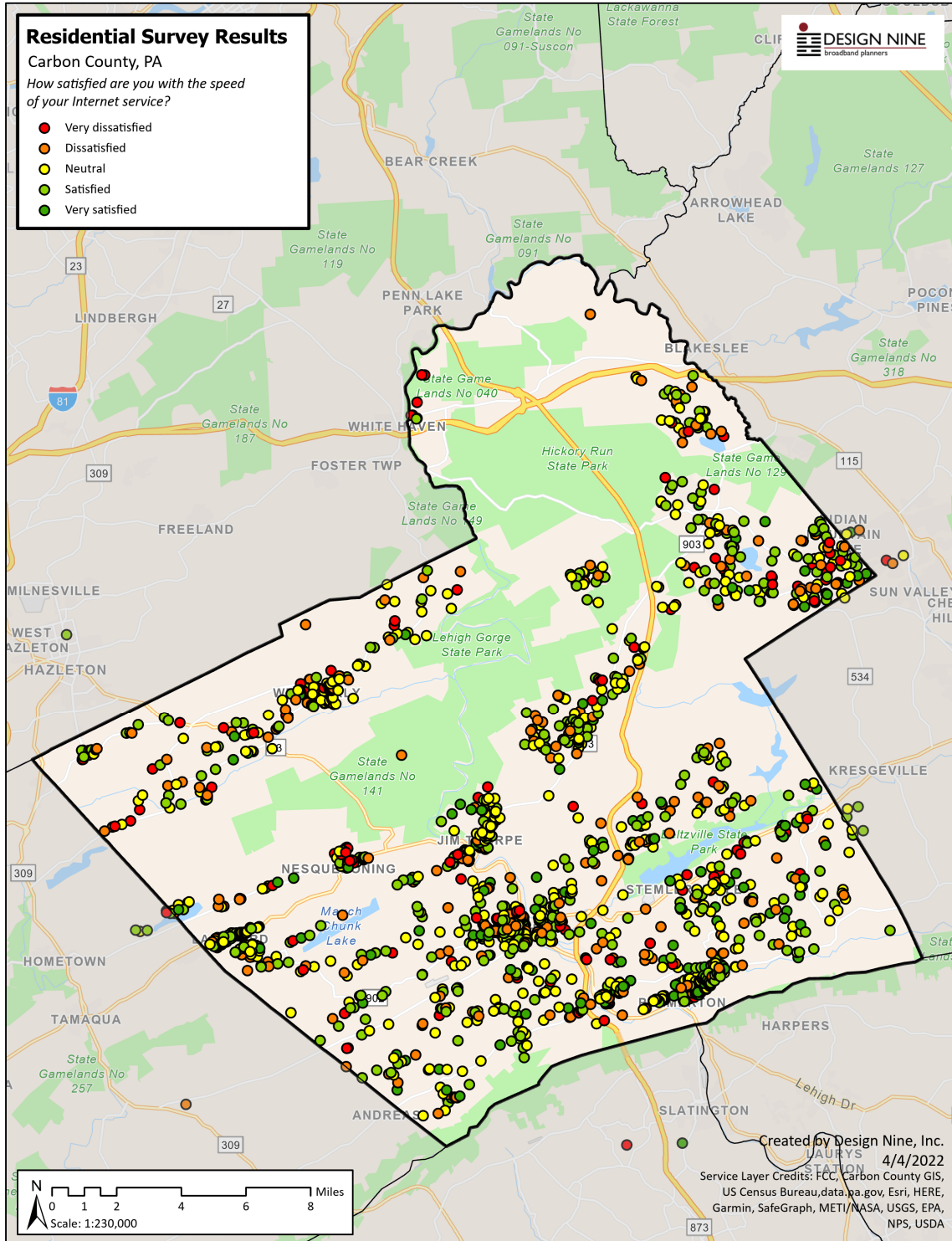# 5.1 DISTRIBUTION OF RESIDENTIAL SURVEY RESPONSES

The map below shows the geographic distribution of responses to the residential survey, coded according to the *download speed* of their Internet connection (Question 9).
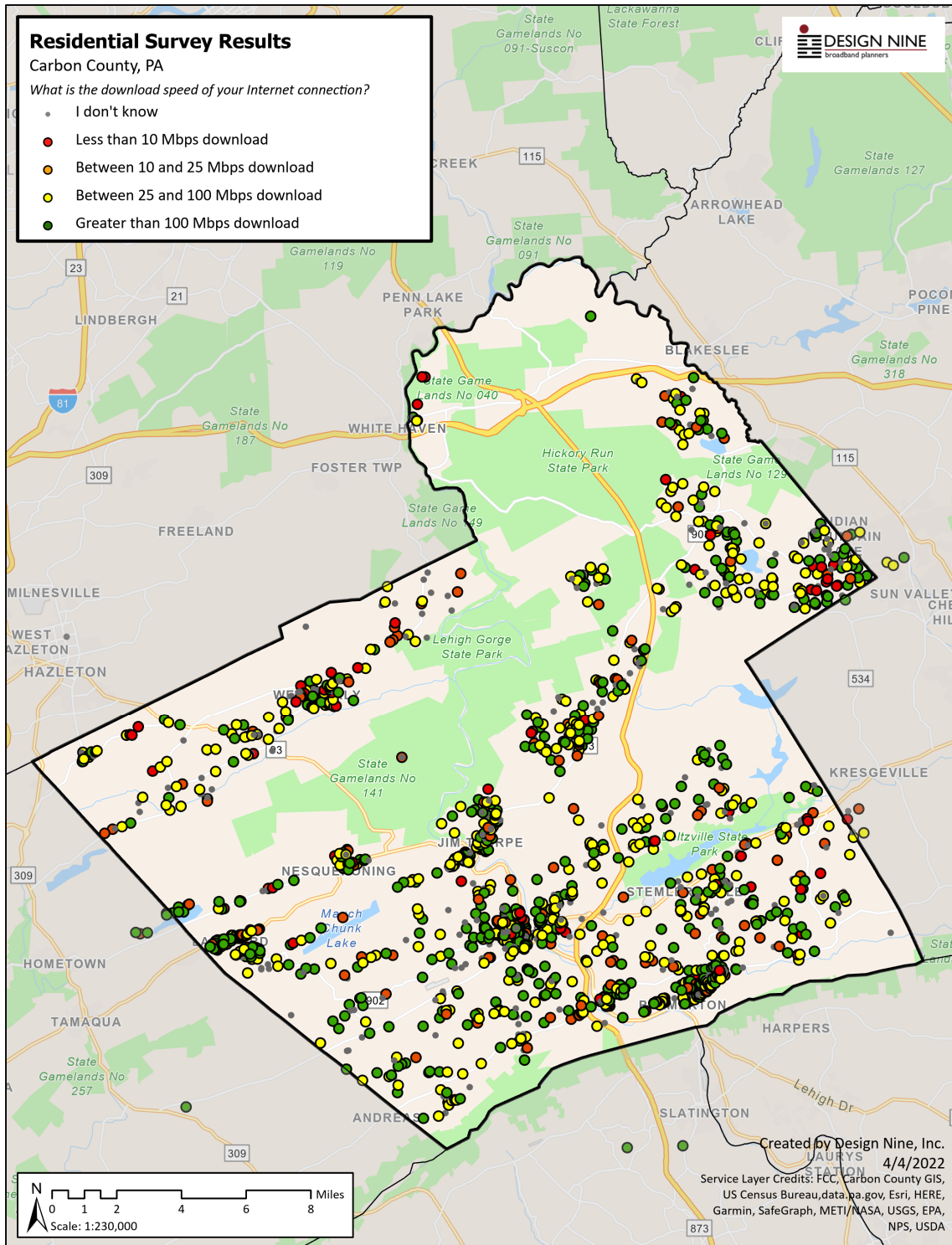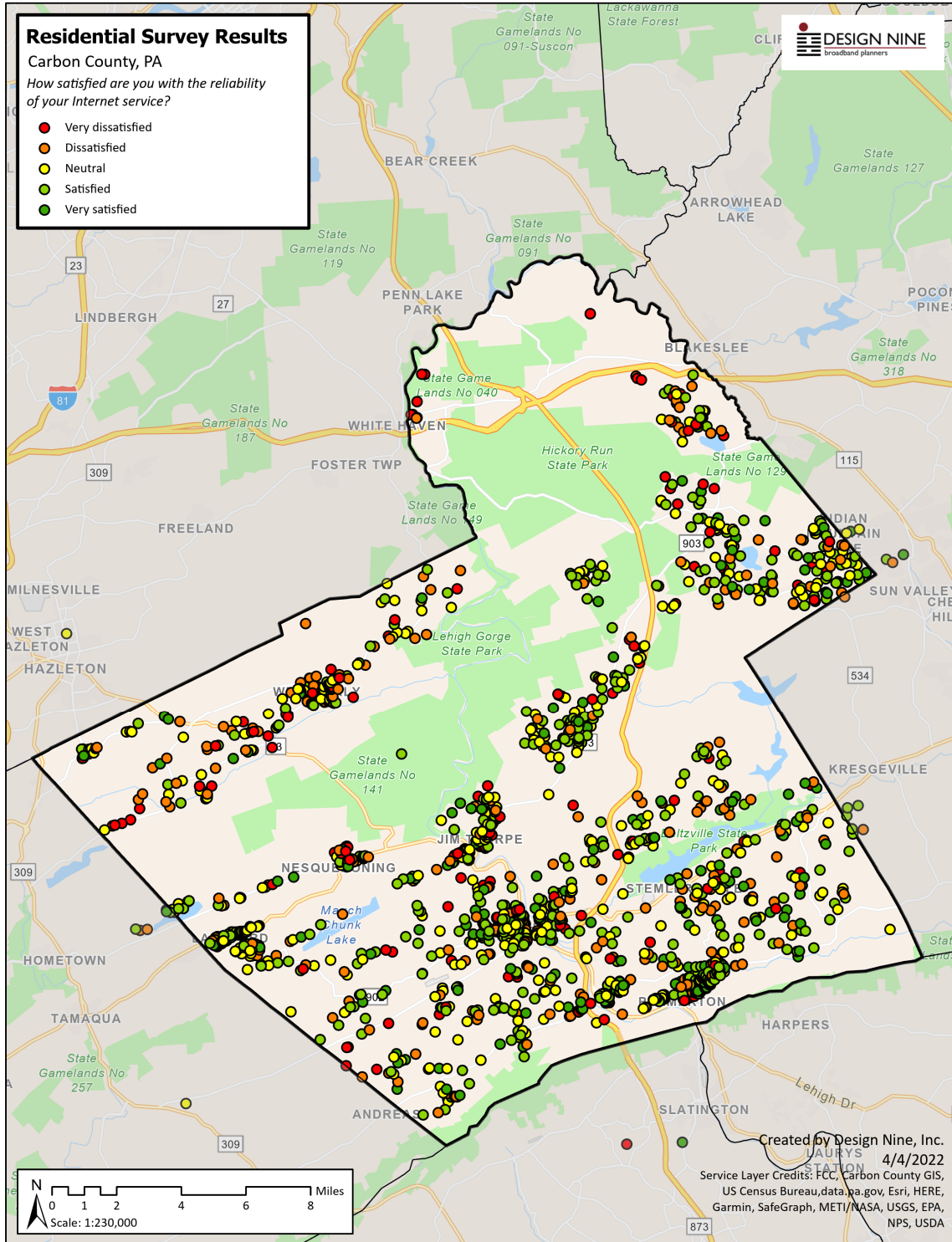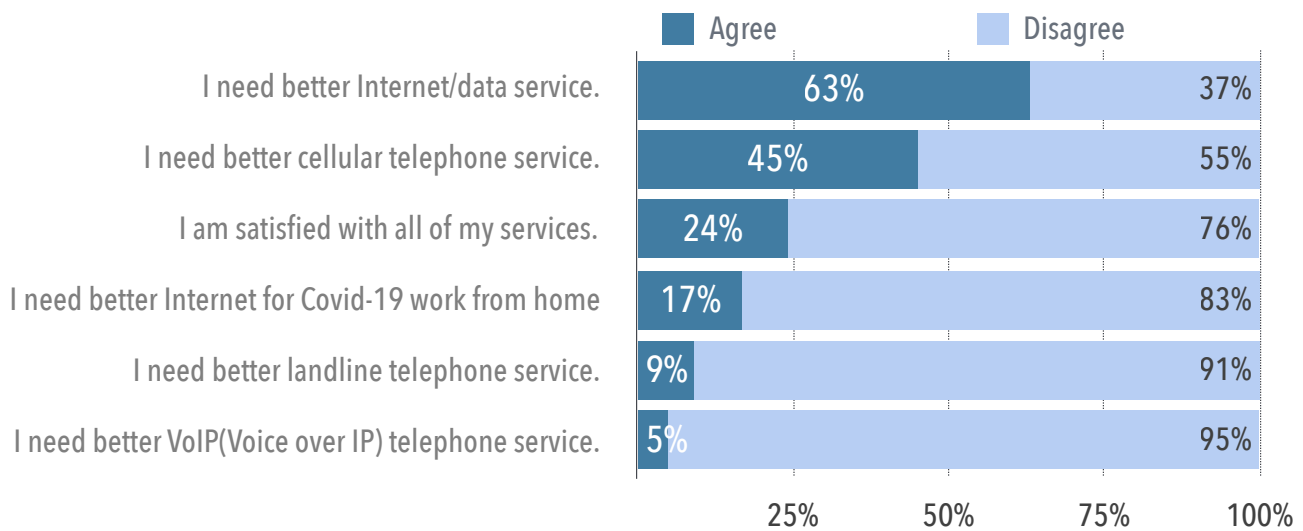
The map below shows the geographic distribution of responses to the residential survey, coded according to the *upload speed* of their Internet connection (Question 10).
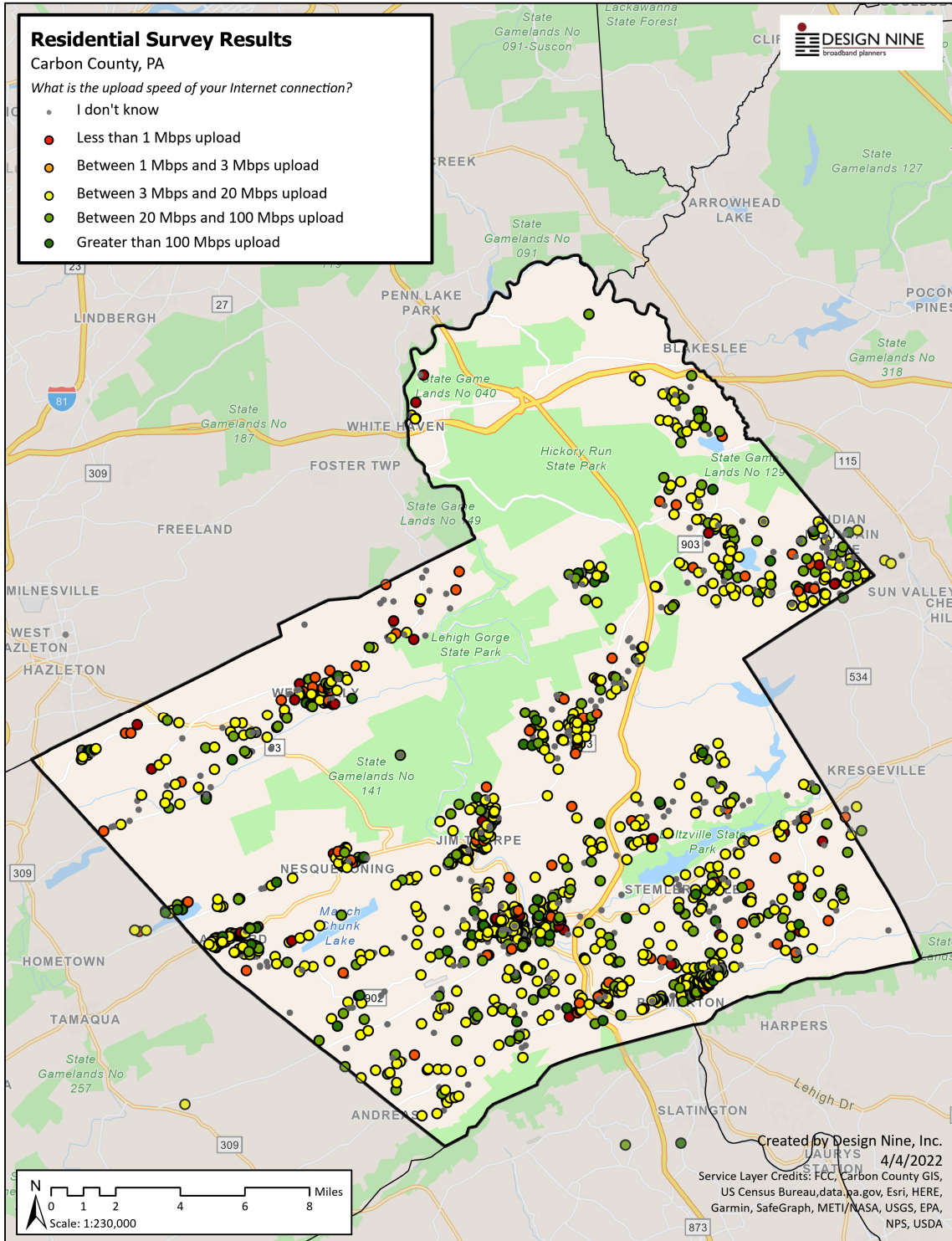
Residential Survey Results
Carbon County, PA
What is the upload speed of your Internet connection?
- •   I don't know
- 🔴   Less than 1 Mbps upload
- 🟠   Between 1 Mbps and 3 Mbps upload
- 🟡   Between 3 Mbps and 20 Mbps upload
- 🟢   Between 20 Mbps and 100 Mbps upload
- 🟢   Greater than 100 Mbps upload

Created by Design Nine, Inc.
4/4/2022
Service Layer Credits: FCC, Carbon County GIS, US Census Bureau,data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Scale: 1:230,000

The map below shows the geographic distribution of responses to the residential survey, coded according to their satisfaction with the *speed* of their existing Internet service (Question 11).

The map below shows the geographic distribution of responses to the residential survey, coded according to their satisfaction with the *reliability* of their existing Internet service (Question 12).

Residential Survey Results
Carbon County, PA
How satisfied are you with the reliability of your Internet service?

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very satisfied

5.2 RESIDENTIAL SURVEY SUMMARY DATA

1. Select the items you agree with below

	Agree	Disagree
I need better Internet/data service.	63%	37%
I need better cellular telephone service.	45%	55%
I am satisfied with all of my services.	24%	76%
I need better Internet for Covid-19 work from home	17%	83%
I need better landline telephone service.	9%	91%
I need better VoIP(Voice over IP) telephone service.	5%	95%

2a. Total number of adults in household

None	1	2	3	4	5	6	7+
5	73	292	20	4	1	0	0
1%	18%	74%	5%	1%	0%	0%	0%

2b. Total number of K-12 Students in the house hold

None	1	2	3	4	5	6	7+
1278	46	43	9	2	0	0	0
93%	3%	3%	1%	0%	0%	0%	0%

2c. Total number of college students in household

None	1	2	3	4	5	6	7+
1505	36	7	0	1	0	0	0
97%	2%	0%	0%	0%	0%	0%	0%

2d. How many total Internet users in household

None	1	2	3	4	5	6	7+
20	63	198	52	56	10	3	1
5%	16%	49%	13%	14%	2%	1%	0%

3. How important is Internet access to you or your household?

Importance of the Internet

Very Important	90%
Somewhat Important	9%
Neutral	0%
Unimportant	1%

0%   30%   60%   90%
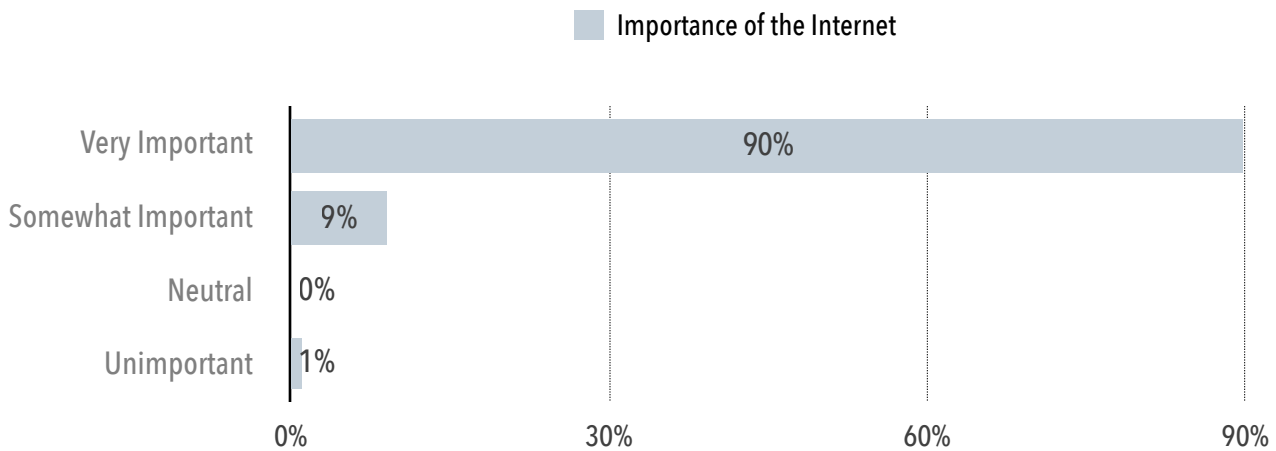
4. How much do you spend each month for ALL telecom services? This would include any fees for services like phone, TV, and Internet. Do not include cellphones.

$50 or less	$50 to $75	$75 to $100	$100 to $150	$150 to $200	More than $200/month
99	136	234	308	326	677
6%	8%	13%	17%	18%	38%

5. How much do you pay just for Internet access each month?

No Internet	I only use free hotspots	$10 to $20	$21 to $40	$41 to $60	$61 to $80	More than $80/ month	I don't know
36	6	18	105	456	479	571	98
2%	0%	1%	6%	26%	27%	32%	6%

6. What type of Internet do you have at home?

Cable Modem	1,388	78%
I Don't Know	100	6%
DSL Line	78	4%
Wireless ISP	71	4%
Fiber	38	2%
Other	32	2%
No Internet	29	2%
Cellular wireless	25	1%
Dial-up	11	1%
Satellite	8	0%

Other internet types responses:

Many comments were received. Because of the volume of replies, these comments can be found in Appendix A.

7. Who is your Internet Service provider?

Some responses included more than one provider. Verizon was the most popular "other" response.

Blue Ridge Cable	1,214	77%
Atlantic Broadband	200	13%
Other	122	8%
Windstream	34	2%
PenTeleData	0	0%

8. Based on the type of Internet connection/ISP you indicated in the above questions, why do you still have it? (select all that apply)

51% of respondents indicated they have no alternative to their current Internet provider
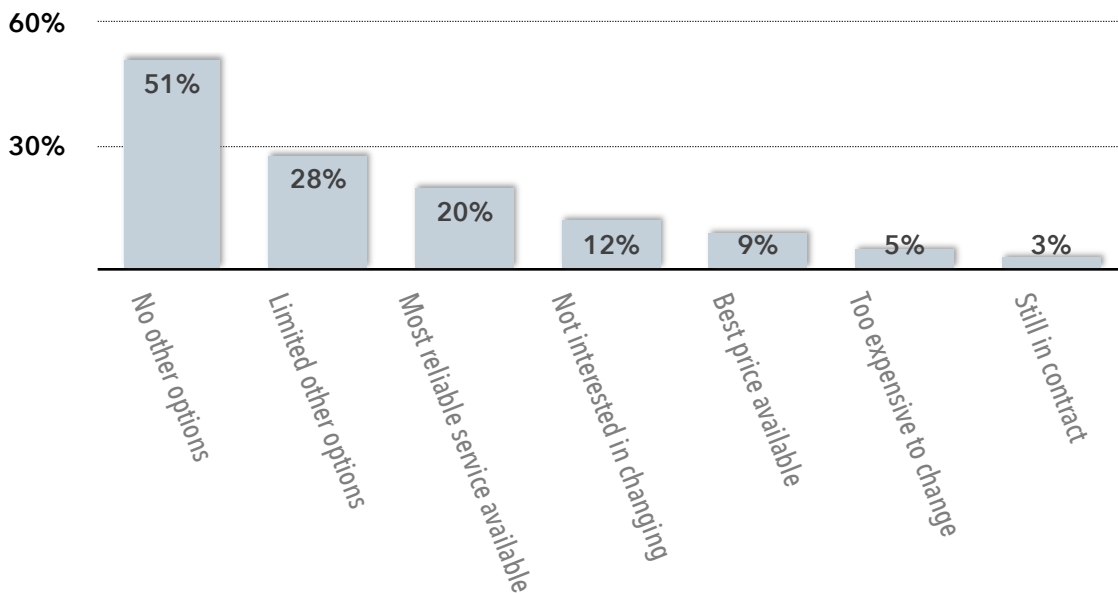
9. What is the download speed of your Internet Connection?

Only 64% of residents can confirm that they have Internet service that meets the FCC definition of adequate broadband service (>25 Meg down). It is not unusual that many respondents do not know their exact Internet speeds.

Internet Download Speed

Category	Percentage
Less than 10 Mbps download	6%
Between 10 and 25 Mbps download	9%
Between 25 and 100 Mbps download	31%
Greater than 100 Mbps download	33%
I don't know	22%
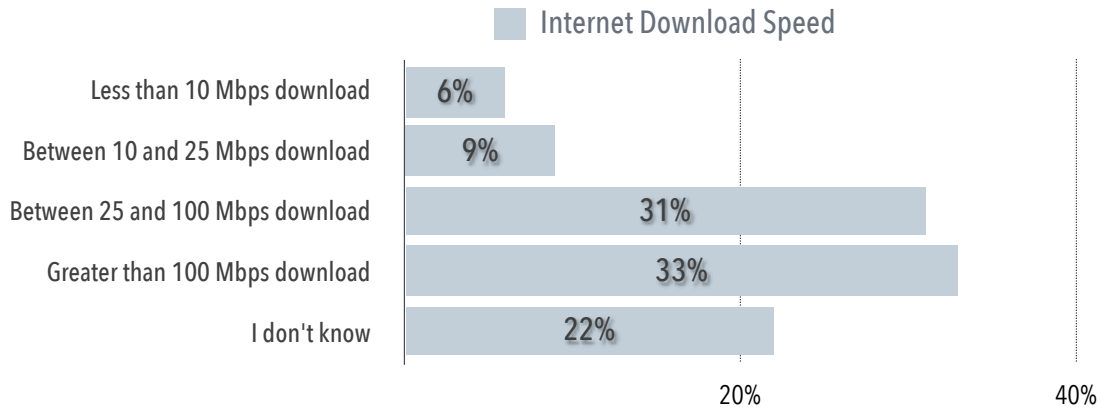
10. What is the upload speed of your Internet Connection?

Only 64% of residents have Internet service that meets the FCC definition of adequate broadband service (>3 Meg up). It is not unusual that many respondents do not know their exact Internet speeds.
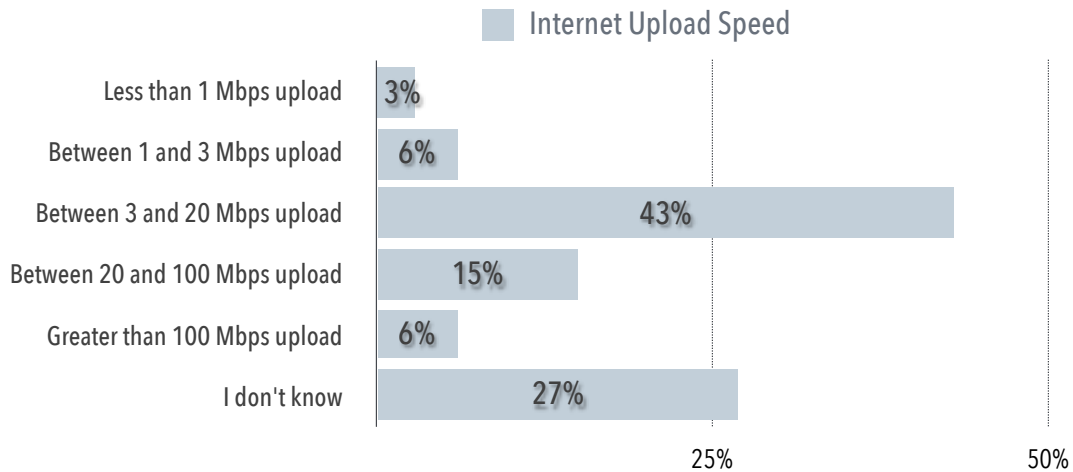
Internet Upload Speed

Category	Percentage
Less than 1 Mbps upload	3%
Between 1 and 3 Mbps upload	6%
Between 3 and 20 Mbps upload	43%
Between 20 and 100 Mbps upload	15%
Greater than 100 Mbps upload	6%
I don't know	27%

11. How satisfied are you with the speed of your internet service?

Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
12%	29%	28%	20%	11%

12. How satisfied are you with the reliability of your internet service?

Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
15%	31%	23%	19%	12%
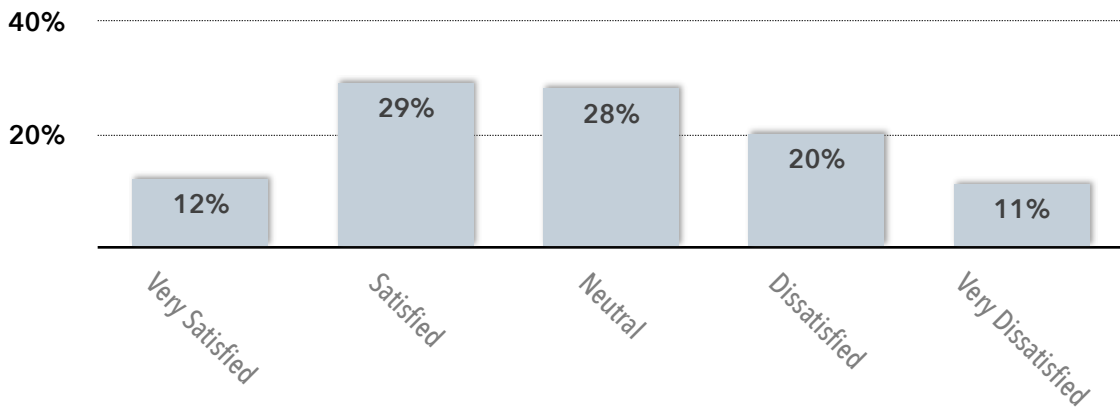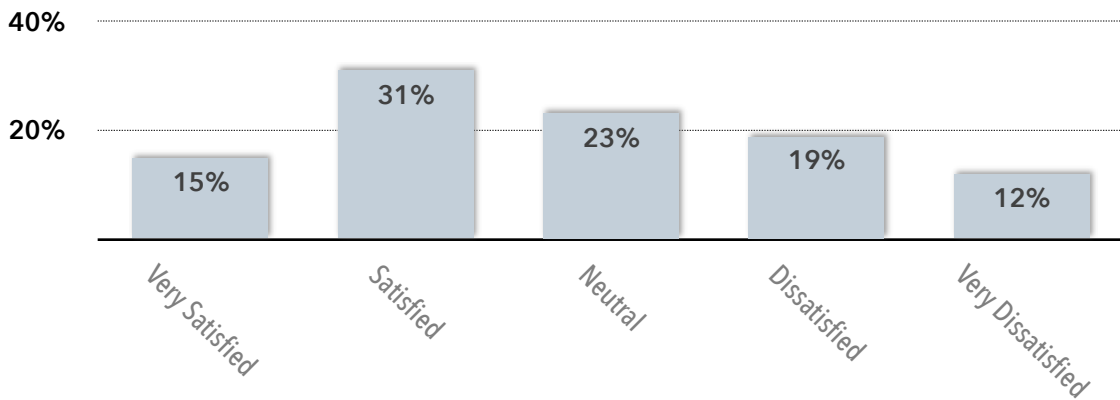
13. Select the items you agree with below

> More than 50% of respondents report they have trouble using common Internet services

	Agree	Disagree
I have trouble viewing online videos/lectures/ movies/tv shows	33%	67%
I have trouble using the Internet when others are using it	32%	68%
I have trouble using Facetime, Skype or other video chats	17%	83%
I have trouble loading pictures to my social media account(s)	14%	86%
I do not have trouble performing any of these activities	45%	55%
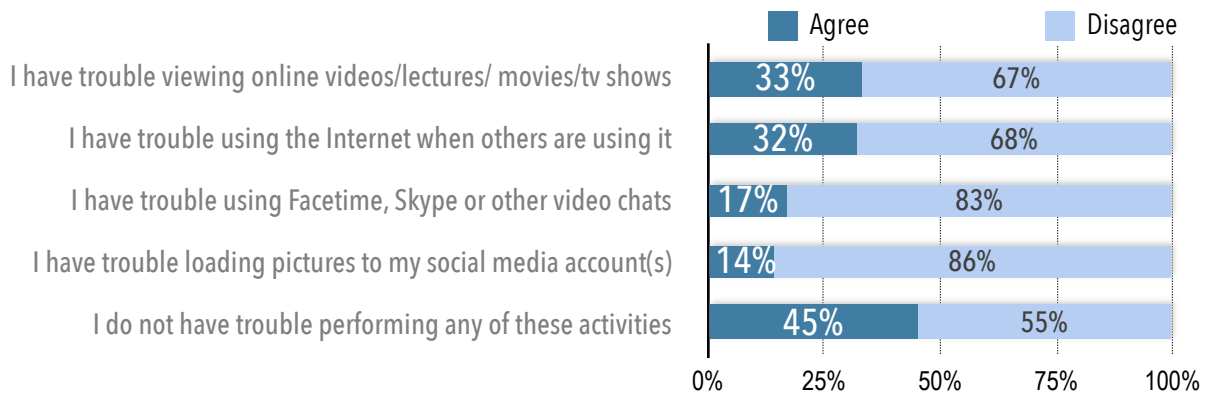
14. Select all items you use the Internet for now

Email	1,692	94%
Online Shopping	1,612	89%
Streaming video services (Netflix, Hulu, Prime, etc)	1,351	75%
Online Backup (files, photos, music)	977	54%
Smart Home Technology(e.g. video doorbells, smart speakers, Alexa, smart lights, etc)	849	47%
Work from home during Covid-19 pandemic	763	42%
Telemedicine or tele-health	748	41%
Online gaming	748	41%
Learn about Covid-19 pandemic issues and information	676	37%
VoIP Internet phone (Vonage, Skype, FaceTime, etc.)	649	36%
Homework/Schoolwork/Distance learning	617	34%
Other	121	7%

Other internet types responses:

Many comments were received. Because of the volume of replies, these comments can be found in Appendix B.

15. How many devices (for example computers, cellphones, smart TVs) connect to the Internet in your household?

Internet-Connected Devices in the Home

1-3	16%
4-6	32%
7-9	21%
10-12	15%
13+	16%

52% of residents have 7 or more Internet-connected devices in their home
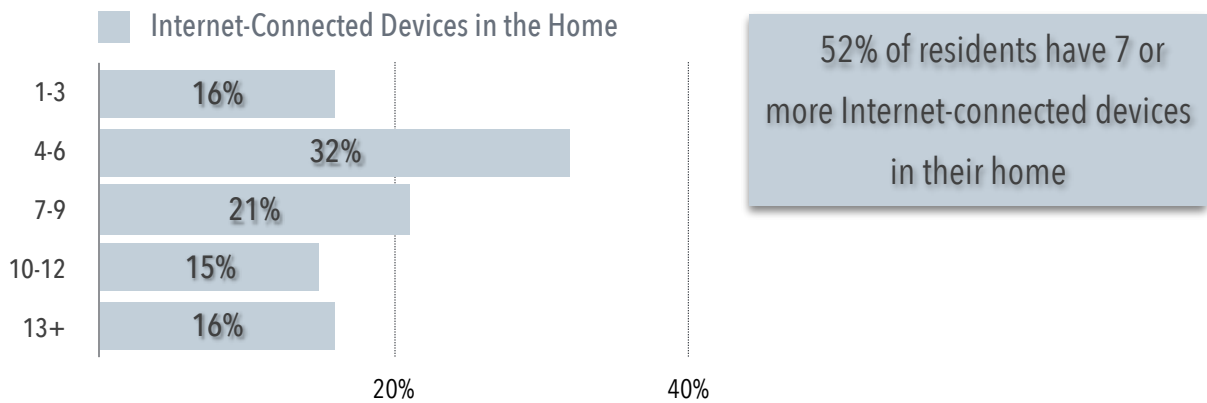
16. High speed, affordable Internet influences where I choose to live?

Availability of broadband Internet is affecting where people choose to live. The response of 30% is typical compared to most communities. Internet availability can impact home prices and community development.
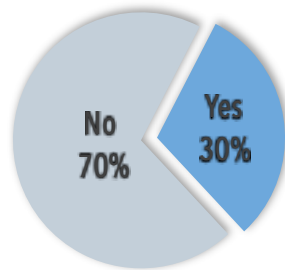
17. Has the Covid-19 crisis had a negative economic impact on your household?
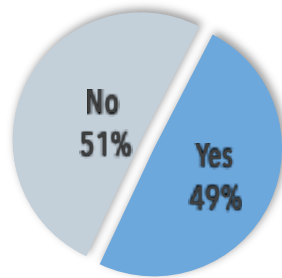
18. Does anyone in your household use / need the Internet to complete school assignments, participate in distance learning, or receive job training course work?
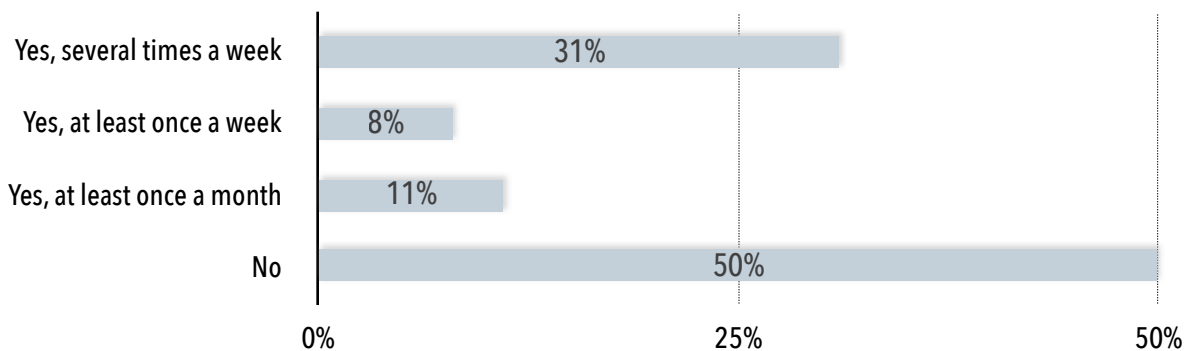
19. Do you have data limits (caps) on your current Internet service?

I don't know 32%

Yes 30%

No 37%
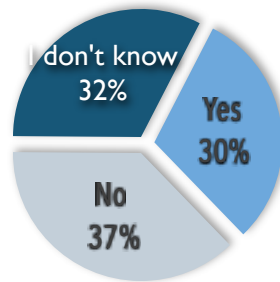
20. If you have data caps, have you exceeded those caps?

Yes	8%
No	32%
I do not have data caps	29%
I don't know	31%

21. Do you work from home?

61% report working from home part or full time—the Internet has made residential neighborhoods into business districts. Home-based jobs and businesses reduce traffic congestion and reduce road maintenance. This is also a high number relative to past surveys we have conducted, and undoubtedly the Covid crisis has caused this number to rise.

I am self employed and work part time from home.   7%
I am self employed and work full time from home.   14%
I work part time at home for my employer.   17%
I work full time at home for my employer.   12%
I need nights and weekends access for my job.   19%
I never work from home.   4%
I would if I had better Internet at home   6%
I am retired and do not work from home   30%

0%   10%   20%   30%
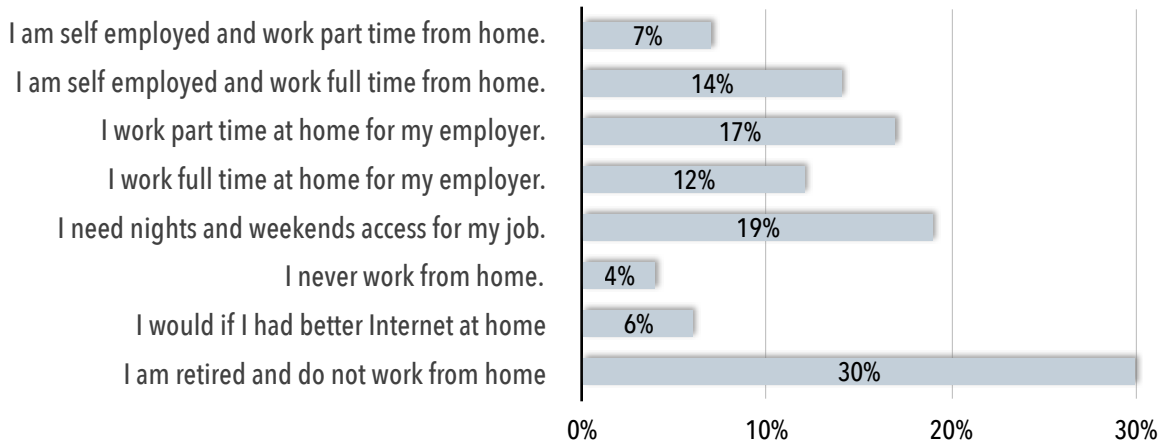
22. Are you interested in Gigabit fiber Internet service?

Yes • No • I need to know more about fiber internet first

31%

59%

10%
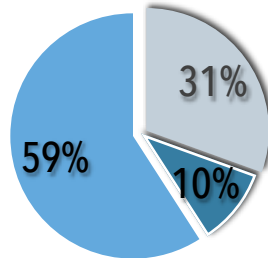
23. Should the County government facilitate better and more affordable broadband services?

No 12%

Yes 88%
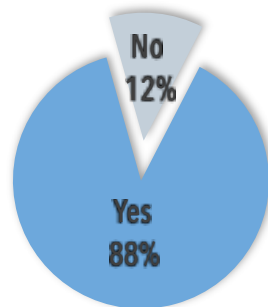
24. Any Other Comments

Many comments were received. Because of the volume of replies, these comments can be found in Appendix C.

6 BUSINESS MARKET STUDY

During the winter of 2022, a broadband business survey was conducted in Carbon County, Pennsylvania as part of a county wide study in broadband needs. The online (Web) version of the survey was publicized on social media. Businesses were encouraged to complete the survey online or fill out and return the paper version by surface mail. A total of 58 responses were were collected from businesses in the County. Not all responders answered every question. Some key findings from the results are listed below.

64% of business respondents want better Internet access

89% of respondents said that they believe the County government should help facilitate better broadband

97% indicated that the Internet is important to the success of their business over the next five years

Only 32% of businesses are "satisfied" or "very satisfied" with the speed of their current Internet service

23% of the businesses that responded are home-based

66% of businesses that responded need employees to be able to work from home

Home-based workers and businesses need affordable Internet access

6.1 DISTRIBUTION OF BUSINESS SURVEY RESPONSES

The map below shows the geographic distribution of responses to the business survey, coded according to the *download* speed of their Internet connection (Question 11).
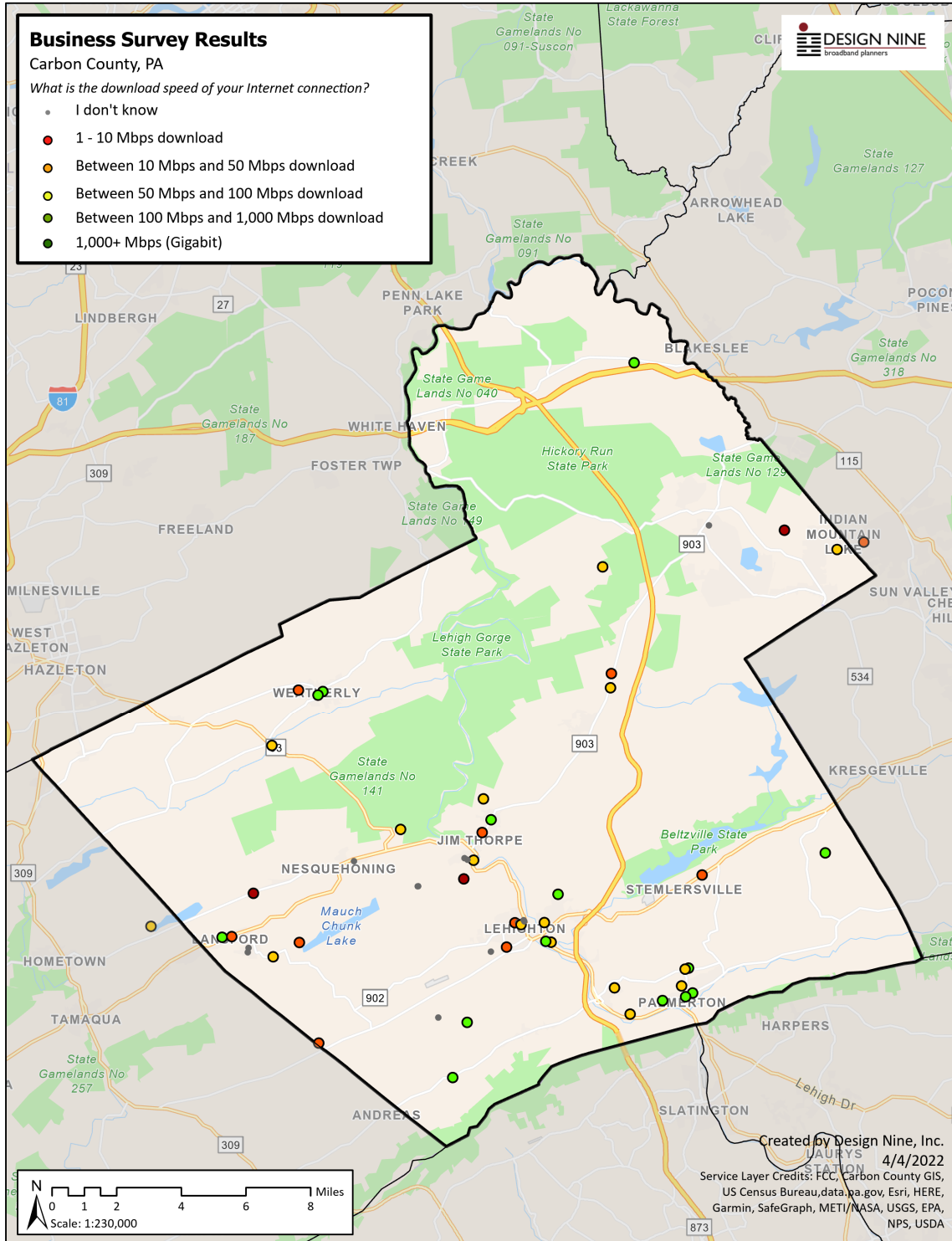
The map below shows the geographic distribution of responses to the business survey, coded according to the *upload* speed of their Internet connection (Question 12).
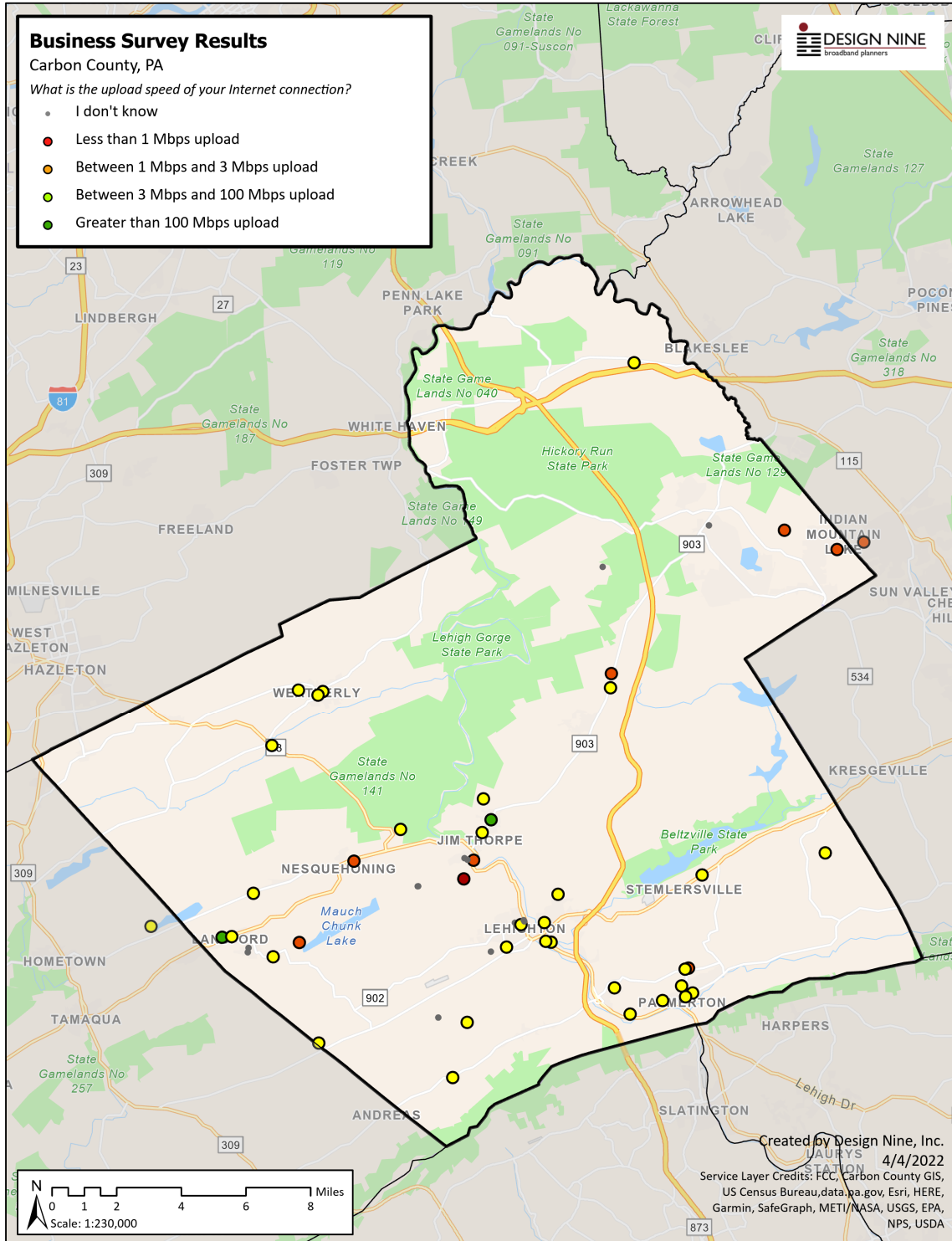
Business Survey Results
Carbon County, PA
What is the upload speed of your Internet connection?
- I don't know
- Less than 1 Mbps upload
- Between 1 Mbps and 3 Mbps upload
- Between 3 Mbps and 100 Mbps upload
- Greater than 100 Mbps upload

The map below shows the geographic distribution of responses to the Business survey, coded according to their satisfaction with the *speed* of their existing Internet service (Question 13).

Business Survey Results
Carbon County, PA
How satisfied are you with the speed of your Internet service?

- Very dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very satisfied
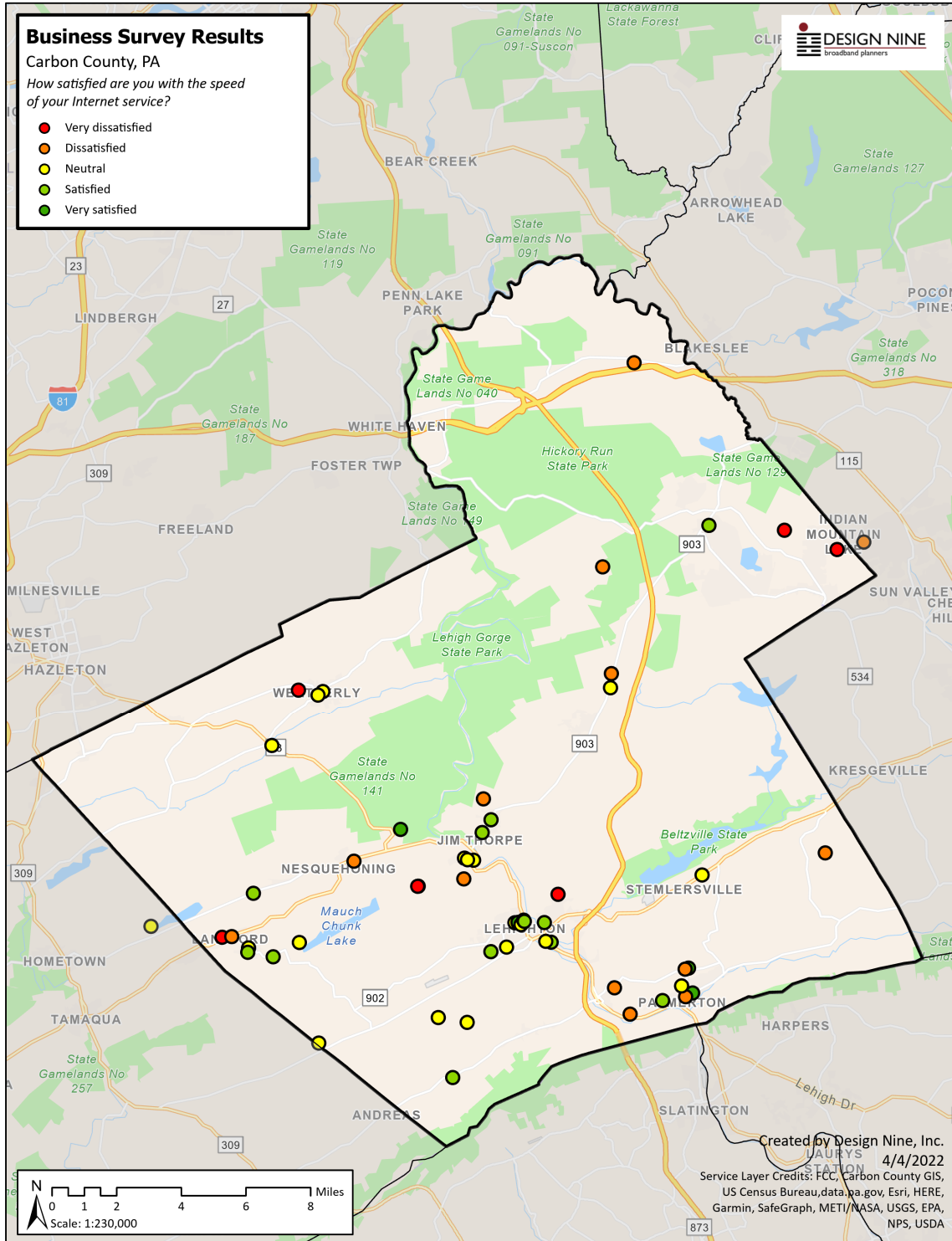
The map below shows the geographic distribution of responses to the Business survey, coded according to their satisfaction with the *reliability* of their existing Internet service (Question 14).
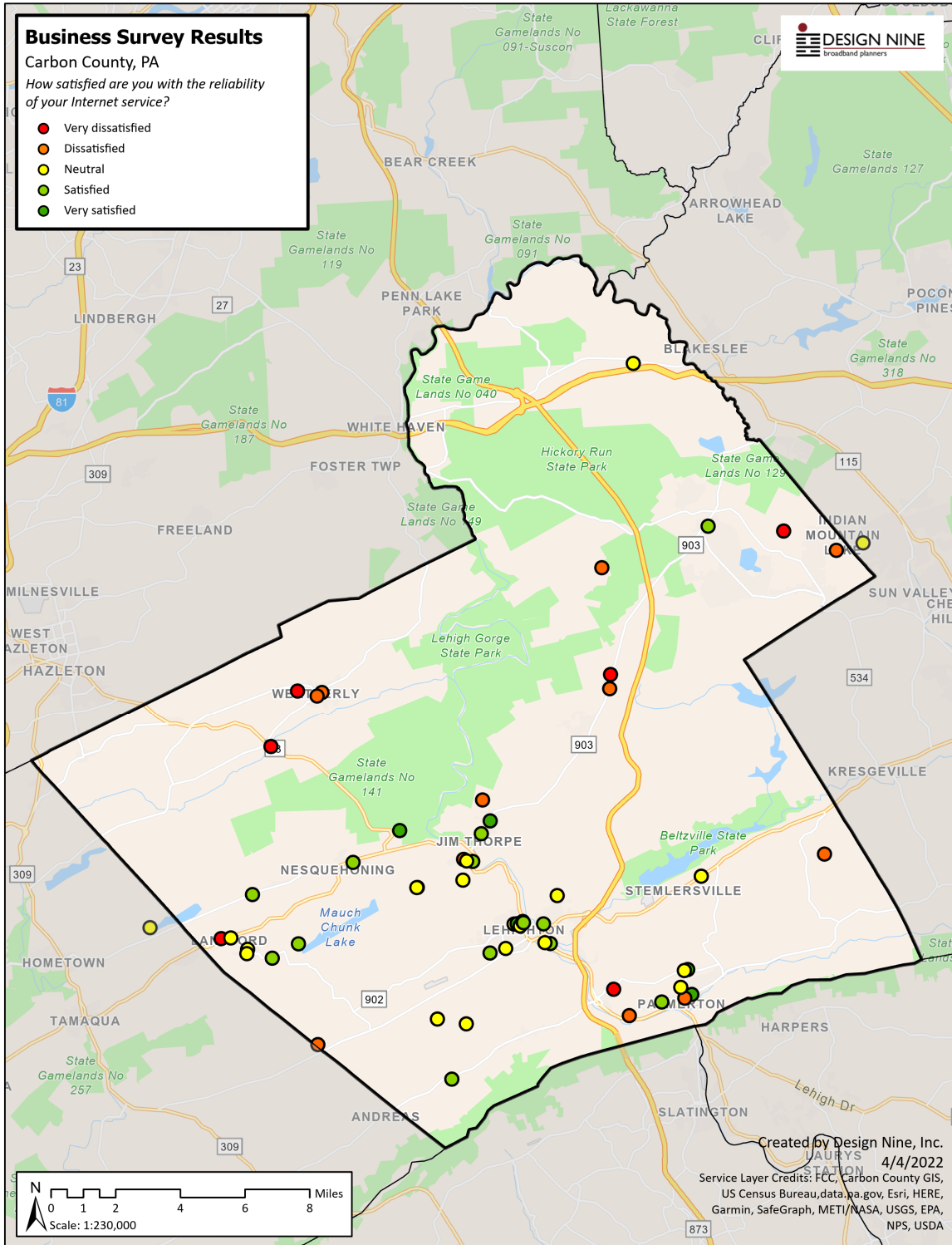
6.2 BUSINESS SURVEY SUMMARY DATA

1. Select the items you agree with below

A large number of businesses indicated that the downtown areas of the county could benefit from free WiFi for visitors and shoppers.

Legend: ■ Agree ■ Disagree

Statement	Agree	Disagree
My business needs better Internet/data service.	64%	36%
My business needs better cellular telephone service.	33%	67%
Downtown areas of the county need free WiFi for visitors	29%	71%
My business needs better landline telephone service.	28%	72%
We are satisfied with all of our services.	22%	78%
I need better Internet for Covid-19 work from home	14%	86%

(Scale: 0% – 25% – 50% – 75% – 100%)

2. How important do you think Internet technology will be for the success of your business over the next five years?

Category	Percentage
Unimportant	0%
Neutral	3%
Somewhat Important	17%
Very Important	79%

(Scale: 0% – 27% – 53% – 80%)
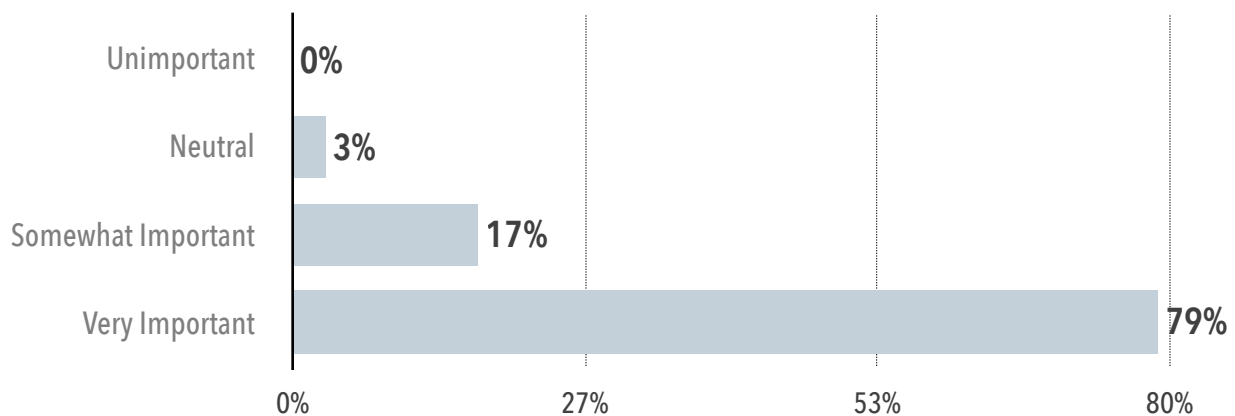
3a. Total number of employees

1 to 10	72%
11 to 40	12%
41 to 80	4%
81 to 150	5%
Over 150	7%

3b. Total number of Internet users

1 to10	60%
11 to 40	26%
41 to 80	3%
81 to 150	5%
Over 150	5%

4. If you are a business, what type? (select all that apply)

Retail / Wholesale	12	21%
Professional / Office	9	16%
Government	4	7%
Educational	4	7%
Medical	4	7%
Non-Profit	8	14%
Restaurant/Food Service	3	5%
Communications/Technology	2	3%
Agriculture/Forestry	2	3%
Manufacturing	1	2%
Outdoor Recreation	8	14%
Construction / Maintenance/ Repair	3	5%
Other	17	29%

Other types of businesses

- Religious Non-Profit serving the Carbon County for 37 Years
- Residential/light commercial real estate inspections
- Bowling alley

- Manufacturer''s representatives for commercial and industrial applications.
- Publishing
- A Winery, a Campground and 270 Short Term Rental Residential Homes are approved to be built and rented to families and businesses vacationing in Carbon County.
- Garage
- Horse boarding, training, riding lessons
- Childcare
- Transportation
- Lake Community
- Financial Services
- Self Storage Facility
- PUBLIC LIBRARY
- Real Estate
- B+B
- 104 Short Term Rental Residential Homes
- Funeral Home
- Property owners association
- Wellness-yoga, meditation, reiki
- Sales

5. Is this a home-based business?

Yes	No
13	43
23%	77%

23% of the county businesses that responded are home-based

6. How much do you pay now for Internet access each month?

$0 to $100	$101 to $150	$151 to $500	$501 to $1,000	$1,001 to $5,000	$5,000 or more	I don't know
21	17	12	3	2	0	3
36%	29%	21%	5%	3%	0%	5%

7. Are you satisfied with what you pay for Internet service?

Yes   No

29%

71%

8. What type of Internet do you have?

Cable modem	62%
Fiber	14%
Cellular wireless	7%
Wireless Broadband provider	7%
DSL line	5%
I don't know	2%
No internet	2%
Other	2%

0%   18%   35%   53%   70%
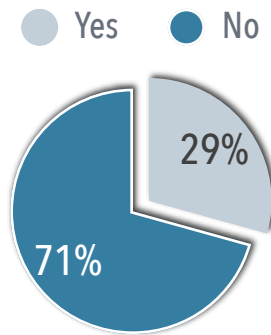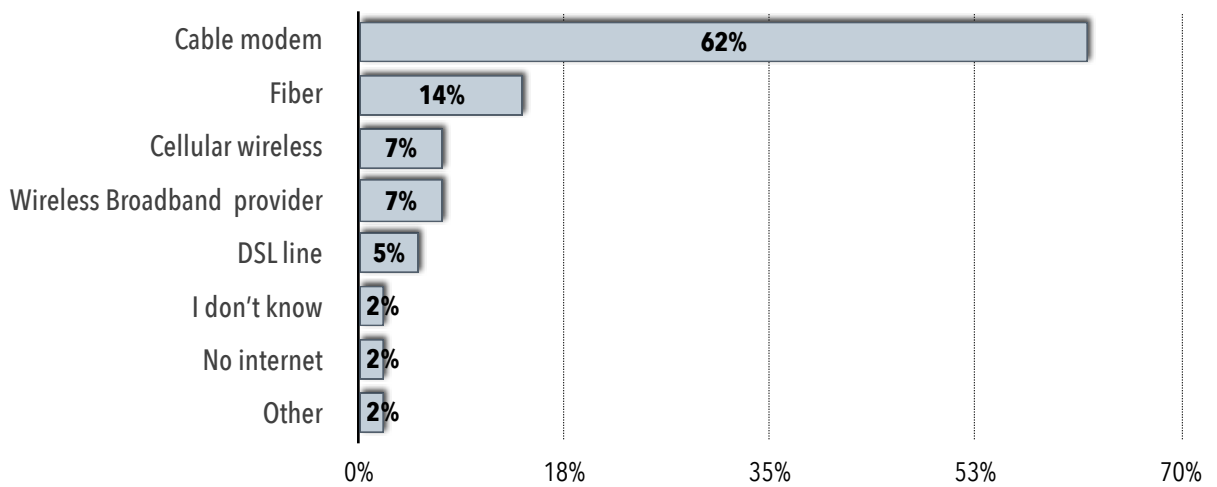
9. Based on the type of Internet you selected above, why do you still have it?

Respondents could choose more than one option.

Category	Value
Most reliable service available	53%
No other options	23%
Limited other options	26%
Best price available	11%
Too expensive to change	7%
Not interested in changing	7%

30%   60%
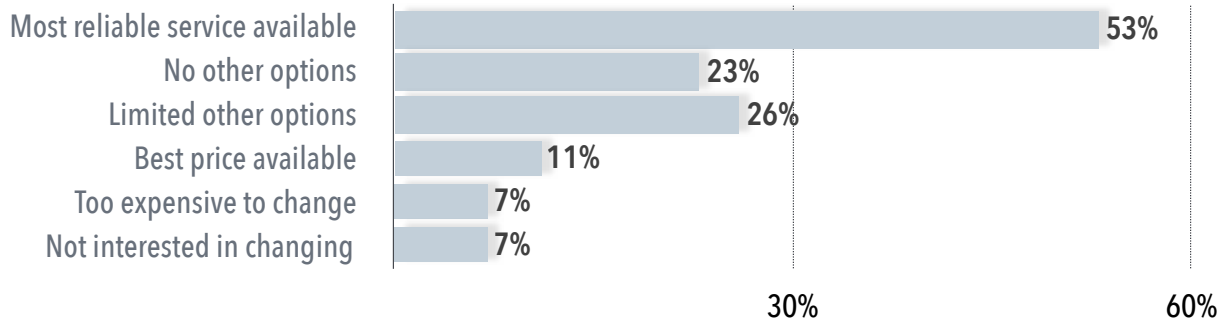
10. What is the download speed of your Internet connection? (A Gigabit is 1000 Megabits (Mbps)

Less than 1 Mbps	1-10 Mbps	10 - 50 Mbps	50-100 Mbps	100 - 1,000 Mbps	1,000+ Mbps (Gigabit)	I don't Know
0	3	11	16	14	0	11
0%	5%	20%	29%	25%	0%	20%

11. What is the upload speed of your Internet connection? (A Gigabit is 1000 Megabits (Mbps)

Less than 1 Mbps	1 - 3 Mbps	3 - 100 Mbps	100+ Mbps	I don't Know
1	8	33	0	13
2%	15%	60%	0%	24%

12. How Satisfied are you with the speed of your Internet service?

Response	Percentage
Very Satisfied	7%
Satisfied	25%
Neutral	32%
Dissatisfied	23%
Very Dissatisfied	13%

13. How Satisfied are you with the reliability of your Internet service?

Response	Percentage
Very Satisfied	9%
Satisfied	29%
Neutral	32%
Dissatisfied	20%
Very Dissatisfied	11%
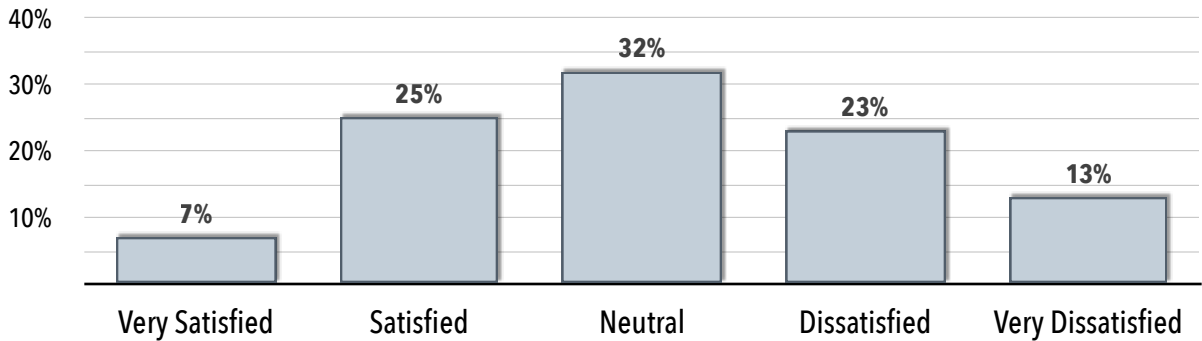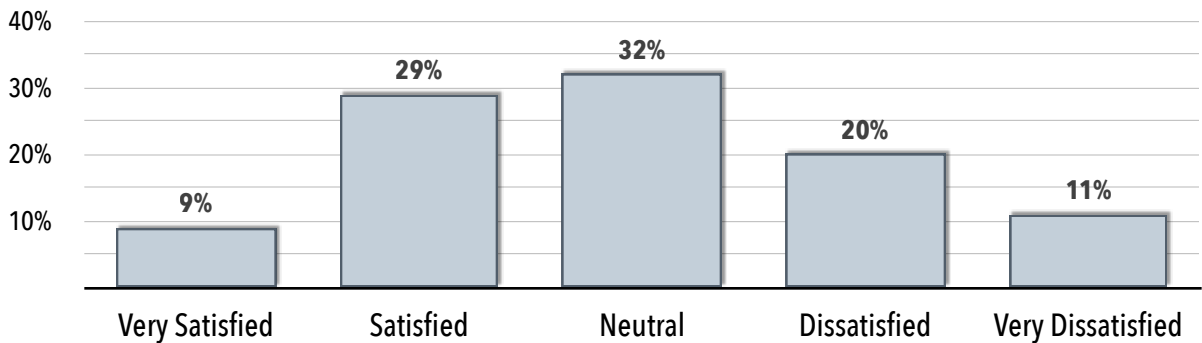
14. How important is a redundant or second Internet connection to your business?

Response	Percentage
Neutral	36%
Somewhat Important	31%
Very Important	33%
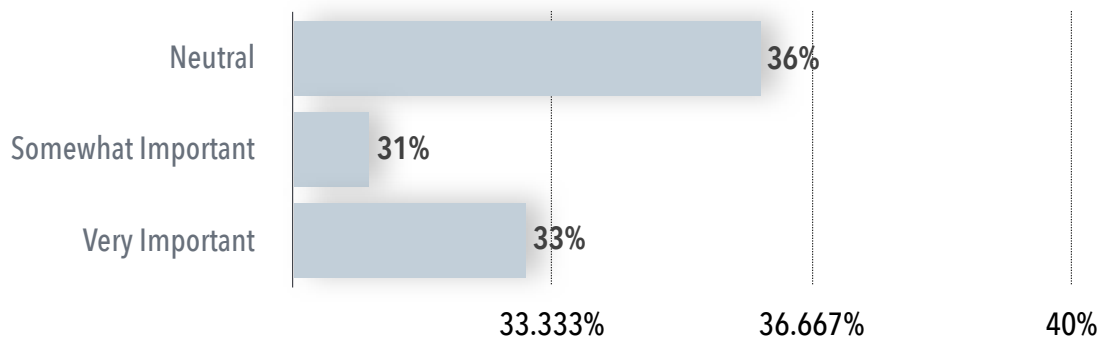
15. Please select all that apply to your current Internet provider

Price is unreasonable for the service I receive	45%
Cannot rely on service	18%
Slow or poor technical support	18%
The speed I want is not available at my business location	16%
Poor customer service	9%
I am satisfied with my Internet provider	38%
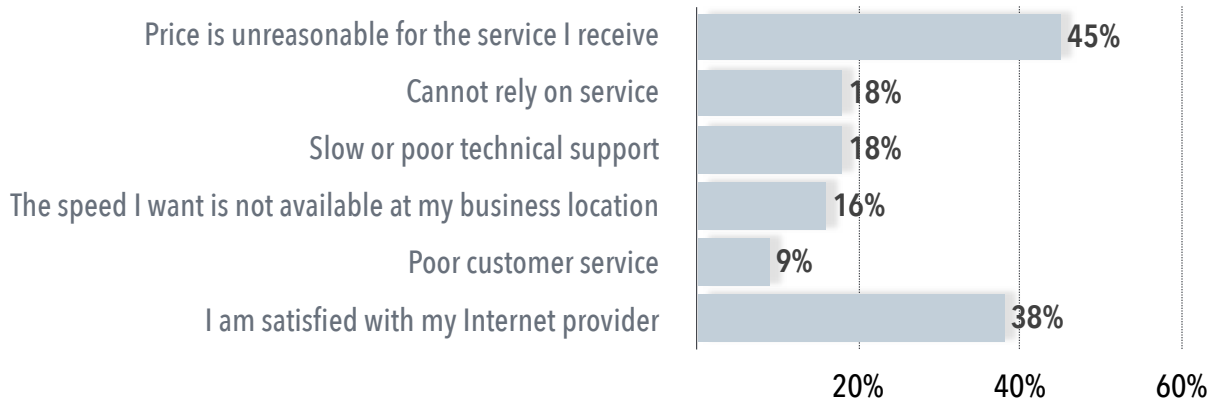
16. Select all the items you use the Internet for now(Select all that apply)

Social media (Facebook, LinkedIn, Twitter, etc.)	42	72%
Monitor / control security, alarms, health, processes, etc.	36	62%
Ordering / managing inventory	34	59%
Online Backup (files, photos, music)	33	57%
Processing credit card / debit card transactions	33	57%
Cloud-based business, accounting or other services	26	45%
Receiving and processing online orders	22	38%
VoIP Internet Phone(Vonage, Skype, etc.)	21	36%
Offer customers free WiFi while shopping	9	16%
Other	7	12%

Other uses for the Internet

- Educational information accessed thru the internet to our servers
- Uploading files for printing, receiving files from customers
- We cannot offer internet to public due to slow DSL speeds
- Email Streaming webinars Providing virtual education to schools and other organizations Streaming live videos (from us) for the purpose of education and entertainment
- internet research, info gathering and sharing

- Internet is used for all aspects of the childcare center. Billing, signing in and out, staying in contact with parents all day, plus all emails, payroll, and business information is from the internet.
- JOB SEARCHING, BUYING BUS TICKETS, SCHOOL INFORMATION
- have been asking for a WIFI hotspot so that we could offer to the homeless a place where they can come to use phone via wifi apps... this option could save lives...
- High Speed Internet Service is required for 104 Short Term Rental Residential Homes
- Streaming video or movies

17. Who is your Internet Service provider?

Blue Ridge Cable	29	53%
PenTeleData	17	31%
Atlantic Broadband	4	7%
Other	3	5%
Windstream	2	4%

18. What kind of telephone service do you have?

Landline and cellphone service — 47%
Cellphone service only — 33%
Landline only, no cellphone service — 21%

(axis: 25%, 50%)
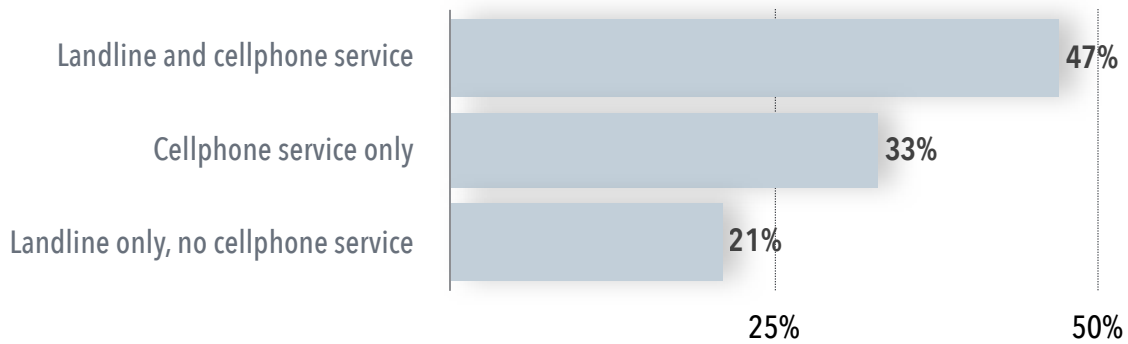
19. Do you or your employees use a VPN (Virtual Private Network) to obtain remote access for your work or to a company network?

Yes	No	I Don't Know
15	37	27
19%	47%	34%

20. Do you or your employees need or want to work from home?

Very important on a consistent basis — 29%
No — 25%
Occasionally — 23%
Very important occasionally — 14%
It would be nice, but it's not important — 9%
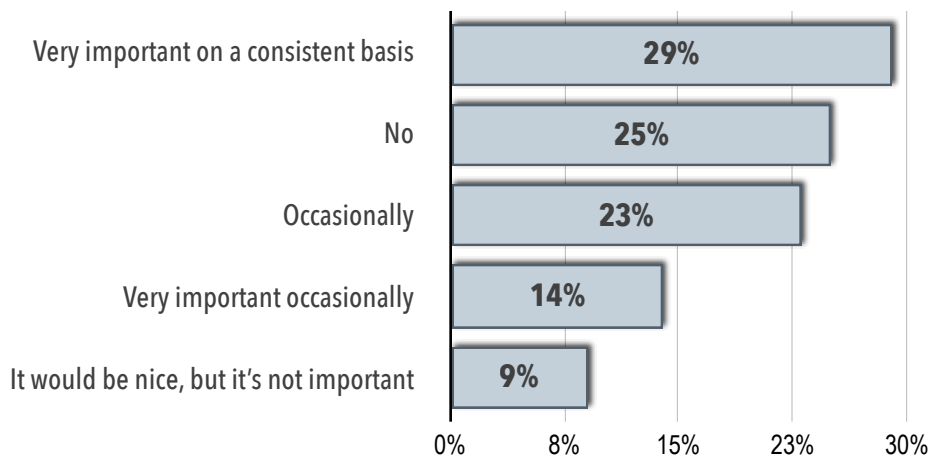
66% of businesses that responded need employees to be able to work from home

21. Does limited Internet access at employees' residences impact your business?

Yes   No

32%
68%
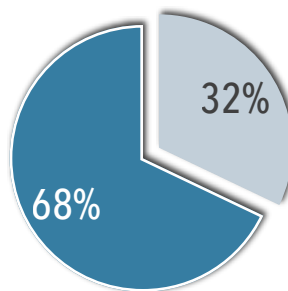
22. Do the existing internet service options impact your business's decision to relocate or stay in the County?

If yes, briefly state why:

- Educational services and community services are essential to us.
- Can't open up a brick and mortar store because business class w/ speeds high enough for a computer repair shop would be over $350 a month. That's almost half as much as RENT for a month.

Yes • No

7%

93%
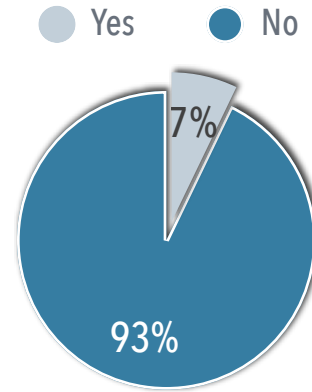
23. Are you interested in Gigabit fiber Internet Service?

Yes • No

23%

77%
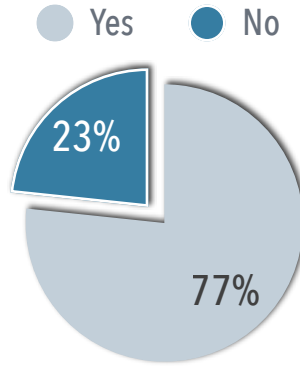
24. Should New North and/or your county government facilitate better broadband services and more affordable services?

Yes	No
50	4
93%	7%

25. Any Other Comments

- I would be glad to donate time and any resources we have to facilitate a speedy sustaining solution for the county.
- Don't enter a business that is presently handled by private entrepreneurs! Government can NEVER compete and ultimately cost taxpayers more money....Joe
- Reliability is the key. Current internet cuts in and out regularly.
- Funding is needed to extend Blue Ridge Fiber Line up Flagstaff Road
- Yes, but don't take away the quality and consider the customer service program that goes with the internet. Consider also the # of local employees who work for BRC and PenTeleData. They are both Carbon County employers.
- NEED MORE COMPETITION IN THE AREA VS JUST 2 PROVIDERS
- would love more affordable....other than that blue ridge does a great job
- Your grouping of upload speeds 3-100mbps is not granular enough. There is a massive difference between 5mbps up and 25mbps up. You are not collecting enough information on this metric. I suspect the 3mbs metric comes from the FCC guidelines for 'broadband' but that minimum threshold is laughable and was determined through lobbying of DSL broadband providers 3mbs is no longer satisfactory to be considered broadband. As for cell service, the only carrier that has covered is Verizon. AT&T re-aimed their antenna at their cell site years ago and the neighborhood lost service. Downtown Jim Thorpe has no indoor coverage from AT&T, T-Mobile for 3G let alone 4 or 5G.
- Funding is needed for Blue Ridge Cable to run a fiber internet line up Flagstaff Road in MAHONING Township and Jim Thorpe Borough.
- As a business owner, downtown Jim Thorpe is in desperate need for a free visitor's wifi hub or reliable cell signals for ALL carriers. The business district (JTTA) has numerous possible ways to communicate with our visitors, however the limitations of wifi/cell service significantly reduces these options.
- Having a choice for reliable internet would be appreciated. BRC is our only choice and I experienced outages while trying to work at home during the day. There pricing has increased greatly over the past year and there is no other options to even consider.

7 TECHNOLOGY OPTIONS

7.1 OVERVIEW OF THE TECHNOLOGY

There are still many areas of Carbon County where businesses and residents need improved Internet service. There are a variety of wired and wireless technologies that could improve service, but the county, in large part because of difficult terrain, has very limited fixed point wireless service, and wider availability of fixed point wireless broadband is not likely to increase.

The table below summarizes the kinds of fiber and wireless options that are in common use today. In Carbon County, a focus on advocating that local ISPs upgrade their existing copper-based networks to fiber will be important

Distribution Type	Access Type	Capacity
Wireless	Wireless	Typical customer connection starting at 5 to 10 Megabits, can be higher, with 50 Meg connections common. More dependent on the capacity of the wireless Distribution link.
Wireless	Fiber	Users can have fiber Gigabit connections locally, but total throughput dependent upon the capacity of the wireless link, which can be up to a Gigabit, depending on distance and budget.
Fiber	Fiber	Any amount of bandwidth needed, with standard connection typically a Gigabit (1,000 Megabits).
Fiber	Wireless	Typical customer connection starting at 5 to 10 Megabits, can be higher, with 50 Meg connections common.
Fiber	Coax, DSL	Providers can use a fiber middle mile backbone and distribute improved broadband Internet services using copper-based coax (cable Internet) or DSL (copper phone lines).

7.1 DARK FIBER AND LIT FIBER

About Dark Fiber

Dark fiber is installed in conduit underground and/or hung on utility poles. It is called "dark" because no network electronics are installed to "light" the fiber (using small lasers in a fiber switch). For small municipal/local government fiber installations, dark fiber has a significant advantage in terms of management—very little ongoing operational responsibility is required.

Dark fiber is leased out to service providers, who install their own network electronics in cabinets or shelters attached to the fiber cables. The providers typically lease fiber pairs between the cabinet and their customers, and are responsible for all equipment-related management and maintenance. Dark fiber networks can be used by service providers to provision either Active Ethernet or GPON services to their customers.

Dark fiber networks do not generate large amounts of revenue, but this is offset by very low maintenance costs—primarily an emergency break-fix arrangement with a local or regional firm qualified to splice fiber. Emergency break-fix contracts are usually based on a time and materials basis, so there is little or no expense if there are no fiber breaks.

Other costs include "locates," which are called in to Pennsylvania 811 (Miss Utility Hotline) and are performed by either the local Public Works department or a private sector contractor. For small fiber networks, locate costs are generally modest.

About Lit Fiber

A "lit" fiber network includes the network electronics needed to transmit data over the fiber (using the small lasers in a fiber switch, hence there is light traveling over the fiber cable). In a lit network, "lit circuits" are leased out to service providers rather than fiber pairs. The muni/local government/community network provides the network electronics, which reduces costs for the service provider—meaning they are able to pay higher lease fees for the circuits they use to deliver services (like Internet) to their customers. Lit networks generate more revenue, but also have higher expenses because the network electronics have to be monitored and managed on a 24/7/365 basis (this task can usually be outsourced at reasonable cost). However, very small fiber deployments often do not pass enough homes or businesses to generate sufficient revenue to cover the higher costs.

Like dark fiber, a lit network incurs break-fix and locate costs as well.

7.2 WIRELESS TECHNOLOGIES

WISPs (Wireless Internet Service Providers) use a wide variety of radio frequencies to deliver fixed point wireless broadband. By "fixed point," this means that these systems are not designed to support roaming in the way that cellular voice/data radios are (that is, mobile phone and data services).

Fixed point broadband is broadcast from a tower to individual homes and businesses (fixed points). Most of the frequencies used require clear line of sight between the tower and the location where service is desired.

Hilly topography can work for or against good wireless broadband service. Towers located on the tops of hills and mountains can provide service over a larger area than a tower in relatively flat terrain, but hills also block the signal. A residence can be a short distance from a large tower, but heavy tree cover or an intervening hill will block service. The solution to this can be addressed in several ways:

More larger towers of 180' to 300'

The taller the tower, the wider the coverage, but as tower height increases, the cost of the tower also increases. Towers taller than 199' require a light at the top to make them visible to low-flying aircraft, and lighted towers are more expensive to erect, and the bulbs have to be changed periodically at significant expense. Many broadband towers are 180' to avoid the additional cost of lighting.

Small cell broadband utility poles

Small cell broadband utility poles, often called community poles, are shorter towers or utility poles of typically 60' to 80', located in or very near a cluster of homes. The towers can be wooden utility

poles or relatively low cost steel monopoles or steel lattice towers. These towers are located to get above local tree cover so that clear line of sight to a distant taller tower is available.   Local access point radios provide service to homes and businesses with line of sight to the pole.

Variety of radio frequencies

WISPs are beginning to deploy a wider range of licensed and unlicensed radio frequencies to overcome distance, bandwidth, and line of sight issues. Traditional 2.4 Ghz and 5.7 Ghz WiFi and WiMax frequencies are being supplemented or replaced with LTE and CBRS licensed broadband frequencies that provide better bandwidth and will tolerate light tree cover better (2.5 Ghz, 3.5-3.7 Ghz). Some WISPs are also using lower frequencies (e.g. 900 Mhz) that will travel farther and will also provide better penetration in light tree cover.

7.3 EMERGING WIRELESS TECHNOLOGIES

MIMO Wireless

MIMO (Multiple Input, Multiple Output) describes a variety of technologies that can be summarized as using more than one receive and transmit antenna for wireless data applications. Wireless protocols that are using the MIMO concept include IEEE 802.11n (Wi-Fi), IEEE 802.11ac (Wi-Fi), 4G, LTE (Long Term Evolution), and WiMAX.   Each of these protocols use the MIMO technology to increase the amount of available bandwidth in a given section of radio frequency spectrum.

New hardware is required to make effective use of MIMO. While the technology increases wireless bandwidth, the typical amount of bandwidth being used by wireless devices is also increasing rapidly. Some applications where MIMO is likely to provide noticeable improvements are in home wireless routers, where the effective throughput will be able to better handle the demanding bandwidth requirements of HD and 4K video streams.   MIMO is slowly being developed for use with cellular smartphones, but both the phones and the cell tower radios have to be upgraded to support MIMO.

LTE/4G/5G

LTE (Long Term Evolution) is a set of protocols and technologies designed to improve the performance of voice/data smartphones.   Like MIMO, both the user phone and the cell tower radios have to be upgraded to support LTE improvements. In 2013, only 19% of U.S. smartphone users were able to take advantage of LTE speeds, although that percentage has been increasing rapidly since then, and more than 85% of the U.S. cellular towers have been upgraded to LTE. As noted previously, the actual bandwidth available to a smartphone user is highly variable and depends on distance from the cell tower, the number of smartphones accessing the same tower simultaneously, and the kinds of services and content being accessed by those users.

The primary purpose of cellular bandwidth caps is to keep cellular users from using too much bandwidth and degrading the overall service. While LTE and MIMO improvements will improve overall cellular service, these technologies are not going to replace fiber to the home and fiber to the business.

In 2017, new fixed broadband wireless systems entered the marketplace using LTE frequencies, and many WISPs have begun to replace existing wireless radio systems with LTE equipment. These

LTE systems do not provide any cellular voice services; they are designed specifically to support only broadband/Internet service.

In our conversations with both vendors of these systems and WISPs that have begun deploying them, we get two different stories. The vendors have been conservative in discussing the improvements, while some WISPs have been taking single user test results and suggesting that they will be able to deliver higher speeds at greater distances to all users.

> To achieve the full benefit of 5G technology, more fiber is needed.

There is little debate that the LTE equipment offers higher bandwidth, at somewhat greater distances, and with somewhat better penetration of light foliage and tree cover. Over the next two to four years, most WISPs will change out most of their existing radio systems for the improved LTE radios. Perhaps the most significant advantage of LTE fixed point broadband is its ability to provide better performance when clear line of sight between the customer and a tower is not available. LTE provides better penetration of light to moderate tree cover and other line of sight obstacles.

The official standard for 5G radio technologies was release in 2019, and many metro areas of the country now have 5G radio systems. It is worth noting that many smartphones, even some late model smartphones, do not have 5G support built in.

5G does bring much higher speeds to wireless broadband (e.g. it might be able to deliver 30 to 50 Meg of bandwidth consistently). But 5G has significant limitations that do not make it a good solution in rural areas of the U.S.

The fact that 5G can deliver much higher bandwidth means that 5G cell sites will require fiber connections. This is going to effectively limit 5G deployments to denser urban environments where both customers and fiber are plentiful.

There is no free lunch in the physics of radio frequencies. The higher bandwidth of 5G means that cell sites need to be closer together because the 5G frequencies do not travel as far as existing 4G/LTE frequencies currently being used by the cellular industry. Most users will have to be within 500 to 1,000 feet to receive 5G service.

Some experts estimate that more than a million miles of new fiber will have to be deployed just to support the 25 largest metro areas in the U.S. 5G will not appear overnight.

As many as eight to twelve cell sites per square mile may be needed to make 5G widely available in a given area. If, as an example, about 25%, or 95 square miles of Carbon County is underserved or unserved, very conservatively, 800 or more cell sites would be needed to provide good coverage (as many as nine or ten cell sites per square mile).

For rural areas, the cost of 5G service may be one of the most significant obstacles. The cellular carriers see the increased customer bandwidth use possible on 5G networks as a major revenue opportunity. While they will increase the "standard" bandwidth package for monthly service, bandwidth caps and rate limiting is likely to keep 5G cellular customers bills high.

There are some areas of the county where residents who responded to the broadband survey reported poor or no cellular voice/data service, and somewhat counter-intuitively, more fiber can solve that problem. Cell towers need fiber backhaul connections to provide the best cellular data performance, and so rural fiber will also help address the issue of poor cellular service.

White Space Broadband

White space broadband uses some of the frequencies that were formerly used by analog TV channels. These lower frequencies travel farther and provide better penetration of light foliage. Microsoft has been supporting a number of community white space experiments, and has promised much wider support for this technology, but there are few other users, equipment is still relatively expensive, and few WISPs have ventured into this still largely experimental technology. A Microsoft white space project in southern Virginia, although still underway, serves less than three hundred households and is still regarded as experimental. Other white space pilot projects have reported good results. One ISP experimenting with the technology has indicated that their trials with white space equipment has been able to deliver 50 Meg/50 Meg service.

Low Earth Orbit (LEO) Satellite Internet

The Elon Musk-funded Starlink effort began offering "beta test" service in late 2020. There is a one time equipment and installation fee of $499, and a monthly fee of $99. The company is promising download speeds of between 50 Meg/sec and 100 Meg/sec and upload speeds of up to 20 Meg/sec. Latency is lower than traditional satellite Internet services. If the prices remain reasonable, this is likely to become a much better alternative to the older satellite Internet services.

In early fall of 2021, Starlink announced that the company would be moving the service out of beta, which would make the service more available to more users. The service has received generally favorable reviews from beta users in terms of speed and reliability. It will be important mostly for rural users who have line of sight problems for terrestrial fixed point wireless and for households and businesses that are completely outside the coverage area for fixed point wireless.

Service reports emerging in late 2021 and early 2022 have indicated that Starlink has been able to provide download speeds reliably at 50 Mbps to 75 Mbps, with a latency of 45 to 60 milliseconds. Low latency is critically important for good quality two way voice and video conversations.

By comparison, geosynchronous satellite service may have latency of ten to twenty times higher than Starlink. At the end of 2021, speed test results from the Ookla speed test service suggested that as Starlink is adding more customers, the average speed is flattening out, and Ookla's third quarter 2021 data was showing Starlink with average 87 Mbps download and 14 Mbps upload speeds, and average latency of 44 milliseconds.

In some areas of Carbon County, Starlink will be an important and useful option for improved Internet service.

Millimeter Wave Service

Millimeter wave services use a variety of very high frequency wavelengths in range of 30 Ghz to 300 Ghz. An emerging wireless broadband service that uses the term "millimeter wave" covers very short wavelengths in the 71-76 GHz, 81-86 GHz, and 92-95 GHz (70/80/90 GHz) bands. These shorter wavelengths permit the use of very small antennas while still being able to provide high directivity and high gain. A primary advantage of the smaller antennas is the ability to use more of them and to make each individual antenna highly directional. The higher frequencies also permit transmission of much higher bandwidth. However, the higher bandwidth rates are distance limited.

In early testing in 2020, U.S. Cellular was able to demonstrate speeds of 100 Mbps at distances of three miles using 5G radio equipment (5G equipment is also close to the millimeter wave

spectrum using lower frequencies of 24 Ghz, 28 Ghz, and 39 Ghz for some equipment).   Radio equipment tests are often conducted in optimum conditions, and in real world conditions, the practical distance may be lower and the bandwidth may be lower, where buildings and trees can degrade or block the radio signals.

7.4 CONNECTIVITY SOLUTIONS

Both wireless and fiber networks, as well as legacy copper-based networks, all share three primary components. How these are designed and deployed can vary greatly, but all networks have these three parts in some form.

- The **Core Network** provides access to the Internet, a place for service providers (ISPs) to distribute their services locally on the network,   and for larger institutional and business customers to meet service providers. Carbon County has both landline and wireless service providers, but there are still areas that are underserved. Each of these providers has their own Core Network.

- The **Distribution** portion of the network connects the Core Network with collections of users. A Distribution network can include both fiber and wireless portions of a network.

- The **Access or Last Mile** portion of the network connects residential users and businesses to the network, and like the Distribution network, that connection will be by fiber or by a wireless link.

The illustration below shows the full range of technology options (fiber and wireless) and how they can be connected together in various ways to meet the diverse needs of the county. More detail is provided on the following pages.
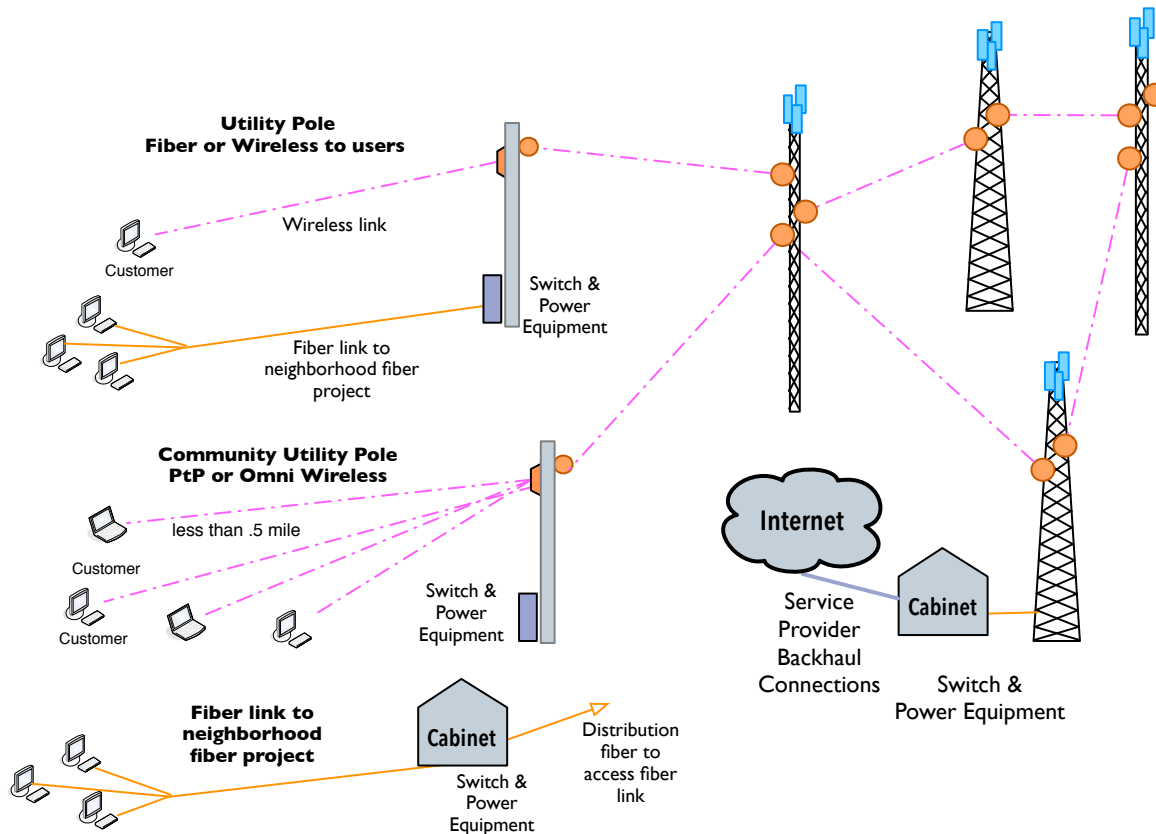
Last Mile Access

The Last Mile Access is the portion of the network that connects customers to their service provider and the Internet. Both broadband wireless and fiber links can be utilized to provide service. There are several ways that customers can receive service:

- Service providers can install their own local access radios on the Distribution towers, using both point to multi-point and point-to-point radios to deliver service to their customers.

- A single user utility pole (or inexpensive steel lattice tower) can be installed on the property of a single resident or business. A radio at the top of the pole receives service from another tower site (typically one of the Distribution towers).

- A utility pole (or inexpensive steel lattice tower) can be installed near a cluster of homes (e.g. a rural residential sub-division, several homes in close proximity on a rural road). Service providers can install their point to multi-point radios on this pole and provide economical service to several customers from a single pole.

- A utility pole (or inexpensive steel lattice tower) can be installed in a rural subdivision. A service provider installs a point to point radio on the pole, and fiber cable can be run from the pole past several homes to offer fiber service with wireless backhaul.

- Customers near existing fiber can have a fiber drop installed directly to their home or business.

Distribution Network

Distribution is the portion of the network between the Distribution sites to the Last Mile Access portion of the network. It is desirable for each distribution site to have a connection back to more than one Distribution site (tower) on a redundant ring. This ring topology protects against hardware failure at the port level and does provide some protection if one of the tower to tower wireless links is disabled by an equipment failure.
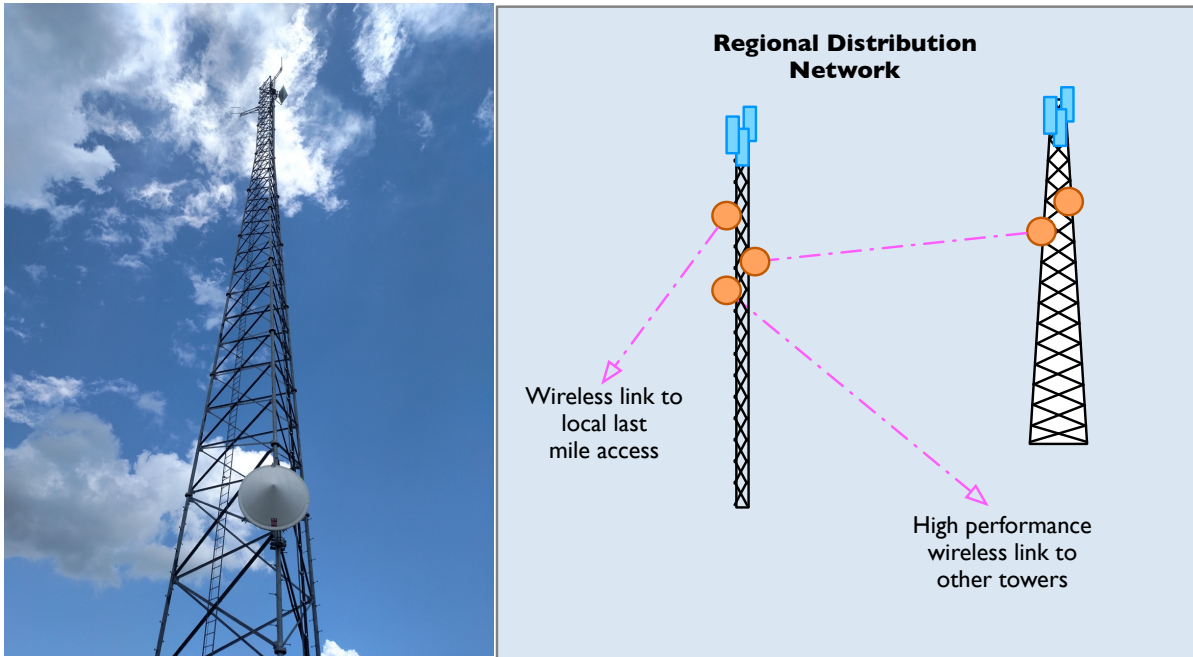
**Utility Pole
Fiber or Wireless to users**

Wireless link

Customer

Switch & Power Equipment

Fiber link to neighborhood fiber project

**Community Utility Pole
PtP or Omni Wireless**

less than .5 mile

Customer

Customer

Switch & Power Equipment

Fiber link to neighborhood fiber project

Cabinet

Switch & Power Equipment

Distribution fiber to access fiber link
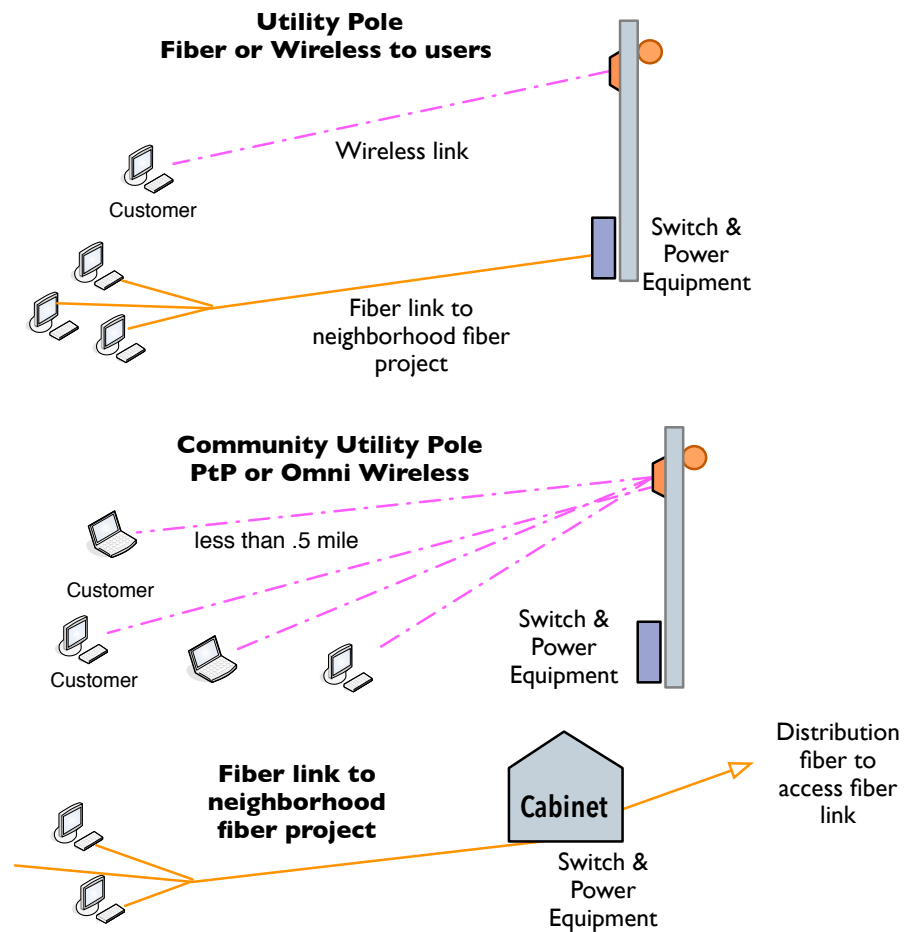
These tower sites are typically 120' to 180' tall to provide the height needed to enable Line Of Sight (LOS) between towers, and for local access, to enable service providers to mount point to multi-point radios on the towers.

Towers taller than 199' become subject to FAA regulations because the height can be a potential hazard to airplanes. Towers that exceed 199' usually have to be painted (alternating red/white) and have a blinking light at the top. These requirements increase the long term maintenance costs, but the taller towers can improve line of sight to other towers.

The towers can provide two functions:

- Space for backhaul connections to other towers in the region.
- Space for local access radios to provide Internet access within 2-3 miles of the tower (or farther with good Line Of Sight).

Regional Distribution Network

Wireless link to local last mile access

High performance wireless link to other towers

Core Network and Service Providers

In the past, the telephone company switch office (Central Office, or CO) has provided that function. Today, many communities have either a community-owned data center or a privately owned data center that offers an affordable range of options for customers of broadband services.

The Co-Location facility provides a meet point for various public and private fiber cables and networks to inter-connect. A local facility with space available for both public and private uses could help attract additional private sector investments (e.g. a long haul fiber provider wants connect to this facility because of increased access to customers).

A colocation facility is a controlled environment (i.e. secure, heated, and air-conditioned) room with Internet access through wired and/or wireless systems. The colocation facility is a place where fiber, wireless, and copper-based network facilities meet. It is equipped to house high-end network equipment, servers, and other electronic gear.

A variety of middle layer network components and services can be located within the co-lo including, for example, directory services, replicated content servers, routing services, and other elements needed to deliver new multimedia services to the home and small office from multiple, competing providers.

Characteristics of the colocation facility are:

- A reliable source of AC electric power is required, with backup UPS (Uninterruptible Power Supply) service, and additional power backup available by an onsite generator is desirable.

- Controlled access to the facility (e.g. by electronic keycard) 24 hours/day, seven days a week. Service providers need to be able to gain access to the equipment room as needed, and work activities performed at night or on weekends is common.

- Racks for locating network equipment and servers, and optionally locked cages for equipment racks.

- Sufficient cooling capacity for the network's current and long-term needs. Equipment rooms require both a cool air input vent and an air return vent.

Service Provider Backhaul Connections

Internet

Provider 1

Wireless link to regional wireless network

Provider II

Advanced Services

Data Backup

VoIP Service

Cabinet

Fiber route to other locations

K12 Schools

Video Surveillance

Government facilities
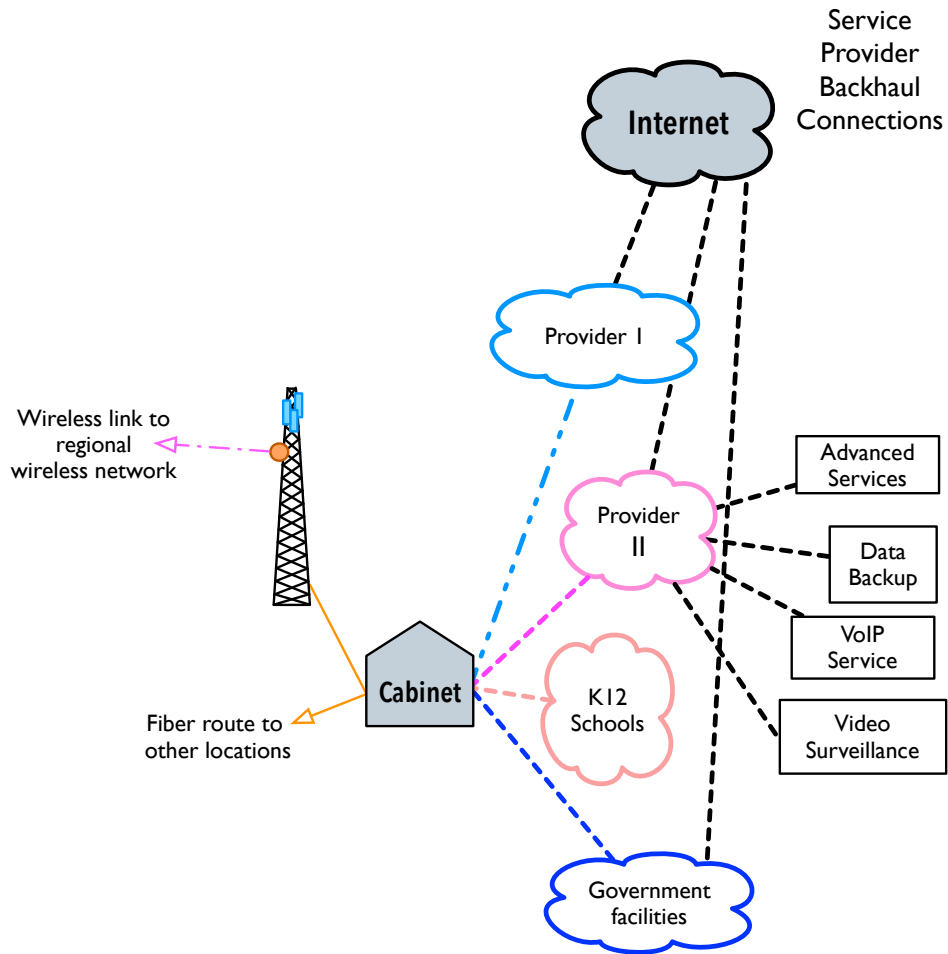
7.5 NANO-CELL AND WIFI CALLING SERVICE

As noted previously, some residents and businesses responding to the broadband surveys indicated that they have poor cell service. In some parts of the county, there may be adequate broadband service via DSL or fixed point wireless Internet, but poor cellular phone/data service. There are now two solutions to improving rural cellular service that do not involve the expense or difficulty of attracting and/or building more cellular towers.

WiFi Calling – This approach takes advantage of the WiFi Calling feature that is now common in many late model cellphones. Once the phone is connected to a WiFi network (e.g. in the home using the home's broadband Internet service), the phone will automatically route the call over the WiFi network—phone calls and text work normally, as if the phone is connected to a cellular tower.

Nano-cell Calling – Poor or no cellular service in rural areas can be addressed by promoting the wider use of "nano-cell" devices.   These small pieces of equipment are connected to the DSL or wireless broadband connection and provide improved cell service in the home or business. The working distance of these devices is limited, and service generally drops off once you leave the house itself (it may work for some short distance in the yard).   These devices work very well and do not require an upgrade to a newer phone.

The cellular providers do not always promote the use of these devices, so many cellular users who would benefit from their use are not aware that this option is available.   The device averages around $200 retail, but the cellular providers often provide substantial rebates (50% discount or more) and in some cases may provide them at no charge.

The improved wireless broadband service will also support use of WiFi calling and/or nano-cell devices.

This strategy is important because improved broadband service can also improve cellular service without the need for more cellular towers, especially in parts of the county where cellular providers have not been able to make the business case for more towers.

7.6 FINANCIAL PROJECTION AND COST ESTIMATES

The cost of building new fiber to the home to all homes and businesses in Carbon County would cost between $80 million and $100 million, with the average cost of connecting a home or business ranging between $2300 and $4500. Rural homes and businesses have a higher cost of connectivity than those located in higher density towns and neighborhoods. A complete county-wide over-build with fiber is neither necessary nor recommended.

In the underserved and unserved areas of the county, there are an estimated 2,350 unserved homes and businesses, and an estimated 2,530 underserved homes and businesses, based on FCC data (see Section 3.6). This represents approximately 20% of all address locations in the county.

These locations are primarily in more remote and rural areas of the county. In rural areas, the cost per home passed and connected can be in the range of $5,000 to $10,000 per home connected.

To upgrade service to Federal standards with fiber (i.e. 100 Megabits/second download, 100 Megabits/second upload), the estimated cost for all underserved and unserved locations (4,880 locations) would range between $18 million and $40 million. This illustrates that the problem cannot be solved in a single year or with a single grant. The County and the incumbent ISPs will need to work together to solve the problem over a period of several years.

8 INFRASTRUCTURE FINANCING OPPORTUNITIES

It is important to note that any investment by county government in broadband infrastructure should be focused on passive infrastructure. Passive infrastructure can be leased to private sector service providers, generating long term revenue for maintenance and expansion. Leasing passive infrastructure like towers and dark fiber is not a "telecommunications service" (in Pennsylvania, it remains difficult for counties become an ISP, and that is not recommended for Carbon County).

These assets will have a conservative life span of thirty years or more (e.g. wireless towers, conduit, fiber cable). These types of infrastructure investments create hard assets that have tangible value and can then be leveraged for additional borrowing. The demand for services and the associated fees paid for those services will provide the revenue that will pay back loans over time. There is ample time to recoup not only the initial capital investment, but also to receive regular income from the infrastructure.
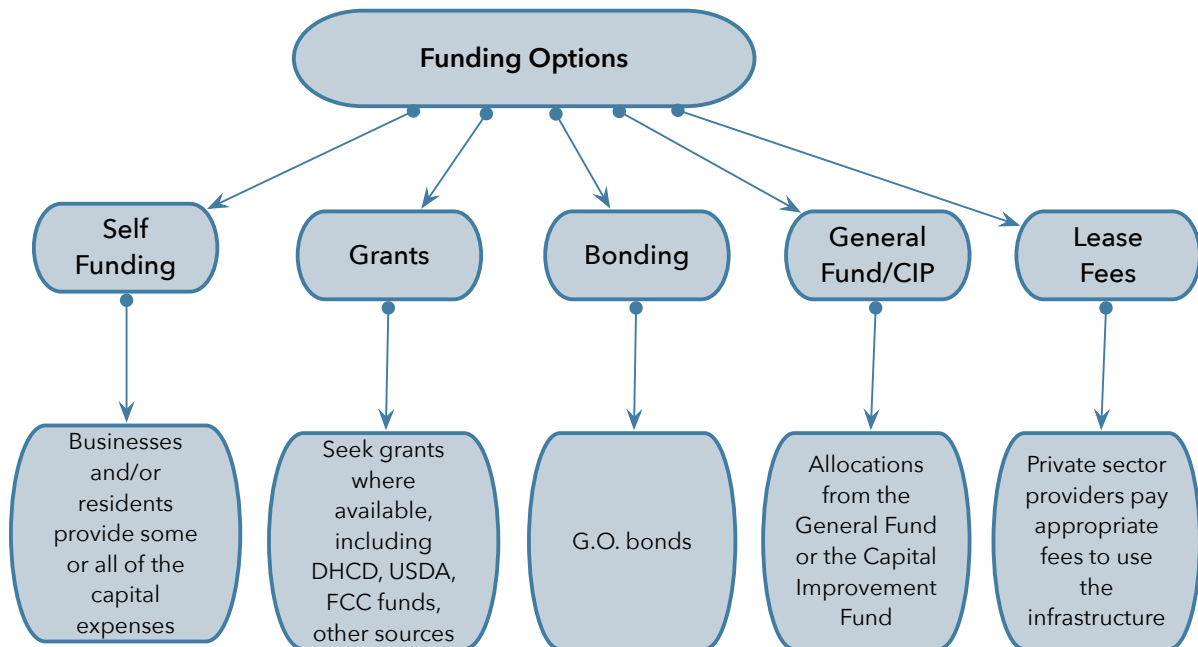
The financing of local government and/or community-owned telecommunications infrastructure faces several challenges with respect to funding.

- Not all local governments are willing to commit to making loan guarantees from other funding sources like property taxes, because the idea of community-owned telecom infrastructure has a limited track record and therefore a higher perceived risk.

- Similarly, citizens are not always willing to commit to the possibility of broadband fees or higher taxes that may be needed to support a telecom infrastructure initiative, for many of the same reasons that local governments are still reluctant to make such commitments: perceived risk and a lack of history for such projects.

- Finally, banks and investors are also more skeptical of community telecom projects because of the relative newness of the phenomenon. By comparison, there are decades of data on the financial performance of water and sewer systems, so the perceived risk is lower.

Somewhat paradoxically, the cost of such a community digital road system is lower when there is a day one commitment to build to any residence or business that requests service. This maximizes the potential marketplace of buyers and attracts more sellers to offer services because of the larger potential market. This is so because:

- Service providers are reluctant to make a commitment to offer services on a network without knowing the total size of the market. A larger market, even if it takes several years to develop, is more attractive.
- Funding agencies and investors that may provide loans and grants to a community network project want to know how the funds will be repaid and/or that grants will contribute to a financially sustainable project. Knowing that the size of the customer base is the maximum possible for a service area helps reduce the perceived risk for providing loans and grants.

8.1 PENNSYLVANIA FUNDING OPPORTUNITIES

In December, 2021, the Commonwealth of Pennsylvania formed the Pennsylvania Broadband Development Authority. The agency has been tasked with creating a statewide broadband plan and also to allocate state and Federal funds to unserved and underserved areas of the commonwealth. The Authority has a goal of ensuring that Pennsylvania residents and businesses have the the Internet and broadband services they need at home and at work. A long term goal is to eliminate the digital divide in Pennsylvania.

Pennsylvania will receive a minimum of $100 million through the Broadband Equity Access and Deployment (BEAD) Program, additional funding will be determined by a formula. The National Telecommunications and Information Administration (NTIA) created the Notices of Funding Opportunity (NOFOs) and is charged with administering funds for these programs. The Federal Communications Commission (FCC) is presently working on an updated broadband map, with a publishing date of late 2022/early 2023. The map will provide new data and guide the NTIA in their efforts to deploy formula based funds.

Carbon County should maintain regular communications with the Broadband Development Authority to pursue every possible funding opportunity (https://dced.pa.gov/broadband-resources/pennsylvania-broadband-development-authority/).

8.2 BEAD FUNDING

The BEAD (Broadband Equity, Access, and Deployment) Program has been allocated $42.5 billion to expand Internet access. The funds will be distributed to individual states, based on the number of unserved households in each state. The BEAD program is part of the Infrastructure Investment and Jobs Act (IIJA) passed by Congress in 2021, with a total of $46.2 billion in funds for broadband.

Funding will be distributed state by state based on the number of locations that fall below the 25/3 threshold. The program will allow some overbuilding (i.e. fiber deployment in areas that exceed the 25/3 threshold) but cannot be more than 20% of the total locations to be served. Areas that

already have federal, state, or local funding allocated are not eligible; RDOF areas need to be examined as part of the application process, as they would not qualify.

Funds can be spend for:

- Broadband mapping, planning, and data collection.
- New or upgraded broadband infrastructure (i.e. materials and equipment).
- Cost of installation, labor, engineering, and related expenses.
- Workforce training and development.

An interesting requirement of acceptance of grant funds is that no data caps will be allowed. This is an excellent requirement that protects customers   from a common type of "hidden" price increase in the future after the initial build is completed.

One billion of the $42.5 billion has been allocated specifically for middle mile projects that will be operated as open access (non-discriminatory use by any and all providers and users). Partnerships are encouraged.

8.3 MIDDLE MILE BROADBAND INFRASTRUCTURE PROGRAM

The Federal Middle Mile (MM) program has been allocated $1 billion for high speed Internet access. The goal of the program is to expand middle mile infrastructure in unserved and underserved areas. "Middle mile" is defined as the mi-section of Internet infrastructure that transports high volume data at high speed over long distances. Middle mile investments can also assist with the development of redundant fiber routes, which are important for economic development, public safety, education, and health care.

Both states and local governments are eligible to apply, and collaborations are also eligible (e.g. county government and one or more ISP partners). The grant application was released in May, 2021, and the applications are due by September 30th, 2021. Awards will be made sometime later in the first quarter of 2023. Grant funds can be expended over a five year period.

Grants can be used for the construction, improvement, or acquisition of middle mile infrastructure, including:

- Construction, improvement, or acquisition of facilities and equipment
- Engineering design, permitting and work related to project reviews
- Personnel costs, incl. salaries and benefits for staff and consultants
- Other costs necessary to programmatic activities

8.4 HUD COMMUNITY DEVELOPMENT BLOCK GRANTS

The U.S. Housing and Urban Development CDBG State Program allows the Pennsylvania state government to award grants to smaller units of general local government (e.g. counties, towns) that develop and preserve decent affordable housing, to provide services to the most vulnerable in our communities, and to create and retain jobs.   In recent years, CDBG funds have been successfully used for broadband infrastructure development where the local government applicant

can show the improvements meet the general guidelines of the program—so grant funds have to spent in low and moderate income areas.

Over a 1, 2, or 3-year period, as selected by the grantee, not less than 70 percent of CDBG funds must be used for activities that benefit low- and moderate-income persons. In addition, each activity must meet one of the following national objectives for the program: benefit low- and moderate-income persons, prevention or elimination of slums or blight, or address community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community for which other funding is not available. More information is available here (https://www.hud.gov/program_offices/comm_planning/communitydevelopment/programs).

8.5 USDA RECONNECT PROGRAM

The ReConnect program is a new funding program managed by the USDA Rural Development Office. This program is sometimes called the USDA e-Connectivity pilot program. Grant applications can be a combination of 100% grant, 50% grant/50% loan, or 100% loan. $1.1 billion has been allocated to the program for 2022, and a wide variety of entities can apply, including non-profits, coops, and state and local governments.

As much as $200 million will be available for loans, with another $250 million allocated for loan/grant combinations. A $350 million fund will be distributed with a 25% matching requirement and another $350 million in grants with without a match, for projects in tribal and socially vulnerable communities. Applications are due in the spring of 2021, and USDA will begin accepting applications in late 2021. More information is available here: (reconnect.usda.gov). A mapping tool is available on the Web site to show areas that are eligible. To qualify as an eligible area, households must have less than a minimum of 10 Megabit down/1 Megabit up broadband service.

8.6 911 FEES

Improved broadband access in the county can improve household access to 911 services by using broadband Internet to carry 911 voice calls, using one or more strategies to include:

WiFi calling – now a commonly available feature on new cell phones. WiFi calling switches voice telephone call from the cellular network to a nearby WiFi Internet network seamlessly. The reduces the need for additional large cell towers in low density areas of the county.

Nano-cell Devices – Nano-cells are a small box attached to a home wireless router. The nano-cell, which is typically obtained from the cellular provider, enables a cellphone to operate inside the home or business even if there is no cell tower near by.

A modest increase in the 911 fee to improve 911 access in rural areas of the county could generate funds to support additional broadband towers and community poles, but this approach would require legislative changes at the state level—which has been a topic of discussion in Charleston. See the tables above in the Special Assessment section of this chapter.

8.7 OPPORTUNITY ZONES

An Opportunity Zone is an economically-distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment. Localities qualify as Opportunity

Zones if they have been nominated for that designation by the state and that has been approved by the Internal Revenue Service. Opportunity Zones are designed to create tax incentives for private investors to make investments that can encourage economic development and job creation in distressed communities. Opportunity Zones would be of most use for Internet Service Providers who could use the tax benefits to make a business case to improve Internet access in a qualifying area (zone).

Opportunity Zones are defined by census tract, and the Census Bureau's Geocoder online tool can provide census tract ID numbers. A link to the list of currently qualified census tracts can be found on this page (https://www.cdfifund.gov/opportunity-zones). Carbon County does not appear to have any designated Opportunity Zones.

8.8 BONDING

Revenue bonds are repaid based on the expectation of receiving revenue from the network, and do not obligate the local government or taxpayers if financial targets are not met. In that respect, they are different from general obligation bonds. Many kinds of regional projects (water, sewer, solid waste, etc.) are routinely financed with revenue bonds. We believe many community projects will eventually finance a significant portion of the effort with revenue bonds, but at the present time, the limited financing history of most community-owned broadband networks has limited using revenue bonds.

Selling revenue bonds for a start up municipal network can be more challenging because there is no financial or management history for the venture. Bond investors typically prefer to see two or three years of revenue and expenses and a track record of management success. It would be advisable for the county to have an early conversation with qualified municipal bond counsel to assess the viability of this approach. ***However, the Covid crisis and the subsequent increase in demand for better broadband seems to encouraged the bond market to regard muni broadband financing as less risky than in past years.***

Obtaining funding using revenue bonds requires an excellent municipal credit rating and an investment quality financial plan for the operation and management of the network. Revenue bonds must be used carefully, and a well-designed financial model is required to show investors that sufficient cash flow exists to pay back the loans.

General obligation bonds are routinely used by local governments to finance municipal projects of all kinds. G.O. bonds are guaranteed by the good faith and credit of the local government, and are not tied to revenue generated by the project being funded (i.e. revenue bonds). G.O. bonds obligate the issuing government and the taxpayers directly, and in some cases could lead to increased local taxes to cover the interest and principal payments. Some bond underwriters have indicated a willingness to include telecom funds as part of a larger bond initiative for other kinds of government infrastructure (e.g. adding $1 million in telecom funds to a $10 million bond initiative for other improvements).

In discussions with bond underwriters, it has been suggested that it would be easier to obtain bond funds for telecom if the telecom bonding amount was rolled into a larger water or sewer bond, or some other type of bond request that are more familiar to the bond market.

8.9 RDOF/CAF2 FUNDING

The second round of the FCC Connect America Fund (CAF2) (Rural Digital Opportunity Fund) continues to provide funds to incumbent and competitive service providers. The funds must be used in unserved or underserved areas as defined by Federal census blocks. To be eligible, a census block could not have been served with voice and broadband of at least 10/1 Mbps (based on Form 477 data) by an unsubsidized competitor or price cap carrier. It does not appear that any ISPs in Carbon County bid or won CAF2 funds. As noted in Section 3.7, the only two landline carriers that won RDOF funds were Frontier and Windstream, for very small areas of the county.

The FCC published the final eligible census blocks for the auction on February 6, 2018. The final areas were based on FCC Form 477 data as of December 31, 2016 (the most recent publicly available FCC Form 477 data at the time). So there is a time lag between the determination of a qualifying census block or blocks and the schedule for submitting a bid to serve those areas.

The first round of funding was announced in early 2021, and was immediately met with widespread criticism. SpaceX (Starlink) was awarded almost $900 million, and it may have to return some of those funds because the company appears to have included some ineligible census blocks. Many large incumbents also received substantial awards when some smaller ISPs that might have offered competition to the incumbents received much less or no funds.

Because many CAF2 qualifying areas are only served by low performance DSL (e.g. less than 10/1 Mbps service), incumbent carriers use the awards to upgrade DSL switches, which is not a long term solution. More recently, competitive carriers are applying for CAF2 funds to provide higher performance broadband wireless and in some cases fiber to the home. Because the use of CAF2 funds are so restricted, it has not had as much impact as many hoped. The FCC, as of fall 2021, has not announced the rules for the second round of funding.

8.10 LEASE FEES

Initiatives like tower access and access to local government-owned conduit and fiber can create long term revenue streams from lease fees paid by service providers using that infrastructure. The City of Danville, Virginia has recovered their entire initial capital investment from lease fees paid by providers on the nDanville fiber network.

8.11 COMMUNITY REINVESTMENT ACT

The Community Reinvestment Act (CRA) was developed forty years ago to encourage banks and savings institutions to help meet the credit needs of their local communities, with a focus on low and moderate income areas of those communities. The Federal agencies that oversee private banks assign a CRA rating to each institution. Banks are often looking for well-planned community efforts that need loans. Such loans can improve a bank's CRA rating.

The CRA was revised in 2016 to encourage banks to support community broadband efforts. A community broadband project may be able to get some loan financing from a local bank that wants to get credit for their CRA work.

8.12 CONNECTION FEES

Tap fees, pass by fees, and connection fees are already commonly used by local governments for utilities like water and sewer. The revenue share model can be strengthened from additional sources of revenue, including one time pass by fees, connection fees and sweat equity contributions. It is important to note that the Coop Membership Fee can be treated as a connection fee in whole or in part.

Pass By Fees – Pass by fees could be assessed once the fiber passes by the property, just as some communities assess a pass by fee when municipal water or sewer is placed in the road or street– and the fee is assessed whether or not the premise is connected, on the basis that the value of the property has been increased when municipal water or sewer service passes by. At least one study has indicated that properties with fiber connections have a higher value by $5,000 to $7,000 that similar properties without fiber access.

One Time Connection Fees – A one time connection fee can be assessed to property owners (e.g. residents and businesses) when the fiber drop from the street to the premise is installed. This is similar to the kinds of connection fees that are typically charged when a property is connected to a municipal water or sewer system. The fee is used to offset the cost of the fiber drop and the Customer Premise Equipment (CPE) needed to provide the operational access to the network. The connection fee can be modest (e.g. $100) or it can be a larger percentage of the actual cost of the connection. Fiber CPE may range from $250 to $350 and a fiber drop may cost from $200 for a premise very close to the distribution fiber passing along the property to $1,000 or more if the premise is hundreds of feet from the road. One variant would be to charge a minimum connection fee for up to some distance from the road (e.g. $100 for up to 75' and $2 for each additional foot).

There is already some data that indicates that residential property values increase by as much as $5,000 to $7,000 if fiber broadband services are available, so pass by fees can be justified on the basis of increased property values accruing to the property owner. Given the novelty of this approach, pass by fees may need more time to become an accepted finance approach, but tap fees (for installing the fiber cable from the street or pedestal to the side of the home or business) may be easier to use, especially for businesses that may need improved broadband access. Tap fees have the potential of reducing the take rate in the early phases of deployment, but as the value of the network becomes established, it is likely that there will be much less resistance to paying a connection fee.

8.13 SPECIAL ASSESSMENT/SERVICE DISTRICT

Communities like Bozeman, Montana and Leverett, Massachusetts have been funding broadband infrastructure improvements with special assessments (in Leverett, $600/year for five years), and in Bozeman, TIF (Tax Increment Funding) is being used in some areas to add telecom conduit, handholes, and dark fiber. In some localities, it is possible to levy a special assessment in a service district designated for a particular utility (like broadband) or other kind of public service.

Charlemont, Massachusetts intends to add an $11/month assessment to every household to build a town-owned Gigabit fiber network that will pass every household in the community. A town-wide vote supported this funding approach. Put in perspective, the average cost of a large, single topping pizza in the U.S. is currently $9 to $12.

Two small cities in Utah are currently evaluating the potential of a $10-12 utility tax levied on every household and business to finance a full fiber to the premises build out, including a modest "free" Internet service that would be adequate for email and light Web use. Most households will probably choose to select a higher performance Internet package from a private provider on the network. A $10/month special assessment (the cost of one large pizza) on every household in Carbon County could raise as much as $63 Million for broadband over twenty years—enough to take Gigabit fiber to nearly every home and business.

The tables below shows the kind of funds that could be generated over several time periods. If ten dollars per month were collected from each household for thirty years, it would easily finance the immediate build out of Gigabit fiber that would pass nearly all homes and businesses in each county.

Individual Service District Examples				
Monthly Assessment Amount	Fifty Homes Five Year Assessment	Fifty Homes Ten Year Assessment	100 Homes Five Year Assessment	100 Homes Ten Year Assessment
$5	$15,000	$30,000	$30,000	$60,000
$10	$30,000	$60,000	$60,000	$120,000
$25	$75,000	$150,000	$150,000	$300,000
$50	$150,000	$300,000	$300,000	$600,000

A lesser amount (e.g. $2/month over twenty years) would easily finance the immediate build out of a comprehensive wide area wireless tower network in each, as well as some fiber infrastructure.

Carbon County Special Assessment Examples		
Monthly Assessment Amount	Twenty Year Assessment	Thirty Year Assessment
Number of Households	26,545	
$1	$6,370,800	$9,556,200
$2	$12,741,600	$19,112,400
$5	$31,854,000	$47,781,000
$10	$63,708,000	$95,562,000

8.14 PROPERTY TAX INCREASE

While raising taxes can be politically very difficult, a very small incremental increase in property taxes, with the increase clearly earmarked specifically designated for broadband development (.e.g. one-quarter cent) might be possible to sell to citizens and businesses.

The table below illustrates a hypothetical example of what funds might be raised for broadband improvements with a sample county-wide assessed property value.

	Sample Assessed property value	Broadband increment	Annual Broadband Fund	Ten Year Aggregate	Twenty Year Aggregate	Thirty Year Aggregate
1/4 of one cent	$7,000,000,000	$0.0025	$157,500	$1,575,000	$3,150,000	$4,725,000
1/2 of one cent	$7,000,000,000	$0.0050	$315,000	$3,150,000	$6,300,000	$9,450,000
1 cent	$7,000,000,000	$0.0100	$630,000	$6,300,000	$12,600,000	$18,900,000

8.15 GRANT APPLICATION ACTIVITIES

Activity	Description	Discussion	Tasks
Develop a grant application	The grant application process, from start to award announcement, can be nine to twelve months.	Broadband grant application requirements have become more stringent over time, with more grant agency oversight and review. Careful planning is essential to develop a successful application.	• Once a grant opportunity has been identified, review grant requirements to determine if the project can qualify. For example, some grants require two years of financial history. • Identify regional agency that will assist • Begin contacting potential ISP partners. • If the project qualifies, identify at least two people to take the lead to prepare application. • Prepare a task list of all grant materials requirements and identify data needed. • Develop a timeline for developing sections of the grant. • Identify requirements for letters of support and matching funds and develop timeline to solicit and collect commitments. • Complete all sections of grant application with assistance from public and private partners. • Submit grant application.

Typical Timeline						Months						
Tasks	1	2	3	4	5	6	7	8	9	10	11	12
Determine grant qualifications	■											
Identify regional council partner	■											
Identify ISP or WISP partner if needed		■										
Appoint grant team	■											
Create grant task list		■										
Prepare timeline and assign tasks to partners		■										
Identify matching fund requirements and letters of support to solicit and collect as needed		■	■	■								
Complete all sections of the grant application			■	■	■							
Submit grant					■							
Grant agency review						■	■	■	■			
Awards announcement										■		

9 LEGAL CONSIDERATIONS AND RISKS

9.1 LEGAL AND REGULATORY ISSUES

Regional and local government-owned broadband projects are subject to state and Federal regulations of various kinds, but unless a project is offering retail services (e.g. the local government is selling Internet, TV, and/or voice services directly to residents and businesses), there are limited regulatory issues. There has never been an incumbent legal challenge to an open access infrastructure program started by local government because incumbent providers are always invited to use the infrastructure (and usually decline).

Carbon County has indicated it does not intend to invest in and own any broadband infrastructure directly, so there are no significant legal or regulatory issues to consider.

9.2 SERVICE PROVIDER RISKS

While in many respects a broadband network shares many similarities with other public utilities (e.g. roads, water, sewer) there is one fundamental difference. Other public utilities like water and sewer have a captive audience and the utility is able to operate as a monopoly–meaning the customer base can be taken for granted. Early discussions with service providers have been positive, with at least two providers announcing planned improvements and investments during the study.

If the County assists providers with the process of obtaining grant funds that are channeled through the County (some grants require the application be submitted by the local government), the agreement for the funds should include the ability for the County to claw back the infrastructure and/or the funds if the ISP fails to make the required infrastructure improvements or becomes financially insolvent.

9.3 TECHNOLOGY RISKS

A question that often dominates early discussions of broadband projects is, "Are we picking the right technology and systems?" Everyone has experienced the rapid obsolescence of computers, cellphones, printers and other IT equipment.

There is always some risk associated with making a substantial investment in a network. However the risk can be managed. In a predominantly fiber network, a large portion of the investment will be dedicated to getting fiber in the ground or on poles throughout the community. Properly installed fiber has a minimum 30 to 40 year useful life, and fiber installed by the telephone companies in the seventies is still in use today.

Fiber also has a useful property not shared with other public systems like water, roads, and sewers. The capacity of fiber can be increased without replacing the fiber or adding additional fiber. Instead, fiber capacity can be increased indefinitely by replacing the electronics at each end of the fiber. This means that an investment in fiber creates a stable, long term asset for the community with long lasting value.

The equipment used to light the fiber has a shorter useful life, and is usually depreciated over a period of 7 to 9 years. Some equipment may remain useful longer than that. Wireless equipment must be replaced much more often (typically 2 to 4 years of useful life) because it is typically exposed to much harsher conditions (extreme heat and cold, lightning strikes, ice, snow, rain, wind).

Because nearly all telecom infrastructure includes some use of public right of way, collaboration between a county government and ISPs is common. Between Carbon County and private entities like ISPs and WISPs, the more common synergies are:

- The need for more bandwidth,
- The need for more affordable bandwidth, and
- The need for more affordable bandwidth to be more widely available.

Potential project partners include:

ISPs and WISPs

Throughout the U.S., many WISPs are aggressively pursuing public-private partnerships (PPPs) with county governments. These partnerships may include a variety of strategies: collaboration on a grant opportunity, shared costs of developing a new tower site, revenue sharing, fee waivers, and other sorts of cost and revenue sharing. The advantage of this kind of PPP is that the WISP typically is responsible for most of the day-to-day management of the network assets.

The County can pursue collaborative relationships with technically qualified and financially stable ISPs and WISPs. Where appropriate, the County can channel grant funds to providers who will use the funds to build and manage new broadband infrastructure.

Selected providers should be able to show technical competency and have a demonstrable track record of managing substantial fiber and/or wireless builds on time and within budget. It will also be important for any transfer of grant funds to a private sector ISP have a claw-back agreement. When public funds are transferred to a private company, the County should have the ability to "claw back" the built infrastructure for a minimum of five to ten years.

Conditions for a claw back could include bankruptcy of the ISP, sale to a third party (where substantial profit taking leverages the public funds), poor service, unreasonably high cost of service, and/or poor service reliability.

Public Safety

The Sheriffs department, fire, and rescue departments all need better access to broadband and improved wireless voice/data communications. Throughout the United States, public safety voice and data communications systems are being upgraded, often at staggering cost. Many of the upgrades include new towers to eliminate "holes" in the served area where first responder, fire, and rescue radios do not work. Combining public safety needs with community broadband needs can bring new sources of funding and cut costs, sometimes dramatically. Elected officials may need to take the lead in this area to ensure that public safety officials work collaboratively with the broadband efforts.

The availability of public-safety towers and/or new towers can enable new services and applications for police, fire, and rescue in Carbon County. Secure WiFi hotspots can be set up around and near the towers, so that reports can be filed from the field using the WiFi Internet connection. Other communities that have done this have found that it saves time and keeps patrol cars out in the field longer.

There are often grants available for public-safety voice and data communications improvements, like new towers and upgrades to existing tower facilities, that could also support the broadband initiative. Any public-safety tower or communications expenditure should be analyzed to determine if the expenditure can also support expanded broadband access in the county.

It may also be possible to partner with cellular providers who want to expand service. The County could offer grant funds to help offset the cost of new cellular towers, with the County receiving space on the towers for public safety repeaters.

K12 Schools

Carbon County schools have adequate broadband service at existing school locations. But K12 students often lack adequate Internet service at home, and some schools are careful not to assign homework that requires Internet access. Parents consistently report on the burden of having to drive children to a public library or some other WiFi hotspot to get Internet access for school work. The County should work with the schools to apply for education grant funds to achieve this goal, and to keep K12 parents informed about broadband activities.

County Businesses

Businesses in the county and the local Chamber of Commerce chapters have an important role to play as advocates for the broadband work of the County. At both the county and state level, businesses that need more affordable and better broadband should ensure that elected officials understand the urgency. The County, as part of its broadband awareness efforts, should ensure that local businesses are kept up to date with work activities, grants, and other efforts (e.g. attend CoC meetings at least quarterly to report on the work of the County).

6. What type of Internet do you have at home? Other internet types responses:

- Hot Spot
- Cellular
- cellular wireless
- I believe Blue Ridge is building fiber eventually to my community which I am looking forward to, and appreciate their continued efforts to improve their network.
- Cellular wireless
- Also cellular wireless
- i am not sure but believe it is called wireless
- Atlantic Broadband, which just changed their name to Breezeline. I pay almost $140 per month just for internet. The price is terrible. Please help!!!
- cable modem
- don't know Wifi from a cable company
- I must use the wireless access of the cable modem for cell phone service, as the cell phone tower is too far from my location to effectively and efficiently use my cell phone, even for telephone service.
- Also have dsl and cellular
- TV and phone service only
- my bill says Digital Phone Modem
- dry loop through Verizon
- Digital phone modem
- I don't know
- I use my cell phone because I have no option. There is no XFinity in the area so I have no chance to use my internet from my other home. It would be nice to get XFinity in are to be consistent with the Philadelphia area.
- digital phone modem
- Not sure what it is, through blue ridge.
- Also, use a hotspot as the service sucks here and no other options than Blue Ridge. They monopolize the market here. We need more and better choices!
- Breezeline
- i have 1 gig
- Fiber Optic
- We use our cell phones as hot spots for all internet needs
- Cable modem AND satellite
- Eero
- Cellular
- Verizon Hub
- Verizon
- Turbo HSD
- with Eero routers
- We have Verizon and blue ridge for internet

- Digital phone modem
- Currently waiting for my starlink to be delivered, tired of the monopoly blue ridge has on this area.
- I'm not sure what it is, it's just regular internet wifi
- I have a modem and use wireless devices
- Also Dial Up on separate line
- Blue Ridge Cable Internet
- only use hot spots
- fiber, wireless, satellite - multiple connections
- cellular wireless
- THE MONTHLY BILL SAYS HIGH SPEED INTERNET SERVICE. HIGH SPEED UP TO 200mbps. ONLY WORKS HALF THE TIME.
- Blue ridge
- Cable modem and cellular wireless
- Blue Ridge for TV
- cellspot
- Hot spot thru my cell phone carrier
- breezeline
- AT&T Mobile Hot Spot
- cellular wireless
- Blue Ridge
- Verizon jetpacks (2)--one for personal, one for work from home
- Pay monthly for use of hotspot
- cellular wireless
- Jetpack, creates a hotspot
- Hotspot
- EERO
- Digital

Question 14. Select all items you use the Internet for now: Other Internet types.

- Always running slow and constantly booting me off including while streaming tv along with freezing up and buffering

- I just got over covid I'm suffering from liver cancer and have covid long hall pneumonia they're putting my transplant on hold and I'm raising a 7 year old disabled granddaughter who needs the Internet for virtual learning and because I already had cable before broadband it's costing me a fortune out of pi we have fortune out of pocket on a fixed income I've already been penalized from the school marked with illegal unexcused absence because we could not access access her virtual learning 5 minutes after 9 AM she was marked illegally absence for I don't know how many times.

- Talking with My Va Mental Health Doctor for 90 minutes at a time every week always lose connection and she is in Pittsburg.

- typing letters

- Work

- Permanent work from home job

- Work software

- meeting with congregation

- zoom

- news media, informational web-sites for history, science, outdoors, garden, animals, relax my cat channel ,feral&T.N.R. programs, the environment and oceans.

- Paying bills and online banking services

- Work

- Full time work from home

- research, banking

- cameras

- Sports

- Work from home unrelated to Covid 19.

- news

- Price

- OneDrive cloud service for work.

- I have been working from home for 12 years and I am required by my company to have the fastest internet speed - I was not a remote worker just due to the pandemic

- watching Youtube etc.

- Facebook, general things.

- Google meetings
- Work from home (not covid related, not all wfh is attached to Covid...)
- ebay sales, purchase shipping labels, research, news, sports info...
- Banking and paying Bills
- Finance management
- Internet surfing, Basic information
- information, bill paying
- Central air
- For my iPhone and iPad
- fantasy football league
- general research
- Job is remote IT Admin and having working internet is crucial to my job functions for work.
- Gaming
- Job hunting
- Zoom meetings occasionally display a popup that my internet connection is not stable. Frames freeze. I can avoid this from happening if I change my wireless connection to a direct connection to the router.
- Working remotely
- Google, Facebook, MCALL, TNONLINE, and other news sources
- Running my business, online trading, research
- To look up information on specific items or topics.
- All of the above
- Work From Home Full Time
- I use it mostly to create, maintain and store my crafting files with Microsoft 365. I'm really into all sorts of handcrafts. I then share them with other people and groups. I would also like to learn how to use the internet for video chats, streaming, etc.
- Medical devices
- Work
- Get the news, check financials.
- Banking and bill paying
- Zoom conferences, presentations, meetings
- Kids online school. All cannot log on at once. No one can have wifi on phone if one TV is on for internet.
- information
- Bill paying, having access to online only insurance documents, etc.
- cell phone/wifi
- Monitor my windmills !!!
- Volunteer fire company work. Grants, on line banking, emergency call reporting to the state and much more.

- webex meetings for work
- YouTube
- For this survey, It took me eight minutes to get to the correct site.
- I permanently work remotely, since pre Covid.
- Occasionally work from home
- work from home sometimes.
- facebook, solitaire, business and volunteer emails
- Work clock in / out
- checking bookings For Air BnB
- Faxing and Solitaire
- As a HAZMAT responder I attempt to use it for chemical research but since cable is not on our road I have to use the satellite system. My wife is the Asst General Manager for a hotel and frequently works from home and uses a cell phone with limited service as a hotspot.
- General work-from-home.
- bill paying
- Heating/Fuel tank reading
- play games
- social media
- Work from home as needed
- Banking, paying bills
- Full Time Employment Unrelated to Covid-19
- all accounts SS, banking, bill paying, everyone wants you to use online
- Self employed work, researching materials etc
- zoom with our cong. meetings
- News NYT, Wash Post, WSJ, online trading,Telnet
- Research for Family Tree, antiques, travel, and face book to talk with friends and family not in our state.
- Need internet for my business
- News - Newspapers
- Webinars, research, selling on line
- down load tax forms, and get updates, make appointments and get info
- Bill paying
- Research for freelance writing assignments
- Internet research for health issues, crafting, woodworking
- General information
- Online eCommerce Business
- work from home non-covid related
- I work from home 2 days a week that have nothing to do with the pandemic. When I first moved here I was running up and down the stairs while on video calls because I couldn't get a signal

upstairs. I had to invest in a $300+ system to have better internet in my home which Blue Ridge provides at an extra cost per month.

- Direct tv stream
- read news via Internet. Do banking via internet.
- to learn how to fix things via You Tube
- Business
- bill pay
- zoom
- Would like to have better service to work from home , to watch shows but I'm limited
- Surfing the net. Pay bills. Online banking.
- games
- paying bills
- My business needs to connect to Liheap for fuel orders
- pay bills
- My cable goes out a lot when the internet is down.
- Accessing shift info for work
- None
- do not have internet at this time
- Why is work from only Covid related. Some work from home is just work from home.
- All bills pertaining to home, utility, mortgage, taxes etc
- cell phones
- Social media, keeping in contact with others, Discord
- Banking
- I work from home three days per week, sometimes four.
- Banking
- Education info
- online banking
- online gaming, xbox
- engineering
- I work from home one day per week, which requires establishing a VPN to a military network.
- I work remotely not just because of the Covid-19 pandemic
- Work from home not during Covid-19 and essentially everything
- Paying bills, doing income taxes, banking, accessing other accounts and records.
- Banking, paying bills...
- planning military reunions
- Because of health concerns for my elderly mother, I use contactless food delivery services such as instacart in order to keep safe.
- Streaming music and podcasts.

Question 24: Any other comments

- I'm tired of being strong armed by only having 1 provider in my area. I have VZ less than 2 miles from my house yet I cannot get FiOS. DSL is useless for running my computer and void work phone. Our internet service is spotty and not consistent. Makes it very hard when working from home. The area needs more maintenance with dead trees falling on cables.

- Is this government vs capitalism?

- This should remain a private market opposed to 5G wireless in my neighborhood. Thanks for soliciting our input first!

- Because of the pandemic and my cancer Treatments ECT quarantining and actually catching covid, Has changed my quality of medical care My entire quality of care has been limited because of quarantining because of porn deeming and actually catching covid and now having long haulers my treatments put on hold my doctors need to reach me And had to keep in touch My cable has been disconnected twice for financial reasons If there's anything you could do to assist me with broadband give given my condition I would appreciate it

- The county should permit competition for services. Verizon has been running fiber-optic lines in front of my home and doesn't provide their FioS service, only very slow DSL which isn't sufficient to work. Atlantic Broadband is about twice the price of service anywhere else I lived (all of which had more than one provider).

- Please do something I need a reliable internet service I pay $125.00 a month and it always goes out at the wrong time especially when taking to my Doctors for PTSD and she is in Pittsburg. Thank You.

- Although windstream(Kinetic) is an option in carbon county due to speed and reliability Penteledata is truly the only option. This leads to penteledata being able to raise their prices constantly and basically monopolize internet subscriptions. They are constantly raising prices and the consumer is getting nothing in return. This is very unprofessional and a unacceptable way of doing business.

- There are too many outages. They also don't have high enough speed internet in our area. We pay so much money for bad cable internet services.

- Blue ridge is a monopoly in the Pocono area. No other company is able to come in. Nor can I get any other provider

- Wish we had more of a choice in providers.

- Blue Ridge Cable/Penn Tel Data have the worst imaginable customer service. The technicians are pretty good.

- We currently do not have internet or cable services I am exploring the cost and supplier. Our cellphones do not have service at our home this is very frustrating not to have cell service we are with Verizon. We have to ride 2 or 3 miles to get service.

- PTD is sporadic. I am not sure why they are allowed to monopolize both the cable and internet industry in Palmerton. They claim to have paid for cable lines but when our lines went in we paid

the cost from road to house. Having said that, levying any taxes or costs on middle America to augment internet service to a select population should not be, in my opinion, tasked to any government regulation or agency. Forcing internet providers to provide low cost options will increase the prices we are currently paying for the same exact product. Nothing is free. Tax payer dollars should not go to increasing the profits or infrastructure of a private corporation.

- All school students should have internet access

- I wish we had other choices for cable/internet. Blue Ridge goes up every month.

- I don't care. Internet has removed our personal privacy. Nothing is private anymore

- costs need to be reduced and service improved

- There are two 5G cell towers within line of sight yet no provider (AT&T or other) has the ability to provide a 5G FWA modem in Carbon County. Countless attempts to request this over a period of several years have failed. Had Blue Ridge cable and could not maintain a connection for more than 48 hours. In the mid nineties when the internet was just catching on I had DSL at .7 mb down. 27 years later now living in Carbon County, with one of the highest tax rates in the country, I have .7 mb down. I get this county doesn't have the population of Philadelphia, but my cell phone (AT&T) has no problem connecting and receiving data at realistic rates so I know the 5G cell towers can indeed provide the service. AT&T told me they CANNOT move into the area because of competitors. The fact that we have no options in this county is ridiculous and I am glad someone is finally addressing it. If you ever need a volunteer to test a 5G FWA router - count me in. For years I provided pathetic statistics to SamKnows who also had eaten up .3 mb of the .7 mb down. I finally told them I will no longer provide these given I can barely maintain enough bandwidth to download email. 21st century streaming is simply not an option. Thanks for looking into this.

- Buffering and latency CP issues when streaming and gaming

- We have no internet choices in this area other than Blue Ridge. There is a monopoly with high prices for low speeds. RCN offers much better prices with higher speeds.

- Lack of competition keeps the prices expensive. More densely populated areas get the download and upload service I have much cheaper.

- the price of cable and internet is crazy.maybe the equipment should be free.paying per unit is stupid with such high costs

- I'm tired of constantly having phone calls dropped because of 'dead spots' places that drop my phone calls

- I am limited in choices in this area

- being older and retired the Internet helps keep me informed about the many things that I do to keep myself active.I always look up the things that I have questions about, and I have a lot.So it is a big help to me even though I am just one small person.So what ever you can do to update things go for it.Thank you.   T.C.

- Blue Ridge does work with local communities and governments to provide services, but their prices are astronomical. It doesn't make sense that franchise fees are charged on behalf of communities that we do not benefit from (my parents pay a penn forest franchise fee and receive no money in their development). They build on property, which causes damage and do not have to account for the property issues it has caused. They have been transparent that they 'make no profit' on television, but internet has a high profit margin. I pay over $100 per month for just

internet and home security and only have a mid level speed. Blue Ridge hires people and they hold them to very little accountability as well. They are not consistent with their promises or repairs.

- I have a fantastic internet provider with Blue Ridge, and rarely experience service issues. Their customer service is better than larger companies I've dealt with in the past like Verizon or Comcast. Blue Ridge provides many jobs to the local citizens, and helps the local community greatly. There are other options if I desire to look elsewhere, but I will be staying with Blue Ridge. I work hard to afford luxuries like TV entertainment, and this survey proves the government is not interested in making my life better. If the government did care they would be more interested in making sure social security will be there when I retire or bringing down food and gas costs, then the luxuries that this survey mentions. This survey wasn't worth my tax dollars!! But I am sure my voice wont be heard, you will listen to others who just want everything for free. Get your priorities straight!

- Jim Thorpe should seek out more internet service providers

- Nesquehoning just approved Blue Ridge for another 5 years which makes it virtually impossible for another company to come in since they would have to install their own lines. Because of the contract signed by the town no other provider could use the lines. Blue ridge is a monopoly in the area and Nesquehoning just contributed to it

- It would be nice to have a choice

- Have no clue what gigabit fiber service is, never heard of it, don't care. I have no computer, had to use them when working. As soon as I retired, pulled the plug, cut off service. Hate them

- Need more affordable options

- My tax dollars should not be used for surveys to bring in other providers.   That provider should use their company money to do so.

- Just tired of Blue Ridge having a monopoly over these services

- I do not have a problem with the speed of the internet service, I have a problem with the reliability of the service. The internet is always down, no service which means no phone service or cell service since my cellphone only works through WiFi. For what they are charging, I should have the most reliable service in the country. I tried to fill this survey out earlier but every time I tried, the internet was down. I also have streaming from Netflix, Prime Video and they go out on a regular basis while watching.

- Reliable fast (5 to 10MB) service should be a utility standard for low or no-cost to ALL people (households and those without homes) in the United States.

- this is a total waste of tax payer money

- My service is reliable and affordable and employs local residents

- LEAVE EVERYTHING ALONE. THERE ARE OTHER THINGS THE COUNTY SHOULD BE DOING INSTEAD OF THIS. BRING MORE INDUSTRY TO THE COUNTY TO HELP COMBAT THE HIGH COUNTY TAXES WHICH INCREASED BY OVER 40% A WHILE BACK. STOP NEEDLESS SPENDING.

- Cell phone service is terrible and there are no WiFi Hotspot while driving around the area. At least in Philly Comcast was everywhere and cell phones worked much better.

- Better cell phone service too as unable to use cell when not connected to Wifi.

- Rates should be reduced and require approval for any increase. If a cable company gets public funds equipment should be considered public property. Households should be able to pick any provider they need.
- Thank you for taking the time to collect this data :) I hope it helps improve services for all.
- I wish we had more internet providers to increase competition and decrease costs for consumers. With Blue Ridge/PenTeleData the only quality internet service in the area, excluding LTE services, they control the market and the price virtually creating a monopoly. You can go to any suburban area and find 3 different gig fiber providers with costs lower than what I pay per month now for internet. The county should really look at services like FIOS or Google Fiber.
- Question 5 - I have Internet service. I work for Pencor Services and my High speed Internet is paid for by the company as a benefit.
- Atlantic broadband is now 'breezeline'
- Very dissatisfied with Atlantic Broadband. Since there is no competition, they charge exorbitant rates, I pay $95 per month just for internet. And their customer service is lousy. Very hard to get a live person on the phone. I discontinued their cable tv service because of the cost and very unreliable and not user friendly service. Therefore I rely on streaming from internet but that is expensive and not great. We need another internet option here. Competition is good for the customer. Internet should be regulated like a utility, because nowadays it is as vital as electricity, phone, etc. Please help us get more affordable, dependable internet service!
- Blue ridge cable are really the only tv and internet provider in the area. They are constantly up their prices. Given people no choice for other companies to go to.
- I pay way too much for internet! Cannot afford cable and TV and it goes out all the time!
- Not if it has anything to do with Dominion
- we need more choices for internet. Thank you
- I hope this issue is rectified very soon
- We literally have to turn off the wifi on all our cellphones if we want to watch tv or if we have to do any meetings on the laptop just to have a clean connection and even then it is spotty.
- Since I live by the Mauch Chunk Lake Windstream said I can get only get a certain internet speed because I live far away from the base.
- Please get Fiber internet over Blue Ridge Cable.
- BRC is the only game in town. Would be nice to have other options to challenge BRC with hopes of lowering prices. We purposely cut cable TV because their pricing is ridiculous for even a generic 30 channel package let alone the full spectrum of their offerings. I also wouldn't mind seeing fiber in the area for speeds above 1gig down. Upload speed could be increased as well. For over $100 a month 40mbps up is weak.
- Broadband access at this point is a financial issue more than a technical one. There needs to be incentives and/or mandates to provide access everywhere - not just where it's profitable. A rural electrification-like program is needed.
- I find the cost of what I'm paying for just internet service far too expensive.
- What manner of 'facilitation' is provided now and what is being proposed?

- have the option to work from home as needed - work full time for an outside employer - work at home during bad weather - also we have a generator which assists when services are down - have had to use out hot spot via our cell phones occasionally

- Here in Weatherly, we have no option other than satellite internet or 1 cable company. Their infrastructure is failing. Our internet cuts out and disconnects constantly. In 6 years, we've seen 3 different providers. They keep raising prices, but never fixing the service issues. It's so bad the school had to give out there own hot spots because our children didn't have reliable service for school work. We've been fighting for more options for years as a community, but it remains a monopoly. In today's technological world, we shouldn't have to pay outrageous prices for horrible declining service. I pay for way more bandwidth than I receive. Our phone line often doesn't ring. Our TV service constantly cut out so we ended up canceling it, and our internet cable service is so awful we often have to use our cell phones for internet access.

- Yes, please bring in better and more affordable broadband service. It is needed by my community and would be a wonderful improvement to the area.

- While I would consider fiber internet should it be an option where I live, cable internet is plenty fast enough and I am not nearly at the top of the plans available. Furthermore, I do not think taxpayer money should be used for the expansion of fiber internet. It is an extra top of the line model type internet. Cable internet is super fast. The broadband benefits act that the government had which transitioned into the affordable connectivity program is doing a great job alleviating some burden of internet costs. By now most people should be back to work, and children are back in school and the programs to reduce internet costs should not be needed due to covid. There are likely a few handfuls of students who may not have had internet at home prior to covid who may still need help, but the vast majority, likely well over 95%, have had internet at home that was satisfactory to begin with because that is just how life is in this day and age. That is not to say that people will not try to benefit from the government and take as much money and assistance as they can even when they do not need it. We seen that as clear as day with all the people on unemployment with covid who would rather remain on unemployment with the extra money than actually find a job. So no, as someone who was released to work with the first batch of essential businesses after the covid quarantine and my partner who was essential the entire time, we do not want our taxpayer dollars to go to multimillion dollar companies to expand their broadband services, which will allow them to make more money from our citizens, or get paid by way of part citizen check and part government (taxpayer) check.

- It is about time that we end the monopolies on internet access that date back to the monopolies that were in place when cable tv was the primary means of providing tv service. Open up to whoever wants to provide high speed internet access by eliminating ALL current laws and regulations that ensure only one provider can supply service to any home.

- need to have more than one cable company to bring down prices and better service.

- Just do what you should be doing. Government sticking its nose into this sounds invasive and 1984 scary to me. There are plenty of things going to hell that you should be taking care of, so why in hell's name do you try to take over something else that shouldn't be in your per view at all.

- Yes, the county should help facilitate better and more affordable broadband services, but in a fiscally responsible way.

- Competition should be introduced into the Carbon County internet access, as the government regulated monopoly is not policing itself for the betterment of the consumer. After Martin (for the

consumer) was removed from the FCC, the newer FCC heads are supporting the cable television companies, and Verizon over the consumers.   Breezeline (Atlantic Broadband) has my internet access set at 20mbps download and 2mbps upload speeds, whereas a new customer will receive 50mbps download speeds for the same price. A neighbor has 100mbps internet service, and he has told me that his system buffers, while he is streaming content to his television. Comcast (now Xfinity) would not update firmware for a customer's modem, in order for the customer to actually receive the higher speed, for which the customer is paying for the internet access service. The cable companies are charging for particular services, and not delivering the product as per the customer billing schedule. I have seen modem service that has been operating on the ring, after the useful life of the equipment (where the drivers have been removed from the ring,) and the cable company does not inform the customer of the discontinued service for that piece of equipment, until the internet access does not work for the customer. When the customer calls for service, they are charged a service call rate to replace obsolete equipment, that goodwill of the company should be exercised to notify the customer of a needed upgrade. My brother had called me about the internet service at his house, that had stopped working, and I related some information, and stories to him about loss of internet access. The next day, when the cable company office opened for business, he took the modem into the office for exchange, where the clerk told him that the equipment was obsolete, and no drivers were in the ring in order to make the system work for internet access. I am paying about $220 per month for cable television and cable modem internet access. My 'package' for cable television, and cable modem internet access is rated at $150 per month, so I pay about $70 per month for off-air television access through the cable company, sports (which I do not utilize,) franchise fees, HD-DTA rental, modem rental, taxes, etc. Through Antennaweb.org, or TVFool, It is my responsibility to upgrade equipment, and services, but while I am on a fixed income, I cannot afford too much more than I am paying now. I do not have access to the off-air television signals from the Penobscot Knob transmission towers, since the house is at about 1,186 feet in elevation, and the tops of the mountains are above 1,600 feet in elevation. Areas, such as Port Carbon in Schuylkill County have translators, which give these areas off-air television signals for the local television stations.   I must use the wireless access of the cable modem for cell phone service, as the cell phone tower is too far from my location to effectively and efficiently use my cell phone, even for telephone service.

- Municipality franchise agreements prevent competition of providers. Government entities should not bear the cost of enhanced internet service alone but must be a collaboration of governments, hospitals, school districts, businesses, ISPs, etc.,

- We need more choices for cable and internet

- We need other options beside Blue Ridge. Internet is extremely unreliable and has been a complaint of many people in this area.

- I have no issues with my Blue Ridge internet services. I work from home 40+ hours a week and never have any issues unless my power goes out.

- County should have better B. Band services

- There seems to be few reliable/ cost effective options available in this part of Carbon County and as such, we are being subjected to ever- rising costs with little recourse. Just this month my bill which includes cable TV, Internet and home phone (NOT CELL PHONE)increased yet again, this time, $13/month Also, by using your link to www.nperf.com to test my internet speed, I find that I

have 19.2 mbps, however, I am being charged a high speed internet premium for up to 200mbps!!

- Speed of Blue Ridge cable internet access varies widely but is mostly far below what they advertise. Advertised download speed is 100Mbps but is usually around 10-20Mbps and frequently dipping as low as 2-3Mbps

- Carbon County needs more choices of reliable, dependable and inexpensive Internet service. I am from Nesquehoning and we only have Blue Ridge as our provider.

- It is terrible that the only options for internet for weatherly are both terrible. Breeze line keeps upping their price every bill. It's never the same price. I used to have service electric and it was excellent. Breeze line is terrible. I would love better options and better prices that stay consistent.

- We should have more than just one option for high speed internet. Internet is a necessity and since we have no other options, we are at their mercy.

- Fiber optics heed to be affordable as well

- Apparently this area is low priority for Verizon to upgrade their internet speeds.

- Thanks for including Unit 129 E. Hazard St

- thanks for your interest

- I would love affordable gigabit fiber service to everybody's door. Including upload speeds that are at LEAST half of what the download speeds are. My current service is 500mbps down, and 10mbps up. Upload speed is one of my complaints with the current blue ridge service, there is no justifiable reason for it to be this limited.   I would only want the government involved in facilitating better broadband if that is in fact the extent of it. There should be no monitoring, censorship, etc. whatsoever after it is set up.

- We're all for it unless the cost is too high. Also if we need to upgrade computer, smart tv, cell phones, etc. that would also restrict our acceptance of the new broadband.   Cable bill is off the charts for what it is. BRCTV is a greedy corporation that basically has no regard for their customers financial situations. I know their taxes included that they probably pass on to us. A $300 cable bill is outrageous.   Thank You .

- please get better internet service to my area. Verizon is the only option I have a download speeds are terrible. Only one person can be connected at a time, which makes things very difficult. The town of weatherly and surrounding areas need an update ASAP

- We need help. We lose our internet almost daily. The company told us that they recorded 6,000 internet interruptions for just our home over the past year, as well as our neighbors. Wife needs it for work and grandson needs uninterrupted Wifi internet for s hook.

- we had Verizon for land line and called for internet since they advertised it and was told it is not available in our area. Atlantic Broadband was the only provider that would service us and now just for phone and internet we are paying almost $150/mo. More competition to Atlantic would be great and maybe lower rates. We certainly need better cell phone service too, on most days I only have one bar on my phone and this is really sad in today's times.

- The blue Ridge monopoly needs to go

- You should be able to shop for your internet services, like electric and voip services. I see no reason why I have to deal with an unregulated monopoly for my internet and cable TV service. If you can select an electric supplier, there should be no reason you should not be allowed to select a cable TV or internet supplier.

- Our BRC bill is ridiculously high. We are exploring ways to change from our expensive bundled cable TV, internet, & phone d/t fixed income.
- We have ZERO options in our area for internet. Blue Ridge is a monopoly and there is no one else to choose from. Friends that live in bigger areas pay a lot less for all the services I pay for because they have options. Carbon County has ZERO options and no one cares!!!!!
- No to 5G towers!
- Pencor Services (company) needs to be broken up, some of their subsidiaries have profited, while damaging our community by continuing to lie about baseless election fraud. They helped promote the Insurrection Bus trip in 2020, and should be held accountable. They are a privately company that owns far too many critical services in Carbon County.
- I am hoping that in the near future Verizon, AT&T, or any other phone company can service the Weatherly Area.
- The county should provide more affordable broadband services, depending on who will pay for it. If it comes out of our tax dollars or will increase our taxes, then no. We already pay extremely high taxes to live in Summit Hill.
- We only have internet service. No land phone or cable TV service. Internet service is extremely important to our daily lives.
- The best internet and TV I've ever had was from Verizon FIOS. I was paying half of what I'm paying now and had 1 gigabyte per second download and upload and a great TV package. Even after the promotion rate expired I would have been paying about what I'm paying now and that included phone. We don't currently have a home phone line
- I answered what I could. I do not have internet service because the options are so limited and or expensive for the level of service.
- Atlantic broadband is now breeze line And the service is terrible Sometimes it goes down 5 times in A-day And we have no choice we have to have breeze line
- Our granddaughter does not live with us but was here for school for a year and a half. When I had Zoom meetings and she was online for school, there were some problems. She is back in school now, so no problem at present.   Answer to Question 21: I am retired but am involved in various community and nonprofit activities that require broadband for Zoom meetings and other work. So I work from home but not for an employer - it is unpaid volunteer work. I can afford internet service but would like to be sure all residents of the county, especially children of school age, could have fast, affordable service. Poor kids keep getting left behind, ensuring they stay poor as adults.
- The school children need access.
- estimate of 7 devices connected to the internet
- Please find a way to make getting great internet service a real possibility at an more affordable price
- please explain exactly what the county has in mind. Are you planning to compete with commercial providers? Are you planning to levy an additional tax to support installing internet to areas not yet connected?
- Dissatisfied with high cost only. Cheaper alternatives such as DSL, Satellite Internet are low quality (had them before Blue Ridge Cable came to the area).

- Would really be interested in seeing different internet providers here in Carbon County
- Any options other than blue ridge would be great!
- I believe that it would be in the best interest for the county, the people and business that are here and in need of upgraded internet service
- internet needs to be more affordable!
- Every month I am charged $40-$60 in internet overages. I have been working from home for the last two years. Some months I don't have overages and other months I have $60 worth. It doesn't make any sense and it's to the point now that my cable/internet bill is $300 a month.
- Bring in a company besides Blue Ridge! Give us options, it's not fair we are only allowed one choice.
- wifi single weak at best does not reach downstairs or other areas of the house.
- We need more than one local provider!
- I tried nperf.com for down and loads but I didn't get it
- There are many days that our internet is slow or doesn't work at all. Always resetting the modem.
- We need more options in the carbon county area. Atlantic broadband has a monopoly in this area. And their customer service is not very reliable. And it does take a long time before problems can get rectified.
- Blue ridge/penteledata is overpriced and garbage service. Unfortunately I have no other options. We need more options
- Cellular is by far the biggest problem I face in terms of data access and connectivity. Even though the speeds are sufficient, higher upload speeds are desired.
- Stay out of private enterprise. The market will drive services and prices.
- I feel that we are hostage to a local monopoly. there is no meaningful competition
- would like more affordable reliable internet
- BRC needs competition!!! PRICES (even considering pkg discounts) for those of us who are RETIRED and are ON FIXED INCOMES are getting out of reach! This is so UNFAIR in cost distributions.
- There is no competition in my area, no other choices available. We frequently have outages. Gets frustrating when we constantly have to reboot even though we are using the Blue Ridge Modem
- High speed internet is a requirement for most people in modern society (even more so than a phone line) and should be a public utility and not under the control of 1 monopolistic provider.
- It would be great to have a choice of internet providers. More competition could result in better price, better options and better service.
- We need more affordable choices in our area please. BRC is too expensive!
- I do not know if the county should assist, but I believe we need a choice in the service providers.
- The government needs to stay out of the broadband business. ISPs and other connection businesses can do the job better and within reasonable prices. Get rid of government fees, regulations and restrictions and maybe the cost would come down a little bit.
- I am disgruntled at the lack of available options when it comes to Internet and more specifically cable TV in Carbon County. What disgusts me even more is how much Blue Ridge charges for

theses services. My bill currently has a $70 discount for a promotional package that expires in August 2022, when my bill will increase to $220 a month. I'm not sure how we can afford to continue to pay those rates after that increase. Blue Ridge has a monopoly on the area.

- More options equals competition which equals more affordable rates

- Need to introduce additional offerings for internet services to promote better pricing. Costs for services for counties located to the south appear to be lowers as they have multiple choices for ISP's.

- I don't think it's the county government's job to install internet infrastructure. I don't want the county government to raise taxes to install internet infrastructure. My present Blue Ridge Communications $34.95/month internet does the job adequately.

- If we had to work from home, or if my 5 children were still at home, doing school work or gaming, our internet would not be able to support it.

- There is no other choice where I live, not enough homes for another service so Blue Ridge Can do what they want and charge what they want. Cell service sucks so I will never not have landline.

- My cell phone service is expensive because my kids need to use a hot spot as house cuts out while they are taking online tests.

- Get rid of dead zone areas for cell service

- There should be a lower rate for School related internet use for children and work from home for adults.

- This area has many "dead zones" for cell phone service

- Give us affordable and reliable options. Blue Ridge/ Pentele data have monopolized our region. You pay for services you do not actually receive and when you show them factual data they say well it is the best my location can get even tho I pay for more speed for WFH job requirements. Constantly at odd with Blue Ridge/ pentele data for issue with dropping my VPN for work and i can see I have several low speed drops and short outages which disrupts my work and production numbers for work and they never take responsibility the just excuse their poor services

- Thank you for caring!

- Blue Ridge has a monopoly on our internet service. We need options

- thanks for caring for the citizens/ population of Carbon County. Toni & I do appreciate your concerns for quality.

- There should be more competition than just Blue Ridge Cable. They control the market. Get more company for cable in our area.

- I may sometimes have to work from home depending on the weather. Because of how far out of town we live we do not have many options. It is ridiculous to have to pay someone to bring it to your home then pay them for service.

- Prices increase without notice or change in service also we have no cable options

- My kids suffer in school because of no high speed internet.

- ref #13 - Our issue is staying connected. We are constantly disconnected, and our service goes out completely several times a day. ref #18 - We don't have data limits with BRCTV however, because of constant outages we have to use our hot spots and run into these issues with our cell service provider. We literally have no service besides brctv and it's awful for our location. We

moved to the area before the demands of the internet. If I was looking to move to the area today, I would literally pass. In fact, we have considered moving for this very reason. Help us Obi-Wan Kenobi, you're our only hope... ,)

- I live on a back road and do not have any other choices.
- the community needs this!
- Give us more and faster options than Blue Ridge!!!!!
- we NEED a better and more reliable internet provider other than penteledata! Over priced for crappy service!
- No cell service available at 1795 Walnut Dr. Palmerton, Pa.
- Everyone I know has unreliable Atlantic Broadband and we lose service frequently.   It gets interrupted often. We need competition
- The bill for Blue Ridge is outrageous anymore and we do not have any other options. We need choices to hold them accountable for their constantly rising prices.
- Thank you for considering additional internet service options. BRC/PTD needs some competition to bring prices down.
- Bring on the competition or at least get the existing infrastructure upgraded to meet/beat current standards. Right now BRC is the only real provider of Internet Service (sorry satellite doesn't qualify, IMO). I pay for Blue Ridge's Gig Internet $89/$125.90+taxes) which is supposed to provide me with 1Gbps (download) and 40Mbps(upload) but seems to cap out between 200-400Mbps down.   I have been doing IT since 1991 and have maintained Comcast (Cable) and Verizon (Fiber), along with other carriers across the country, in both a residential and corporate environments. These speeds and limited offerings on DOCSIS 3.1, which is capable of supporting 10Gbps down and 2Gbps up, is not good. DOCSIS 4.0 is now out, supporting up to 10Gbps/6Gbps.   Now to compare current offerings, Comcast for example offers 1.2Gbps Cable for $79/$113/month and you actually get the full 1.2Gbps down and roughly 100-250Mbps up, you also get Peacock Premium and a 4K streaming device. They even offer 3Gbps (3,000Mbps) internet service now too. Verizon on the other hand offers Gig fiber for $89 which gives you 1Gbps (@940Mbpsdown/880 Mbps up). Mind you these offerings deliver more for the same or better pricing than BRC. Lastly, we could use a few more cell towers to improve coverage.
- Thank you for all you do. This is a great place to live, thank you for your interest in improving it.
- Breezeline, formerly Atlantic Broadband has the worst customer service. Billing is always messed up and when I have service issues it is almost impossible to get in touch with them. Their system is not redundant and when a line broke in Berwick we were out for days
- our biggest problem is that our service is very unreliable. it is constantly going down sometimes for days at a time, and windstream doesn't even credit our bill for the down time!! plus it is very expensive. We have a bundle of satellite, internet, and phone, and out bill is over $371 per month!!!!
- Atlantic Broadband is our only option. The connectivity is unreliable. Atlantic Broadband told me and my neighbor to purchase a hot spot if we needed reliability.
- This has been an ongoing very frustrating experience made worse by the pandemic. When there is a problem, contracting Atlantic Broadband (Breezeline) customer service is difficult.

- We need fiber and higher speeds, and we need lower prices for t.v. competition would help I think. We should also have a right to select what t.v. stations we have rather than bundled packages, we have over 150 stations and we find only about 10 that are relevant to what we want.
- When my internet works, it's great. But each day I lose connection at least twice, which significantly impacts my ability to work from home. I often resort to using a personal hotspot through my cellular carrier to ensure continued connection. The issues I have raised to my service provider have not been adequately explained or corrected.
- access is not available. Internet cable would need to be strung.
- we should be focusing on better cell phone service. we get no service at our home and surrounding forest inn rd. if someone is in an accident, without home phones, there is no service.
- Cable and internet service prices should be regulated and made affordable
- I feel cable costs are too high. Called Company many times
- The county should make it easier for the companies to operate here, and give them tax incentives, etc. but the taxpayers should not actually pay for it
- Would love to see the results of this survey, as well as actions planned or taken as a result.
- Too many same channels on Blue Ridge Cable. Cost of cable TV, phone and internet is too high
- I can get Gigabit from BRC, but don't need it.
- Internet service is completely overpriced.
- Please get fiber into our area/development! We are at the bottom of the mountain and our cell service is spotty at best. The top of the mountain has no cell reception problem.
- Blue Ridge internet has been the best internet around. I have lived several places in which Blue Ridge has been my provider and I would never switch as the competitors out there are awful. They service is always out and with working from home I can not have that. Blue Ridge internet is fast and reliable and they are always looking to better their service.
- Yes, the high cost of internet service. I just turned 75, live alone, and live off of my social security. I do not have a smartphone-only a flip phone. The TV (provided by the landlord) is not a smartTV, therefore the internet is my only real means of outside connection. I was paying $73.56 just for the internet (my landlord pays for the cable, which is included in my rent) but qualified for the EBB credit. However, Blue Ridge reduces the high-speed internet to 100 mpbs while applying this credit and I will have to pay full price again once it expires. I wish there was a senior citizen discount for the internet that could be used by people like me.
- The County should step in and put a cap on cable prices.Six years ago I only paid (127.00 and now 179.00).At this rate I'll be paying (200.00 A Month) for cable.I never added anymore service. In fact I removed service, to lower the bill.And for the rise in our bill,We where rewarded with less channels. Thank you, Kevin
- We have to pay a high amount to have any kind of useable internet.
- No more projects that will wind up costing taxpayers money. The people that are indiscriminately making kids and can't afford them should all be sterilized and FORCED to work. No more FREE HANDOUTS!
- I want cable tv service that doesn't charge me a huge amount for hundreds of channels I don't watch. It should be selective and charge the end user for what he watches, not what other people watch. I like the news, sports, and weather....and I don't watch anything else.

- more providers as Blue Ridge is a monopoly!
- The biggest concern for internet is the price and lack of options. I pay almost $150 a month for just internet.
- Way too expensive!!   Blue Ridge has a monopoly! RIP OFF!!!
- School remote learning is the #1 priority. Cell service where I live is horrible. Only 2 companies work here at home. Verizon & AT&T and even then I only have 2 bars. My disabled son had a Lifeline phone and it didn't work here. I won't pay high prices for a home phone. I'm retired, and low income so I can't afford high prices for TV, Phone, & Internet. The prices I pay monthly are outrageous for what service we get. What can you offer as an option?
- Wireless 5G could be a great alternative for our area
- I could pick a higher speed plan from Service Electric however, I feel I pay enough for basic internet service now. At different times of the day and night, the service is, at times, slow. I don't use it for streaming apps. My usage is a basic computer program installed on my computer for my part-time job. I do not sit at the computer all the time and I am the only person using it at home so I feel it is a slow connection. I have no desire to pay more money if that's what gigabit fiber service is.
- I say yes to question 23 but keep in mind that I do not have any idea what that would entail. How could my county make internet service cheaper? I also have no idea what gigabit fiber service is.
- Internet service providers keep raising the minimum speed and use that as an excuse to raise prices. You can operate a home with dozens of internet devices on 50Mbps but they stopped offering it. Verizon requires you to buy television service from them to get internet at a reasonable price. There is no choice of providers in many areas, Internet access is a utility now just like electricity and we should have choice.
- Improve cell phone service, especially with 5G roll out. I needed to purchase a $500 cell phone signal booster in order to get a reliable signal.
- Blue Ridge offers fast reliable internet. When the power goes out their internet keeps working. They are local people and know this area. I like the fact that they are local and money stays local. Our payment doesn't go out of state. They hire local people and we need more of that in Carbon County.
- We have no other choices so Blue Ridge charges us a higher fee. My son and daughter moved aware from the area and have options to pick from.   They pay 1/2 of what I do for high speed internet.   We need other internet providers in our area.   Also Cell service is not great. With all the mountains we do have dead spots.   I live on top of Mountain and I am lucky to get 2 bars.   I currently have Verizon but also tried AT&T same amount of bars.   T-Mobile does not even work here. Losing power as much as we do cell service is the only way we can report it.
- I am paying almost triple for internet than I was last year because I had a data cap and the overage charges amounted to more than $300 in one month while my husband and I were working remotely during the pandemic and i had absolutely no idea until I received my bill. That should be illegal, in my opinion. I was paying $54/month with Service Electric in Bethlehem and our internet was far superior. In 2022 we should have options in Carbon County and they should be more affordable options.
- Blue Ridge/PTD needs to stop being such greedy scumbags and release synchronous internet. 100mbps down is worthless if you only have 8mbps up. They're ripping us off and forcing us to

get 1000mbps down just to get 40mbps up. We have the latest docsis modems available and the new hospital has digital tv so there is no longer an excuse to not open up those older analog frequencies for upload bandwidth.

- BKC has monopoly and we are limited to access other options!

- Competition is the answer- give customers choices

- I work for a cable company with reasonable prices but unfortunately I can't get their service and I am paying MORE THEN DOUBLE for the service I do have because there are NO Other choices by me.

- I am disgusted that I have no choice other than to put money in Fred Reinhard's pocket by purchasing his internet service, so that he can use it to fund his political agenda with which I vehemently disagree. Please give me another option.

- I feel the County needs more providers of high speed internet to be competitive and so that there is not a monopoly by one provider.

- Blue Ridge Communications and PenTeleData have been providing the most up to date services and will continue to do so. Carbon County is fortunate to have them as a major employer and provider of these services.

- invest in fiber internet & put it in the ground

- PenTeleData/ProLog/BlueRidge has a monopoly in this area and are expensive. They do not care if they serve you or not. Before we decided to disconnect from cable I asked them if they could give us a better deal, our bill went from $99/mo to $235/mo because we were past our introductory period, their response was no, not for existing customers. I said that I want to disconnect the cable and their reply was to have their equipment turned in to the office the following day. If I could find another internet company that served PennForest I would drop that also.

- Faster and more reliable data transfer is nice but what about lowering our borough and school taxes??

- Carbon County needs to have several competitive internet service providers. Essentially, we suffer the pricing policy, service tiers and options of a single provider. Prices keep rising with few options (equipment, service packages, etc.) for those on a retirement fixed income. And the internet becomes more important every day to communicate with health care providers, pharmacies, retailers, restaurants, online shopping websites, package tracking, etc. Furthermore, the overall infrastructure needs to be updated. Current cable lines are aging and the distribution of cable lines within a residence is antiquated (no central 'circuit' panel in house).

- Carbon County has one of the highest median property taxes in the United States, and is ranked 372nd of the 3143 counties in order of median property taxes. The average yearly property tax paid by Carbon County residents amounts to about 4.02% of their yearly income. Carbon County is ranked 228th of the 3143 counties for property taxes as a percentage of median income. Therefore, I don't want the government to do anything, because it's just going to bite us in the end. Local government can't get much right, I don't want your fingers in this too.

- Not many choices to choose from, and the most reliable one it's very inconsistent and expensive... Also the cellular signal around the county, is very very bad... I have no signal in my home...

- Don't like that blue ridge is basically a monopoly and my only choice.

- Please break the monopoly Blue Ridge/PenTeleData/Pencor have on high speed internet in Carbon County. I have no other choices for fast internet. Reliability is poor. There are frequent service interruptions, especially at night. Gigabit broadband should be affordable and available to as many people in the county as possible. It can be done, see the example of Chattanooga TN: http://chattanoogagig.com/

- Atlantic Broadband (Breezeline)has a monopoly on our internet that is horrible service, price is so high! I have only basic cable and internet service pay almost 250.00 a month for service that goes out when the wind blows or no reason all at random times. No matter the name of this company (which I have had for at least 20 years) price just keeps going up outrageously!! You have no choice here to switch to a cheaper service and they just keep raising it! Which I am so tired off for horrible service! I would really like to have a choice!! This company makes me so mad!!

- It's frustrating at the cost for internet and it just keeps growing up. Where I live I do not have any other options. Our internet is always going out.

- Competition is welcomed. Keep government out of it.

- The government's only role in internet should be to not impede access to normal market competition. Other companies have the ability to compete and provide services. There should be no government interference in market or provision of money with strings attached. The government should not be involved in providing internet service!

- The services provided by Breezeline are unreliable and provide less than par service on a daily basis, customer service is nearly impossible to reach when there are issues. Weatherly needs more options and reliable service. I am a teacher and cannot provide online instruction to my students, when learning virtually. I pay for the highest plan to receive the "best" service and it is horrible. Please help make our community more advanced and accessible.

- Need Better faster less expensive I internet access. More options. Blue ridge seems to have a monopoly on internet access

- One adult is a K-6 Educator and is required to work from home at times.

- The only reason we are able to afford internet services at a speed package that suites our needs is because the company I work for provides highly discounted pricing due to work from home. This household is well within the 'middle income' economic class and $100+ a month for internet access was not affordable during favorable conditions prior to the pandemic. The extreme inflation that we are witnessing is making internet access even less accessible/affordable for the average household. Prior to the pandemic, and even more so now, internet access has turned from a luxury to a mandatory utility required to function in common society. With things like 'going paperless', the closing of many bank branches, and an increase in video conferences in lieu of office visits, I would not be able to run my household without the internet, even if I did not work from home. Without government assistance, inflation will require broadband providers to raise prices in order to maintain infrastructure and high-quality internet services, further exasperating the income to the cost of living predicament that has been brewing for decades.

- we need choices THAT we can AFFORD

- Not enough options in our area

- Atlantic broadband/ breezeline is horrible. Each month the bill goes up and you can never get anyone on the phone. Even scheduling a call back never happens. No email response. Service is unreliable and very expensive. As stated above, only 1 device can be on the internet at a time.

- i have 1 gig
- We live 1/2 mile from a paved road and have BEGGED Blue Ridge to run an internet cable to our home, but it isn't cost effective for them. Verizon is available, but their 'high speed internet' provided us with less than 1mbps download speeds. We have been using Hughes Net because we don't have any better choices, and our bill is around $180 a month with download speeds that vary from 1 to 3mbps. My 3 children are homeschooled and we can only use 1 device at a time. My husband is disabled and must utilize the internet for checking in with his doctors. I would love to be able to get a remote job (can't leave because of disabled husband and 3 children), but the lack of decent internet makes it impossible. HELP! It is so frustrating.
- Although my download speed is above 100mb, as soon as I start using one of my devices and have to do work on a second device, it immediately drops very slow
- Government has a poor performance record on too many issues over the years.Forcing already overburdened tax payers to foot the bill so every household has access to these services is ridiculous.Let the private sector handle it.You have enough to deal with.
- Why is this a county thing? Competition and capitalism should be the only driving forces
- blueridge is too expensive! but so are carbon county taxes!
- I already have Gigabit fiber optic service
- Blue Ridge sucks!!
- Blue Ridge is very expensive. Please allow us to have other options.
- I am.beyond frustrated with Blue Ridge cable which is why I got Starlink. I haven't gotten it fully functional yet. I am also looking into Cellular wifi.
- It is remarkable that in 2022 we only have one company that offers high speed internet. Back in the early 2000's it was mandated by FCC that you cannot have a 'monopoly' on the services in any particular area. How is it that south of Palmerton you can have high speed internet packaged with digital cable (same or higher speed internet) and it costs less than what I currently pay for internet by itself? Even more ridiculous is that the internet provided is PTD/BRC! How is it that there is no recourse for price gouging us?
- Blue Ridge Blows!!!!!!
- Wish I had more choices in companies other than wireless or satellite. Or cheaper in general prices keep going up and up but other ppl I know pay less for same type of service from other companies
- My service is up and down a lot causing problems
- We shouldn't have to pay so much for speeds slower than all of the other first world countries. Our speeds should match theirs.
- Time to end the provider monopoly in this area.
- cable/internet costs are excessive
- I think everyone should have affordable high speed internet.
- Something seems fishy about my current download speed. It's never been higher than 25mbps. I feel like they messed with it because they know about the survey
- Why the covid questions, how are they related to internet service? We need badly need internet competition in Carbon County. Blue Ridge TV was fine when analog, switching to digital lot of people complained about service. I gave up and went to streaming on TV content. Still have

some issues but not as bad as with Blue Ridge cable service. I don't think their infrastructure has the proper bandwidth to handle demand.

- I HOPE THIS WILL INCLUDE TV
- Internet service is very expensive when there is only one company supplying service
- Nights and weekends for fire company online work.
- costs too much but good service needs to be cheaper
- paid to increase internet speed modem and cable/internet keeps going out and need to reset
- I have 2 Eero wifi boxes and I still get buffering on internet
- Blue Ridge Com will NOT provide service to my home but houses all around me have service from them. Blue Ridge is a very poor company and lacks proper staffing and management.
- Our internet service on the outskirts of town works fairly well in comparison to others who live in town between 1st & 6th Street.
- Still have land line due to dropped calls with cell phone every time a car or truck pass the house. Can only use cell phones in certain areas of the house. Landline is the same. Can lose calls with landline too.
- I pay for up to 1Gb but it is never anywhere near there and it goes down every day and night. I have called Blue ridge many times over the last 8 months with no luck the fixing it
- Please offer the citizens more options than blue ridge cable they are expensive and there isn't even another option
- We were told 14 years ago from a Blue Ridge installer the outside lines needed to be updated. Nothing has ever been done to upgrade just more homes add to the lifne causing us horrible service. College professors are not very understanding when your internet cuts out in the middle of an exam.   Cellphones can only be used if you stand in on spot and don't move a muscle or it will disconnect. Ridiculous in this day and age of technology.
- We do not have any other options then blue ridge. The Verizon hotspot we have does not have service where we live. It would be nice to have other options, especially with the poor customer service we have received at blue ridge. I believe having only one internet provider allows the provider to treat customers however they want because they know the customer has no other options.
- Blue Ridge is available with a wide variety of service. The internet speeds range from those who may just need basic connection for school and those who rely on it for entertainment and more. The prices also are fair for what you are looking for. If you are looking for internet to support your entertainment and replace your cable, then you are going to pay a little more for higher speeds so that you can have that luxury. Internet is not a utility and it's understandable to pay a little more for a higher level of service if you are running everything in your household on it. There are plenty of areas throughout Pennsylvania that are providing dial up service or DSL with speeds that are extremely low and a high cost. Blue Ridge is available to us at all times and is constantly trying to better their networks to provide innovative service. As a whole, society has become more dependent of internet services for all types of things including communication, entertainment, work and school. However, the dependency on internet for these things does not require the companies to provide it at little or no cost. We prioritize money for what we find important.

- We already have 1 gig. This survey should not have been taken out of my tax dollars and given to a company in VA. This should have been done by somebody in Pa. It's also very bias in the way it asks questions. It's unfair and should be redone. Did the FCC check these questions?
- We need to have other options. My cable, internet, and phone bill is now $297/month. We have no other options but Blue Ridge & Penteledata. We should be able to choose who we want. I tried to change and I have no fiber optics in my area so I am stuck. I work full time from home. My friends have tried streaming but the costs still add up. We need other options...enough is enough. If I could I would get rid of the cable but that is not an option. HELP! My brother is on a fixed income and he took the basic which is 51.08/month. How can these senior citizens afford it? Terrible...no discount for them either.
- Seems like a monopoly with the only provider that has reliable service. If it's a monopoly that's ok, regulate the price. I know you can't, but just saying.
- Old age and covid took my wife in May 2020. I'll be 70 in April 2022. Some shopping online, watch old classic movies on line free. Some breaks and waits in the conation by the server. I had the cable TV turned off. { $111.5o for basic }... Had Med's to buy
- Land-line phone service (Verizon) very unreliable-
- I'm looking into an outside TV antenna because Blue Ridge Cable is too expensive, and think they want to monopolize.
- Need more competition
- We need more options/competition for high speed internet in our area.
- Hi, really glad you're doing this...we were just having a conversation about our frustration with the limited internet options around here as we've started to inexplicably approach our monthly data caps with Blue Ridge, despite no change in activity. Plus, I pay for several levels of upgrades on the plan, but the upload speed is still pretty terrible (9mbps), and I need to upload large file-sized video clips to Youtube regularly.
- I would not change providers, my service is perfect, reliable, and affordable for my needs.
- Re: 21   I am retired but do volunteer work for my church
- the internet cuts in and out on Sunday afternoons
- We also have grandchildren on snow days and COVID closures etc. and do remote learning.
- Blue Ridge Cable is the only option for internet where we live. They're a rip off. Their prices are high and their service sucks. We need other options in the area.
- It would be nice to have a choice. One internet provider is not acceptable!
- cell phone service is terrible
- Just remember, we live in a poverty area. Now with KME closing its going to be worse on us with taxes. If the price is affordable. Everything is going up & my bill with BRC is over 250$ a month & I don't have extras. We can't afford another increase.
- better cell
- Blue ridge internet is insanely high cost and it's unfair they have a monopoly here
- More company options would be nice. We are pretty much locked into Blueridge in this area.
- In regards to number 23, the county should stop the monopoly Blue Ridge Communications has over cable/internet in Carbon County and let other providers compete in this market to lower the prices.

- The cost of cable and internet is absurd. We pay $200 monthly for these services through Blue Ridge. I have been exploring other companies for less cost per month. With the help of the county government, more low income families would have internet. I have 6 grandchildren and they aren't able to have internet due to the cost of living. Makes me sad. Any help would matter at this point.

- Stop spending money on shit like this . You people send money like Democrats.

- BLUE RIDGE HAS HAD A MONOPOLY FOR FAR TOO LONG. WE NEED OPTIONS. I WAS PAYING HALF THE PRICE FOR THE SAME DOWNLOAD AND UPLOAD SPEEDS AT SERVICE ELECTRIC WHEN I LIVED IN A DIFFERENT COUNTY. ITS RIDICULOUS.

- not with tax monies

- We need more options available to us, and better pricing for broadband services. Also, better cellular coverage.

- Honestly I have no issues with my provider, but it may be good for people to have cheaper services with better quality. I know not everyone can afford the top internet services provided which causes a lot of issues. Like I said I have no complaints, but I also pay for the more expensive internet plan.

- We are very pleased with Blue Ridge Cable. Not only do they offer high quality service, their customer service is excellent, and local.

- Wiring in our building is antiquated and cannot accept higher internet service

- NEED ANOTHER INTERNET PROVIDER, BLUE RIDGE HAS IT MONOPOLIZED, AND THEREFORE CAN CHARGE WHAT THEY WANT.

- There needs to be a better internet option. If not, there needs to be more internet options to choose from!

- I believe reliable access to home Internet is crucial for child education success in today's environment. I also believe reliable internet helps promote improved access to a 'work from home' lifestyle, which reduces commuting, which reduces vehicle traffic and fuel usage.   My current supplier plan is 'up to 150mb' but my speed test worked 75-80mb/s.

- senior discounts in the future

- Until I upgraded to Eero, our service was less than desirable. It's better now but of course comes at a cost.   More choices would be good to have.

- Very expensive!!!

- In my opinion technology grows best and becomes most affordable when left to entrepreneurs that must compete via affordability, service, delivery, and continuous innovation, development, and implementation of new intuitive products that are fluid because of the competition. I'm not sure what you mean by 'facilitate'. (antonym is 'complicate') I know easing regulations and providing financial incentives to competing communications companies would be the American way to improve access to the worldwide web for everyone. We all own the internet as without us it doesn't exist. We all contributed to its invention. We all feed it to make it work therefore everyone deserves to have it. Like air. Government will only screw it up unless they intend to facilitate competition on the same grid and for new innovative modes of transmission.

- Also need better cell phone service in this area. Carbon county has too many dead spots, regardless of the carrier (e.g. Verizon, A&T, etc.).

- Our service is spotty and unreliable.
- In Carbon County, we should have more than just Blue Ridge as Cable/Internet.
- use cell phones
- We could not change our services do to blue ridge cable is the sole provider for the towamensing trails development in albrightsville area and there is no FiOS up here which i heard is good and better prices.
- Blue Ridge is basically a monopoly in our area...more competition would make services less expensive
- GOVT NEEDS TO STAY OUT OF BROADBAND!
- When my son comes to visit he has difficulty making/receiving phone calls on his iPhone. He also has difficulty accessing the internet with his iPhone and busy times of day unable to access internet altogether.
- Since there is not many houses where we live the ONLY option is Blue Ridge Cable. Seems like it's very monopolized. PLEASE HELP!
- I'm against government having any hand in the any form of communication because it leads to censorship and only allow the information the government wants you to see or disseminate. This then becomes a violation of your First Amendment rights.
- I don't want to sacrifice the quality of my internet or the quality of the customer service I receive when I have questions, issues, etc. Having internet for a few $ cheaper is not worth sacrificing quality or the support of our local BRC/PenTeleData companies.
- Blue Ridge Cable is sooo expensive. We are going to be getting rid of the cable and only keeping the internet due to their pricing. 250 a mouth is outrageous for cable and internet.
- Prices are going up and up and becoming almost unaffordable. AT&T Directv Is $165/mo and Verizon landline and DSL and answering service is $143.42. Amazing prices from when we started. I guess that's how Verizon and AT&T can afford to buy competitive companies. Screw the customer. Only stockholders matter anymore.
- Waiting for FIOs
- The price of internet service is atrocious actually, especially because the internet is terrible. Blue ridge cable keeps putting up prices and the internet service gets worse and worse. I have close to the highest plan and it is still terrible. If my children are gaming, and I have school work to do, the computer does not perform well. I work in a doctor office close to my home and again the internet service just stinks. Please help
- Breezeline (Atlantic Broadband/metrocast) is and has been the only high speed internet option and is completely unreliable. Please invest in alternative solutions and 5G options to provide choices.
- Remove data caps, increase upload speed
- We need internet on Flagstaff Road, we have limited cell phone service and a minuscule limit on our satellite internet that slows it even more. I have filed complaints with the FCC about the slow service but it is the only option that we have.
- Blue Ridge cable is reliable but very expensive. The monthly bill just increased to $224.63. This is higher than my electric bill, higher than my propane bill and higher than my mobile phone bill (2 phones). They did run the infrastructure for the cable but being the ONLY reliable service they

can charge what ever they want to because no competition. The taxes and fees are just under $10.00 ... ugh!

- Please consider adding gigabit fiber internet service or even any other broadband internet service into Palmerton. The Blue Ridge ISP is good but much overpriced. Competition would be welcomed.

- 23). If it falls within the parameters of the function of county government

- As long as the commissioners use the money from the federal government and not raise out taxes

- The internet in carbon county is monopolize by blue ridge cable. And that is very sad because you have no other options and that allow them to control the people in this county with cable. And it also allow then to control prices of cable because there is no other company to compete with. That should be illegal.

- At NO POINT should the county be involved with this. Internet is a LUXURY despite the belief anyone NEEDS it. I am not interested in paying more taxes so people can have better Hulu and Netflix! Blue Ridge already offers assistance to people who needed internet. Also as a former blue ridge employee most people were just taking advantage of that assistance program. Free internet but brand new phones, tvs, cars etc. At their homes. People need to live within their means. Not to mention you really have no clue of the actual cost to provide this kind of service and will you actually provide service to all or will it only be for people living in town?

- Blue Ridge needs to be more affordable and have better service. We should have other options too!

- I ordered and waited for starlink due to being so sick of how blueridge and penteledata run. I will gladly spend 600+ on a new provider, than deal with what i have been dealing with any longer

- Need competition to hopefully bring the cost down to an affordable level.

- The government should not be involved with these services. That would be akin to the government telling Claude's what kind of hot dogs to sell.

- I believe that it is incumbent upon the County Government to take an active interest in the development of ALL communications within the area.

- My internet is linked in with my cable and home phone line. It's the only way to get a better price. Unfortunately, that price is still very hard to come up with monthly.

- should be more affordable to all. gotten more and more expensive every year as more people rely on it for many everyday tasks.

- We are interested in internet service, but to get fiber, we were quoted $10,000 to dig a trench directly through the center of our farm and then we would have the 'privilege' of paying for a service beyond that investment. We cannot justify that expense, nor the major disruption and segmentation of our fields because what looks like an 'easy path' for the telecoms company's engineers would be a mess for our property. Having a hard line would be nice, but the future is in satellite. We are actively looking at the satellite system being deployed by Tesla. Paying to hardwire every home in the county would be a shortsighted, expensive mistake.

- We need more options than Blue Ridge and Wind stream

- Always trying to reconnect to many dropped connections/old underground cables never updated.

- More affordable service.
- to to costly for all whole package. No senior discount.
- Get anything else than blue ridge. It's horrible we have one provider to get from. They are absolutely horrible to deal with, rude, and treat you like an idiot. Absolutely the worst company that I have ever dealt with
- We need more competition among providers in our area, which should result in more affordable prices. Need more options.   We are more dissatisfied with our TV service and cost of overall package than anything else. TV seems to be very unreliable for the amount we pay. We pay 282.41 a month for tv, internet and phone from Breezeline (Atlantic Broadband).   The individual cable companies seem to hold a monopoly in their individual areas and they don't infiltrate the others area. They should be able to compete more.
- As a computer programmer, reliable internet is essential.
- We are very limited in internet provider options in this area. We should have access to more reliable companies to force the change of the current suppliers and have better service for a more reasonable price.
- I'd like my existing take dollars to go towards infrastructure improvements that would allow for fiber optic cable to offer better internet.
- Why does Blue Ridge have a monopoly in this area? Verizon/FIOS is a much better service.
- Fiber optic, more competition.
- It is troubling that Blue Ridge Communications is the only choice for my area. More competition in the market could result In lower costs. Many of my friends and associates pay much lower rates for similar cable and internet services.
- limited competition=limited options
- It is my understanding that Verizon FIOS has promised to wire most places but is balking at the cost. It would seem to make sense to wire the county, in fact, fiber the whole country.
- Paying at least 270 a month for phone internet and cable is way too expensive
- Blue Ridge Communications and PenTeleData already provide 1 Gig service and greater in Carbon County, and Blue Ridge has active plans to build a fiber to the home network to provide even greater capacity, so I'm not sure what the point of this survey was.
- What adds to the cost is all the fees Penn Forest pays.   Universal service fee,, county 911, sales tax, Penn Forest, etc
- Cell phone service is a much bigger issue than internet service in my area. There are many no service areas and in bad weather Cell service cuts out in areas it would normally work. Internet may be expensive but at least its available, good cell phone service isn't even an option
- We have 2 ISPs in the area and the one is like a Monopoly and charges through the nose for basic service. The other one isn't based in the area and the service drops a lot. I work from home full time and need good, reliable internet so I can keep my job. I also don't have cable anymore, so I stream my tv and if I'm streaming and trying to do work at the same time, my internet drops, freezes or has some other issue. I pay for 400mbps and am only ever receiving 15 -30mbps. That's a HUGE difference! And I have fiber. Affordable, reliable, fast internet is what is needed so desperately around here.

- Just need reliable service that is always up. Missed too many Teams calls for work at home due to slow or lacking service.
- BRC should NOT have monopoly!
- If companies want to sell broadband, they should pay fire it. Not my tax dollars. No free stuff for the lazy. Bible days if you do not work, you do not eat!
- There needs to be better control on costs. I'm not thrilled with my internet serve, it's average. If something better was offered at the same price we currently pay, I'd look into it. I'm not about to shell out more money. Our TV, internet and cell phones is as much as a new car payment. That in itself is ridiculous.
- I am a heavy user of internet services on Blue Ridge's 250Mbit down plan for ~85/month. I am fairly happy with this service, however I am forced into the plan as this is the minimum that does not have data caps. Our area would fair better economically should fiber or another reasonable option exist - as so many people are moving from the cities and working from home, there is a real opportunity here to restart the economic engine of Carbon County. Thank you.
- DO NOT RAISE TAXES
- We have been really happy with Blue Ridge! We get faster internet for less money. When we lived in the Lehigh Valley, we had slow internet that wasn't reliable and we paid way more!
- I think that it is a shame that we have no choice of internet providers and are at the mercy of Blue Ridge cable for our fastest internet provider. Satellite and cellular internet options are much more unreliable than cable.
- We need more choices in palmerton for internet and better service.
- Regarding #23 - I do not want the County government facilitating anything else that is currently in the private sector and proving to be stable. Please focus on Law enforcement, traffic & roadways, municipal planning, housing and economic/community development.
- Stop making taxpayers pay for big companies. You are wasteful
- As a former PID employee I receive a discount
- As an IT professional, as much as I'd like to see a fiber option I'm weary of the government being able to pull it off. I'd be happy to speak further on this matter.
- Latency 41.40 ms
- Atlantic Broadband is the most unreliable ISP i have ever had. Bad customer service and internet has constant issues. only reason i keep them is because there are no other options in my area. i believe we as people should have more then one service provider in the area so we have a choice.
- It would be nice to have some options that we older retires could understand as well as use.
- My cell phone signal isn't the best out here so maybe more towers that work.
- Internet cable and phone at $236/ month. Senior citizens on fixed income, cannot afford this each month.
- What do you mean by 'facilitate'? If it means that the County decides and then charges me accordingly, I am against it.
- Sadly, the only internet option we have is Blue Ridge. I don't think they really care about their customers or the service they provide.

- I don't think the county should spend money or raise taxes to increase broadband services unless it will save county residents money and make it more affordable in the long run.
- I have had trouble with my land line.
- The county should assist the installation of fiber thru minimal 'enabling' to providers.
- For question 21, I do work remotely at times from home. My kids also do virtual learning several times a month from home.
- Blue Ridge is awful and ridiculously overprotective because it has NO competition. We pay over than $300/mo for basic cable/internet/phone, with no premium channels. We have a 2nd home in NYC with Fios for everything plus 7 premium channels and greater internet speed for only $240/mo. Carbon county needs another cable company.
- The government isn't doing a very good job right now in my opinion so NO I do not want them interfering in the internet. Make things affordable by getting our pipelines back and running the country as a business instead of a political shit show. Do what's right for the American people, not your own pockets. Stop giving to those who aren't working or refuse to work.
- I had Direct TV for internet but the speed was terrible so I had to switch and pay for the highest package available
- Blue ridge has gotten ridiculously priced and internet service ain't good always having to reboot there modem
- too slow, unreliable customer service
- Our existing cable company Blue Ridge is wonderful and I have no complaints, but more options are always welcome. I am especially interested in Gigabit fiber internet.
- Current options always have outages.
- I am not sure about 23,as far as I know my service is connected to the local government now, it is the only one that is not satellite that I can get others are not allowed in the town. Since I am in the black hole of Carbon county, satellite is iffy at my residence. Same for cell phone reception, there are only a few providers that I can use, others no bars.
- I have no issues with Blue Ridge. In the last couple years, I have been without internet for no more than a couple hours. When I needed a technician, I could get an appointment for the same day. I hear it takes a week for RCN and SECTV technicians to show up in Allentown.
- We need more options than just one cable company in this area.
- Without competition we have limited choice with cable/internet or satellite
- Having the PTD/Blue Ridge monopoly is bad for the town. Other areas with broadband competition get better service for lower prices. We need municipal broadband and / or other competitors to keep PTD/Blue Ridge in check.
- Our services shouldn't be outsourced to a company that isn't local. Blue Ridge is a locally owned and operated business that deserves to stay here.
- Without a tax increase, please.
- The internet is down at least once or twice a week for 'maintenance' for hours such as last night it was out from 12:03am till 5:57am. When there are storms it's patchy and in and out. Some days the internet is extremely slow even though we have the highest tier of internet service. Blue ridge is the o ly internet/cable/landlines phone service penteledata/blue ridge cable are a monopoly in my community and nothing else is offered/allowed this needs to change.

- Data Caps are probably the number 1 issue our household faces. We could pay less and have decent speed but we would go over the data caps and end up paying more so we have to pay for a faster speed which comes with unlimited data. I homeschool 3 children, while we are traditional homeschoolers and do not rely on a cyber or umbrella school, we do heavily rely on internet in our household. We cut cable years ago and switched our phone to magic jack because our bill was over $300 a month. We need a home phone in our area of Lansford because we often have dead zones in and around our home.
- more providers needed in the area
- Thank you
- Leave it to private business, not government
- I do not have WIFI in my home and depend solely on my iPhone for internet service which is terrible in my immediate area. During peak hours and high season tourists months in summer I can only access the internet in very AM or late PM hours. More help is definitely needed. Rare times I also have difficulty making/receiving calls on my iPhone.
- I believe that we need competition in our area to help control the prices. Right now Blue Ridge Cable has a monopoly primarily on television and the price continues to go up and up. It's ridiculous! Competition would help.
- the palmerton area offers suitable internet service. the majority of issues i have had in the past were due to interior network or sharing of internet in my home. (router, wifi etc.) Once i updated my routing equipment including what broadcasts my wifi, i have not had any issues. When the covid pandemic started both my wife and i worked from home (internet intensive) as well as 2 kids at home and online for schooling. After day 2 i replaced the mentioned equipment and things have been great, no complaints at all. Many other parents found the same resolve in updating their personal owned equipment.
- Although I don't have any complaints about our current service, it is expensive and there is no other option. It would be nice to at least have another option to compare and to keep competitive rates.
- Just like to add, growing up here my entire life penteledata and co. have had a monopoly here, even after getting Gigabit down speeds they still fail to deliver that speed consistently and has always blamed equipment even after putting in new equipment. I think that it would be great to have competition here. I have an associates in CIS, so I kind of know how this should work , it's 2022. No citizen in Palmerton and surrounding areas should be paying $200 a month for internet. Gigabit speeds should be around $50-$60 a month. That is normal. PTD is ripping everyone in this area off for years and I am finally glad to see the chance for some other companies to come in.
- Presently there is a monopoly in Carbon County for internet services. Without competition we have to pay the price. Competition promotes better pricing. Also, how about discounts for our senior citizens.
- The Weatherly Area needs better service !!!
- I currently pay for the fastest available internet and get speeds less than 1/10th what I pay for and regularly experience outages and interruptions. Blue Ridge has a monopoly here and it is terrible for the experience of the consumer.

- People over 65, retired should have cheaper rates on internet/phone service. I'm on very limited monthly income.
- The cable provider is not the best I have ever experienced. Presently they provide TV, Internet and land line service. The problem is that if you decide to cancel one feature, they charge more for the services that you keep. Cable TV providers seem to have a monopoly geographically. There is no other cable provider available in Carbon County.
- It should be that the municipality's be made to have at least 2 options for TV and internet so there is options in pricing and service. Not one service setting the choice and prices
- In our area we have no good options. Broadband out of white Haven has poor rating .
- Stop the Pencor monopoly. Allow other providers to operate in the area. I've been offered higher internet speeds, but Blue Ridge is the only game in town. And if you're planning on fiber, please make it affordable for us retired folks.
- Fiber internet is the new and better service for internet. This County is limited with the amount of service providers that offer fiber optics if any at all. More residents would be more satisfied if the County granted other service providers such as Verizon Fios.
- such a waste of tax dollars.
- Government should not control the internet. Stay out of it!
- It feels like Blue Ridge has a monopoly because there are simply no options.
- It would be nice to have options for internet here at my house. We have no other choice but to use satellite internet
- Cell service (at least from Verizon) is very poor and at times unusable in many of the populated rural areas of Carbon County.
- My internet kicks off and on and am constantly resetting it.
- This area needs options and direct TV, or the dish is NOT an option to me. Why should I have to put some ugly thing on my roof so I can pay less and still have crappy internet during inclement weather? Options are good. Allow people to have choices and stop the monopoly. I don't care how great they take care of their employees, people in this area cannot afford to pay $200+ for internet and basic cable and that is what my bill was. I had to cut cable, but I cannot go without internet, most of us cannot and Blue Ridge knows this and capitalizes on it.
- I work from home for Blue Ridge Communications. Due to this, when answering questions 4 and 5 in regards to how much I pay for services those price ranges are based upon the discount I receive for working for the company. Those are not the standard price ranges at regular rate.
- I find the amount paid each month to BRC for high speed internet, basic plus cable and digital phone to be very expensive. I look a few times a year to see if Verizon is available on their website but no joy for me!
- We have BlueRidge because there is no other choice. This area needs more internet providers to prevent the situation we have now--the ability of BlueRidge to raise their rates arbitrarily.
- Blue Ridge has customers by the balls. They continually raise prices because they're the only cable company in the area
- I have a problem that I lose connections sometimes 2-3 times a week. Blue Ridge was made aware of it, but lately I just reboot rather than call and wait to speak to someone.

- Carbon county has many homes in a rural setting. Many homes need internet access. It is not feasible to install wired services to many rural homes - cost is too great and homeowners would bear the cost. The solution is wireless access (cellular) to rural homes. I currently use 4G LTE (download 15Mbps/upload 1.4Mb/s). My current AT&T bill is $211/month. Cellular providers should offer 5G services to homes in Carbon county. The would be the most cost effective solution. I currently do not have any wired internet access to my home. I work from home 5 days a week (and weekends). The current cellular internet is barely enough for me to work at home. I can't enable video and need to limit my application sessions when working.
- We must have unimpeded competition not this exclusive sourcing
- Most of the problem is with our cell phone coverage. We use consumer cellular which turned out to be better than AT&T.
- A 'canopy' over towns and full service ion rural areas should be a given in this day and age.
- RE question 23 : Only if there is NO Government interference in the content or day to day operation of any Company providing the service.
- I purchase the best internet plan that they offered to me. When it works it is very good but there are too many times that the internet goes down, sometimes multiple times per day. We have all the latest equipment so that is all up to date. The downtime interferes with our security system and my son's access to homework.
- I prefer cable provided internet access and feel that satellite would be nice if it were cheaper. We really have no choice since PTD has a monopoly in this area.
- -Should be able to have a choice of providers -Internet costs shouldn't increase constantly -Service should be reliable -Shouldn't have to pay for down time of service
- Being limited to one high priced internet is not fair. And the fact that we constantly drop service and have to wait lengthy times for restore
- I am very pleased with Blue Ridge internet service and have no issues with our work from home/ online schooling needs. Plus, they have plans to rebuild their full network to provide Fiber to the Home in the near future which is exciting!
- Internet services should cost less!
- Yes anything other then a monopolize blue ridge provider in my area. It's not fair that we can't choice. It's expensive service and out dated service networks. Consistently have a problem with landline and very slow internet speed with poor connection daily not fair. When you call service they always tell you nothing wrong. Should have the freedom to go anywhere you want and have service through any provider you want to not be forced to. Changes need to be made moving forward. I want to use another company I choose. Help customers not take their money.
- We pay too much for Internet service and we do not have any other options than to go with one company.
- Please help other Internet providers enter the area. Windstream is trying but can't. We need options.
- Please bring Fiber. We need the upgrade.
- We need Fiber Internet and more options/competition.
- I can not afford internet. I only have cellular service on my phone.

- Lehighton has only ONE choice, Blueridge Cable. They are very expensive and bern told very unreliable. Will not use them, can't afford if very expensive and unreliable. Why only one choice? Why am I not protected by the monopoly laws???
- Please bring fiber access to Palmerton and local region. Seems like only businesses can afford fiber connections.
- We should be very lucky to have Blue Ridge Cable and PTD right in our backyard, even-though they are small in comparison to larger providers, they have been able to keep up with advancing technology and offer fast internet speeds and other services.
- Cable is getting increasingly expensive but difficult to get Philadelphia Sports on other methods. Cellular phone sometimes loses contact.
- internet is very slow, cell phone signal is hard to get(low bars). I pay WELL over 200$ a month for crap service.
- I do not want tax increases so no, I do not want the county involved in anything that will increase my tax burden.
- Without internet I would not be able to use the computer. Without a T-Mobile cellspot I would not be able to use the phone at home. When the internet is acting up or down I cannot use the phone because there is no signal. The signal where I live is horrible.
- More affordable services.
- County needs more than Blue Ridge in some areas
- More options!
- I don't use up my data because I stop using it before I get additional charges. system is slow and I don't have money to spend over 150. a month to have the services
- i already have more technology than i can handle!
- The costs for cable internet are increasingly becoming too expensive. At least 1-2 times a month the service does not work and the modem needs to be rebooted.
- Please leave the government out of the internet business
- There should be more competition for better pricing
- By facilitate, the only government involvement is to give incentives to internet providers such as tax credits or less regulation.
- We only have one carrier for internet, cable, and phone, and they are USELESS. Signals cut out constantly, tv goes dead, internet drops all the time for hours at a time, and nothing changes. It's unpredictable and horrible to deal with, not to mention insanely overpriced.
- Living rural makes it hard to keep up with the ever changing world .
- WE NEED BETTER INTERNET!!!! SO SLOW
- These should be options like Verizon or Comcast
- We need more options, also if I cancel my cable subscription, I must pay even more for internet service.
- monthly charge too expensive
- I have very stable Internet working from home. The only problem I did have was an old modem router. I went to HomeFi through BLue Ridge and I have no problems with my service.
- Better cell phone service is desperately needed.

- We need more internet connection to select from.
- Bring better broadband to the rural country areas.
- I don't know anything about gigabit fiber internet, but my desire would be for something more affordable.
- NEED MORE/BETTER OPTIONS AND PRICING!!!
- Have someone available to assist those senior citizens who are not computer-savvy and don't have anyone to turn to for computer assistance so as to provide some help with buying the appropriate new computer and/or setting up a new computer and which computer applications/ types of programs to use (i.e., security features), etc. Thank you for doing this survey. Your efforts are appreciated!
- Internet too expensive. Need more competition. Waiting for Starlink or 5G. I'm a senior citizen on fixed income.
- I'm told we can only have Atlantic broadband for internet , no other options and doesn't work half the time. I recently was updated in my internet because I was told I had slow speed and gave me the best. I have less internet now than before. . I am very unhappy with this internet
- WE NEED MORE THAN JUST ATLANTIC BROADBAND...BREEZELINE BROADBAND SERVICE. CHARGE WAY TO MUCH AND POOR SERVICE
- thanks for asking
- Thank you for the opportunity to provide feedback for our internet services.
- there are too many black areas- no service. I'm disabled, this needs to get better
- blue ridge very expensive
- For the price I pay - we should never have issues with our internet service. $107 a month and the service is choppy on most days. I work full time from home and need to be able to use the internet without interruptions 9 hours a day mon-Fri.
- Thanks
- We are always having issues with our internet here in Weatherly with Breezeline (formerly Atlantic Broadband). When it's working, it's not terrible but we do have issues with certain devices in our home that won't connect. I've been working from home for 12 years and definitely noticed a difference once covid hit and more people were using the internet at home - we had outages non stop for a long time and learned from a few technicians that our particular node is overloaded which also hinders the service. Seems like even if it's just a rainy day, nothing too bad, it goes in and out a few times even. We pay for the highest speed they offer but I know that we will never actually get those speeds because the lines here need to be replaced/aren't new enough to handle the fastest speeds they offer. We would definitely like to see some more options, like fiber, or have lines replaced here - especially now that most schools don't have many snow days anymore and we also have kids online for a full school day at times. Thank you for taking the time to do this study and we hope that something good will come out of it for the residents of Carbon County.
- throughout the week we consistently lose internet service at approximately the same times of the day. sometimes these outages last longer than normal and have a negative impact on other individuals within the household as far as work etc....

- Need more options here in carbon county besides just blue ridge. The cost is continuing to rise with no where else to even consider and they offer no specials to any long term customers.
- Yes! We need more options. Also cell service is difficult to access in some areas.
- The statements to select from seem to point that all work from home is Covid related. These are inflammatory statements and not representative of real world conditions.
- Blueridge is expensive, but it is the only option I have where I live.
- The service needs to be upgraded and more affordable, however, do not forget the cable lines to the homes are also old and outdated, unable to carry high speed from the pole to the residence
- Power outages often in the area
- Switched from blue ridge because it was overpriced and was constantly not working. Switched to a cheaper option but still have issues.
- Although I am satisfied with Blue Ridge it would be nice to have a few options to compare. Competition keeps everyone honest. Right now we really don't have anything other than Blue Ridge or more expensive cellular options and we don't have 5G available in Palmerton.
- Good thing to do.
- blue ridge is the worst!!!!
- Gave up on Blue Ridge internet because of exorbitant prices. Can't afford it.I am a senior citizen, and could sure use it. No TV at home.
- I've often thought that if there was more competition in local internet providers, perhaps the service would be better and the price might come down.
- Blue Ridge cable internet option is our only option. It's a monopoly!! We have no choice to us their internet. For average internet services, we pay $87.95 per month and that's a promotion they gave us. It will be close to $100 in month or two!
- Verizon has been advertising for years their FIOS option. Every time I inquire the rates are high or service not available. Outside of that we have limited options as Blue Ridge Communications raises their rates every year and they are primarily the only game in carbon county. We need more options and competition to better rates.
- Service Electric only internet service available in Tresckow. Tried satellite but not reliable.
- I am retired and technology has passed me by . Have internet with Blue Ridge Cable & We had basic internet $35.95 25mpbs download / 1mpbs upload. Internet was extremely slow upgraded to $60.95 download 150mpbs/ 8 upload. Could see the difference but as time went by internet speed got slower not as slow as original service but slower . Had a tech come out 'everything looks okay ,you need to upgrade for faster internet'. I explained previous upgrade 'must seem slower to you but it's not'. I beg to differ. Maybe senior centers or the county could provide info on streaming, the dish other cable options besides Blue Ridge.I would change internet service if I knew of other options. I had BRTV cable but it got too expensive once I retired . Blue Ridge should offer senior discounts . I had phone land line through Blue Ridge & now have magicjack landline and I learned how to stream (Hulu).It was convenient to have it bundled with one company but way to expensive. when you are the only cable provider in area you can charge what you want which is not fair especially to seniors . Thank You for taking your time to read

- I believe as a consumer that we should have a choice of providers. Having only one option is a monopoly and WAY outdated!

- Alternatives to a single provider should be pursued as well. Better Cell Phone coverage as well to better cover all the valleys would be helpful. Coverage is very spotty across the county. Cell Phone coverage could be an alternative to physical cable. Satellite does not provide equivalent speeds, but would be another alternative if they could increase it.

- We have a very limited number of internet service providers in our area

- Yes, ABSOLUTELY, please do facilitate better, more affordable services. Due to the location where I live (born & raised--no intention of moving) my cell phone, internet, and even landline capabilities stink. Until very recently, landline service would unexpectedly and without warning go down (no dial tone), I needed it for work from home. Landline reliability/functionality has been somewhat better since I rather recently filed a complaint with the PUC. Verizon (landline carrier) seems to expect everyone to convert from landline to cell phone when not everyone has access to reliable cell phone service. Cell-tower-generated internet and voice access is generally a problem in the town of Weatherly and in rural areas (where I live) immediately surrounding the borough of Weatherly. I tell my friends I feel like I live right on the edge of technology--close enough to look across the border and see all the things to which others have easy access, but not close enough to avail myself of the same. Further, I am so terribly tired of explaining to people why I can't reliably receive texts or cell phone calls or even cell phone voice mail messages. Landline is the only generally reliable method of contacting me. They look at me like I live on Mars! My cell works just fine at my office in Pottsville, but it's always OFF when I am home because the signal is EXTREMELY unreliable--sometimes I get only a weak signal, other times none at all. The cell phone battery goes dead, due to the phone constantly searching for a signal. Satellite (DirecTV) is my only option for television. Verizon jet pack is my only option for internet. The local cable cable company would charge me thousands of dollars to run cable to my house. I can't get internet through the landline, due to no fiber optic capability in this area. With respect to my Verizon Jetpack, I pay EXTRA for 'gaming capability' (no one in the household indulges in 'gaming') just so I can get basic access to the internet! Bundling of services is not even in the realm of possibility. Someone PLEASE bring me into the world of easy and affordable access to technology. Thanks.

- Prices have increased, they need to lower the cost. And offer more providers. Thank you!!!

- Frustrated that we only have one option Blue Ridge and the cost is so high...if more choices were available prices would be more competitive and maybe the price would go down or we could get better service

- we need more affordable pricing

- Atlantic Broadband no longer exists, the company is called Breezeway I believe.... we had no notification of this change, plus the internet keeps going out with no explanation. The last time was last Friday for over 9 hours. This will make us have to leave the area if it continues.

- Need beter Cell coverage (reception)

- Local telecom providers (e.g., Atlantic Broadband/Breezeline) seem to be taking advantage of their monopolies by frequently hiking prices while providing mediocre service.

- Lucky if we spend one hour a week on internet

- Only have 1 service provider, think would have better choices and price with more competition

- I think the county should facilitate a better and affordable broadband for the residents.
- ABB is the only cable and internet service in our area. There is no competition, so there is no need to compete for better price or service. The cable and infrastructure are obsolete and are unable to keep up especially on nights and weekends. After this notice was mailed, ABB or Breezeline service techs were out taking measurements. We deserve to have affordable and reliable internet.
- Blue Ridge Cable constantly increases cable/internet rates. BRC increases channel choices I don't even use then justify rate increases with that they give 'more selections'. By the time I get home from work, eat supper, there is barely enough time to view television. In addition there is no competition in Carbon County for cable except for Dish. If you stream (HULU< ROKU, etc.)using BRC you still need internet to stream if you need internet that means you need BRC. Monopoly.
- Need more competition and options here
- The internet service from Breezeline formerly Atlantic Broadband is very unreliable. It is out at least once a week. Today, Friday, 3/11 it has been out for six hours and counting……..
- We have Blue Ridge and I don't have many general complaints about the service. We have the second to highest package and I don't feel it performs to its aforementioned specs. With multiple devices being connected at once ,although not all in stressing bandwidth use, things run pretty slowly with poor resolution. We have the occasional outage but never really for an extended period of time and the maintenance schedule typically doesn't interrupt the use of service.
- BRCTV and Penn Tele Data have a monopoly. I use their service because there are no other competitive solutions in the area. Based on what I pay I feel the speeds are less than adequate. I have family in the Philadelphia region who pay less for higher speeds because there is competition for service. We very limited options here so BRC can set whatever price they want!
- Why gigabit fiber?
- I recently got rid of my cable TV and land line because I was paying $240 per month. I now stream TV and have no landline. The Internet costs $94 per month and the TV streaming costs $65 per month. Still expensive. I would like to have a land line in addition to cell because I don't get good cell service [Verizon] here because of the mountains. I just needed to reduce that enormous bill. Helping to reduce that amount while improving internet speed would be wonderful.
- Satisfied with service but the price is ridiculous and there are no other options to choose from
- The government should stay out of private business.
- While my internet connection is fairly reliable it costs significantly more than much higher speed services in other areas solely due to the Blue Ridge Communications monopoly in this area. No competition means we can set any price we want and you'll pay anyway because you need internet access in this day and age.
- I wish I had another non-satellite, cable option than Breezeline. I feel I have to pay way too much a month, $272. I am about 2 miles from Beaver Meadows and they have Service Electric. Just would like an option.
- Blue ridge/pen teal data have a monopoly on tv and internet service in our area . They charge way to much for just the internet. I now streaming for tv shows and such but you still need the internet. They know it and can charge whatever they want essentially.

- There needs to be an upgrade to the system. When the tourists come to the small area of Lake Harmony on the weekends and the rentals are all filled. Our current system cannot handle that many people accessing it at once. The system struggles and you can't pick up the Internet. Also, there are no options. It is a complete monopoly on the business. It is the one company or nothing. They can make their charges, give their services, and you are stuck. There are no options.

- Blue ridge has a monopoly as the ISP for my area, therefore they price gouge and provide unreliable service and you have no choice because you cant shop around. When I lived in Allentown I was able to pay half of what I pay for here, have the modem relocated anywhere I wanted to in the house and never had outages with RCA.

- service needs to be more affordable and more dependable

- The answer to question #23 should not be a yes or no. I would need to know more about what the county government proposes before I could intelligently answer that question. And 'county' in that question should not be capitalized (just a grammar police observation).

- give us a better or more choices for an ISP we only have 1 we can choose

- The system in Weatherly is ancient and needs to be totally replaced - phone lines, cable and internet services. The amount charged for such poor service is a sin. There needs to be competition between multiple providers at very reasonable prices for reliable services. PLEASE HELP RESOLVE THE ONGOING ISSUES WITH THE OLD WORN-OUT SYSTEMS THAT ARE IN WEATHERLY!

- We not only need better service, we need more options. Blue Ridge is our only provider and they take advantage of that. It's too expensive and I have nowhere else to go.

- I feel there should be some type of competition with blue ridge for better pricing and services. It is very unfair that I need to be obligated to one provider. We should be able to compare prices with other competitors. There should not be a monopoly with any internet service. I check ALL the time for another internet service and they don't provide services to our area. Such an injustice! It is difficult enough getting by after Covid-19. So many families can not even afford to eat and pay their bills! Such a travesty!

- intermittent internet service problem

- Residents should be able to choose from other companies, there is no choice here.

- I'm not paying much now since I'm a new customer (we moved into the new home in May 2021) but once my discount rate time expires I will be paying over $100 for my current service. My child does school completely online and I need the faster service

- The County SHOULD NOT be in the internet infrastructure business. However, They could focus on issues such as franchise agreements,ROW,Zoning and siting required to expand infrastructure. Carbon County and the municipalities create too many obstacles for infrastructure improvements of any type.

- My answers reflect my own experience and the County government should be able to do what it can for the betterment of the communities.

- It is absolutely ridiculous that there is only 1 ISP where we live. That's how they get away with charging so much money for terrible internet speeds. For other ISP's in other areas you can get gigabit for around $90, where now I'm paying over $100 for around 250-300 mbps.

- we need cell coverage in our area! when you view the various cell companies coverage maps they show coverage, but in reality we have zero coverage. we also need internet provider options, blue ridge cable has a monopoly in our area and it's not good, it's not reliable and they can charge whatever they like.
- I live in a rural area. There is no cable access at my home. Short of getting a landline phone for internet service, using a hotspot/cell service is my only internet option. I count myself lucky to not be forced into blue ridge cable, though. I would rather have more reliable high speed access
- More options so that cost would be lower. I have seen 5G just beginning to be offered by T Mobile but I haven't looked into it yet. I would like better cell phone coverage.
- Most of the county is under a monopoly, Blue Ridge Cable is my only option as it is in many places and therefore, without any competition, BRC can and does charge as much as it wants.
- ISP's are limited in Carbon County, it would be nice if other affordable options existed.
- Peterborough NH has wifi in the streets of the borough. This would be nice in JimThorpe.
- County should make it very affordable for residents as localities and townships lock in long term contracts with cable/internet providers and remove and chance for competitive prices from competition.
- I have to go elsewhere when I work from home to use the internet.
- Provide and allow more than one internet provider
- The county government has chosen to pay a very large amount of taxpayer dollars to facilitate a study for services that are already available. Pencor Services and its companies, including PenTeleData and Blue Ridge Communications, have already privately funded broadband and Gigabit Internet services for our area and government grants or dollars given to other national level companies to do the same will be harmful to our county. Not only will it hurt the employees of Pencor Services by potentially reducing employment and outstanding benefits, but the local communities will lose the many benefits of having these employees living and working in the area. This study and the potential to needlessly hand out government funds for services that are already available or pending are a shameful act by our government leaders.
- Keep the government out of my life. Why is the government spending my money to determine what we all really know. Pencor Services Inc. and its subsidiaries have treated this area with the greatest concern for its customers. Internet is one of those products and they have exceeded most other cable companies and Internet companies have done. I hope that if you're spending this kind of money that you find what we already know that being that this area is well served.
- I think affordable high speed internet access is essential today and although my family can afford it I'm perfectly happy to have a tax to provide it to all that cannot afford it. Trying to have school from home I think has shown the huge disparity in access that should be addressed to bring everyone up to a fair base level of access which I think would help everyone.
- Need to end the Blue Ridge Cable/Palmerton phone monopoly in town. Allowing options would increase value and speed. Competition is good and keeps companies more honest.
- PenTeleData has a monopoly on the Internet, they sell through Blue Ridge communications to residential and to Service Electric in Allentown and directly to Commercial customers. Living in Palmerton we have no choice no competition so they are free to charge what they want and the service does not get any better. RCN, Verizon etc I've asked and tried and they wont do service here. There is no incentive or need for PTD to get better if there is no competition.

- Blue ridge is too expensive and our only option
- Let's face it, for all intents and purposes, PTD has a monopoly in my area. We are moving to Lehigh County next Spring (2023), but we are interested in the future of this area.
- need other provider options
- Better cellphone reception is a top priority for me.
- While I am satisfied with my phone and tv/internet service's they are expensive.
- Gigabit Fiber access would be amazing provided that the connections are unfiltered, unmonitored, and there is an option for a static IP. I'm more than happy to pay for the access, but privacy is important as is my ability to host my own services. And to be clear, I'm more than happy to abide by a ToS dictating acceptable conduct for hosted content.
- We do not get cell service in Sunrise Ridge Development. Service stops by the mailboxes by Broad Mountain Dr. and Bayberry Road
- Yes but not out of date copper cable From the 80s Upgrade to fiber!
- I will say that BRC is a good, local company who provides a lot to our local economy. However, I can't say I'm happy with my service. I pay over $225/month for cable (no special stations like hbo, special sport channels, etc) and apparently unserved internet speed. Per my speed test, I'm getting about 19% of what I pay for. That should be a crime. Everyone who visits from other service areas comments on our horrible internet speed. It's kind of embarrassing considering we live in the town where BRC is headquartered. I used to hear that the old zinc plant would be marketed as a business park and potential "Wall Street west" due to the infrastructure BRC provides. Clearly, that hasn't materialized or attracted that type of development. I could work from home, but rarely do due to low confidence on the internet connection and speed on my end. I bet advertising very affordable fiber to home in carbon county for remote work could attract some real talent and the type of people we want living in the county. Sure, it's nice to know that BRC has the infrastructure to provide faster speeds but how many people can afford to pay for that!? Thanks for doing this study, I hope it somehow providers faster and more affordable internet to our region.
- The town of Jim Thorpe relies on a tourist economy, investing in better internet and cell coverage would help future-proof rising data requirements. Current networking capabilities are insufficient, during peak seasonal occupations, packet-loss and slowdown events are common. In addition, cell service along broadway/west broadway has remained near unusable for decades due to lack of coverage and must be supplemented at the owners expense with expensive cell boosters. Broadway has been the economical powerhouse and main draw of the town for decades, yet the entire street is a dead zone. A single tower placed at 40°51'47.7'N 75°44'04.2'W would likely suffice, but as a layman I am unable to say for certain.
- I recently quit my landline and cable because it saves me $200 a month through Blue Ridge, our only option.
- We need more internet options. Blue Ridge is our only option. Our internet crashes often which makes school and work from home difficult.
- Lack of ISP competition and over reliability of service (lots of outages) are real problems. Very expensive too.
- Need additional ISP providers for competition and better network capabilities.
- Something has to change, we need to have a choice for cable and internet

- If Blue Ridge can't give better pricing/service then we as residents of Carbon County should have other options!
- We need competition not just Blue Ridge
- It is almost impossible to communicate with Breezeline when you have a problem that requires the assistance of a live person. It took over a half hour going in circles to get the help I needed.
- Why is this COVID-19 driven. Just provide better access for the residents.
- Broadband without too much government oversight is acceptable.
- We don't need any more government intrusion in our homes
- I believe prices are very high especially for cable tv
- Blue Ridge Cable should not be allowed to have the monopoly and control it currently has. There needs to be more competitive services available so that rates do not continue to skyrocket. I am on a fixed income and have been forced to cancel my cable service due to affordability.
- Bring in other cable and internet companies for residents to compare prices and plans
- With regard to question #19- my 200 Mbps plan has a limit for data but it is 1.5 TB which is beyond our needs----I see no need for any more for home use---in our house we all switch our cell phones over to our home wifi when we are at home because cellular plan data limits are so restrictive---everybody I know does this ...would guess this is true for most if not all-- for question #22 BRCTV offers Gig broadband service and is available to us now... dedicated fiber is already available all over Carbon county---hospitals, banks and any businesses needing it have it or can get it now
- I think Blue Ridge Cable the largest employer in Carbon County offers an excellent service for a great price. There will be people that cable can't reach because years ago Government got involved and said cable companies couldn't charge a small fee for rural expansion. So in hind sight Governments have no business in private bushiness because the results are always worse or raise taxes. your questionnaire is designed to skew the results in favor of your agenda. If there are residents who don't have cable it's because it can't be done for a profit. How about sending out a survey with what you spend our tax payer money on and ask us if the government is doing a good job. This sounds like something Joe Biden would do.
- offer Frontier as a service provider
- I thought monopolies were illegal
- Offer Verizon FIOVS
- The private sector - be it Blue Ridge or Windstream, or any other private company - can and will provide internet service to those Carbon residents who demand it. It is not and will never be in the purview of the 'county' to concern itself with, let alone provide internet service.
- question 22).   No idea what it is, never heard of it.   Question 23). I don't care
- Blue Ridge Cable is the most reliable service around. I've tried other providers with horrible customer service and even worst Internet quality.
- Competition is needed. However, do not raise our taxes to do it.
- there needs to be competitive choices!
- blueridge cable is a monopoly in our area
- THANKS FOR YOUR HELP

- get competition for blue ridge. they are the only game in town & well overpriced.
- Considering switching to Kinetic Favorable reports on them Blue Ridge I get your internet is unstable   Its in spirts sometime very often during the day other times not as bad.. Not every day but several times a week

Active network: Typically a fiber network that has electronics (fiber switches and CPE) installed at each end of a fiber cable to provide "lit" service to a customer.

Asymmetric connection: The upload and download bandwidth (speed) are not equal.   Cable Internet and satellite Internet services are highly asymmetric, with upload speeds typically 1/10 of download speeds.   Asymmetric services are problematic for home-based businesses and workers, as it is very difficult to use common business services like two way videoconferencing or to transfer large files to other locations.

Backhaul: Typically refers to a high capacity Internet path out of a service area or locality that provides connectivity to the worldwide Internet.

Colo facility: Colo is short for Colocation.   Usually refers to a prefab concrete shelter or data center where network infrastructure converges. A colo or data center can also refer to a location where several service provider networks meet to exchange data and Internet traffic.

CPE: Customer Premises Equipment, or the box usually found in a home or business that provides the Internet connection.   DSL modems and cable modems are examples of CPE, and in a fiber network, there is a similarly-sized fiber modem device.

Dark fiber: Dark fiber is fiber cable that does not have any electronics at the ends of the fiber cable, so no laser light is being transmitted down the cable.

Fiber switch: Network electronic equipment usually found in a cabinet or shelter

Fiber Optic Splice Closure: See **FOSC**.

FOSC: Fiber Optic Splice Closure. Typically a water and air tight cylindrical container where fiber cable is split open to allow splicing (connecting together) of fiber strands for a drop to a premises.

FTTH/FTTP/FTTx: Fiber to the Home (FTTH), Fiber to the Premises (FTTP), and Fiber to the X (FTTx) all refer to Internet and other broadband services delivered over fiber cable to the home or business rather than the copper cables traditionally used by the telephone and cable companies.

Handhole: Handholes are open bottom boxes with removable lids that are installed in the ground with the lids at ground level. The handholes provide access to fiber cable and splice closures that are placed in the handhole. Handholes are also called **pull boxes**.

IP video: Video in various forms, including traditional packages of TV programming, delivered over the Internet rather than by cable TV or satellite systems.

Latency: The time required for information to travel across the network from one point to another. Satellite Internet suffers from very high latency because the signals must travel a round trip to the satellite in stationary orbit (22,500 miles each way).   High latency makes it very difficult to use services like videoconferencing.

Lit network: A "lit"network (or lit fiber) is the same as an active network. "Lit" refers to the fact that the fiber equipment at each end use small lasers transmitting very high frequency light to send the two way data traffic over the fiber.

MST: Multiport Service Terminals are widely used in fiber to the home deployments to connect individual home drop cables to larger distribution cables on poles or in handholes.   Pre-connectorized drop cables snap into the MST ports and do not require any splicing.

Passive network: Refers to infrastructure that does not have any powered equipment associated with it. Examples include wireless towers, conduit (plastic duct), handholes, and dark fiber.

Pull boxes: Pull boxes (also called handholes) are used to provide access to fiber cable and splice closures. They are called pull boxes because they are also used during the fiber cable construction process to pull the fiber cable through conduit between two pull boxes.

Splice closures: Splice closures come in a variety of sizes and shapes and are used to provide access to fiber cable that has been cut open to give installers access to individual fiber strands. Splice closures are designed to be waterproof (to keep moisture out of the fiber cable) and can be mounted on aerial fiber cable or placed underground in handholes. Also called **FOSC**s.

Splicing: The process of providing a transparent joint (connection) between two individual fiber strands so that laser light passes through. A common use of splicing is to connect a small "drop" cable of one or two fiber strands to a much larger (e.g. 144 fiber strand) cable to provide fiber services to a single home or business.

SCADA: Supervisory Control and Data Acquisition. Used by the electric utility industry and some other utilities (e.g. water/sewer) to manage their systems.

Symmetric connection: The upload and download bandwidth (speed) is equal. This is important for businesses and for work from home/job from home opportunities.

Virtual Private Network: A VPN creates a private, controlled access link between a user's computer and a corporate or education network in a different location. VPNs are often encrypted to protect company and personal data.   VPNs usually require a symmetric connection (equal upload and download speeds) to work properly.