SENECA
COUNTY

BROADBAND STRATEGIC REPORT

for Seneca County, Ohio

AUGUST 30, 2022

DLZ | THOMAS P. MILLER & ASSOCIATES | IceMiller Whiteboard

> *"We have to close the digital divide and we have to close it quickly."*
>
> —Congressman Bob Latta
> Broadband Strategic Plan
> Kick-off Meeting

Executive Summary

In February 2022, Seneca County engaged Ice Miller Whiteboard, Thomas P. Miller & Associates, and DLZ Company to develop a Broadband Strategic Plan to guide Seneca County's efforts to expedite broadband deployment throughout Seneca County.

The Scope of Work for the Broadband Strategic Plan included the Project Team:

1. Conducting a kick-off meeting;
2. Releasing a survey and conducting stakeholder meetings regarding potential broadband gaps in Seneca County;
3. Inventorying current broadband providers in Seneca County and existing fiber optic paths;
4. Conducting an asset inventory;
5. Engaging broadband providers;
6. Identifying obstacles to broadband deployment in Seneca County; and
7. Identifying funding resources available for broadband deployment.

Over the years, broadband access has shifted from a luxury to a necessity, given its role in communication, business, education, government services, health care, socialization, and public service delivery. Every household and business needs options for robust, high-speed internet to operate and sustain. Increased digitization of daily responsibilities demand speeds beyond what is currently achieved in parts of Seneca County.

> "Broadband" is currently defined by the Federal Communications Commission ("FCC") as speeds of 25 megabits per second for downloads (what a user pulls "down" from the internet) and 3 Mbps for uploads (what a user pushes "up" to the internet).

However, efforts are underway at the FCC to increase this definition. Though subjective user experiences vary widely, demand for additional speeds continues to increase exponentially. As further discussed in the Gap Analysis, 79% of respondents to the Seneca County Broadband Strategic Plan survey have access to home broadband service, but their connection is unreliable and/or inconsistent, therefore failing to meet their needs.

We have already reached the tipping point in broadband where, if an area has not already seen service expansion, it is unlikely to do so in the near future due to lack of perceived economic return on investment for private providers. There are two primary tactics to encourage broadband build-out in such areas:

1. Financially incentivize the build-out; or
2. Reduce build-out costs, such as through access to and use of existing infrastructure.

Throughout the development of this Strategic Plan, several Internet Service Providers ("ISPs") expressed interest in expanding current broadband service within or bringing new broadband to Seneca County, and none expressed challenges in working with Seneca County leadership. The obstacles that were identified:

- Lack of physical infrastructure and funding;
- Limited or no coordination among broadband providers, utility companies, and rail providers;
- Broadband adoption rates in Seneca County versus the cost to bring service to each location;
- The complexity and stringent requirements of federal broadband funding programs; and
- Labor shortages for both wired and wireless broadband expansion.

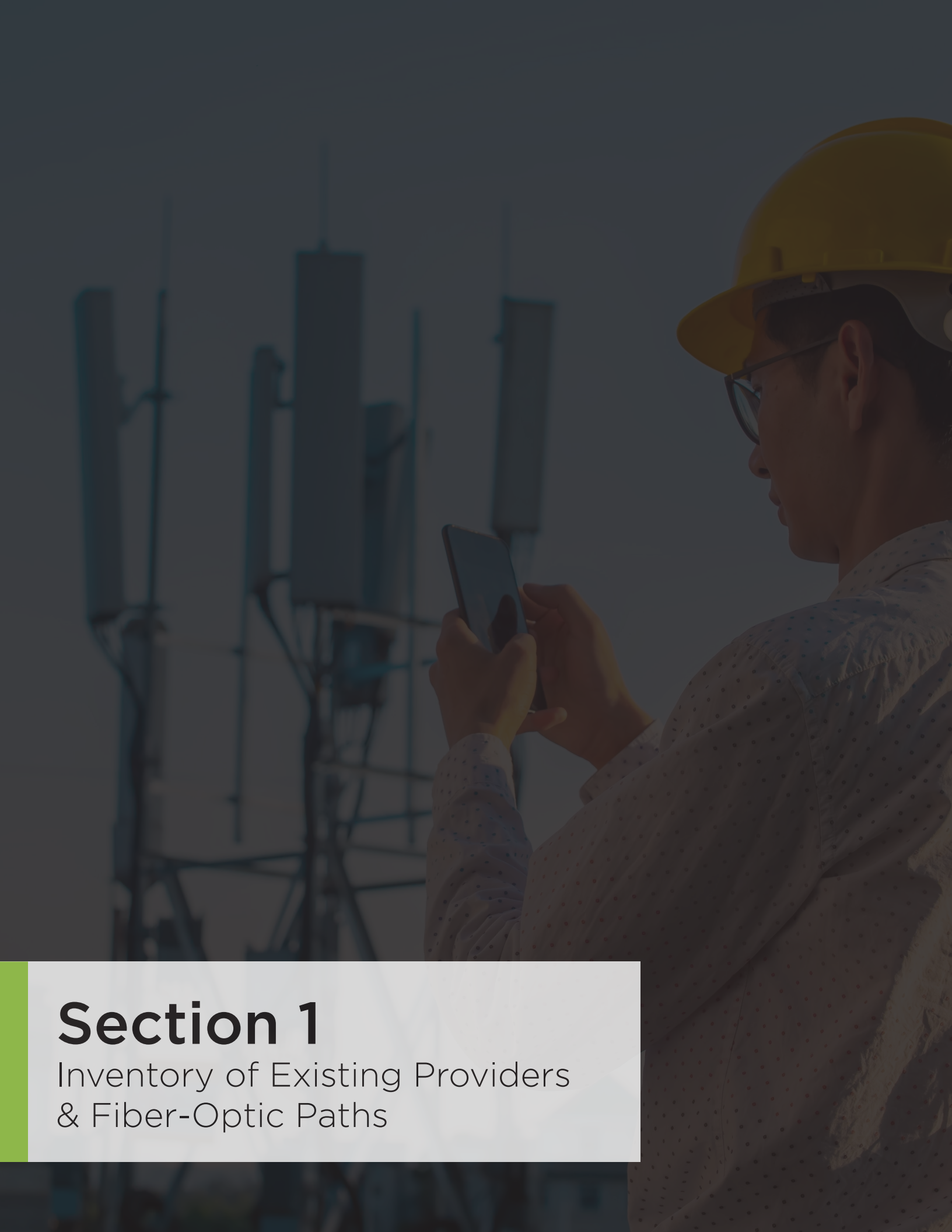
Additional feedback received indicates that, while affordability is a concern in Seneca County, broadband availability is the top barrier for citizens who currently do not have broadband internet. Access and affordability challenges are in part exacerbated by a limited number of providers in rural areas and a lack of competition driving down prices. **Stated simply, Seneca County needs additional broadband options.**

To encourage additional options, we recommend:

- Utilizing and maintaining the Asset Inventory provided with this Broadband Strategic Plan to reduce build-out costs;
- Issuing a County-led procurement process to encourage build-out in target areas:
- Addressing local broadband affordability challenges by supplementing outreach on subsidy programs; and
- Coordinating between providers and training programs to address the local skills gap.
- Encourage utilization of the Terra State Community College Fiber Optic construction program.

Broadband is not Field of Dreams: it isn't a circumstance of "if you build it, they will come." However, it is a circumstance where, if you don't, build it they will likely leave in current and future generations. Implementing the recommendations in this Broadband Strategic Plan will set a new vision for Seneca County. A vision where connectivity and services are readily available to all who need them, creating new opportunities for community advancement, economic development, health care, education, and ensuring long-term vitality and growth for Seneca County.

Table of Contents



Section 1

Inventory of Existing Providers & Fiber-Optic Paths

1 Inventory of Existing Providers & Fiber-Optic Paths

a. Inventory of Existing Providers and Fiber-Optic Paths

It is important to note at the outset of this analysis that "broadband" is not a single technology, but a term that describes a range of technologies that provide reliable high-speed internet access, including fixed service, such as fiber, cable, DSL, and fixed wireless; cellular/ mobile wireless connectivity; and satellite.[1]

While early broadband network deployments utilized digital subscriber lines ("DSL") or cable, ensuring sufficient fiber and wireless availability has become a priority for residents, businesses, and community organizations across the country.

FIBER

Fiber optic lines pulsate light through insulated glass tubes, transmitting massive amounts of data at superfast speeds. Fiber is often described as "future-proof" infrastructure. In practical terms, this means that once the fiber optic lines are buried or strung aerially, they do not need to be replaced to enhance download/ upload speeds. Instead, only the electronics that transmit or receive the data need changed to respond to increased demands. As a result, although fiber is one of the more expensive solutions up front, it may be a proportionally lower-cost solution over time. Fiber networks are also generally easier to operate and maintain and often require less troubleshooting than other connections. However, to have fiber-optic service, one needs to live in proximity to where the network already exists, which is mostly limited to dense urban areas with high incomes.

---

1 Although low-orbit satellite deployments, such as SpaceX Starlink, are receiving significant attention, to-date these networks are supplemental to local fiber and wireless needs, not a replacement. According to the satellite companies that we spoke with in the development of this plan, satellite service not here to compete with fiber, but can be a temporary solution until terrestrial service becomes available to areas with low population densities or topography challenges, or if a location cannot get more than DSL/ cable service.

Traditional satellite service differs from low-orbit satellite in several ways, including that it has multiple service tiers. Traditional satellite providers serve mostly residents and small/ medium businesses as opposed to enterprise organizations. Service is available to schools/ community centers as an enterprise group, but these require custom builds.

A benefit to satellite service is that it is quick to market and can be installed in only 3-4 days. Further, satellite can serve an entire area without the need for any infrastructure within that area. However, the service requires line of sight from the ground position to the satellite orbit location. Modern satellite technologies can adjust for some interferences, but extreme weather, mountains, buildings, tree cover, etc. can interfere with the line of sight.

MOBILE WIRELESS

The "fifth generation" mobile wireless, or 5G, will be the next mobile wireless telecommunications standard. While much of the population has heard the promise of 5G through television commercials and headlines, what has not been clear to the public is ***that there are different types of 5G deployments:***

Low-band 5G
uses a similar frequency range to 4G (between 600-850 megahertz (MHz)) and provides a "nationwide 5G" experience.

Mid-band 5G
the most widely deployed band, it often operates between 2.5-3.7 gigahertz (GHz) at download speeds of around 100-900 Mbps. Transmissions in the mid-band spectrum can travel several miles, depending on how equipment is configured.

High-band/mmWave 5G
is an ultra-high frequency that can achieve download speeds in gigabits per second ("Gbps") and will provide unprecedented bandwidth and speed. Unlike the other "types" of 5G, mmWave has limited distances (currently only 200 to 350 yards/ a few thousand feet in optimal conditions) and limited ability to pass through certain material, affecting its deployment in partitioned environments.

Many mobile providers attempt to make "5G" synonymous with mmWave deployments; however, the economics of mmWave require dense traffic environments and specific use cases. To that end, mobile providers will focus mmWave deployments on major metropolitan areas, downtown areas, entertainment districts, hospitals, manufacturing facilities, convention centers, school campuses, sporting venues, shopping areas and targeted business locations.

FIXED WIRELESS

It has been said that "[b]etween [wired] broadband and mobile broadband sits fixed-wireless broadband technology." Fixed wireless systems broadcast high-speed internet using radio frequencies/ spectrum from a vertical asset, such as a tower, that is connected to a wired backhaul network, to receivers, such as rooftop dishes or a fixed antenna connected to a router, installed on the user's property.[i] Generally, fixed wireless communicates between two fixed endpoints, otherwise referred to as point-to-point ("P2P") telecommunications. A signal transmitted from one tower communicating with multiple antennas—i.e., point-to-multi-point telecommunication ("P2MP")—is also available, but is generally more limited in range due to the widely fanned beam. Traditional fixed wireless solutions require "line-of-sight" between the broadcast radio and the receiver (i.e., the radio can "see" the receiver without interference) and topography and interferences such as rain or haze can challenge this line-of-sight.

Federal broadband data on the above technologies has been notoriously flawed, leading to inaccurate, overstated coverage. Although a variety of organizations have released broadband maps and analyses, the source of these maps is predominantly the providers' FCC Form 477 data.

Broadband providers are required to file their fixed broadband coverage data with the FCC twice each year using the FCC's Form 477.[ii] In their Form 477 submissions, so long as the reporting provider *"does or could . . . without an extraordinary commitment of resources"*[iii] serve at least one location within a census block, the provider can depict the entire census block as served by broadband at the reported speed.[iv]

Census blocks are the smallest unit of geography defined by the United States Census Bureau (the "Census Bureau"). In urban areas, a census block may be smaller than a tenth of a square mile; however, in rural areas, such as Seneca County, a census block can encompass many square miles. With simply one location being the determining factor as to whether an entire area is "served," overstated coverage—particularly in the larger census blocks—is inevitable.[v] Not only does this inflate coverage, but it creates uncertainty as to local broadband competition, perpetuates broadband access and affordability issues, and exacerbates digital divides.

"Accurate connectivity data is the foundation for investments in our nation's broadband infrastructure as Congress and federal agencies use data collected by the Federal Communications Commission to determine gaps in connectivity and the level of funding needed to address these disparities. Unfortunately, connectivity data provided to the FCC is often inaccurate and inflated — leaving many communities overlooked and disconnected."

-National Association of Counties

While efforts are underway at the FCC to improve national broadband data, recognizing the current limitations of FCC data, we analyzed and compared multiple datasets for as accurate of an estimation of broadband coverage in Seneca County as possible:

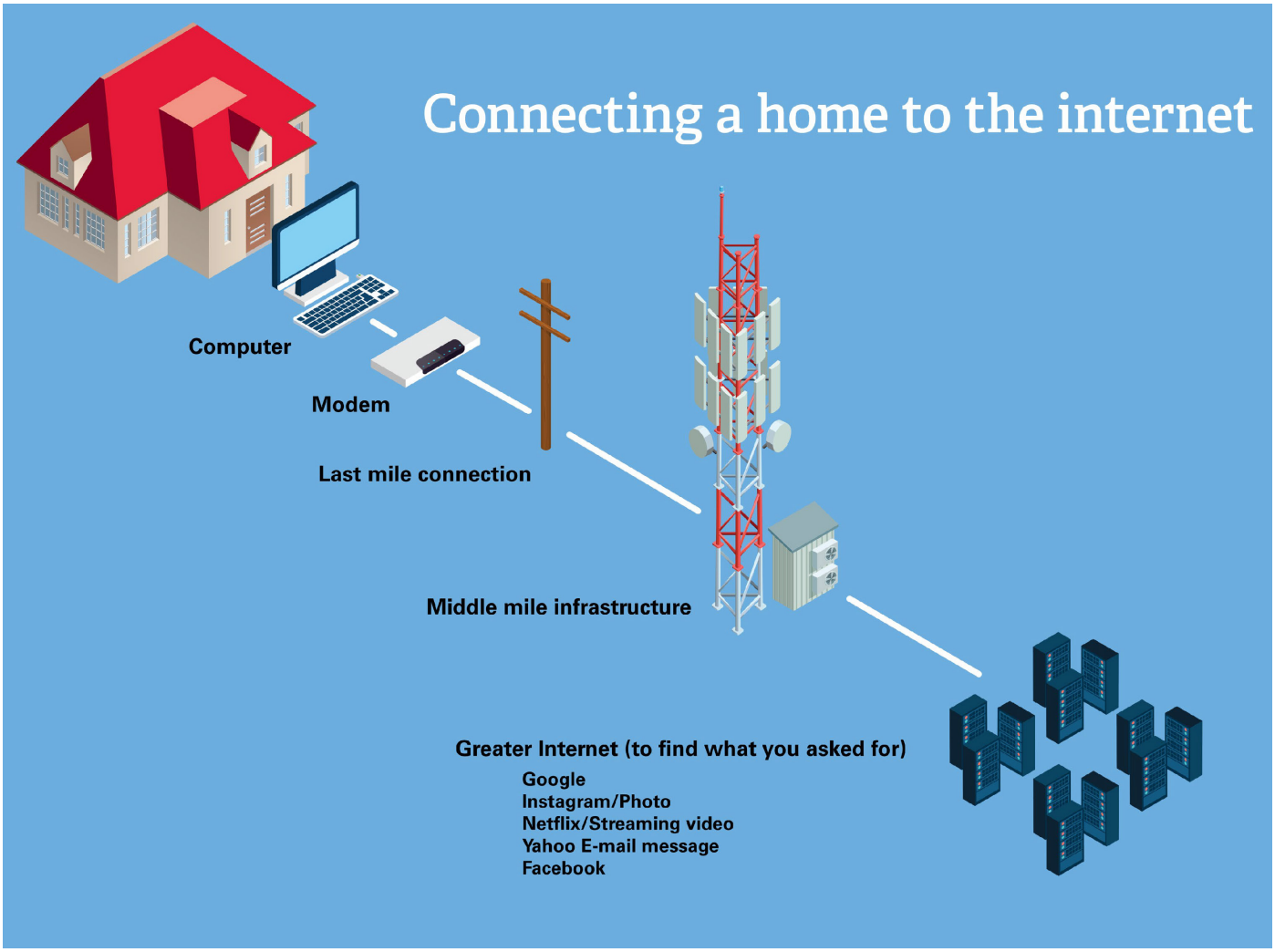
- **STATE OF OHIO BROADBAND AVAILABILITY MAPS:** BroadbandOhio launched a new mapping resource in early 2022 that more accurately shows how many of the state's households are connected to high-speed internet, providing a clearer, more detailed picture of Ohio's broadband availability gaps. The maps use on-the-ground Ookla Speedtest Intelligence® records from a 15-month-period to measure four different internet speeds: under 10 Mbps; under 25Mbps; under 50 Mbps; and 50-100 plus Mbps.

- **INDICATORS OF BROADBAND NEED MAP CREATED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION ("NTIA"):**[VI] This map incorporates multiple data sources to depict U.S. broadband availability including the American Community Survey ("ACS") collected by the U.S. Census Bureau (the "Census"), speed test organizations Ookla and Measurement Lab ("M-Lab"), and Microsoft.

- **PURDUE CENTER FOR REGIONAL DEVELOPMENT ("PCRD") DIGITAL DIVIDE INDEX ("DDI"):**[VII] The DDI consolidates data from the 5-year American Community survey and the FCC Form 477. The DDI measures the physical broadband access, adoption, and socioeconomic characteristics that may limit use, skills, and motivation for internet use. The DDI is composed of two scores: the infrastructure/adoption ("INFA") score and the socioeconomic score ("SE").

The INFA score consists of variables related to broadband adoption and infrastructure. These variables include the percentage of the population in 2019 without access to 100 Mbps download/ 20 Mbps upload fixed broadband, median advertised upload and download speeds, percentage of homes without internet access or non-subscription, and percentage of homes with no computing device. When computing the INFA, more weight is given to broadband access, percent of homes without internet access or not subscribing ("NIA"), and percent of homes with no computing devices ("NCD") than upload and download speeds.

The SE score groups five variables that are known to impact the adoption of technology. These variables include the percentage of the population who is 65 or older, percentage of the population 25 and over with less than a high school degree, individual poverty rate, percentage of noninstitutionalized population with a disability, and a new digital inequality indicator called the internet income ratio ("IIR") measure. The IIR is calculated by dividing the number of homes that make less than $35,000 per year without internet access by the number of homes making $75,000 or more per year without internet access. To put it simply, the greater the IIR, the greater the inequality on internet access based on household income.



Existing fiber coverage in Seneca County is **predominantly through private fiber providers.**

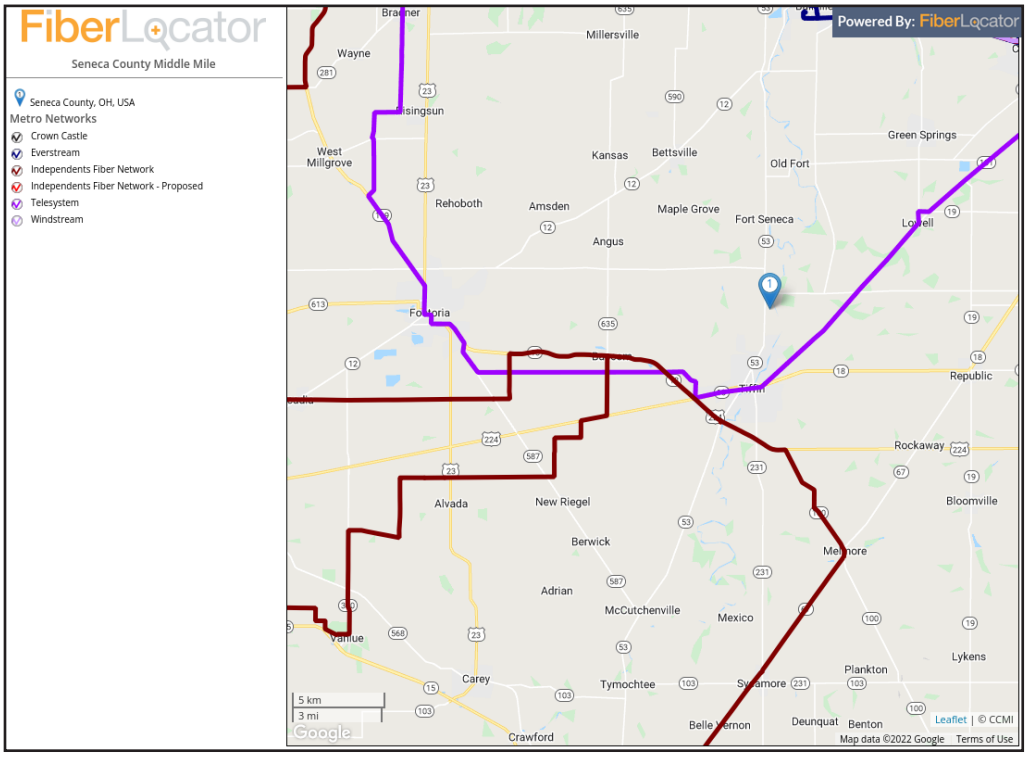
When examining fiber access, the Project Team examines long-haul, middle-mile, and last-mile service, as depicted in the following maps:

Long-haul refers to the network connection over long distances, such as nationwide, between various towns, cities, and other political subdivisions.

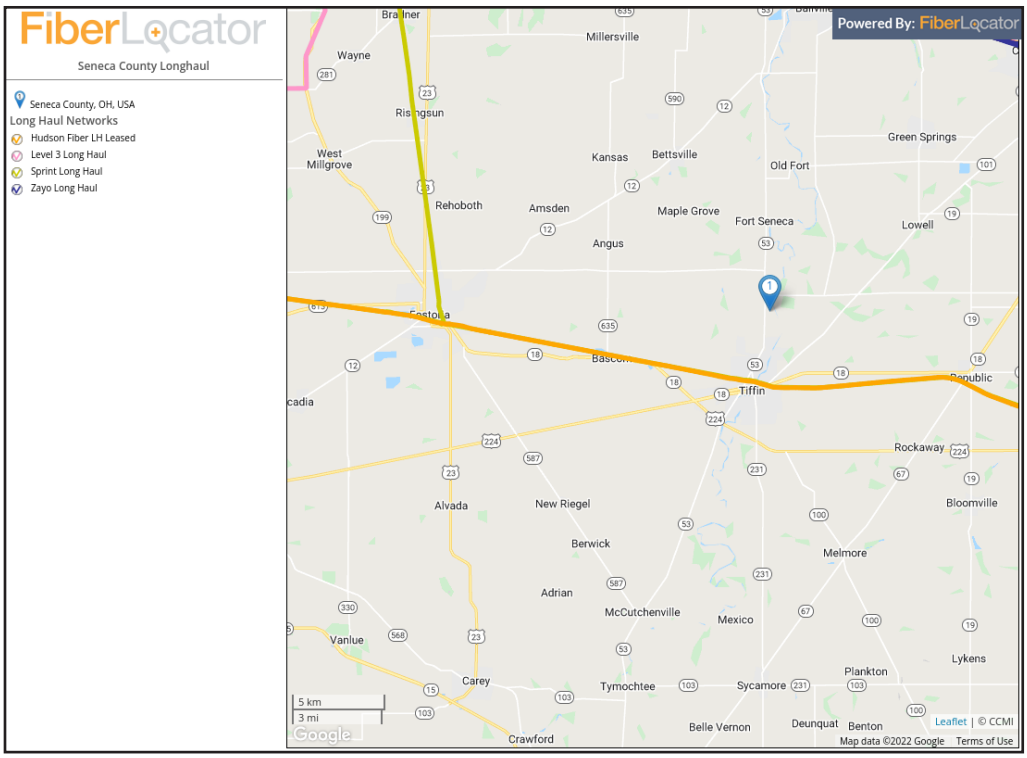
Middle-mile refers to the network connection between the last-mile and internet. For example, in a rural area, the middle mile would connect the town's network to a larger metropolitan area where it interconnects with major broadband carriers' long-haul networks.

Last-mile is the final leg of an internet connection between a service provider and the customer. For example, the last-mile is the connectivity (from a service provider) that passes a home or business that allows them to use the internet once connected through what is called a "lateral" connection.

Broadband connectivity is the roads of tomorrow (and arguably today). Thinking of the above connections from this standpoint, a lateral connection is analogous to a driveway, which connects to a last-mile network that is analogous to your road, which connects to a middle-mile connection that is analogous to a state route; which connects to a long-haul connection that is analogous to an interstate system.



« MAP: FIBERLOCATOR MIDDLE MILE



« MAP: FIBERLOCATOR LONGHAUL

**Note: not all providers include their fiber coverage in the Fiber Locator tool*

Additional broadband coverage in Seneca County is provided in the Gap Analysis.

In this section we analyze the areas of Seneca County that are well-served, underserved, and unserved by broadband, as well as area broadband subscription/ adoption trends. This analysis will enable the County to focus its resources and target its incentives to areas of the County in which broadband deployment is most needed and reaches the greatest populations. This section is followed by an Asset Analysis of existing infrastructure to support closing such broadband gaps.

Purdue's Center for Regional Development's Digital Divide Index

Tract #	Demographics					Broadband			Score		
	Age 65+	Less than HS Degree	Poverty Rate	Disability	Internet Income Ratio	Median Download (Mbps)	Median Upload (Mbps)	Pop. No Access 100/20	Digital Divide Score	Socioeconomic Score	Infrastructure Score *
39147962500	17.7%	8.2%	5.5%	9.7%	3.5	16	3	47.0%	18.3	14.1	26.3
39147962600	16.6%	6.1%	9.7%	15.5%	4.4	16	3	52.6%	20.1	17	26.6
39147962700	16.8%	4.8%	4.7%	10.1%	6.7	16	3	21.2%	16.8	13.5	23.8
39147962800	18.2%	10.6%	31.6%	23.1%	5.7	15	3	0.1%	23.7	27.2	21.6
39147962900	10.6%	12.6%	18.0%	16.9%	5.1	15	3	0.0%	18.1	19.3	19.4
39147963000	21.0%	16.0%	27.7%	16.3%	36.6	15	3	0.0%	26.4	31.6	22.1
39147963100	16.0%	6.1%	3.3%	8.4%	13.6	15	3	16.5%	15.5	13.9	20.5
39147963200	17.9%	10.5%	14.2%	15.2%	5.8	16	3	0.4%	19.7	19.6	22.4
39147963300	15.2%	5.7%	13.1%	12.6%	40.1	16	3	0.6%	19.5	22.8	18
39147963400	24.4%	10.2%	14.8%	23.3%	11.7	15	3	3.7%	25.8	26.6	27.1
39147963500	12%	7.10%	14.8%	15.60%	29.8	16	3.0	0%	20.40	21.90	21
39147963600	14.7%	6.0%	14.0%	12.6%	16.7	16	3	0.2%	16.3	18.4	16.8
39147963700	24.8%	6.3%	5.0%	11.7%	7.5	16	3	1.3%	16.5	17.5	18.2
39147963800	16.7%	6.7%	8.2%	13.0%	24.3	16	3	31.5%	20.4	19.6	24

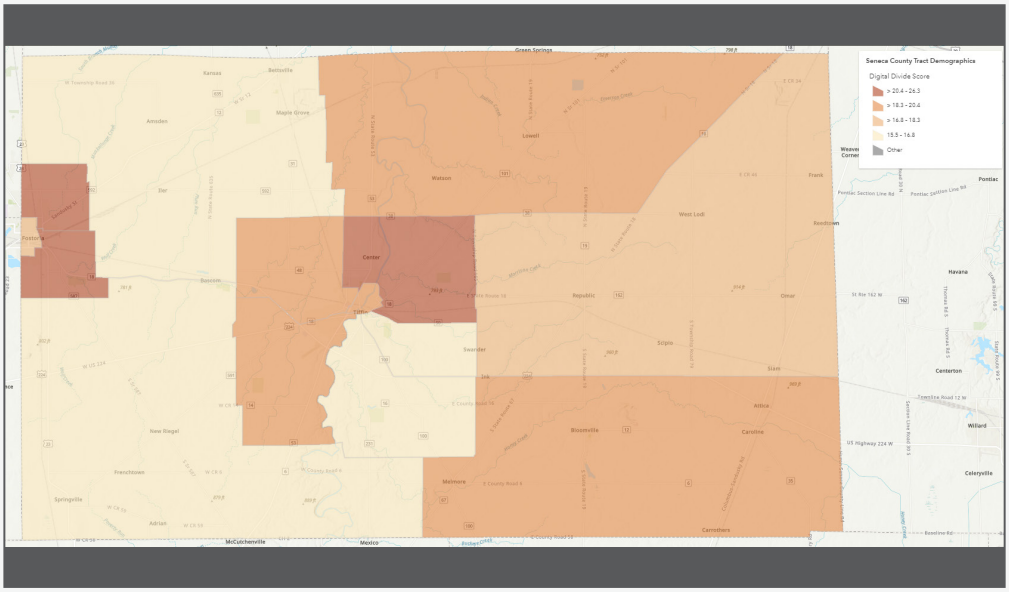
** Fields contain a margin of error percentage that is not included*

NTIA - Indicators of Broadband Need Map

Tract #	Demographics					Broadband			
	Pop. (FCC 2019 Estimate)	Total Households*	% of Pop. Whose income in the past 12 months is below poverty level*	ACS % Households w/o Internet Access*	ACS % Households w/o Computer, Smartphone, or Tablet*	Form 477 All Terrestrial Broadband: Max Advertised Consumer Download Speed	Form 477 All Terrestrial Broadband: Max Advertised Consumer Upload Speed	Ookla Speedtest Download (Mbps)	Ookla Speedtest Upload (Mbps)
39147962500	3926	1455	5.5%	17.7%	10.6%	1000	1000	16.83	5.0
39147962600	4042	1493	9.7%	16.5%	10.3%	1000	1000	15.09	4.1
39147962700	3523	1385	4.7%	16.2%	14.2%	1000	1000	35.09	10.1
39147962800	3384	1480	31.6%	19.7%	13.1%	1000	1000	76.96	11.18
39147962900	4059	1553	18.0%	17.0%	10.3%	1000	1000	65.37	11.42
39147963000	3011	1320	27.7%	16.5%	16.7%	1000	1000	68.51	11.39
39147963100	4601	1613	3.3%	14.7%	9.4%	1000	1000	22.11	7.58
39147963200	4092	1645	14.2%	16.4%	17.5%	1000	1000	76.44	12.57
39147963300	3890	1368	13.1%	14.5%	8.8%	1000	1000	60.39	13.33
39147963400	3869	1765	14.8%	24.9%	20.7%	1000	1000	57.23	11.49
39147963500	3796	1469	14.8%	15.7%	15.5%	1000	1000	76.96	11.54
39147963600	4226	1608	14.0%	11.5%	8.3%	1000	1000	78.42	11.07
39147963700	4685	2043	5.0%	13.1%	10.1%	1000	1000	53.85	10.89
39147963800	4074	1451	8.2%	15.0%	12.3%	1000	1000	28.65	10.56

** Fields contain a margin of error percentage that is not included*

Using the PCRD DDI, the scores of both the SE and INFA are combined to calculate the overall DDI score. A score of 100 indicates the highest digital divide. If a county has a higher INFA score than a SE score, PCRD recommends that the county take steps to improve broadband infrastructure; if a county has a higher SE score than INFA score, PCRD recommends that the county take steps to improve increase digital literacy and the exposure of the benefits that technology gives the population.

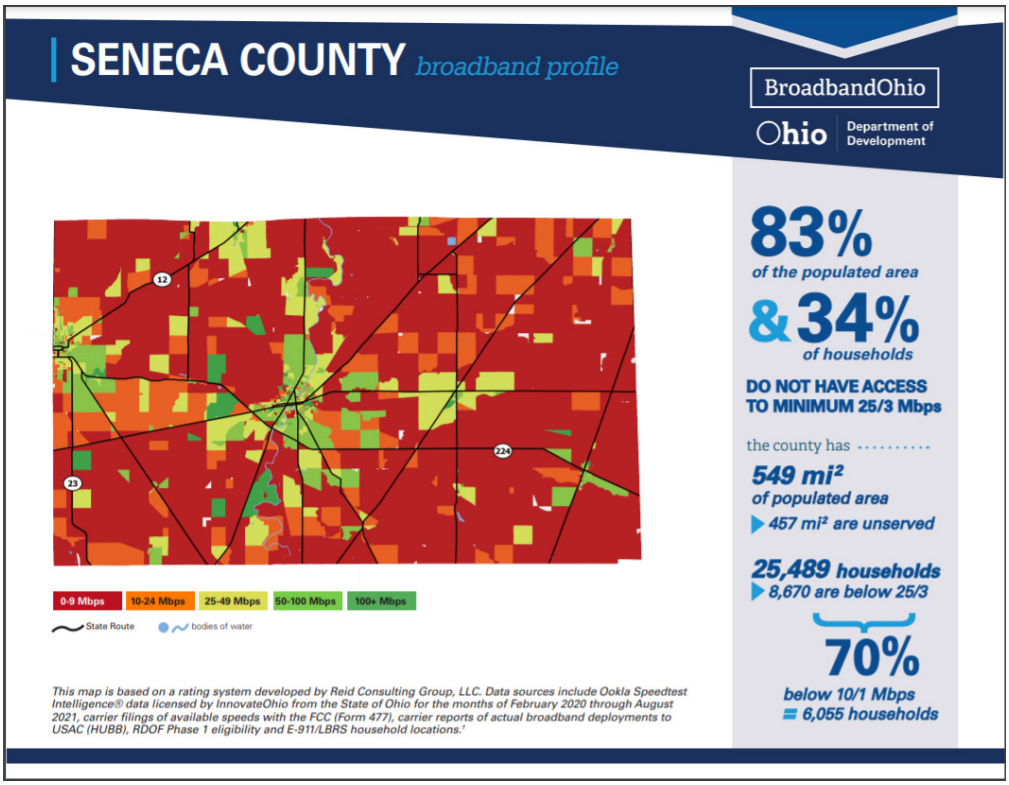


^ MAP: CENSUS TRACTS SHADED TO REFLECT THE ABOVE

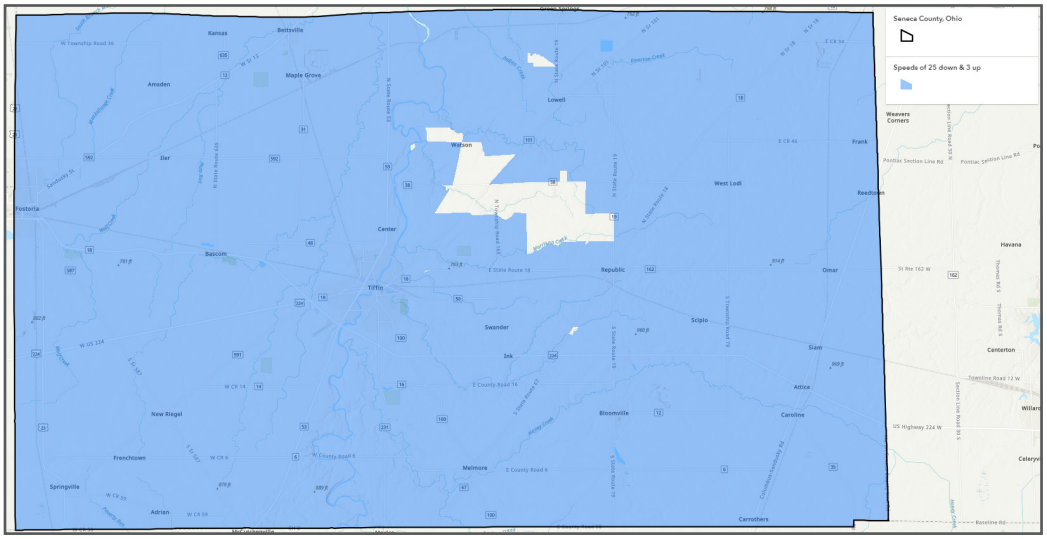
In Seneca County, the SE score is higher than the INFA score in five (5) census tracts, indicating that the County should take steps to improve broadband infrastructure in these areas; while the INFA score is higher than the SE score in nine (9) census tracts, indicating that the County should take steps to address broadband adoption challenges and digital inclusion in these areas.

i. Residential Access

As discussed previously, the FCC's current definition of "broadband" is 25 Mbps download/ 3 Mbps upload. Areas of the county that lack access at this speed tier are depicted in the following map.

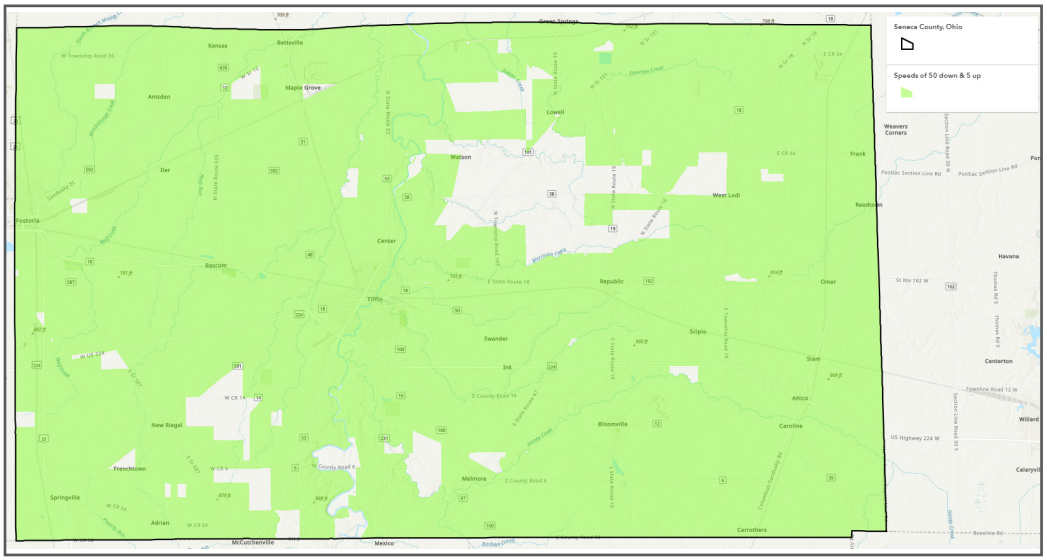


^ MAP: BROADBANDOHIO MAP

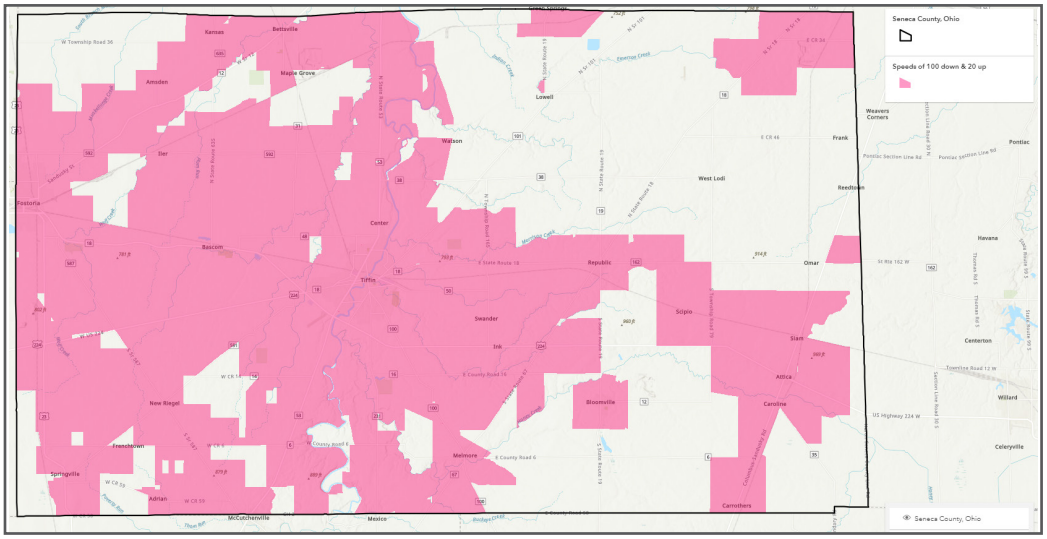


« **MAP:** CURRENT COVERAGE IN SENECA COUNTY AT 25 MBPS DOWNLOAD/ 3 MBPS UPLOAD

As would be expected, depicted coverage decreases as speed tier increases, and the further from the county seat, Tiffin, the more coverage gaps become apparent.



« **MAP:** CURRENT COVERAGE IN SENECA COUNTY AT 50 MBPS DOWNLOAD/ 5 MBPS UPLOAD

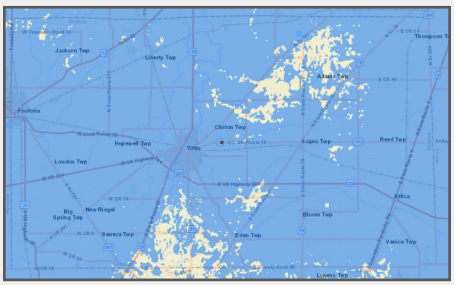


« **MAP:** CURRENT COVERAGE IN SENECA COUNTY AT 100 MBPS DOWNLOAD/ 20 MBPS UPLOAD

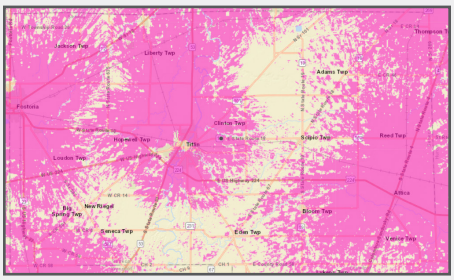
ii. Mobile Broadband Access

Mobile broadband service providers report their total subscribers for each state in which they provide service to customers utilizing the FCC Form 477.[viii] Although mobile carrier coverage maps depict near ubiquitous 4G and even 5G (see earlier discussion on the types of 5G service) for the Seneca County, mobile connection digital divides unquestionably still exist.

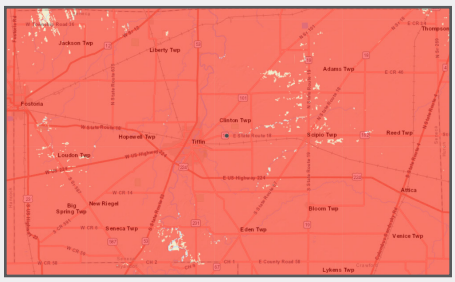
On December 30, 2020, the FCC's Office of Economics and Analytics issued a working paper discussing the digital divide in U.S. mobile broadband.[ix] The paper found that a mobile digital divide indeed exists in the U.S. as rural areas are more dependent on non-Wi-Fi mobile technology and experience slower speeds on mobile connections. Demographically, the paper concluded that counties with greater minority populations are more likely to use older mobile technologies. Counties with older populations tend to use mobile technologies, but are more likely to have slower speeds. Meanwhile, counties with larger households are more likely to use Wi-Fi and have faster Wi-Fi.



^ MAP: AT&T MOBILITY DATA



^ MAP: T-MOBILE MOBILITY DATA



^ MAP: VERIZON MOBILITY DATA

iii. Projected Build-out

Below is an overview of planned build-out in Seneca County as a result of various federal and state programs. This overview is not exhaustive, and additional build-out projections are included in the Plan for Engaging Broadband Providers, provided

a. The Rural Digital Opportunity Fund

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

- Phase I of RDOF provides $16 billion to target areas that are "wholly unserved" by broadband at 25 Mbps download/ 3 Mbps upload.
- Phase II of RDOF provides $4.4 billion to target areas that are "partially unserved" and any areas not won in Phase I, after the FCC updates its availability data through the Digital Opportunity Data Collection, as detailed in the Service and Infrastructure Analysis.[x]

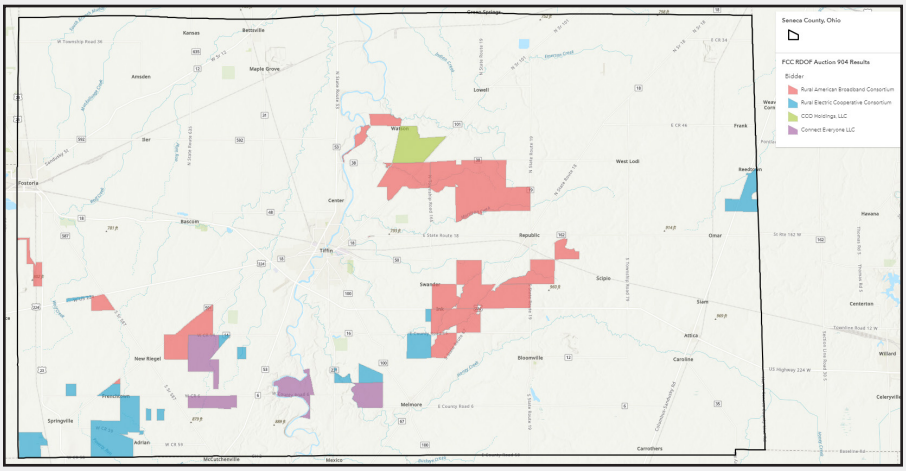
Recipients of RDOF funds must: [xi]

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

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

The RDOF awards in Seneca County are provided below:

CCO Holdings, LLC (Charter/ Spectrum)	25	$51,177.90
Connect Everyone LLC (Starry Communications)	126	$262,155.00
Rural American Broadband Consortium	412	$364,846.70
Rural Electric Cooperative Consortium (Conexon)	140	$405,180.00
Seneca County, Ohio Total	**703**	**$1,083,359.60**



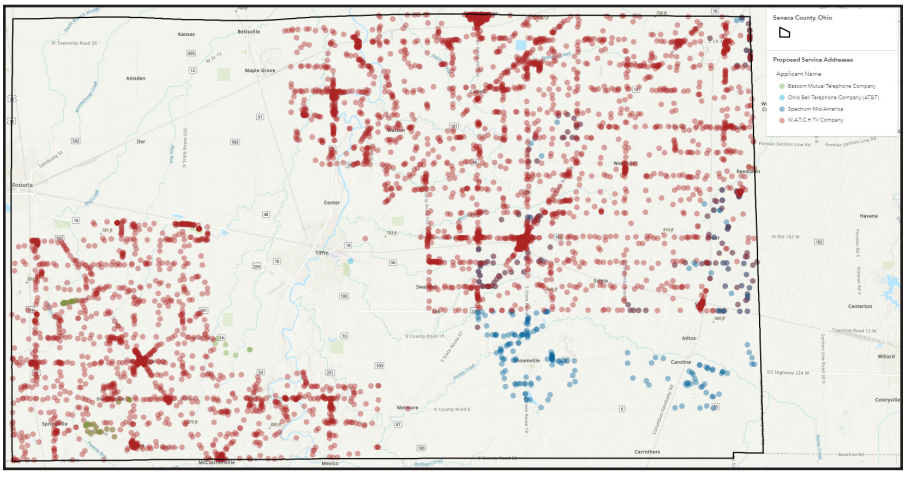
^ MAP: RDOF AWARDS

Although RDOF will heighten connectivity in the County, it will be several years before many of the networks built under the program are available, and the build-out priority of all Seneca County awardees remains to be seen. There is also a general question nationally as to abilities of Mercury Wireless and LTD Broadband to perform under this program. In addition, concern was expressed at the Kickoff Meeting that the penalties from the FCC for a provider's failure to perform under such programs are insufficient to ensure build-out occurs, and this has been experienced in neighboring counties.

As a result of these considerations and other criticisms of the program,[xiii] **we recommend that Seneca County does not delay any efforts to address broadband expansion locally, nor remove an opportunity for another provider to provide such service, in anticipation of RDOF build-out.**

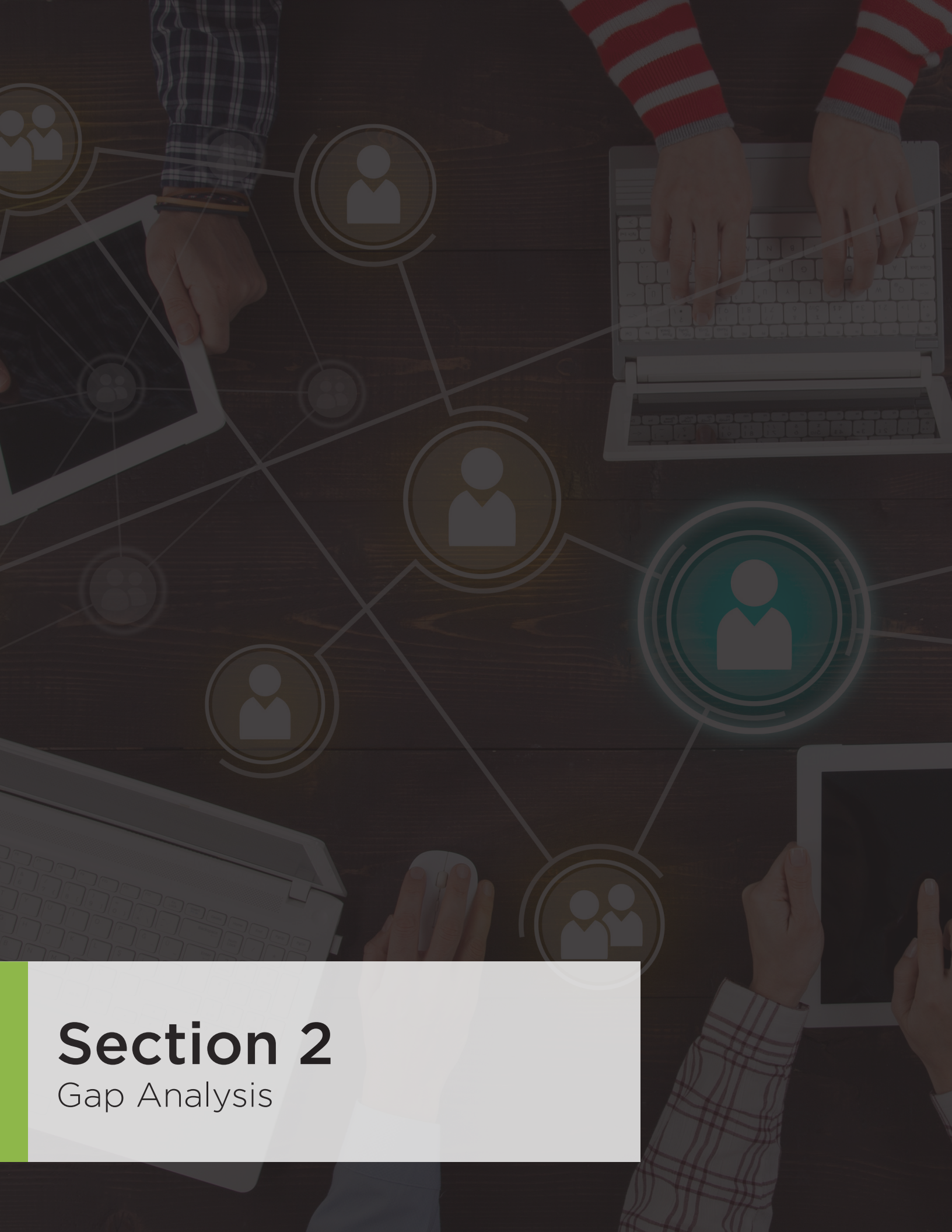
b. Ohio Residential Broadband Expansion Grant Program

The Ohio Residential Broadband Expansion Grant Program ("ORBEG") will be detailed further in the Funding section of this Plan. However, from a build-out perspective, it is important to note that three (3) providers applied to the ORBEG Program for Seneca County – AT&T, Bascom Communications, and Charter/ Spectrum. Unfortunately, none of these applications were awarded in the first round of the Program, but they demonstrate the interest among the provider community in Seneca County.



^ MAP: ORBEG APPLICATIONS FOR SENECA COUNTY

As referenced previously, access is only one component of the broadband challenge facing Seneca County: the other is broadband adoption, digital equity and inclusion.



Section 2
Gap Analysis

2 Gap Analysis

Introduction

In help in developing the Broadband Strategic Plan for Seneca County, Ohio, a gap analysis informed through a citizen survey was conducted to understand the status of broadband access, affordability, and availability across the county.

The Tiffin-Seneca Economic Partnership and North Central Ohio Educational Service Center (NCOESC) aided in efforts to promote and distribute the survey. The survey was distributed both online and in paper form. To better outreach, over 3,000 postcards were handed, mailed, and distributed out to residents in Seneca County explaining the importance of the survey and offering a QR Code to scan for residents to take the survey online.

A complete copy of the survey and the postcard handout can be found in ***Appendix A***. For an overview of insights from the stakeholder focus group sessions held, please see ***Appendix C***. The online survey was produced via SurveyLegend.

Executive Summary

A total of 1,273[1] survey responses within and closely surrounding Seneca County helped complete the gap analysis portion of the Broadband Strategic Plan over the period of March 14th – May 31st, 2022. The survey results offer key information on broadband access, reliability, and accessibility within the county, as well as demographic insights and information regarding internet challenges, both in remote working and e-learning, caused by the COVID-19 Pandemic. A key aspect of the survey was the addition of an "online speed test" that gave direct insight into what download, and upload speeds are available at each household that completed the survey. The survey targeted all populations within Seneca County, with special attention to Parents and Guardians of those who had a child in school and Teachers and Educators. General citizens who were interested in completing the survey, were welcome to participate. Roughly 10% of survey respondents identified as a "Teacher/Educator", while 45% represented the "Parents/Guardian" population. The remaining 45% of respondents fell in the "Citizen/Other" category, with many write-in responses indicating the respondent being a general citizen, retiree/senior citizen, or homeowner.

In addition to the survey, several stakeholder focus groups were held to gather information about experiences of residents and organizations regarding broadband, the impact of current service levels on education and economic development opportunities, and any efforts being undertaken to improve connectivity. Stakeholder groups represented in the focus groups included education providers, local government officials, libraries, local businesses, and townships.

1 *After survey cleaning*

Below, several key takeaways are listed that are provided through both insights from key stakeholders and survey analysis. For more specific information regarding survey results and analysis, please refer to the ***Appendix A.***

Summary of Findings

Slow Internet Speeds, especially in Rural Areas

- Nearly 45% of all speed tests taken by survey respondents at their home internet had download speeds under 25 Mbps, and nearly 37% had upload speeds under 3 Mbps.
- Although most residents have access to a broadband internet subscription (79% of survey respondents), connection is often unreliable and inconsistent.
- Connectivity issues are more common with legacy technology, or during times of heavy traffic.
- Increased digitization of daily responsibilities demand speeds beyond what is currently achieved in rural parts of Seneca County.
  - The lack of physical infrastructure and funding is a main obstacle facing the betterment of rural broadband services based on citizen input

Access and Affordability Concerns

- Citizens are generally dissatisfied with current internet reliability, accessibility, and affordability.
  - While affordability is a concern in the region, availability of high-speed broadband internet is the top barrier for citizens who currently do not have broadband internet.
- Over half (52%) of survey respondents pay between $40 - $80 per month for internet service, with 15% of respondents paying more than $100 per month.
  - Household income, as well as monthly payment for internet, was seldom a differentiator in internet satisfaction and challenges experienced.
  - Although, income was found to be an inhibitor to accessibility to higher speed packages offered by providers
- Those who recorded the slowest download speeds (Under 10 and 25 Mbps), were proportionally found to select the most challenges experienced with their current internet.
- Access and affordability challenges are in part exacerbated by a limited number of providers in rural areas and a lack of competition driving down prices.

COVID-19 Impacts

- Roughly 50% of survey respondents indicated that they experienced internet related challenges as part of the transition to remote life in 2020.
  - The increased use of internet during the COVID-19 Pandemic, both in terms of functions and people online in the home, had the greatest impact on speed and reliability of at home connection
- The lack of broadband accessibility and reliability in the county impacted both e-learning and e-business during the COVID-19 Pandemic, and challenges are ongoing as more aspects of daily life remain digital.
  - The libraries and schools who collaborated to provide hotspots to accommodate remote learning and work during the COVID-19 pandemic are still seeing high demand for services.
  - For recruitment and growth potential, there is a strong demand to enhance current broadband service by business owners in the County.
- The K-2 grade levels were the most challenging to engage for virtual learning during the COVID-19 Pandemic for teachers and educators alike.
  - While a majority of Teachers and Educators felt they are equipped to conduct online classes from home and at school, 52% agreed that students who face internet access challenges struggle to participate/ complete online class activities.

Survey Analysis and Results

a. Survey Respondent Insight

SURVEY RESPONDENTS BY LOCATION

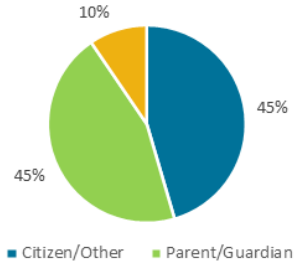
The geographic scope of this analysis included Seneca County in north central Ohio, although additional counties that border Seneca are represented as survey respondents live in cities that can cross county lines. [2] Of the 1,273 completers, Seneca County had the majority of respondents (1,175) followed by Huron County (21), Wyandot County (19) and Hancock County (15). Full responses and a list of all counties represented can be found in the chart below. In total 7 counties are represented, with several respondents leaving the question blank as well as two respondents selecting "Other" as their county was not listed.

County	Responses
Seneca	1,175
(Blank)	34
Huron	21
Wyandot	19
Hancock	15
Crawford	14
Sandusky	10
Wood	2
Other	2
Total	**1,273**

SURVEY RESPONDENTS BY IDENTITY

The survey was broken into three separate sections based on the "type of respondent" selections provided. As seen, roughly 45% of all respondents selected Citizen/Other, while an additional 45% identified as a Parent/Guardian. Both the Citizen/Other and Parent/Guardian survey counts were near identical. That said, 10% selected Teacher/Educator as type of respondent. While similar, this survey had additional questions regarding the use of internet in the classroom, as well as if at home learning/teaching has been impacted by internet challenges. Information regarding these questions can be found in the COVID-19 Impact section later in the report.

Respondent	Responses
Citizen/Other*	579
Parent/Guardian	573
Teacher/Educator	121
Total	**1,273**



*Most common write in responses for Citizen/Other were: Senior Citizen, Retired, Retired Adult, Resident/Citizen, and Homeowner.

2 *Undoubtedly Not every survey was conducted where each citizen lives, but a general idea of geographical scope of the survey can be seen from the answers listed.*

DID YOU KNOW?

SURVEY RESPONDENTS BY CONNECTION

Nearly 65% of all survey respondents took the survey through the use of a cellular phone, while an additional 30% took the survey through a laptop or computer. That said, for those who answered where they are taking the survey from, 71% of all survey respondents took the survey on "My at Home Internet", while 23% took the survey on "Cellular Data". The additional 6% selected a "Public Internet Connection".

These insights are important as **speed test data is strictly limited to those who took the survey on "My at Home Internet",** regardless of device. This is because the intent of the speed test is to see how each respondent at home internet is currently performing, not cellular, work, school, or another public internet connection.

b. Summary of Demographics

The following sections outline the demographics of the 1,273 survey respondents.

Several demographic questions, including age and income, are further analyzed later in the report when compared to internet connectivity and reliability. In addition to the demographic analysis, survey respondent results are also compared to US Census Bureau 2020 American Community Survey (ACS) 5-Year Estimates for Seneca County (shown as "2020 Census Data" in the following tables).

Census data for Seneca County is shown to better understanding how survey demographic representation differs from current demographic makeup. The next sections include information regarding gender, age, race/ethnicity, education, income, and other demographic data points.

1. *Survey Respondents by Gender*

As shown in the table below, 57% of all survey respondents identified as Female, while 38% identified as male. The remaining 5% selected "Prefer Not to Say/Other". When compared to 2020 census data, Female representation is noticeably higher (7%) than current representation (50%) in the county. This could be partially explained by the fact that the survey specifically targeted Teachers and Educators, an industry that commonly leans toward larger female representation.[3] With that said, near 70% of the Teachers/Educators who responded to the survey identified as Female.

Gender	Responses (#)	Responses (%)	*2020 Census Data* Seneca County
Male	370	38%	50%
Female	553	57%	50%
Prefer Not to Say/Other	44	5%	0%
TOTAL	**967**	**100%**	**100%**

2. *Survey Respondents by Age*

Age distribution by survey respondents is skewed towards an older population. That said, this distribution of respondents was somewhat expected as the information asked for in the survey required in-depth knowledge of current internet status and capabilities. The largest percentage of respondents fell in the 35 to 44 age group, followed by the 45 to 54 age group. Both age groups combined represent nearly half of all respondents (49%). While response rate distribution by age differs quite significantly than Seneca County's census makeup, the relatively large representation by each age group in consideration is a positive sign for data reliability and ensuring a comprehensive view of responses.

Age	Responses (#)	Responses (%)	*2020 Census Data* Seneca County
Under 18	2	0%	21%
18-24	8	1%	10%
25-34	91	9%	11%
35-44	243	25%	12%
45-54	230	24%	12%
55-64	182	19%	15%
65 & Up	208	22%	20%
TOTAL	**964**	**100%**	**100%**

3 National Center for Education Statistics, 2022 https://nces.ed.gov/programs/coe/indicator/clr

3. *Survey Respondents by Race/Ethnicity*

More than 90% of survey respondents identified as White/Caucasian, closely following the county makeup based on census data. The second largest Race/Ethnicity represented is the Latino or Hispanic subgroup, with 10 responses.

Race/Ethnicity	**Responses (#)**	**Responses (%)**	*2020 Census Data* **Seneca County**
African American	2	0%	4%
Asian	2	0%	0.6%
White/Caucasian	875	91%	95%
Latino or Hispanic	10	1%	5%
Native American or Alaskan Native	5	1%	1%
Native Hawaiian or Pacific Islander	1	0%	0.1%
Prefer Not to Say	64	7%	N/A
Two or More Races	7	1%	2%
TOTAL	**966**	**100%**	**N/A**

4. *Survey Respondents by Educational Attainment*

Those with a higher educational attainment, including any degree above a High School Graduate, were heavily represented by survey respondents. While in Seneca County 17% of the population has a bachelor's degree or higher, 46% of survey respondents identified as having achieved this educational attainment. The low response rate by those who have less than a college degree could be a potential concern for survey representation. This is because, in general, those who earn a college degree often have higher household income and may be able to afford better or more reliable internet, potentially skewing data results. While speculation, the underrepresentation in survey responses compared to census data of those obtaining a high school degree or less is a note to consider when viewing the survey data.

Educational Attainment	**Responses (#)**	**Responses (%)**	*2020 Census Data* **Seneca County**
Less than High School	6	1%	8%
High School Graduate	231	24%	45%
Some College, No Degree[4]	N/A	N/A	20%
Associates Degree	238	25%	10%
Bachelor's Degree	225	23%	11%
Graduate Degree or Higher	221	23%	6%
Prefer Not to Say	45	5%	N/A
TOTAL	**966**	**100%**	**N/A**

4 Some College, No Degree was not offered as a selection on the survey, differing from Census breakouts. That said, the distribution of population by this educational attainment is still shown in the table for accuracy and comparability.

5. *Survey Respondents by Annual Household Income*

Household income is relatively distributed by survey responses while being slightly skewed towards those with an overall higher annual income. A relatively large percentage of respondents (21%) opted to not select their household income. The largest disparity in response rate by annual household income compared to census data falls in the $100,000 - $200,000 income bracket. Close to 30% of survey responses selected this income range, while the county has approximately 17% of the overall population that earns this income. Further analysis by annual household income is provided in the report, specifically broadband access based on income.

Annual Household Income	Responses (#)	Responses (%)	*2020 Census Data* Seneca County
Less than $25,000	57	6%	19%
$25,000 to $50,000	154	16%	29%
$50,000 - $100,000	294	30%	35%
$100,000 to $200,000	220	23%	17%
More than $200,000	33	3%	2%
Prefer Not to Say	206	21%	N/A
TOTAL	**966**	**100%**	**N/A**

6. *Other Demographics for Survey Respondents*

Several other demographic questions were answered by respondents to get better insights into household and family statistics. These questions were asked to better understand the possible differences in internet reliability and access between those with multiple people or children living in the home. As seen, a broad range of survey responses based on how many “people in home” and “children in home” was recorded. Additionally, survey respondents were asked on disability status. Those who did identify living with a disability, were further asked if Assistive Technology was used in their household to help with technology needs. Of the 105 who answered, 86% responded they did use assistive technology. Overall, after analysis, “people in home” and “children in home” compared to broadband access and reliability was found to have little relationship for the data compiled in this survey.

People in the Home	Responses (#)	Responses (%)
1	57	6%
2	154	16%
3	294	30%
4	220	23%
5+	33	3%
Prefer Not to Say	206	21%
TOTAL	**966**	**100%**

c. Broadband Connection

The following section gives insight into survey respondents connection to broadband internet. Along with accessibility, the type of provider, connection, and monthly payments are analyzed. Several questions are further cross-analyzed by demographic subgroups as mentioned earlier, specifically income and age.

ACCESS

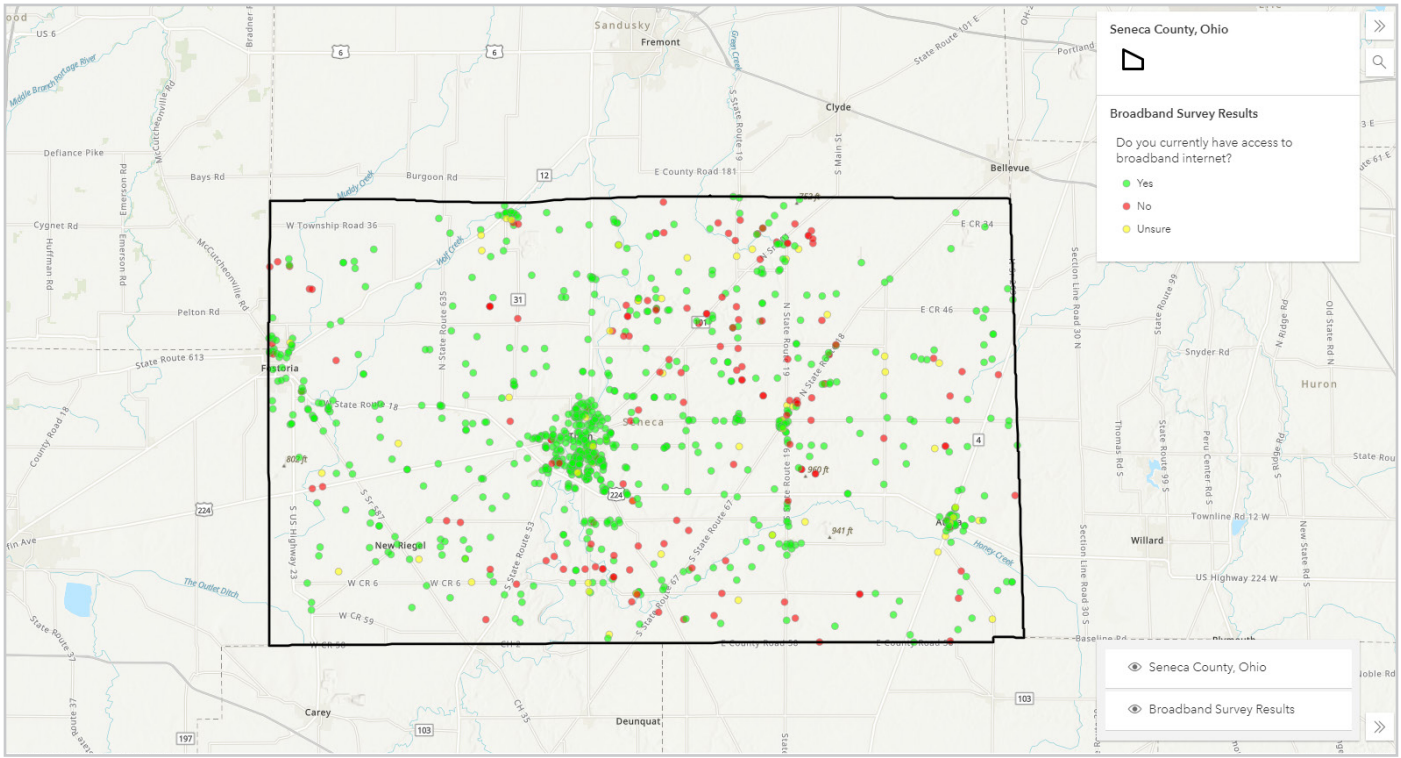
One of the first and most important questions asked in the survey is if respondents had access to broadband internet.[5] As seen, 79% of respondents answered “Yes” while 15% answered “No”, with the remaining 6% of respondents answering “Unsure”.

The near 80% access to broadband internet closely resembles 2020 census data in Seneca County regarding percentage of the population that do have access to broadband of any type (82%).

“Do you currently have access to broadband internet?”

	Responses (#)	Responses (%)	*2020 Census Data* Seneca County “Access to Broadband of Any Type”
YES	57	6%	82%
NO	154	16%	18%
UNSURE	294	30%	N/A
TOTAL	**966**	**100%**	**100%**

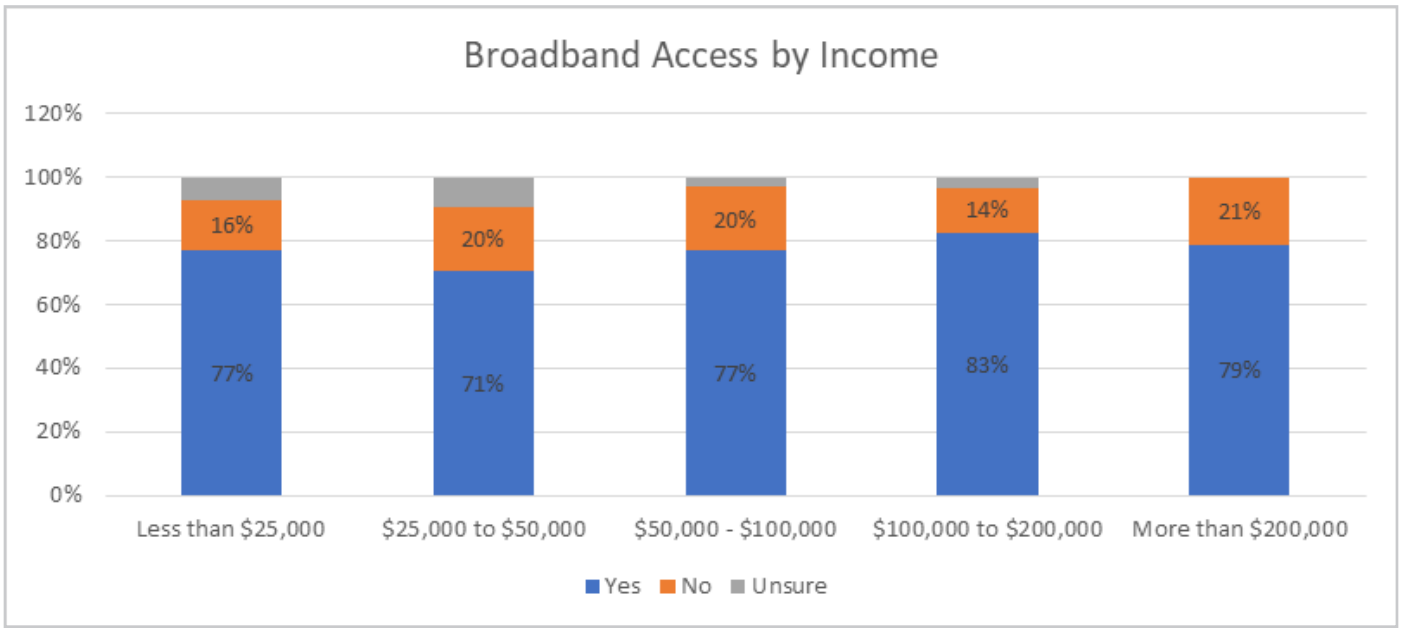
*8 respondents left this question blank



^ MAP: BROADBAND SURVEY RESULTS - BROADBAND ACCESS

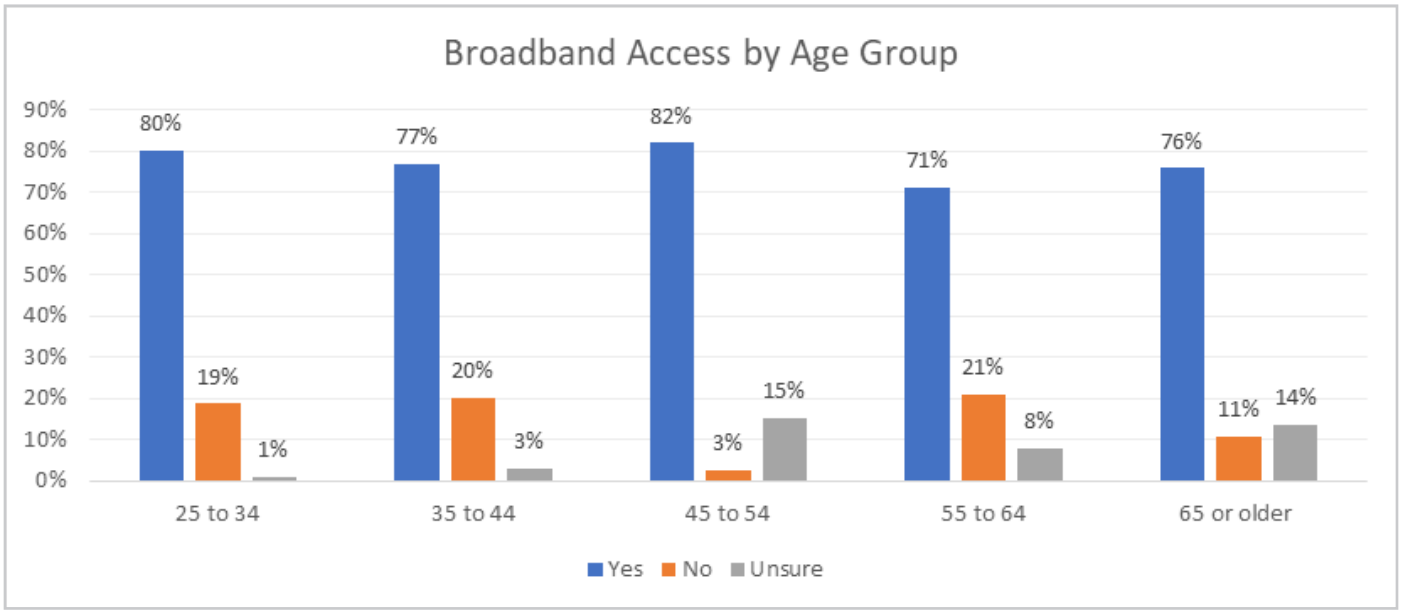
5 *The survey identified that the term broadband “commonly refers to high-speed Internet access that is always on and faster than the traditional dial-up access.”*

Access to broadband internet was also analyzed by annual household income. As seen in the chart below, income has relatively little relation to access, although the $25,000-$50,000 income bracket (second lowest bracket in terms of dollars) had by far the lowest access to income at just 71% of respondents answering "Yes". This bracket also had the largest percentage of "Unsure" responses which could influence the lack of "Yes" answers.



*Unsure make up the remaining percentages for each category

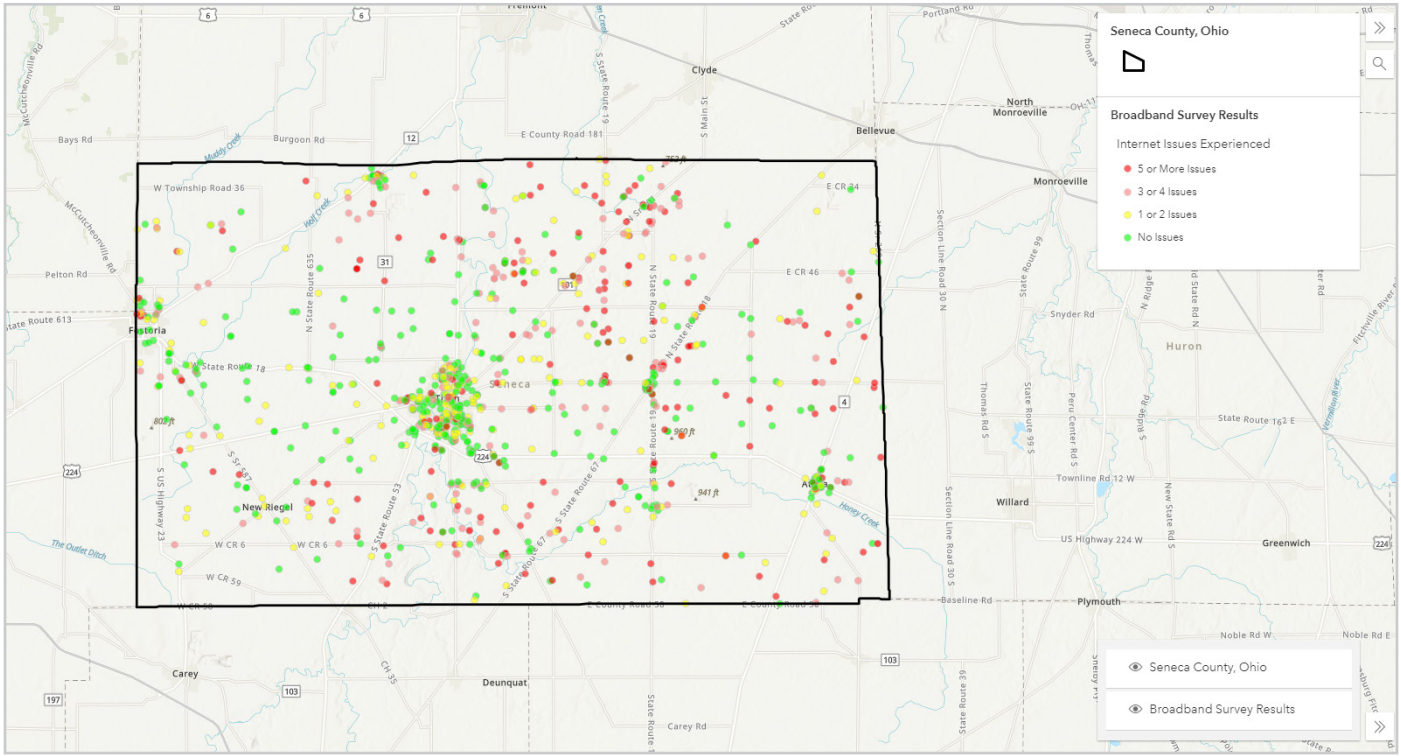
In addition to income, access to broadband internet was also analyzed by age group. As seen in the chart below, age has no clear relationship to access. That said, the "55 to 64" and "65 or older" age groups do have the lowest percentage of access based on survey respondents, although the differences to other age groups are minimal. The minimal relationships based on income and age suggest that access to broadband internet could rely more heavily on location and other factors than demographic statistics.



For those who do not have access to broadband internet, the overwhelming majority selected “Service is not Available” as the reason for why they do not have broadband internet. The lack of physical infrastructure and funding was commonly mentioned in the survey as well as discussed in stakeholder groups for a top barrier impacting availability. Service being too expensive was the next highest selection. Respondents were able to choose multiple selections, even with this option, the vast majority of respondents selected availability as the sole and main reason for no broadband access currently.

Main reason no broadband internet access:	Responses (multiple selections)
Service is not available	154
Service is too expensive	47
Do not see a need for internet service	5
Do not know how to subscribe to internet service	0
Do not want internet service	0
Other (please specify):	3*

*Several “Other” responses related to either availability or price, and therefore were moved into the selections listed.



^ MAP: BROADBAND SURVEY RESULTS - INTERNET ISSUES

PROVIDERS

Distribution of who survey respondents at home or fixed provider is listed in the table to the right. In total, 938 survey respondents listed their provider given they answered "Yes" to having access to broadband internet. A total of 27 providers are listed, with Spectrum having by the far the most representation with 500 responses. Bascom Communications is the second largest provider represented with 148 mentions, followed by AT&T.

Internet Provider	Responses
Spectrum	500
Bascom Communications	148
AT&T	44
CenturyLink	43
Sycamore Telephone Company	28
Bright Net	27
Amplex	26
Frontier	26
Verizon	18
HughesNet	15
Local TV	11
Watch Communications	11
Wavelinc	6
NCool.net	5
Radio Shack	5
Viasat	5
HDER Link	4
Starlink	3
Time Warner	3
T-Mobile	3
Buckeye	1
Com Net	1
Dish Network	1
Fixed	1
Twc	1
UBIFI	1
Wavz	1
TOTAL	**938**

TYPE OF INTERNET

To best determine the type of connection for each respondent, a multiple selection question based on "Type of Internet" was asked. As seen, Wireless Broadband had the largest total selections, with 367, followed by Cable (Coaxial Cable) at 282, and Mobile (Cellular) Internet at 228 responses. These three internet types comprised nearly 60% of all responses.

*A majority of the "Other" responses listed provider names (not intended for the question).

Type of internet	Responses (#, multiple selections)	Responses (%, multiple selections)
Wireless Broadband	367	24%
Cable (Coaxial Cable)	282	18%
Mobile (Cellular) Internet	228	15%
Unsure	179	12%
Fiber Optic	128	8%
Digital Subscriber Line (DSL)	104	7%
Hotspots	101	7%
Satellite Internet	98	6%
Broadband over Powerlines	30	2%
Other*	23	1%
Dial-Up	7	0.5%
ISDN	2	0.1%

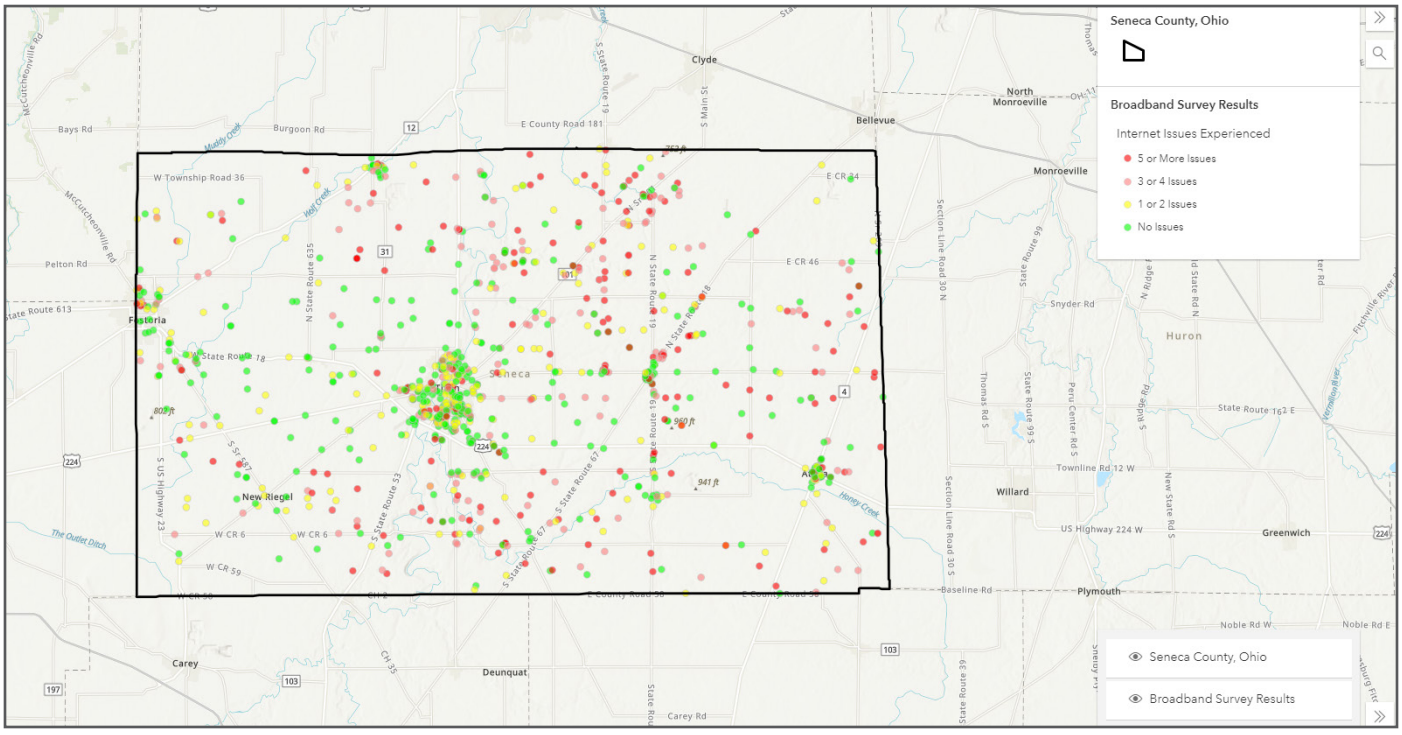
MONTHLY PAYMENT

More than 50% of survey respondents paid in between $40 - $80 monthly for internet service. An additional 18% pay between $81 - $100, while 15% pay $101 or more. Several other options were available for survey respondents to select, including “No Internet” at 4% of responses, “Internet is provided as part of housing package” at 3%, and “Unsure” at 4% of responses. Further cross-analyzation of monthly payment by provider packages and speeds is highlighted below.

To gain further insight into why respondents may not be receiving the internet speeds they desire, respondents were asked whether their current provider offered higher speed packages. As seen, the largest percentage of respondents answered “Yes”, at 39%, followed by “Yes, but I cannot afford” at 23%. Several respondents listed they have not asked or do not have a provider, while 21% of all survey respondents said “No” their provider does not offer higher speed packages.

Monthy Payment for Internet	Responses #	Responses %
Under $40	40	4%
$40 - $60	259	26%
$61 - $80	260	26%
$81 - 100	178	18%
$101 - $120	67	7%
More than $120	79	8%
No Internet	39	4%
Internet is provided by housing package	25	3%
Unsure	40	4%
TOTAL	**987**	**100%**

If Current Provider is Able to Offer Higher Speed Packages	Responses #	Responses %
Yes	320	39%
Yes, but I cannot afford	190	23%
No	175	21%
I don't have a provider	37	4%
I haven't asked	83	10%
Other	21	3%
TOTAL	**826**	**100%**



^ MAP: BROADBAND SURVEY RESULTS - CURRENT PROVIDER OFFERINGS

For those who answered "Yes" to my provider offering higher speed packages, a large majority of the respondents have Spectrum as their current provider. Bascom Communications also has higher response representation along with AT&T. Comparatively, respondents' providers who answered "No" to having the option for higher speed packages are also shown. As seen, Bascom Communications, CenturyLink, and Frontier have considerably higher response representation in the "No" column.

Provider	"Yes" Responses
Spectrum	93
Bascom Communications	12
AT&T	9
Bright Net	7
HughesNet	6
Amplex	3
Watch Communications	3
Radio Shack	2
Verizon	2
Fixed	1
Frontier	1
Local TV	1
Sycamore Telephone Company	1
UBIFI	1
Wavelinc	1

Provider	"No" Responses
Spectrum	14
Bascom Communications	12
CenturyLink	12
Frontier	6
Amplex	5
AT&T	5
Verizon	5
Watch Communications	5
Bright Net	3
Local TV	2
Viasat	2
HughesNet	1
NCool.net	1
Starlink	1
T-Mobile	1
Wavelinc	1

For the 190 respondents who answered "Yes but I cannot afford" higher speed packages offered by my current provider, a total of 107 of these respondents also entered their annual household income. By comparing the total survey respondents by income bracket to those who answered "Yes but I cannot afford", there is a clear relationship that income is an inhibitor to accessibility to higher speed packages as shown in the table below.

Income Bracket	"Yes but Cannot Afford" Respondents	Total Survey Respondents by Income	% Of Respondents who Cannot Afford Packages by Income Bracket
Less than $25,000	15	57	26%
$25,000 to $50,000	34	154	22%
$50,000 - $100,000	38	294	13%
$100,000 to $200,000	19	220	9%
More than $200,000	1	33	3%
TOTAL	**107**	**758**	**100%**

d. Broadband Reliability

As mentioned previously in the report, one of the most significant portions of the survey was the addition of a speed test to gain valuable insights into what download, and upload speeds survey respondents are experiencing.

Survey respondents were encouraged to take the speed test at this link https://www.speedtest.net/, which would then perform an online speed test and give results in under a minute. Several survey respondents indicated (in a previous question asked) they were taking the survey on an internet connection other than their home internet (i.e. work, school, or public connection). To ensure collecting valid responses for only home internet speeds, only those survey respondents who indicated they were taking the survey from their "at home internet" are included in the analysis of the speed test data.[6]

DOWNLOAD SPEEDS

Overall, 596 download speed responses, for survey respondents on their at home internet, were recorded. Of the 596 inputs, 43% of all download speeds recorded are under 25 megabits per second (Mbps). This is an important indicator, as since 2015, the Federal Communications Commission (FCC) has maintained that minimum broadband speeds should be 25 megabits per second for downloading files, and 3 megabits per second for uploading.[7] Overall results for download speeds are shown below:

- 596 speed tests/inputs from those on "at home internet"
- 43% of speeds recorded under 25 Mbps
- Significant variance of responses, user error prevalent

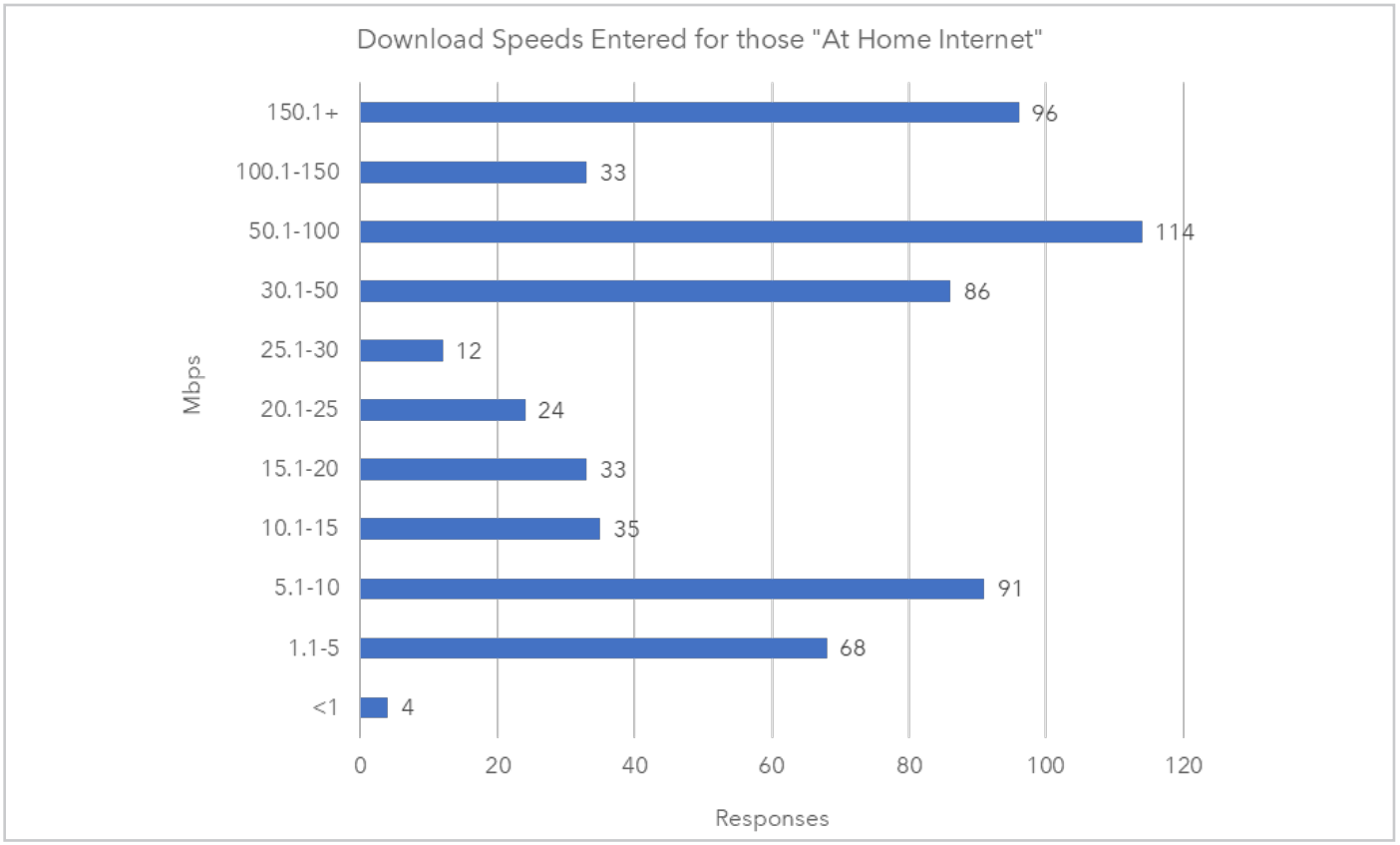
As the speed test took survey respondents to an external link, users were asked to input the speeds into the survey after the test had occurred. Possible user error was prevalent in responses, and there for several speeds inputted were thrown out.[8] Download speed responses can be seen on the following pages.

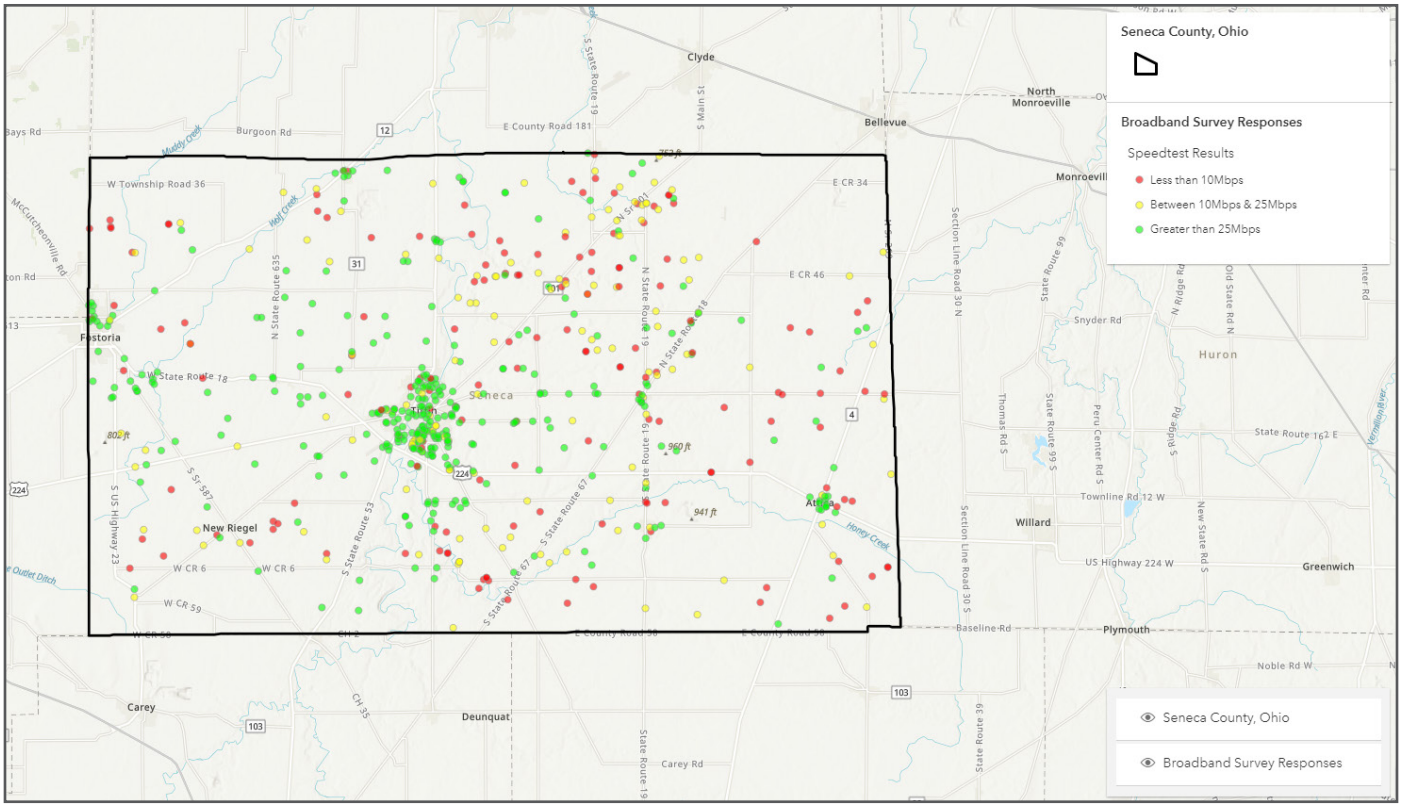
---

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

7 https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-eleventh-report

8 Speed input errors included responses that were non-numeric, numeric answers that were clear outliers, etc.





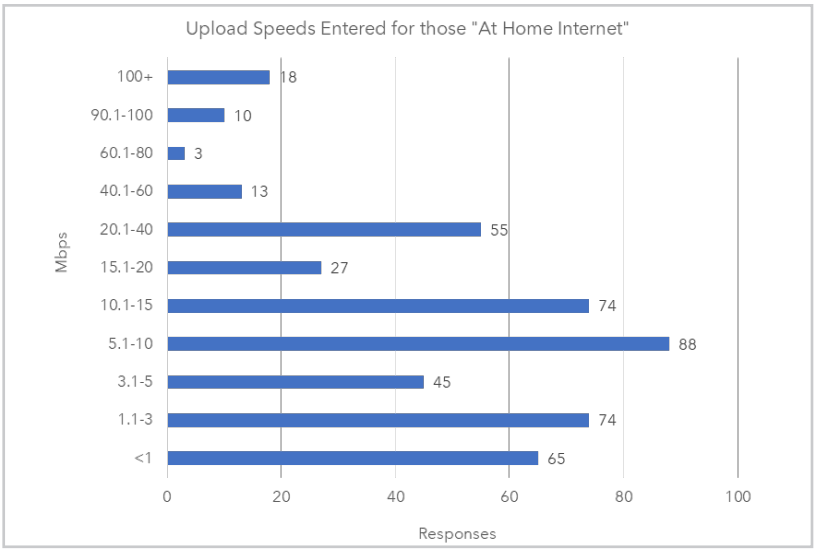
^ MAP: BROADBAND SURVEY RESULTS - SPEEDTEST RESULTS

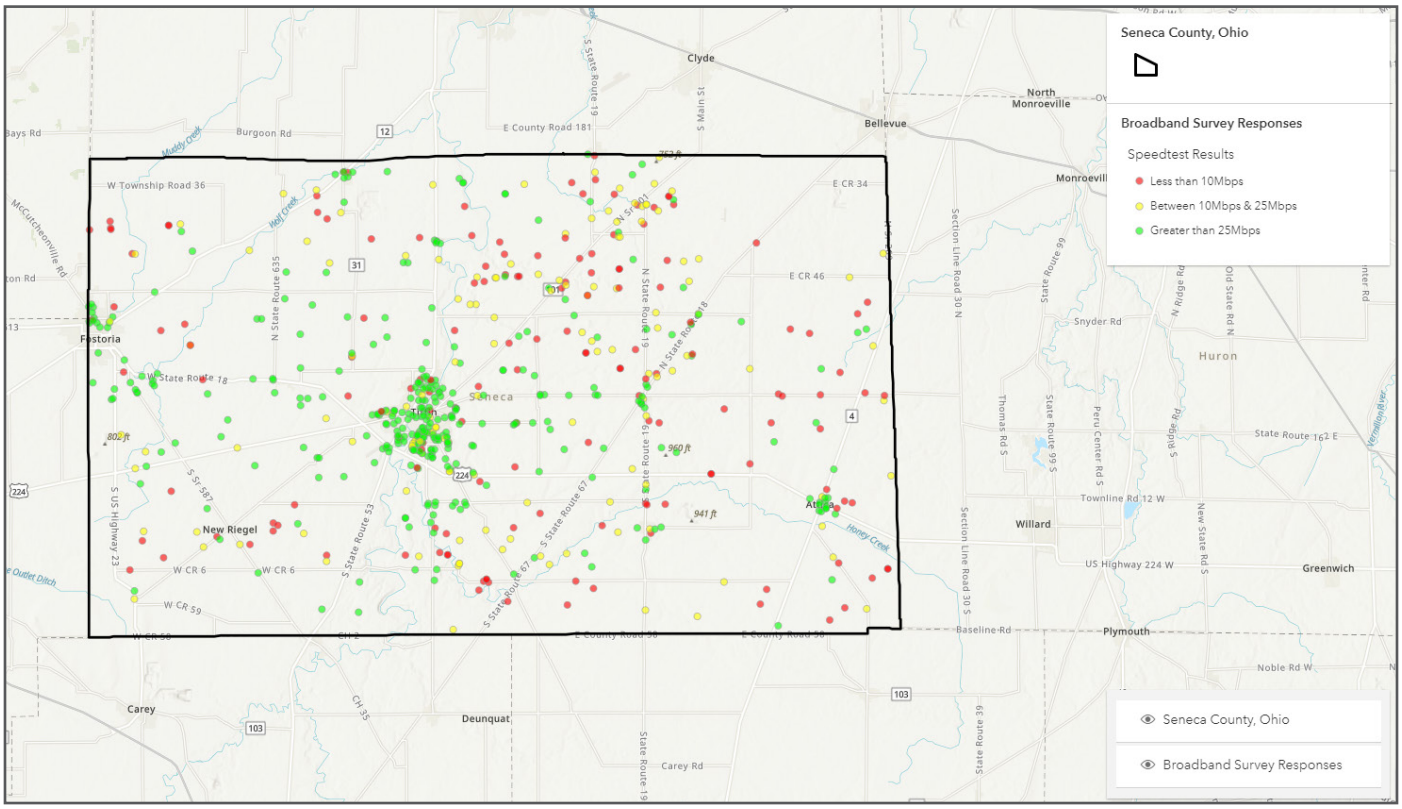
UPLOAD SPEEDS

Overall, 472 upload speed responses, for survey respondents on their at home internet, were recorded. Of the 472 inputs, 37% of all download speeds recorded are under 3 megabits per second (Mbps). This is an important indicator, as since 2015, the Federal Communications Commission (FCC) has maintained that minimum broadband speeds should be: 25 megabits per second for downloading files, and 3 megabits per second for uploading.[9] Overall results for upload speeds are shown below:

- 472 speed tests/inputs from those on "at home internet"
- 37% of speeds recorded under 3 Mbps
- Significant variance of responses, user error prevalent

As the speed test took survey respondents to an external link, users were asked to input the speeds into the survey after the test had occurred. Possible user error was prevalent in responses, and there for several speeds inputted were thrown out.[10] Upload speed test breakdown by inputs can be seen in the chart to the right.





^ MAP: BROADBAND SURVEY RESULTS - SPEEDTEST RESULTS

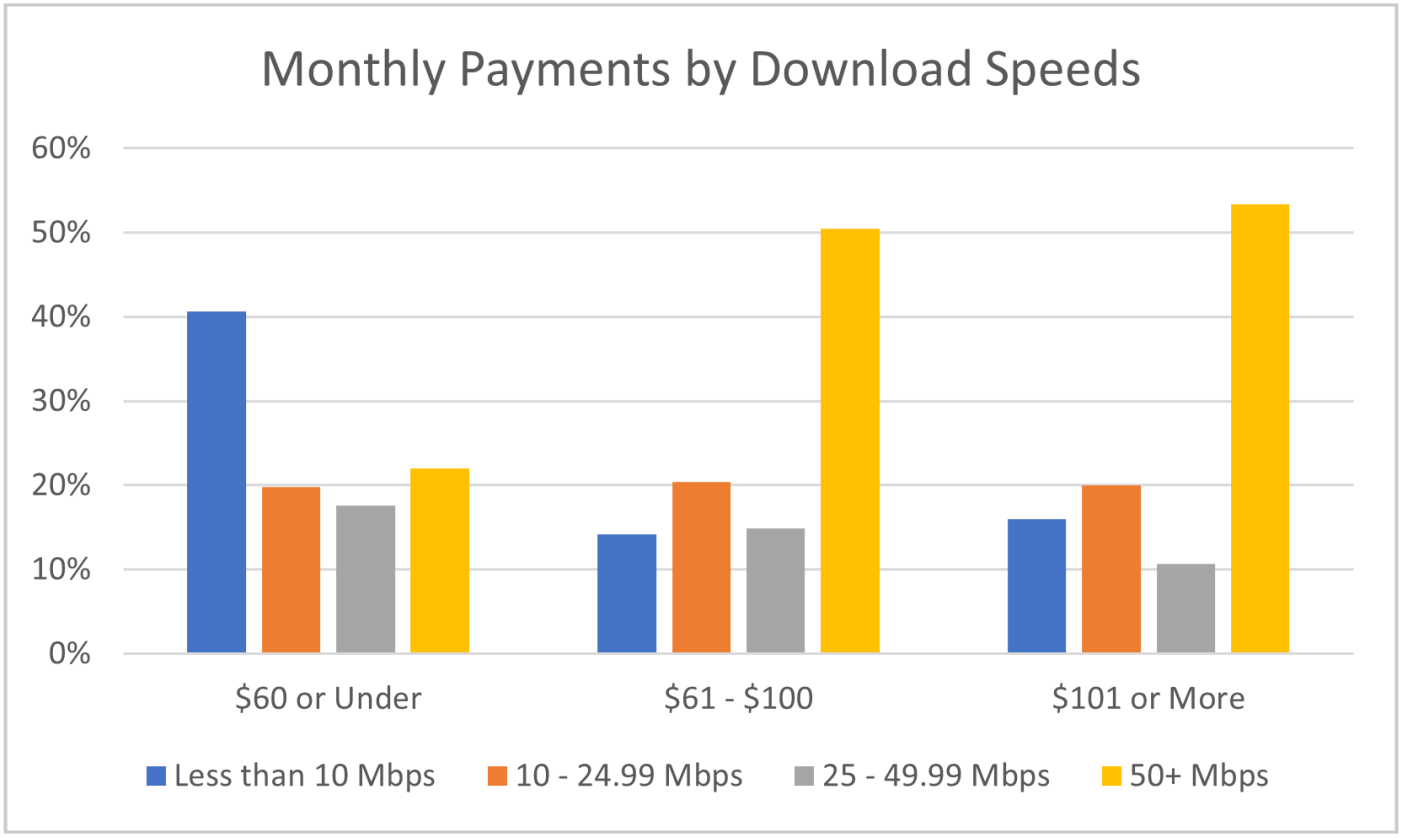
9 *https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-eleventh-report*

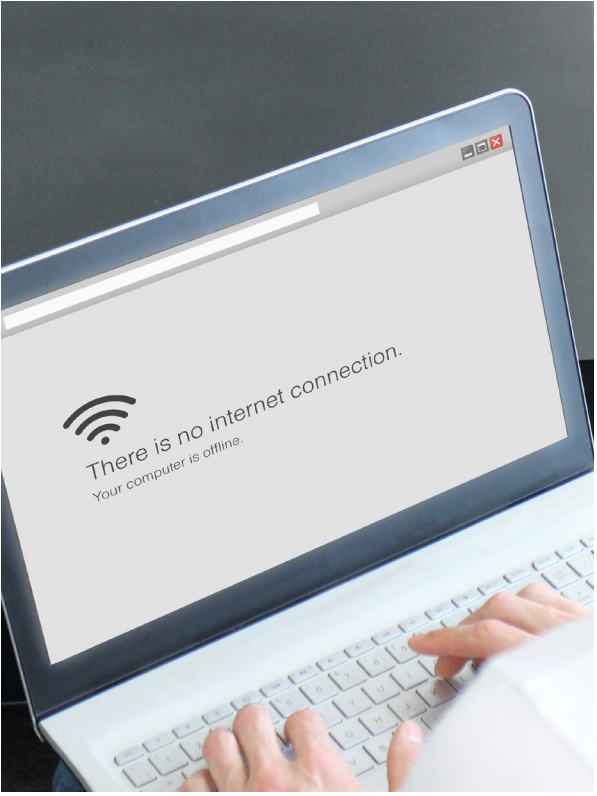
10 *Speed input errors included responses that were non-numeric, numeric answers that were clear outliers, etc.*

Download speeds were also analyzed through the lens of how much each respondent was paying monthly for internet. As shown in the table, responses by monthly payment and speeds were combined for simpler analysis. Total answers for each monthly internet category were then divided by download speed categories to establish the percentage of respondents by download speed per monthly payment bracket. This calculation was done to see a better understanding of the relationship between monthly payment and download speeds recorded.

As seen in the chart below, for those respondents who pay "$60 or under", a large percentage of these respondents (40%) recorded internet download speeds of less than 25 Mbps. On the other hand, a reverse relationship is seen with those respondents who pay $101 or more for monthly internet, as over 50% of these respondents recorded speeds over 25+ Mbps. Interestingly, for those who pay $61-$100 per month for internet, a similar recording of speeds is recorded compared to those paying $101 or more per month.

	Less than 10 Mbps	10 - 24.99 Mbps	25 - 49.99 Mbps	50+ Mbps	Total
$60 or under	74	36	32	40	182
$61 - $100	41	59	43	146	289
$101 or More	12	15	8	40	75





e. Internet Issues and Satisfaction

While gaining raw data regarding actual upload and download speeds is crucial to the report, additional insights on satisfaction and experiences with respondent's internet experience helps gain a more comprehensive picture. Survey respondents were also asked on the importance of the County's role in bettering broadband for further awareness.

ISSUES EXPERIENCED

In particular, as seen in the table below, respondents were asked what problems they have experienced, if any, with their internet. Respondents were able to select multiple responses, with large representation in each category. The largest selection was "Strong/weak signal based on location in home" with 468 responses, followed by "Spotty service/unreliable connection" with 454, and "Connection issues with multiple users" with 437.

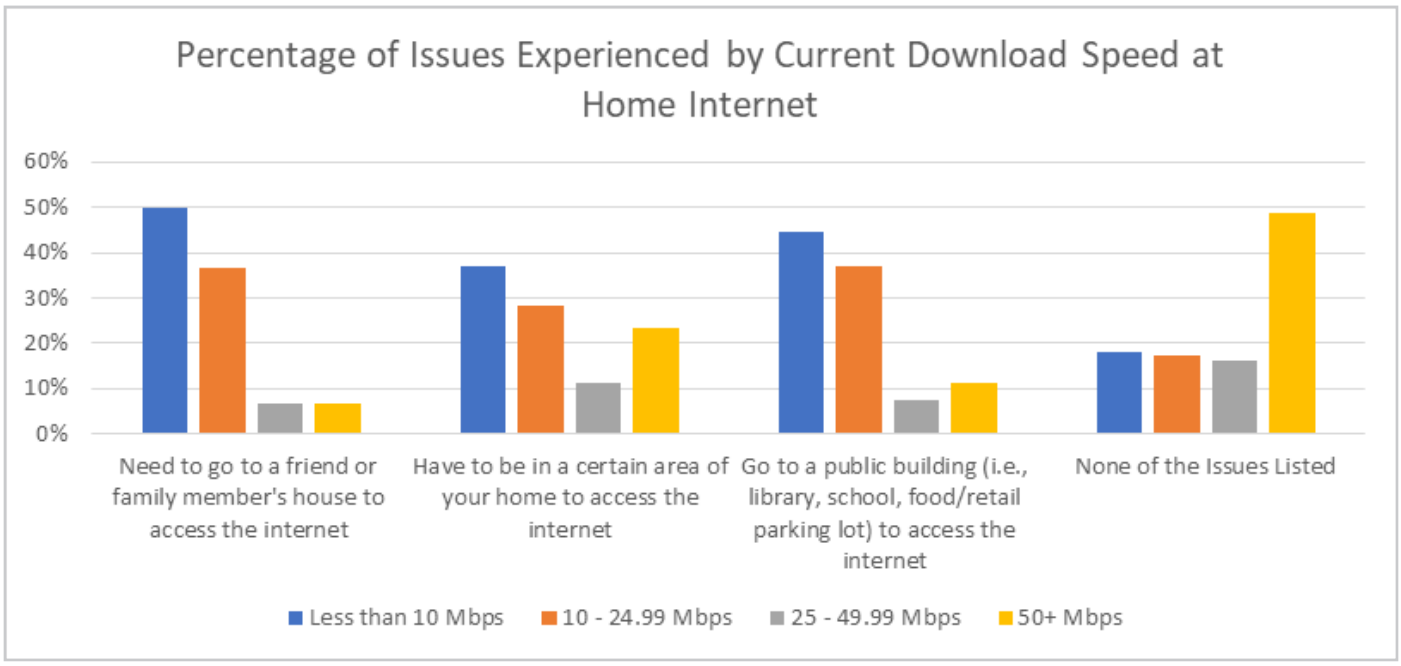
Internet Related Issues Experienced	Responses (Multiple Selections)
Strong/weak signal based on location in the home	468
Spotty service/unreliable connection	454
Connection issues with multiple users	437
Varying signal strength based on time of day	426
Weak signal in inclement weather	382
Frequent periods of interrupted connection	379
None of the above	209
Other*	29

*Common "Other" responses include buffering, no internet or very slow speeds, slow and inconsistent internet, and slow internet when construction or fixes are occurring

Additional questions related to internet related issues were asked for those who identified as a "Parent/Guardian" or "Citizen/Other". Again, respondents were asked if to select which issues, they have experienced (if any), with multiple selections available. The largest issue faced by survey respondents was the need to "Have to be in a certain area of your home to access the internet" with 230 responses. The majority of responses selecting have none of the issues listed, accounting for 60% of all respondents.

Internet Related Issues Experienced	Responses (Multiple Selections)	Responses (Multiple Selections)
Need to go to a friend or family member's house to access the internet	92	9%
Have to be in a certain area of your home to access the internet	230	23%
Go to a public building (i.e., library, school, food/retail parking lot) to access the internet	81	8%
None of the Above	608	60%
TOTAL	**1,011**	**100%**

Again, those experiencing internet issues were cross-analyzed by their current downlaod speeds to see if a relationship exists between the two factors. As shown, respondents who recorded less than 25 Mbps were much more likely to select they have experienced one of the issues listed. Those under 25 Mbps accounted for 87% of all respondents who selected “Need to go to a friend or family member’s house to access internet”, 65% of all responses in “Have to be in a certain area of your home to access the internet”, and 81% of all respondents who selected “Go to a public building to access the interent”.



	Need to go to a friend or family member's house to access the internet	Have to be in a certain area of your home to access the internet	Go to a public building (i.e., library, school, food/ retail parking lot) to access the internet	None of the Above
Less than 10 Mbps	15	43	12	75
10 - 24.99 Mbps	11	33	10	71
25 - 49.99 Mbps	2	13	2	67
50+ Mbps	2	27	3	202
Total	**30**	**116**	**27**	**415**

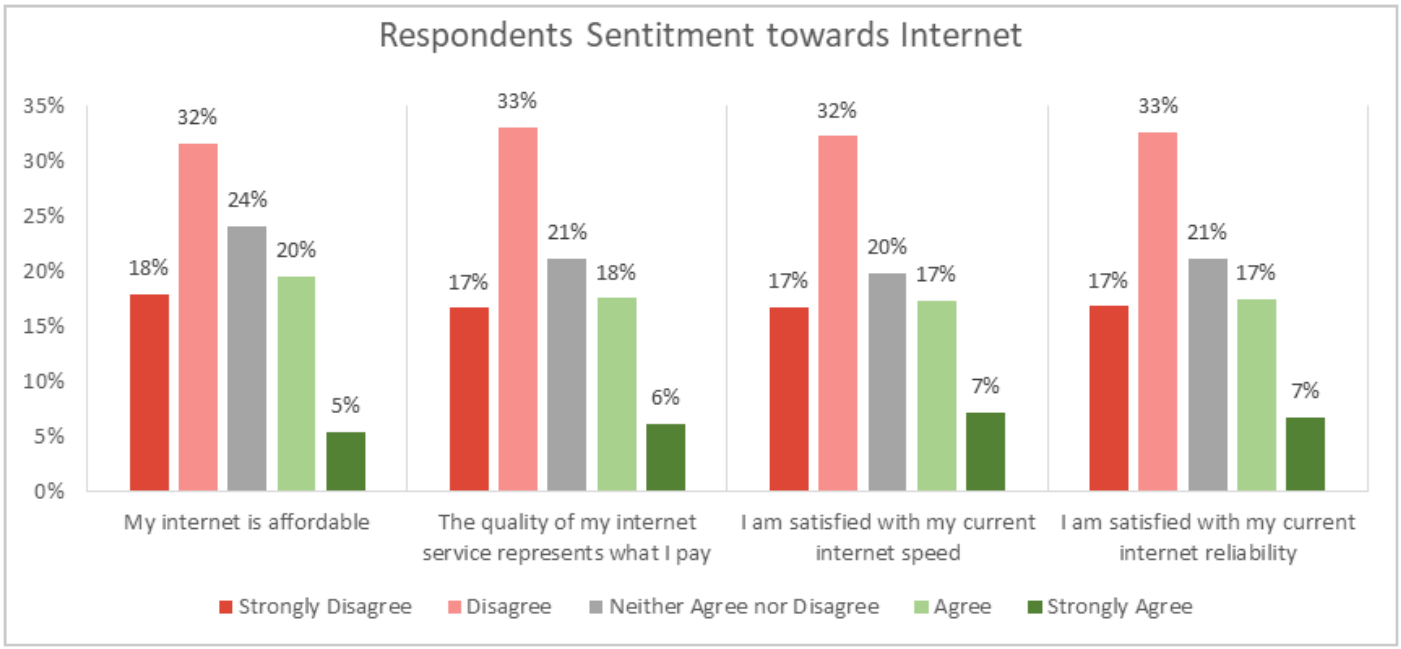
*Speed tests taken from “My at home internet”

INTERNET SATISFACTION

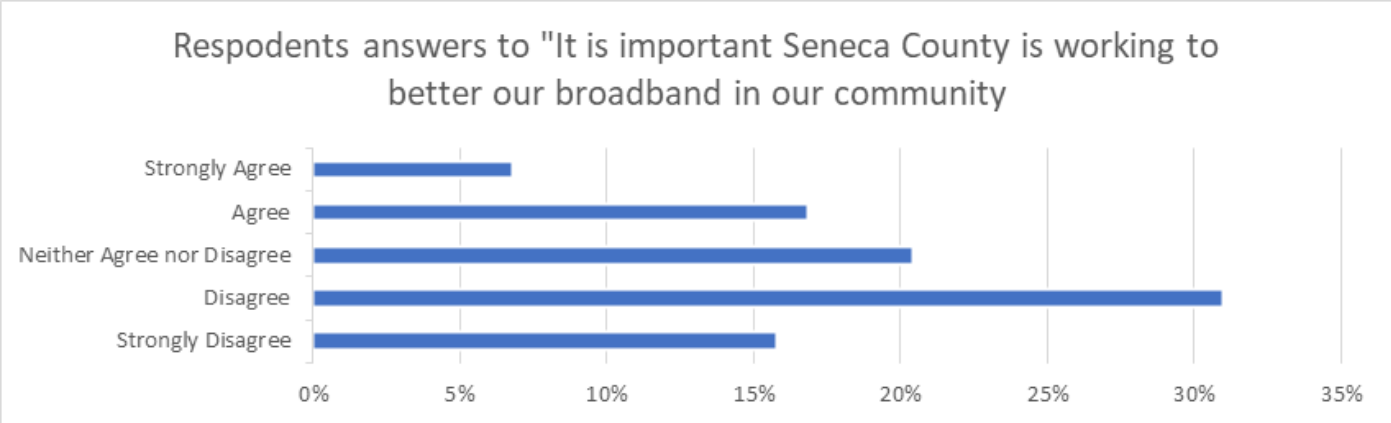
Overall, survey respondents are generally not satisfied with the speed, reliability, and affordability of their internet service. While varying slightly by question, in general, roughly half of all respondents indicated they either “Strongly Disagree” or “Disagree” with all four questions stated below. Additionally, roughly a quarter of respondents selected they “Neither Agreed nor Disagree” while the final quarter selected “Agree” or “Strongly Agree” to the four questions stated. The uniformity in each questions responses suggests that respondents were likely to select similar levels of satisfaction for each. Income, as well as monthly payment for internet was found to have little relationship based on internet speed, reliability, and affordability satisfaction.

	Strongly Disagree & Disagree	Neutral	Strongly Agree & Agree
My internet is affordable	50%	24%	25%
The quality of my internet service represents what I pay	50%	21%	24%
I am satisfied with my current internet speed	49%	20%	24%
I am satisfied with my current internet reliability	50%	21%	24%

*Unsure answers round out each response to 100%



Along with high percentages of dissatisfaction, roughly 42% of survey respondents "disagree" or "strongly disagree" that it is important the County is working to better broadband in the community. That said, 24% of respondents "agree" or "strongly agree" with the statement, while a fifth of all respondents were neutral. The overarching dissatisfaction with current broadband service and frustrations written by respondents could explain the negative sentiment towards the County's current efforts. Further communication and outreach should be explored by the county to gain more support and commitment with residents for increased broadband services.



*Unsure answers round out responses to 100%

f. COVID-19 Impact

OVERALL CHALLENGES

The impact of the COVID-19 Pandemic on residents in relation to internet connectivity in Seneca County was explored through the survey as well as the stakeholder groups held. In general, roughly half of all respondents indicated they experienced internet related challenges as a part of the transition to remote life in 2020. 40% of respondents indicated they did not experience any challenges, while the remaining 13% were unsure. Monthly internet payment as well as income were found to not have a relationship for internet challenges experienced by respondents.

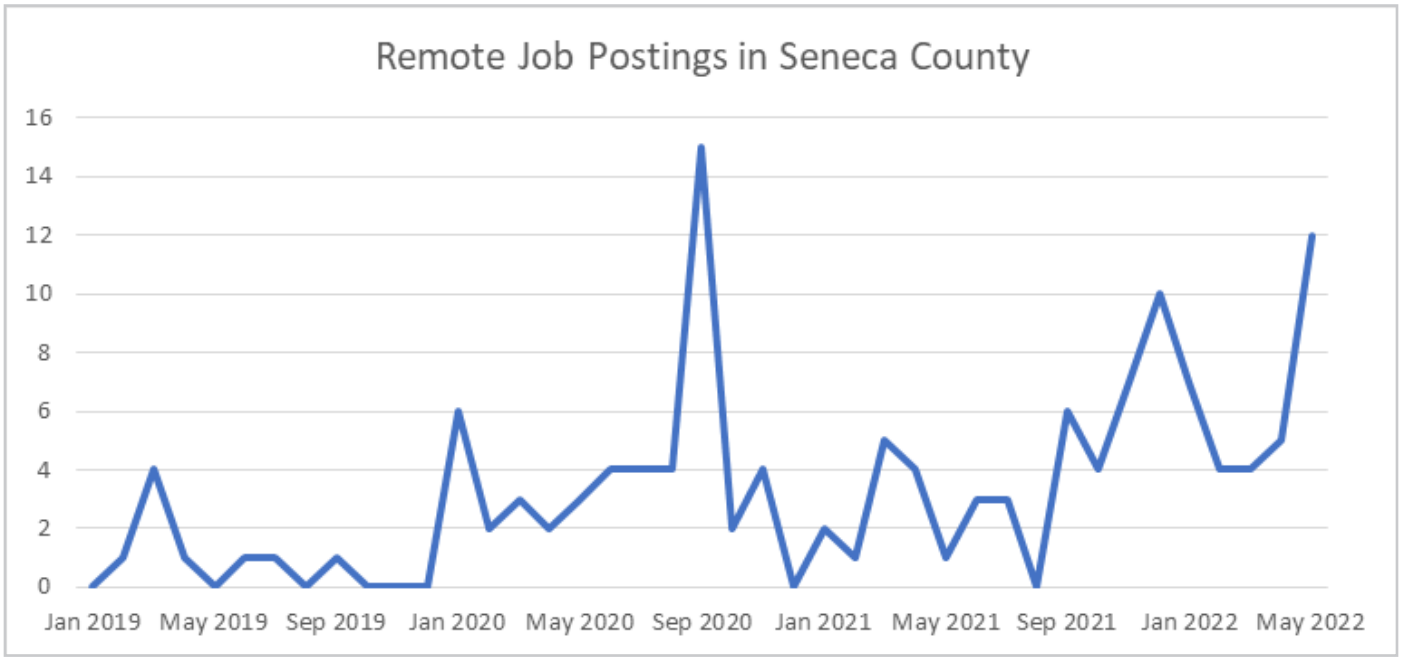
Did you experience internet related challenges as part of the transition to remote life in 2020?

	Responses (#)	Responses (%)
YES	430	47%
NO	359	40%
UNSURE	117	13%
TOTAL	**906**	**100%**

Over 400 additional write-in responses were collected for those who answered "Yes" to experiencing internet related challenges due to the pandemic. While answers varied widely, the top challenges explained by respondents for difficulties through the pandemic related to cost, affordability, connection issues with multiple users, slow speeds, and troubles working both remotely and e-learning. A large number of respondents indicated that the increased use of internet with more people at home greatly impacted speeds and would shut down/slow down speeds to an unusable state. Additionally, many families saw troubles with online zoom classes as screens would freeze and calls were dropped. An unreliable internet connection paired with slow speeds was the clear source of frustration and challenges experienced for many citizens and families during the pandemic.

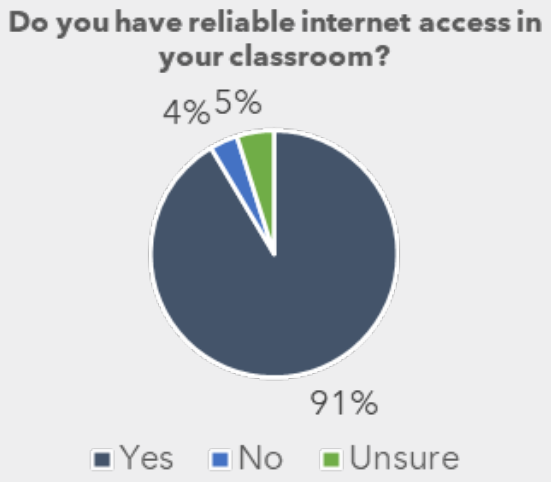
In addition to remote learning challenges, many respondents, including several in stakeholder focus groups, indicated they faced significant challenges with remote work. This could include employers facing challenges with helping connect employees to reliable internet if service was limited at home, as well as employees having troubles efficiently conducting work due to slow or unreliable speeds. Businesses owners, chamber members, and industry stakeholder representatives indicated that remote work will be a tool used by the private sector moving forward for recruitment, retention, and cost-saving initiatives.

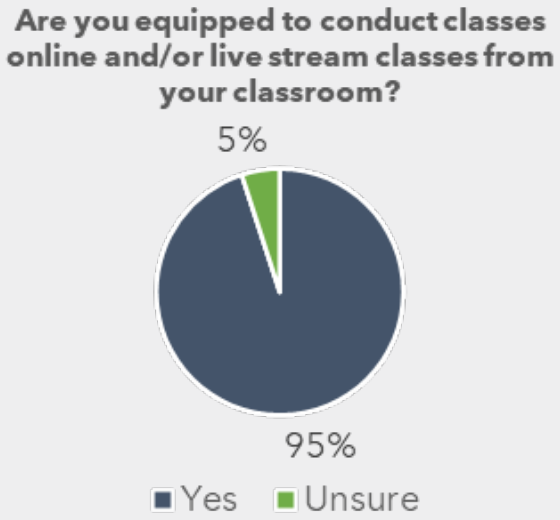
The importance of reliable broadband internet to help grow and expand existing and new industries in Seneca County was also mentioned by Government and public officials. One potential indicator of the growth in remote work is the total remote job postings in Seneca County over the last three years. As seen from data pulled from Emsi-Burning Glass,[11] total remote job postings (although small in scale) in Seneca County increased by over 440% from 2019 to 2020. The initial spike of postings hit in late 2020, once the pandemic and lockdowns were in full strength. That said, remote job postings are on an upward trend – with 2022 already accounting for 70% of 2021's total postings while being less than half-way through the year (May). These trends, along with insight from public and private stakeholders indicate that remote work will continue in the County moving forward, and the need for reliable, fast, and affordable broadband internet is crucial to the business community.

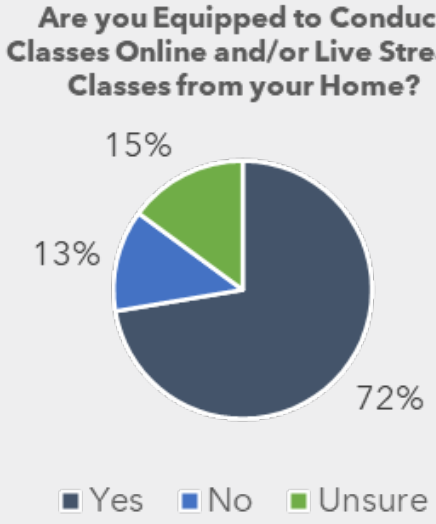


Source: Emsi-Burning Glass, 2022.1

11 *https://www.economicmodeling.com/data/*





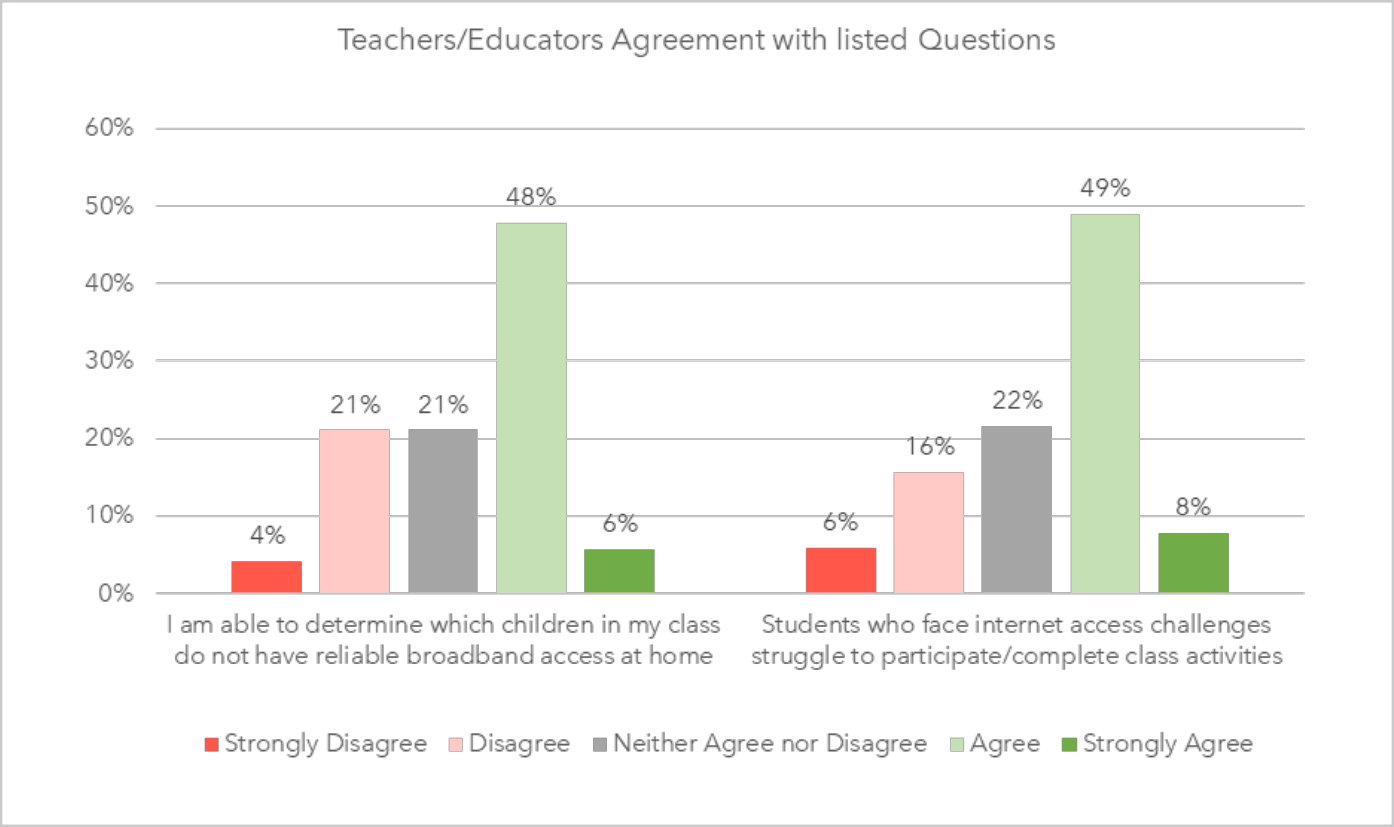


EDUCATION SPECIFIC CHALLENGES

With the great impacts internet accessibility and reliability has on remote learning during and now after the pandemic, survey respondents who selected they were a "Teacher or Educator" were asked additional questions regarding the state of remote learning. The importance of these questions cannot go unstated as many of the write-in responses for those who had internet related challenges during the pandemic revolved around their kids struggling with remote work.

As seen, Teachers and Educators were asked three questions regarding remote learning and their internet. Overall, 91% of Teachers/Educators feel they have reliable internet in their classrooms, while 95% believe they are equipped to conduct classes online and or/live stream from their classroom. That said, only 72% of Teacher/Educator respondents indicated that they are equipped to conduct classes online and/or live stream from their home. 13% of Teacher/Educator respondents selected they were not equipped for this task, while 15% selected unsure. Those who selected "No" to being equipped to conduct remote learning were asked to please provide additional information. Of the 12 who wrote-in information regarding not being equipped for remote learning from home, 10 of the respondents indicated that speed and reliability connections were the main source of issue, while two respondents indicated they do not own the proper equipment.

A final question for Teachers/Educators was to rate the level of agreement they felt regarding students facing broadband internet connection issues. Over 54% of respondents "agree" or "strongly agree" that they are able to determine which children in class do not have reliable broadband access at home. An additional 25% "disagree" or "strongly disagree". From qualitative inputs, the constant freezing of screens, lack of clear audio and connection, and difficulty engaging students online were clear indicators of unreliable access. Additionally, well more than half (57%) of Teacher/Educator respondents either "agree" or "strongly agree" that students who face internet access challenges struggle to participate/complete class activities. The importance of reliable, fast, and accessible broadband internet for students is clearly shown through survey respondent results, as both teachers/educators, as well as parents and guardians displayed the challenges of remote learning for those with slow speeds and the potential frustrations and gaps that may occur in learning.

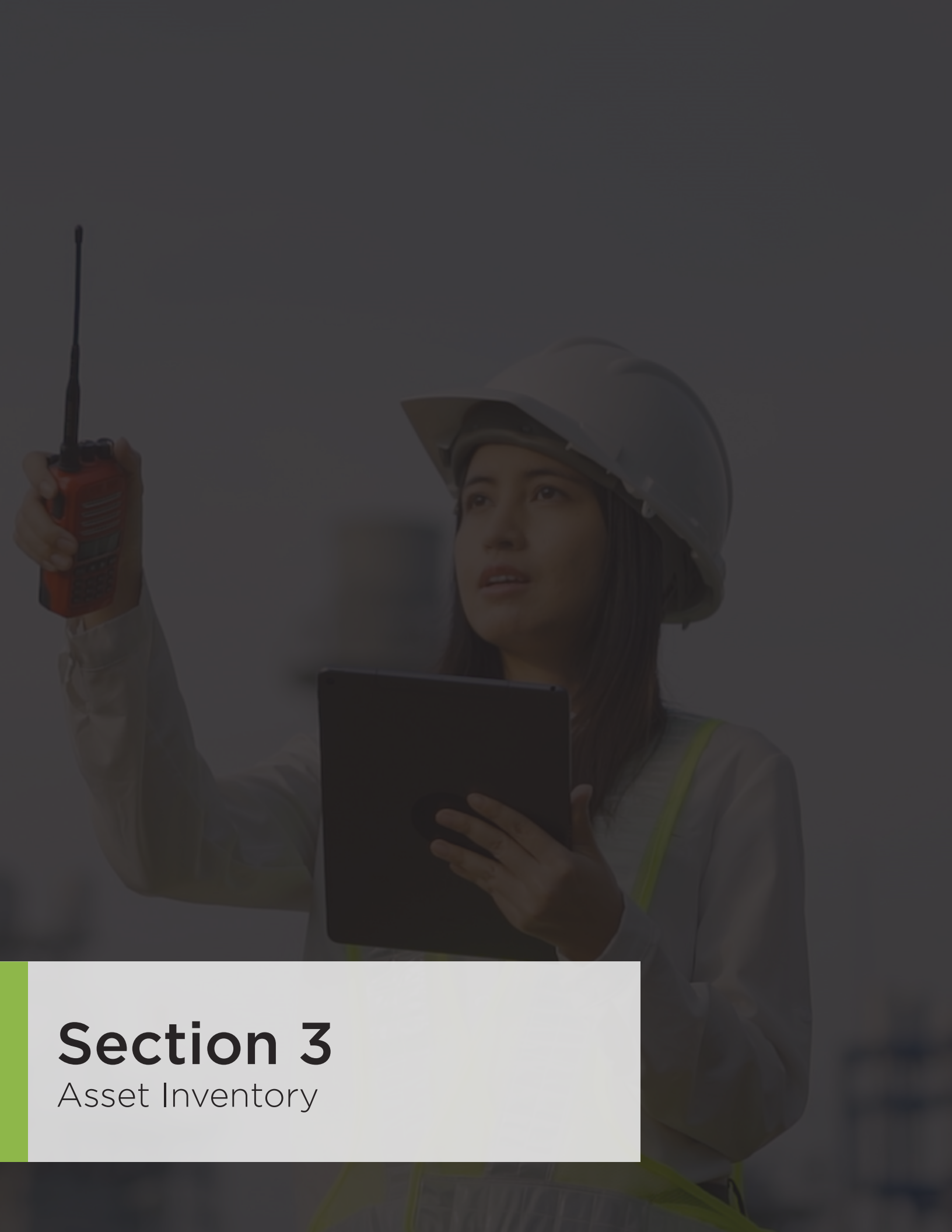


In Summary

Seneca County holds a variety of conditions that illustrate a need for increased broadband access, and an overall higher quality product. In addition, there is a large share of unmet demand for quality broadband service, all throughout the county and specifically in rural areas.

The quality of speeds offered by current providers, in the form of download and upload speeds, vary widely based on location and in general are underperforming. A number of a barriers are impacting speeds that relate to overall accessibility, including geographical obstacles, affordability, and a lack of physical infrastructure. Further, emerging trends in remote working and learning in the Country create the need for a quality broadband standard for residential users. Teachers and Educators, as well as Parents and Guardians heavily touched on the impact on remote learning with unreliable internet, and business leaders alike related the importance of quality broadband to enhancing and growing industry. Enhancing the current download and upload service will allow the County to attract and retain residents and help match today's remote work and learning needs.

It is important that County utilize this data to properly address its residents, providers, and policymakers in enhancing quality access at an affordability level that allows maximum participation. The County should also increase its communication and engagement with residents in the area to gain further support on the need to better broadband in the county and show the benefits of increased services.



Section 3

Asset Inventory

3 Asset Inventory

Seneca County Asset Inventory

A cost-effective tactic for communities to encourage and facilitate enhanced broadband expansion is to reduce build-out costs.

One approach to doing so is to utilize existing infrastructure and dig-once opportunities. With a clearer picture provided as to broadband access, or in certain locations lack thereof in Seneca County, it is next important to determine whether existing assets could be used to better facilitate local broadband expansion.

The Project Team, working with our Seneca County liaisons, compiled the following list of assets available within Seneca County. The list is comprised of municipal, emergency first responder, education, and many other community anchor organizations and sites. These locations may be able to be used for network equipment for fixed wireless broadband, such as rooftop mounts; or colocation facilities for fiber expansion, such as existing pole lines.[1] For example, other sites for consideration are those utilized by other utility providers, such as the North Central Electric Cooperative in Seneca County. Like individuals and communities, utilities have recognized the value of available broadband access. Several utilities in Ohio have already deployed significant fiber networks to support their day-to-day utility operations, and across the country utility providers have been setting up private LTE networks to inspect power lines, provide workers with mobile voice and data, ensure substation redundancy, control energy flow, provide performance and outage notification, and more.

---

1 Fixed wireless delivers broadband services to the end-user by connecting to the internet using a fiber-optic middle-mile to the wireless base stations, then transferring the signal from the wireless sites to the end-user or other wireless sites.

Medina Fiber

NETWORK LOCATION
Medina County, OH

SIZE (LAST MILE)
450 miles of fiber

BUDGETED COST
$58mm

SCOPE
Business Plan, Road Map and Deployment for approximately 50,000 residents and businesses

DATE
July 2017 – Present

ANTICIPATED COMPLETION
48 months

NETWORK TYPE
Aerial & Underground

INITIAL SERVICES
Internet: 100/100 Mbps, 250/250 Mbps, 1 Gig

Middle Mile Partnership

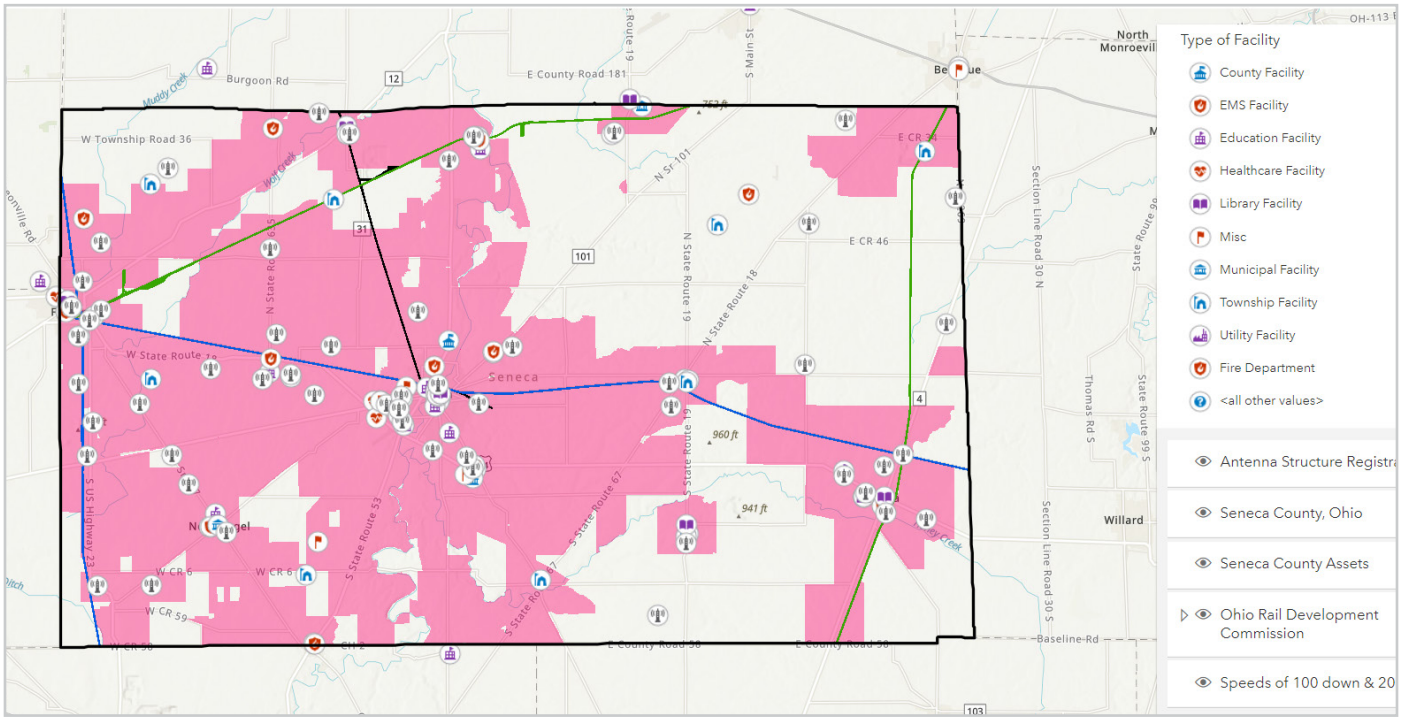
- In 2010, the Medina County Port Authority bonded a broadband project, Medina County Fiber Network (MCFN), to create the infrastructure for robust broadband service that could be shared by multiple telecommunications carriers as part of driving economic development within Medina County.
- The MCFN created a strategic plan in 2017 that addresses expansion of certain fiber trunks into industrial parks and to introduce a residential and small business fiber product through commercial partnering.
- In 2021, a relationship was created with the commercial entity, Medina Fiber, to introduce a residential and small business offering to Medina County. Medina Fiber is partnering with MCFN, leasing strands to build last mile connectivity to the residents and small businesses of the County.

Current Status

- Since March 2021, Medina Fiber has deployed fiber across nearly 4,000 households in Seville, Westfield Center, Montville and Medina City combined.
- In October 2021, Medina Fiber opened its first Demonstration Center in Seville for customers to provide direct customer service, learn about gigabit internet services and its utilization in the home and business.
- Through a partnership with Medina County, Medina County Fiber Network and the Lorain-Medina Rural Electric Co-op, Medina Fiber is applying for the State of Ohio's Residential Broadband Grant Program to bring gigabit service to over 4,500 unserved and underserved households, students, businesses, and remote workers who currently do not have access to reliable and affordable internet.

www.litcommunities.net

The map below depicts where these assets are located within Seneca County.



^ MAP: ASSET MAP

After the final deliverables are submitted and Seneca County has determined how it would like to proceed, this Asset Inventory can be a helpful resource for the planning that will need to take place and the network deployment to follow.

For example, we recommend that Seneca County create and maintain an online, comprehensive broadband asset inventory, building off of the information gathered throughout the development of this Plan, on its existing GIS site.[i]

We recommend that this inventory include:

- ☑ buildings with rooftops available for lease for wireless broadband expansion;
- ☑ street lights and other poles, such as those of the cooperatives;
- ☑ utility easements and right-of-ways;[2]
- ☑ EMA facilities, as allowable given public safety constraints;
- ☑ water towers/tanks;
- ☑ grain silos/ feeds;
- ☑ existing broadband infrastructure, captured by Planning and Zoning through the permitting process;
- ☑ and more.

Once created, this listing could be "marketed" to the providers and utilized to target investment and facilitate in priority areas of Seneca County.

2 *Utility providers in other jurisdictions have begun to show a willingness to allow their rights-of-way and easements to be used for broadband network construction. If there is any such interest locally, such paths could also be incorporated into the asset inventory.*

Another program to fill broadband gaps locally is the Connecting Seneca County Residents Program offered through the Seneca County Department of Job and Family Services ("Seneca County JFS").

> Connecting Seneca County Residents provides laptops and internet access to help low-income families find employment, retain employment, and assist students with school assignments.[ii] Further, the program helps families find food, housing, and childcare assistance, and also allows individuals to participate in virtual medical appointments.[iii] Seneca County JFS implements the program through the Prevention, Retention, and Contingency (PRC) Program.[iv] The PRC implements this program to support the Temporary Assistance for Needy Families ("TANF") goal of "end[ing] the dependence of needy parents on government benefits by promoting job preparation, work and marriage."[v]

Eligible families receive a laptop valued around $300.[vi] Further, the program intended to provide active internet hotspots for those that lacked internet access, but due to restrictions within the funding source, as well as difficulty finding vendors to provide hotspots, only fifty eligible families received an active Verizon internet hotspot for one year.[vii] According to the Seneca County JFS, over one hundred and fifty laptops have been distributed, as well as all fifty Verizon hotspots.[viii] To be eligible, families must live in Seneca County and be at or below 200% of the federal poverty line or have received public assistance through SNAP or Ohio Works First (OWF) in the thirty days prior to applying to the program. Additionally, to qualify for the program, applicants must be:

- a legal custodian or guardian with minor child(ren);
- a specified relative with minor child(ren);
- a noncustodial parent if the noncustodial parent or child lives in Seneca County; or
- a pregnant person.[ix]

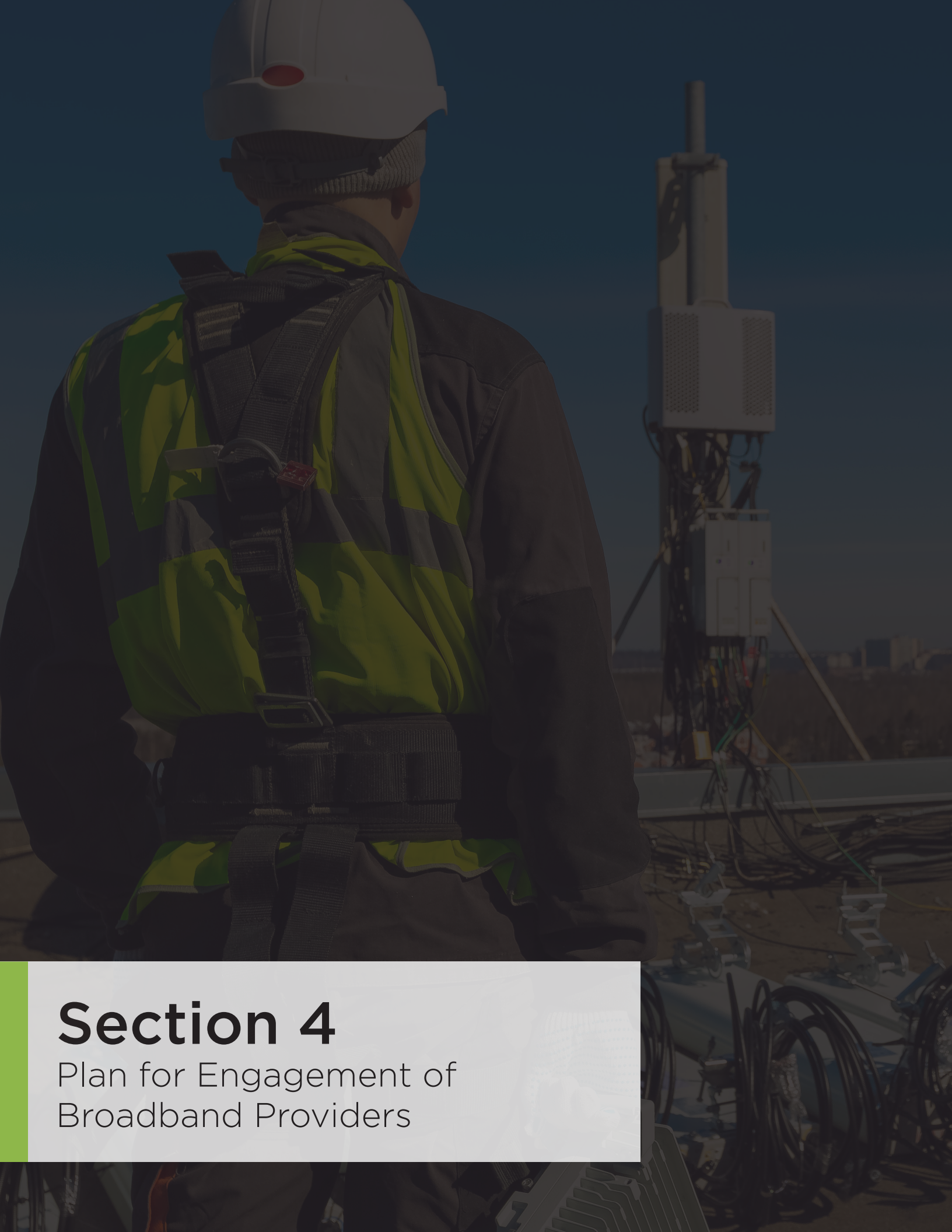
Finally, to apply, families must complete a PRC application and provide proof of income for the thirty days prior to the date of the application.[x]

> The Tiffin-Seneca Public Library offers a hotspot lending program with Verizon service. These hotspots were provided through a Library Services and Technology Act ("LSTA") mini grant, through the State Library of Ohio and funded through the Institute of Museum and Library Services ("IMLS"). The original grant was $3,000 and covered the cost of 10 hotspots with unlimited data. Each hotspot can be checked out for two weeks at a time. The Tiffin-Seneca Public Library experiences long waitlists and numerous checkouts for the hotspots, with many repeat lenders for at-home service.
>
> The Tiffin-Seneca Public Library also offers twenty-three public computing sites that remain heavily used, even with the hotspot lending program available. Further, the Tiffin-Seneca Public Library offers basic internet courses online through the North Star Initiative and one-on-one technology tutoring.

Although not a physical asset, a community's current economic "spend" on telecommunications services, and how those amounts will increase in the years ahead is an "asset" that, if managed appropriately, can be contributory to expanding local service. **We recommend that Seneca County review its current broadband and telecommunications "spend" to determine whether it could be attributed to additional local provider expansion.**

Another non-physical asset that Seneca County has is the fiber construction program that nearby Terra State Community College offers. Terra State has a certificate program for utility construction including fiber optic construction. Yet another non-physical asset is the Telecommunications Tower Technician Program at nearby North Central State College.

Recently (August 15, 2022) Ohio based Omni Fiber and the City of Tiffin entered into discussions regarding the companies plan to provide broadband access to the majority of Tiffin with a new state of the art 100% fiber network. The network, if constructed, would bring two gigabit service to the residents and businesses of Tiffin.



Section 4

Plan for Engagement of Broadband Providers

4 Plan for Engagement of Broadband Providers

Company	Current Presence in Seneca County (** in name signals no current presence)	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
5G Mesh CONTACT www.5gmesh.com WEBSITE www.5gmesh.com	√			√	44802 - Alvada	Up to 30 Mbps	62.9%	N/A	N/A	N/A		5G Mesh is based in Fremont, OH.
					44883 - Tiffin	Up to 30 Mbps	90.9%					
					44830 - Fostoria	Up to 30 Mbps	10%					
					44811 - Bellevue	Up to 30 Mbps	100%					
					43410 - Clyde	Up to 30 Mbps	100%					
					44867 - Republic	Up to 30 Mbps	34.1%					
					44836 - Green Springs	Up to 30 Mbps	100%					
					44853 - New Riegel	Up to 30 Mbps	100%					
					44841 - Kansas	Up to 30 Mbps	100%					
					44809 - Bascom	Up to 30 Mbps	100%					
					44815 - Bettsville	Up to 30 Mbps	100%					
					44828 - Flat Rock	Up to 30 Mbps	100%					
					44861 - Old Fort	Up to 30 Mbps	100%					
Agile Network Builders** CONTACT Rick.Strecansky@agilenetworks.com WEBSITE http://agilenetworks.com/						In similar residential deployments in Ohio, have offered 25 Mbps download /5 Mbps upload		In similar residential deployments in Ohio, have offered packages for $52/ month	N/A	In similar residential deployments in Ohio, have allowed the subscriber to elect to sign a 2-year contract, or reduce the term and pay higher installation fees.	Fixed Wireless	Agile Network Builders, LLC (“Agile”) focuses on filling in gaps where fiber is not currently feasible with its fixed wireless service. There are currently approximately 20 sites/ towers in Seneca County that could be used for service expansion. Agile was recently acquired by Cincinnati Bell Telephone Company and, although they have no immediate plans for expansion in Seneca County, an anchor tenant (school, college, government, enterprise) and/ or partner may justify such expansion. Samples of Agile’s packages, contracts, etc. are provided here, but these are created on case-by-case basis based on community partnerships and more. Agile does not currently participate in the Affordable Connectivity Program (“ACP”), but are willing to partner with local Wireless Internet Service Providers (“WISPs”) and that provider may choose to enroll in such programs.

Company	Current Presence in Seneca County *(** in name signals no current presence)*	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
altafiber CONTACT Timothy.lonsway@altafiber.com WEBSITE https://www.cincinnatibell.com/cincinnati-bell-altafiber				√								altafiber, formerly Cincinnati Bell, is Interested in expanding all throughout Ohio, including Seneca County, whether directly or with a partner. Partnership could be a middle mile solution for last-mile providers or wireless carriers.
Amplex CONTACT Mark@amplex.net WEBSITE https://amplex.net/	√			√	44807 - Attica	Packages range from 5 Mbps download/1 Mbps upload to 50 Mbps download/ 5 Mbps upload for residential fixed wireless and from 200 Mbps symmetrical service to 1,000 Mbps symmetrical service for residential fiber	5.5%	Packages range from $39.95 - $89.98/ month for residential fixed wireless and $49.95 - $79.95/ month for residential fiber		1 year, unless the subscriber is enrolled in the ACP	Fixed Wireless (Amplex's residential fiber service is not currently available in Seneca County)	Amplex covers much of the Northeast portion of Seneca County with its fixed wireless service; however, their fixed wireless product does not complete with residential fiber service. Amplex is currently building out fiber service in a county that neighbors Seneca County, which may lead to additional fiber in the southwest portion of Seneca County over the next two years, but they do not have any immediate expansion plans in Seneca County.
					44883 - Tiffin		9.8%					
					44830 - Fostoria		79.4%					
					44811 - Bellevue		99.5%					
					43410 - Clyde		100%					
					44867 - Republic		43.2%					
					44836 - Green Springs		100%					
					44841 - Kansas		100%					
					44809 - Bascom		100%					
					44815 - Bettsville		100%					
					44828 - Flat Rock		100%					
					44861 - Old Fort		100%					
AT&T CONTACT anthony.costanzo@att.com WEBSITE https://www.att.com/	√	√		√	44802 - Alvada	25 Mbps download+	12.5%	$55 - $180/ month	AT&T Access	N/A	Enhanced DSL - Fiber to the Node ("FTTN") and copper to the premise/ IPBB (DSL)	Not all of Seneca County is within AT&T's footprint, but existing coverage is mainly in Tiffin, Fostoria, and New Reigel - largest is Tiffin, which has U-verse and plans to transition/ upgrade to fiber by 2024/ 2025. Current footprint is not fiber in Seneca County and each of the wire centers will need updated for fiber. Once available, AT&T will seek to partner with local governments to "market" new service. AT&T also expressed that it is likely to apply again to ORBEG for Seneca County; and seek other state and federal funds, and would be interested in local procurement.
					44883 - Tiffin	25 Mbps download+	74.3%					
					44830 - Fostoria	25 Mbps download+	81.9%					
					43316 - Carey	25 Mbps download+	2.10%					
					44853 - New Riegel	Up to 24 Mbps download	100%					
					44815 - Bettsville	Up to 10 Mbps download	7.20%					
Bascom Communications CONTACT njb@bascomtelephone.com WEBSITE https://bascomtelephone.com	√	√	√	√	44802 - Alvada	35 Mbps to 1000 Mbps; the same speeds are offered across entire footprint	32%	$44.95 - $149.95/ month	Lifeline Program; also offer metered plans (in addition to unlimited plans) for gigabit connectivity to provide more pricing options	N/A	Fiber	Bascom Communications is a nonprofit cooperative that has actively constructed broadband in Seneca County since 2003. Bascom's current construction in Seneca County is under its FCC RDOF award. Bascom's cooperative structure reinvests the money generated by network users into further network expansion. Although gigabit connectivity is available for all within footprint, approximately 83% of their subscribers select the lowest cost service package. Historically Bascom has not pursued state/ federal grants given significant compliance and limited staff, but are very interested in local funds for expansion.
					44830 - Fostoria		20.4%					
					44818 - Bloomville		3.7%					
					44867 - Republic		5.5%					
					44853 - New Riegel		65.5%					
					44844 - McCutchenville		5.6%					
					44883 - Tiffin		100%					
					44809 - Bascom		100%					

Company	Current Presence in Seneca County *(** in name signals no current presence)*	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Bright Wireless (under Bascom Communications) CONTACT njb@bascomtelephone.com WEBSITE https://bascomtelephone.com/data-services/wireless-internet/	√			√	44802 - Alvada	Up to 16 Mbps download/ 4 Mbps upload through its "accelerate package"; are legacy packages in more rural areas of Seneca County that offer 8 Mbps download / 3 Mbps upload service, but only market the lesser package if there is no other option in the area/ will be upgrading the area in near future	100%	$44.95 - $169.95/ month	N/A	N/A	Fixed Wireless	Bright Wireless is contracted with Seneca County to be located on EMA tower sites and are working on bids on additional tower sites in Seneca County. Bright Wireless' fixed wireless service is more quickly deployable and cost-effective than Bascom Communications' fiber. Bascom will then build-out in areas with significant need and sign ups for Bright Wireless' service.
					44807 - Attica		100%					
					44883 - Tiffin		100%					
					44830 - Fostoria		100%					
					44811 - Bellevue		16%					
					43410 - Clyde		6.8%					
					43316 - Carey		63.2%					
					44818 - Bloomville		78.9%					
					44867 - Republic		100%					
					44836 - Green Springs		83.6%					
					44853 - New Riegel		100%					
					44841 - Kansas		100%					
					44844 - McCutchenville		47.5%					
					44809 - Bascom		100%					
					44815 - Bettsville		100%					
					44828 - Flat Rock		100%					
					44845 - Melmore		96%					
Buckeye Broadband*** WEBSITE https://www.buckeyebroadband.com/	√				43410 - Clyde	Up to 1 Gbps	3.1%	$19.99 - $124.99/ month	FreeNet - ad-supported Internet product	N/A	Cable	***The Project Team was unable to reach Buckeye Broadband.
Century Link/Lumen CONTACT Josh.Motzer@lumen.com WEBSITE https://www.lumen.com/en-us/home.html	√			√	44883 - Tiffin	Speed varies by serving address and customer equipment. Higher speed availability is more limited in Seneca County as the customer must live close to serving device; however, show floor of 1.5 Mbps and 10 Mbps in Connect America Fund Phase II areas	2.4%	$44.95 - $149.95/ month	Lifeline Program; also offer metered plans (in addition to unlimited plans) for gigabit connectivity to provide more pricing options	N/A	Fiber	Bascom Communications is a nonprofit cooperative that has actively constructed broadband in Seneca County since 2003. Bascom's current construction in Seneca County is under its FCC RDOF award. Bascom's cooperative structure reinvests the money generated by network users into further network expansion. Although gigabit connectivity is available for all within footprint, approximately 83% of their subscribers select the lowest cost service package. Historically Bascom has not pursued state/ federal grants given significant compliance and limited staff, but are very interested in local funds for expansion.
					43410 - Clyde		5.1%					
					44818 - Bloomville		26.1%					
					44867 - Republic		15.4%					
					44836 - Green Springs		93.4%					
					44841 - Kansas		5.5%					
					44861 - Old Fort		78.1%					
					44809 - Bascom		10%					

Company	Current Presence in Seneca County *(** in name signals no current presence)*	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Charter Communications (Spectrum) CONTACT Brian.Young1@charter.com WEBSITE www.spectrum.com	√	√	√	√	44802 - Alvada	Up to 50 Mbps download	58.40%	$49.99 - $89.99/ month	Spectrum Internet Assist; Stay Connected K-12	N/A	Cable/ Fiber	Charter Communications (“Charter”) currently provides service in all of Seneca County’s municipalities/ villages. Although they were awarded under RDOF in Seneca County, their build will be limited to one census block/approximately 25 passings – construction will begin this year. Once complete, Charter’s RDOF build will offer fiber-to-the-premises (“FTTP”) service up to 1 Gbps. Although Charter was not awarded under ORBEG for Seneca County, their Huron County award splits Seneca East School District on the Huron County side. Charter believes they could serve any part of Seneca County with the right conditions given their hubs in Bascom, Green Springs, Huron County, and Wyandot County; but, they typically avoid expanding in markets that already have a fiber presence. However, Charter would be interested if a local procurement were available for broadband.
					44807 - Attica		68.70%					
					44883 - Tiffin		88.60%					
					44830 - Fostoria		92.80%					
					44811 - Bellevue		85.20%					
					43410 - Clyde		93.70%					
					43316 - Carey		77.80%					
					44818 - Bloomville		53.70%					
					44867 - Republic		48.20%					
					44836 - Green Springs		64.70%					
					44853 - New Riegel		54.80%					
					44841 - Kansas		73.70%					
					44844 - McCutchenville		70.40%					
					44809 - Bascom		100.00%					
					44815 - Bettsville		100.00%					
					44828 - Flat Rock		100.00%					
					44845 - Melmore		100.00%					
					44861 - Old Fort		100.00%					
Earthlink WEBSITE https://internet.earthlink.net					44807 - Attica	Up to 75 Mbps	45.00%	N/A				Earthlink is a 3rd party vendor, not a direct provider. They service AT&T, Verizon, etc. in Seneca County, but they do not have their own lines, nor their own footprint
					44883 - Tiffin		15.00%					
					44830 - Fostoria		45.00%					
					44811 - Bellevue		28.00%					
					43410 - Clyde		29.00%					
					43316 - Carey		43.00%					
					44818 - Bloomville		45.00%					
					44867 - Republic		34.00%					
					44836 - Green Springs		45.00%					
					44853 - New Riegel		79.20%					
					44802 - Alvada		13.00%					
					44844 - McCutchenville		26.00%					
					44809 - Bascom		45.00%					
					44815 - Bettsville		45.00%					
					44828 - Flat Rock		8.00%					
					44861 - Old Fort		45.00%					

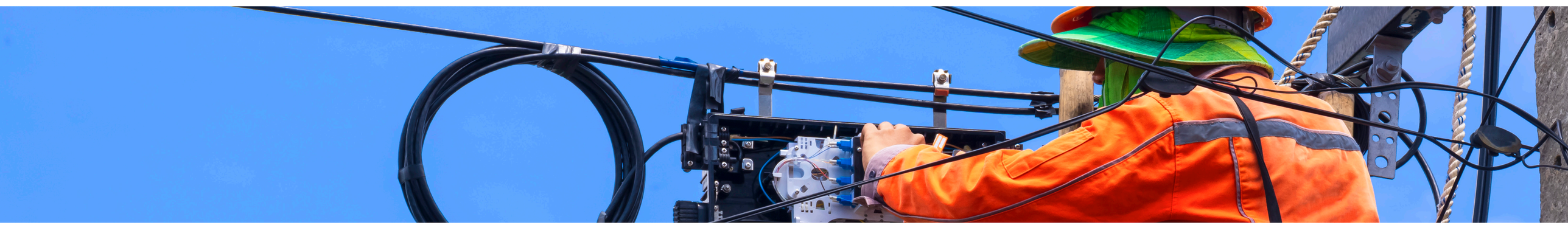
Company	Current Presence in Seneca County *(** in name signals no current presence)*	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Frontier Communications*** WEBSITE www.frontier.com	√				44811 - Bellevue	Up to 6 Mbps download	87.40%	$32.99 - $149.99/ month	E-Rate Program; Lifeline Program; Rural Healthcare Program	N/A	DSL	***The Project Team was unable to reach Frontier Communications.
					43410 - Clyde		89.30%					
					43316 - Carey		92.30%					
					44818 - Bloomville		66.20%					
					44807 - Attica		89.80%					
					44867 - Republic		67.20%					
					44836 - Green Springs		7.70%					
					44841 - Kansas		62.40%					
					44844 - McCutchenville		16.80%					
					44815 - Bettsville		100.00%					
					44828 - Flat Rock		98.20%					
HDER Link*** WEBSITE https://hderlink.com/	√				44802 - Alvada	Up to 100 Mbps download	100.00%	$34.99 - $109.99/ month	N/A	N/A if customer pays installation fee	Fixed Wireless	***The Project Team was unable to reach HDER Link.
					43316 - Carey		100.00%					
					44818 - Bloomville		83.80%					
					44853 - New Riegel		99.60%					
					44841 - Kansas		7.80%					
					44844 - McCutchenville		100.00%					
					44845 - Melmore		100.00%					
HughesNet CONTACT Mark.Wymer@hughes.com WEBSITE www.hughesnet.com	√				44802 - Alvada	Up to 25 Mbps download	99.40%	$64.99 - $159.99	N/A	2 years required	Satellite	"HughesNet is a geo orbit satellite service provider that covers all of the lower 48 states. Their impediments to service are line of sight issues from the ground position to the satellite orbit spot, but this is very low (~2%), and typically in locations with mountains/ buildings/ trees engulfing the service area. HughesNet offers service for an allocated amount of data (similar to cellular) – speeds are guaranteed up to that data amount, but after that it goes to the network's "best efforts." HughesNet has invested in low-orbit satellite (similar to SpaceX Starlink). These are still in the evaluation stage regarding how to bring products to market, but they anticipate that roll-out is in foreseeable future. In addition to low orbit, HughesNet is testing/ exploring a hybrid satellite/ wireless network under its "Fusion" product line. This service utilizes the terrestrial service to mitigate latency issues, which enables business applications that are more latency sensitive, and then uses the geo satellite platform for large data downloads and data usage. Those products will be rolling out in next couple years across full footprint, but it does require them to build-out wireless in specific areas where others are not available and enter into partnerships with existing, larger carriers/ providers. HughesNet is also launching its Jupiter 3 (J3) platform – currently they have Jupiter 1 and Jupiter 2 satellites. This launch will double the size of HughestNet's current capacity, delivering faster speeds and more data allocations – for example, J3 will be able to support plans up to 50 Mbps or 100 Mbps download in some areas. HughesNet does not target areas where cable/fiber/ faster terrestrial services are available – those services out-perform them. HughesNet instead targets areas where it is not cost effective for those services to deploy, such as the lower population density/ topography-challenged regions where it may cost thousands of dollars per house served with fiber."
					44807 - Attica		100.00%					
					44883 - Tiffin		100.00%					
					44830 - Fostoria		100.00%					
					44811 - Bellevue		100.00%					
					43410 - Clyde		100.00%					
					43316 - Carey		100.00%					
					44818 - Bloomville		100.00%					
					44867 - Republic		100.00%					
					44836 - Green Springs		99.31%					
					44853 - New Riegel		98.72%					
					44841 - Kansas		98.11%					
					44844 - McCutchenville		100.00%					
					44809 - Bascom		100.00%					
					44815 - Bettsville		100.00%					
					44828 - Flat Rock		100.00%					
					44845 - Melmore		100.00%					
					44861 - Old Fort		100.00%					

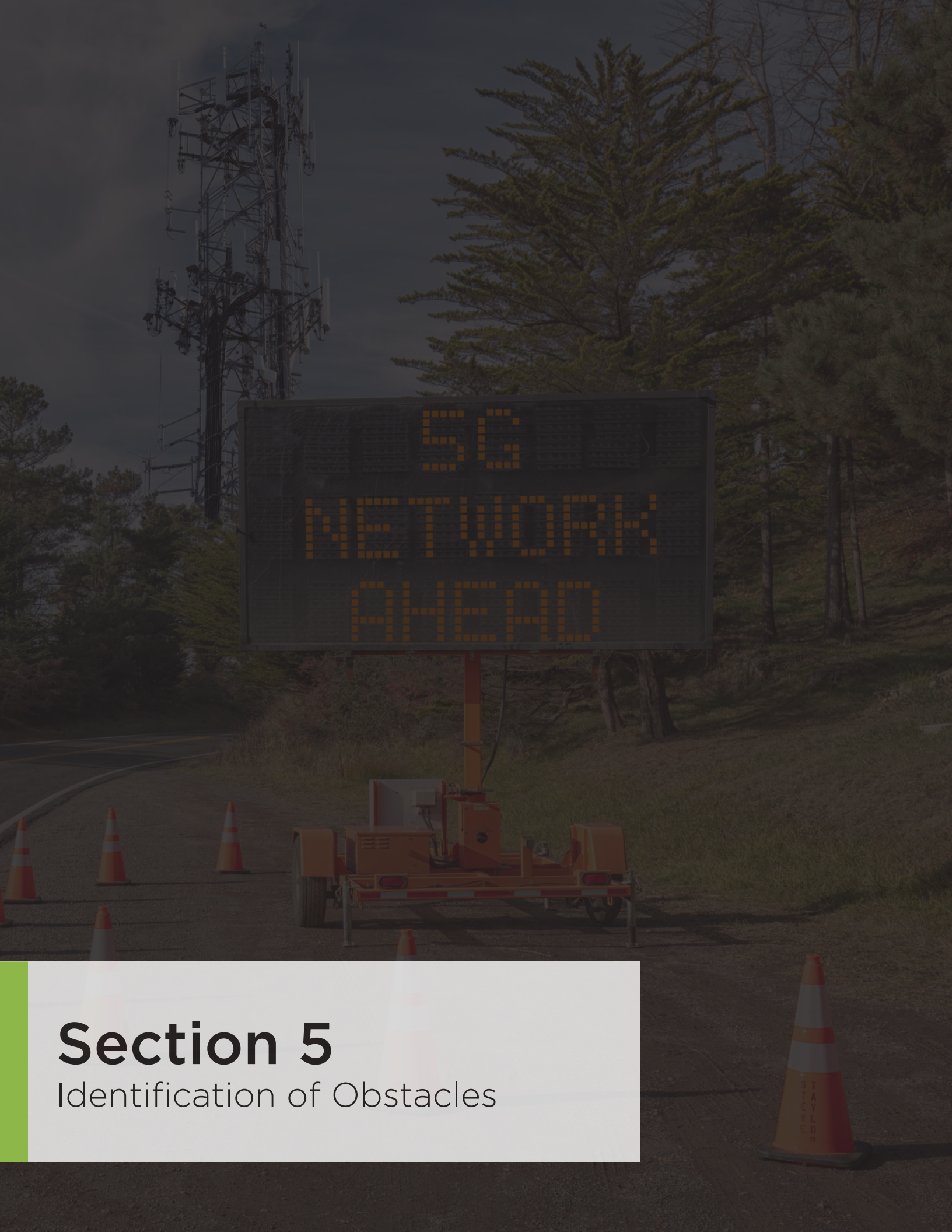
Company	Current Presence in Seneca County (** in name signals no current presence)	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Lit Communities*** CONTACT ckirkland@litcommunities.net WEBSITE https://litcommunities.net/												Work with a sister co-op organziation to North Central Electric Cooperative through Federated Energy Services Cooperative, Inc. (FESCO) in their Medina County deployment. They would be interested in a similar deployment in Seneca County.
MetaLink Technologies*** WEBSITE https://www.metalink.net/	√				44830 - Fostoria	Up to 15 Mbps download	8.00%	$69.95 - $99.95/ month	N/A	3 Years Required	Fixed Wireless/ Cellular	***The Project Team was unable to reach META Link.
NCOOL*	√				44807 - Attica 44811 - Bellevue 44818 - Bloomville 44867 - Republic 44828 - Flat Rock	Up to 25 Mbps download	100.00% 44.90% 72.30% 30.20% 100.00%	$75 - $100/ month	N/A	N/A	Fixed Wireless	***The Project Team was unable to reach NCOOL.
North Coast Wireless* CONTACT Matt@ncwcom.com WEBSITE https://www.ncwcom.com/	√				44807 - Attica 43410 - Clyde 44836 - Green Springs 44828 - Flat Rock 44811 - Bellevue	Up to 100 Mbps download	14.60% 97.30% 10.40% 100.00% 97.50%	$39.95 - $149.95/ month $39.95 - $89.95/ month	N/A	1 Year required	Fixed Wireless	***The Project Team was unable to reach North Coast Wireless.
Omni Fiber* CONTACT Darrick.Zucco@omnifiber.com WEBSITE https://www.omnifiber.com/												Considering a local build using private capital.
Ohio Transparent Telecom** CONTACT Megan@OhioTT.com WEBSITE https://ohiott.com/												Offers a Massive MIMO LTE wireless services targeting difficult to serve areas of Ohio.

Company	Current Presence in Seneca County (** in name signals no current presence)	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Sycamore Telephone Company CONTACT rick.ekleberry@syctelco.com WEBSITE http://sycamoretelephone.net/	√				43316 - Carey	25 Mbps service up to 250 Mbps+ symmetrical service available through their fiber service; 3 Mbps download/ 1 Mbps upload to 10 Mbps download/ 1 Mbps upload on DSL	4.7%	$44.95 is the base price for 25 Mbps symmetrical fiber service; all packages within Sycamore Telephone Company's Local Exchange Carrier ("LEC") footprint require voice line	N/A	N/A	Fiber/ DSL	Sycamore Telephone Company ("Sycamore") expanded fiber in Seneca County in 2021, but the federal maps do not include their full fiber coverage, which includes over approximately 150 miles of fiber in 3 counties (Wyandot (majority), Seneca, and Crawford). Sycamore is an ACAM elector through the FCC and must expand enough annually to meet the program requirements – most expansion in Seneca County in the upcoming years will be based on these commitments and have minimal planned expansion otherwise in Seneca County, but this could change if a local procurement was available.
					44818 - Bloomville		4.60%					
					44845 - Melmore		99.10%					
					44844 - McCutchenville		100.00%					
TDS* **	√				44802 - Alvada	Up to 100 Mbps download	49.30%	24.95/ month	N/A	N/A	DSL	***The Project Team was unable to reach TDS.
					43316 - Carey		6.90%					
T-Mobile Fixed Wireless/Ultra Home Internet CONTACT mick.berstein3@t-mobile.com WEBSITE https://homeinternet.ultramobile.com/	√			Mobile: yes Fixed: no	44802 - Alvada	Up to 115 Mbps download	10.20%	$50 - $55/ month	N/A	N/A	Fixed Wireless/ Cellular	T-Mobile is focused on nationwide mobile 5G. Ultra Home Internet is backed by T-Mobile's 5G and LTE network and shares T-Mobile's coverage and availability. Ultra Home Internet is one of the newcomers in the residential internet market as more mobile providers begin using 5G to provide home internet over their current networks.
					44807 - Attica		95.70%					
					44883 - Tiffin		20.20%					
					44830 - Fostoria		30.50%					
					44811 - Bellevue		86.80%					
					43410 - Clyde		23.40%					
					43316 - Carey		81.00%					
					44818 - Bloomville		27.50%					
					44867 - Republic		10.80%					
					44853 - New Riegel		5.60%					
					44828 - Flat Rock		24.70%					
Verizon* ** WEBSITE www.verizon.com	√											***The Project Team was unable to reach Verizon.
ViaSat CONTACT Jason.Sophinos@viasat.com WEBSITE www.viasat.com	√				44802 - Alvada	Up to 100 Mbps download	98.30%	$65 - $250/ month	N/A	2 years required	Satellite	ViaSat has widespread service, it is a question of what class of service - the low end of service is 12 Mbps download. The service requires line-of-sight to the southern sky and extreme weather can still impact service. They are not attempting to compete with fiber, but provide an option in areas that cannot get more than DSL service, or to serve as a temporary option until terrestrial service is available.
					44807 - Attica		100.00%					
					44883 - Tiffin	25 - 50 Mbps download	100.00%					
					44830 - Fostoria	Baseline of 12 Mbps download	100.00%					
					44811 - Bellevue		100.00%					
					43410 - Clyde		100.00%					
					43316 - Carey		100.00%					
					44818 - Bloomville		100.00%					
					44867 - Republic		100.00%					
					44836 - Green Springs		98.65%					
					44853 - New Riegel		95.71%					
					44841 - Kansas		96.67%					
					44844 - McCutchenville		96.60%					
					44809 - Bascom		100.00%					
					44815 - Bettsville		100.00%					
					44828 - Flat Rock		100.00%					
					44845 - Melmore		100.00%					
					44861 - Old Fort		100.00%					

Company	Current Presence in Seneca County *(** in name signals no current presence)*	Applied for OH Residential Broadband Expansion Program for Seneca County	RDOF Recipient in Seneca County	Participate in ACP	Coverage by Zip Code	Speed	Availability in Seneca County	Pricing	Offer Additional Low-cost Program(s)	Contract Timelines	Type of Service in Seneca County	NOTES
Watch Communications CONTACT mmiller@corp.watchcomm.net WEBSITE https://watchcomm.net/	√			√	44802 - Alvada	10 - 100 Mbps download	100.00%	$59.99 - $120/ month	Lifeline Program; PCs for People	N/A	Fixed Wireless	Watch Communications was awarded Connect America Fund (CAF) Phase II funding in the Eastern and Southeastern portions of Seneca County in October 2019. Build-out using this funding must be complete by the of the sixth (6th) year after the awards and 40% of the build-out must be complete at the close of 2022 (with 60% by the end of 2023 and 80% by the end of 2024). Watch Communications is a year and a half ahead of schedule. Once complete, there will be nine (9) new fixed wireless sites offering 100 Mbps download/ 20 Mbps upload. Watch Communications also has three (3) Priority Access Licenses ("PALs") for Citizens Band Radio Service ("CBRS") spectrum in Seneca County.
					44807 - Attica		17.60%					
					44883 - Tiffin		99.90%					
					44830 - Fostoria		99.90%					
					44811 - Bellevue		100.00%					
					43410 - Clyde		100.00%					
					43316 - Carey		100.00%					
					44818 - Bloomville		83.60%					
					44867 - Republic		97.60%					
					44836 - Green Springs		100.00%					
					44853 - New Riegel		100.00%					
					44841 - Kansas		100.00%					
					44844 - McCutchenville		90.30%					
					44809 - Bascom		100.00%					
					44815 - Bettsville		100.00%					
					44828 - Flat Rock		100.00%					
					44845 - Melmore		100.00%					
					44861 - Old Fort		100.00%					
Wavelinc Communications CONTACT kurt@wavelinc.com WEBSITE http://www.wavelinc.com/	√	√			44807 - Attica	25 Mbps download/3 Mbps upload; 50 Mbps download/5 Mbps upload; 100 Mbps download/ 10 Mbps upload	95.30%	$74.95 for 25 Mbps download/ 3 Mbps upload; $99.95 for 50 Mbps download/ 5 Mbps upload; $149.95 for up to 100 Mbps download/ 10 Mbps upload	N/A	None required - all service is month-to-month	Fixed Wireless	Wavelinc's long-term goal is to transition from fixed wireless to fiber and is interested in leasing existing fiber from in Seneca County to expand to desired areas. While they are currently not building in Seneca County, they are active in neighboring counties and would be interested in expanding these builds into Seneca County, especially considering existing towers in the county. Their towers are currently connected by microwave links and need to be upgraded to fiber. Wavelinc has not previously applied for federal grant programs, but is considering. Wavelinc is self-funded to cost can be a large barrier. If Seneca County issued a procurement they would be interested.
					44818 - Bloomville		99.90%					
					44867 - Republic		27.70%					

***It is important to note that the above check marks are not intended to rank or score the providers.**

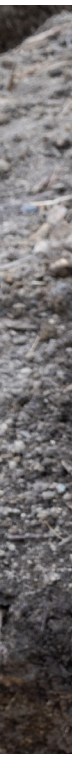




Section 5

Identification of Obstacles

5 Identification of Obstacles



In this section, we identify potential obstacles to broadband deployment in Seneca County, including physical obstacles, legal/ statutory/regulatory obstacles, and more.

We then list the associated recommendations to overcome such obstacle. Some of the following obstacles are more easily surmountable than others. While overcoming these obstacles can incentivize further build-out, not all need to be addressed simultaneously to expand broadband in Seneca County.

Notably, no legal/ statutory/ regulatory obstacles were identified in Seneca County from our statutory review, survey, stakeholder meetings, and provider engagement. According to the Seneca County Engineers Office, depending on the terrain (i.e., bedrock, soil, etc.), they require wired broadband infrastructure to be buried four (4) feet below the surface or soil and ten (10) feet under any stream. Three (3) to four (4) feet is a common depth of bury among Ohio counties. Further, existing Internet Service Providers said that working with local government is not an obstacle to local build-out. This is highly positive feedback as it is often a challenge in many other jurisdictions.

Obstacle 1:

COORDINATING LOCAL BROADBAND PROVIDER EFFORTS

It is both a benefit and a challenge that Seneca County has such a high number of broadband service providers present in the county. Among the challenges is that the presence of so many providers, especially those with smaller footprints, can lead to available service being overestimated in Seneca County on federal broadband maps. The more areas that are depicted as served, the less Federal and/ or State funds may be targeted to Seneca County, which has already been the experience in the first round of the Ohio Residential Broadband Expansion Grant Program.

Further, as some of these programs have, to-date, maintained lower broadband speed requirements in order to be deemed un- or underserved (such as 10 Mbps download/ 1 Mbps upload and 25 Mbps download/ 3 Mbps upload, respectively, under the Ohio Residential Broadband Expansion Grant Program), areas are shown as “served” although the service that is available is less robust than what may be present in other areas of Seneca County.

Coordinating build-out among so many providers can also be challenging and opportunities to enhance efficiencies and reduce costs, such as by ensuring that multiple providers are given access to open trenches, existing fiber and conduit, and opportunities to co-locate on existing infrastructure, have likely been missed. However, we were informed in our provider interviews that providers have discussed collectively overlaying fiber across Seneca County.

Obstacle 2:

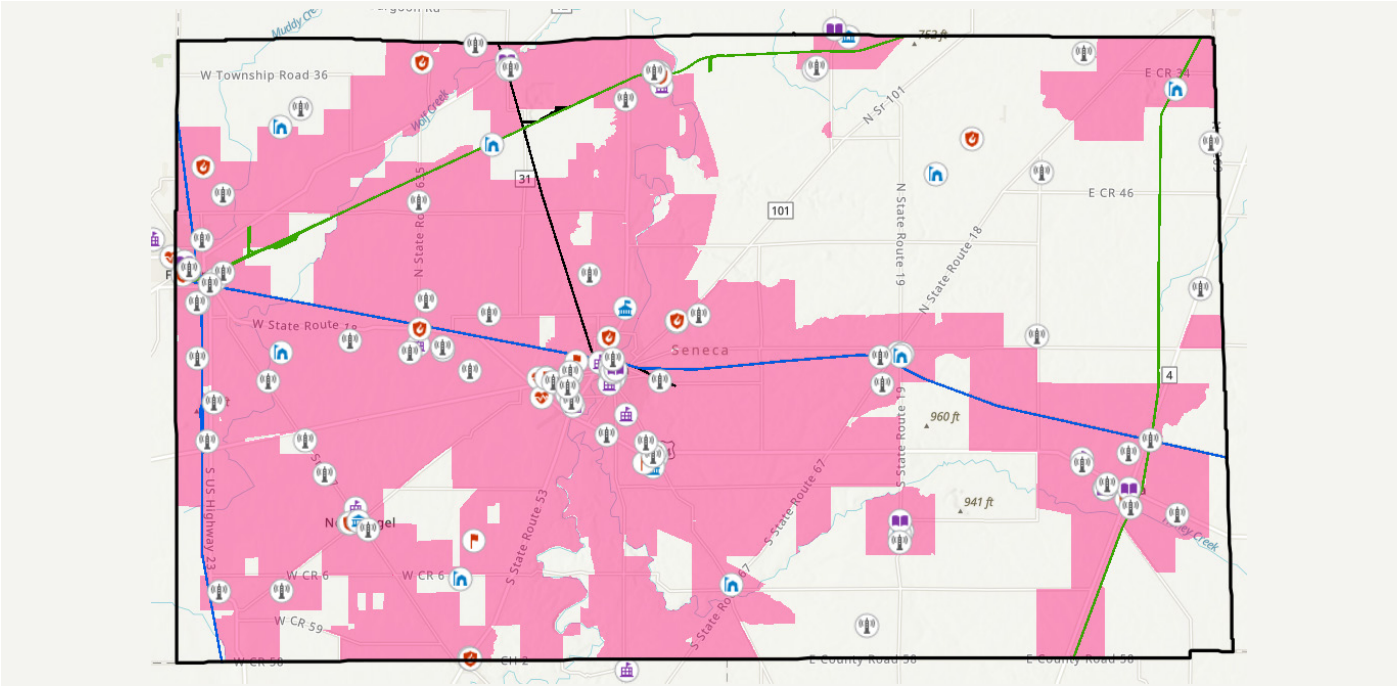
COORDINATING BROADBAND BUILD-OUT WITH EXISTING UTILITIES AND RAIL PROVIDERS

Expanding broadband can be a balancing act among multiple entities with disparate interests. Broadband deployment also has many land use considerations and implications. For example:

- Some wired ISPs prefer to install their networks underground for security purposes, yet water and sewer companies likely will not want wired broadband lines installed within a certain proximity to their infrastructure.
- Some wired ISPs prefer to install their networks aerially because it is often more cost-effective. The North Central Electric Cooperative ("NCEC") has significant infrastructure in Seneca County but utilizing their poles for this purpose is likely to be subject to additional approvals and costs, such as make-ready.[1] Additionally, NECE deploys its electric service lines through many private limited easements rather than using available general public rights of way which tend to cost less and allow for other services in addition to electric.
- Three rail organizations are present throughout Seneca County: CSX, Norfolk Southern, and Omni Track.

Rail has many rights-of-way and can provide significant opportunity for fiber broadband expansion.[i] Further, in 2022, TowerCo and Norfolk Southern Corporation ("Norfolk Southern") announced a strategic partnership to expand market opportunities for wireless carriers along Norfolk Southern's rights-of-way and industrial real estate parcels.[ii]

However, rail companies have traditionally been protective of their rights-of-way and broadband providers in Seneca County expressed that rail permits are expensive and can take several months to secure, which can be especially problematic in bringing service to locations such as The City of Fostoria, as it is surrounded by rail lines. Fees can also vary, and structures may be on a case-by-case basis. For example, through our provider engagement, the Project Team was informed by a provider that CSX and Norfolk Southern have been "good to work with recently," but Omni track charged $5,000/ year for crossings with an escalator clause.



^ MAP: RAIL MAP OVER BROADBAND

1 The Project Team reviewed the North Central Electric Cooperative's Pole Attachment agreement and believes the terms are reasonable based on normal market conditions. However, it is important to note that, depending upon the circumstances and specifics of each individual attachment, the fee charged for each attachment may vary.

Obstacle 3:

BROADBAND ADOPTION VERSUS COST-PER-PASSING

There are two key barriers to broadband expansion occurring in a community at a pace that aligns with local demand: lack of population density and/ or challenging area topography. A challenging local topography can increase the capital expenditures needed to build-out a broadband network. With a lack of population density, even if every household in an area signs up for service, it may be insufficient for the provider to recoup its investment in the build-out. Broadband providers will have different "take rates" needed to secure a return on investment ("ROI") based on their company's economics. For example, some area providers referenced needing a take rate of approximately 25% within the first year, but this number will vary by provider. Additionally, challenging geographic topography such as numerous hills or significant crossing required due to numerous streams/lines can increase build out costs and provide economic challenges for providers. Communities with one or both of these challenges will be less likely to see investment in local broadband expansion.

Network access is only one piece of the broadband puzzle: the other is adoption/ subscription to the access that is available, and local residential economics are creating further challenges in Seneca County (i.e., even if service is available, households may not be able to afford it, or are limited to subscribing to lower-tier packages). For example, according to Bascom Communications, although gigabit connectivity is available for all within its footprint, approximately 83% of subscribers select the lowest cost service package. Sycamore Telephone Company echoed this experience with the majority of subscribers selecting their lowest cost fiber package. Watch Communications shared a similar experience. This creates further challenges to a provider's ROI.

Broadband access has shifted from a luxury to a necessity, given its role in communication, business, education, socialization, and service delivery. Every household and business needs options for robust, high-speed internet to operate and sustain. However, we have already reached the tipping point in broadband in which, if an area has not already seen service expansion, it is unlikely to do so due to lack of perceived return on investment for private providers for the reasons stated above. In such areas, there are two primary tactics to encourage broadband build-out:

1. Financially incentivize broadband expansion, such as through local contributions; and/ or
2. Reduce build-out costs, such as to access to existing infrastructure.

In utilizing these tactics, the following must be considered in Seneca County:

- In the eastern part of Seneca County (east of the river), tree cover can be problematic for fixed wireless service.
- Given the topography in some areas of Seneca County, particularly the southeast region, the cost per passing for a last-mile fiber deployment can be high, making it even more challenging for a private provider to recoup investment.
- Backhaul fiber is also a problem in Seneca County – fixed wireless providers can use fixed wireless backhaul for a period, but this is challenging in areas with significant tree cover.
- However, we were informed that the soil in Seneca County is favorable to underground fiber builds.
- There is not a plethora vertical structures available in Seneca County and those that are present are often already "taken" by multiple fixed wireless providers. Further, feedback from area fixed wireless providers was that tower owners attempt to charge fixed wireless providers similar rates on macro towers as they would a cellular/ mobile carrier, but the possible end-user subscribers for the fixed wireless deployment are significantly less than those for a mobile provider, making it cost-prohibitive.

Obstacle 4

THE COMPLEXITY OF APPLYING FOR AND COMPLYING WITH FEDERAL BROADBAND FUNDING PROGRAMS

As stated above, one tactic to encouraging broadband expansion is to financially incentivize its construction. Historically, many communities that were interested in launching and/or encouraging broadband initiatives were unprepared to fund such projects. However, a silver lining of the COVID-19 pandemic is it solidified that access to robust, reliable, affordable broadband is imperative, and, as a result, we are seeing unprecedented amounts of federal and state dollars for its expansion.

We provide an analysis of these dollars, as well as traditional financing tools, in the Funding section of this Plan. As detailed therein, in some instances, Seneca County and/or its political subdivisions may be an eligible applicant, in other programs a public or private entity/partner may be eligible to apply, and in certain circumstances a combination of the two, a public-private partnership ("P3") may be the most appropriate applicant.

Obstacle 5

LABOR SHORTAGES EXIST FOR BOTH FIBER AND WIRELESS NETWORK EXPANSION

Several providers, both fiber and wireless, expressed issues with staffing and concerns regarding the labor shortage. In the fiber industry, a specific need for directional boring training was raised.

Recommendations to address the above Obstacles:

1. *Utilize and maintain the Asset Inventory provided with this Study:*

We recommend that private providers seeking to expand in Seneca County be provided with the Asset Inventory created as part of this Study, and that such inventory continue to be updated and maintained by the County GIS Department. The interactive Asset Map is available at: https://dlzcorp.maps.arcgis.com/apps/instant/basic/index.html?appid=d6542739301c48829cc396c009f1b45d.

Seneca County can further support use of such assets by enacting dig-once and asset management policies (including what entities currently utilize such assets, barring confidentiality requirements) to facilitate broadband deployment by encouraging use of space available for access/lease for wireless broadband expansion (e.g., rooftops, streetlights, communications towers, municipal electric poles, certain flag poles, water towers under municipal ownership, water tanks), as well as wired expansion (e.g., dark fiber, existing conduit). Once created, such infrastructure can be leased to providers to facilitate deployment.

A major cost barrier to broadband expansion, particularly wired broadband, is the cost of excavating existing roadways or otherwise digging, boring, or trenching into the ground. A dig-once policy is a commonsense method to reducing the cost of infrastructure deployment.

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

Dig-once policies typically require that broadband providers be notified when public rights-of-ways are excavated/ opened so that they can have the opportunity to install broadband infrastructure, including conduit and/ or fiber optics. Such policies often require that dedicated internet conduit be laid in the right-of-way during new construction to prepare for future broadband needs."[iii] A dig-once policy is a common-sense method of reducing the cost of communications infrastructure deployment. However, Seneca County should think broadly when implementing a dig-once policy - broadband infrastructure does not simply have to be buried alongside a roadway project or in coordination with a telecommunications project.

A dig-once policy can help get additional conduit and fiber under the ground; however, this is only one approach to broadband expansion – the other is above ground. One approach to doing so is enacting a broadband asset management policy to facilitate use of existing vertical infrastructure. Such infrastructure should not be limited to traditional micro and macro communications towers.

In addition, we encourage collaboration with area municipalities to ensure that their publicly owned infrastructure available for broadband expansion is included. For example, water towers and tornedo sirens could be utilized with the appropriate propagation studies.

Other sites for consideration are those utilized by public and private utility providers. There are also many privately owned sites in Seneca County that could serve as a co-location site and aid in coverage expansion, including grain silos.

2. *Issue a County-led procurement process to encourage build-out in target areas:*
Historically, governments were forced to be reactive as opposed to proactive when it pertained to broadband build-out within their communities – they simply had to wait until the private provider built out. We have already reached the tipping point in broadband access in which, if a large carrier has not yet expanded service to an area, they are unlikely to do so due to a perceived inability to create a return on investment. As a result, those areas that are more populous show stronger service coverage than less dense, more rural areas of the region. This aligns with the broadband access experience across Ohio and the United States.

Two approaches that Seneca County can take to encourage local provider expansion and enhance competition among private entities in the shorter term include:

(1) subsidizing costs through a procurement, grant/ loan funds, or financing; and/ or

(2) reducing costs of build-out through expedited permitting, reduced processes, etc. Our recommendations above are examples of this approach.

As was experienced in the round of the Ohio Residential Broadband Expansion Grant program, Seneca County may be challenged to receive federal and state grant awards as compared to Appalachian areas of Ohio. As a result, to continue to address broadband access and adoption gaps, **we recommend that Seneca County oversee a local procurement process in order to solicit responses for potential strategies and partnerships to expand affordable, high-speed broadband.**

> *"Strategically accessing and building towers within rural areas throughout the state will allow for greater distribution of wireless solutions. Especially focusing on unserved locations can bring high-speed internet solutions to these areas."*
>
> — Source: The Ohio Broadband Strategy

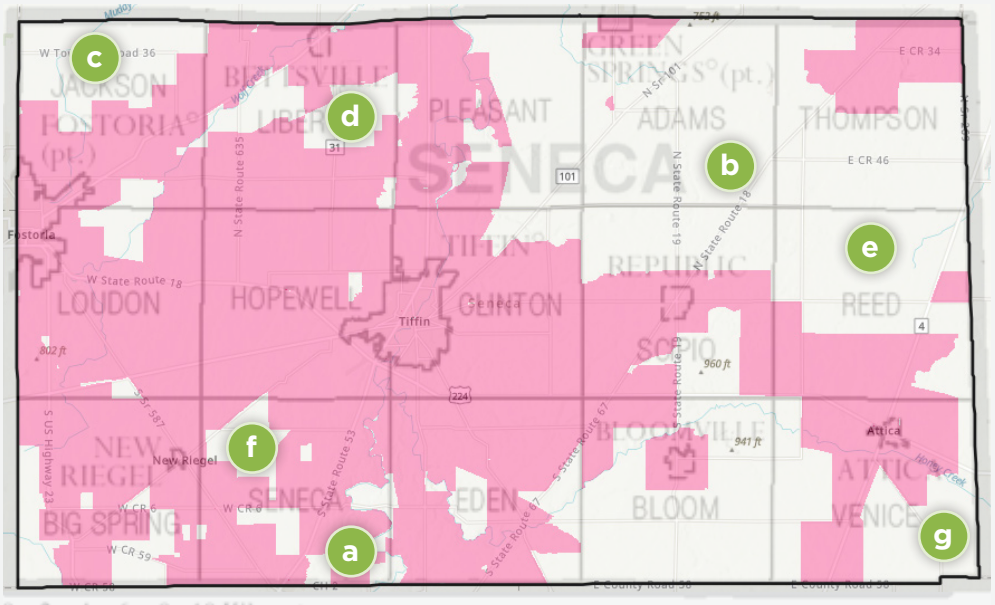
Sample procurement processes that have been utilized in other Ohio communities, such as those included in ***Appendix D.*** However, many of these are limited solely to fiber or solely to wireless.

Although fiber is one of the more expensive solutions up front, it may be a proportionally lower cost solution in the long run. Additionally, fiber networks are generally easier to operate and maintain and often require less troubleshooting than other connections. However, fixed wireless' use of airwave transmission alleviates the need for infrastructure- and maintenance-dependent phone or cable lines. Further, unlike mobile broadband systems, which are limited by the capacity of the system and frequently institute a cap on usage or charge a high premium above a defined usage level, fixed wireless broadband is not as sensitive to capacity issues and monthly plans typically allow for unlimited usage. As a result, it is often a more affordable broadband service option.

Given various topography and density challenges, **we recommend that Seneca County open this opportunity to all area providers to see who will provide the best option** to do all of the following:

1. Partner with Seneca County;
2. Build-out broadband service at speeds of 100 Mbps download/ 20 Mbps upload, or greater,[2] at the lowest cost/ most cost-effective construction rate, targeting specific areas (specifics listed on map below).
3. Provide such service to the greatest number of Seneca County residents, businesses, and community anchor organizations;
4. Provide such service at an affordable price to Seneca County residents; and
5. Utilize the greatest amount of existing infrastructure within Seneca County, identified in the Asset Inventory.

2 *In order to align with American Rescue Plan, the Infrastructure Investment and Jobs Act, and other federal program requirements.*



Speeds of 100 down & 20 up

a. Fiber expansion in eastern Seneca County, particularly southeastern Seneca County where tree cover is problematic for fixed wireless options;
b. Broadband coverage into Adams Township;
c. Expanded broadband coverage in Jackson Township;
d. Broadband coverage into Liberty Township;
e. Broadband coverage into Reed Township;
f. Broadband coverage into Seneca Township
g. Expanded broadband coverage into Venice Township.

In addition to its own funds, we recommend that Seneca County leadership engage leaders in local jurisdictions within Seneca County to determine whether they would be willing to contribute funds to projects targeting their area. For example, over $13 million is allocated to units of government in Seneca County through the American Rescue Plan. Given that the recommended targeted areas include several townships, we recommend that the Seneca County Commissioners approach other jurisdictions within the county to determine availability and willingness to contribute American Rescue Plan allocations to broadband projects targeting their area. The complete list of ARP allocations is provided below:

Seneca County ARP

UNIT OF GOVERNMENT	ARP ALLOCATION
Adams Township	$135,653
Attica Village	$90,191
Bettsville Village	$65,155
Big Spring Township	$152,308
Bloom Township	$84,220
Bloomville Village	$95,428
Clinton Township	$422,147
Eden Township	$225,215
Hopewell Township	$286,913
Jackson Township	$153,670
Liberty Township	$137,433
Loudon Township	$214,635
New Riegel Village	$24,721
Pleasant Township	$167,602
Reed Township	$85,163
Republic Village	$54,471
Scipio Township	$119,416
Seneca County	$10,717,680
Seneca Township	$162,469
Thompson Township	$144,661
Venice Township	$86,001
TOTAL:	**$13,625,152**

This funding should also help in overcoming make-ready costs (i.e., the costs of getting an existing utility pole ready for the fiber)[3] and labor shortages. For example, additional "points/ funds" could be awarded if applicants (1) utilize existing assets as identified herein, (2) incorporate digital inclusion efforts as discussed further below, and (3) partner with local training programs (e.g., offer staff as instructors) and/ or commit to hiring from those programs, as also discussed below.

Other counties have prioritized building out by self-created zones, U.S. census tracts, or simply as the areas shown to lack broadband service according to available mapping tools. We recommend that Seneca County Commissioners issue a procurement that prioritizes geographical units within the county – doing so would not create exclusivity as additional providers could continue to expand in those areas but would give additional predictability and enable Seneca County to set its expectations for build-out to ensure county-wide consistent speeds. Examples of such procurement documents from other jurisdictions are attached as ***Appendix D***. However, we do not recommend simply copying and pasting language from another community – any RFP should be tailored to Seneca County and be approved by the County's regular Purchasing Team and the County Prosecutor.

Enhancing awareness of local provider efforts will benefit Seneca County as it seeks to inform its citizens, and benefit providers as they try to determine possible subscription rates for an area.

3 Make-ready costs assessed by an electric utility are higher in urban areas compared to rural. One rule of thumb for a per foot estimate of overhead engineering and make-ready cost would be ~$3.00 per foot (~$10,000-$20,000 per mile).

3. *Address local digital inclusion challenges:*
Challenges to what has been historically called "broadband adoption" typically fall into one or both of two categories: (1) affordability (including devices, monthly costs, and one-time costs); and (2) a need for enhanced digital skills. **Feedback was repeatedly received from the local provider community in Seneca County that, even when higher service is available, local residents often select the lowest-cost package.** This demonstrates local affordability challenges.

To address the affordability issues in Seneca County we recommend distributing information on the Affordable Connectivity Program ("ACP") and other provider low-cost options. As a result of these programs, qualifying families may be able to secure robust, high-speed service for no cost.

The ACP was created under the Federal Infrastructure Investment and Jobs Act ("IIJA"). Formerly the FCC's Emergency Broadband Benefit Program ("EBB"), the ACP subsidizes broadband service for eligible households— defined as those that suffered income loss during the pandemic or meet other need-based criteria, such as eligibility for school lunch programs. The subsidy is provided at a lower rate than the EBB program (down to $30 from an original of $50 per month) to extend its longevity across the 5-year budget window. Certain participating providers have committed to offering a $30/ month packaging, meaning that ACP-eligible households with access to that provider's service will be able to subscribe to at-home internet with zero out-of-pocket cost.

Additional provider materials on their low-cost programs are provided in ***Appendix E*** and whether a provider is enrolled in the ACP is designated in the provider engagement section of the Study.

As of May 2022, the ACP program had 2,594 subscribers in Seneca County.[iv] In the EBB program, less than 25% of eligible households enrolled in the program in the majority of Seneca County.[v] However, approximately 38% of eligible households enrolled in the Fostoria area.[vi] Assuming similar numbers for the ACP program, there is a significant gap between eligible households enrolling and an opportunity to help Seneca County families get affordable options.

4. *Further address the skills gap and aid providers in staffing their build-out:*
In spring 2021, Vanguard-Sentinel Career and Technology Center was selected for a grant as one of the first three pilots for the Tower Technician Program through the Ohio Governor's Office of Workforce Transformation ("OWT").They are tasked with providing this program for the entire northwest portion of Ohio.

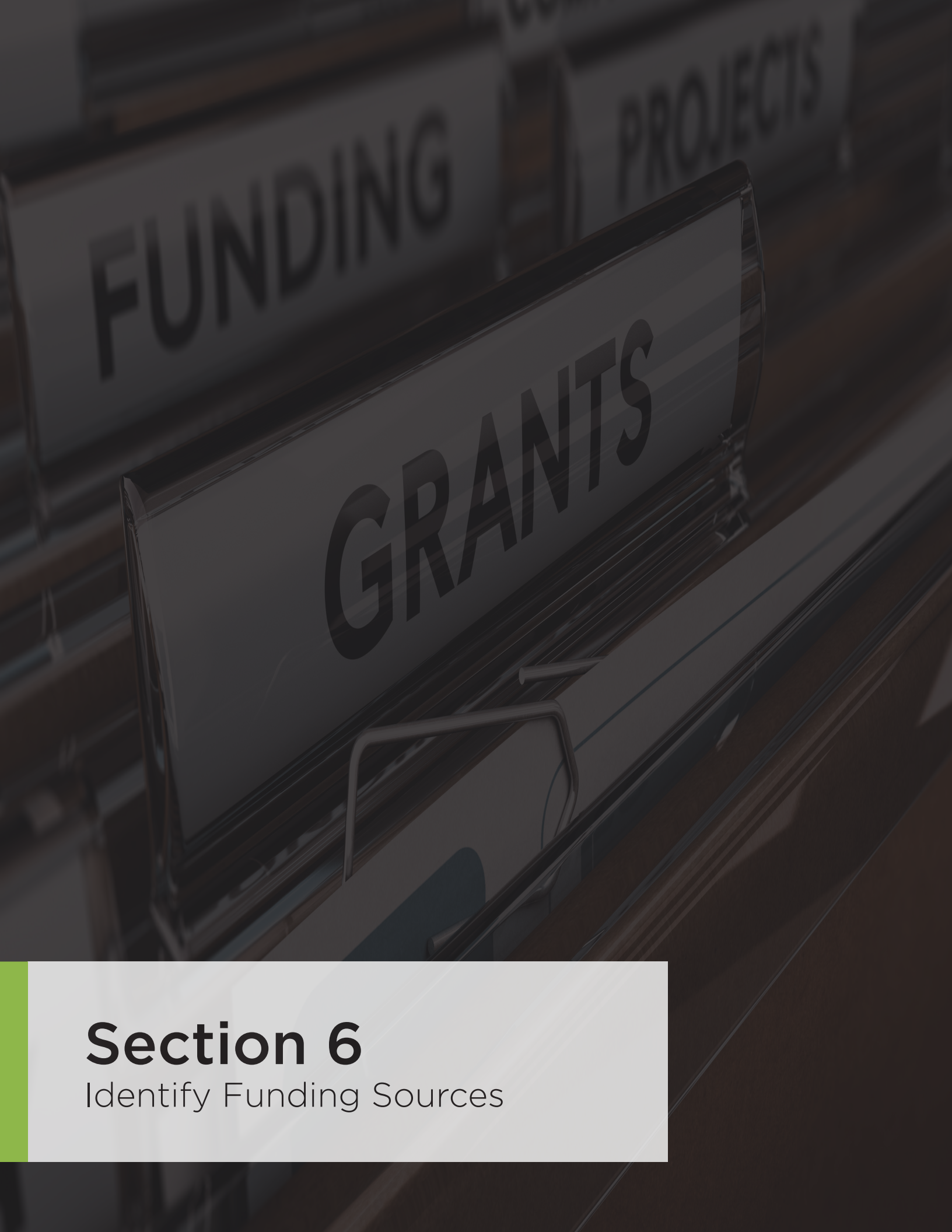
The Tower Technician Program is available for adults over the age of 21. Vanguard is currently recruiting and marketing for participants. Although only eight (8) individuals are required per class, only two (2) had registered at the time of our conversation, causing them to delay starting the six-week, eight-hours-per-day course. While the standard tuition for the program is $3,500 – 4,000, the first round is covered by the grant with only a $100 deposit required from the participants.

Vanguard-Sentinel Career and Technology Center has been coordinating with NATE: The Communications Infrastructure Contractors Association ("NATE"), a non-profit trade association dedicated to providing a unified voice for companies in the diverse tower and communications infrastructure construction, service, and maintenance industries;[vii] and Job & Family Services Departments to help market the program. Starting salaries for these positions range from $50,000-$60,000.

In addition, Terra State Community College was to participate in the Utility Construction Installer Certificate program. The program will help students by teaching them the basic electricity, blueprint reading and facility locating by introducing outside plant cabling practices, installed as aerial cable between poles in an underground conduit system or by direct burial. Upon competition of the program by meeting the required 30.5 credit hours, students will receive a certificate where they will be looking at a median salary of $65,000.[viii]

Vanguard-Sentinel Career and Technology Center and Terra State Community College have also discussed partnering to combine their programs for individuals who seek both trainings.

We recommend that Seneca County convene regular meetings between the Vanguard-Sentinel Career and Technology Center and Terra State Community College training programs, and the broadband providers identified earlier in this Study to discuss training curriculum and hiring needs, as well as opportunities for such providers to fill the training programs' own instructor hiring needs.



Section 6

Identify Funding Sources

6 Identify Funding Sources

Funding Sources

Historically, many communities interested in launching and/ or encouraging broadband initiatives were unprepared to fund such projects. However, a silver lining of the COVID-19 pandemic is it solidified that access to robust, reliable, affordable broadband is imperative, and, as a result, we are seeing unprecedented amounts of federal and state funding sources for its expansion. Below, we provide an analysis of these sources. In some instances, Seneca County and/ or its political subdivisions may be an eligible applicant, in other programs a public or private entity/partner may be eligible to apply, and in certain circumstances a combination of the two, a public-private partnership ("P3") may be the most appropriate applicant.

> Seneca County has utilized a variety of State and Federal grants for infrastructure improvements previously including . . .

STATE BROADBAND FUNDING

The Ohio Broadband Strategy, released in 2019, included a goal of "work[ing] with the Ohio General Assembly to implement a statewide grant program to assist in bringing high-speed internet access to unserved and underserved areas in Ohio,"[i] that focused on the following principles:

1. Provide broadband service in areas that are unserved or underserved by broadband at speeds of 25 Mbps download/ 3 Mbps upload;
2. Incentivize private sector investment in needed broadband infrastructure deployment;
3. Establish sound metrics and eligibility requirements to ensure that grant funds are limited to expanding coverage in eligible areas; and
4. Focus on expanding broadband coverage in the most appropriate manner for the community, as opposed to favoring one type of technology or method over another.

In 2021, Ohio House Bill 2 created the Ohio Residential Broadband Expansion Grant Program, focused on the above principles. This is now codified in Ohio Administrative Code ("OAC") section 122:30-1.

The Ohio Residential Broadband Expansion Grant Program (the "State Broadband Grant") allowed broadband providers to apply for funds to provide last-mile service of at least 25 Mbps download/ 3 Mbps upload ("tier two service") to households currently without access to such speed. More specifically, broadband providers could apply for funds to help cover the "broadband funding gap," defined as the difference between the total amount of money a broadband provider calculates is necessary to construct the last mile of a specific broadband network and the total amount of money that the provider has determined is the maximum amount of money that is cost effective for the provider to invest in last mile construction for that network.[1] A comprehensive summary of the State Broadband Grant and OAC section 122:30-1 is provided in ***Appendix F***.

Awards under the State Broadband Grant were to be first prioritized to areas without access to 10 Mbps download/ 1 Mbps upload or 25 Mbps download/ 3 Mbps upload broadband (defined as "unserved areas"), and then to areas without access to 25 Mbps download/ 3 Mbps upload broadband (defined as "tier one areas"). Applications in the first round of State Broadband Grant were due November 8, 2021. The following providers submitted applications for Seneca County:

Provider
Ohio Bell Telephone (AT&T)
Bascom Mutual Telephone Company (Bascom)
Spectrum Mid-America (Spectrum)

1 Any broadband infrastructure constructed by a broadband provider under H.B. 2 remains the property of the provider. However, nothing in H.B. 2 prevents an assignment, sale, change in ownership, or other similar transaction associated with the broadband infrastructure. Regardless, no assignment, sale, change in ownership, or other similar transaction relieves the successor of any obligation under H.B. 2.

The above applicants were next subject to the Grant's Challenge Process in which another provider could submit evidence to the State that it currently provides tier two service to a residential address included in an application, or that the challenging provider provides tier two service in the area adjacent to the residential address and has plans to provide tier two service to the addresses contained in the application no later than two (2) years from the challenge date.[ii]

Unfortunately, none of the above providers were awarded in Seneca County for the first round of the Grant Program. The initial application round to the State Broadband Grant was approximately nine times (9x) oversubscribed, demonstrating the ongoing demand for broadband connectivity in Ohio. We anticipate future funding rounds under the State Grant Program, and additional opportunities to address broadband service gaps in Seneca County are available through the following Federal programs.

FEDERAL BROADBAND FUNDING

There are a variety of federal broadband funding programs available, many of which are relatively new given the onset of COVID-19.

a. *The Infrastructure Investment and Jobs Act*

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

> Broadband internet is necessary for Americans to do their jobs, to participate equally in school learning, health care, and to stay connected. Yet 14% of Ohio households do not have an internet subscription, and 2% of Ohioans live in areas where, under the FCC's benchmark, there is no broadband infrastructure. Even where infrastructure is available, broadband may be too expensive to be within reach. Under the IIJA, Ohio will receive a minimum allocation of $100 million to help provide broadband coverage across the state, including providing access to the at least 259,000 Ohioans who currently lack it. And, under the IIJA, 3,167,000 or 28% of people in Ohio will be eligible for the Affordability Connectivity Benefit, which will help low-income families afford internet access.

In total, the Infrastructure Investment and Jobs Act ("IIJA") includes $65 billion for broadband. NTIA will administer $48.2 of the $65 billion through six programs, as outlined below. Ohio will receive a minimum allocation of $100 million to help provide broadband coverage across the state, including providing high-speed access and helping low-income families afford it.

PROGRAM NAME	PROGRAMS OFFERED
Grants to States for Deployment (BEAD Program) (~$42.45 billion)	This funding supports a formula-based grant program through NTIA, the Broadband Equity, Access, and Deployment (BEAD) Program, to provide funding to states, territories, the District of Columbia, and Puerto Rico for broadband deployment.
	The program does not favor particular technologies or providers.
	Projects will have to meet a minimum speed of 100 Mbps download/ 20 Mbps upload.
	Includes a 10% set-aside for high-cost areas and each state and territory receives an initial minimum allocation, a portion of which could be used for technical assistance and supporting or establishing a state broadband office.
	States will be required to have enforceable plans to address all of their unserved areas before they are able to fund deployment projects in such areas. After both unserved and underserved areas are addressed, states may use funds for anchor institution projects.
Inclusion (Digital Equity Act Program) (~$2.75 billion)	This includes the Digital Equity Act, which establishes three NTIA-administered grant programs (two formula-based programs and one competitive grant program) to promote digital inclusion and equity for communities that lack the skills, technologies, and support needed to take advantage of broadband connections. These programs are: • **State Digital Equity Planning Grant Program ($60 million)** - This is a formula grant program for states and territories to develop digital equity plans. • **State Digital Equity Capacity Grant Program ($1.44 billion)** - This is a formula grant program for states and territories to implement digital equity projects and support the implementation of digital equity plans. • **Digital Equity Competitive Grant Program ($1.25 billion)** - is a discretionary grant program for specific types of political subdivisions to implement digital equity projects.
	The legislation also tasks NTIA with evaluating digital inclusion projects and providing policymakers at the local, state, and federal levels with detailed information about which projects are most cost-effective.
Middle Mile (Enabling Middle Mile Broadband Infrastructure Program) ($1 billion)	This provision creates a state grant program for the construction, improvement, or acquisition of middle-mile infrastructure.
	Eligible entities include telecommunications companies, technology companies, electric utilities, utility cooperatives, and more.
Tribal Grants (Tribal Broadband Connectivity Program) (~$2 billion)	This provision provides additional funding to the Tribal Broadband Connectivity Program, which was established by the December COVID-19 relief package and is administered by NTIA. Grants from this program will be made available to eligible Native American, Alaska Native, and Native Hawaiian entities for broadband deployment, digital inclusion, workforce development, telehealth, and distance learning.

The Infrastructure Investment and Jobs Act ("IIJA") also invests $14.2 billion in funding for the FCC to expand its affordability program and make it permanent:

PROGRAM NAME	PROGRAMS OFFERED
Affordability (Affordable Connectivity Program) ($14.2 billion)	This provision devotes additional funds to the FCC's Emergency Broadband Benefit Program, now called the Affordable Connectivity Program (ACP), which subsidizes broadband service for eligible households—defined as those that suffered income loss during the pandemic or meet other need-based criteria, such as eligibility for school lunch programs. The subsidy will be provided at a lower rate (down to $30 from an original of $50 per month) to extend its longevity across the 5-year budget window.
	Ohio will receive a minimum allocation of $100 million to help provide broadband coverage across the state, including providing high-speed access and helping low-income families afford it.

In addition, U.S. Department of Agriculture is allocated $2 billion in IIJA funds to support rural America:

PROGRAM NAME	PROGRAMS OFFERED
Support for Rural Areas (~$2 billion)	This provision includes support for programs administered by the U.S. Department of Agriculture, including the ReConnect Program, that provide loans and grants (or a combination thereof) to fund the construction, acquisition, or improvement of facilities and equipment that provide broadband service in rural areas. Recipients are required to utilize $5 million of their award for the establishment and growth of cooperatives to offer broadband.

Finally, while much has been released on the various grant programs, a lesser discussed tool is that of Private Activity Bonds ("PABs") under the IIJA:

PROGRAM NAME	PROGRAMS OFFERED
Private Activity Bonds ($600 million)	Based on the Rural Broadband Financing Flexibility Act, this provision allows states to issue Private Activity Bonds to finance broadband deployment, specifically for projects in rural areas where a majority of households lack such access.

b. *American Rescue Plan Act of 2021*

The $350 billion American Rescue Plan ("ARP") provides funds to state, local, territorial, and Tribal governments to provide foundation for a strong economic recovery from the pandemic.

From a broadband access perspective, the ARP Fiscal Recovery Funds (sec. 602 & 603) and the Coronavirus Capital Projects Fund (CCPF) (sec. 604)[2] are most pertinent.

ARP FISCAL RECOVERY FUNDS (SECTIONS 602 & 603)

While sections 602 and 603 contain the same eligible uses, section 602 applies to states, territories, and tribal governments and section 603 establishes a fund for metropolitan cities, counties, and non-entitlement units of local government (generally those with populations of less than 50,000). Thus, section 603 is most applicable to Seneca County. A complete list of ARP funding allocations in Seneca County is included as ***Appendix F***.

Counties and cities have until December 31, 2024 to incumber the funds and until December 31, 2026 to complete construction, which can include investments in broadband infrastructure. Per U.S. Treasury's Final Rule, eligible broadband projects are those designed to deliver service to unserved or underserved areas, defined as those with an identified need for additional broadband investment, that reliably meets or exceeds equal download and upload (i.e., "symmetrical") speeds of 100 Mbps. In areas where such speeds are impracticable because of geography, topography, or excessive costs, projects must reliably deliver at least 100 Mbps download, at least 20 Mbps upload, and be scalable to a minimum of 100 Mbps symmetrical service. Funds can also be used for middle mile networks to provide reliable last-mile service. Recipients are encouraged to prioritize use of fiber optic infrastructure, where feasible, and to incorporate affordability options into their projects.

Other Eligible Uses:

- Digital Literacy: Under section 603(c)(1)(A), funds can also be used to provide internet access or digital literacy assistance to populations facing negative economic impacts from COVID-19.
- Pre-project Costs: Pre-project costs for broadband infrastructure planning and engineering are also eligible uses of the funds, as are technical assistance and evaluations that are directly tied to or reasonably expected to lead to commencement of an eligible project.[iii]

2 *31 C.F.R. § 35 (2021).*

THE CORONAVIRUS CAPITAL PROJECTS FUND (SECTION 604)

The second fund eligible for broadband projects under ARP is the Coronavirus Capital Projects Fund ("CCPF").[iv] CCPF provides $10 billion for states, territories, and Tribal governments to invest in broadband and other critical community hubs or capital assets that directly enable work, education, and health monitoring in response to COVID-19. As a result of the aforementioned criteria, Seneca County is not directly eligible for this program. However, eligible applicants, including the State of Ohio, must provide a plan detailing how they intend to use the allocated funds and why the communities they have identified have a critical need for access, affordability, reliability, and/ or consistency.

As a CCPF recipient, the State of Ohio is encouraged to address broadband affordability challenges when developing their programs and ensure that the service provider in a CCPF-funded project participate in federal programs that provide low-income consumers with subsidized broadband services, such as the ACP referenced earlier in this section. Once the State's full plan is determined, eligible project costs under CCPF include, but are not limited to, the following:

- Construction;
- Improvements and repairs to buildings;
- Pre-project development costs and uses, including data collection and feasibility studies;
- Community engagement and public feedback processes, equity assessments and planning, and needs assessments;
- Permitting, planning, architectural design, engineering design, and work related to environmental, historical, and cultural reviews;
- Costs of repair, rehabilitation, construction, improvement, and acquisition of real property, equipment (e.g., devices and office equipment), and facilities (e.g., telecommunications equipment, including infrastructure for backhaul, middle, and last mile networks);
- Cost of leases for terms greater than one year of facilities required to provide qualifying broadband service, including indefeasible right-of-use (IRU) agreements;
- Personnel costs including salaries and fringe benefits for staff and consultants (such as project managers, program directors, subject matter experts, equity consultants, grant administrators, financial analysts, accountants, and attorneys);
- Ancillary costs necessary to operationalize and put the capital assets to full use, including costs to increase broadband adoption and improve digital literacy;
- Costs associated with monitoring of and reporting in accordance with Treasury requirements, including award closeout costs; and
- Costs for collecting and measuring performance data and conducting activities needed to establish and maintain a performance management and evaluation system.

c. *Federal Broadband Grants*

The following Federal broadband grant programs are also applicable for Seneca County and fully detailed in ***Appendix G:***

FEDERAL GRANT NAME	PROGRAMS OFFERED
Department of Agriculture Rural Development	Community Connect Grant Program
	Distance Learning and Telemedicine Grants
	ReConnect Program
	Rural Broadband Access Loans and Loan Guarantees
	Telecommunication Infrastructure Loans and Loan Guarantees
	Business & Industry Loan Guarantees
Department of Commerce Economic Development Administration	Public Works and Economic Adjustment Assistance Programs
Department of Housing and Urban Development	Community Development Block Grant
	Choice Neighborhoods – Planning
	Choice Neighborhoods - Implementation
Department of Transportation	Rebuilding American Infrastructure With Sustainability and Equity (RAISE) Grant Program
Department of Homeland Security - Federal Emergency Management Agency	Building Resilient Infrastructure and Communities

Endnotes

SECTION 1 - INVENTORY OF EXISTING PROVIDERS AND FIBER-OPTIC PATH

i *Schell, A. (2019, November 6). Fixed wireless internet vs DSL: What are the pros and cons of both types of internet. Upward Broadband. Upward Broadband. https://www.upwardbroadband.com/fixed-wireless-internet-vs-dsl-the-pros-and-cons/.*

ii *FCC website, Fixed Broadband Deployment Data from FCC Form 477 (2021), Retrieved from https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477*

iii *FCC website, FCC Fact Sheet Digital Opportunity Data Collection (2019), Retrieved from https://docs.fcc.gov/public/attachments/DOC-358433A1.pdf (emphasis added).*

iv *FCC website, Fixed Broadband Deployment Data from FCC Form 477 (2021), Retrieved from https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477*

v *FCC website, More About Census Blocks from Form 477 (2020), Retrieved from https://transition.fcc.gov/form477/Geo/more_about_census_blocks.pdf*

vi *Broadband USA website, Data & Mapping, Retrieved from https://broadbandusa.ntia.doc.gov/resources/data-and-mapping*

vii *Gallardo, R. (2020). Digital Divide Index. Purdue Center for Regional Development. Retrieved from Digital Divide Index (DDI): http://pcrd.purdue.edu/ddi.*

viii *FCC website, FCC Fact Sheet Digital Opportunity Data Collection (2019), Retrieved from https://docs.fcc.gov/public/attachments/DOC-358433A1.pdf.*

ix *Dempsey, J. and Sun, P. (2020, December 30). The Digital Divide in U.S. Mobile Technology and Speeds. FCC website. https://docs.fcc.gov/public/attachments/DOC-369010A1.pdf.*

x *USAC.org website (2021), Rural Digital Opportunity Fund, Universal Service Administrative Co., Retrieved from https://www.usac.org/high-cost/funds/rural-digital-opportunity-fund/*

xi *FCC website, Auction 904: Rural Digital Opportunity Fund, Federal Communications Commission, Retrieved from https://www.fcc.gov/auction/904/factsheet*

xii *Rivkin-Fish, Ziggy (April 29, 2021), Is the FCC's reverse auction fatally wounded or just bloodied?, Benton Institute for Broadband & Society, Retrieved from https://www.benton.org/blog/fcc%E2%80%99s-reverse-auction-fatally-wounded-or-just-bloodied?utm_campaign=Newsletters&utm_source=sendgrid&utm_medium=email*

xiii *Crosby, Misty and Reid, Tom, (February 18, 2021), Re: Concerns regarding RDOF Phase 1 auction results, WC Docket Nos. 19-126 and 10-90, Buckeye Hills Regional Council, Retrieved from https://prodnet.www.neca.org/publicationsdocs/wwpdf/21921buckeye.pdf*

SECTION 2 - ASSET INVENTORY

i *https://portal-senecacountygis.hub.arcgis.com/search?groupIds=f009eb52882f458581b17a4393dec196*

ii *PRC RESOURCES, Seneca County Prevention, Retention, Contingency Plan Amended, 1, 17 (April 1, 2022), https://djfs.co.seneca.oh.us/wp-content/uploads/2022/04/PRC-Plan-4.1.22.pdf (last visited June 22, 2022); Phone Interview with of Mike McClain of Seneca County JFS, (June 23, 2022) (internet access was only provided for the first fifty applicants who needed internet services because of difficulty in funding internet coverage beyond four months and difficulty in finding vendors to provide hotspots).*

iii *REVIEW TIMES, Seneca County Families Can Get Free Laptop with Internet, (Dec. 8, 2021, 6:00 PM), https://reviewtimes.com/news/358114/seneca-county-families-can-get-free-laptop-with-internet/.*

iv *PRC RESOURCES, supra note 1, at 5.*

v *Id at 2.*

vi *Id at 17*

vii *Mike McClain, supra note 1.; see also Id.; REVIEW TIMES, supra note 2;*

viii *Mike McClain, supra note 1.*

ix *PRC RESOURCES, supra note 1, at 17.*

x *Id.*

SECTION 7 - IDENTIFICATION OF OBSTACLES

i *See Norfolk Southern, Wire, Pipeline, and Fiber Optics Projects, Retrieved from: http://www.nscorp.com/content/nscorp/en/real-estate/norfolk-southern-services/wire-pipeline-fiber-optic-projects.html.*

ii *TowerCo website, Norfolk Southern, TowerCo Partner to Expand Broadband and Wireless Infrastructure Development (2022), Retrieved from: https://www.towerco.com/norfolk-southern-towerco-partner-to-expand-broadband-and-wireless-infrastructure-development/.*

iii *Rembert, Mark, (April 2017), Connecting the Dots of Ohio's Broadband policy, Ohio State University, Retrieved from: https://aede.osu.edu/sites/aede/files/publication_filesA/Connecting%20the%20Dots%20of%20Ohio%20Broadband_0.pdf*

iv *USAC website, ACP Enrollment and Claims Tracker, Retrieved From: https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/#enrollment-and-claims-by-zipcode-and-county*

v *ArcGIS website, EBB Enrollment by Eligibility, US, Retrieved from: https://www.arcgis.com/home/webmap/viewer.html?webmap=cac3e230a7df4e58a6c013dbdd6788e4&extent=-121.187,24.5643,-56.2798,52.1046*

vi *Id.*

vii *NATE (2022), Retrieved from: https://natehome.com/*

viii *Utility construction installer certificate, Terra State Community College, Retrieved from: http://terra.edu/degrees_programs/technology_skilled_trades_division/construction_technology/utility_construction_installer_certificate.php*

SECTION 6 - IDENTIFYING FUNDING

i *Husted, Jon, The Ohio Broadband Strategy, innovateohio.gov, Retrieved from https://innovateOhio.gov/wps/wcm/connect/gov/bde9a8ce-5f93-4a04-b937-102788469bdb/OhioBroadbandStrategy_121919.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_M1HGGIK0N0JO00QO9DDDDM3000-bde9a8ce-5f93-4a04-b937-102788469bdb-mYuKib6*

ii *Broadband.ohio.gov, Ohio Residential Expansion Broadband Expansion Grant Program Challenge Process, Ohio Department of Development, Retrieved from https://broadband.Ohio.gov/static/challenge-process-10182021.pdf*

iii *Id.*

iv *Capital projects include work, education, health monitoring, and remote options for work, education, and health. Home.treasury.com . (January 25, 2022). Capital Projects Fund. (n.d.). U.S. Department of Treasury. Retrieved from https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/capital-projects-fund.*

Appendices