DRAFT

State of Ohio

Five-Year Action Plan

Broadband Equity, Access, and Deployment (BEAD) Program

BroadbandOhio

Ohio Department of Development

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1 Executive Summary

> "Lack of access to high-speed internet can stand in the way of our ability to do business, to obtain an education, or even to access emergency services. My administration is serious about improving broadband connectivity to corners of Ohio that have been left behind." [1]
> – Governor Mike DeWine

> "In today's information-driven world, high-speed internet access is not a luxury — it is a necessity. By connecting our communities, we are reconnecting Ohioans with one another and helping to ensure that everyone has the opportunity to benefit from this vital resource" [2]
> – Lt Governor John Husted

Ensuring that every Ohioan has access to high-speed internet and the opportunity to benefit from it has been a priority of the DeWine-Husted administration since January 2019. Led by Lt Governor Husted and InnovateOhio, Ohio released its first broadband strategy in December 2019 and created the BroadbandOhio office, housed in the Ohio Department of Development, in March 2020.[3] Since then, BroadbandOhio has:

- Launched the Ohio Residential Expansion Grant Program (ORBEG), which has deployed $250 million in state funds, matched by another $250 million in private sector funds.
- Partnered with the Department of Transportation to streamline permitting.
- Implemented a telehealth pilot in schools to meet mental health needs.
- Built a broad network of partners across local government, other state agencies, internet service providers, and community-based nonprofits. Many of these stakeholders are among the more than 500 members of the Ohio Broadband Alliance, which convenes stakeholders quarterly to discuss progress toward our collective goals, insights, best practices from recent work, and opportunities to collaborate.

The pandemic confirmed what we already knew about high-speed internet — all our residents need access and opportunities, and we must do much more work to reach this goal. Ohio is ready to capitalize on the historic federal infrastructure investment made in the wake of the pandemic,[4] and we take the depth of planning required very seriously.

The following pages summarize key results of our planning to date, including our vision and goals; the needs, gaps, and obstacles that we must address to achieve our vision; the programs, assets, and partners required to make the vision a reality; and our implementation plan, including our preliminary estimate of deployment costs for a fully connected Ohio and strategies that will guide execution.

[1] https://governor.ohio.gov/administration/lt-governor/062019
[2] 2019 Ohio Broadband Strategy
[3] https://governor.ohio.gov/media/news-and-media/creation-of-broadbandohio
[4] 2021 Bipartisan Infrastructure Law (BIL)

This is the first of four documents focused on accessing and implementing the federal funding. The State Digital Opportunity[5] Plan (SDOP), the BEAD Initial Proposal (BEAD-IP), and the Final Proposal (BEAD-FP) will build on this effort.

Ohio's broadband vision. As described in our 2023 Broadband Strategy, Ohio has set a four-pronged broadband vision, anchored in 11 strategic pillars.

This vision aligns with and reinforces the administration's focus on innovation, economic development and opportunity, and economic competitiveness for all Ohioans, as well as the goal of improving outcomes in education, health, and safety, especially for those most in need.

Needs and gaps. Achieving this vision of access and opportunity for all Ohioans must start with a clear picture of our current state. To this end, we conducted extensive quantitative and qualitative analysis, including engagement with affected stakeholders.

Statewide, some 1.3 million Ohioans lack subscriptions to high-speed internet. This gap is attributable to one or more issues:

[5] The Infrastructure Investment and Jobs Act defines digital equity as "the condition in which individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States"; and defines digital inclusion as "the activities that are necessary to ensure that all individuals in the United States have access to, and the use of, affordable information and communication technologies, such as— (i) reliable fixed and wireless broadband internet service; (ii) internet-enabled devices that meet the needs of the user; and (iii) applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration; and includes— (i) obtaining access to digital literacy training; (ii) the provision of quality technical support; and (iii) obtaining basic awareness of measures to ensure online privacy and cybersecurity." For the purposes of this document, Ohio uses the term "digital opportunity" to reflect both of these concepts.

- Infrastructure availability. Of the 4.5 million locations in Ohio, 188,000 remain unserved (4 percent) and 144,000 remain underserved (3 percent), according to the FCC National Broadband Maps.[6]
- Affordability. Of the 1.98 million Ohio households eligible for the Affordable Connectivity Program (ACP) (41 percent), only 850,000 have enrolled (43 percent of those eligible).
- Access to devices. Some 17 percent of Ohioans do not have an internet-ready device (e.g., laptop, computer, or tablet).[7]
- Digital literacy and skills. At least 706,000 households earn $50,000 or less per year and have "low digital skills."[8]

The impact of these issues varies by region and by covered population group.

Deployment factors:
- Sixty-one percent of unserved locations and 38 percent of underserved location are in Appalachian Ohio — a region that represents only 20 percent of all Ohio locations.
- Twenty-three percent of underserved locations are in Northwest Ohio — a region that represents only 14 percent of all Ohio locations. This correlates with a concentration of FWA technologies in cities and towns with lower housing density.
- Local government and resident feedback indicates connectivity gaps in multi-dwelling-unit buildings (MDUs). The FCC maps do not capture these gaps that BroadbandOhio is exploring via a targeted survey.

Non-Deployment factors (to be further expanded in the SDOP)
- Fifty percent of the households without subscriptions are located in 10 of Ohio's 88 counties, especially Cuyahoga (161,000), Franklin (107,000), Hamilton (79,000), Montgomery (62,000), and Summit (54,000) counties[9].
- Lowest adoption rates are in the Appalachian counties
- Adoption gaps are disproportionate in low-income households and among the aging and disabled populations.
- For internet devices, the same trend is present, but with smaller gaps

Participants in listening sessions stressed the need for digital skills development, focused especially on digital skill-building, cybersecurity, and privacy. This need surfaced particularly strongly in communities notable for low incomes, an aging population, and language barriers. These gaps exacerbate their lagging educational outcomes, well-being, and access to healthcare and economic development opportunities.

Obstacles. Diverse stakeholders have given BroadbandOhio valuable feedback on the obstacles to closing the digital divide in Ohio.

The overarching barrier to broadband deployment is the gap in funding required to make provider co-investments business feasible. Root causes of this barrier are the terrain where gaps

[6] FCC National Broadband Maps accessed on January 31, 2023
[7] This analysis does not include smart phone as an internet-ready device because it is insufficient for such use cases as remote education, reskilling, and working from home.
[8] Preliminary estimate that a survey of Ohio residents will refine
[9] Cuyahoga, Franklin, Hamilton, Montgomery, and Summit are Ohio's most populous counties.

in infrastructure availability persist (e.g., the Appalachian Mountains), low household density, and excessive distance to middle-mile access points. Make-ready[10] costs and potential labor and supply chain shortages could exacerbate the funding gap. Stakeholders also called permitting processes and timelines, especially for railroad crossings, an obstacle to efficient deployment. Gaps in the maps — missing locations and insufficient visibility into MDU gaps — further complicate reaching the state's goal of a fully connected Ohio.

Stakeholders repeatedly cited the affordability of subscriptions as the primary obstacle to closing the adoption gap. ACP has secured wide adoption in Ohio, and broadband leaders across the state voiced concerns about how long ACP will remain available. Other key barriers to increasing adoption mentioned by stakeholders include digital learning and the development of digital skills needed for education, jobs, and telehealth, resources for replicating and tailoring quality, and program accessibility.

Residents, digital inclusion experts, and practitioners all highlighted the importance of community-based programs to building residents' trust. Often confusing pricing and contract terms and ever-changing applications, technologies, and privacy and cybersecurity risks create obstacles to accessing and using the internet. Developing open, trust-based relationships with residents is a first, critical step in overcoming barriers to residents' digital learning.

Partners and assets. Fully connecting Ohio will require leadership and collaboration by many partners across the state and leveraging Ohio's considerable programmatic and physical assets for efficient, effective execution. BroadbandOhio already has more than 90 distinct private and non-profit partners across the state, collaborative partnerships with 17 state agencies, and over 200 programmatic and physical assets to tap.

Implementation plan. We estimate that bringing high-speed internet access to all Ohioans will cost $1.14 – 1.61 billion, taking into account expected cost pressures on labor rates, make-ready costs, and likely undercounting of unserved and underserved locations, and we expect that execution will take 5 – 7 years. The state has already allocated $370 million of this cost via the Rural Digital Opportunity Fund (RDOF), Connect America Fund Phase II (CAF II), and ORBEG. We will detail the expected cost for driving digital adoption in the SDOP that we plan to publish in late summer 2023.

Closing the digital divide will require implementing a competitive grant program that funds only efforts undertaken with co-investment by the private sector, streamlining permitting, and building a skilled, broadband deployment workforce. As described in the 2021 Strengthening Ohio's Broadband & 5G Workforce Strategy, BroadbandOhio will partner with the Office of Workforce Transformation to support the planned approach and investments in multiple awareness, recruitment, and training programs to develop that workforce.

Finally, increasing internet access and adoption, with deep impact on education, healthcare, and economic development, will require participation by a wide range of public, private, non-profit, and resident stakeholders. Through ongoing partnerships and participation in listening sessions

[10] Make-ready describes the work that must be done before a Service Provider can add a new attachment or line to a utility pole so that the pole can handle a new attachment/line.

and surveys, over 2,500 stakeholders have already contributed to the effort, and BroadbandOhio will continue engaging them until we have a fully connected Ohio.

2 Overview of the Five-Year Action Plan

2.1 Vision

The Ohio economy ranks #7 in the US[11] and #24 in the world.[12] Thanks to the hard work and innovation of Ohioans, we stand on the precipice of the next phase of growth.

Innovation has a long and deep history in our state. The Wright brothers flew the world's first successful airplane. Thomas Edison secured more patents than any other American. Twenty-five astronauts are Ohio natives; they have completed three trips to the moon, among numerous other space flights. Ohio has also led innovation in bringing high-speed internet access to our K-12 schools, higher education institutions, and local governments by creating a nationally recognized statewide infrastructure called OARnet to deliver ultra-fast fiber-optic connectivity.

The strength of our economy and the skills and ingenuity of our workforce attract top American companies. For example, Intel will invest more than $20 billion to build two factories and establish a new epicenter for advanced chipmaking in Ohio.[13] Ford has announced plans to invest $1.5 billion and create 1,800 jobs in Avon Lake to assemble an all-new electric commercial vehicle for Ford Pro customers (debuting mid-decade), plus plans to invest $100 million and create 90 jobs in the Lima Engine and Sharonville transmission plants.[14] The Cleveland Clinic has announced a $1.3 billion capital investment that will create 2,000 jobs at a new one-million-square-foot Neurological Institute and expand the Cole Eye Institute and the research facilities of the Cleveland Innovation District.[15]

To capitalize on these investments and realize their potential for innovation, all Ohioans must be connected to the modern economy through affordable high-speed internet. Otherwise, they face a competitive disadvantage in today's technology-infused, global economy. And, as the pandemic demonstrated, without high-speed internet at home, children cannot complete homework, and adults cannot access the full range of job and upskilling opportunities.

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[11] GDP by State, World Population Review, 2020

[12] GDP Ranked by Country, World Population Review, 2020

[13] Intel Announces Next US Site with Landmark Investment in Ohio, Intel newsroom, 2022

[14] Corporate Investments Continue to Pour into Ohio, JobsOhio, 2022

[15] Ibid

Internet access is the gateway to this technology-charged economy. More and more jobs require digital skills, and internet access opens the door to reskilling, upskilling, and working remotely, regardless of zip code. Internet access creates opportunities for business creation, expansion, and growth statewide. Key Ohio industries stand to benefit from applications like digital agriculture and smart transportation enabled by high-speed internet.

Internet access is also the way that people connect with their communities and the world. The internet connects people with loved ones; this connectivity can be especially important for older Americans. Today, many people use multiple internet channels (e.g., social media, email, and video calling) to stay connected with family, friends, and the world.

With the acute understanding that lack of broadband and internet access limits opportunities for businesses and residents in Ohio, the DeWine-Husted Administration has made concerted efforts toward establishing Ohio as a leader in broadband deployment and utilization, as well as identifying the opportunities to fill the gaps in access to high-speed internet for all Ohioans. Since the announcement of the 2019 Ohio Broadband Strategy, the state has made great progress, including the establishment of the office of BroadbandOhio in March 2020 as an executive branch state agency housed within the Ohio Department of Development to lead broadband deployment and digital opportunity efforts.

Looking ahead and building on progress to date, the State of Ohio specifically envisions broadband deployment and digital participation within the state along 4 key priorities:

A. Bring reliable, affordable, high-speed internet to all Ohioans, in their homes and communities;
B. Promote the creation of world-class broadband networks throughout the state, via the use of best-in-class technologies;
C. Enable participation in the modern economy; and
D. Empower Ohioans through training, device access, and digital skills

2.2 Goals and Objectives

With the above vision, the State of Ohio and BroadbandOhio aims to bring high-speed internet access to every Ohioan and build a best-in-class broadband network in Ohio. The strategic pillars represent the state's priorities for investment of both state and federal dollars that will be made available over the next several years. Aligned to each priority is a set of core pillars / goals that the State of Ohio has defined. BroadbandOhio has additionally defined a set of specific objectives for the purposes of BEAD, which will help guide how Ohio leverages BEAD to achieve this strategic vision.

Vision	Goal	Objective
A. Bring reliable, affordable, high-speed internet to every Ohioan, in	**A1**. Invest in last-mile infrastructure deployment	**A1a**. All Ohioans have access to at least 100/20 Mbps reliable internet by 2030
		A1b. Award first round of BEAD grants by 2025, and second round by 2027
		A1c. Increase ACP uptake in Ohio to 45 percent[16]

[16] This objective will be dependent upon the continuation of ACP or an equivalent federal program.

Vision	Goal	Objective
their home and in their community		**A1d**. All ACP-eligible Ohioans have access to a $30/month plan, regardless of the status of ACP funding availability
	A2. Expand middle mile network to facilitate last mile deployment	**A2a.** Reduce the median cost of middle mile by 5-8 percent
		A2b. Increase network resiliency and redundancy
	A3. Remove barriers to broadband deployment and maximize asset reuse	**A3a**. Facilitate last-mile build-out by reducing make-ready costs via subsidies, pending legislative approval
		A3b. Create a standard pricing list for utilizing MARCS towers
B. Promote the creation of world-class broadband networks throughout the state, via the use of best-in-class technologies	**B1**. Keep pace with changing technology and demand	**B1a.** All Ohioans have access to internet technology with the highest standards of reliability, scalability, and security
	B2. Connect community anchor institutions to serve as digital hubs	**B2a.** Expand availability of public Wi-Fi throughout the state
C. Enable participation in the modern economy	**C1**. Expand telehealth access and usage via targeted programming	**C1a.** Analyze 10 school districts to understand readiness to implement telehealth
		C1b. Create a telehealth steering committee
	C2. Expand access to remote education opportunities	**C2a.** In 2 years, identify students who lack consistent access to a high-speed internet connection
		C2b. In 3 years, identify a plan to help identified students maintain and sustain connectivity despite barriers
	C3. Support Ohio's farmers to improve productivity by enabling digital agriculture uptake	**C3a**. 100 percent of farms in Ohio have access to high-speed internet
		C3b. Pilot digital agriculture use cases for future deployment
	C4. Enable safe and easy movement of people and goods via foundational investments to enable intelligent transportation	**C4a**. Institute policy that accelerates fiber deployment along roads during construction projects
		C4b. Create an additional SMART highway
		C4c. Determine the effectiveness of SMART highways on traffic congestion

Vision	Goal	Objective
	systems	
D. Empower Ohioans through training, device access, and digital skills	**D1.** Support workforce development initiatives that connect Ohioans to broadband deployment and digital jobs	**D1a**. Expand curricula and internships in middle and high school to create broadband industry career awareness
		D1b. Scale education and training programs for skill development for the broadband industry
		D1c. Increase the number of available broadband training programs
		D1d. Increase utilization of broadband training programs
	D2. Accelerate adoption, usage, and economic empowerment via Regional Digital Inclusion Alliances	**D2a**. Improve adoption rates both overall and for each Covered Population
		D2b. Increase share of Ohioans with access to internet-ready devices
		D2c. Increase the number of digital literacy programs available statewide

Below, we provide a description of each objective listed above, as well as associated KPIs that Ohio will track to evaluate progress.

A. Bring reliable, affordable, high-speed internet to every Ohioan, in their home and in their community

1. **Invest in last-mile infrastructure deployment**: Bring reliable, affordable high-speed internet to all Ohioans via a competitive grant process

Relevant BEAD Pillars: Broadband Deployment, Broadband Access, Broadband Affordability

Ohio seeks to invest in last-mile infrastructure deployment to ensure all Ohioans have access to reliable internet. To date, there remains a sizeable gap in access to high-speed internet for many Ohioans. According to the FCC's service availability maps as of 31 January 2023, there are ~332K broadband service locations in Ohio without access to reliable broadband, with access challenges most acute in Ohio's Appalachian counties.[17] The gaps are not only in rural areas, but also in urban areas – especially in apartment buildings and other multi-dwelling units. In addition to prioritizing the build out of high-speed internet, affordability of subscriptions is a key priority. Even in communities where high-speed internet is available, high subscription prices make home internet unaffordable for many Ohioans.

Key objectives to address this goal include:

[17] Reliable broadband defined as fiber, cable, copper, and licensed fixed wireless.

Objective	KPI	Baseline	Relevant BEAD pillars
A1a. All Ohioans have access to at least 100/20 Mbps reliable internet by 2030	Share of OH broadband serviceable locations (BSLs) with access to 100/20 Mbps reliable internet	93 percent[18]	Broadband deployment; Broadband access
A1b. Award first round of BEAD grants by 2025, and second round by 2027	Share of BEAD 1st and 2nd round grants awarded by 2025 and 2027, respectively	0 percent	Broadband deployment
A1c. Increase ACP uptake in Ohio to 45 percent[19]	ACP uptake rate	41 percent[20]	Broadband affordability
A1d. All Ohioans would have access to an ACP-eligible ($30/month) plan, regardless of the status of ACP funding availability	Share of OH HHs with access to at least 1 affordable $30/month internet plan	~15 percent BSLs with access to $30/month plan for 25/3 Mbps[21] ~14 percent BSLs with access to $30/month plan for 100/20 Mbps[22]	Broadband access; Broadband affordability

2. **Expand middle mile network to facilitate last mile deployment**: Extend the reach of middle mile network through unserved areas of the state to help facilitate last mile deployment, increase competition, and improve affordability

Relevant BEAD Pillars: Broadband Deployment, Broadband Access, Broadband Affordability

Last mile connection affordability could be enabled via increased middle mile options. Today, there are at least 10 different middle mile network providers in Ohio, with key players including AT&T, Independents Fiber Network (IFN), the Ohio Middle Mile Consortium, OARnet, and Digital Access Ohio. However, certain regions in Ohio, such as the Appalachian counties, have limited middle mile access. Ohio needs more expansive middle mile to bring down last-mile deployment cost and enable universal, reliable, high-speed internet coverage.

[18] Calculated as share of unique OH BSLs with 1+ internet service provider offering 100/20 Mbps broadband service via technologies that are not unlicensed FWA or satellite. Data from FCC Data maps, downloaded 31 January 2023.
[19] Objective is dependent upon the continuation of federal ACP funding or an equivalent program.
[20] Affordable Connectivity Program Enrollment Dashboard. Education Superhighway. As of April 13, 2023
[21] Access to an affordable plan is defined by FCC availability data and market research. For example, a BSL has an affordable 25/3 plan at $30/month IF 1 or more providers reports 25/3 service to the FCC maps AND that provider advertises a $30/month plan with minimum speeds of 25/3. Based on 4,478,218 broadband-serviceable locations (BSLs) in Ohio as of January 31st, 2023.
[22] ibid

Key objectives to address this goal include:

Objective	KPI	Baseline	Relevant BEAD pillars
A2a. Reduce the median cost of middle mile by 5-8 percent	Median cost per prem	To be determined in specific areas where middle mile funding awards are won	Broadband affordability
A2b. Increase network resiliency and redundancy	Share of uptime	To be determined in specific areas where middle mile funding awards are won	Broadband deployment; Broadband access

3. **Remove barriers to deployment & maximize asset reuse**: Reduce cost barriers / streamline permitting processes (e.g., railroad crossing) and leverage existing state and local assets to support infrastructure deployment

Relevant BEAD Pillars: Broadband Deployment, Broadband Affordability

To date, Ohio's efforts to reduce barriers to broadband deployment have focused on simplifying permitting and application processes related to broadband infrastructure and use of state assets by ISPs. Ohio additionally has significant assets available to support broadband deployment. OARnet's 100-Gigabit-per-second fiber network is available to hospital systems, private companies engaged in R&D, select economic development-focused projects and private data centers. The MARCS towers project lets ISPs broadcast via the publicly owned Multi-Agency Radio Communications System, expanding their reach into unserved areas.

Key objectives to help achieve this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
A3a. Facilitate last-mile build-out by reducing make-ready costs via subsidies, pending legislative approval	Average make-ready cost	To be determined through survey of ORBEG grant recipients	Broadband deployment; Broadband affordability
A3b. Create a standard pricing list for utilizing MARCS towers	Utilization rate of MARCS towers	n/a	Broadband deployment; Broadband affordability

B. Promote the creation of world-class broadband networks throughout the state, via the use of best-in-class technologies

1. **Keep pace with changing technology and demand**: Ensure Ohio's broadband infrastructure always meets the highest standards of reliability and

scalability through efficient upgrades and by upholding standards in grants and permitting processes

Relevant BEAD Pillars: Broadband Deployment

Ohio aims to keep up with the pace of changes in broadband demands in its network development efforts. The increasing data, throughput and latency demands of new applications along with scientific and technological advances means that what is considered "high-speed internet" will continue to change. In the early 2000s, common uses of the internet were simply email and web browsing; and at that time, the FCC defined *broadband* as 200/200 Kbps. In 2010, that definition was updated to 4/1 Mbps as usage, data demands and file sizes scaled. Then in 2015, the definition of broadband was again updated to 25/3 Mbps, as video and streaming usage took off.

Key objectives for achieving this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
B1a. All Ohioans have access to internet technology with the highest standards of reliability, scalability, and security	Share of BSLs with access to fiber or licensed spectrum	43.5 percent Ohio BSLs with fiber access[23], and 79.4 percent with fiber / fixed wireless access[24]	Broadband deployment
	Share of ISPs across Ohio compliant with NIST cybersecurity measures	Not available, to be determined during BEAD application process	
	Share of fiber deployment materials sourced within United States for BEAD projects	Not available, contingent upon BEAD deployment start	

2. **Connect community anchor institutions to serve as digital hubs**: Empower CAIs as local hubs for connectivity, digital inclusion, and innovation through access to Gigabit symmetrical service

Relevant BEAD Pillars: Broadband Deployment, Broadband Access, Broadband Adoption, Digital Opportunity

Ohio plans to support Community Anchor Institutions (CAIs) so that they can serve as digital hubs for Ohioans. Ohio has a broad array of CAIs that provide needed services to local communities, including access to health and wellness services, formal and informal education and skill building, and spaces for various community events. Many already function as digital

[23] Calculated as [Unique OH BSLs with access to 1 or more ISP that provide fiber broadband with greater than 0/0 speed] / [All unique OH BSLs]. Data from FCC Data maps, downloaded 31st January 2013
[24] Calculated as [Unique OH BSLs with access to 1 or more ISP that provide fiber, licensed FWA, or licensed-by-rule FWA broadband with greater than 0/0 speed] / [All unique OH BSLs]. Data from FCC Data maps, released Nov 18, 2022.

hubs, where members of the community can go to use the internet, access, or borrow devices, and take courses to build digital skills. Others need more resources to expand their offerings to meet the needs of residents.

Key objectives for achieving this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
B2a. Expand availability of public Wi-Fi throughout the state	Count of BSLs without access to at least 1 CAI that offers public Wi-Fi within 5 miles	62,425 BSLs[25]	Broadband deployment; Broadband access; Broadband Adoption, Digital Opportunity

C. Enable participation in the modern economy

1. **Expand telehealth access and usage via targeted programming**: Expand telehealth access & usage by linking Ohio's health systems to schools and expanding current program to additional health priorities

Relevant BEAD Pillars: Broadband Adoption, Digital Opportunity

The 2019 Broadband Strategy highlighted mental health as a concern for Ohio. At the time, Ohio ranked in the bottom quartile for incidence of Adverse Childhood Experiences (ACEs). The pandemic exacerbated the health crisis, especially as alcohol and substance use rose significantly, according to the Ohio Department of Mental Health and Addiction Services.[26] Despite the small improvements in certain metrics, improving health outcomes for Ohioans, especially amid the nationwide, multi-year trend of declining mental health, is a priority for Ohio.

Improving access to telehealth, especially to treat mental health issues, would help achieve several broader goals of the DeWine-Husted administration, including those set forth in the Ohio Department of Health's State Health Improvement Plan.[27] Broadening internet availability would help the Ohio Department of Health (ODOH) meet its goals for improving access to care.

Key objectives include:

Objective	KPI	Baseline	Key relevant BEAD pillars
C1a. Analyze 10 school districts to understand	Number of school districts analyzed	0	Broadband adoption; digital opportunity

[25] FCC Broadband data map, HIFLD data, State Library of Ohio data, Ohio Department of Health data
[26] Breaking Point. Ohio's Behavioral Health Workforce Crisis. The Ohio Council of Behavioral Health & Family Providers
[27] ODH State Health Improvement Plan. Ohio Department of Health (2020-2022)

Objective	KPI	Baseline	Key relevant BEAD pillars
readiness to implement telehealth			
C1b. Create a telehealth steering committee	Establishment of telehealth steering committee	In progress	Broadband adoption

2. **Expand access to remote education opportunities**: Ensure all students & teachers have access to reliable internet and internet-capable devices to access digital learning at home & school

Relevant BEAD Pillars: Broadband Access, Broadband Adoption, Digital Opportunity, Economic Growth and Job Creation

The DeWine-Husted administration is focused on literacy, accelerating learning, workforce readiness, student wellness, and supporting children, families, and school communities. As all Americans remember, remote education was the only learning available to millions of students during the pandemic; school closings affected 50 million students. Many Ohio students still suffer from pandemic learning loss, particularly among vulnerable populations.

Internet access has clear benefits for school-aged children. The internet enhances classroom learning. Digital skills give school-aged children access to a wide range of knowledge and resources that are important for accessing job opportunities in the digital economy. Wi-Fi can enable virtual field trips, coding classes, digital guest teachers, and more. Internet access is also needed at home, especially as online homework has become a big part of education.

Key objectives to help promote internet access for education include:

Objective	KPI	Baseline	Key relevant BEAD pillars
C2a. In 2 years, identify students who lack consistent access to a high-speed internet connection	List of students without access to reliable internet & devices	Not started	Broadband access
C2b. In 3 years, identify a plan to help identified students maintain and sustain connectivity despite barriers	Plan to provide resources (e.g., subsidy, hot-spot) to students without access to reliable internet & devices	Not started	Broadband access; Broadband adoption; Digital opportunity; Economic growth and job creation

These objectives will be further detailed and refined in the State Digital Opportunity plan.

3. **Support Ohio's farmers to improve productivity by enabling digital agriculture uptake**: Enhance agricultural productivity by enabling digital agriculture uptake through identification of use cases, strategic partnerships, and expanded broadband access

Relevant BEAD Pillars: Broadband Deployment, Broadband Adoption, Digital Opportunity, Economic Growth and Job Creation

Ohio aims to support Ohioan farms by enabling digital agriculture uptake. Agriculture is critical to the Ohio economy and the livelihood of many Ohioans. As of 2018, there were about 77,800 farms in Ohio, fourth most in the nation.[28] Using technologies like crop health sensors and spatial data management systems, digital agriculture can make Ohio farmers more efficient and resilient.

While 30 percent of Ohio farmers currently use digital agriculture technology— five percentage points above the national average – broader adoption faces challenges.[29] Only 64 percent of Ohio farmers have internet access, which is 18 percentage points below the national average.[30] Digital agriculture enables farmers to manage their farms remotely and more efficiently. These technologies allow farmers to analyze and maintain soil and crop health, making Ohio ecosystems more stable, and yields more predictable. But digital agriculture requires special equipment and software to analyze information in real time, and access to reliable broadband is critical.

Key objectives to achieve this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
C3a. 100 percent of farms in Ohio have access to high-speed internet	Share of farms with access to 100/20 Mbps internet	64 percent with internet[31]	Broadband deployment
C3b. Pilot digital agriculture use cases for future deployment	Number of pilot programs for digital agriculture use cases	To be set in coordination with Digital Ag partners – detailed in State Digital Opportunity Plan	Broadband adoption; Digital opportunity; Economic growth and job creation

These objectives will be further detailed and refined in the State Digital Opportunity plan.

[28] 2020 Ohio Facts - Economy
[29] USDA Farm Computer Usage and Ownership (2021)
[30] ibid
[31] Figures for farms with internet access, from USDA Farm Computer Usage and Ownership, 2021. Note: Speed data not available.

4. **Enable safe and easy movement of people and goods via foundational investments to enable intelligent transportation systems**: Ensure robust highway broadband access to support the deployment of smart corridors across Ohio in partnership with the Department of Transportation

Relevant BEAD Pillars: Broadband Deployment

Ohio has laid the foundation for taking full advantage of intelligent transportation technologies. The state made significant investments in building and maintaining a road network that totals 121,000 center line miles and includes 21 interstate highways. Ohio has also demonstrated a strong commitment to road safety. Ohio is building a state-of-the-art intelligent transportation system that includes smart corridors and CCTV, dynamic message signs, and ramp meters. The state has made the necessary investments in fiber optic and communications technology near roadways to support data acquisition, processing, communication, and utilization in advanced processing systems.

A range of intelligent transportation technologies could build on this foundation, including Vehicle-to-everything (V2X) communication, intelligent traffic management, fleet management, intelligent electric vehicle charging, smart corridors, and more. The further promotion of intelligent transportation systems could additionally support public safety and economic development by enabling safe and efficient movement of people and goods.

Key objectives to achieve this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
C4a. Institute policy that accelerates fiber deployment along roads during construction projects	Right-of-way policy in place	State Right-of-Way policy in place State highway right-of-way policy not yet in place	Broadband deployment
C4b. Create an additional SMART highway	Number of SMART highways	1 SMART highway currently exists	N/A
C4c. Determine the effectiveness of SMART highways on traffic congestion	Report on effectiveness	Not started	N/A

D. Empower Ohioans through training, device access, and digital skills

1. **Support workforce development initiatives that connect Ohioans to broadband deployment and digital jobs**: Partner with universities & workforce development organizations to build the broadband network, upskill workers for digital jobs, and enable remote work opportunities

Relevant BEAD Pillars: Broadband Deployment, Broadband Adoption, Digital Opportunity, Economic Growth and Job Creation

The unprecedented investment in deploying broadband will create jobs in broadband deployment across the state and will enable opportunities for digital jobs and remote work in communities where broadband availability and adoption is currently low. Ohio's "Strengthening Ohio's Broadband & 5G Workforce" strategy, for instance, noted that federal funding of approximately $500 million for broadband deployment could create 1,250 direct construction jobs that will need to be filled, compounding the current labor shortage.

Broadband deployment will additionally bolster Ohio's economic growth and creation of gainful jobs. From 2018 to 2028, industries that provide services are expected to grow 2.9 percent, while industries that produce goods are expected to shrink 0.4 percent. The largest growth will be in the healthcare and social assistance sector (11.3 percent).[32] According to a study for central Ohio, eight of the 25 occupations that will experience the greatest demand over the next decade require little more than a high school diploma and are vulnerable to technological disruptions. Workers skilled in interacting with smart devices will be critical to the economy.[33]

Key objectives to achieve this goal include:

Objective	KPI	Baseline	Key relevant BEAD pillars
D1a. Expand curricula and internships in middle and high school to create broadband industry career awareness	Number of participants in High School Tech Pilot Program for broadband-related occupations	To be determined	Broadband deployment; Economic growth and job growth
D1b. Scale education and training programs for skill development for the broadband industry	Number of participants trained for broadband-related occupations	To be determined	Broadband adoption; Digital opportunity; Economic growth and job creation
D1c. Increase the number of available broadband training programs	Number of training programs offered for broadband-related occupations	To be determined	Broadband adoption; Digital opportunity; Economic growth and job creation
D1d. Increase utilization of broadband training programs	Number of participants enrolled in broadband training programs (e.g., TechCred, IMAP)	To be determined	Broadband deployment; Economic growth and job creation

2. **Accelerate adoption, usage, and economic empowerment via Regional Digital Inclusion Alliances (RDIAs)**: Partner with RDIAs as they engage

[32] 2028 Ohio Job Outlook. Department of Job and Family Services
[33] Fast Forward: The Future of Smart Work in Central Ohio. 2020

local communities in driving Digital Opportunity via funding for programs that promote broadband adoption and provide training on digital skills

Relevant BEAD Pillars: Broadband Adoption, Broadband Affordability, Digital Opportunity, Economic Growth and Job Creation

Universally available high-speed internet infrastructure will enable all Ohioans with access, but it is not sufficient to reach the vision of full participation in the modern economy. Enabling improved health outcomes, educational opportunities, economic development, and safer transportation requires that Ohioans have the digital devices and digital skills to productively use the internet.

Making this vision a reality will be a challenge. Even where high-speed internet is available, Ohioans face barriers to internet adoption, with some 1.3 million Ohio households (28 percent) without subscriptions to high-speed, fixed broadband.[34] The gap between having a broadband subscription is especially pronounced for underrepresented population groups relative to the general population, such as those who live below 150 percent of the federal poverty line and those in rural areas.

Gaps in device access follow the same trends but are less pronounced. Nearly 83 percent of Ohioans have access to an internet-capable device in their home (excluding those with only smartphones). But access lags among people are over 60 (77 percent), who are English language learners (73 percent), and who are disabled (71 percent).[35]

To accelerate digital opportunity, in February of 2023, Ohio established the Regional Digital Inclusion Alliances (RDIAs). The role of the RDIAs is to convene diverse stakeholders to coordinate regional planning efforts, support digital inclusion activities, and collect local feedback to inform Ohio's Digital Opportunity Plan, in partnership with BroadbandOhio. BroadbandOhio promotes local and regional digital inclusion success stories and ensures that the state's plan incorporates regional plans to best meets the needs of all Ohioans.

Key objectives that Ohio aims to achieve with RDIAs include:

Objective	KPI	Baseline	Key relevant BEAD pillars
D2a. Improve adoption rates both overall and for each Covered Population	Difference in internet adoption rates between covered and non-covered populations	(Among others) 20pp gap between those living on <150 percent FPL and rest of population[36]	Broadband adoption; Digital opportunity
D2b. Increase in share of Ohioans with access to internet-ready devices	Percent of Ohioans with a computer, laptop, or tablet device	64 percent for computer / tablet[37]	Broadband adoption; Broadband affordability; Digital opportunity

[34] American Communities Survey. US Census Bureau (2021 5-year estimates)
[35] From U.S. Census 2021 ACS 1-Year Estimates Subject Table.
[36] ibid
[37] Share of Ohioans over the age of 3 who responded that they use a desktop computer, laptop computer, or a tablet on the NTIA Internet Use Survey 2021

Objective	KPI	Baseline	Key relevant BEAD pillars
D2c. Increase the number of digital literacy programs available statewide	Number of new digital literacy programs	Not started	Broadband adoption; Digital opportunity; Economic growth and job creation

These objectives will be further detailed and refined in the State Digital Opportunity plan.

3 Current State of Broadband and Digital Inclusion

3.1 Existing Programs

In March of 2020, Ohio Governor Mike DeWine announced the creation of BroadbandOhio, an office housed within the Ohio Department of Development dedicated to improving access to high-speed internet across Ohio. As part of the 2019 Ohio Broadband Strategy, BroadbandOhio is the lead for all broadband projects in Ohio. The office identifies high-priority initiatives and works to implement the goals of the state in expanding access to Ohioans who have been left without access to the modern economy, education system, and healthcare system due to their lack of high-speed internet connectivity. BroadbandOhio is a resource for local governments and private industry as they undergo their own expansion efforts.[38]

Toward achieving its vision to bring high-speed internet access to every Ohioan and build a best-in-class broadband network in Ohio, BroadbandOhio is supported by a team of full-time staff spearheading and coordinating various broadband-related initiatives state-wide. Included below is a list with information on key current activities, staff, funding, and other relevant information.

Table 1: Current Activities conducted by BroadbandOhio (Non-exhaustive)

Activity Name	Description	Intended Outcome(s)
Development of the Ohio Broadband Strategy[39]	Created by the initial 2019 Ohio Broadband Strategy, BroadbandOhio now serves as custodian of the strategy, responsible for collecting input from business and community leaders and regularly revisiting the strategy to reflect developments in Ohio.	The strategy provides a roadmap for Ohio to prioritize broadband-related efforts and a guide to track progress against.
"Strengthening Ohio's Broadband & 5G Workforce" Strategy[40]	To ensure smooth broadband deployment, the Governor's Office of Workforce Transformation and BroadbandOhio released a strategic plan in September 2021 that outlines a detailed framework and roadmap to address three main issues: lack of industry career awareness, lack of education and training programs, and lack of awareness of existing state and federal funding programs. The document outlines 4 strategies, with implementation supported by the Governor's Office of Workforce Transformation and BroadbandOhio (e.g., Ohio Broadband and 5G Sector Partnership).	The strategy will help address labor supply gaps in broadband so that broadband and 5G infrastructure projects (e.g., BEAD) can proceed with minimal disruption due to labor shortages.

[38] Why Broadband Matters. BroadbandOhio
[39] The Ohio Broadband Strategy. BroadbandOhio
[40] Strengthening Ohio's Broadband & 5G Workforce. Governor's Office of Workforce Transformation and BroadbandOhio

FINDER Program[41]	BroadbandOhio developed and has maintained FINDER, a publicly accessible online digital asset inventory. BroadbandOhio gathers information on assets via a public stakeholder information entry form and compiles them into the FINDER tool for public access.	As a publicly available asset map, FINDER helps promote digital opportunities statewide by supporting households locate devices, hotspots, and device donation locations.
Broadband Community Accelerator Program[42]	BroadbandOhio and the Governor's office collaborates with Heartland Forward, the Benton Institute, and The Ohio State University Office of Extension to run the jointly established Community Accelerator, a new planning and capacity-building program to help leverage historic broadband infrastructure funding for community-driven expansion. The first cohort announced in June 2022 includes 4 teams made up of 50 representatives from 11 counties across Ohio. The program works to prepare communities to establish and implement a full-scale broadband connectivity vision. Through more than 30 hours of no-cost expert counseling, the program offers an immersive, 15-week program for communities to identify broadband goals, gather data, understand available funding options, and target capital dollars to support implementation.	By offering planning support and engaging the community, BroadbandOhio can empower more villages, cities, and counties, regardless of their size or staffing, to prepare for funding opportunities from both the state and federal levels by creating local plans on how to expand broadband access.
Cuyahoga County Connectivity Project[43]	The State of Ohio, through BroadbandOhio, allocated $9.7 million in funding for the initiative, with Cuyahoga County providing matching funds, for a total of nearly $20 million. The state and county have partnered with PCs for People to provide in-home, high-speed internet access to roughly 25,000 Cuyahoga County households. PCs for People will build a fixed-wireless network that can support approximately 20,000 suburban households where more than 20 percent of the population does not have home internet. A wired approach will be used for multi-dwelling units, adding up to 5,000 households. The project was announced in July 2022.	The project will provide internet to these traditionally un/underserved communities, at a cost of $15 a month and in some cases for free.

[41] https://broadband.ohio.gov/highlights/finder/01-finder
[42] https://governor.ohio.gov/media/news-and-media/Governor-DeWine-Announces-BroadbandOhio-Community-Accelerator-Cohort-06152022
[43] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/cuyahoga-county-connectivity-project; https://governor.ohio.gov/administration/lt-governor/072122

City of Dayton Department of Recreation Broadband Expansion[44]	InnovateOhio and the city of Dayton are driving a broadband expansion project that, once complete, will provide high-speed internet to three community recreation centers. Through the Office of BroadbandOhio, the State of Ohio has allocated $250,000 in funding for the initiative. The funding will go towards the infrastructure necessary to create Wi-Fi systems at 3 select community recreation centers. These community recreation centers are open to the public and are free to enter. The project was announced in September 2022.	This project will allow the City of Dayton Department of Recreation to offer visitors Wi-Fi access. Visitors would be able to use their own electronic devices to connect to internet. The rec centers could also create education resources for digital skills (e.g., educational support for afterschool and summer camp programming, education resources for students using laptops).
East Cleveland Connectivity Project[45]	BroadbandOhio, Cuyahoga County, Eaton Corporation, GE Lighting- a Savant company, Greater Cleveland Partnership, InnovateOhio, Microsoft, and PCs for People are piloting a new broadband expansion project located in the City of East Cleveland to connect residents to reliable, low-cost high-speed internet. PCs for People will serve as the internet provider and distribute antennas and modems for residents to have in their homes. Case Western Reserve University, Connect, East Cleveland City Schools, OARnet, and University Hospitals will assist with the technical infrastructure. The project was announced in April 2021.	The project will connect more than 1,000 households in its first phase, with plans to scale up access to 2,000 households, to $15/month plans with internet speeds of 50 Mbps for download and 10 Mpbs for upload.
Mt. Healthy Connectivity Pilot Project[46]	The State of Ohio, Hamilton County, Mt. Healthy City Schools, and the City of Mt. Healthy have partnered with altafiber to improve digital opportunity and drive more access to educational, healthcare, and employment opportunities through broadband Internet. Through the partnership, altafiber and UniCity (its Smart City organization) will deliver fiber-enabled, high-speed public Wi-Fi to 4 apartment complexes that represent 828 apartment units. In addition, altafiber will provide high-speed public Wi-Fi in Mt. Healthy City Park and the Central Business District of Mt. Healthy along Hamilton	The project will provide high-speed internet to approximately 3,000 residents and create public hotspots around the city, enabling the community to access high-speed connectivity through a splash page where small businesses and the local school district can also place important announcements.

[44] https://broadband.ohio.gov/news-and-events/all-news/2022-0912-broadband-expansion-project-dayton
[45] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/east-cleveland-connectivity-project; https://governor.ohio.gov/media/news-and-media/broadband-expansion-project-east-cleveland-04072021
[46] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/mthealthy-connectivity-pilot-project; https://governor.ohio.gov/administration/lt-governor/040122

	Avenue and along Compton Road. The project was announced in April 2022.	
Muskingum Valley ESC's School-Based Telehealth in Appalachian Ohio Project[47]	The project is a collaborative effort between InnovateOhio, BroadbandOhio, the Muskingum Valley ESC and the Appalachian Children's Coalition. The project will provide telehealth services to 15 school districts, spanning 6 counties in rural Appalachian Ohio. Funding for this program also allows 4 school districts in the region to access telemedicine supports for students with acute illness or chronic conditions through remote access to pediatricians and other providers. The project was announced in May 2021.	This BroadbandOhio initiative will connect nearly 20,000 students to telehealth services through a $1.15 million appropriation by InnovateOhio.
Riverside Connectivity Pilot[48]	Riverside Local School District (RLSD) was awarded $121,172.93 in funding through the BroadbandOhio Connectivity Grant, which allocated $50 million in state funding through federal CARES Act to provide hotspots and internet-enabled devices to students for purchases made between July 1, 2020 and December 30, 2020. RLSD used part of its grant funding to provide hotspots on school buses. Additionally, BroadbandOhio, InnovateOhio, and RLSD, collaborated with OARnet, WOCO (Western Ohio Computer Organization), and PCs for People to utilize fixed wireless technology on school property to bring high-speed internet access to approximately 600 households in 3 surrounding towns. Subscribers will pay a low upfront fee for a router and then a low monthly fee of $15, and RLSD is subsidizing the cost of some units to help low-income households. The BroadbandOhio Connectivity Grant was announced in July 2020, grant awardees were notified in September 2020, and the pilot went operational in February 2021.	The project will help connect students to the internet, with the school bus hotspots offering a place for students to do homework if internet is not available in their homes, and the low-cost plans helping connect 600 households in the vicinity. A new phase of the project is under discussion to help amplify the benefits of the original Riverside Connectivity Pilot, providing surrounding communities with network coverage.
Starlink[49]	Allen Township in Union County has been selected by Starlink as the site of the SpaceX Starlink Broadband Pilot project, where SpaceX's Starlink uses a constellation	The pilot aims to deliver Starlink's space-based high-speed internet to 90 underserved households and

[47] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/muskingum-valley-educational-service-center-telehealth-project; https://innovateohio.gov/news/news-and-events/052621

[48] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/riverside-connectivity-pilot

[49] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/starlink; https://www.prnewswire.com/news-releases/new-satellite-high-speed-internet-service-will-connect-underserved-households-and-businesses-in-central-ohio-301194384.html; https://broadband.ohio.gov/static/alliancemeetings/dana-saucier-03312021.pdf

	of low Earth orbit satellites to deliver high speed internet of 100-150MB speeds (with near-term plans to increase to 300MB). The project brought connection to select underserved households and small businesses where access has been unreliable, expensive, or completely unavailable. It marks the largest Starlink pilot in the Midwest. The pilot began in the first quarter of 2021 and the service ran at no cost to the participants for 12 months. While the subsidized pilot phase has been concluded, service continues to be available and provided to piloted households who chose to transition to a personal payment subscription to continue receiving service. Approximately $200,000 has been invested by JobsOhio.	about 10 underserved small businesses.
Broadband Telehealth Pilot Project at Switzerland of Ohio School District in rural Monroe County[50]	The 1st phase of the Telehealth Pilot Project, now fully operational, allows in-demand virtual counseling for K-12 students by the 2 mental health counselors who physically work in the schools. The district has over 2,000 students in 8 buildings across 536 square miles, and poor cell phone coverage makes it difficult to reach counselors while they are traveling to reach students in need, a commute time of up to 60 minutes. By enabling telehealth solutions, this lost time can be recovered and still provide mental health services. Phase 2 will work to connect the school's existing fiber-optic network directly to remote offices of mental health professionals, so students can have access to care and additional services beyond the two counselors who physically work in the schools. The school district was also able to leverage additional dollars through the Appalachian Regional Commission to receive a $500,000 grant that will extend broadband into the community, as a last mile connection point. The project was announced in March 2020.	The pilot aims to provide students in-demand access to the 2 contracted counsellors and additional mental health professionals via telehealth, and the community with better last mile broadband connection.
Washington County/MARCS	Multi-Agency Radio Communications System towers (MARCS towers) are part of a statewide, wireless, digital communication network that allows emergency and law enforcement personnel	The project enhances and expands high-speed internet access to unserved and underserved Ohioans, particularly those in the

[50] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/telehealth-pilot-project

Tower Pilot Project[51]	to communicate instantly during emergencies. The Southeast Ohio Broadband Cooperative (SEOBC) has been granted access to use these MARCS towers, which were used to broadcast a signal out to hundreds of previously unserved homes in range, and an additional 130 households are now able to maintain coverage after a local internet service provider was going to stop providing internet service to the area. The project was announced in October 2021.	Appalachia region of the state, by creatively leveraging state assets.
Lake-to-River Broadband Corridor[52]	BroadbandOhio allocated $500,000 in funding for a broadband expansion project to improve digital opportunity through Ashtabula, Trumbull, Mahoning, and Columbiana counties, which will go towards conducting an engineering analysis necessary to complete a Lake-to-River Fiber Broadband Corridor along State Route 11. The engineering analysis will help turn the vision for Route 11 into a technical blueprint that can be followed by an internet service provider to build the project.	The development of a Lake-to-River Fiber Broadband Corridor was one of the key recommendations of an extensive Broadband Feasibility Study released by Eastgate Regional Council of Governments in June 2021. The project will help eliminate the digital divide in the rural and urban areas within the region by improving middle mile infrastructure and last mile broadband capabilities.
FCC Internet Availability Challenge process facilitation[53]	In addition to preparing and submitting their own bulk challenges, BroadbandOhio informs constituents about the FCC Internet Availability Challenge process with a dedicated page on their website, with step-by-step guidance, what to expect, and additional resources.	BroadbandOhio aims to improve the accuracy of the FCC map to ensure a clear picture of the current state, which will ultimately help provide universal coverage for Ohioans.
Ohio's Broadband Availability Gaps map development[54]	BroadbandOhio launched a new mapping resource that more accurately shows how many of the state's households are connected to high-speed internet. The map leverages Ookla Speedtest Intelligence's on-the-ground data from actual internet customers (data from February 2020 – August 2021) to determine where there are gaps in coverage.	The map supplements other available data and helps provide a clearer, more detailed picture of Ohio's broadband availability gaps to BroadbandOhio, statewide stakeholders, and constituents.

[51] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/washington-county-marcs-tower-pilot-project; https://governor.ohio.gov/administration/lt-governor/10042021
[52] https://development.ohio.gov/home/news-and-events/all-news/2022-0928-broadbandohio-announces-state-support-for-lake-to-river-regional-broadband-expansion-project
[53] https://broadband.ohio.gov/explore-broadband/fcc-availability-challenge
[54] https://broadband.ohio.gov/view-maps/ohios-broadband-availability-gaps

Ohio Residential Broadband Expansion Grant Program[55]	BroadbandOhio administers the Ohio Residential Broadband Expansion Grant Program, which awards grants to internet service providers to fund the construction of broadband projects in unserved and underserved areas of the state. The Broadband Expansion Program Authority was created within the Ohio Department of Development to receive and review applications from providers, and ultimately award these grants. The House Bill 2 of the 134th General Assembly, which created ORBEG, was signed into law in May 2021.	ORBEG grants will help ISPs expand into and build the networks in unserved and underserved areas in Ohio that lack high-speed internet.
Regional Digital Inclusion Alliances (RDIAs)[56]	As part of the planning process for the State Digital Opportunity Planning Grant (SDEPG) Program, BroadbandOhio established Regional Digital Inclusion Alliances (RDIAs) across five regions of the state to champion digital inclusion and opportunity at local and regional levels. Started with a statewide kick-off event in February, collaboration with RDIAs will include regional planning sessions to develop regional plans, presentation, and consolidation into the final State Digital Opportunity Plan. Organizations chosen to lead five Regional Digital Inclusion Alliances (RDIAs) that will champion digital opportunity at the grassroots level were announced in February 2023.	RDIAs will serve as collaborative partners to BroadbandOhio, bringing together diverse stakeholders to coordinate regional planning efforts, support digital inclusion activities, and collect local feedback to better inform Ohio's Digital Opportunity Plan.
BroadbandOhio Alliance[57]	BroadbandOhio convenes quarterly gatherings of public and private sector stakeholders interested in working together collaboratively to help close the digital divide in Ohio. The first meeting was held in March 2021.	Meetings will provide updates on BroadbandOhio's efforts and an opportunity for best practice sharing from stakeholders, which would inform BroadbandOhio and Ohio's digital ecosystem.
Broadband Working Group	The Broadband Working Group, facilitated by BroadbandOhio, convenes various Ohio government agencies to enable cross-agency cooperation and collaboration on broadband-related efforts.	Meetings will help align on priorities and key efforts, gather cross-agency input, and guide BroadbandOhio efforts related to BEAD planning and implementation.

[55] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1
[56] https://broadband.ohio.gov/grant-opportunities/state-digital-equity-grant; https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan
[57] https://broadband.ohio.gov/news-and-events/all-events/12132022-broadbandohio-alliance-meeting; https://broadband.ohio.gov/news-and-events/broadbandohio-alliance-meetings

Broadband Expansion Program Authority Meetings[58]	The Authority, created from House Bill 2, has met regularly since December 2021 to deliver on its various broadband-related responsibilities, ranging from monitoring ORBEG and promoting digital literacy programs. BroadbandOhio currently serves as a member and Chairperson of the Authority.[59] The first meeting was held in December 2021.	As a cross-government entity, the Authority helps promote state-wide collaboration and alignment on key broadband topics including deployment, affordability, and access.
Connectivity to State Park Lodges	BroadbandOhio is partnering with the Ohio Department of Natural Resources to make sure that each of the 9 State Park Lodges have high-speed internet connectivity. Prior to the involvement of BroadbandOhio, some of the lodges were using 50/10 upload/download speeds to serve their customers. Now, each of the lodges have an OARnet connection of speeds up to a gigabit.	Providing lodges with faster internet connection makes them competitive and allows them to be used in the case of an emergency such as the pandemic. With a robust internet connection, the lodges can be used for everything from a field hospital to a temporary shelter or place where people can go to get online when they otherwise could not.
Statewide K-12 Telehealth Administration with OCHIN[60]	BroadbandOhio and OCHIN, a nonprofit leader in equitable health care innovation, partnered to expand crucial healthcare services for Ohio's K-12 students. As the state's telehealth administrator, OCHIN will assist BroadbandOhio in the planning and development of blueprints that school administrators can use to connect students in their district with healthcare providers and counselors via real-time video conferencing technology. The partnership with OCHIN was announced in February 2023.	This initiative will aim to help administrators in at least 10 districts successfully implement telehealth programs in their schools.
Fiber connection to Butler County Rochester Hills	BroadbandOhio worked with Butler Tech and altafiber to bring fiber connectivity to the trailer park that is Rochester Hills. The service in the area before this was a copper connection, and numerous students were not online. Now, the entire community will have access to fiber-to-the-home services, and every student that lives in Rochester Hills will be offered completely free home internet service. BroadbandOhio financially supported connecting students to internet,	The program ensures that students in this impoverished area has access to the best high-speed internet available.

[58] https://broadband.ohio.gov/news-and-events/broadbandohio-expansion-authority
[59] https://broadband.ohio.gov/news-and-events/broadbandohio-expansion-authority
[60] https://development.ohio.gov/home/news-and-events/all-news/2023-0215-broadbandohio-announces-selection-of-state-telehealth-administrator-to-expand-services-to-ohios-k-12-students

	while altafiber built the project with its own funding.	
Creative Housing and the Franklin County Department of Developmental Disabilities	BroadbandOhio is partnering with Creative Housing, which helps people with developmental disabilities stay in their homes longer by providing renovations that allow for greater access. BroadbandOhio is paying for internet connectivity to people who are on a DD waiver (provided to people with developmental disabilities so they can receive specific services from Medicaid) so that they can utilize (i) remote monitoring devices and (ii) an online platform that connects people with DD with doctors and nurses who are trained to help people with DD. This helps streamline the process for people with DD to get the services they need quickly.	Medicaid has discontinued paying for household internet services. BroadbandOhio and Creative housing are working to prove that the use of remote supports in conjunction with the online platform leads to better outcomes for people with DD. At the end of this pilot program phase, Creative Housing and BroadbandOhio will work on publishing a report of the findings to show why Medicaid should reconsider its current practice, assuming that the pilot project goes as expected.
OSU Molly Caren Precision Agriculture Project	BroadbandOhio is partnering with Ohio State University (OSU) to help create a fully operable smart field at the Molly Caren test facility that is located near London, Ohio. The idea will be to make sure that autonomous tractors, remote millers, remote grain bins, and other technologies can be tested at the facility in actual field conditions.	BroadbandOhio understands the importance of agriculture to the state and has been looking to promote agricultural use cases to show what farmers can do when they have the right technology deployed. That opportunity has been realized in the partnership with OSU so that there is a place that can showcase the technology not just for the state, but for the country at the Farm Science Review that happens at the facility annually.
BroadbandOhio Connectivity Grant[61]	BroadbandOhio partnered with the Ohio Department of Education to provide $50 million through the BroadbandOhio Connectivity Grant using CARES Act funds. School districts applied for funding to purchase connectivity devices to make remote learning more accessible to students who did not have broadband access in their homes. The BroadbandOhio Connectivity Grant was announced in July 2020, and grant awardees were notified in September	The grant has helped students get internet access and in turn support remote learning. To date, over 900 school districts received funding and every applicant school district received some funding. Some schools used these funds to not only provide devices, but also to leverage other resources to

[61] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/student-connectivity

	2020. Future rounds are planned pending funding.	expand public wi-fi access in their local communities.
School District RFI[62]	To help support school districts, BroadbandOhio released a Request for Information (RFI) through the Department of Administrative Services to the telecommunications industry to create a transparent price list that school districts could use to make informed decisions about what vendors and products might work best for them. 36 different companies responded with information on pricing for various equipment, ranging from HDMI cables to hotspots. The first round of RFIs were opened in 2020, with a second round opened in January 2021.	The RFI compilation helps promote price transparency to inform school districts regarding their technology-related vendor and product choices.
Partnership between BASCOM and Seneca County	Bascom is a rural electric telephone cooperative in Seneca County, Ohio. The county is attempting to reach 100 percent of its residents to make sure that everyone has access to high-speed internet services. To that end, Bascom and the rural electric cooperative have partnered, using their own funding, to bring broadband to all four corners of the county. To get the project started, Bascom needs to construct some middle mile fiber that will not only be the backbone for the project but will also directly serve some residents with fiber-to-the-home immediately.	Seneca county represents an innovative partnership that BroadbandOhio would like to continue to replicate throughout the state. Encouraging multiple locally owned and operated entities to come together to provide broadband to the community is exactly the model that BroadbandOhio has been looking to pilot and expand further.

Table 2: Current and Planned Full-Time and Part-Time Employees

Current/ Planned	Full-Time/ Part-time	Position	Description of Role
Current	FT	Chief, BroadbandOhio	Oversees the Office of BroadbandOhio and liaises with Ohio's Cabinet
Current	FT	Deputy Chief of Grants & Special Projects, BroadbandOhio	Oversees projects and grants that are administered and supported by BroadbandOhio
Current	FT	Grants Administrator, BroadbandOhio	Oversees grant management activities and compliance with relevant regulations
Current	FT	Manager, Digital Equity & Inclusion, BroadbandOhio	Oversees digital inclusion and opportunity efforts in Ohio, and manages Ohio's Digital

[62] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/student-connectivity; https://excelined.org/2021/02/09/state-spotlight-ohios-broadband-rfi/

			Opportunity Plan development and stakeholder engagement, including coordination with Regional Digital Inclusion Alliances
Current	FT	Senior Financial Analyst	Manages annual budget, reviews performance data, and prepares financial reports for BroadbandOhio
Current	PT	Assistant Chief Council	Reviews all materials and initiatives pertaining to BroadbandOhio's BEAD efforts to ensure compliance
Current	PT	Senior Public Information Officer, Ohio Department of Development	Oversees all communications and branding for BroadbandOhio and its BEAD efforts
Current	PT	Social Media Coordinator	Manages social media for Ohio Department of Development and supports BEAD-related social media efforts
Current	PT	Multimedia Designer	Designs and builds communications materials and assets for BroadbandOhio and its BEAD efforts
Current	PT	Chief, Office of Research	Manages state data and research, including identifying the state's digital gap and deployment needs
Current	PT	Cartographer	Supports cartography to identify BSLs funded by existing federal and state broadband funding programs

Table 3: Current and Planned Contractor Support

Current/ Planned	Time	Position	Description of Role
Current	FT	Consultant	Provides support for the FCC Mapping and Challenge Process and for development of the BEAD Five-Year Action Plan, Initial Proposal, and Final Proposal, including assistance on targeted data analyses, stakeholder engagement, and strategic planning for implementation

Table 4: Broadband Funding

Note: Certain funding (e.g., RDOF, CMC) were not directly awarded to BroadbandOhio but to other entities within the state for broadband-related efforts.

Source	Purpose	Total	Expended	Available
House Bill 2 of the 134th General Assembly[63]	Provision of ORBEG grants to internet service providers to fund the infrastructure cost of broadband projects in unserved and underserved areas of the state.	$232,849,488.15	$232,849,488.15 (disbursement pending)	$0
	Deployment of various state pilot projects by BroadbandOhio for broadband deployment, adoption, and digital opportunity. Pending and ongoing projects include: • ACCESS/United LSD • Cuyahoga County Connectivity Project • Dayton Recreation Centers Project • Creative Housing Pilot • (In progress) Regional Council of Eastgate, Lake-to-River Broadband Corridor • (In progress) State Telehealth Administrator with OCHIN	$34,650,511.85	$13,314,000.00	$21,336,511.85

[63] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1

Source	Purpose	Total	Expended	Available
	• (In progress) OSU Molly Caren Pilot • (Pending contract execution) BASCOM / Seneca County Project • (Pending finalization) Mt Healthy Project • (Pending finalization) MARCS Towers, Jackson • (Pending finalization) MARCS Towers, Germano • (Pending finalization) Lodges pilots • (Pending finalization) Legacy (Corridor Assessment) RFP • Rochester Hills Project • (Pending finalization) Cleveland Project • (Pending finalization) Riverside Project expansion • (Pending finalization) Smartway/Tran Wireless MARCS Pilot • (Pending finalization) Youngstown Pilot / AT&T			

Source	Purpose	Total	Expended	Available
	• (Pending finalization) FCC Map outreach			
FCC Rural Development Opportunity Fund (RDOF) Phase I Auction	Provision of high speed fixed broadband service to rural homes and small businesses in census blocks that are entirely unserved.	$123,585,126.20[64] (note, excludes defaults as of April 2022)	n/a – Federally administered program directly to providers	n/a
CARES Act[65]	Provision of hotspots and internet-enabled devices to students for purchases made between July 1, 2020 and December 30, 2020 through the BroadbandOhio Connectivity Grant. Federal legislation has extended the grant opportunity through November 22, 2021.	$50,000,000	$50,000,000	$0
State Digital Opportunity Capacity Grant Program[66]	Development of a statewide plan for achieving digital opportunity goals and closing the digital divide.	$1,470,550.76	$726,801.60	$743,749.16
Connect America Fund Phase II[67]	Provision of fixed broadband and voice services across the United States	$13,186,434.40	n/a – Federally administered program directly to providers	n/a
National Telecommunications	Expansion of high-speed Internet access and	$2,066,822.86 (Awarded to	n/a – not administered by the state	n/a

[64] https://www.fcc.gov/document/auction-904-winning-bidders/attachment-b; https://www.fcc.gov/document/auction-904-winning-bidders/attachment-a. Excludes $8,179,419.00 awarded to LTD Broadband and $38,273,659.90 awarded to Connect Everyone LLC (Starry).
[65] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/riverside-connectivity-pilot; https://ohio-k12.help/broadbandohio-connectivity-grant/
[66] https://broadband.ohio.gov/grant-opportunities/state-digital-equity-grant/state-digital-equity-planning-grant
[67] [67] From Connect America Fund Phase II Auction (Auction 903) results page (https://www.fcc.gov/auction/903), award amount by state found here.

Source	Purpose	Total	Expended	Available
and Information Administration (NTIA) Connecting Minority Communities Pilot Program (CMC)[68]	connectivity to eligible Historically Black Colleges and Universities (HBCUs), Tribal Colleges or Universities (TCUs), and other Minority-serving institutions (MSIs).	Wilberforce University		
(Application in process) Appalachian Regional Initiative for Stronger Economies (ARISE) Grant[69]	Cross-state development of a large-scale middle-mile network across Ohio, Pennsylvania, Kentucky, and West Virginia designed to create a multistate ecosystem.	TBD – in application process	n/a	n/a
(Application in process) NTIA Middle Mile Grant	Development of underground routes in the Appalachian region to offer long-term alternatives and an affordable, redundant service to expand upon limited existing aerial-only spans, which would reach 29 counties, 277,825 households that do not have access to 25/3 Mbps, and over 350 CAIs within 1,000 feet from the route.	$130,329,707 ($76,894,527 requested from NTIA, $53,435,180 provided as match)	$0	To be confirmed – currently in application process
(Application in process) Coronavirus Capital Projects Fund (CPF)	Enhancement of broadband deployment by funding 5 broadband infrastructure projects aimed at affordability, fiber construction,	268,578,200.00	$0	To be confirmed – currently curing the application with Treasury

[68] https://www.internetforall.gov/news-media/biden-harris-administration-announces-more-175-million-internet-all-grants-61-minority
[69] https://www.arc.gov/arise/

Source	Purpose	Total	Expended	Available
	infrastructure upgrade, and more. Projects include: • Ohio's Affordability and Digital Equity Grant ($20 million) • Multi-County Last Mile Fiber Build Pilot ($60 million) • Shovel Ready School District Project ($7 million) • Western Ohio Infrastructure Upgrade Pilot Project ($3 million); • Ohio Broadband Expansion Grant Program ($80M); • Line Extension Program ($10M); and • Creation of Appalachian Community Innovation Centers ($90M)			

3.2 Partnerships

Table 5: Partners

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
Cross-state efforts	Midwest Regional Collaboration – Appalachia (MRC-A)	The Midwest Regional Collaboration – Appalachia (MRC-A) is a group comprised of state research and education networks, broadband offices, and offices of Appalachia from Ohio, Pennsylvania, West Virginia, and Kentucky. MRC-A plans to leverage ARISE grants to build Appalachia's infrastructure, specifically by architecting a large-scale middle-mile network designed to create a multistate ecosystem. The MRC-A will provide a highly scalable, resilient, and redundant network with open access, ensuring that large and small providers alike have the opportunity to use the infrastructure to bring broadband to the areas, while also leveraging connectivity to community anchor institutions (CAIs). The partners comprising MRC-A include: Ohio Academic Resources Network (OARnet); Keystone Initiative for Network Based Education and Research (KINBER); Three Rivers Optical Network (3ROX); Kentucky Regional Optical Network (KyRON); West Virginia Network (WVNET); the State Broadband Offices of Ohio, Pennsylvania, Kentucky, and West Virginia; and the State Governor's Offices of Appalachia for Ohio, Pennsylvania, Kentucky, and West Virginia.
State government	Broadband Working Group	The Broadband Working Group convenes key Ohio state agencies related to broadband to enable a whole-of-government approach in terms of identifying barriers to broadband deployment, aligning on priorities, collecting information on existing assets to leverage, and more. The Working Group consists of InnovateOhio, Department of Development (Office of Workforce Transformation, Governor's Office of Appalachia), Department of Education, Department of Administrative Services, Department of Higher Education, OARnet, and the Ohio Education Computer Network Management Council.
	Broadband Expansion Program Authority[70]	The Authority examines and proposes updates to any broadband plan provided by law enacted by the general assembly or executive order issued by the governor, monitors ORBEG, promotes digital literacy programs, tracks affordable broadband plans in Ohio, and more. The Authority includes five members: (i) Development Director or designee, (ii) Director of the Office of InnovateOhio or designee, (iii) One member appointed by the Speaker of the House of Representatives, (iv) One

[70] https://broadband.ohio.gov/static/House_Bill_2_Legislation.pdf

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		member appointed by the President of the Senate, and (v) One member appointed by the Governor. BroadbandOhio currently serves as the Development Director designee.[71]
	InnovateOhio	InnovateOhio provides financial support, strategic guidance, and additional support to a wide array of BroadbandOhio projects, including ORBEG funding awarding, local broadband deployment pilot projects, MARCS tower utilization support, telehealth pilot and blueprint development, and more. InnovateOhio will continue to support BroadbandOhio throughout the BEAD sub-grant and implementation process.
	Ohio Department of Transportation	BroadbandOhio and the Ohio Department of Transportation have collaborated in broadband strategy development and implementation, including streamlining permitting processes via its new e-permit system and Smart City / Transportation initiatives. BroadbandOhio will continue to work with ODOT on Right of Way policies that will help streamline broadband deployment.
	Ohio Department of Education	BroadbandOhio and the Department of Education have collaborated to bolster student connectivity and internet adoption. Prior collaborations include leveraging the CARES Act to provide $50 million to over 9000 school districts for purchasing connectivity devices, and the Broadband Telehealth Pilot Project. BroadbandOhio will continue to partner with ODOE to ensure students and teachers have the digital connectivity required for education and well-being.
	Ohio Department of Health	BroadbandOhio collaborates with the Ohio Department of Health to identify potential strategies that could be accelerated via expanded access to broadband (e.g., telehealth) and to identify the internet connectivity status of health centers across the state (as health centers represent a priority CAI for Ohio).
	Ohio Department of Mental Health and Addiction Services	BroadbandOhio and the Ohio Department of Mental Health and Addiction Services have collaborated on the Broadband Telehealth Pilot Project implementation in the Switzerland of Ohio School District in Monroe County. BroadbandOhio will continue to partner closely with the department to ensure expanded access to broadband will help achieve the broader goals for Ohio related to mental health
	Ohio Department of Medicaid	BroadbandOhio and the Ohio Department of Medicaid have collaborated on the Broadband Telehealth Pilot Project implementation in the Switzerland of Ohio

[71] https://broadband.ohio.gov/news-and-events/broadbandohio-expansion-authority

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		School District in Monroe County. BroadbandOhio will continue to partner with the department on any pilot projects and for the promotion of ACP adoption.
	Ohio Department of Administrative Services	BroadbandOhio and the Department of Administrative Services have partnered on promoting both internet deployment and adoption. They have collaborated to help bolster student connectivity by launching an RFI to the telecommunications industry to create a transparent pricing list that schools could use to make an informed decision on vendor and product choices. The Department of Administrative Services additionally supported BroadbandOhio in its MARCS Tower Pilot Program. BroadbandOhio will continue to partner with DAS on these initiatives throughout the BEAD program.
	Ohio Governor's Office of Workforce Transformation	BroadbandOhio and the Ohio Governor's Office of Workforce Transformation collaborated to strategize addressing the labor needs for broadband deployment via the joint development of the "Strengthening Ohio's Broadband & 5G Workforce" Strategy. The strategy will help preempt labor shortages and enable smooth deployment of BEAD.
	JobsOhio	BroadbandOhio and JobsOhio have partnered to deliver the Starlink pilot program, where JobsOhio offered financial support to enable the project. JobsOhio additionally partners with Agile Networks to create Digital Access Ohio, a company dedicated to expanding high-speed internet services in traditionally underserved areas by building, owning, and operating new fiber-backed infrastructure and partnering with local internet providers. BroadbandOhio and JobsOhio will collaborate to help address potential labor gaps as it pertains to broadband deployment as well as efforts to enable Ohioans to participate in the digital economy.
	Ohio Department of Higher Education	Ohio Department of Higher Education funds OH-TECH, an umbrella organization for Ohio's statewide technology infrastructure organizations including the Ohio Academic Resources Network (OARnet), the Ohio Supercomputer Center (OSC), and the Ohio Library and Information Network (OhioLINK). BroadbandOhio and the Ohio Department of Higher Education have collaborated regarding OARnet on a wide range of topics, including understanding the status quo of CAI connectivity, providing technical oversight for the NTIA Middle Mile Grant, and other activities. BroadbandOhio will continue to partner with ODOE to expand the OARnet network and upgrade internet access for CAIs.
	Ohio Department of Natural Resources	BroadbandOhio and the Ohio Department of Natural Resources have partnered to provide high-speed internet to 9 State Park Lodges. BroadbandOhio plans to

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		continue working with the Ohio Department of Natural Resources to identify additional priorities for expanded internet access.
Local government	Cuyahoga County	Cuyahoga County and BroadbandOhio have partnered on multiple internet deployment projects, such as the East Cleveland Connectivity Project and the Cuyahoga County Connectivity Project.
	Hamilton County	BroadbandOhio and Hamilton County have partnered to bolster internet access, jointly delivering the Mt. Healthy Connectivity Pilot program.
	Defiance County	BroadbandOhio and Defiance County have collaborated on broadband adoption-related topics such as agribusiness (e.g., visits).
	Preble County	BroadbandOhio and Preble County have collaborated on broadband expansion, including discussions between BroadbandOhio and Preble County Commissioners to discuss broadband expansion.
	Franklin County	BroadbandOhio and Franklin County have collaborated to deliver the Creative Housing pilot program.
	Seneca County	Seneca County worked with BASCOM and developed a successful partnership for providing connectivity to residents. BroadbandOhio is supporting the partnership by providing funding to assist the construction of the middle mile fiber infrastructure throughout the county, thereby supporting the partnership's last mile expansion efforts.
	City of Dayton	BroadbandOhio and the City of Dayton have partnered to expand broadband for its Department of Recreation.
	City of East Cleveland	BroadbandOhio and the City of East Cleveland have jointly delivered the East Cleveland Connectivity Project for new broadband expansion.
	City of Cleveland	The City of Cleveland has partnered with DigitalC to improve the city's connectivity, and have shared key takeaways to stakeholders, including presenting in BroadbandOhio Alliance meetings.[72]
	City of Marysville	BroadbandOhio and the City of Marysville have partnered to implement the Starlink pilot program.
	City of Mt. Healthy	BroadbandOhio and the City of Mt. Healthy have partnered to expand connectivity by jointly delivering the Mt. Healthy Connectivity Pilot program.
	County Commissioner's Association of Ohio (CCAO)	CCAO and BroadbandOhio have collaborated on stakeholder engagement, where BroadbandOhio has presented in CCAO's events on broadband-related updates and how stakeholders could be involved.[73]

[72] See April 27, 2022 meeting agenda as an example. https://broadband.ohio.gov/news-and-events/broadbandohio-alliance-meetings

[73] An example is a 2023 CCAO webinar delivered by BroadbandOhio, a recording of which can be found here: https://ccao.org/aws/CCAO/pt/sp/webinars

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
Internet providers	OARnet	OARnet currently provides middle mile connection and 1Gbps speed internet to a large share of Ohio's CAIs. OARnet has supported BroadbandOhio in various broadband deployment projects, including assisting with the technical infrastructure of the East Cleveland Connectivity Project, and utilizing the fixed wireless technology on the school property of Riverside Local School District to provide residents with internet access. OARnet additionally supports BroadbandOhio in various broadband planning efforts, including its involvement in the Ohio Middle Mile Plan partnership with BroadbandOhio and the Eastgate Regional Council of Governments, which is aimed at constructing a new underground fiber route starting at Lake Erie and moving along the Ohio River towards Cincinnati.
	altafiber	BroadbandOhio and altafiber have collaborated on broadband deployment pilot projects, including the Mt. Healthy Connectivity Pilot and Butler County Rochester Hills. altafiber has additionally sponsored BroadbandOhio's programs for broadband deployment and digital opportunity, including the Digital Opportunity Summit in February 2023. altafiber is a BroadbandOhio partner for the pending NTIA Middle Mile Grant, with plans to expand middle mile connection with 323 miles of new fiber that will go through 15 counties encompassing over 350,000 households and bring 199 anchor institutes within 1,000 feet of the middle mile route. altafiber is also a pending CPF partner, where it will help enable the construction of fiber to the home for 85,000 homes of Adams, Brown, and Clermont counties in Appalachia Ohio.
	SpaceX	BroadbandOhio and SpaceX have partnered to deliver the Starlink pilot, which leveraged SpaceX's Starlink satellite broadband service.
	PCs for People	BroadbandOhio has collaborated with PCs for People for multiple broadband deployment projects, including financial investment, internet provision, and antenna / modem distribution for the East Cleveland Connectivity Project; construction of fixed wireless networks and wired networks for the Cuyahoga County Connectivity Project; and provision of high-speed internet to residents neighboring the Riverside Local School District.
	Everstream	Everstream is a BroadbandOhio partner for the pending NTIA Middle Mile Grant, with plans to expand middle mile connection with 99 miles of new fiber that will go through 4 counties encompassing 310,746 households and bring 40 anchor institutes within 1,000 feet of the middle mile route.

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
	Ohio Gig	Ohio Gig is a BroadbandOhio partner for the pending NTIA Middle Mile Grant, with plans to expand middle mile connection with 280 miles of new fiber that will go through 13 counties encompassing over 280,030 households and bring 80 anchor institutes within 1,000 feet of the middle mile route.
	Comcast Cable Company[74]	The Comcast Cable Company is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The proposed project will serve 2,466 households in Belmont, Columbiana, Harrison, and Jefferson counties, 2,466 of which have less than 10/1Mbps speed today.
	Frontier North Inc.[75]	Frontier North Inc. is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The proposed project will serve 94 households in Harrison and Jefferson counties, 74 of which have less than 10/1Mbps speed today.
	JB Nets[76]	JB Nets is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The proposed project will serve 816 households in Lawrence and Gallia counties, 811 of which have less than 10/1Mbps speed today.
	North Coast Wireless (NCWCOM)[77]	North Coast Wireless is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping subsidizing infrastructure build out costs.
	South Central Power[78]	South Central Power is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The 2 proposed projects will serve 13,615 households in Belmont, Carroll, Jefferson, Harrison, Monroe, Noble, Adams, Brown, Clermont, Fayette, Highland, Pike, Ross, and Scioto counties, 9,875 of which have less than 10/1Mbps speed today.
	Southern Ohio Communication Services[79]	Southern Ohio Communication Services is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The proposed project will serve 3,291 households in Adams, Highland,

[74] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[75] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[76] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[77] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[78] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[79] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		Pike, and Scioto counties, 3,291 of which have less than 10/1Mbps speed today.
	Spectrum[80]	Spectrum collaborated BroadbandOhio and the City of Dayton to provide connection to its recreation centers and enable them to serve as broadband hubs for the community. Spectrum is also a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The 17 proposed projects will serve 19,734 households in Lawrence, Coschocton, Pike, Perry, Gallia, Morgan, Trumbull, Highland, Clark, Hardin, Washington, Richland, Huron, Muskingum, Carroll, Fayette, and Brown counties, 16,016 of which have less than 10/1Mbps speed today.
	Telephone Services Company[81]	The Telephone Services Company is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The proposed project will serve 575 households in Hardin County, 575 of which have less than 10/1Mbps speed today.
	The Chillicothe Telephone Company[82]	The Chillicothe Telephone Company is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The 2 proposed projects will serve 2,588 households in Fayette, Highland, and Ross counties, 1,913 of which have less than 10/1Mbps speed today.
	Windstream[83]	Windstream is a Round 1 recipient of the ORBEG grant, aimed at expanding high-speed internet into unserved and underserved areas of Ohio by helping with infrastructure costs. The 6 proposed projects will serve 294 households in Trumbull, Licking, Athens, Meigs, Washington, Guernsey, Noble, and Muskingum counties, 294 of which have less than 10/1Mbps speed today.
	Independents Fiber Network (IFN)	IFN supplies bandwidth to 26 Ohio ISPs, OARnet, NOACSC, SWOCA, MVECA and several hospitals and other anchor institutions in Ohio. IFN partnered with BroadbandOhio for the pending CPF Grant, with plans to upgrade existing infrastructure in the north and western part of Ohio (to 100G) to accommodate for additional bandwidth in the area.
	BASCOM	BASCOM worked with Seneca County and developed a successful partnership for providing connectivity to

[80] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[81] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[82] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[83] https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		residents. BroadbandOhio is supporting the partnership by providing funding to assist the construction of the middle mile fiber infrastructure throughout the county, thereby supporting the partnership's last mile expansion efforts.
	Agile Networks[84]	Agile Networks partnered with JobsOhio in creating Digital Access Ohio, a company dedicated to expanding high-speed internet services in traditionally underserviced areas, particularly in Appalachian Ohio.
	Ohio's Broadband and Cable Association (OCTA)	OCTA has been an active stakeholder providing recommendations to BroadbandOhio and other broadband-related entities, including its testimony to the Broadband Expansion Program Authority on August 2022, participation in the Broadband and 5G Sector Partnership, and membership in the BroadbandOhio Alliance.[85]
	Wireless Infrastructure Association (WIA)	The WIA has been selected to lead the Broadband and 5G Workforce Sector Partnership. The Partnership is tasked with implementing the "Strengthening Ohio's Broadband & 5G Workforce" strategy for addressing workforce needs in the broadband industry. WIA's work as the Partnership lead will support BroadbandOhio's BEAD implementation efforts by mitigating potential labor force issues.[86]
	Ohio Telecom Association (OTA)	OTA has been an active stakeholder providing recommendations to BroadbandOhio and other broadband-related entities, including its testimony to the Broadband Expansion Program Authority on August 2022, participation in the Broadband and 5G Sector Partnership, and membership in the BroadbandOhio Alliance.[87]
	Wireless Internet Service Providers Association (WISPA)	WISPA has actively shared broadband-related insights as a member of the BroadbandOhio Alliance, including WISPA's participation in the BroadbandOhio Alliance meetings and BroadbandOhio's participation in WISPA roundtables.[88]
	Fiber Broadband Association	Fiber Broadband Association and BroadbandOhio have collaborated on stakeholder engagement, including BroadbandOhio's participation in a fireside chat

[84] https://www.jobsohio.com/digital-access-ohio; https://www.jobsohio.com/news-press/jobsohio-investment-seeks-to-help-close-digital-divide-in-ohio
[85] https://broadband.ohio.gov/static/authoritymeetings/08032022-Compiled-Testimony.pdf; https://workforce.ohio.gov/news/051822
[86] https://broadband.ohio.gov/explore-broadband/strengthening-ohios-broadband-5g-workforce; https://workforce.ohio.gov/news/051822
[87] https://broadband.ohio.gov/static/authoritymeetings/08032022-Compiled-Testimony.pdf; https://workforce.ohio.gov/news/051822
[88] https://broadband.ohio.gov/static/alliancemeetings/meeting-presentation-12132022.pdf

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		discussion hosted by the Fiber Broadband Association.[89] Fiber Broadband Association also participates in the Ohio Broadband and 5G Sector Partnership.[90]
	Ohio Rural Broadband Association (ORBA)	The Ohio Rural Broadband Association (ORBA) is a partnership of ISPs particularly in the northwest region of Ohio. BroadbandOhio and ORBA have collaborated on ORBEG, where ORBA members provided recommendations for improving ORBEG and offered technological expertise (e.g., inviting BroadbandOhio to their Technology Days).
CAIs	Ohio State University	BroadbandOhio and OSU have collaborated on the Molly Caren Precision Agriculture Project.
	Ohio State University Office of Extension	BroadbandOhio has partnered with the Ohio State University Office of Extension for delivering the Community Accelerator Program. The Ohio State University Office of Extension provides more than 30 hours of no-cost counseling to communities participating in the Program.
	Case Western Reserve University	BroadbandOhio has collaborated with Case Western Reserve University to assist with the technical infrastructure of the East Cleveland Connectivity Project.
	East Cleveland City Schools	BroadbandOhio has collaborated with the East Cleveland City Schools to assist with the technical infrastructure of the East Cleveland Connectivity Project.
	Mt. Healthy City Schools	BroadbandOhio and Mt. Healthy City Schools have partnered to deliver the Mt. Healthy Connectivity Pilot program.
	Riverside Local School District	BroadbandOhio and the Riverside Local School District have collaborated to bring high-speed internet to the neighboring residents and leverage CARES Act funding to set up hotspots on school buses.
	Switzerland of Ohio School District	BroadbandOhio and Switzerland of Ohio School District in Monroe County have partnered to implement the Broadband Telehealth Pilot Project.
	Dayton Recreation Centers	BroadbandOhio and Dayton Recreation Centers have partnered to provide public Wi-fi to residents and offer digital skills programs, allowing the centers to serve as a local digital hub.
	Ohio Library Council	BroadbandOhio and the Ohio Library Council have coordinated on various broadband-related efforts, including the FCC challenge and the stakeholder engagement process.
	Toledo Lucas County Public Library	The Toledo Lucas County Public Library serves as the Northwest RDIA lead for the State Digital Opportunity Plan. It will support BroadbandOhio in its stakeholder

[89] An example is a 2023 CCAO webinar delivered by BroadbandOhio, a recording of which can be found here: https://ccao.org/aws/CCAO/pt/sp/webinars
[90] https://workforce.ohio.gov/news/051822

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		engagement efforts for BEAD and SDOP by leveraging their local relationships to ensure the final plan meets federal requirements of the State Digital Opportunity Planning Grant Program and BEAD while also meeting the needs of all Ohioans.[91]
NGOs	Appalachian Regional Commission	The Appalachian Regional Commission has financially supported BroadbandOhio projects, including providing funding for last mile connection extension in the telehealth pilot project in the Switzerland of Ohio School District in rural Monroe County.
	OCHIN	OCHIN will collaborate with BroadbandOhio as designated state telehealth administrator, including expanding crucial healthcare services to K-12 students.
	Southeast Ohio Broadband Cooperative	BroadbandOhio and the Southeast Ohio Broadband Cooperative collaborated in Washington County to launch the MARCS Tower Pilot Program to bring connectivity to unserved or soon-to-be unserved households.
	Muskingum Valley ESC	BroadbandOhio and Muskingum Valley ESC have partnered to connect students in rural Appalachian Ohio to telehealth services.
	Appalachian Children's Coalition	BroadbandOhio and the Appalachian Children's Coalition have partnered to connect students in rural Appalachian Ohio to telehealth services.
	The Heartland Forward	BroadbandOhio has partnered with Heartland Forward for delivering and scaling the Community Accelerator Program. The project was initiated and is funded by Heartland Forward's Connecting the Heartland initiative.
	The Benton Institute	BroadbandOhio has partnered with the Benton Institute for delivering the Community Accelerator Program. The Benton Institute provides more than 30 hours of no-cost counseling to communities in the Program.
	Greater Cleveland Partnership	BroadbandOhio and the Greater Cleveland Partnership have jointly supported the East Cleveland Connectivity Project.
	Western Ohio Computer Organization	BroadbandOhio and the Western Ohio Computer Organization have collaborated to bring high-speed internet to the neighboring residents with the Riverside Local School District.
	Management Council (MCOECN) Connectivity Champions	Powered by the Management Council, Ohio Connectivity Champions is part of the Future Forward Ohio project that works to remove barriers to internet access. Efforts include ensuring Ohioans have home internet access for online learning, telehealth, job seeking and applying,

[91] https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		and skills development; helping school districts with deployment and development of connectivity programs; promoting and assisting households enroll in cost saving programs (e.g., ACP); and coordinating with stakeholders including the Ohio Department of Education, libraries, digital opportunity coalitions, and Ohio's Information Technology Centers. The Connectivity Champions helped schools and districts link to and maximize use of a $50,000,000 BroadbandOhio Connectivity Grant aimed at immediately expanding broadband services across Ohio.[92]
	Pew Research Center	The Pew Research Center has supported efforts to bring stakeholders and share best practices, including its June 2022 Broadband Access Summit where BroadbandOhio participated as a speaker.[93]
	The Cleveland Foundation	The Cleveland Foundation serves as the Northeast RDIA lead for the State Digital Opportunity Plan. It will support BroadbandOhio in its stakeholder engagement efforts for BEAD and SDOP by leveraging their local relationships to ensure the final plan meets federal requirements of the State Digital Opportunity Planning Grant Program and BEAD while also meeting the needs of all Ohioans.[94]
	Smart Columbus	Smart Columbus serves as the Central RDIA lead for the State Digital Opportunity Plan. It will support BroadbandOhio in its stakeholder engagement efforts for BEAD and SDOP by leveraging their local relationships to ensure the final plan meets federal requirements of the State Digital Opportunity Planning Grant Program and BEAD while also meeting the needs of all Ohioans.[95]
	Buckeye Hills Regional Council	The Buckeye Hills Regional Council serves as the Southeast RDIA lead for the State Digital Opportunity Plan. It will support BroadbandOhio in its stakeholder engagement efforts for BEAD and SDOP by leveraging their local relationships to ensure the final plan meets federal requirements of the State Digital Opportunity Planning Grant Program and BEAD while also meeting the needs of all Ohioans.[96]
	United Way of Greater Cincinnati	The United Way of Greater Cincinnati serves as the Southwest RDIA lead for the State Digital Opportunity

[92] https://www.ohio-k12.help/connectivity-champions/
[93] https://www.pewtrusts.org/en/about/events/2022/broadband-access-summit
[94] https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan
[95] https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan
[96] https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		Plan. It will support BroadbandOhio in its stakeholder engagement efforts for BEAD and SDOP by leveraging their local relationships to ensure the final plan meets federal requirements of the State Digital Opportunity Planning Grant Program and BEAD while also meeting the needs of all Ohioans.[97]
	Creative Housing	Creative Housing is a nonprofit organization dedicated to providing safe, accessible, and affordable housing to individuals with disabilities in the Columbus metropolitan area.[98] BroadbandOhio, Creative Housing, and Franklin County Department of Developmental Disabilities have collaborated on providing connectivity to people with developmental disabilities.
Other stakeholders	Regional Digital Inclusion Alliances	A stakeholder collaboration, the Regional Digital Inclusion Alliances coordinate with BroadbandOhio to bring together diverse stakeholders to support regional planning efforts, digital inclusion activities, and collect local feedback to better inform Ohio's Digital Opportunity Plan and relevant BEAD efforts.
	Digital Equity Coalitions	BroadbandOhio is connected with several digital equity coalitions statewide, including the Greater Cleveland Digital Equity Coalition, Franklin County Digital Equity Coalition, and Greater Toledo Digital Equity Coalition. BroadbandOhio and these Digital Equity Coalitions will continue to collaborate on broadband-related issues, such as stakeholder engagement and ACP awareness programs.
	BroadbandOhio Alliance	The BroadbandOhio Alliance, as a gathering of public and private stakeholders, collaborate to find ways to close the digital divide in Ohio, providing best practices and insights to BroadbandOhio. Meeting quarterly, the Alliance will help BroadbandOhio gather input for its BEAD plan and related best practices.
	Broadband and 5G Sector Partnership	Established as part of the recommendations from the "Strengthening Ohio's Broadband and 5G Workforce" strategy, the Broadband and 5G Sector Partnership serves as a central convening entity for the workforce strategy. Led by the Wireless Infrastructure Association (WIA) and made up by an additional 25 entities from industry, education, and government, the Partnership is supported by the Governor's Office of Workforce Transformation and BroadbandOhio. The Sector Partnership will work to design and distribute curriculum and training programs across the state and promote career awareness to supply the industry with a

[97] https://development.ohio.gov/home/news-and-events/all-news/2023-0217-broadbandohio-ndia-host-kick-off-event-for-state-digital-opportunity-plan
[98] https://creativehousing.org/about-us/

Partner type	Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
		skilled workforce, directly supporting filling labor force gaps for expanding broadband access.[99] The Partnership will support BroadbandOhio in BEAD by supporting workforce-related initiatives that will enable smooth BEAD implementation.
	Ohio Township Partnership	BroadbandOhio and the Ohio Township Partnership have collaborated on stakeholder engagement, where BroadbandOhio has presented to the Ohio Township Partnership on broadband-related updates.[100]
	Intel	BroadbandOhio and Intel have held discussions to understand broadband-related needs that Intel may have.
	Muskingum Education Service Center	The Muskingum Valley ESC has partnered with BroadbandOhio on delivering the School-Based Telehealth in Appalachian Ohio Project.[101]
	Eaton Corporation	BroadbandOhio and the Eaton Corporation have jointly supported the East Cleveland Connectivity Project.
	GE Lighting	BroadbandOhio and GE Lighting have jointly supported the East Cleveland Connectivity Project.
	Microsoft	BroadbandOhio and Microsoft have jointly supported the East Cleveland Connectivity Project.
	Project 10Million	Delivered via a partnership with T-Mobile, the Ohio Department of Education, and the Connectivity Champions, the T-Mobile Project 10Million provides free 100GB of internet per year for 5 years, as well as free hotspots with free shipping, with no fees, costs, or annual re-certifications for eligible K-12 students. Additional affordable devices could be purchased as a Project 10Million participant. Parents / Guardians or school administrators can apply for the program.[102]
	Ohio State University	BroadbandOhio and OSU have collaborated for the Molly Caren Precision Agriculture Project.
	Butler Tech	BroadbandOhio and Butler Tech have collaborated to deliver the Butler County Rochester Hills pilot project.

[99] https://broadband.ohio.gov/explore-broadband/strengthening-ohios-broadband-5g-workforce; https://workforce.ohio.gov/news/051822

[100] An example is a 2023 CCAO webinar delivered by BroadbandOhio, a recording of which can be found here: https://ccao.org/aws/CCAO/pt/sp/webinars

[101] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/muskingum-valley-educational-service-center-telehealth-project

[102] https://www.ohio-k12.help/connectivity-champions/; https://www.t-mobile.com/brand/project-10-million; https://www.t-mobile.com/business/education/project-10-million?icid=MGPO_TMO_U_20TENMM_N5ZH1361JIX6NMJ922748

3.3 Asset Inventory

The State of Ohio has numerous entities offering assets related to broadband and digital opportunity. The following table includes an example list of related assets offered at the state-level. The full asset inventory can be found in the Appendix. *(Please note that the inventory is not an exhaustive list of all assets in the State of Ohio and there may be additional assets not included in the current inventory.)*

Table 3.3.1: Ohio assets related to broadband deployment

Organization Name	Asset Name	Description
Ohio Department of Administrative Services	MARCS (Multi-Agency Radio Communication System)	MARCS is a 700/800 MHz radio and data network that provides statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10-mile radius outside of Ohio. The MARCS system provides statewide, secure, reliable public service wireless communication for public safety and first responders.[103]
Ohio Department of Natural Resources	Land available for deployment	The Ohio Department of Natural Resources owns a large amount of public lands that can be used to facilitate broadband deployment when necessary. The Ohio DNR collaborates with internet service providers regarding right-of-way on public lands under DNR management to ensure efficient deployment of new broadband infrastructure.
Ohio Department of Higher Education	OARnet	OARnet delivers more than 5,500 miles of fiber-optic broadband connectivity, providing connectivity for more than 4,000 government and community institutions.[104] OARnet also has points of presence (PoPs) throughout Ohio where it can offer various connection services.
Ohio Department of Transportation	Right-of-Way E-Permitting system	ODOT centrally manages its rights-of-way and utility permits via a new online system, replacing paper MR 505 forms.[105]
Ohio Department of Transportation	OhROW (ODOT Right-of-Way)	OhROW offers geospatial mapping of ROW plans and centerline survey monuments from state highways.[106]
Ohio Department of Transportation	REAL OS	REAL OS is a web application to create, track, and maintain all the forms and information necessary for Real Estate ROW.[107]
Ohio Department of Transportation	ODOT Project list	ODOT publishes an information library of current and upcoming projects on the state transportation system, filterable by project name, type, status, and county.[108]

[103] https://das.ohio.gov/technology-and-strategy/marcs
[104] https://www.oar.net/
[105] https://www.transportation.ohio.gov/working/engineering/real-estate/row/broadband-projects
[106] http://gis3.dot.state.oh.us/ohrow_viewer/
[107] https://realos.dot.state.oh.us/
[108] https://www.transportation.ohio.gov/projects#page=1

Organization Name	Asset Name	Description
Ohio Department of Higher Education	OARnet Last Mile Enhancement Program	OARnet is spearheading a $12.1 million Last Mile Enhancement Program to increase broadband speeds by 1,000 percent at 40 Ohio colleges and universities. [109]
Ohio Department of Rehabilitation & Corrections; Ohio Central School System (OCSS)	Secure wireless network	A secure wireless network provides access to education in prisons, which was expanded to housing units, providing digital opportunities to other program areas such as mental health and recovery services.[110]
Management Council of the Ohio Education Computer Network (MCOECN)	Information Technology Centers	As non-profit public agencies created by the Ohio legislature, Ohio's 18 Information Technology Centers (ITCs) work collaboratively as the Ohio Education Computer Network to serve over 1.4 million students in 980 public school districts, career centers, and community schools. As Internet Service Providers for Ohio PreK-12 schools, they meet and exceed the national standard of providing every student with 100 kilobits per second of Internet bandwidth. ITCs offer a wide range of programs and services that meet the technology needs of Ohio's school districts. Among an ITCs core services are Internet connectivity, fiscal systems, INFOhio resources (digital learning content and library services), student information, and EMIS services. In addition to Ohio's PreK-12 education community, ITCs continue to serve Ohio government agencies, non-profit organizations and communities with efficient and reliable services for over four decades. The Ohio K12 Network is an advanced, state-of-the-art, private, fiber network linking Ohio's 18 Information Technology Centers (ITCs) to each other and to the Internet. The Ohio K12 Network infrastructure was developed in 2004 as part of a partnership with OARnet, Ohio's statewide telecommunications network.[111]
Ohio Public Library Information Network	Broadband connection and digital literacy tools	OPLIN provides Internet services to the public library systems of Ohio, mostly providing one broadband connection to the main library of each system, and access to the commodity Internet for any public library which routes Internet-bound traffic through OPLIN's network core in Columbus, Ohio. OPLIN provides and manages this physical network connecting libraries to the Internet.

Table 3.3.2: Ohio assets related to broadband adoption

[109] https://www.oar.net/content/last_mile_enhancement_program
[110] https://drc.ohio.gov/About/Press-Releases
[111] https://www.managementcouncil.org/connect/

Organization Name	Asset Name	Description
State Library of Ohio	Guiding Ohio Online	Guiding Ohio Online is a State Library administered competitive LSTA (Library Services and Technology Act) grant. The purpose of the grant is to allow public libraries in rural Ohio to hire a dedicated technology trainer for their library. The technology trainer is hired as an independent contractor in a full- or part-time capacity depending on the needs of the library. Trainers can assist with computer instruction, technology-focused community outreach, one-on-one instruction, and other technology related duties. The LSTA funding covers 75 percent of the project costs; the remaining 25 percent must come from a local cash match. This cash match typically comes from the library but may come in whole or in part from a partner organization.[112]
Ohio Department of Aging; Assistive Technology of Ohio	Assistive Technology support	ODA and Assistive Technology of Ohio, a non-profit organization, offers support to Ohioans who need assistive technology. AT Ohio's services include device lending and rental, computer refurbishing, training and more.[113]
Ohio Department of Developmental Disabilities	Assistive Technology	Assistive Technology can be used as a creative solution to help with a person's health and safety and can support a person's desire for more independence at home, in the community, or at work. The service also pays for consultation to make sure people are matched with the right technology to meet their needs, the appropriate equipment, and equipment training for the person as well as for their paid or unpaid caregiver.[114]
Ohio Department of Developmental Disabilities; Ohio Developmental Disabilities Council	Lending Libraries map	The Ohio Developmental Disabilities Council has identified assistive technology lending libraries across Ohio and created an interactive and downloadable map for these facilities.[115]
Ohio Department of Rehabilitation & Corrections; Ohio Central School System (OCSS)	Loaner Chromebooks for remote learning	CARES Act funding has been used to deploy 10,000 Chromebooks to prisons across OH to allow for remote learning during the pandemic and create personalized and modern educational opportunities.[116]

[112] https://library.ohio.gov/services-for-libraries/library-programs-development/guiding-ohio-online/
[113] https://aging.ohio.gov/care-and-living/caregiver-support/assistive-technology-1
[114] https://dodd.ohio.gov/about-us/resources/tech-first/AssistiveTech
[115] https://dodd.ohio.gov/about-us/resources/tech-first/Lending+Libraries
[116] https://drc.ohio.gov/About/Press-Releases

Organization Name	Asset Name	Description
Ohio Department of Developmental Disabilities	Ohio's Telepsychiatry Project for Intellectual Disability	The program is aimed at reaching remote areas throughout the state or those with limited access to psychiatric services. Eligible referees could additionally receive support from the County Board to get access to necessary computer equipment and other coordination for telepsychiatry services, if not available individually.[117]
Ohio Department of Developmental Disabilities	Remote Support	Remote Support allows an off-site direct service provider to monitor and respond to a person's health, safety, and other needs using live communication, while offering the person more independence in their home.[118]
Ohio Department of Developmental Disabilities	Innovative Technology Solutions Project	DODD created the Innovative Technology Solutions project to increase the use of innovative technologies within service delivery and service operations for individuals with developmental disabilities.[119]
Ohio Department of Rehabilitation & Corrections	Telemedicine to incarcerated individuals	ODRC offers telemedicine to provide specialty medical consults to Ohio prisons by linking ODRC institutions across the state and Medical Operations with the Franklin Medical Center and the Ohio State University Medical Center.[120]

Table 3.3.3: Ohio assets related to broadband affordability

Organization Name	Asset Name	Description
Connectivity Champions; Ohio Library Council	ACP Promotion	Connectivity Champions provide community-based support in removing barriers to internet access, including helping eligible Ohioans with ACP-related questions and support. Ohio Library Council supports ACP outreach efforts to improve awareness of the program.[121]
Akron Metropolitan Housing Authority; Cuyahoga County Public Library	FCC Affordable Connectivity Outreach Grant Program–Pilot Program Grants	"The Affordable Connectivity Outreach Grant Program (ACP Outreach Grant Program) helps facilitate the promotion and awareness of and participation in the Affordable Connectivity Program (ACP) among eligible households. The program selected partners to serve as trusted community messengers and is providing those partners with the funding and resources needed to implement innovative outreach strategies to reach historically underserved and unserved communities in connection with their participation in two one-year ACP Pilot Programs: (1) the Your Home, Your Internet Pilot Program, which is focused on ACP outreach and

[117] https://dodd.ohio.gov/about-us/MIID/Telepsychiatry/Telepsychiatry
[118] https://dodd.ohio.gov/about-us/resources/tech-first/RemoteSupport
[119] https://dodd.ohio.gov/about-us/resources/tech-first/Innovative_Technology_Solutions_Project
[120] https://drc.ohio.gov/correctional-healthcare
[121] https://broadband.ohio.gov/grant-opportunities/federal-resources-and-grants/affordable-connectivity-program

		application support to recipients of federal housing assistance; and (2) the ACP Navigator Pilot Program, which provides selected applicants access to the National Verifier to help low-income households complete and submit their ACP application.[122]
Digital Equity Coalition based in Ohio, RDIAs	ACP Promotion efforts	As part of the state's digital opportunity efforts, digital equity coalitions based in Ohio and RDIAs focus on addressing barriers to internet adoption within their communities.
Ohio Department of Developmental Disabilities	Internet Assistance Project	The Internet Assistance Project provides funding to eligible county boards of developmental disabilities to support the boards in providing internet assistance to people with developmental disabilities.[123]
Ohio Housing Finance Agency	Save the Dream Ohio – Utility Assistance Plus	Save the Dream Ohio – Utility Assistance Plus provides eligible Ohio homeowners with financial assistance to pay delinquent utility bills (including internet service), property taxes, and other housing costs not included in the mortgage payment.[124]

Table 3.3.4: Ohio assets related to broadband access

Organization Name	Asset Name	Description
InnovateOhio	Ohio Wi-Fi Hotspot	InnovateOhio offers a list of public Wi-fi hotspot locations offered by ISPs and CAIs (e.g., universities) in OH, with address information and/or ISP webpage link that list hotspot locations.[125]
Ohio Public Libraries	Ohio Wi-Fi Hotspot	All of Ohio's public libraries have Wi-Fi available and can be accessed from the parking lot.[126]

Table 3.3.5: Ohio assets related to digital opportunity

Organization Name	Asset Name	Description
JobsOhio	Ohio To Work	Through Ohio To Work, JobsOhio unified a statewide coalition of existing workforce partners to offer customized support to job seekers through connections with training providers, career coaches and resources, and local employers in the manufacturing, healthcare, and technology industries. Now delivered regionally via local partners, Ohio To Work support includes free personalized career coaching, accelerated training options, funding opportunities, and more.[127]

[122] https://www.fcc.gov/acp-grants
[123] https://dodd.ohio.gov/about-us/resources/tech-first/Internet+Assistance+Project
[124] https://savethedream.ohiohome.org/resources.html#utility
[125] https://innovateohio.gov/news/news-and-events/04042020
[126] https://oplin.org/fal/
[127] https://www.jobsohio.com/programs-services/talent; https://www.ohiotowork.com/

Organization Name	Asset Name	Description
JobsOhio	Innovation District	JobsOhio, together with the State of Ohio and partners, is investing over $3 billion to fuel the creation of three world-class Innovation Districts in Cincinnati, Cleveland, and Columbus. Three key Innovation Districts establish Ohio as a global leader in healthcare, life sciences, and technology. These Innovation Districts are expected to inspire more than 47,000 new STEM graduates, fuel an estimated 60,000 new jobs, and generate up to $9 billion in annual economic impact to the state over ten years.[128]
Ohio Department of Job and Family Services	TechCred	Ohio's TechCred program reimburses employers up to $2,000 for training costs incurred when one of their employees earns a short-term, industry-recognized technology credential.[129]
Ohio Department of Transportation	DriveOhio	DriveOhio is an initiative of the Ohio Department of Transportation, serving as the state's hub for smart mobility technology on the ground and in the air. DriveOhio is a blend of public and private infrastructure entities that coordinate with advanced mobility technology developers to create a smart transportation system. DriveOhio's current portfolio includes automated vehicle, connected vehicle, electric vehicle, and advanced air mobility efforts.[130]
Ohio Department of Youth Services, Circleville JCF	Circleville JCF programming	Circleville JCF offers several digital programs, including Career Tech Training via Career Based Intervention and Graphic Design Program.[131]
Ohio Governor's Office of Workforce Transformation	Individual Microcredential Assistance Program	The Individual Microcredential Assistance Program (IMAP) helps Ohioans who are low income, partially unemployed, or totally unemployed participate in a training program to receive a credential at no cost. IMAP training providers offer both online and in-person programs, with programs including 5G and Broadband deployment, computer programming and tech-related skills, and other broadband adoption-related programs.[132]
Ohio Department of Aging; Ohio Department of Higher Education	Lifelong Learning Programs	Lifelong learning programs at Ohio's four-year universities and two-year technical colleges allow residents aged 60 and older to attend classes at little or no cost.[133]

[128] https://www.jobsohio.com/programs-services/innovation/innovation-districts
[129] https://techcred.ohio.gov/
[130] https://drive.ohio.gov/
[131] https://dys.ohio.gov/facilities/circleville-jcf/circleville-jcf
[132] https://workforce.ohio.gov/initiatives/initiatives/imap/imap
[133] https://aging.ohio.gov/care-and-living/staying-active/staying-active-catalog/marketing-yourself

Organization Name	Asset Name	Description
Ohio Department of Developmental Disabilities	Rapid Response System	The rapid response system (RRS) is a DODD application that helps to accelerate conversations between SSAs and technology vendors. The RRS is a gateway for county board of developmental disabilities to request a consultation with technology vendors to identify what technology solutions might be beneficial for a person with developmental disabilities.[134]
Ohio Public Library Information Network	E-Rate information and training	OPLIN supports workshops on E-rate for public libraries each fall, supporting OH public libraries receive discounts on internet connection, wireless access and hardware that supports internet access through the E-rate program.[135]
Ohio Public Library Information Network	Northstar Digital Literacy	OPLIN offers guidance on implementing Northstar locally, materials to market the program, and other technical support. Northstar focuses on basic digital literacy skills—such as using a mouse, searching on the internet, and using email—as well as advanced skills, like using Google Docs and searching for jobs online. Northstar is available to all Ohio libraries, and libraries can create learner accounts, which track online learning and the assessments completed. [136]
Ohio Department of Developmental Disabilities	Ohio Technology First Taskforce	Technology First is an initiative to ensure that people with developmental disabilities have increased opportunities to live, work, and thrive in their homes and communities through state-of-the-art planning, innovative technology, and support that focuses on their talents, interests, and skills.[137]

[134] https://dodd.ohio.gov/about-us/resources/tech-first/Rapid+Response+System
[135] https://www.oplin.ohio.gov/erateinfo
[136] https://www.oplin.ohio.gov/services/northstar
[137] https://dodd.ohio.gov/about-us/resources/tech-first/Ohio+Technology+First+Taskforce

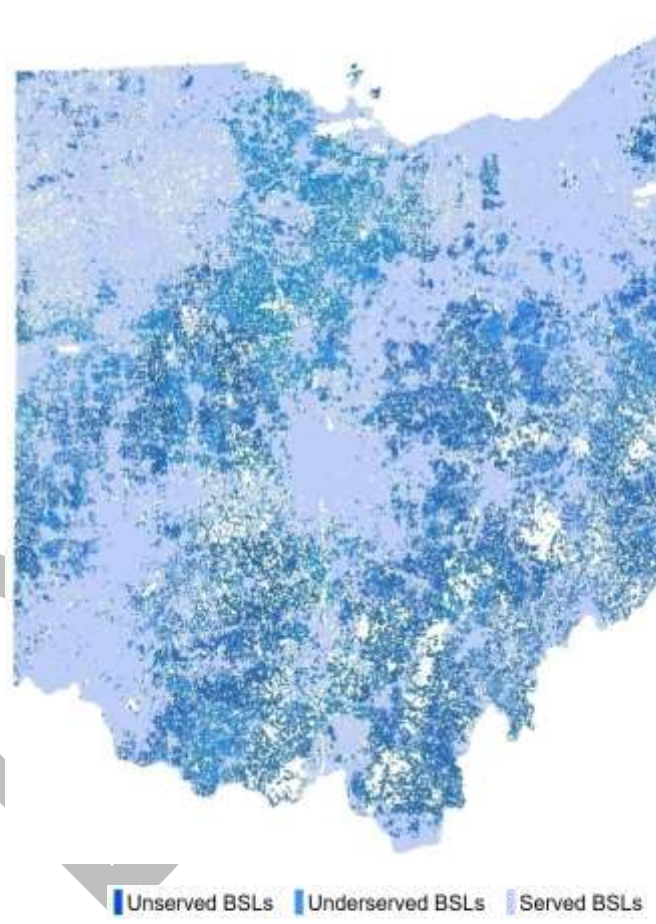
3.4 Needs and Gaps Assessment

3.4.1 Broadband Deployment

3.4.1.A Service to unserved and underserved locations

As shown in Figure 1, Ohio has identified approximately 188,000 unserved broadband serviceable locations (BSLs) (4 percent of all BSLs) and 144,000 underserved BSLs (3 percent of all BSLs). The remaining 4,145,000 BSLs were designated as served as of January 31, 2023.[138] These locations and their associated service-availability designations are sourced from the FCC's latest service-availability maps as of January 31, 2023.[139]

Figure 1: Map of unserved, underserved, and served locations in Ohio[140]

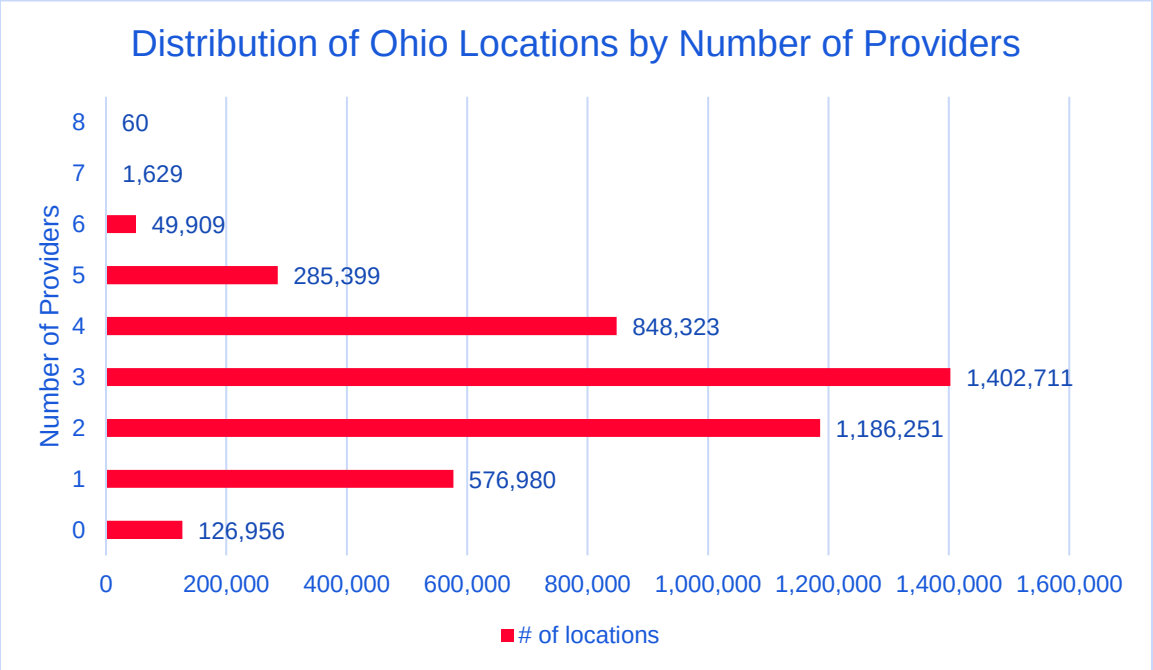


[138] Service availability estimates are based on BEAD definitions of served (speeds greater than 100 Mbps downstream/20 Mbps upstream), underserved (less than 100/20 Mbps but greater than 25/3 Mbps), and unserved (less than 25/3 Mbps).
[139] FCC Broadband Map, as of January 31, 2023 (https://broadbandmap.fcc.gov/data-download). Please note that, according to email communication from the FCC with BroadbandOhio, "[m]aps are updated with availability data from successful challenges and re-submissions on a rolling basis." While the data in this section represent the latest available data as of January 31, 2023, the exact totals of unserved, underserved, and served locations may be updated further.
[140] FCC Broadband Availability Maps as of January 31, 2023

Unserved and underserved locations are concentrated primarily in suburban and rural regions in Ohio. Unserved locations are especially concentrated in the 32 counties in southeastern Ohio, commonly referred to as "Appalachian Ohio." While Appalachian Ohio only accounts for 20 percent of all broadband-serviceable locations (BSLs) in Ohio, it contains 61 percent of unserved locations and 38 percent of all underserved locations – approximately 3.1 times the rate of unserved BSLs compared to the rest of the state. At the county level, southeastern Ohio has the greatest availability needs, with more than 50 percent of locations in the five counties of Adams, Gallia, Monroe, Morgan, and Vinton designated as unserved or underserved. Additionally, in 13 counties – also in Appalachian Ohio – 30-50 percent of locations are un- or underserved.

Of the approximately 4.478 million locations identified in FCC availability maps, 126,956 (2.8 percent) have no provider of service speeds greater than 0 Mbps upload/0 Mbps download for reliable broadband technologies. Many of these locations are concentrated in suburban and rural communities. Additionally, 576,980 locations (12.9 percent) have only a single provider, as shown in Figure 2. The median BSL in Ohio has three reliable technology broadband providers available.

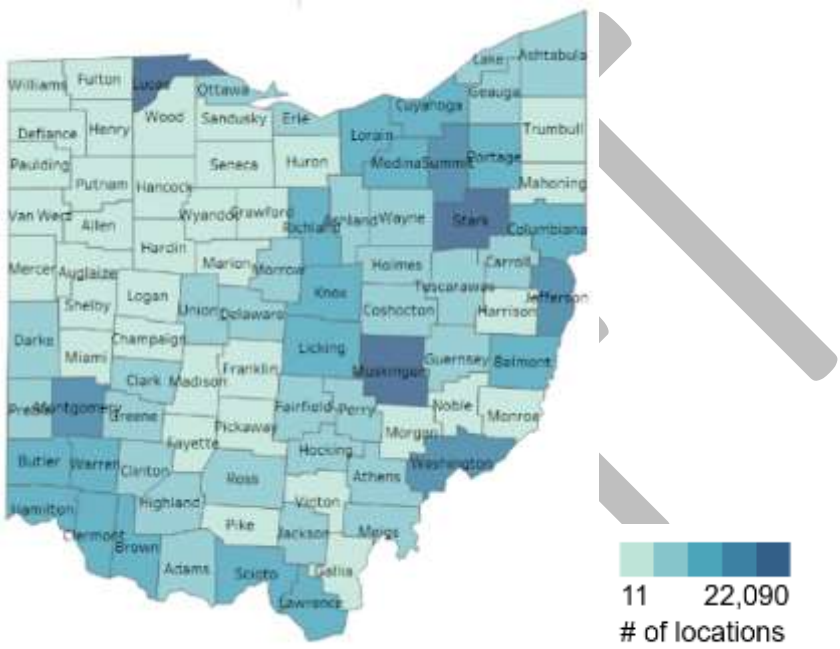
Figure 2: Distribution of locations by number of providers reporting service in the latest FCC broadband availability maps[141]



[141] FCC Broadband Availability Maps as of January 31, 2023

As seen in Figure 3, counties within Appalachian Ohio tend to have more locations with single providers, while counties in the Northeast usually have the fewest locations with a single provider. Eighteen of 88 total counties have more than 10,000 locations with a single provider. Lucas, Stark, and Muskingum counties have over 22,090, 20,506, and 18,528 broadband-serviceable locations with a single provider, respectively; these three counties thus have the highest numbers of broadband-serviceable locations served by a single provider.

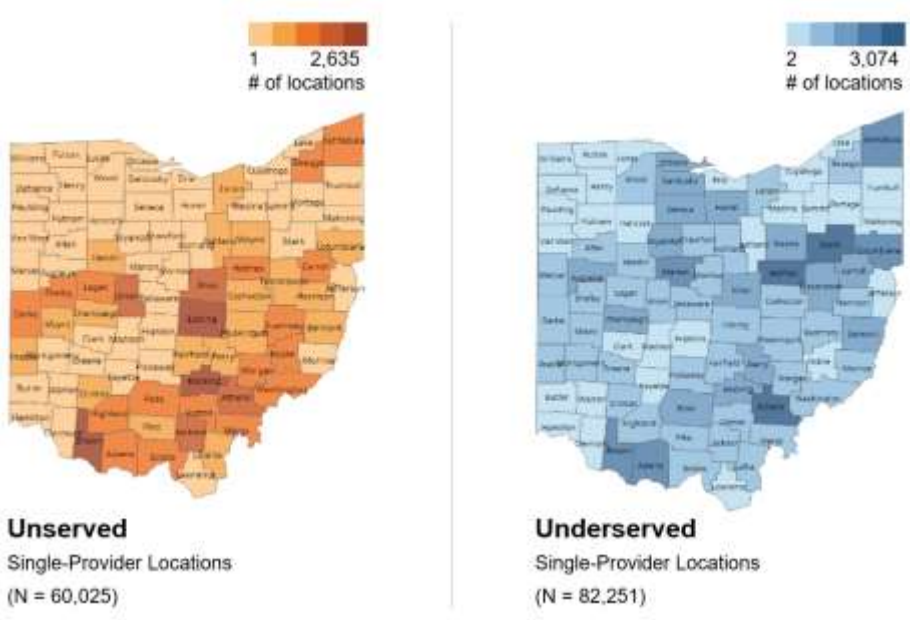
Figure 3: Map of single-provider locations in Ohio by county[142]



Unserved locations with a single provider show different trends from underserved locations with a single provider, as seen in Figure 4. Unserved single-provider locations are heavily concentrated in Appalachian Ohio, with the highest counts in Licking, Hocking, and Brown counties. Underserved single-provider locations are more evenly distributed across regions, but the highest concentrations are in Stark, Holmes, and Athens counties. Consumers with single providers often find that their provider cannot meet their needs in customer service, affordability, and reliability.

[142] FCC Broadband Availability Maps as of January 31, 2023

Figure 4: Unserved and underserved single-provider locations[143]



3.4.1.B Service to CAIs without gigabit service

The National Telecommunications and Information Administration (NTIA) defines nine types of community anchor institutions (CAIs) in Section I.C. of the BEAD NOFO: schools, libraries, institutions of higher education, health clinics, health centers, hospitals or other medical providers, public safety entities, public housing organizations, and community support organizations.[144] BroadbandOhio classifies these entities under four major categories: education, health, safety, and community support organizations.

While some Ohioan CAIs have one-gigabit symmetrical service, the speeds available to other CAIs could be raised to one-gigabit symmetrical so that they could have enough throughput to serve as digital hubs for their communities. These include CAIs in healthcare, institutions of higher education, and K-12 schools. BroadbandOhio leveraged Homeland Infrastructure Foundation-Level Data (HIFLD) to establish a baseline number of CAIs. Libraries, state government locations, and local government locations report the highest rates of one-gigabit symmetrical service, as seen in Figure 5.

Figure 5: CAI locations in Ohio with at least one-gigabit service

CAI category	Total with 1G symmetrical speeds[145]	Total CAIs, per HIFLD[146]

[143] FCC Broadband Availability Map, as of January 31, 2023
[144] BEAD NOFO FAQ 1.7 from May 13, 2022
[145] OARnet ITC sites. According to OARnet, all their partner CAIs have 1G symmetrical speeds
[146] Homeland Infrastructure Foundation-Level Data (HIFLD), downloaded 2023

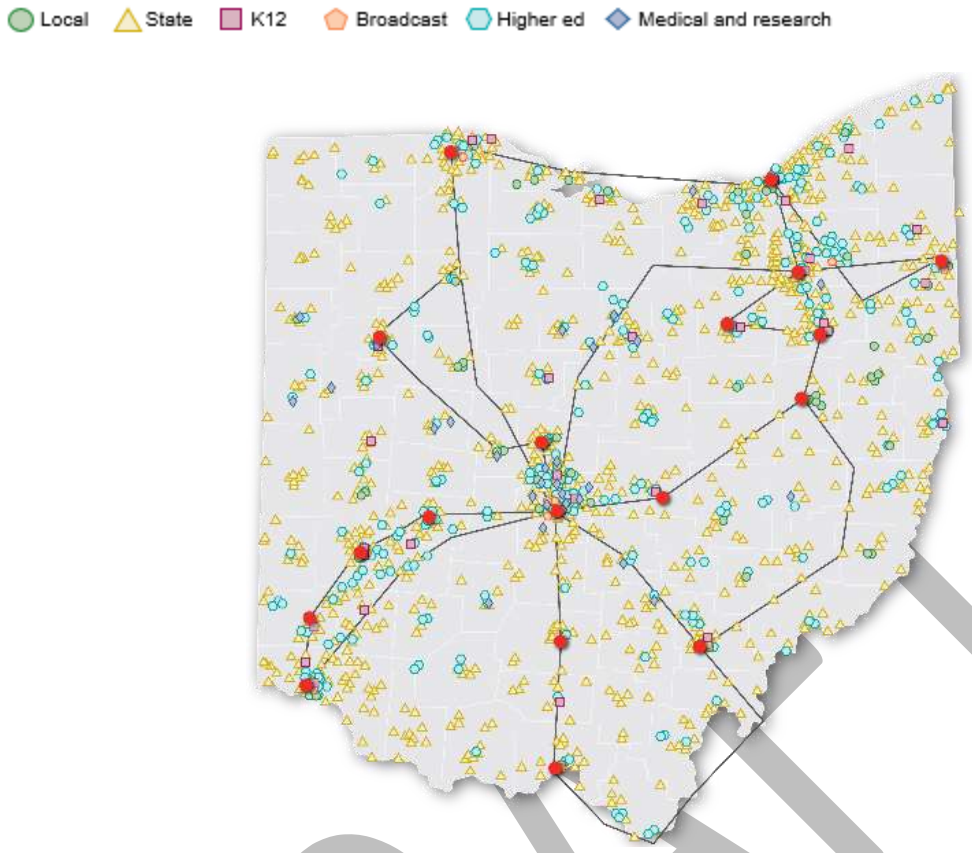
Education	At least 1,094	10,952
Health	At least 102	2,492
Safety	*TBD via ongoing BroadbandOhio survey and analysis*	8,717
Community-oriented	*TBD via ongoing BroadbandOhio survey and analysis*	11,007

Ohio CAIs have OARnet as a key broadband provider. OARnet currently offers more than 2,000 miles of statewide high-speed fiber that serves various Ohio CAIs, including government agencies, research institutions, medical centers, and libraries, as seen in Figure 6: Map of OARnet's high-speed fiber offerings

. OARnet reports having one-gigabit or greater speeds for its locations as well as terabit capability, an Internet Protocol Multi-Protocol Label Switching (IP MPLS)-routed network, an optical core with dense wavelength-division multiplexing (DWDM), and highly scalable bandwidth.[147]

Figure 6: Map of OARnet's high-speed fiber offerings[148]

[147] OARnet interviews
[148] Ibid.



In total, OARnet serves approximately:

- 2,900 state government sites and 50 state agencies
- 100 local government sites for a total of 65 clients
- 100 healthcare sites for a total of 10 clients
- More than 625 K-12 school sites in over 600 school districts
- 470 higher education sites on 100 main campuses and 325 regional campuses
- 30 public broadcasting locations for 10 different stations
- 15 research sites for 10 clients.

Another service provider, ESInet, supports NG-911 services for eight counties, four cities, and one university, with future sites planned.

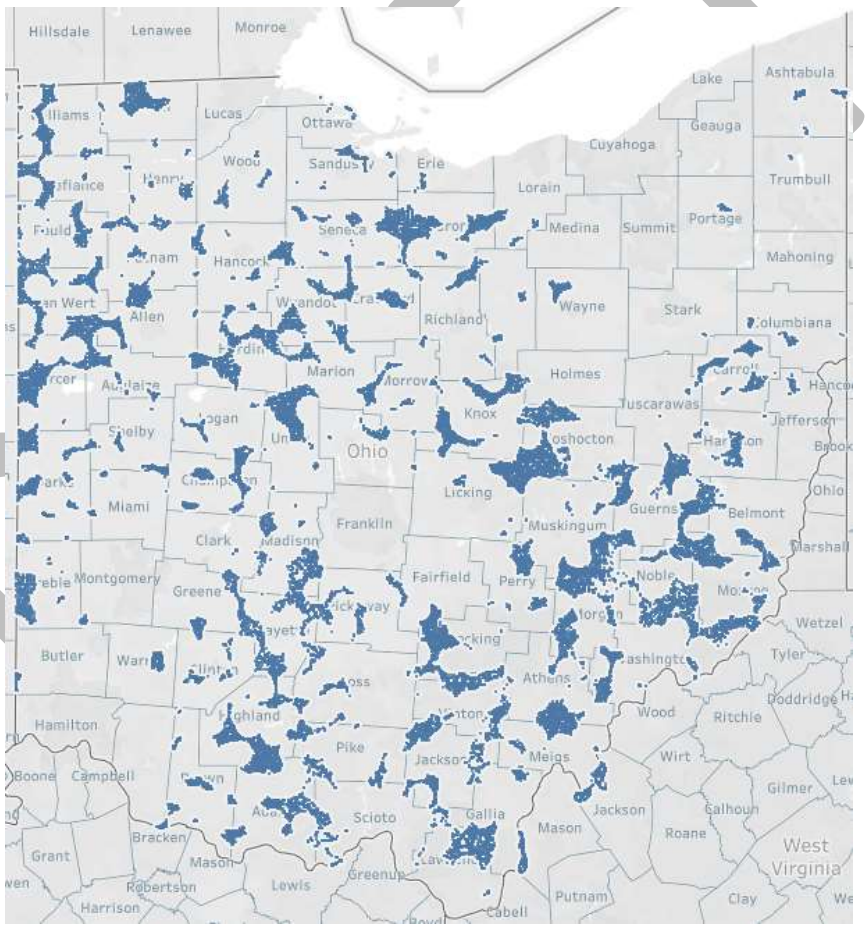
BroadbandOhio is currently conducting a survey to further understand service availability gaps facing CAIs that subscribe to mass-market service.

According to the NTIA, CAIs such as historically black colleges and universities (HBCUs), minority-serving institutions (MSIs), and tribal colleges and universities (TCUs) often face obstacles in gaining internet access, particularly in terms of availability, affordability, and adoption. These challenges may be linked to outdated

and/or overloaded infrastructure, the high cost of devices, limited IT support, or limited digital literacy.[149]

To identify CAIs that can serve as community digital hubs, BroadbandOhio has conducted a preliminary geospatial analysis to determine which locations are more than five miles from key education, health, and safety CAIs that could be prioritized for BEAD funding. (See Figure 7.) So far, BroadbandOhio has identified 18,083 CAIs – including colleges and universities, public and private schools, libraries, childcare services, hospitals, nursing homes, urgent care centers, fire stations, EMS stations, federally qualified health centers, rural health clinics, and critical access hospitals – by leveraging data from HIFLD, the State Library of Ohio, and the Ohio Department of Health. An initial geospatial analysis shows that 62,425 of Ohio's BSLs are more than five miles from these CAIs (Figure 7).

Figure 7: Map of BSLs without a key CAI within five miles[150]



BroadbandOhio will prioritize upgrading service to additional CAIs in areas without key CAIs within five miles. Assuming the average CAI-to-BSL ratio from above

[149] https://broadbandusa.ntia.doc.gov/sites/default/files/2022-11/DOC_NTIA_OMBI_Congressional_Report.pdf
[150] FCC Broadband data map, HIFLD data, State Library of Ohio data, Ohio Department of Health data

(approximately 250 BSLs per CAI) applies to the remaining BSLs, an additional 250 CAIs may need to be identified to ensure that all Ohio households are within five miles of a CAI that offers free public Wi-Fi.

Stakeholder engagement has revealed that public parks and campgrounds (managed by the Ohio Department of Natural Resources) are often more accessible CAIs to rural communities, and that healthcare providers are potential CAIs that could reach certain covered populations (such as the aging and disabled) by leveraging existing relationships. Additional CAIs that Ohio may consider enabling as digital hubs include pre-kindergarten schools, childcare centers, homeless shelters, halfway houses, refugee resettlement centers, YMCAs, Jewish community centers (JCCs), food banks, places of worship, and grocery stores dedicated to specific ethnic groups. Some of these CAIs have already been identified via web searches and include 76 YMCAs, 20 foodbanks, seven JCCs, eight refugee resettlement organizations, 17 grocery stores, 43 housing organizations, three places of worship, and one community center.

Research will continue via surveys and stakeholder engagement to better understand the identified CAIs' connectivity needs, as well as their willingness to serve as community digital hubs and to provide free Wi-Fi to the community. Findings from this research will clarify how to prioritize BEAD funding to support infrastructure upgrades that would provide public Wi-Fi for the community.

3.4.1.C Solutions to funding barriers in designated "extremely high-cost" areas

As defined in Section 1.C.(k) in the BEAD NOFO, there may be several extremely high-cost areas in which not less than 80 percent of broadband-serviceable locations are unserved locations. Expanding broadband access to these areas may cost more than the average cost of building out broadband service in the United States.

When fiber deployment is cost-prohibitive, Ohio's BEAD funding could be allocated to licensed fixed wireless technology to reach the goal of universal service. A scenario analysis could help to determine the extremely-high-cost-per-location threshold so that fixed wireless access (FWA) could be used selectively in locations where fiber deployment is not considered to be economically viable. FWA can be approximately 40-50 percent cheaper than fiber-to-the-home in rural areas, and in some deployments and geographies has the potential to reach speeds comparable to fiber.

3.4.1.D Broadband office and associated governance structure

Housed within the Ohio Department of Development, BroadbandOhio is Ohio's dedicated office for overseeing broadband deployment and promoting digital opportunities. Serving as the centralized state authority, BroadbandOhio is well-positioned to support the multi-year implementation requirements of BEAD and to continuously sustain its relevant project management efforts.

Other Ohioan entities will be engaged throughout BEAD deployment to maximize the efficiency of fund utilization, broadband access, and broadband adoption. Such entities may include:

- **Broadband Alliance:** Quarterly gatherings of public- and private-sector stakeholders interested in working together to close the digital divide in Ohio.

Internet service providers (ISPs), community and non-profit organizations, local government leaders, state and federal agencies, economic development organizations, and industry trade associations are especially encouraged to attend.[151]

- **Broadband Expansion Program Authority:** Created by House Bill 2 of the 134th General Assembly, which also created the Ohio Residential Broadband Expansion Grant (ORBEG), this authority oversees the ORBEG grant and receives, reviews, scores, and approves applications.[152] The Ohio Department of Development staffs the authority, which consists of five members:
    - Lydia Mihalik, Director of Development
    - Lt. Governor Jon Husted, Director of InnovateOhio
    - One member appointed by the governor of Ohio
    - One member appointed by the Speaker of the Ohio House of Representatives
    - One member appointed by the Ohio Senate President

  Additional responsibilities of the authority include:
    - Continually examining and proposing updates to any broadband plan provided by law
    - Monitoring the Ohio residential broadband expansion grant program
    - Reviewing all progress reports and operational reports required under Section 122.4070 of the Revised Code
    - Reviewing all pending county requests made pursuant to Section 122.4051 of the Revised Code for program grants
    - Identifying any best practices for, and impediments to, the continued expansion of tier-two broadband infrastructure and technology in the state
    - Coordinating and promoting the availability of publicly accessible digital literacy programs to increase fluency in the use and security of interactive digital tools and searchable networks. Such fluency includes the ability to use digital tools safely and effectively for learning, collaborating, and producing.
    - Identifying, examining, and reporting on any federal or state government grant or loan programs that would promote the deployment of tier-two broadband infrastructure and technology in the state
    - Tracking the availability, location, rates and speeds, and adoption of programs that offer affordable tier-one and tier-two broadband service to low-income consumers in the state.

[151] https://broadband.ohio.gov/news-and-events/all-events/04282022-broadband-alliance
[152] https://search-prod.lis.state.oh.us/solarapi/v1/general_assembly_134/bills/hb2/EN/05/hb2_05_EN?format=pdf

- **Broadband Access Ohio:** Represents public entities and public-private partnerships across the state that are committed to investing in high-speed internet access. Broadband Access Ohio's members include municipalities, townships, associations, educational institutions, and other public entities that understand the importance of a connected Ohio for all.[153]

3.4.1.E Legislative and regulatory solutions to accelerate infrastructure deployment

Ohio has several laws, policies, and practices that may enhance broadband deployment. Policies and actions that may impact deployment include right-of-way stipulations, "dig-once" rules, and municipal broadband ownership.[154]

Right-of-way: Ohio has various legislations that help to define the role of relevant authorities and the expectations of right-of-way use. For instance, **Ohio Rev. Code 4939** establishes the terms for use of public rights-of-way – including for the deployment of small-cell and advanced wireless facilities – and recognizes the authority of municipal corporations to manage rights-of-way and the need to promote coordination and timely review processes. It additionally defines key expectations for public right-of-way usage – including the timeframe required for municipalities to respond to applications for co-location, construction, modification, or replacement of a small-cell facility on a wireless facility – as well as limitations on municipalities regarding facility taxing, fees, and removal.

Ohio has taken steps to streamline right-of-way applications. For state-owned rights-of-way, the Ohio Department of Transportation's (ODOT) Right of Way E-permitting System helps to centrally manage rights-of-way and utility permits via a new online system that replaces paper MR 505 forms.

There are, however, no consolidated application forms for municipal permits. Ohio Rev. Code 4939 enables municipalities to define their own application processes within set boundaries, and ODOT explicitly states that "all work performed within corporation limits must be approved through the appropriate city or village, as ODOT does not have jurisdiction within corporation limits." It also stipulates that "permits for portions of work along county or township rights-of-way must be obtained from the appropriate authorities."[155] This diversity in permit processes may obligate ISPs to research each municipality's requirements before submitting their permit requests, thus adding logistical steps.

"Dig once" rules: Dig-once policies may accelerate the timeline for broadband deployment.[156] Ohio has authorities that oversee excavation efforts in the state that could recommend a dig-once approach for broadband deployment. For instance, the Ohio Public Utilities Commission's (PUCO) "One Call 811" department must be contacted before digging or excavating in Ohio. PUCO is responsible for enforcing

[153] https://broadbandaccessohio.com/about-us/
[154] State Broadband Policy Explorer, Pew Trusts
[155] https://www.transportation.ohio.gov/working/permits/row-utility/row-utility
[156] https://www.govtech.com/network/can-dig-once-policies-hasten-the-close-of-the-digital-divide.html

Ohio's damage prevention laws, and aggrieved parties can report alleged compliance failures to the PUCO to be investigated.[157]

However, Ohio does not have dig-once rules, legislation, or authorities that could help consolidate excavation efforts for multiple parties and streamline construction processes (such as fiber burial). PUCO, for instance, does not regulate internet service or internet service providers.[158]

Municipal broadband ownership: Ohio's Rev. Code 4905.02 defines "public utility" to exclude "[b]broadband service, however defined or classified by the federal communications commission."[159] But state-owned infrastructure could support broadband deployment, and there are no bans on municipal broadband ownership in the State of Ohio. For instance, OARnet's 100-gigabit-per-second fiber network is available to hospital systems, private companies engaged in research, and private data centers.

Additionally, the Ohio Department of Administrative Services operates the state's Multi-Agency Radio Communications System (MARCS) towers. According to the Department of Administrative Services, MARCS is a 700/800 MHz radio and data network that utilizes state-of-the art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio, as well as within a 10-mile radius outside Ohio.[160] BroadbandOhio has partnered with the Department of Development, Lt. Governor Jon Husted, Washington County commissioners, Fairfield Township trustees, and the Southeast Ohio Broadband Cooperative (SEOBC) to deploy broadband services to unserved locations in rural communities that use the MARCS towers. This effort is part of a pilot initiative to bring internet service to hundreds of previously unserved homes within range.[161]

3.4.1.F Improved databases that enhance use of information to inform broadband deployment

The State of Ohio and the BroadbandOhio office have started developing and leveraging databases that could further facilitate broadband deployment throughout the BEAD program. This initiative addresses:

Ohio's broadband availability gaps: BroadbandOhio launched a new mapping resource 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 25 Mbps, under 50 Mbps, and 50 to 100-plus Mbps. These maps will supplement other currently available data to help determine coverage gaps within Ohio.[162]

BroadbandOhio may additionally leverage:

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[157] https://puco.ohio.gov/utilities/gas/resources/call-before-you-dig
[158] Ibid.
[159] https://codes.ohio.gov/ohio-revised-code/section-4905.02
[160] https://das.ohio.gov/technology-and-strategy/marcs
[161] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/washington-county-marcs-tower-pilot-project
[162] https://broadband.ohio.gov/view-maps/ohios-broadband-availability-gaps

The NTIA's Indicators of Broadband Need Map. The NTIA's Indicators of Broadband Need Map was created by the U.S. Department of Commerce and the NTIA. The map uses several different data sources to show information on broadband availability within the United States. Data sources include the American Community Survey collected by the U.S. Census, Ookla, Measurement Lab (M-Lab), Microsoft, and the FCC.[163]

FCC Broadband Availability Map: This map shows where Internet services are available across the United States, as reported by ISPs to the FCC. The map will be updated continuously to improve its accuracy through a combination of FCC verification efforts, new data from Internet providers, updates to the location data, and, importantly, information from the public.[164]

3.4.1.G Increased workforce available to deploy broadband

The "Strengthening Ohio's Broadband and 5G Workforce" strategy estimates that approximately $500 million in government-funded broadband investment will create 1,250 direct construction jobs. The deployment of 5G in Ohio will create an estimated 32,000 jobs solely in network infrastructure.[165] During BEAD stakeholder engagement, internet service providers have reported that labor is increasingly difficult to source. Ohio may consider scaling up existing workforce development programs to meet broadband deployment labor gaps while also developing current workers' skills. Example programs include:

- **Ohio to Work**, a collaboration among multiple regions and employers. The program supports unemployed and underemployed workers in finding well-paying, meaningful employment through job training, job-search tools, and educational resources, including free career coaching.
- **ApprenticeOhio** programs, which offer a combination of paid on-the-job training, technical instruction, and mentoring to learn specific trades across multiple industries. Apprenticeship incentive programs are also offered to eligible employers and sponsors.
- **TechCred**, which helps Ohioans to learn new skills and employers to build a stronger workforce with the skills needed in a digital economy. Through TechCred, the state reimburses businesses that provide skills-development credentials to their employees, especially in the manufacturing industry.
- **The Economic Development Grant and the Growth Fund**, which are grant programs provided by JobsOhio to promote workforce development. The Economic Development Grant offers funding for business expansion and projects related to job creation. The Growth Fund provides capital for expansion projects to companies with limited access to funding.

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[163] https://broadband.ohio.gov/view-maps/indicators-broadband-need-map
[164] https://broadbandmap.fcc.gov/about
[165] https://broadband.ohio.gov/wps/wcm/connect/gov/7bb60dea-a273-4622-9d0c-67e7201a8016/Strengthening-Ohios-Broadband-5G-Workforce-09072021.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K9I401S01H7F40QBNJU3SO1F56-7bb60dea-a273-4622-9d0c-67e7201a8016-odHJMRH

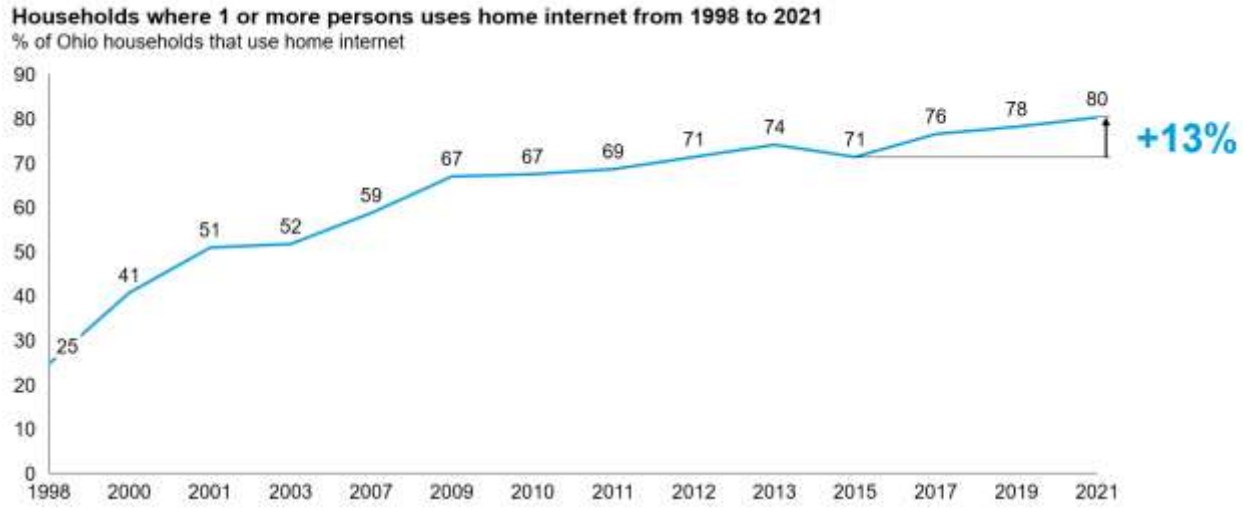
3.4.2 Broadband Adoption

3.4.2.A Broadband subscriptions by household

According to the 2021 American Community Survey's (ACS) five-year estimates, the overall household adoption rate for broadband of any type in Ohio is 86.3 percent. Additionally, 76.9 percent of households have a cellular data plan; 72.2 percent have cable, fiber optic, or DSL services; and 6.2 percent have satellite internet service.[166]

Overall home internet subscriptions in Ohio have steadily risen since 1998, according to the 2021 NTIA Current Population Computer and Internet Use Survey. Approximately 80 percent of Ohio households had home internet in 2021, compared to 25 percent in 1998. Since 2015, the percentage of Ohio households that use home internet has increased by 13 percent, as seen in Figure 8.

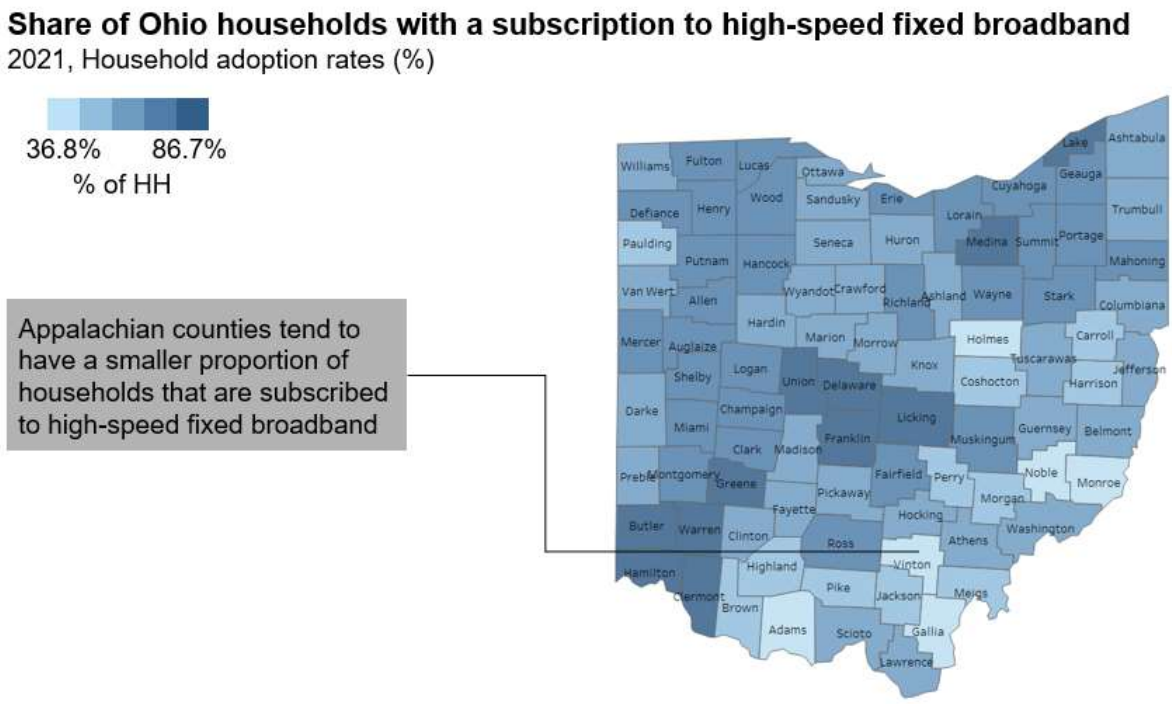
Figure 8: Percentage of households using home internet from 1998 to 2021[167]



While 86.3 percent of households have adopted broadband of any type, only 72 percent of households (3.4 million) subscribe to high-speed fixed broadband, according to the 2021 ACS Five-Year Estimates. The remaining 1.3 million households do not have subscriptions classified as high-speed fixed broadband.[168] Subscription rates to high-speed fixed broadband are highest in counties with large population centers. Less populated counties, especially those in Appalachian Ohio, have the lowest subscription rates, as seen in Figure 9.

[166] ACS 2021 5-Year Estimates, S2801 (https://data.census.gov/table?q=internet&g=040XX00US39&tid=ACSST5Y2021.S2801)
[167] NTIA Current Population Survey – Computer and Internet Use, 2021
[168] Defined as "Broadband such as cable, fiber optic, or DSL" using the language from the American Community Survey

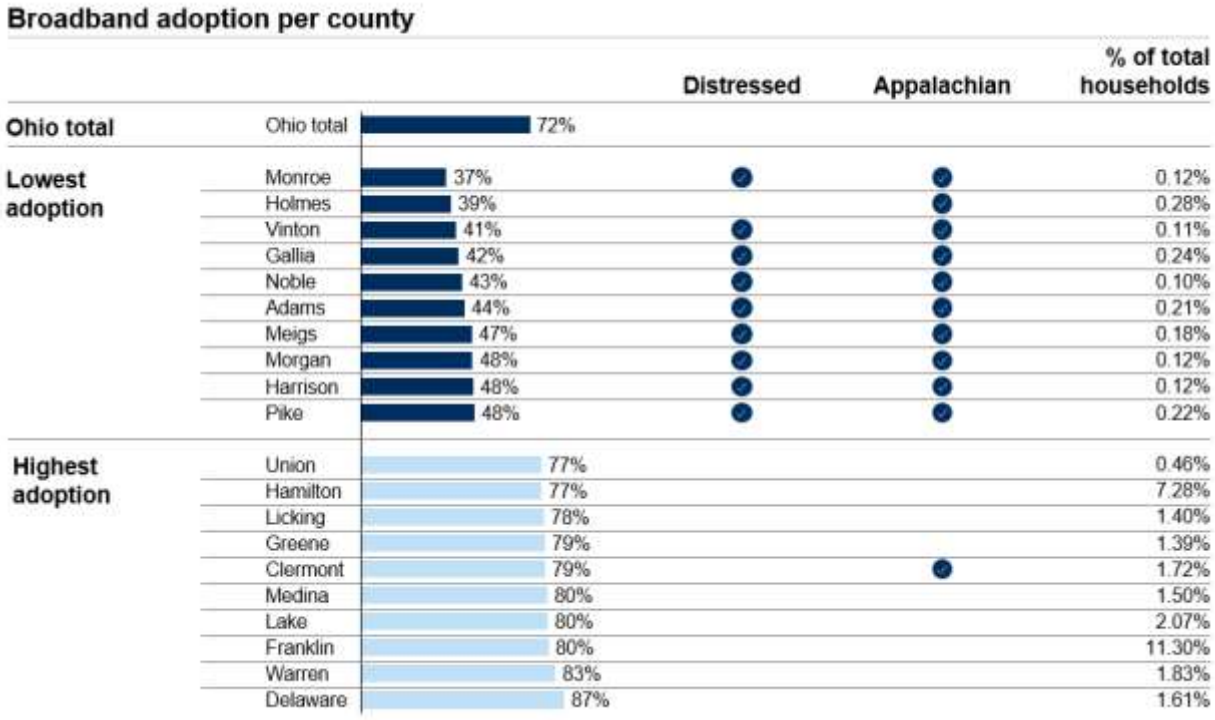
Figure 9: Household subscription rates to high-speed fixed broadband in Ohio by county[169]



The counties with the lowest subscription rates are primarily located in the Appalachian region and are considered distressed.[170] The 10 counties with the lowest adoption rates are all located in Appalachian Ohio. Nine of these 10 counties are classified as distressed, as seen in Figure 10. The 32 Appalachian counties have 22 percent of the households that lack broadband subscriptions, although they represent just 17 percent of total households.

[169] US Census Data, 2021 five-year estimates
[170] Distressed counties are those that meet two of the following criteria: (i) Unemployment rate is 125 percent of US average; (ii) GDP per capita is equal to or less than 80 percent of the median for the US; (iii) the ratio of transfer payment income to total county income is equal to or greater than 1.25.

Figure 10: Counties with the lowest and highest household adoption rates[171]

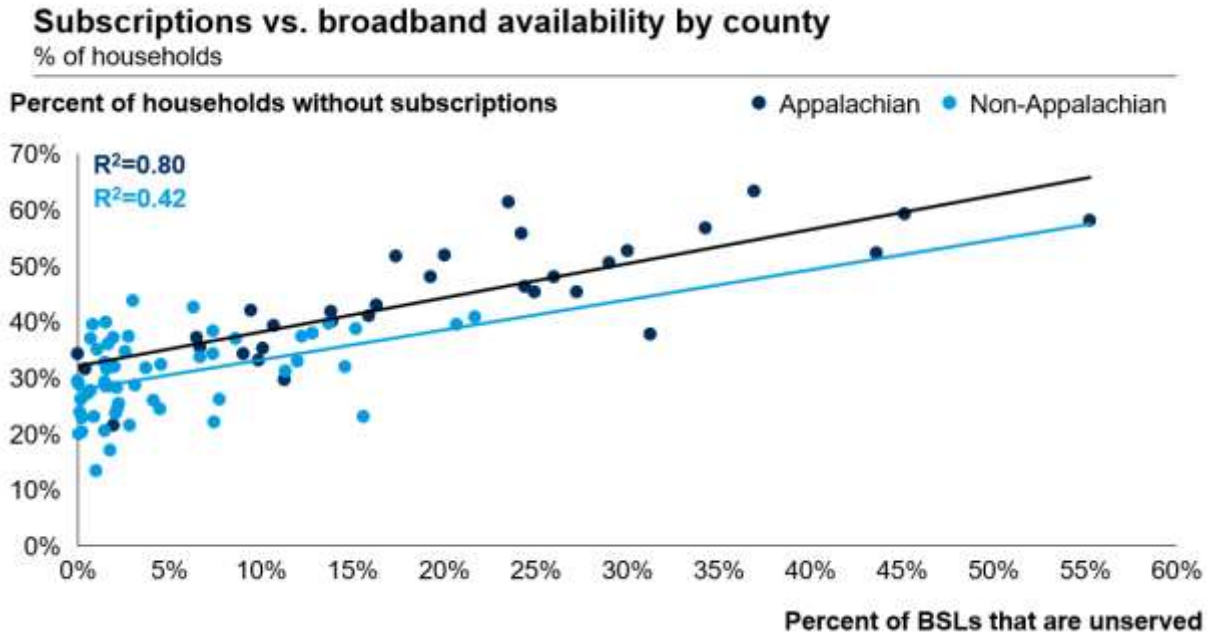


Appalachian and non-Appalachian counties show different patterns in availability and subscription levels, suggesting the need for differentiated approaches to raise adoption rates in each region. Overall, the percentage of a county's BSLs that are unserved and the percentage of households that do not subscribe to broadband strongly correlate (R^2 = 0.795). As seen in Figure 11, the degree of correlation between low access and low subscription rates is stronger in Appalachian counties (R^2=0.80) than in non-Appalachian counties (R^2=0.42), suggesting that factors beyond availability may cause lower adoption rates. Increasing adoption in Ohio's 88 counties may require a differentiated approach in which the state focuses first on availability in locations that lack access, and then on adoption in locations that have access. For example, Cuyahoga County, a large urban county in Northeastern Ohio, has the highest number of households without broadband subscriptions (around 161,000), even though only 31 percent of the county's households do not have broadband subscriptions – a level on par with Ohio's statewide average. At the same time, the county has one of the highest access rates in the state, at approximately 99 percent. On the other hand, Gallia County, a small rural county in Appalachian Ohio, has the fourteenth-lowest broadband adoption rate and the lowest rate of access in the state, at 44 percent, but only represents approximately 6,500 households without adoption.

[171] US Census Data, 2021 5-year estimates

Given their differing gaps in access and adoption rates, the strategy for Cuyahoga would focus on promoting adoption, while the strategy for Gallia would focus first on expanding access.

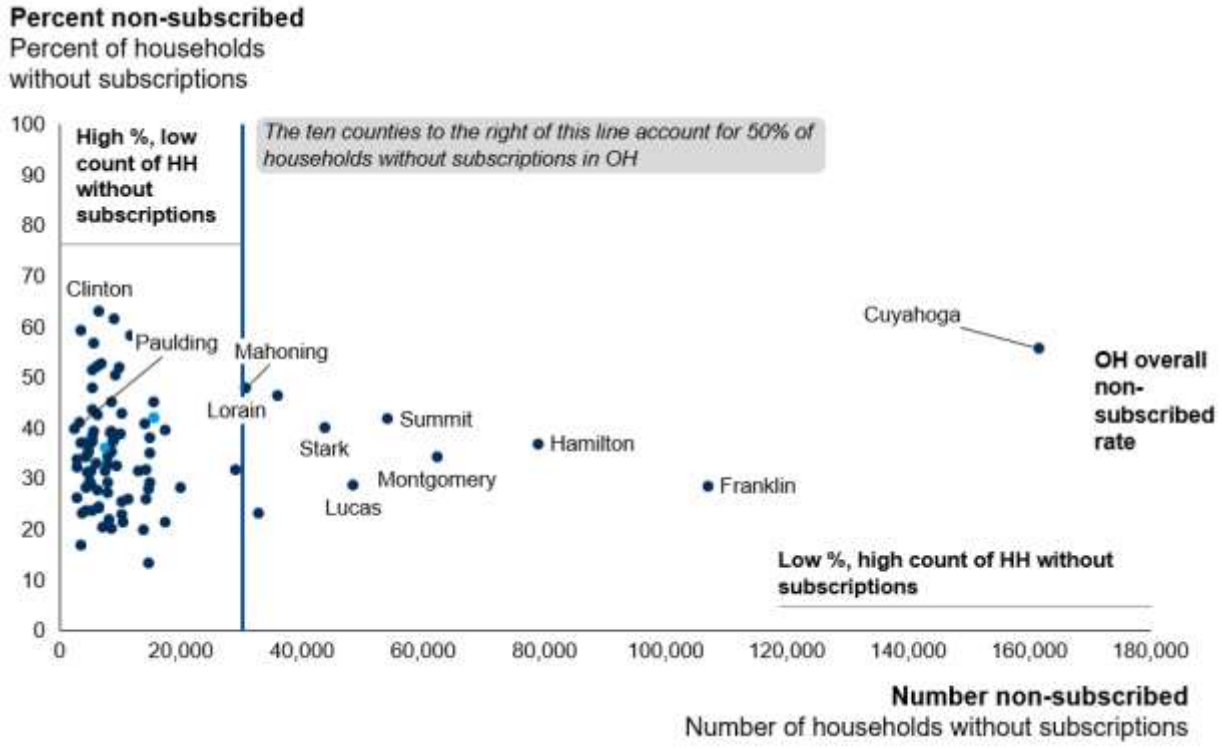
Figure 11: Distributions between household subscription rates and BSL service availability by county[172]



Most households that are not subscribed to broadband services are concentrated in large counties with relatively high subscription rates. Ten counties have more than 30,000 unsubscribed households: Mahoning, Butler, Lorain, Stark, Lucas, Summit, Montgomery, Hamilton, Franklin, and Cuyahoga. These 10 counties account for 50 percent of households without subscriptions in Ohio, despite having relatively high served rates, as seen in Figure 12. BroadbandOhio may leverage different strategies for areas that have higher rates of adoption and lower rates of availability.

[172] US Census Data: 2021 5-year estimates; FCC availability maps as of January 31, 2023

Figure 12: Proportion of households subscribed versus number of households subscribed by county[173]



Among broadband subscriptions of any type, adoption may remain lower in Ohio due to factors that lead to disparities, even where residents have access to the Internet. Three of these factors include affordability, device access, and digital literacy, as described below.

3.4.2.B Device access by household

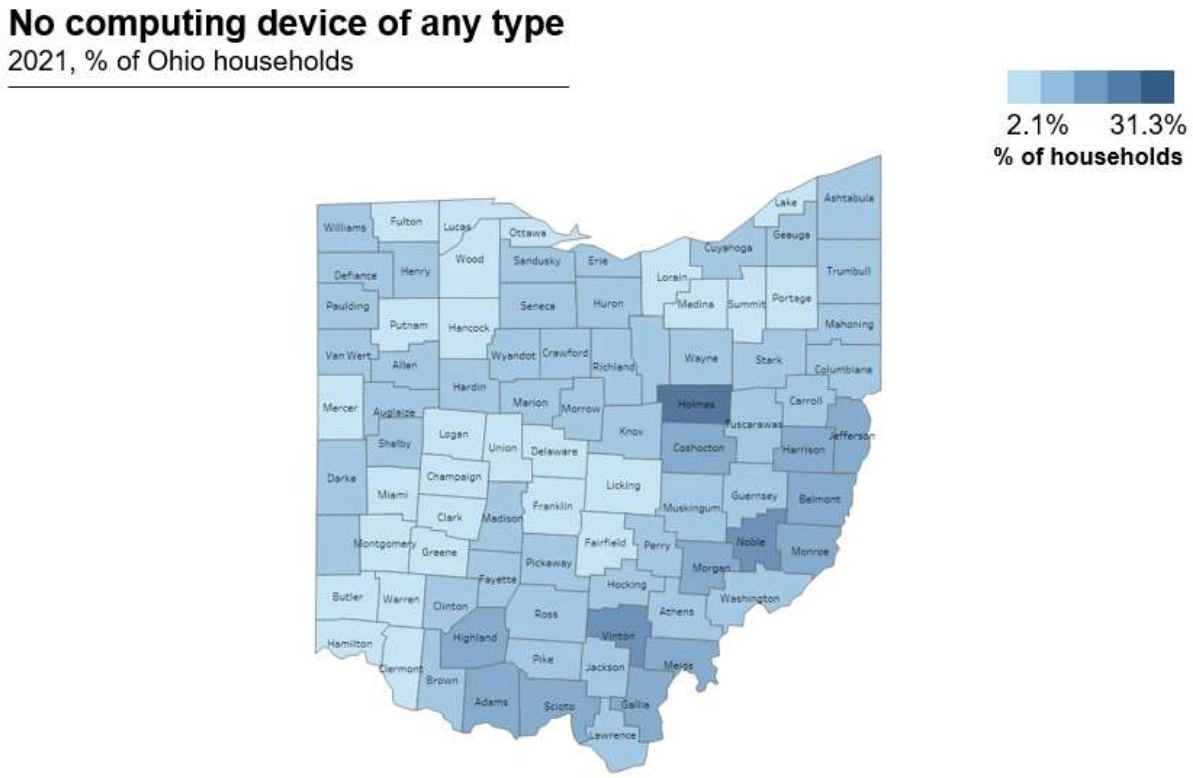
According to the NTIA's Internet Use Survey, internet-capable and internet-ready devices may include smartphones; desktop, laptop, or tablet computers; smart TVs; and wearable devices.

According to the 2021 American Community Survey's five-year estimates, 8 percent of Ohioan households do not have any kind of computing device (such as a laptop, smartphone, or tablet), and 9 percent have only a smartphone.[174] Ten percent of Ohioan households only access the internet through a cellular data plan.[175]

[173] US Census Data. 2021 five-year estimates
[174] US Census Data, 2021 American Community Survey Five-Year Estimates (https://data.census.gov/table?q=internet&g=040XX00US39&tid=ACSST5Y2021.S2801&moe=false)
[175] Ibid.

Southeast Ohio has the highest concentration of counties without access to a computing device, between 20.0 percent and 31.3 percent in Noble, Vinton, and Holmes[176] counties. In nearly all counties in Southeast Appalachian Ohio, at least 10 percent (and up to 32 percent in Scioto and Lawrence) of the population lacks digital access. Ohio's most affluent counties, Warren, and Delaware, have the highest rate of digital access, as seen in Figure 13.

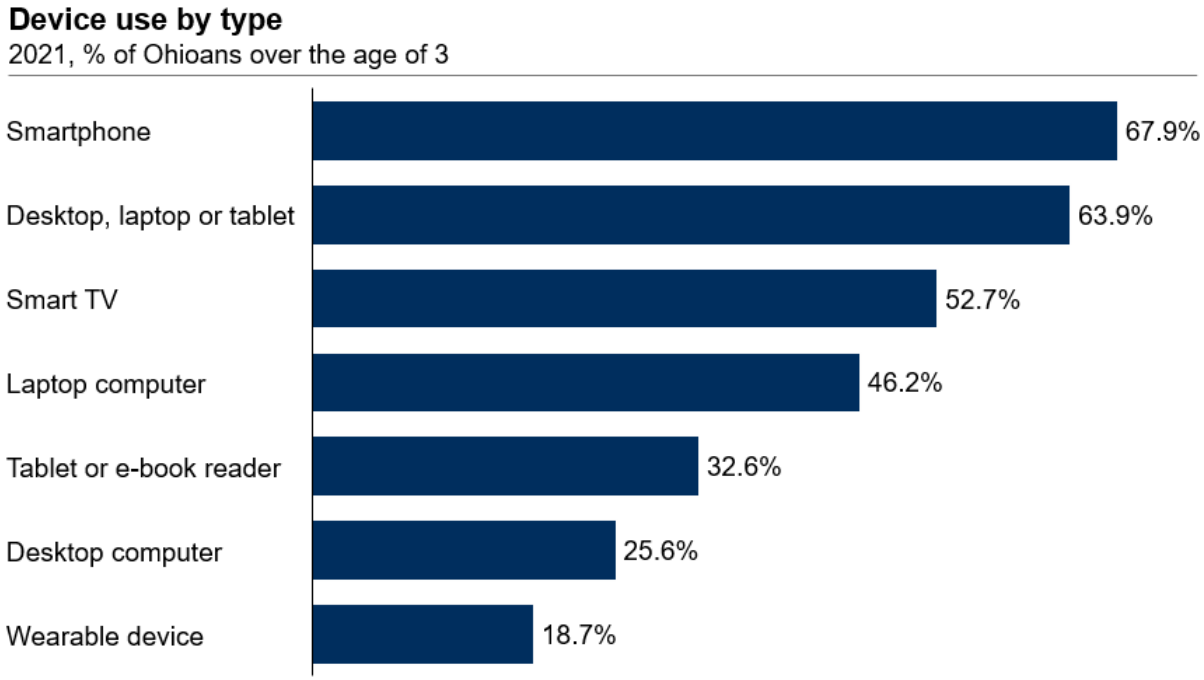
Figure 13: Lack of access to an internet-ready device by county[177]



Smartphones are the most used internet-capable device among Ohioans. According to the NTIA Internet Use Survey, 68 percent of Ohioans use smartphones, compared to 64 percent who use desktop, laptop, or tablet computers. While smartphones allow for multiple digital functions, they often lack the full functionality necessary for many applications used in educational programs and job training, such as the ability to run Java applications requiring a compatible Java Virtual Machine. Additionally, only 25.6 percent of Ohioans report having a desktop computer at home, as seen in Figure 14.

[176] The Amish Community is primarily located in Holmes County, which explains the low percentage of device access. https://amishamerica.com/ohio-amish/.
[177] US Census ACS Survey 2021, Five-Year Estimates

Figure 14: Proportion of internet-capable device usage in Ohio[178]

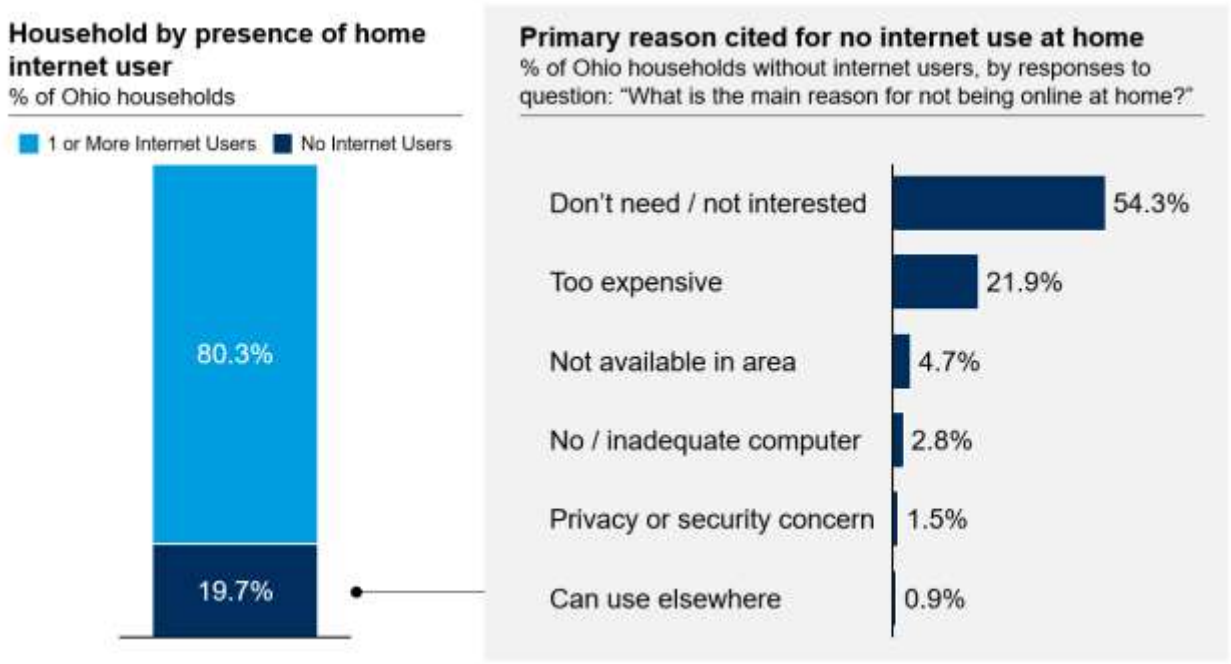


3.4.2.C Interest in the internet

According to the NTIA 2021 Internet Use Survey, 54 percent of Ohio households that do not use the internet cited lack of interest or necessity as the main reason for not being online at home. Another 22 percent of households without internet capability cited affordability as their main reason for staying offline. Five percent of survey respondents in households without any home users reported a lack of availability, 3 percent reported a lack of adequate computers, and 2 percent reported privacy or security concerns, as seen in Figure 15.[179]

[178] NTIA Internet Use Survey 2021 (Ohio)
[179] NTIA Internet Use Survey 2021, results for Ohio (https://ntia.gov/other-publication/2022/digital-nation-data-explorer#sel=homeEverOnline&demo=&pc=prop&disp=both)

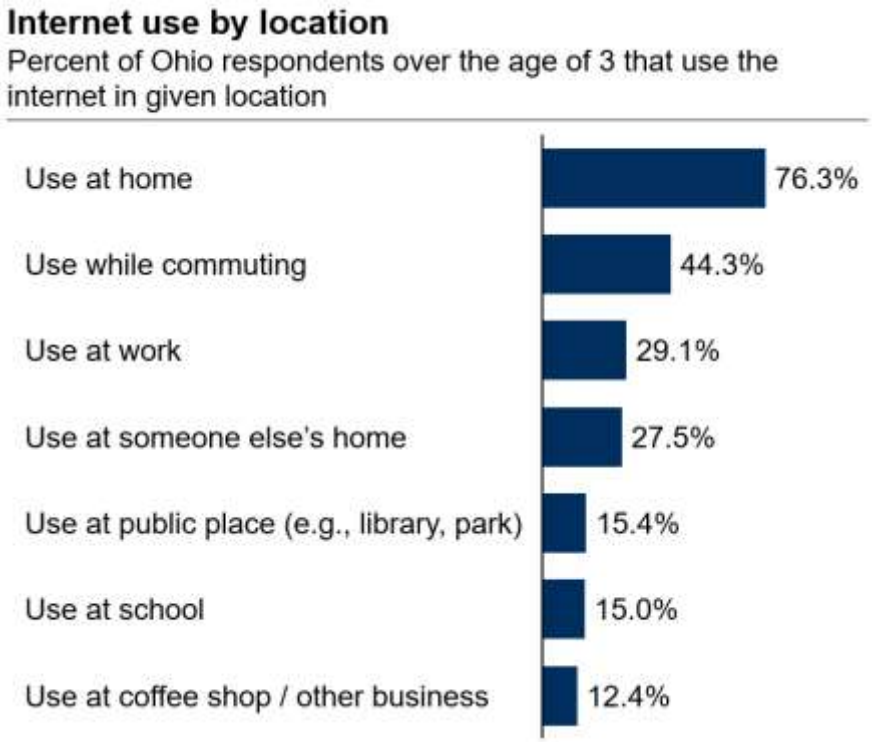
Figure 15: Ohio households' main reasons for not having online services at home[180]



When asked where they use the internet, Ohioan respondents to the 2021 NTIA Internet Use Survey most frequently mentioned "at home" (76.3 percent), "in transit" (44.3 percent), and "at work" (29.1 percent). The full distribution of locations where the internet is used is shown below in Figure 16. Ohioans without internet at home may still be able to use the internet through their cellphones and in places they visit, such as work and public places. While the internet may be available to residents in multiple places outside the home, barriers such as distance and having to pay for online service might still hinder access for certain populations, such as elderly, low-income, and rural communities.

[180] NTIA Internet Use Survey 2021

Figure 16: Locations where Ohioans use the internet[181]



3.4.2.D Multi-sector strategies for broadband adoption

BroadbandOhio has a multi-sector approach to realizing Ohio's broadband vision. This includes engaging telehealth, education, digital agriculture, and intelligent transportation systems in investment and action. Specific objectives include expanding telehealth access and usage, widening access to remote education opportunities, supporting Ohio farmers in improving productivity through digital agriculture technology, and enabling safe and easy movement of people and goods via foundational investments in intelligent transportation systems. Key needs and gaps for each are outlined below.

Telehealth: Improvement in health and well-being is urgently needed in Ohio. For many diseases, Ohio has a higher incidence rate than national averages. For instance, Ohio averages 196.7 deaths attributable to heart disease per 100,000 people annually, compared to the national average of 168.2 deaths per 100,000 people.[182] Limited access to physical care centers is one factor, as 36 percent of rural counties and 34 percent of Appalachian counties face shortages in primary care.[183]

The pandemic exacerbated this health crisis, especially as alcohol and substance use rose significantly, according to the Ohio Department of Mental Health and Addiction

[181] NTIA Internet Use Survey, 2021
[182] Workbook: SHA_FINAL_Summary (ohio.gov)
[183] Workbook: SHA_FINAL_Summary (ohio.gov)

Services.[184] The opioid and overdose epidemic, coupled with the COVID-19 pandemic, has increased the need for behavioral health services. A November 2021 survey conducted by the Ohio Council of Behavioral Health and Family Providers indicated a spike in demand for these services, with notable increases in the number of requests for youth mental health services, adult mental health services, and crisis services.[185]

Many Ohioans may benefit from accessing additional healthcare options through the internet via computers, cellphones, and other devices. By increasing broadband access in unserved and underserved communities, Ohioans may meet with their healthcare providers more frequently and from the convenience of their private homes. Telehealth services can expand access to good healthcare, but it remains out of reach for many Ohioans.

To help fill this gap, BroadbandOhio is currently conducting two telehealth pilots in school districts. The Broadband Telehealth Pilot Project at Switzerland of Ohio School District in rural Monroe County is fully operational, providing real-time access to mental health counselors for over 2,000 K-12 students in the school district.[186] Before the pilot, counselors had to commute for as long as 60 minutes to reach children in need. The Muskingum Valley Educational Service Center (MVESC) pilot gives 20,000 students access to telehealth services. Six of the 15 districts are online, and six more will soon join them.[187]

Recent legislative changes (HB 122) are also aimed at expanding telehealth availability.[188] The bill authorizes more healthcare professionals (such as pharmacists and behavioral analysts) to provide telehealth services and boosts affordability for both recipients and providers.

Through these efforts, the State of Ohio is working toward providing easier, faster access to physical and behavioral healthcare among covered populations; building more trust and interest among these populations in using telehealth so that utilization rates will increase; and making health outcomes more equitable.

Improving access to telehealth, especially to treat mental health issues, would help achieve several of the broader goals of the DeWine-Husted administration.[189] Broadening internet availability would support the Ohio Department of Health (ODOH) in meeting its goal to improve access to care — one of three priorities set in the 2020-2022 State Health Plan (SHIP). Easier internet access encourages the use of telehealth – a key ODOH strategy for improving access to care – and would also address addiction issues, which is another SHIP priority.

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[184] The Ohio Council of Behavioral Health & Family Providers
[185] The Ohio Council of Behavioral Health & Family Providers
[186] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/telehealth-pilot-project
[187] https://broadband.ohio.gov/explore-broadband/broadbandohios-projects/muskingum-valley-educational-service-center-telehealth-project
[188] Ohio Passes House Bill 122, Expands Telehealth Services (natlawreview.com)
[189] 2020-2022-SHIP.pdf (ohio.gov)

Agricultural advancement: Agriculture is critical to the Ohio economy and the livelihood of many Ohioans. According to the U.S. Department of Agriculture, in 2021 there were about 76,900 farms in Ohio, and the preliminary farm value of Ohio field crops produced in 2021 was $7.80 billion – up 25 percent from 2020.[190]

Through technologies like crop health sensors and spatial data management systems, digital agriculture can make Ohio farmers more efficient and resilient. Thirty percent of Ohio farms used digital agriculture practices to manage crops or livestock in 2021, which is 5 percentage points above the national average.[191]

However, broader adoption faces obstacles. Digital agriculture enables farmers to manage their farms remotely and more efficiently. These technologies allow farmers to analyze and maintain soil and crop health, making Ohio ecosystems more stable, and yields more predictable. Digital agriculture requires special equipment, software, and broadband connection to analyze and report information on the health of fields in real time. Access to reliable broadband is critical, but only 64 percent of Ohio farmers have internet access – 18 percentage points below the national average.[192]

Several initiatives to advance digital agriculture are underway in Ohio. Ohio State University's Digital Agriculture Program is conducting cutting-edge research, and BroadbandOhio has begun pilot projects with Ohio State University's Molly Caren Agricultural Center.

Transportation: Increasing internet access to programs for intelligent transportation processes, such as smart corridors, could positively benefit all Ohioans through reduced traffic congestion on freeways, cleaner air, less energy consumption, and more efficient transportation. Wider broadband deployment could directly enhance "smart transportation" technologies that require internet connectivity. For instance, autonomous vehicles require a robust internet connection to function, and statewide broadband deployment would help to build this infrastructure.

Moreover, multi-sector strategies involving smart transportation could facilitate Intelligent Transportation Systems, which are a priority for the Ohio Department of Transportation and DriveOhio. Ohio's first smart corridor, the I-670 SmartLane in Franklin County, opened in October of 2019.[193] Additional smart corridors are under development along I-275 in Hamilton and Clermont counties.[194]

Ohio is also leading cutting-edge innovations in smart mobility technology. In 2021, the Beta District, an innovative technology hub based in Columbus, launched the 33 Smart Mobility Corridor running from Dublin through Marysville to East Liberty. The corridor serves as a pilot area for developing and testing smart mobility technology. It includes

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[190] https://www.nass.usda.gov/Statistics_by_State/Ohio/Publications/Ag_Across_Ohio/2022/aao2203.pdf
[191] Farm Computer Usage and Ownership 08/18/2021 (cornell.edu)
[192] Ibid.
[193] https://www.transportation.ohio.gov/programs/traffic-operations/resources/smart-corridors
[194] https://www.transportation.ohio.gov/programs/traffic-operations/resources/smart-corridors

432 strands of available roadside fiber, 63 installed roadside units, and 45 connected intersections in Marysville and Dublin.[195] It is a unique asset for Ohio that differentiates the state as a one-of-a-kind vehicle-testing area. Investment in broadband can further the creation of smart highways throughout Ohio.

Remote education: Ohio is focusing on improving literacy, accelerating learning, enhancing workforce readiness, and boosting student wellness. The state is committed to supporting children, families, and school communities. During the pandemic, remote education was the only option for millions of students, and school closings affected 50 million students. Unfortunately, many Ohio students are still experiencing the negative effects of pandemic learning loss, particularly among vulnerable populations. To address this issue, Ohio is prioritizing digital learning for its 1.6 million public school students, including those who are economically disadvantaged and who live in rural areas.

Providing internet access to school-aged children can augment classroom learning and increase students' chances of employment later in life. The Economist Intelligence Unit report suggests that increasing a school's connectivity by 10 percent can raise the effective number of schooling years per student and boost GDP per capita by 1.1 percent.[196] While all of Ohio's schools have fiber-optic connections and meet the 2013 FCC minimum bandwidth target of 100 Kbps per student, only 62 percent of school districts meet the 2018 goal of 1 Mbps per student.[197] Bridging this gap is a priority for BroadbandOhio.

Internet access is also crucial at home, especially since online homework has become a substantial part of education. However, many students and teachers lack digital access at home, particularly in underrepresented communities. Enabling digital education would also help achieve the broader goals of the DeWine-Husted administration, such as implementing the Strategic Plan for Education published by the Ohio Department of Education. This plan calls for ensuring that each child knows how to critically read, write, work with numbers, and use technology effectively.[198]

The digital economy: Most Ohioans use the internet for essential activities such as communicating, with 93 percent of residents using it for instant messaging and 90 percent for email. Ohioans also leverage the internet to manage their finances, with 73 percent of residents reporting that they use online financial services.[199]

But Ohioans' participation in the digital economy shows room for improvement. Around one fourth of Ohio residents use the internet to search for a job or work remotely, and over one fifth use it to take classes or job training, as seen in Figure 17. Among internet

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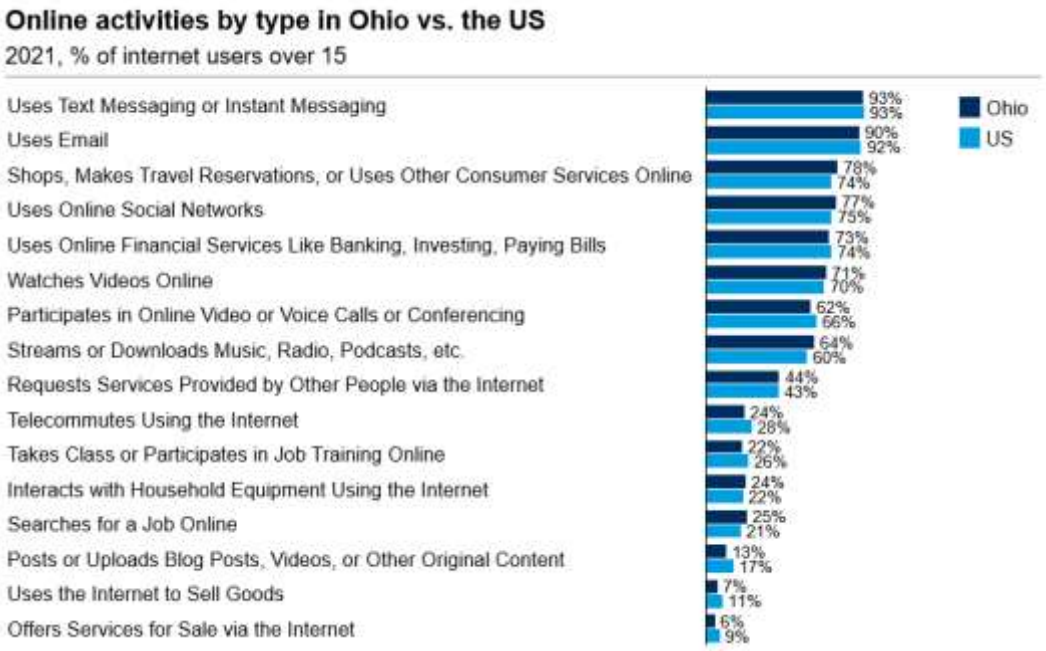
[195] https://www.thebetadistrict.com/us-33-smart-mobility-corridor/
[196] We need to connect every school to the internet. Here's how | World Economic Forum (weforum.org)
[197] State Rankings - EducationSuperHighway; Connect K-12 (connectk12.org)
[198] #EachChildOurFuture - Strategic Plan for Education in Ohio
[199] NTIA Internet Use Survey, 2021 (https://ntia.gov/other-publication/2022/digital-nation-data-explorer#sel=teleworkUser&disp=map)

users over 15 years of age, Ohio lags the US national average in working remotely (24 percent in Ohio versus 28 percent in the US), taking a class or receiving job training online (22 percent in Ohio versus 26 percent in the US), and using the internet to sell goods (7 percent in Ohio versus 11 percent in the US).

Figure 17: Online activities by type, Ohio versus the United States[200]



3.4.3 Broadband Affordability

3.4.3.A Access to affordable plans

The link between household income and broadband adoption is clear. Twenty-seven percent of state households with an annual income under $20,000 do not have home broadband, compared to 12 percent of households with annual incomes between $20,000 and $75,000 and 4 percent of those earning above $75,000 annually.[201] According to the 2021 NTIA Internet Use Survey, as shown in Figure 15, 22 percent of residents in Ohio households without any home broadband cite affordability of subscriptions as the primary reason they do not subscribe to high-speed internet.[202]

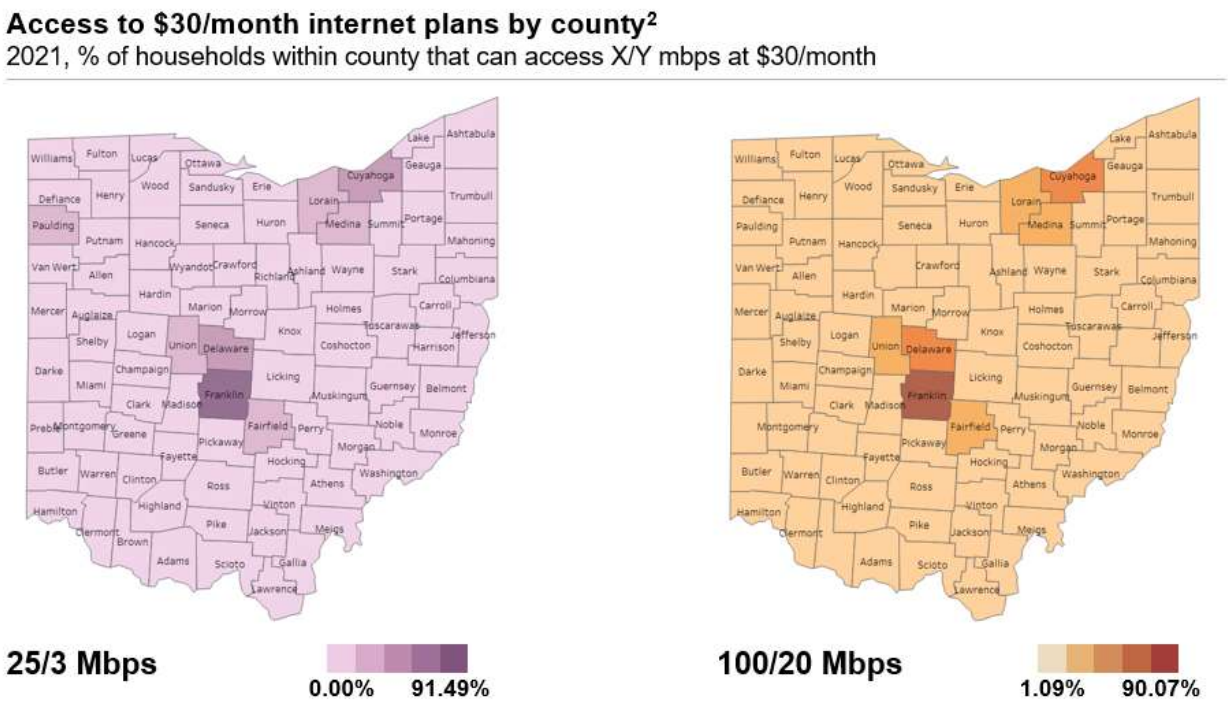
Per the requirements of the BEAD program, BroadbandOhio will develop a low-cost plan for eligible households that sub-grantees must offer to address the affordability gap. While BroadbandOhio has not yet defined what constitutes an affordable plan, an effective analysis can look at different combinations of speed and price points using

[200] NTIA Internet Use Survey, 2021 (https://ntia.gov/other-publication/2022/digital-nation-data-explorer#sel=teleworkUser&disp=map)
[201] US Census Data, 2021 American Community Survey One-Year Estimates
[202] 2021 NTIA Internet Use Survey

thresholds of $30, $50, and/or $100 per month. "Access" can be defined by the FCC availability map and market research; as of January 31, 2023, there were 4,478,218 BSLs in the FCC's Broadband Availability Map data. For example, a BSL may be determined to have access to a 25/3 Mbps plan at $30 per month if one or more provider reports 25/3 service to the FCC maps, and such provider advertises a $30/month plan online with minimum speeds of 25/3.

Based on this analytical approach, the majority of Ohioan BSLs (85 percent) do not have access to a $30/month internet plan with at least 25/3 Mbps. Some 14.8 percent of BSLs have access to a $30/month plan for 25/3 Mbps service, while 13.9 percent of BSLs have access to 100/20 Mbps speeds at the same price. The highest percentage of locations with access to affordable internet plans for $30/month are concentrated around major cities such as Cleveland and Columbus, as seen in Figure 18.

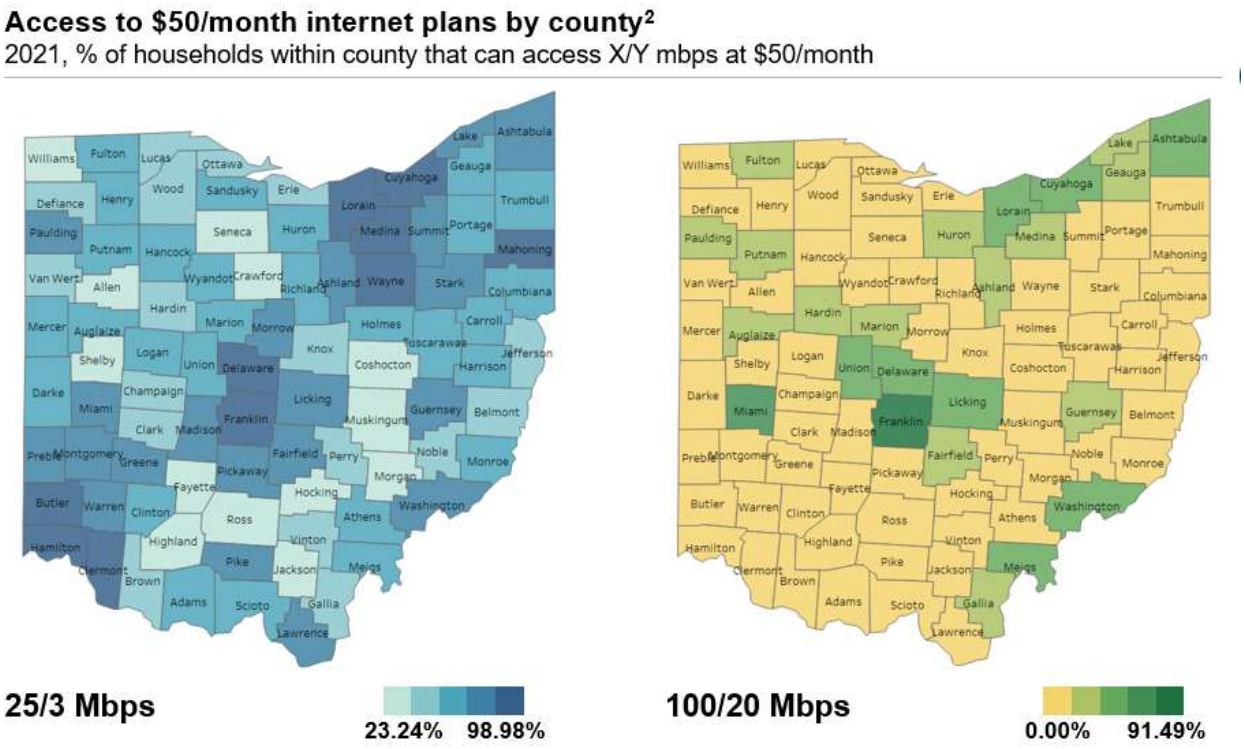
Figure 18: Percentage of locations in with access to $30/month broadband plans at 25/3 and 100/20 Mbps in each county[203]



At $50/month, while 73.1 percent of BSLs can access 25/3 Mbps, only 20.1 percent can access 100/20 Mbps. Morgan, Vinton, and Gallia counties have the largest gap in accessing 25/3 Mbps internet plans for $50 per month. Twenty-eight of the 32 Appalachian Counties tend to have lower 100/20 Mbps accessibility rates than average at $50 per month, as seen in Figure 19.

[203] FCC Broadband Availability Maps as of January 31, 2023

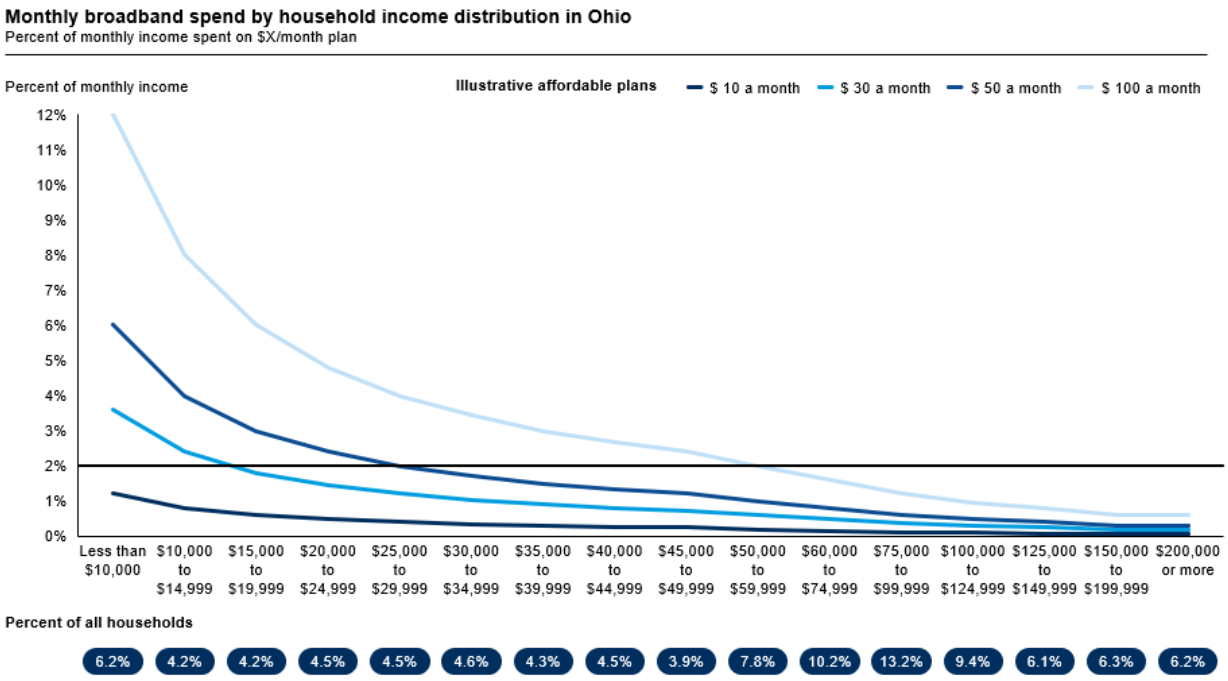
Figure 19: Percentage of locations with access to $50/month broadband plans at 25/3 and 100/20 Mbps in each county[204]



The National Governors Association and the Broadband Commission for Sustainable Development set a threshold of 2 percent of monthly income to consider a broadband plan affordable.[205] In several income groups, Ohio households may be spending more than this amount on broadband. As plans become more costly (moving from $10 per month to over $100 per month), the share of households spending 2 percent or more increases, as seen in Figure 20. Even at a 2 percent threshold, affordable broadband plans may be out of reach for many Ohioans. A $30-per-month plan represents more than 2 percent of monthly income for approximately 13 percent of Ohioan households. This rate increases to approximately 24 percent of households at $50 per month. At $10 per month, however, nearly all Ohio households would spend less than or equal to 2 percent of their monthly income.

Figure 20: Monthly broadband spend by household income distribution in Ohio[206]

[204] FCC Broadband Availability Maps as of January 31, 2023
[205] https://www.nga.org/publications/broadband-affordability-resources/
[206] American Community Survey, 2021 5-Year Estimates



For 13.2 percent to 23.6 percent of Ohio households, affordable broadband plans costing less than 2 percent of monthly income may be unattainable, as seen in Figure 21.[207] Any $50-per-month plan represents over 2 percent of gross monthly income for nearly one out of four Ohioan households. Additional Ohio households (29.6 percent to 51.7 percent) may not be able to afford $30 or $50 monthly broadband plans if spending 1 percent or less of monthly income. In fact, a $10-per-month plan represents 2 percent or less of gross monthly income for nearly all Ohioans.

[207] Methodology: Interpolated the percent of Ohio households at $X/month plans using the intersection between a 2 percent spend threshold and line graphs representing percent monthly spend for each income group and each plan price

Figure 21: Affordable broadband plan attainability by monthly spend threshold[208]

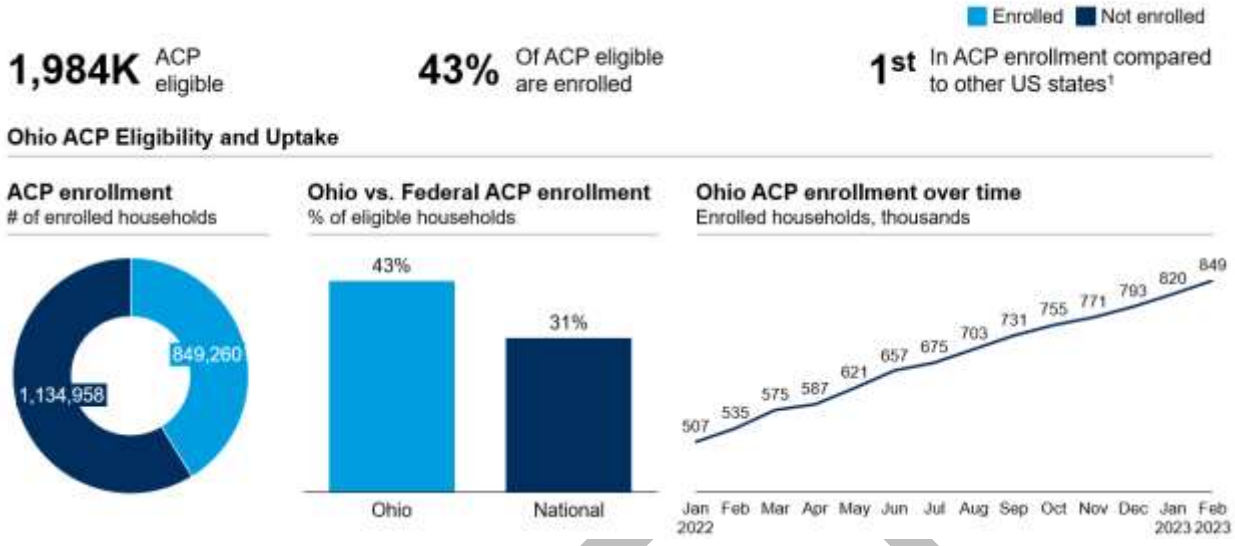
Threshold of gross monthly income	Ohio HHs exceeding income threshold for broadband spend, 2021 (%)		
	$10/month	$30/month	$50/month
1%	8.3%	29.6%	51.7%
2%	0%	13.2%	23.6%

3.4.3.B ACP eligibility and update

Approximately 1.984 million Ohio households (41 percent of all Ohio households) are eligible for the Affordable Connectivity Program (ACP). Of these, approximately 820,000 households (41 percent) have enrolled. This places Ohio first in ACP enrollment compared to other US states. ACP uptake has steadily increased from January 2022 to January 2023, as seen in Figure 22. Opportunities are available to partner with other state agencies, including the Ohio Department of Jobs and Family Services and the Ohio Department of Aging, to further promote ACP, as many of the individuals served by these agencies qualify for ACP. It is important to note, however, that the state's high ACP uptake rate means that Ohio households will be affected more than other states if the ACP program is discontinued.

Figure 22: Ohio ACP eligibility and uptake[209]

[208] American Community Survey, 2021 Five-Year Estimates
[209] EducationSuperHighway.org. as of April 25, 2023



3.4.3.C Other relevant programs for broadband affordability

In addition to ACP, several private-sector programs aim to make broadband more affordable in low-income communities. Example programs include:

Spectrum Internet Assist (hybrid fiber-coaxial cable connections) offers plans with speeds up to 30/4 Mbps. A fee for Wi-Fi applies. Eligible households include participants in the National School Lunch Program (NSLP), the Community Eligibility Provision (CEP) of the NSLP, and Supplemental Security Income (SSI).

Access from AT&T (copper and fiber) offers plans up to $30/month with speeds up to 100 Mbps. Free installation and Wi-Fi are included. Eligible Ohio households include recipients of ACP, the Supplemental Nutrition Assistance Program (SNAP), and NSLP.

Comcast's Internet Essentials (cable) provides plans for $9.95/month for up to 50 Mbps, or $29.95/month for up to 100 Mbps. Also included are low-cost computers, free Wi-Fi hotspots, and free internet training. Eligible households include recipients of ACP, housing assistance, Medicaid, SNAP, SSI, NLSP, and others.

Cox low-cost internet options (coaxial cables and fiber) offers plans through Connect2Compete and Connect Assist. The first costs $9.95/month with speeds up to 100 Mbps for families with children enrolled in government financial assistance programs. The second plan costs $30/month with speeds up to 100 Mbps for low-income households without children.

Other programs, some of which target adoption and digital inclusion, include:

- **Cisco's** Skills for All
- **Apple's** ConnectED
- **Land O' Lakes'** American Connection Project Coalition

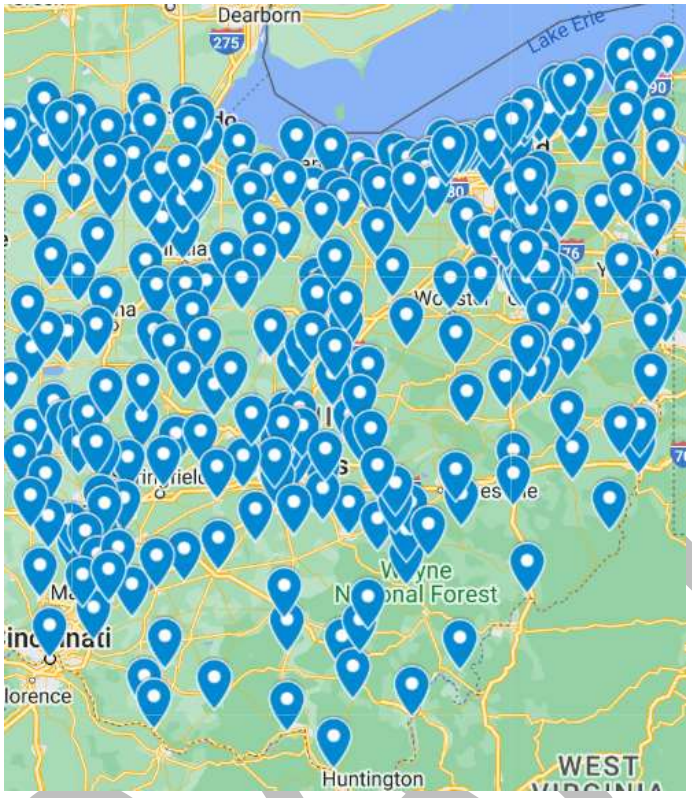
- **Tractor Supply's** rural America partnerships
- **Microsoft's** Airband Initiative
- **VISA's** Digital Empowerment Program
- **P&G's** 1 Million Connected Devices Now
- **AT&T's** $2 billion digital divide investment
- **Verizon's** $3 billion investment from 2020 to 2025 in bridging the digital divide and other objectives
- **Charter Communications'** investment in underserved urban and rural areas.

3.4.4 Broadband Access

3.4.4.A Public Wi-Fi and access points

Libraries may provide the main source of access to public Wi-Fi in Ohio. At least 297 libraries or library systems offer free public Wi-Fi in their buildings or parking lots. Other public places, such as the Oak Hill Collaborative and Giant Eagle Market District, provide free Wi-fi to visitors. The locations of these public access points are shown in Figure 23. While these locations reflect Ohio's current efforts to make the internet more accessible in public places, there may be additional opportunities for Ohioans to connect. Potential ideas include extending public libraries' hours of operation, adding public Wi-Fi options in state and local government sites, and partnering with community organizations to create additional public access points.

Figure 23: Public locations with free-Wi-Fi access in Ohio[210]

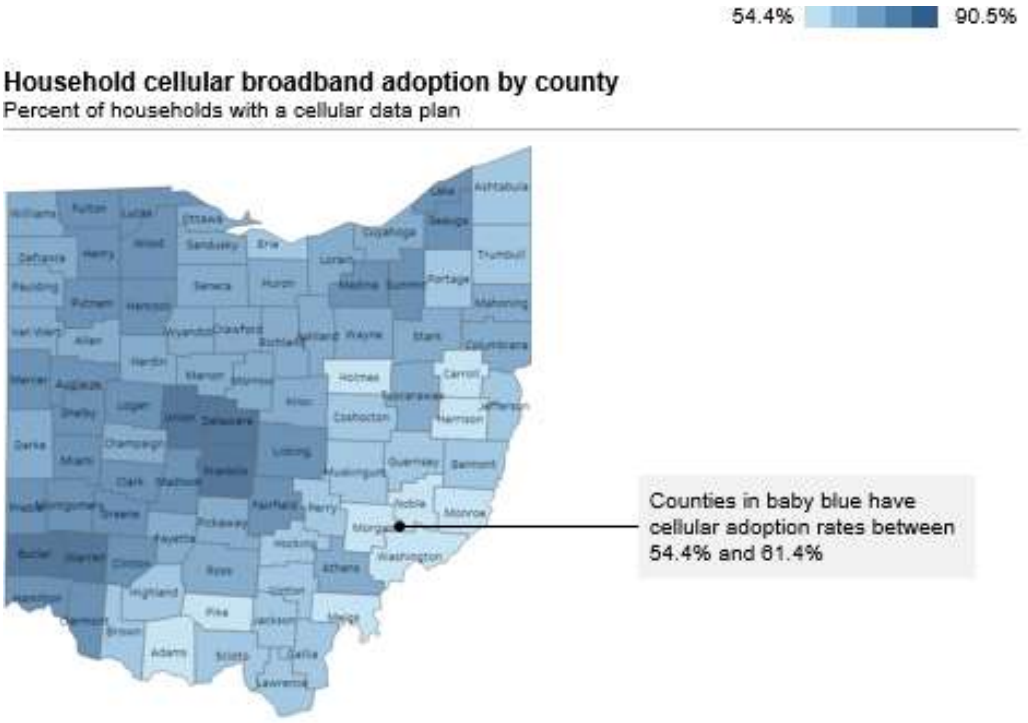


3.4.4.B Cellular connectivity

Many Ohioans use broadband services through cellular connectivity. About 76.9 percent of residents in Ohio subscribe to a cellular broadband plan in some form. As seen in Figure 24, in all counties over 50 percent of households have a cellular internet plan. Regardless, there is room for more adoption, with only Delaware County, the wealthiest county in Ohio, having a cellular adoption rate above 90 percent. Counties with smaller populations generally have lower adoption rates, and counties in Appalachian Ohio have lower rates of cellular broadband adoption compared to other regions. BroadbandOhio may seek to expand access for the 23.1 percent of residents who do not subscribe to a cellular broadband plan.

[210] https://eyeonohio.com/free-ohio-wifi/

Figure 24: Household cellular broadband adoption rates in each county[211]



3.4.5 Digital Opportunity

This section will be further detailed and refined in the State Digital Opportunity Plan.

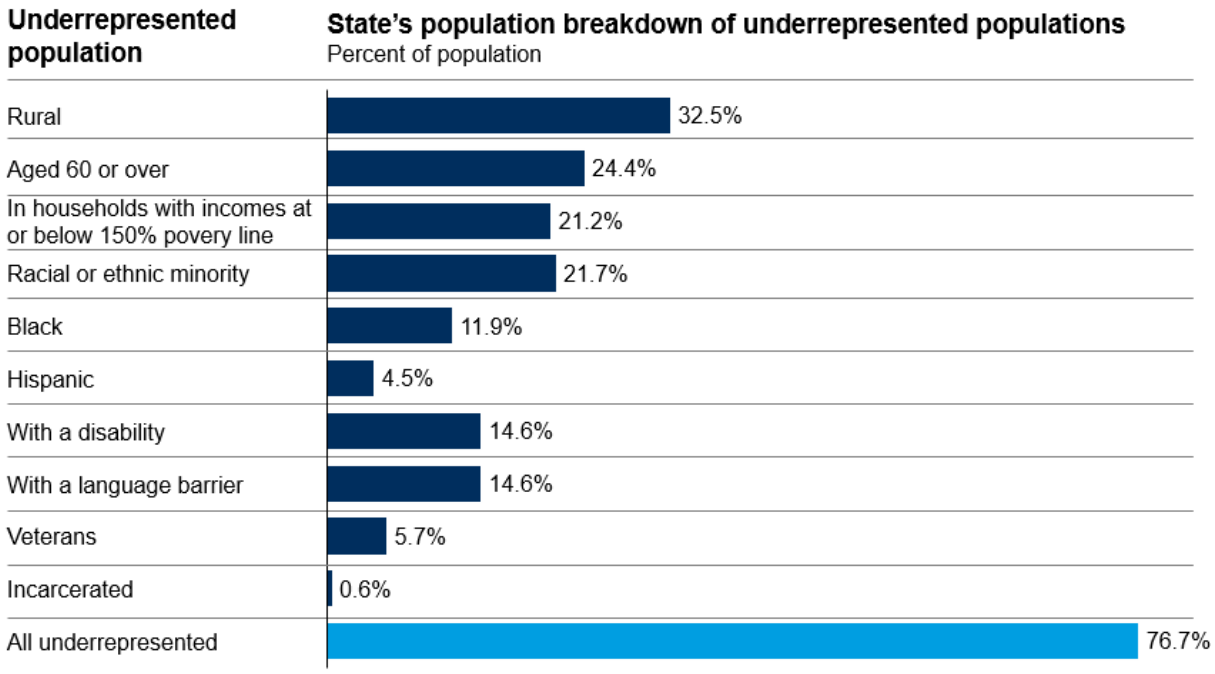
The section below outlines the needs and gaps in digital inclusion in Ohio today. Additional efforts are underway to refine this understanding, including ongoing statewide surveys and stakeholder engagement. Findings from these efforts that were not available at the time this Five-Year Action Plan was compiled will be outlined in the State Digital Opportunity Plan, which will elaborate on the needs and gaps delineated in this report.

As referenced in the BEAD NOFO, several underrepresented communities face persistent barriers to broadband adoption. These populations may represent as much as 76.7 percent of Ohio's population, as seen in Figure 25. These populations include residents in rural communities, those aged 60 or over, households with incomes at or below 150 percent of the poverty line, racial and ethnic minorities, persons with a disability, those who have a language barrier, veterans, incarcerated persons, and other groups as defined in Section 1.C (aa).[212]

[211] US Census data 2021 Five-Year Estimates, Table ID S2801

[212] The term "underrepresented communities" refers to groups that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, including: low-income households, aging individuals, incarcerated individuals, veterans, persons of color, indigenous and Native American persons, members of ethnic and religious minorities, women, LGBTQI+ persons, persons with disabilities, persons with limited English proficiency, persons who live in rural areas, and persons otherwise adversely affected by persistent poverty or inequality.

Figure 25: Distribution of underrepresented populations across Ohio[213]



Stakeholder engagement has shown that underrepresented communities frequently have the most to gain from increased access to broadband and devices. For example, through broadband connectivity, disabled and aging populations with limited mobility can access telehealth services, assistive technology, use smart devices to turn off lights and other appliances, and work from home in remote roles they could not otherwise hold.

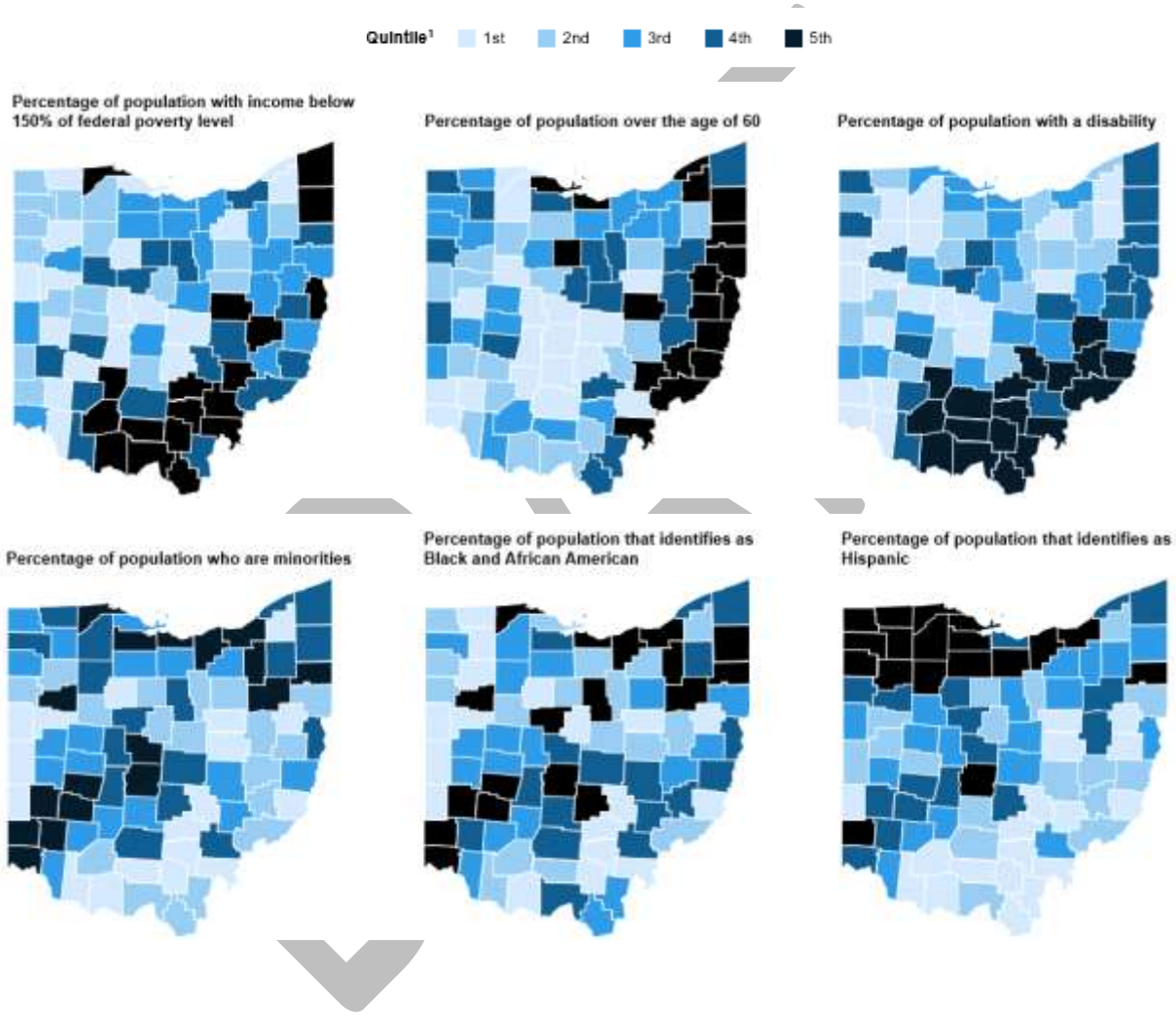
Each underrepresented group is distributed differently across Ohio's many regions, as seen in Figure 26. In nine counties – seven of which are in the state's Southeast region – more than 30 percent of the population has income below 150 percent of the federal poverty line. In 15 counties – eight of which are in Southeast Ohio – more than 29 percent of the population is above 60 years of age. In 11 counties – nine of which are in the Southeast area – more than 20 percent of the population has a disability.

The largest racial or ethnic minority group in Ohio is African American, followed by Hispanic, who make up 13 percent and 4 percent of the population, respectively. In six counties – five of which are in the Northeast or Southwest parts of Ohio – more than 10 percent of the population is African American, with the highest shares in Cuyahoga (Cleveland) and Hamilton (Cincinnati). In three counties – two of which are in the Northwest – more than 10 percent are Hispanic, with the highest shares in Lorain (Lorain) and Defiance (Defiance) counties.

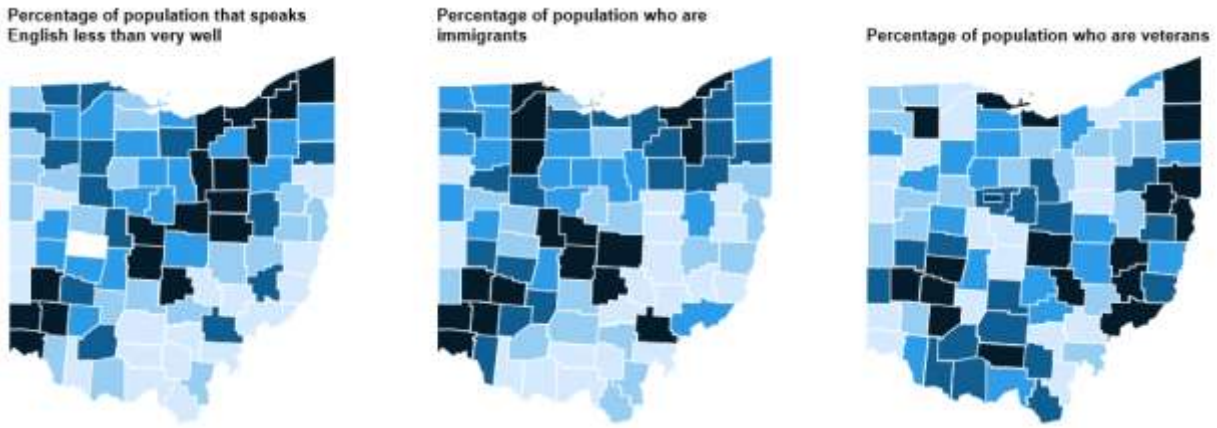
[213] Digital Equity Act Population Viewer, ACS 2021 One-Year Estimates

Additionally, in eight counties – five of which are in the Northeast – more than 3 percent of the population is classified as "speaking English less than very well."[214] In 11 counties that are concentrated in the Southwest, Central, and Northeast, more than 8 percent of the population is composed of immigrants. In seven counties – three of which are in the Southeast – veterans make up more than 8 percent of the population.

Figure 26: Distribution of underrepresented populations by quintiles (1st = lowest quintile; 5th = highest quintile)[215]



[214] Verbiage from US. Census, ACS 2021 Questions
[215] ACS 2021 5-Year Estimates



3.4.5.A Participation in the digital economy by communities that are traditionally disengaged[216]

Statewide, many Ohio households – 86.52 percent – subscribe to internet services. Of these, 0.26 percent subscribe to dial-up services with no other internet subscription, and 85.27 percent subscribe to broadband of all types.[217] The broadband adoption rates in the top third of all Ohio census blocks are high at 79.8 percent or above. The middle third's adoption rates are between 64.8 percent and 79.8 percent. In the bottom third, adoption rates are less than 64.8 percent. [218]

Broadband is widely available across the state, and 91.5 percent of all Ohio residents live in census-block groups with "very high" availability (0-25 percent un- or underserved). About 7.2 percent of residents live in block groups with "middle" availability (25-75 percent un- or underserved), and just 1.3 percent of residents live in block groups with low availability (75-100 percent un- or underserved).[219]

Each of the traditionally disengaged populations (Covered populations) faces specific barriers and obstacles to internet connectivity. Below are availability and adoption rates in each group, along with some of the factors affecting these rates.

Lower-income populations: While those who fall below 150 percent of the federal poverty level are no more likely to live in areas that are under- or unserved, these individuals are concentrated in urban areas and are less likely to subscribe to internet services. Availability rates are generally high, while adoption rates are comparatively low.

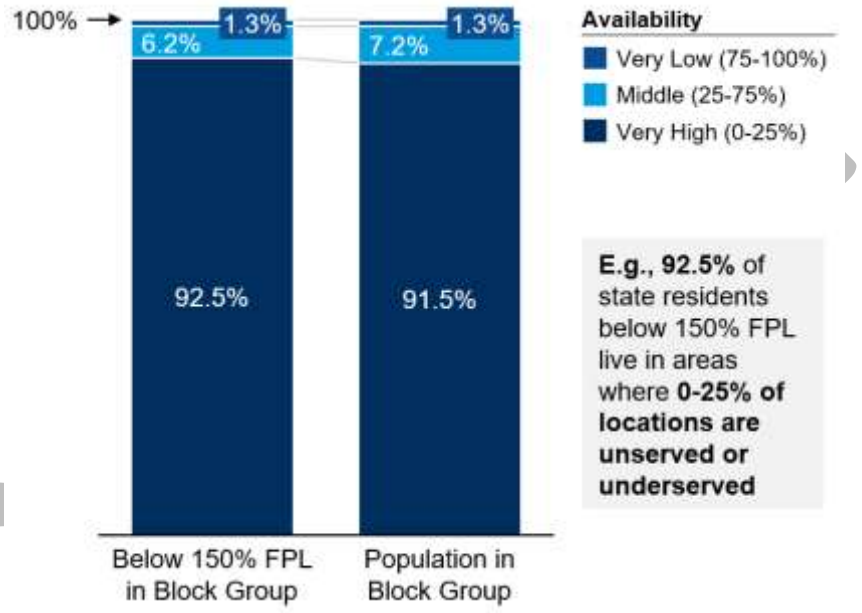
- **Availability**: As shown in Figure 27, about 9.2 of every 10 persons at or below 150 percent of the federal poverty level (FPL) live in areas with very high access to

[216] In this section, Ohio has interpreted the 'traditionally disengaged communities' terminology used in the BEAD five-year action plan guidance to be synonymous with Covered populations. The definition of covered populations is taken from the Digital Equity Act.
[217] ACS 2021 5-Year Estimates
[218] ACS 2021 5-Year Estimates
[219] Analysis of Jan 2023 FCC National Broadband Map data

broadband, as compared to 91.5 percent of the general population. Some 6.2 percent of those below 150 percent of the FPL live in block groups where 25-75 percent of locations are unserved or underserved, compared to 7.2 percent of those above 150 percent of the FPL. [220]

- **Adoption**: Adoption gaps between those who fall below 150 percent of the poverty level and Ohioans overall are widest in urban communities. Urban areas that rank in the top third in terms of percentage of the population who fall below 150 percent of the FPL also rank in the bottom third of adoption rates, as seen in Figure 28. In short, even where broadband is widely available, people whose income is less than 150 percent of the FPL are far less likely than other populations to adopt broadband.

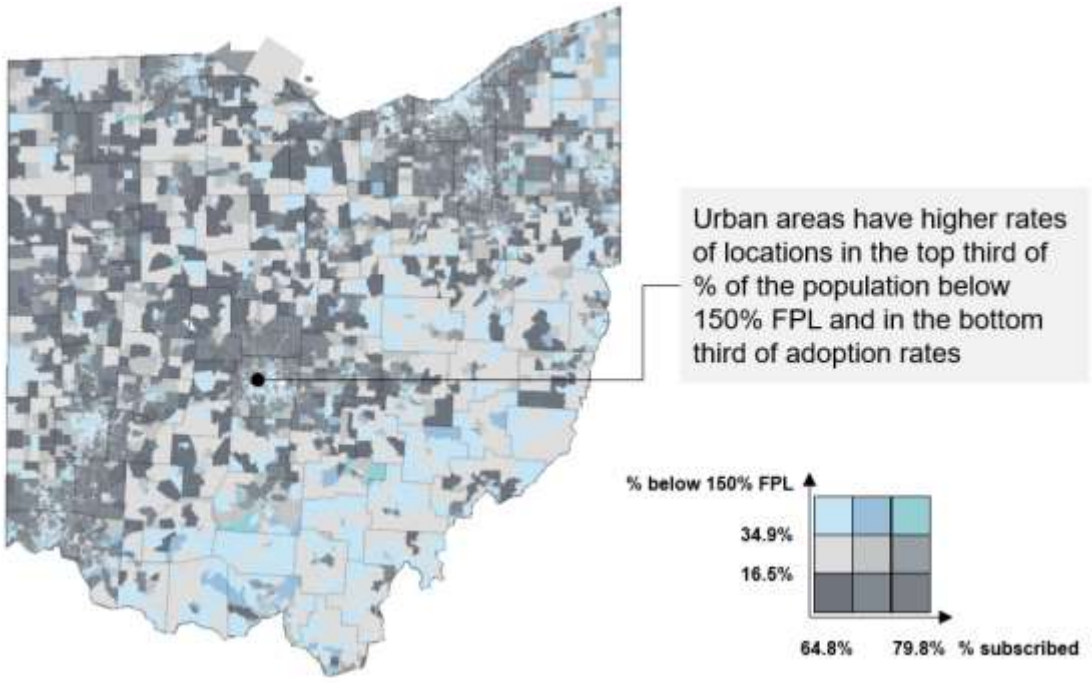
Figure 27: Availability – Percent of locations unserved or underserved in block group, individuals below 150 percent of the FPL versus all of Ohio[221]



[220] Individuals with income below or equal to 200 percent of the Federal Poverty Level in 2020.

[221] ACS 2021 Five-Year Estimates. Analysis focuses on individuals with incomes below or equal to 150 percent of the Federal Poverty Level in 2021.

Figure 28: Adoption – Distribution of individuals below 150 percent of the FPL and subscription rates in Ohio blocks[222]

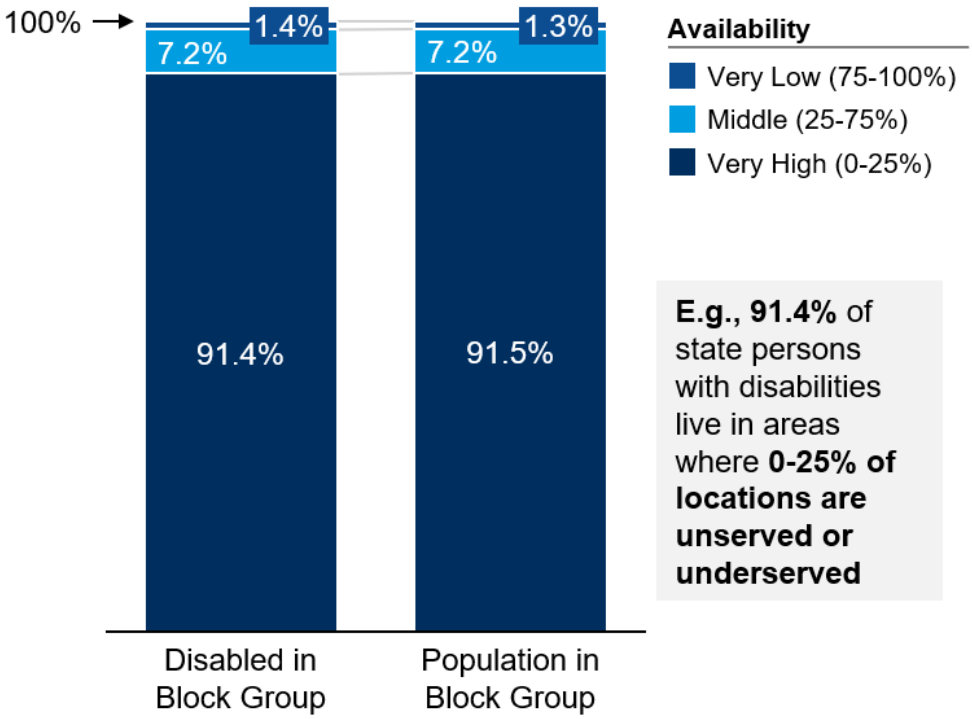


Persons with disabilities: The difference in availability rates for persons with disabilities and statewide rates is minimal, but persons with disabilities are more concentrated in suburban and rural communities, which often have lower adoption rates.

- **Availability**: About 9.1 in 10 persons with disabilities are in areas with very high availability, as seen in Figure 29. Additionally, 1.4 percent of persons with disabilities are in block groups with very low availability, while 7.2 percent are in block groups with middle availability.
- **Adoption**: Suburban regions that rank among the top third in population share of persons who are disabled have higher location rates and fall into the top third of adoption rates, as seen in Figure 30. (Locations are shaded in teal green.) Rural areas tend to have higher rates of locations in the bottom third of subscription rates but are in the top third in number of persons with disabilities.

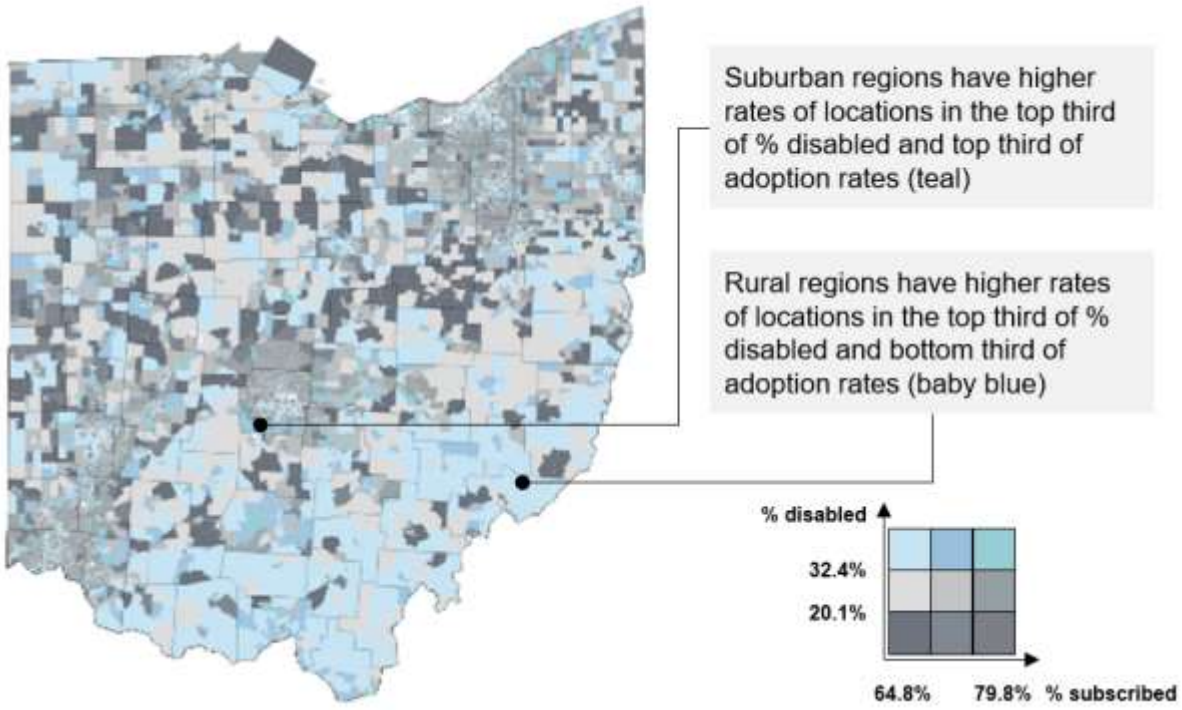
[222] FCC Broadband Availability Maps as of January 31, 2021

Figure 29: Availability – Percent of locations unserved or underserved in block group, disabled populations versus all of Ohio[223]



[223] ACS 2021 Five-Year Estimates. Analysis focuses on households with one or more disabled members.

Figure 30: Adoption – Distribution of persons with disabilities and subscription rates in Ohio blocks[224]



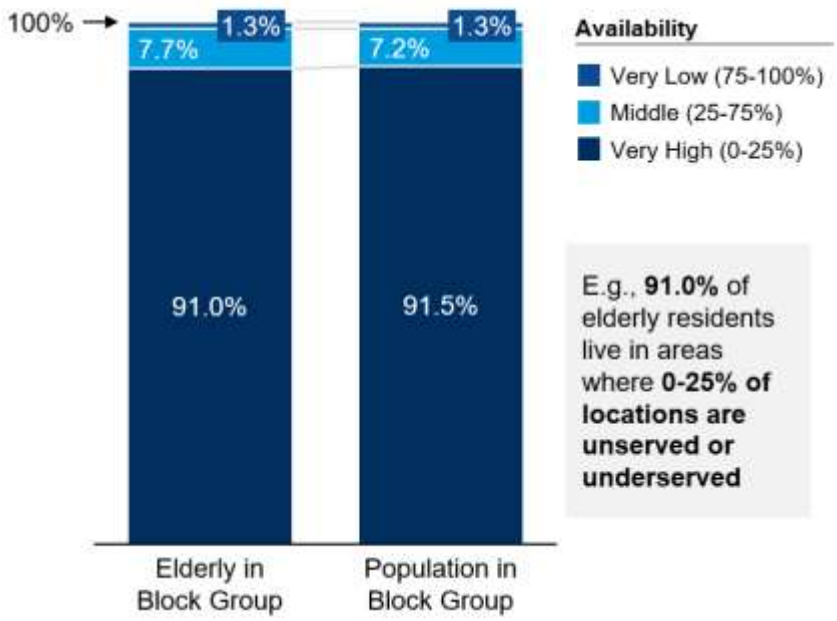
Elderly: Elderly residents are slightly more likely to live in areas with medium levels of internet access, where 25 to 75 percent of nearby BSLs are un- or underserved. These residents are highly concentrated in suburban areas, many of which rank in the highest third of adoption rates. This indicates that elderly residents in suburbs and urban centers may value internet subscriptions more highly than those in rural communities.

- **Availability**: About 9.10 in 10 elderly persons live in block groups with very high broadband availability, compared to 9.15 in 10 for all of Ohio, as shown in Figure 31. Additionally, 7.7 percent of elderly persons live in block groups with middle broadband availability, compared to 7.2 percent of all Ohioans. Both elderly populations and all Ohioans have 1.3 percent of residents living in block groups with very low availability.
- **Adoption**: Unlike other demographic groups, suburban areas have higher rates of locations and rank in the top third in terms of population share of elderly persons. They also place among the top third in adoption rates, as seen in Figure 32 (shaded in teal green). Rural populations with higher rates of locations are in the top third of elderly population share but fall into the bottom third in adoption, perhaps implying

[224] FCC Broadband Availability Maps as of January 31, 2023

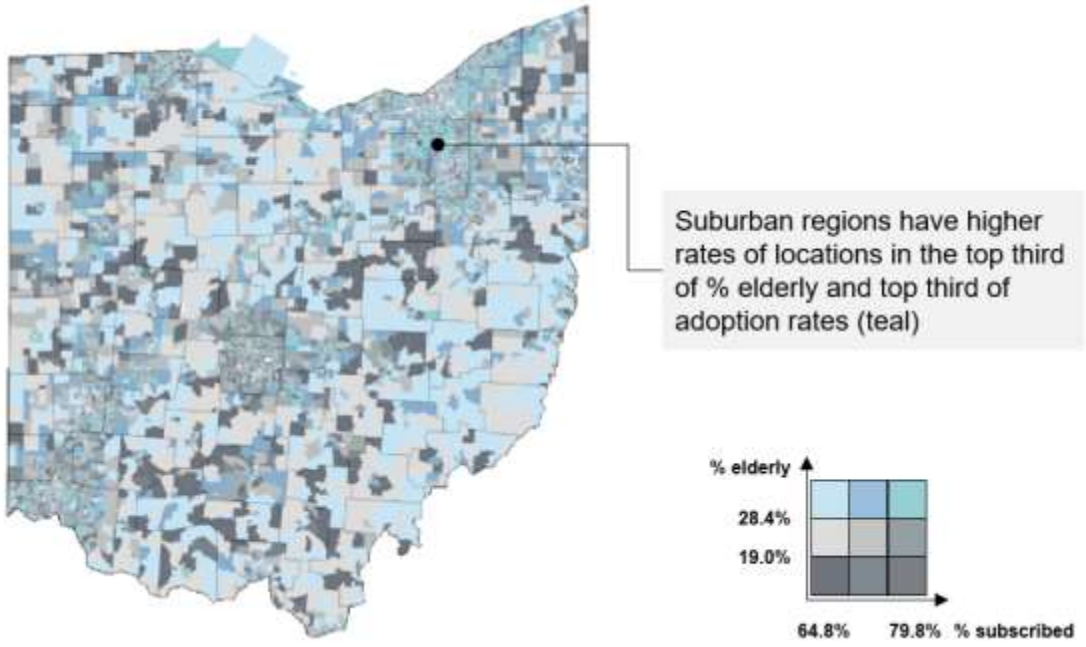
a need for targeted broadband expansion in rural areas with higher shares of elderly persons.

Figure 31: Availability – Percent of locations unserved or underserved in block group, elderly persons versus all of Ohio[225]



[225] ACS 2021 Five-Year Estimates. Analysis focuses on individuals aged 65 and above.

Figure 32: Adoption – Distribution of elderly persons and subscription rates in Ohio blocks[226]



Non-White: Non-White persons are more likely to live in areas with very high availability (where just 0 to 25 percent of nearby BSLs are un- or underserved) and very high adoption levels. They are less likely to live in areas with medium to very low availability – perhaps because they are more likely to live in urban communities.

- **Availability**: Approximately 9.8 in 10 non-White persons live in block groups with very high availability, compared to 9.1 in 10 for all of Ohio, as shown in Figure 33. This figure may imply that broadband is more accessible for non-White persons compared to all of Ohio. One possible explanation is that non-White citizens are generally concentrated in urban areas (as shown in Figure 34), which have higher rates of availability. Only 1.5 percent of non-White persons live in block groups with middle availability, compared to 7.2 percent of all Ohioans. Just 0.3 percent of non-White persons live in block groups with very low availability, compared to 1.3 percent of all Ohioans.
- **Adoption**: Non-White residents are concentrated in urban areas, as seen in Figure 34 (all shades of blue). Locations in the highest third of subscription adoption rates and highest third of the percent non-white are concentrated around Columbus, Cincinnati, Cleveland, Dayton, and Toledo.

[226] FCC Broadband Availability Maps as of January 31, 2023

Figure 33: Availability – Percent of locations unserved or underserved in block group, non-white populations versus all of Ohio[227]

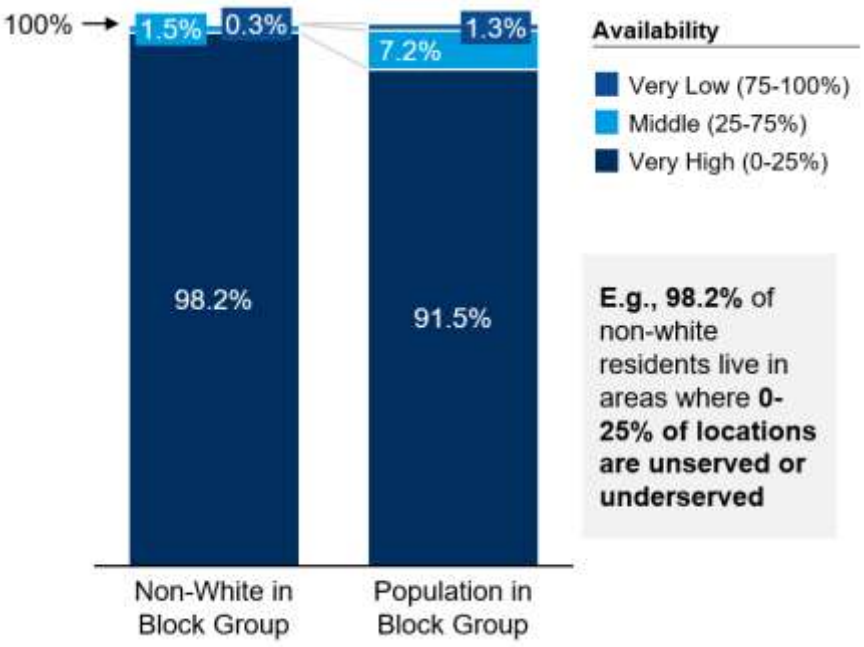
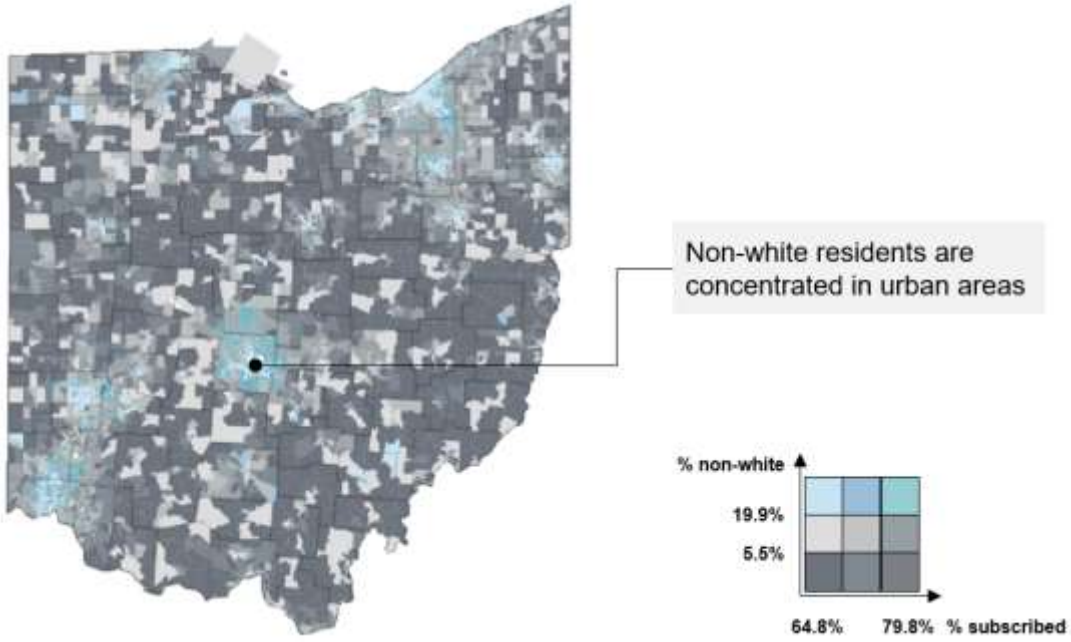


Figure 34: Adoption – Distribution of non-White residents and subscription rates in Ohio blocks[228]

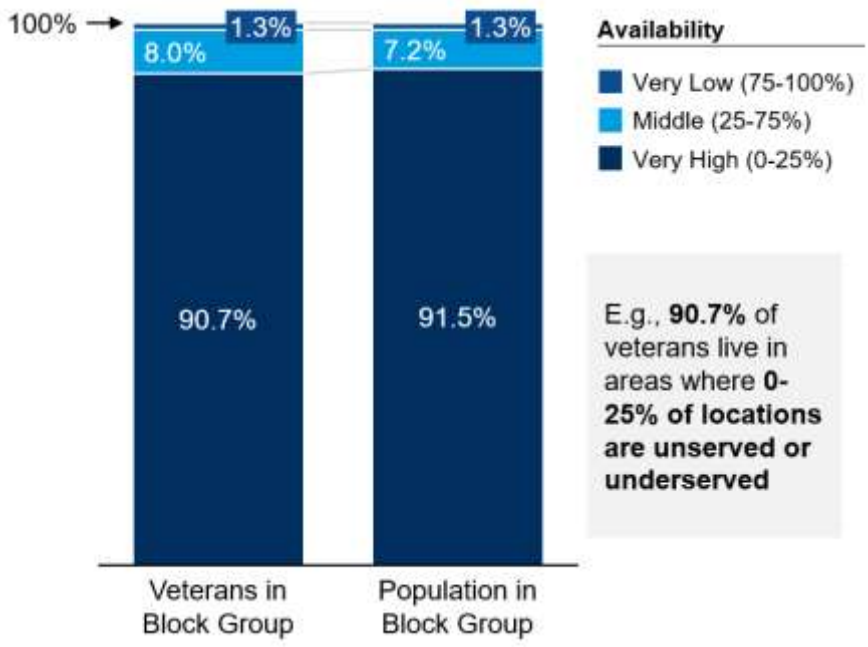


[227] ACS 2021 Five-Year Estimates
[228] FCC Broadband Availability Maps as of January 31, 2023

Veterans: The difference in availability rates between veteran populations and the general Ohio population is slight, but areas with higher proportions of veterans are more likely to have lower rates of adoption – signaling a potential gap that BroadbandOhio may prioritize.

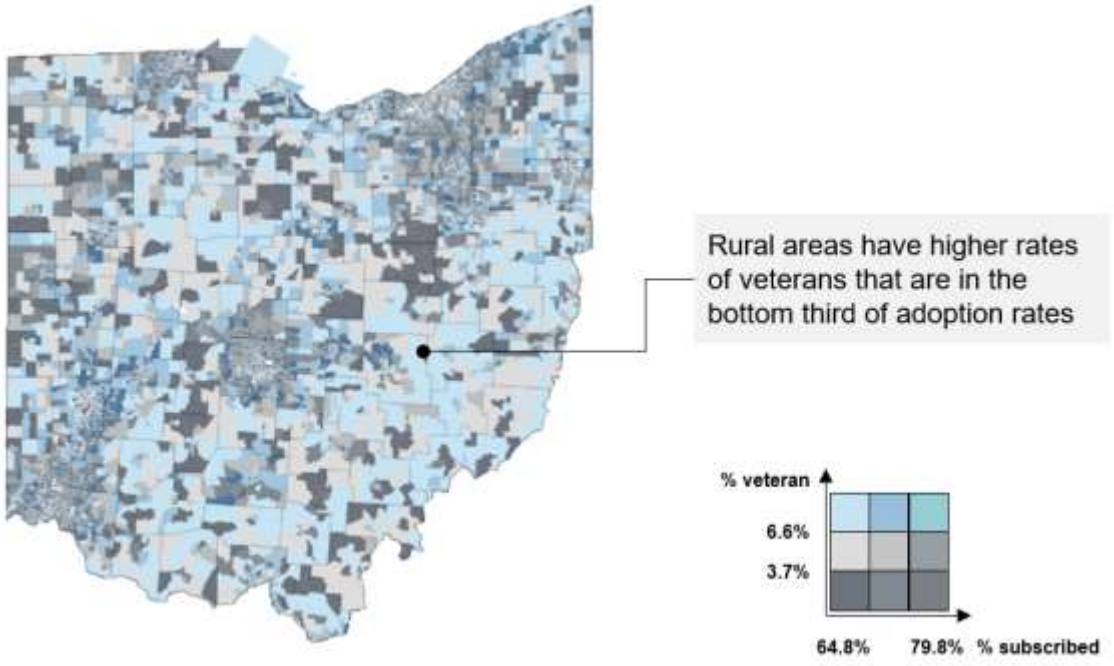
- **Availability**: Veterans are slightly more likely to live in a census block where the availability rate is between 25 and 75 percent (8.0 percent of veterans compared to 7.2 percent of all Ohioans), as seen in Figure 35. Additionally, 9.0 in 10 veterans live in block groups with very high internet availability, compared to 9.1 in 10 of all Ohioans. Among veterans and all Ohioans, 1.3 percent of residents live in block groups with very low availability.
- **Adoption**: Ohio census blocks ranking in the top third in terms of adoption rates have a veteran population of 6.6 percent or more. In the bottom third, just 3.7 percent of the population identifies as veterans. Rural areas have higher rates of veterans who fall into the bottom third in adoption rates, but these areas rank among the upper third in population share of veterans. These figures indicate that adoption gaps among veterans may be widest in rural areas with high concentrations of veterans and low availability of internet services.

Figure 35: Availability - Percent of locations unserved or underserved in block group, veterans versus all of Ohio[229]



[229] ACS 2021 5-Year Estimates

Figure 36: Adoption – Distribution of veterans and subscription rates in Ohio blocks[230]

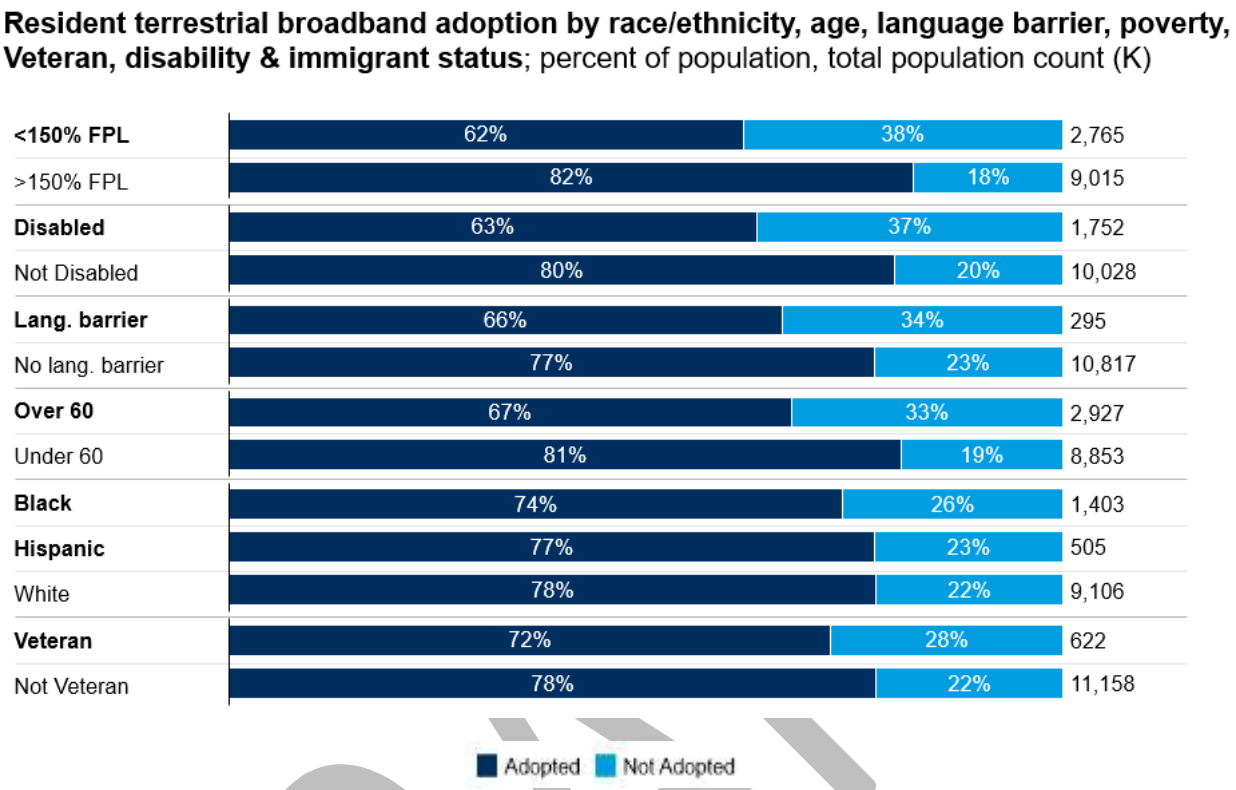


In conclusion, the widest gaps in adoption rates are between the general Ohio population and 1) people whose incomes are below 150 percent of the federal poverty line, 2) disabled people, and 3) veterans. Respectively, these gaps are 20 percentage points, 17 percentage points, and 11 percentage points. The gaps between White residents' adoption rates and those of African American and Hispanic residents are comparatively smaller, at 4 percent points and 1 percent point, respectively.

Stakeholder engagement has highlighted the fact that efforts to increase adoption must consider that populations who are beginning to recognize their need for internet services may be persuaded to overpay for these services. Such deception could exacerbate their skepticism about broadband and technology in general.

[230] FCC Broadband Availability Maps as of January 31st, 2023

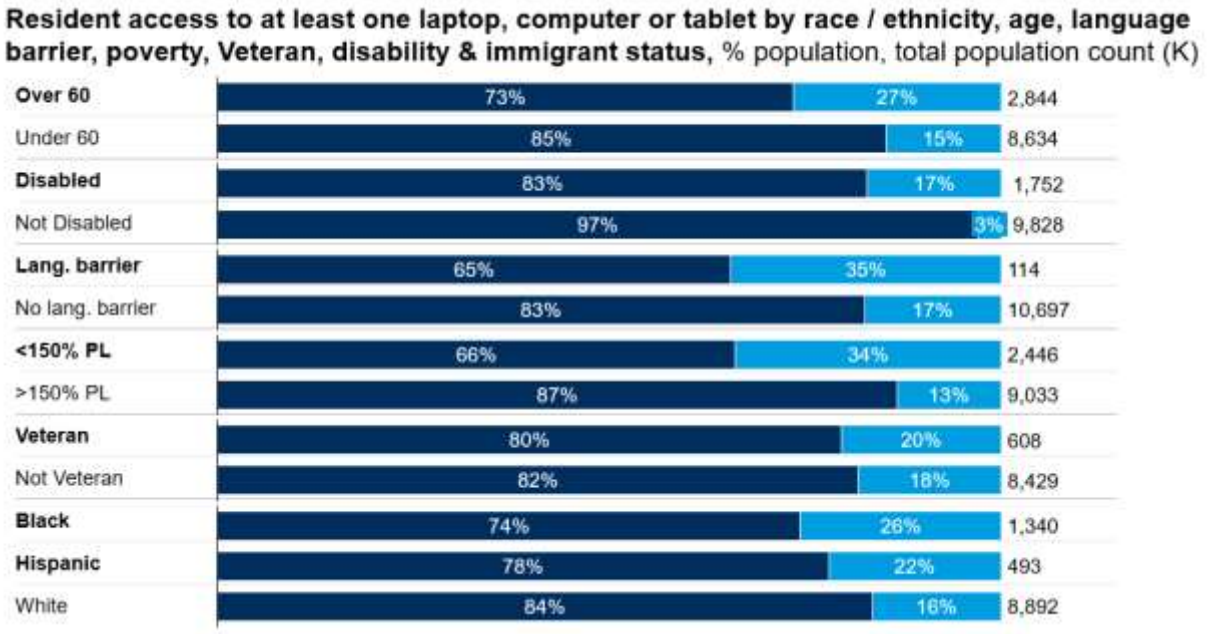
Figure 37: Broadband adoption by underrepresented groups in Ohio[231]



The gap in access to internet-capable devices is most differentiated by age, disability status, and language barriers as seen in Figure 38. The gap in access to internet-capable devices among state residents is generally small for most races when compared with the white state population. In addition, people over the age of 60, disabled people, people with a language barrier and people below 150 percent of the poverty line are less likely to have internet-capable devices, with gaps of 8 percent, 8 percent, 7 percent, and 6 percent respectively.

[231] U.S. Census Bureau, American Communities Survey (ACS), 2021

Figure 38: In-home access to at least one Internet-capable computer, laptop, or tablet adoption by underrepresented group[232]



As demonstrated above, the gap to internet adoption is greater than the gap to device adoption. There may be several factors contributing to this difference. This may in part be driven by some Ohioans accessing public wi-fi, wi-fi at work, or potentially hot spots to connect their laptops / computers / tablets to the internet.

3.4.5.B Resources to support digital opportunity

Ohio can consider understanding where it makes sense to scale existing program or replicating quality programs and that reduce barriers to digital opportunity and adoption. This includes making technology more accessible to covered populations. Ohio departments and nonprofits have already made significant efforts in investing resources to try to create access for underprivileged demographics to technology and internet services. In addition, library systems allow people the ability to check out internet-capable devices, therefore promoting digital literacy and access. A sample list of programs is included below. For more details, please refer to *Section 3.3: Asset Inventory*.

Example covered population	**Programs**
Rural	Public Library Association's DigitalLead program provides devices and training to rural libraries
Individuals with disabilities	Assistive Technology of Ohio has a statewide program that helps people with disabilities obtain computers

[232] US Census Bureau, ACS 2021

Low income	PCs for People Ohio offers desktops starting at $30, and mobile hotspots for low-income families
Students/teachers	Northeast Ohio Regional Library system lends e-tech classroom sets with lesson plans and tablets
Tribal populations	Bureau of Indian Education provides laptops and internet hotspots for students in BIE operated schools
Veterans	VA's iPad program provides qualifying Veterans with cellular-enabled iPads to access telehealth services
Elderly	Assistive Technology of Ohio provides training and device lending to Ohioans of all ages
Hard of hearing	ICanConnect provides equipment and training to people who have vision and hearing loss and meet income guidelines
Blind	
Incarcerated individuals	Ohio Department of Rehabilitation and Correction provides tablets to all incarcerated adults

3.4.5.C Engagement with stakeholders

Several CAIs and stakeholders, such as libraries and schools, already offer digital inclusion programs that could be scaled further through stakeholder engagement to promote digital opportunities. Example programs in libraries include:

- The Champaign County library systems were awarded a grant through the State Library of Ohio's Guiding Ohio Online program to fund a technology trainer. The trainer will visit library sites to hold one-on-one sessions with library users.
- All Columbus Metropolitan Library's (CML) locations offer free Wi-Fi and Internet access. Additionally, CML offers technology training classes, job help assistance and Homework Help Centers with computers for students.
- Libraries, community colleges and educational centers throughout the state partner with Connect Ohio as part of the "Every Citizen Online" initiative to provide free basic computer and broadband training classes to Ohio adults.

Example programs in schools include:

- The Columbus school district distributed hotspots to households without internet and 19,000 Chromebook laptops to students who lacked devices in early 2020, to promote equitable learning.
- Multiple schools / universities across Ohio provide free hotspot in their parking lot and surrounding areas.

For more details, please refer to *Section 3.3: Asset Inventory*.

4 Obstacles or Barriers

There are multiple obstacles and barriers that the State of Ohio faces in execution of its plans to close broadband deployment gaps and drive digital opportunity. This section outlines these obstacles and barriers, as well as mitigation approaches.

4.1 Overall barrier to broadband deployment and digital opportunity

Overall, the key obstacle to achieving universal service is the "broadband funding gap," or the difference between the total investment a provider calculates is necessary to construct the last mile, and the maximum total investment that the provider determined is cost-effective to invest in last mile construction based on the expected return from this investment. There are several compounding factors that affect this funding gap, ranging from barriers affecting deployment investment costs to barriers affecting broadband demand from last mile users. Key factors identified among these are listed below.

4.2 Barriers to broadband deployment

Topography: Thirty-two of Ohio's 88 counties, which are 39 percent of Ohio's land area, are part of the Appalachian region. The Appalachian Regional Council characterizes Appalachia as largely mountainous terrain, of which 58 percent is covered by forest. Mountainous, rocky terrain is often associated with extremely high cost for buried or underground fiber builds due to high-density rock that must be trenched to lay fiber, as well as long, windy roads that may exist off highways, county roads, and between homes to connect back to middle mile access points that are often distant. Aerial construction is less costly to deploy, but is at risk of adverse weather events as well as falling branches and debris in heavily wooded areas. Given the need to deploy fiber up to the tower, FWA deployments are subject to the same debris and weather events relevant to aerial fiber deployments. Depending on the frequency ranges, FWA deployments can also face significant coverage gaps due to obstructed line of sight caused by the hills, mountains, and trees.

Topographical challenges to deployment have been repeatedly raised during stakeholder engagement efforts that BroadbandOhio has been conducting since 2020. In Appalachia in particular, the topography has been noted as a chief driver for the lack of reliable broadband today. During the ORBEG program, for instance, BroadbandOhio received a disproportionate share of applications from Appalachia that were requesting among the highest subsidies to overcome these barriers. During the months of peak COVID infection rates, the Appalachian counties were among the most in need of individual hotspots as well as school bus-enabled hotspots to provide connectivity to neighborhoods with high student populations and low access to high-speed internet.

Consequentially, the need for broadband deployment in the Appalachian counties is disproportionately high:

- According to the November 2022 FCC Broadband map, 61 percent of total unserved BSLs and 38 percent of total underserved BSLs are within the Appalachian counties, despite representing only 20 percent of total BSLs.

- Appalachian counties often face higher degrees of economic distress – with 5 out of 32 counties economically distressed and 15 at risk as of Fiscal Year 2023 – which additionally affects the economic case for ISPs to enter the region.[233]

Mitigation approaches include:

- **Deploy middle-mile in areas of the state facing substantial topographical-driven broadband deployment challenges.** Expansion of the middle mile network closer to unserved and underserved areas of the state can significantly reduce the distance over which topographical challenges must be faced by last-mile providers and, consequently, last-mile deployment costs. Existing efforts by Ohio toward this goal can be found below in the "**Gaps in Middle Mile availability**" sub-section.

- **Smartly subsidize last-mile build-out, taking into consideration technology, costs, and community preferences.** Topographical challenges ultimately require a combination of subsidies and decisions on technologies to overcome. These decisions cannot be made without engaging several stakeholders, with some of the most critical including the community that will be impacted and the service provider partners who will deliver the service reliably. Per the requirements of the BEAD program, BroadbandOhio will make tradeoffs by accounting for both the total broadband deployment funding available and the needs of the entire state to determine when the cost of deploying fiber is "extremely high." This decision will determine when subsidies to alternative technologies (e.g., fixed wireless) that meet Ohio's standards for high-speed, reliable broadband can be made, which ultimately will have an impact on Ohio's overall priority of ensuring all Ohioans have access to high-speed, reliable, affordable broadband by 2030.

Ohio may further explore the following ideas that have been raised through stakeholder engagement:

- Planning grants to encourage community-led, innovative, and collaborative plan development that meet the needs of hard-to-reach areas in the state

- Low-interest loans to service providers, to further reduce the cost of capital

- Facilitation of the creation of public-private partnerships to support broadband deployment

[233] https://www.arc.gov/wp-content/uploads/2022/06/CountyEconomicStatusandDistressAreasFY2023Ohio.pdf

Population density: Given both the high upfront investment cost and the inherently shared nature of broadband access, the higher the density of locations that can subscribe to service, the lower the average cost to deploy to a given location – and, conversely, the lower the population density, the higher the average cost to deploy. All but five Ohio counties have more than 50 percent of their area classified as rural, and 65 counties have more than 90 percent considered rural.[234]

Listening session participants have noted that certain locations with low population density present a prohibitively high fiber deployment cost. Example feedback is included below:

- A government listening session participant stated that certain rural areas have as low as 7 to 8 customers per fiber mile.
- Multiple participants also noted the difficulty to reach farms due to their low population density, and consequential ISPs' unwillingness to offer service due to the amount of fiber deployment required to reach farms end-to-end across their land.
- A non-profit listening session participant mentioned that this difficulty in getting fiber service in farms hinders access to IoT or cloud services required to scale agribusinesses, and necessitates the use of alternative technology (e.g., cellular hotspots) to get connectivity, which may be costly for small rural farmers to support their household or business needs.

In addition to the mitigation approaches outlined above for addressing topographical obstacles, BroadbandOhio will additionally:

- **Fund line extension subsidies.** In some cases, the most efficient solution to get broadband to a home is a localized solution that just involves further extending a nearby plant down a road or driveway closer to the premise. Through its stakeholder engagement process, Ohio has heard from multiple residents about prohibitively high prices that providers have offered for line extensions. BroadbandOhio has proposed the use of ARPA Capital Project Funds for subsidizing line extensions and, if approved, will incorporate these funds into its overarching strategy to close broadband infrastructure gaps.

Gaps in Middle Mile availability: As briefly described above, greater middle mile availability, particularly in traditionally un- and underserved areas, helps enable last mile deployment by reducing distance from last mile destinations to middle mile infrastructure and thereby reducing deployment costs. Middle mile costs represent up to 20 percent of last-mile construction cost, and the lack of existing middle mile infrastructure may deter ISPs from deploying broadband in unserved areas altogether due to prohibitively high costs. Buried middle mile is particularly critical to offering affordable, redundant services to expand upon aerial-only spans, as aerial routes are more susceptible to damage from a variety of climate events such as high winds, lightning, ice, and flooding, as well as other issues such as deteriorated tree limbs and

[234] https://www.cleveland.com/data/2022/04/the-20-most-rural-counties-in-ohio.html

interference from wildlife. Appalachian areas are particularly susceptible to lack of infrastructure, due to low population density and socioeconomic challenges. Investing in middle mile infrastructure to reach these unserved and underserved regions could significantly bolster Ohio's goal of reaching universal connectivity.

Mitigation approaches include:

- **Acquire and deploy funds to expand middle mile access**: In 2022, Ohio applied for middle mile funding, and supported a provider submission for middle mile funding (awarding decisions have not yet been released):
    - **Midwest Regional Collaboration** – Appalachia (MRC-A) plans to leverage ARISE grants to build a large-scale, multi-state middle-mile network in Appalachia
    - **NTIA Middle Mile Grant application** for provision of underground routes in the Appalachian regions, which would add 702 miles to the middle mile infrastructure that would reach 29 counties (22 of which are Appalachian counties), 277,825 households that do not have access to 25/3 Mbps, and over 350 CAIs within 1,000 feet from the route. 3 ISP partners will participate in the project, with altafiber extending middle mile routes from Cincinnati to Columbus and from Cincinnati to Athens; Everstream from East Liverpool to Ashtabula; and Ohio Gig extending from East Liverpool to Athens. The combined network will create a "J"-shaped middle mile network extending from Ashtabula in the northeastern corner of the state to Cincinnati and reaching Columbus at its end point. Specific counties affected would include:
        - **Appalachian Counties**: Adams, Ashtabula, Athens, Brown, Carroll, Clermont, Columbiana, Coshocton, Guernsey, Harrison, Hocking, Jackson, Mahoning, Meigs, Morgan, Muskingum, Noble, Perry, Scioto, Trumbull, Tuscarawas, and Vinton
        - **Non-Appalachian Counties**: Clinton, Fayette, Franklin, Hamilton, Madison, Pickaway, and Warren

Legislative and regulatory barriers: During the creation of the Ohio Broadband Strategy, Ohio released a Request for Information (RFI) seeking to receive feedback on topics including legislative and regulatory barriers to broadband deployment. Specific barriers raised by respondents include streamlining processes for permitting, grant application, and installation; increasing industry standardizations; and leveraging highway rights of way.

BroadbandOhio has additionally received the following feedback on barriers to fiber and broadband deployment during BEAD stakeholder engagement sessions:

- Rights-of-way codes in cities that hinder fiber deployment, due to lack of process standardization and long turnaround times across different cities

- Delays and lack of cross-region standardization (e.g., points of contact) for accessing rights of way for pole attachments and digging for reaching unserved areas

- In all regions of the state, railroad crossings are reported to be one of the top permitting challenges. Costs associated with railroad fees, prolonged timelines, and human resources are compounded by a lack of standardized processes.

- Pole permits and attachments are reportedly taking up to 18 months and state waterways managed by Army Corps of Engineers can take six months (per ISPs)

- Electric utilities are reportedly not meeting make ready timeframes (per Public Utilities Commission of Ohio)

Ohio is currently employing the following mitigation approaches:

- **Process streamlining**: Led by Lt. Governor Jon Husted, Ohio's Common Sense Initiative (CSI) reviews business-impacting rules, helps businesses navigate regulatory obstacles, and leads initiatives to improve Ohio's regulatory climate. The Common Sense Initiative has reviewed over 7,200 agency regulations to date and amended inefficient ones.[235]
- **Municipal Right-of-Way**: Ohio Revised Code Section 4939 establishes terms of use for public rights-of-way, defines and lays guardrails for the authority of municipal corporations, and defines standard turnaround times for municipal responses for public ways.[236]
- **Ohio Department of Transportation (ODOT) Right-of-Way**: ODOT has implemented a streamlined E-Permitting system for right-of-way and utility permits.[237]

Ohio may further explore the following mitigation approaches:

- Further streamlining application forms for rights-of-way across municipalities (e.g., a consolidated webpage with points of contact and application forms for different municipalities)
- Standardizing the template for requirements and turnaround time for railroad crossing permitting across the state
- Implementing a "dig-once" policy by designating a central authority (e.g., ODOT, 811) to consolidate dig requests and streamline construction activities
- Instituting processes to ensure proper installation and post-installation quality-check for pole attachments (e.g., when lines are in the way during pole attachment)

[235] https://governor.ohio.gov/priorities/common-sense-initiative
[236] https://codes.ohio.gov/ohio-revised-code/chapter-4939
[237] https://www.transportation.ohio.gov/working/permits/row-utility/row-utility

Pole permits and make-ready costs: During stakeholder engagement conducted to understand opportunities to improve the ORBEG grant program, BroadbandOhio surveyed ORBEG awardees to understand obstacles surrounding acquiring pole permits and make-ready costs. Some feedback received include the following:

- Overall, respondents noted that unreasonable make-ready requirements, municipalities' creation of additional fees in light of nationwide broadband deployment, excessively high quotes, and long turnaround times may significantly increase deployment costs and subsequently price out smaller providers from reaching locations in need.

- A respondent, for instance, stated that make-ready requirements have escalated over the past 2 years, where pole replacements and load class upgrade standards required from the ISP by pole owners could increase the average make-ready costs from $3,000 to as high as $8,000.

- Another awardee noted that at times a village may maintain the poles but may not know whether they own the poles, which gets additionally complicated when a provider claims to own them.

- Some reported first response turnaround time to take as long as 8 months and another 6 months for subsequent responses.

Subsequently, certain awardees have noted make-ready costs as a significant cost driver for their deployment process, with one awardee estimating make-ready costs as high as over 30 percent of their expected total project cost.

Mitigation approaches:

- **Subsidy program.** Ohio is currently in the process of developing a subsidy program to lower make-ready costs (pending legislative approval). If approved, the program will help control a key driver of deployment costs, thereby enabling more efficient BEAD funding deployment.

Incomplete view of service availability: While the new FCC Broadband maps have improved in their granularity over Form 477-based maps, the maps and the process by which they are being updated and validated are still in their infancy. BroadbandOhio submitted both BSL and service availability challenges between November 2022 and March 2023, and mobilized Ohio residents to do the same. BroadbandOhio and many of our partners are concerned that there are still meaningful gaps in both the fabric and the service availability reporting. For instance, during stakeholder engagement sessions, BroadbandOhio has received feedback including:

- Residents consistently raising concerns that the FCC maps do not accurately capture their service availability

- Government participants of listening sessions noting that certain locations are wrongly listed as served, which has precluded them from prior funding opportunities

Without an accurate picture of service availability, the level of BEAD funding received and the ability of BroadbandOhio to close service availability gaps will be limited.

Mitigation approaches include:

- **Guidance to Ohio residents on how to submit a challenge to the FCC Maps.** BroadbandOhio has developed and published on its webpage guidance to support Ohioans with submitting challenges to the FCC Availability Map, and have worked on increasing participation, including by working with partners such as libraries, and by direct mailing consumers in areas with known levels of limited-service availability.[238]

- **State challenge process ahead of future grant rounds.** A robust state challenge process that defines project areas for funding will help identify and correct inconsistencies and gaps.

Industry participation: For the past three years, Ohio has maintained a strong working relationship with service providers through the ORBEG grant program and the Broadband Alliance. Service providers are a critical partner in Ohio's goal to close the digital divide. Ongoing industry participation in Ohio broadband grant programs will depend on the level of subsidies available to deploy broadband and their impact on net provider ROI, as well as the regulatory environment and requirements attached to receive funds (e.g., ACP participation, low-cost plan requirement, deployment timeline given supply chain constraints).

Listening session participants, for example, have conveyed the following barriers to their participation:

- Many providers are unwilling to work through the bureaucracy involved in managing ACP. For those that do, they often complain about a lack of notification when an enrollee switches providers, because the ISP ends up having to absorb the cost of the subsidy

- Letter of credit requirements could particularly be a dealbreaker for smaller ISPs

- The requirement to provide an ISP match of at least 25 percent poses additional financial barriers for ISP participation

[238] https://broadband.ohio.gov/explore-broadband/fcc-availability-challenge/fcc-internet-availability-challenge-information

Potential mitigation approaches include:

- **Regular stakeholder engagement** on BEAD requirements and ongoing technical support for subgrantees to help ISPs remain compliant

- **State support to prevent supply chain-related bottlenecks** to help mitigate resourcing challenges while meeting requirements of the Buy America Act

- **Provide state support for matches**, such as a low- or zero-interest, long-term loan (e.g., over 10 years), or grants

- **Streamlining and automation of reporting requirements** (e.g., via online platform with standardized form and regular reminders) to simplify compliance

Gaps in inside wiring and/or Wi-Fi equipment in multi-dwelling units (MDUs): Listening session participants have noted that there are many multi-dwelling units with inside wiring and equipment that are incompatible with fast internet speeds supported by modern technology, often due to the age of the building or lack of maintenance. Consequently, while an MDU may show as served on the FCC maps, the individual units or households in the building may still lack access to high-speed internet. These gaps ultimately prevent reaching Ohio's goal of ensuring all Ohioans have access to affordable, reliable high-speed internet.

Potential mitigation approaches include:

- **Allocate funds for inside wiring or wi-fi equipment in MDUs.** Among the eligible uses for BEAD funds is inside wiring and/or wi-fi equipment. Once initial BEAD priorities of connecting unserved and underserved locations are addressed, Ohio may allocate funds to mitigate inside wiring gaps in MDUs.

Labor shortage: The "Strengthening Ohio's Broadband & 5G Workforce" strategy estimates that approximately $500 million in government-funded broadband investment will create 1,250 direct construction jobs, and the deployment of 5G in Ohio is estimated to create 32,000 jobs solely in network infrastructure.[239]

Labor shortages could be exacerbated by nationwide deployment efforts stimulated by federal broadband funding. During listening sessions, ISPs have already noted that labor is increasingly difficult to source. While training programs could help mitigate this labor gap, a listening session participant noted that workforce training programs for

[239] https://broadband.ohio.gov/wps/wcm/connect/gov/7bb60dea-a273-4622-9d0c-67e7201a8016/Strengthening-Ohios-Broadband-5G-Workforce-09072021.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K9I401S01H7F40QBNJU3SO1F56-7bb60dea-a273-4622-9d0c-67e7201a8016-odHJMRH

broadband deployment-related jobs may face attrition due to slow ramp-up in salary and labor-intense nature of the job compared to other jobs with similar entry wage levels.

As a key mitigation approach, BroadbandOhio has developed its "Strengthening Ohio's Broadband & 5G Workforce" Strategy to preempt labor force shortages. The strategy led to the creation of the Ohio Broadband and 5G Sector Partnership, a group of private, public, and education entities that will spearhead the strategy's 3-pronged approach:

- **Help raise broadband industry career awareness** by developing relevant middle- and high-school curricula, internships, and pre-apprenticeships through initiatives such as the High School Tech Internship Pilot Program;

- **Establishing and scaling education and training programs**, such as plug-and-play, non-degree curriculum models for Community Colleges or workforce training programs; and

- **Capitalizing on state / federal funding programs** (e.g., TechCred) to bring to market the talent supply needed for broadband and 5G industry.

Ohio has additional workforce-related agencies and initiatives (e.g., JobsOhio) that can be partners to develop Ohio's workforce.

Supply chain issues and materials availability: Due to a variety of factors, including COVID-related and geopolitics-related supply chain disruptions, various raw materials, and related components critical to fiber broadband deployment have been impacted. Additional surge in broadband deployment across the United States spurred by BEAD funding and other relevant federal programs could increase competition over materials, which could strain the supply chain. Listening session participants have raised that delivery time for certain materials could range between 8 weeks to up to 6 months, and that "Buy American" requirements may additionally increase prices.

Potential mitigation approaches include:

- **Federal and State procurement and storage of key materials** to help leverage greater purchasing power and cost-effective purchases that could particularly benefit smaller scale subgrantees

- **Favorable tax policies** (e.g., rebates) and/or investment attraction efforts (e.g., JobsOhio Growth Fund, JobsOhio Economic Development Grant) to help encourage in-state production and nearshoring of key supply chain segments

- **Flexible extensions within the 1-year NOFO extension cap** requirement to additionally help providers deliver amid supply shortages, where necessary

4.3 Barriers related to non-deployment factors

Affordability of subscriptions: Subscription affordability is a significant barrier to reaching Ohio's goal of closing the digital divide. Analysis of American Community Survey data shows that there could be approximately 13 percent and 24 percent of Ohioan households for which a $30/month and $50/month plan represents more than 2 percent of their annual income, respectively. [240] Additionally, there are 1,984,218 households in Ohio that are eligible for the Affordable Connectivity Program (ACP).[241] However, policy analysts project that the current funding for ACP will run out in early 2024, with no clear extension plans currently in place.[242] Ohio has the highest ACP uptake level among U.S. states, so the absence of the ACP subsidy would substantially raise the affordability barrier in Ohio.

Listening session participants have noted the need to ensure affordability of reliable internet. Example comments are included below:

- A non-profit representative noted locations with high population density (e.g., Columbus) particularly face more acute affordability issues due to the higher cost of living and concentration of lower-income families.

- Another participant cited how, due to affordability reasons, elderly participants of the Starlink satellite internet pilot project reverted to their older, low-cost, low-speed internet after the low-cost pilot period ended.

- Listening session participants for Southeast Ohio noted that a high level of economic distress in the region makes affordability a particularly salient barrier for broadband adoption in the region, which is compounded by high deployment costs driven by topography.

- A nonprofit listening session participant highlighted that the complexity of programs such as ACP must not be underestimated, stating that "[y]ou cannot overestimate the level of intervention that is necessary when you get an individual who doesn't know how a mouse works but has to sign up for ACP."

Potential mitigation approaches include:

- **Require a statewide low-cost plan offering from ISPs receiving BEAD funds.** Ohio may extend the requirement for subgrantees to provide ACP-eligible plans to all Ohio locations that the subgrantees serve beyond awarded BEAD

[240] American Community Survey, 2021 5-Year Estimates, where the figure is interpolated assuming an even distribution of households across the income scale within each income bracket option from the survey and identifying the income threshold where a $30/month plan would represent a share of income greater than 2 percent.
[241] https://www.educationsuperhighway.org/no-home-left-offline/acp-data/. Figures as of April 5, 2023.
[242] https://www.forbes.com/sites/roslynlayton/2022/09/30/policy-no-brainer-extend-the-affordable-connectivity-program-for-5-years-with-30-billion/?sh=64f796eb4557

locations, and require these plans be offered beyond the potential discontinuation of the ACP program.

- **Provide ACP enrollment technical assistance.** Ohio could consider streamlining ACP application processes for ISPs and offering assistance to support their enrollment process.

Knowledge of the Affordable Connectivity Program: While Ohio leads the nation in ACP uptake among states with 819,672 enrollees representing 41 percent of eligible Ohioan households as of March 2023, listening session participants have noted that there is low awareness for affordability programs such as ACP in some communities.[243] Key feedback received include the following:

- ISPs have noted that e-Rate regulations limit their ability to conduct direct outreach programs in schools where they have an e-Rate contract.
- Listening session participants also highlighted the need for trusted partners to promote affordability, ACP, and digital literacy, such as:
    - Local Digital Navigators with a consistent presence in public meeting spaces that are independent of providers and government entities
    - Radio DJs who are locally relevant and trusted, particularly among racial and ethnic minorities

Potential mitigation approaches include:

- **Partnership with state agencies.** The State of Ohio could consider raising residents' awareness of ACP by coordinating with state officials that oversee state and federal programs that target similar populations (e.g., free lunch programs for students, SNAP, Medicaid) to reach eligible households. Potential methods may include distributing information flyers to eligible households as part of relevant state and federal program outreach efforts.
- **Enablement of RDIAs in their ACP outreach work**. Regional Digital Inclusion Alliances are trusted BroadbandOhio partners in each region of the state for driving adoption and digital opportunity. RDIAs may conduct activities to help raise ACP awareness, with examples included below:
    - A cross-mapping exercise of ACP enrollment in a region against enrollment in a different program that targets the same population (e.g., free lunch programs), or mapping of ACP-eligible population within a given locality and actual uptake rate, could help identify key gaps in ACP enrollment and reach them more efficiently.
    - Trusted local resources, such as Digital Navigator programs, could leverage door-to-door visits to raise awareness of ACP and support their enrollment

[243] https://www.educationsuperhighway.org/no-home-left-offline/acp-data/. Figures as of April 5, 2023.

process. Training on talking points (e.g., avoiding marketing the program as "free wi-fi") could additionally help increase credibility.

- Leveraging other local channels, such as local community centers, job fairs, local festivals, and utility service sign-up centers, could additionally help reach similar target populations.

Device affordability and access: The American Community Survey data shows that 311,172 Ohioan households (6 percent) do not have a computing device such as a laptop, desktop, smartphone, tablet, or other computer.[244] BroadbandOhio has received repeated feedback from multiple difference sources – including RDIA leads and residents that have participated in listening sessions – that access to devices is a substantial barrier. Feedback received include:

- A listening session participant shared that access to a device is a more significant barrier than digital literacy for residents in their region
- Library staff has communicated that their loaner programs are often over-subscribed
- Lower income households tend to have phones as opposed to tablets or computers in their households due to affordability issues, which have more limited functionalities and subsequently may create additional barriers to digital opportunities

Potential mitigation approaches include:

- **Enablement of device refurbishing programs**. The State of Ohio could work with device refurbishing 3rd parties to scale their offerings for households in need, and coordinate with stakeholders that work with target populations to share information about device programs.
- **Purchase of devices at state level to exercise greater purchasing power.** Ohio could consider large-scale purchase of devices to leverage better price negotiation power and distribute them to target populations, such as students.
- **Encouragement of bulk purchases by device-providing organizations for greater purchasing power.** Ohio could additionally encourage larger 3rd party partners to similarly leverage bulk purchasing (e.g., as ESCs) to acquire devices with better pricing to provide or lend them to schools.

Customer Education and Digital literacy: Customer education has been highlighted by stakeholder as a necessary component of broadband expansion, as users

[244] American Community Survey 2021 1-year estimates, B28010 "Computers in Household" data set.

cannot achieve the full benefit of internet access without the tools to use it effectively. Listening session participants noted the need for both consumer education and digital literacy skills trainings to ensure Ohioans can select service plans that meet their needs, and productively and safely use the internet. Feedback received include:

- There is a need to ensure that people understand the internet speed and service required for their household to prevent households from signing up for internet speeds too high or low for their needs, as well as greater digital literacy to support households to fully utilize devices and internet services provided to them.
- There is a need to educate consumers on best connectivity placement for devices. Examples include using hardwire to directly connect devices where possible (e.g., TVs or other devices that do not need to move) to prevent having too many devices connected to wi-fi and impact internet speed, and strategically positioning internet routers to ensure all corners of the premise are connected (e.g., in schools).
- There is a need to ensure students get digital literacy education via adequate device access and appropriate in-class instruction.

Potential mitigation approaches include:

- **Scale digital navigator programs**. Ohio could explore investing in scaling digital navigator programs to provide digital literacy and consumer education via CAIs and trusted local sources (e.g., Community Centers, university digital navigator programs, Tech Changemakers program, Apple Clovers Code Grant).

- **Direct outreach programs**. Ohio can coordinate with stakeholders who work with key populations with underrepresented communities to bolster outreach and support digital learning (e.g., aging population via the health system), and encourage online usage (e.g., count digital navigator and training services toward continued learning credit for nurse program). Ohio could additionally conduct focused marketing via trusted channels, such as radio DJs, block parties, and weekend community events. Ohio could potentially leverage door-to-door approaches with trusted local sources to reach more residents and augment above approaches.

- **Support digital hubs**. Ohio could enable central locations (e.g., libraries, colleges, universities, career centers, private investors) to serve as a digital hub for the community covering digital literacy, workforce development programs, digital navigation programs, and other relevant initiatives.

- **Encourage BEAD subgrantees to bolster digital opportunities**. Ohio could consider including as part of the BEAD program a partner requirement for subgrantees to ensure community engagement.

- **Invest in education systems.** Ohio could work toward ensuring teachers have technological knowledge to be able to teach device functionalities and digital

literacy to students, and ensure students have access to devices to learn and practice these skills.

Lack of interest: The NTIA Internet Use Survey results from 2021 shows that the greatest driver of non-adoption in Ohio is lack of need or interest (applying to 54.3 percent of respondents), followed by cost of connection (21.9 percent).[245] In addition, there are sizable populations in Ohio that do not leverage technology in their homes for religious reasons. According to Elizabethtown College, Ohio had the second highest Amish population among U.S. states as of 2022, who may not be interested in adopting broadband.[246]

During listening sessions, stakeholders have additionally raised the following feedback:

- Some people have a general fear of technology and concerns over cybersecurity, privacy, and safety.
- One listening session participant noted that if people don't know how to use devices effectively, then they may be inclined to sell the device even if provided with one.

Potential mitigation approaches include:

- **Improving accessibility of free public internet and digital literacy trainings**. While some Ohioans may not seek to have an in-home subscription, many may still access high-speed internet at community anchors, such as libraries, senior centers, and health centers. In addition to improving access, Ohio may prioritize free digital literacy trainings in targeted areas where the need is high.
- **Waiver request for select areas of Ohio.** Ohio is considering requesting a BEAD deployment exemption from NTIA for locations that do not want broadband deployment due to religious reasons.

[245] https://ntia.gov/category/data-central
[246] "Amish Population, 2022." Young Center for Anabaptist and Pietist Studies, Elizabethtown College. http://groups.etown.edu/amishstudies/statistics/population-2022/

5 Implementation Plan

5.1 Stakeholder engagement process

Since its founding in 2019, BroadbandOhio has worked with countless organizations, agencies, and individuals across the state of Ohio to increase access to broadband. This section outlines BroadbandOhio's efforts to engage a diverse set of stakeholders prior to the BEAD-DE planning process. These efforts are described in the following sections:

1. **Section 5.1.1, Ongoing efforts:** Describes BroadbandOhio's work to engage stakeholders in detailed planning for BEAD since the office's founding in 2020. This work will continue until the plan is completed.
2. **5.1.2, Identifying key stakeholders:** Explains how BroadbandOhio designed its BEAD and DE plan – guided by the BEAD and DE NOFOs – to reach key stakeholder groups, particularly under-represented communities.
3. **5.1.3, Focused BEAD-DE stakeholder engagement efforts:** Details how BroadbandOhio reached out to stakeholders to engage them in the BEAD-DE planning process. Specific work included raising awareness of engagement opportunities, encouraging attendance at in-person and virtual events, and specifically describing potential engagement opportunities.
4. **5.1.4, Key takeaways:** Summarizes insights from virtual and in-person listening sessions, which have been incorporated into the Five-Year Action Plan and will inform BroadbandOhio's ongoing planning efforts.

5.1.1 Ongoing efforts (2020-present)

Since its inception, BroadbandOhio has believed that closing the digital divide requires a broad coalition of stakeholders. To close this divide, BroadbandOhio has worked to understand the relevant obstacles, needs, and gaps involved, and to convene a coalition of stakeholders and partners to address them. With this in mind, BroadbandOhio has initiated and joined various partnerships, as outlined below.

Broadband and workforce partnerships. BroadbandOhio actively participates in:

- **Ohio Broadband Alliance.** BroadbandOhio leads this coalition of over 500 members comprising ISPs, local governments, and non-profits. The alliance convenes quarterly to discuss the status of broadband in Ohio and to identify opportunities for collaborative work.
- **Broadband Expansion Authority.** This organization oversees the Ohio Residential Broadband Expansion Grant (ORBEG), a statewide grant program that help ISPs expand into areas lacking service by assisting with infrastructure costs and network-building. The authority receives, reviews, scores, and approves ORBEG applications, and it creates scoring criteria and applicant resources.
- **Broadband Working Group.** This group convenes key Ohio state agencies related to broadband so they can identify barriers to broadband deployment, align

on priorities, collect information on assets they can leverage, and more. The Working Group consists of InnovateOhio; the Ohio Departments of Development (Office of Workforce Transformation, Governor's Office of Appalachia), Education, Administrative Services, and Higher Education; OARnet; and the Ohio Education Computer Network Management Council.

- **Regional Digital Inclusion Alliances (RDIAs)** In October 2022, BroadbandOhio established Regional Digital Inclusion Alliances (RDIAs) across five regions of the state (Northwest, Northeast, Central, Southeast, Southwest) to serve as collaborative partners with BroadbandOhio. These alliances bring together diverse stakeholders to coordinate regional planning, support digital inclusion, and collect local feedback to inform Ohio's Digital Opportunity Plan. The RDIA selection process included multiple interviews and a survey. Coordination among organizations designated as RDIAs kicked off in February 2023.
- **Broadband and 5G Sector Partnership.** This partnership designs and distributes curricula and training programs across Ohio and promotes career awareness to supply the industry with a skilled workforce.
- **Ohio Industry Sector Partnership.** Meeting bi-weekly, this partnership facilitates collaboration among businesses, education and training providers, and other community leaders who seek to improve their region's workforce. These collaborations yield a more skilled workforce and benefit both Ohioans and Ohio's job-creators.

Infrastructure buildout partnerships. BroadbandOhio has conducted numerous meetings and site visits and has participated in multiple conferences and panels. These efforts have helped to build relationships with providers and to understand their needs and barriers. BroadbandOhio is working with these partners to find mutually beneficial solutions that facilitate infrastructure buildout in the state. Examples include:

- BroadbandOhio holds bi-weekly meetings with **OARnet**'s leadership to stay aligned on strategic priorities and progress on execution.
- Digital Access Ohio has joined a JobsOhio partnership with Agile Networks to expand high-speed internet access to underserved areas of the state, specifically in Southeast Ohio.
- Conferences and panels
    - WISPA (Wireless Internet Service Providers Association) roundtables
    - NCTA (The Internet & Television Association) Conference, panel participation
    - Fiber Broadband Association, "fireside chat" participation
- Site visits
    - Introduction to Intel to identify broadband needs and opportunities as the company opens two new facilities in Ohio
    - Medina County visit with Office of Workforce Transformation to discuss broadband expansion
    - Preble County Commissioners discussion of broadband expansion
    - City of Cleveland and Digital C to meet with leadership and understand needs

Local government and government associations. BroadbandOhio has worked with government leaders and associations to understand local needs and perspectives,

to remain up to date about specific opportunities where they can assist or work in partnership with local governments to increase access to broadband, and to use the associations' networks to disseminate information about BroadbandOhio's work (that is, stakeholder survey distribution). Example associations and government partners include:

- The Governor's Office of Appalachia (GOA) works to foster economic and community development and partnerships to improve the lives of those living in the region.
- The Ohio Township Association is a statewide organization dedicated to promoting and preserving Ohio townships and township government through educational materials, forums, and lobbying efforts.
- County Commissioners' Association of Ohio (CCAO) advances effective county government for Ohio through legislative advocacy, education and training, technical assistance and research, quality enterprise service programs, and greater citizen awareness and understanding of county government.
- Rochester Hills

Project-specific coalitions. BroadbandOhio has participated in multiple cross-county and cross-state coalitions to collaboratively drive broadband expansion. Examples include:

- Middle Mile Coalition
- ARISE Coalition
- Tri-County Coalition for Youngstown

Surveys. Over the past three years, BroadbandOhio has conducted multiple surveys to identify barriers and areas for improvement. These surveys were conducted prior to the BEAD-DE stakeholder engagement efforts and included:

- ORBEG recommendations, in which BroadbandOhio solicited feedback from participants in the initial round of the ORBEG grant process to determine how to improve the program
- Survey on barriers to pole-permitting (to ORBEG applicants)

Digital opportunity engagements. BroadbandOhio has supported digital opportunity initiatives and partnerships since early after the office was founded. Engagements and partnerships have included state agency partnerships as well as participation in and support of community-based non-profits that focus on digital inclusion. Engagement has included:

- JobsOhio (bi-weekly)
- PCs for People (monthly)
- Riverside (monthly)
- Conferences and panels
    - County Commissioners' Association of Ohio (CCAO) panel to discuss BroadbandOhio's Accelerator program
    - Connecting the Heartland panel
    - Education Conference (subject: K-12 funding)

- Site visits and ad-hoc meetings
    - Riverside 2.0 school visit
    - Defiance County Agribusiness
    - Miami Valley Educational Service Center

FCC challenge-specific engagements (Nov. 22 – Jan. 2023). BroadbandOhio conducted about 15 public sessions to inform and educate Ohio residents, local governments, and partners about why the FCC challenge process is important and how they can participate. Engagement activities included:

- A Q&A webinar on the FCC challenge process
- Holding a meeting with the Ohio Library Council to support dissemination of FCC challenge information in local areas, as well as to inform librarians on how they can help residents submit a challenge.
- Meeting with representatives of the NTIA and East Cleveland to discuss challenges submitted by BroadbandOhio.

5.1.2 Identifying key stakeholders

Stakeholders were identified and engaged as the Five-Year Action Plan was being developed to ensure that stakeholders were included throughout the process. BEAD and SDOP stakeholder engagement efforts were done in tandem and leveraged shared resources (the communications team, RDIAs, surveys, etc.) to collect relevant information for both initiatives and to avoid duplicative efforts and messaging.

The next step of the formal stakeholder engagement process was aggregating the contact information and relationships that BroadbandOhio already had for state and local government entities, non-profits, community organizations, internet service providers, and other private businesses. This list was analyzed to identify gaps in the coverage of underrepresented communities at the regional level. These gaps were filled through outreach to all minority-serving institutions (MSIs) in the state of Ohio; internet searches of municipal and county websites and 501c3lookup.org; use of RDIA, digital navigator, and local partners' own networks; and general internet research.

5.1.3 Focused BEAD-SDOP stakeholder engagement efforts

As part of BEAD and SDOP planning, BroadbandOhio implemented a stakeholder engagement initiative over the course of two to three months. The initiative involved in-person and virtual listening sessions, state agency interviews, and three surveys targeting various populations.

Digital opportunity-focused engagement efforts – including 50 additional listening sessions across the state – ran in tandem with BEAD efforts and will continue over the next several months. These efforts will be described further in the Digital Opportunity plan.

The local coordination parameters outlined in the BEAD NOFO were considered throughout the planning, outreach, and engagement phases of BroadbandOhio's stakeholder engagement efforts, including:

1. **Full geographic coverage of the Eligible Entity** was achieved by mobilizing BroadbandOhio's government, internet service provider, and community partners, which include both statewide and regional organizations. The state-wide listening tour visited cities in each of the five RDIAs, covering urban, suburban, and rural areas across the state. The RDIAs added local reach to these efforts, ensuring coverage across the state of Ohio.
2. **Meaningful engagement of and outreach to diverse stakeholder groups** was accomplished by conducting multiple in-person listening sessions with key stakeholder groups, including residents, community-based non-profits and digital inclusion practitioners, local governments, and ISPs. In addition, BroadbandOhio made ongoing contacts with organizations representing underrepresented populations and covered populations. Interviews with state agencies also provided insight into the needs of various stakeholder groups and suggestions on how to best reach and communicate with said groups. Specific communication channels used to reach underrepresented populations are included in a table later in this section. (See "Touchpoints by underrepresented population.")
3. **Utilization of multiple awareness and participation mechanisms and different methods to convey information and outreach** was executed through outreach plans and an engagement model that are described in detail later in this section but included the following:
    - Press releases ahead of events in each city
    - BroadbandOhio's websites
    - BroadbandOhio's social media (Facebook, Twitter, LinkedIn)
    - Handouts with contact information and a survey QR code at BroadbandOhio and RDIA events and libraries, with additional distribution through community partners at local events
    - Public distribution of BroadbandOhio's email address on outreach materials, handouts, and online
    - E-mail
    - Local newspaper placements
    - Local newspaper articles written in collaboration with local journalists
    - Local signage (posters, specifically at libraries and community centers)
    - Digital surveys
    - Print surveys targeted at un/underserved addresses and distributed through libraries and RDIAs
4. **Establishment, documentation, and adherence to clear procedures to ensure transparency** are specifically noted later in this section. These measures include accessibility considerations when planning stakeholder

engagement events; regular website and email updates, including posting listening session materials to the website and a recording of the BroadbandOhio Chief giving the presentation; inclusion of un/underserved households through a mailed survey that provided return postage; and regular meetings with other state agencies, RDIAs (weekly), non-profits and community organizations, local governments, and internet service provider associations.

5. **Outreach and engagement of unserved and underserved communities, including historically underrepresented and marginalized groups and/or communities** was a key component of each stage of the development of the Five-Year Action Plan. An overview of engagement channels per underrepresented population can be found later in this section. Relationships were proactively built with state agencies representing several of these populations. Listening sessions were also planned for urban areas, where adoption and digital opportunity gaps persist; and for rural residents and agricultural workers, who play a significant role in Ohio's economy but face disproportionate gaps in infrastructure availability.

The remainder of this section describes the BEAD-DE stakeholder engagement efforts in greater detail.

Outreach

To formally announce these efforts, BroadbandOhio issued a press release and posted information about BEAD and SDOP, listening sessions, a survey link, and contact information on its website. The press release was followed by social posts from the Ohio Office of Development and an email from BroadbandOhio to its key partners, including:

Local government and government associations, some of which include:

- Ohio RDIAs
- Ohio Library Council
- Ohio Township Association
- County Commissioner' Association of Ohio
- Ohio Mayors Alliance
- Ohio Municipal League
- Congressional leaders and staff
- Regional staff of the Governor and Lieutenant Governor

Internet service providers and associations, some of which include:

- Ohio Telecom Association (OTA)
- Ohio's Broadband and Cable Association (OCTA)
- Wireless Internet Service Providers Association (WISPA)
- Wireless Infrastructure Association (WIA)

Regional Digital Inclusion Alliances (RDIAs) are a fundamental piece of the engagement model and contribute extensive local knowledge aimed at engaging organizations and populations that may not have been included in previous statewide outreach.

The RDIAs were formally launched at the February 2023 Digital Opportunity Summit, which drew over 250 participants state-wide and included speeches by both the executive director of the NDIA and the NTIA's digital equity director.

Leading up to the public announcement of its stakeholder engagement efforts, BroadbandOhio initiated weekly meetings with the RDIAs to address inclusivity and accessibility of all initiatives. These meetings addressed the locations of in-person listening sessions, survey distribution channels, and necessary inputs for the BEAD and DE plans.

To support the RDIAs, BroadbandOhio provided several resources tailored by region to market stakeholder engagement opportunities, including:

- Posters for RDIAs and local partners to display in public meeting places (such as coffee shops, community centers, and places of worship) about in-person listening sessions
- Draft emails for RDIAs to share with local partners to encourage them to participate and to mobilize their own networks to do the same
- Draft emails for RDIAs and local partners to send directly to residents marketing in-person and virtual listening sessions and including BroadbandOhio's contact information.

RDIAs worked with local reporters to publish articles in local newspapers, posted news bulletins in local newspapers, emailed the listservs of their regional CAIs, worked with local boards of education, and posted signage in various counties to market the in-person listening sessions, particularly communities that are typically harder to reach (notably rural and low-income communities).

The Ohio Library Council provided additional local support by distributing regional posters in libraries throughout the state.

Transparency and inclusion

Several steps were taken throughout the stakeholder engagement process to ensure transparency and inclusion, including:

- A press release announcing stakeholder engagement efforts and directing readers to the BroadbandOhio website
- A homepage module prominently featured on the BroadbandOhio website with a "Make Your Voice Heard" call to action
- A dedicated webpage with information on BEAD and the Digital Equity Act, details on listening sessions (featuring regular updates as events were added),

and Internet Access Survey link, and a printable flyer to share information about listening sessions within communities

- Publication of listening session materials online for public viewing; distribution of presentation materials at all in-person listening sessions
- Marketing of listening sessions through RDIAs to increase awareness among covered populations and geographies outside of BroadbandOhio's hometown. RDIAs leveraged numerous local channels to spread the word. (See prior section.)
- An open, in-person Q&A and virtual listening and discussion sessions with the chief of BroadbandOhio
- Attendance of NTIA representatives at all listening sessions
- Weekly meetings with RDIAs to share updates and gather feedback.

Significant effort was made to reach underrepresented populations mentioned in the NOFO. The following table outlines how specific populations were reached.

Table 1 Touchpoints by underrepresented population

Population*	Partnership or coalition	Mtgs.	Listening sessions		Interview	Survey
			In-person	Virtual		
State agencies	X	X			X	
Community anchor institutions			X	X		X
Nonprofit or community-based organizations			X	X		X
Civil rights organizations			X			X
Labor organizations, unions	X	X	X		X	
Workforce development programs	X	X	X		X	
Higher education institutions		X	X		X	X
Local educational agencies			X	X		
Agencies for adult education or literacy			X		X	
Public housing authorities			X		X	X
Organizations representing "diverse stakeholder groups"						

Population*	Partnership or coalition	Mtgs.	Listening sessions		Interview	Survey
			In-person	Virtual		
Individuals w/ disabilities			X		X	
Individuals 60+			X		X	X
English language learners			X			
Individuals w/ low literacy			X	X		
People of color			X	X		X
LGBTQI+			X			X
Immigrants			X			
Veterans					X	
Incarcerated individuals (excl. federal facilities)					X	
Economic development organizations	X		X		X	
ISPs	X	X	X	X		X
Public Utility Commission					X	
Consumer advocacy			X			
Faith-based organizations			X	X		
Neighborhood associations			X	X		
Organizations representing additional underrepresented communities						
Low-income households			X	X	X	X
Individuals in rural areas			X	X		X

*Populations defined as "diverse stakeholder groups" in BEAD NOFO IV.C.1.c.ii; Tribal Governments not included as there are none in the state of Ohio

Summary of focused stakeholder engagement opportunities

In-person listening sessions

Listening sessions at eight sites spanned all five geographic regions of Ohio. Each site visit comprised four one-hour listening sessions for internet service providers and local businesses, government entities, non-profits, and community organizations, and/or residents.

- Accessibility was a deciding factor in selecting all locations. Considerations included hosting events in counties with communities of covered populations, ensuring access to transportation and free parking, and prioritizing trusted, familiar venues for the local population.

- Meeting times for each entity were adjusted based on feedback from RDIAs and other local representatives. Resident sessions were intentionally held late in the day to avoid obstacles related to work and childcare commitments.
- Presentation materials and handouts – including contact information and the Internet Access Survey QR code – were distributed at all sessions.

Table 2 In-person listening session attendance summary

Location	Stakeholder group	Sample entities represented
Mt Gilead	ISPs/businesses	Range of small, local co-ops and statewide providers
	Government	City of Columbus, Morrow County Commissioner, City of Westerville data center lead, Fairfield Economic Development, Ohio Office of the Consumers' Council, Union County IT Director
	Nonprofits	Ohio Management Council (Connectivity Champions), Ohio Consumer Council, Morrow County Farmers Bureau, Education Service Center of Central Ohio, communication workers' union
	Ohio residents	N/A
Rio Grande	ISPs/businesses	Range of small, local co-ops and statewide providers
	Government	Local municipality representatives
	Nonprofits/community organizations	Department of Development, OSU Extension, Hocking Athens Perry Community Action, Connectivity Champions
	Ohio residents	Southeast residents
Cambridge	ISPs/businesses	Range of small, local co-ops and statewide providers
	Government	County leadership, planning commission representatives; Library leadership representatives
	Nonprofits	Guernsey County Senior Citizens Center, Inc. & Meals on Wheels Guernsey County
Xenia	ISPs/businesses	Range of small, local co-ops and statewide providers
	Government	City of Dayton CIO, Miami Valley Regional Planning Commission
	Nonprofits	Ohio Management Council (Connectivity Champions), United Way, National Church Residences, local communications union, Miami Valley Regional Planning Commission
	Ohio residents	Spring Valley Township and Xenia Township residents
Toledo	ISPs/businesses	Range of small, local co-ops and statewide providers, including Buckeye Broadband
	Government	Spencer Township representative, Lucas County, and City of Toledo employees
	Nonprofits	Ohio Management Council (Connectivity Champions), Communication Workers for America, The Ability Center of Greater Toledo, Lucas Metropolitan Housing, Toledo Lucas County Public Library
	Ohio residents	Mostly urban residents (one rural); small business owners (e.g., hairdresser, photographer)

Location	Stakeholder group	Sample entities represented
Findlay	ISPs/businesses	Primarily small providers, including Buckeye Broadband
	Government	Findlay-Hancock Community Foundation, Hancock County Office of IT
	Nonprofits	Ohio Management Council (Connectivity Champions), Financial Opportunities Center of Findlay-Hancock County (associated with Habitat for Humanity), Family Center
	Ohio residents	N/A
Cleveland	ISPs/businesses	Combination of small and large providers, including Northcoast Wireless Communications
	Government	Connect Community, Chief Innovation Officer for Cuyahoga County, Digital Equity Inclusion Manager for Cleveland, Community Health Partnerships at Cleveland Clinic, DigitalC, City Engineer for East Cleveland, Cleveland Public Library
	Nonprofits	Ohio Management Council (Connectivity Champions), Ashbury Senior Computer Community Center (ASC3), MetroHealth, Metro West Community Development, NextGen Interactive, StepForward Training and Education, JumpStart, Wisdom Collaborative in Lake County, East Cleveland Public Library, University Circle Inc., Northeast Ohio Regional Improvement Corporation, Ohio Farm Bureau, Union Miles Community Development, Cuyahoga Valley Career Center, CREW Foundation
	Ohio residents	Cuyahoga Metropolitan Housing Authority, Cleveland Metropolitan School District, Midtown Cleveland representative, ASC3
Youngstown	ISPs/businesses	Mason Cable, Universe Central Association, Lorraine Public Library, Ashtabula County Commissioner, WFMJ (reporter), Packard Motors/Packard Fiber
	Government	Representatives from Canton, Trumbull, and Mahoning Counties; Eastgate Regional Council of Governments
	Nonprofits	Ohio Management Council (Connectivity Champions), Oh Wow! Children's Center for Science & Technology, Northeast Ohio Regional Improvement Coorporation, Ohio Farm Bureau, NDIA, Mercy Health Foundation, Trumbull Community Action, Oak Hill Collaborative, Farmer's Trust Company, Youngstown Area Jewish Federation, Ohio Improvement Corporation
	Ohio residents	Hubbard County and Ellsworth Township residents

Note: "Nonprofits" also includes community organizations

Virtual listening sessions

These sessions consisted of six Zoom webinars dedicated to government (1), nonprofits or community organizations (1), internet service providers (1), or residents (3). This effort involved:

- Marketing virtual sessions for each stakeholder group in tandem with efforts to convene in-person sessions
- Fostering engagement in digital environments using polls, direct chat functionality between attendees and BroadbandOhio panelists, chat functionality between attendees, a Q&A tool with live answer responses, and live discussion.

Table 3 Virtual listening session attendance summary

Date	Stakeholder groups	Sample attendees
March 17, 2023	Local government	Washington County Commissioner, Northeast Ohio Four-County Regional Planning and Development Organization, Ohio Center for Autism and Low Incidence, Sustainable Columbus, OARnet, FairlawnGig
March 28, 2023	Ohio residents	Rhodes State College Digital Ag; residents of Allen County, Springfield
April 5, 2023	Nonprofits/community organizations	Columbus Metropolitan Library, Creative Housing, Ohio Connectivity Champions, Montgomery County Educational Service Center, Great Lakes Community Action Partnership, Circle Health Services, Shelby County representatives, non-profit law firm
April 12, 2023	Ohio residents	Advocates for Basic Legal Equality; Omni Fiber; residents of Highland County, Toledo, Mason, Vinton County, Wilmington
April 18, 2023	ISPs	National, statewide, and local internet service providers
May 2, 2023	Ohio residents	Multiple, including advocate for broadband equity in Miami Valley

State agency interviews

BroadbandOhio engaged 17 state agencies and the Ohio State University Digital Agriculture program in interviews of over 30 agency representatives to understand their goals, the barriers to broadband access facing the communities they serve, potential solutions that could be accelerated by broadband and digital opportunities, existing programs and partners, and opportunities for collaboration. Agencies interviewed included:

- Department of Aging
- Department of Agriculture
- Department of Commerce
- Department of Developmental Disabilities
- Department of Education

- Department of Health
- Department of Higher Education
- Department of Job and Family Services
- Department of Natural Resources
- Department of Rehabilitation and Correction
- Department of Transportation
- Department of Veterans Services
- Governor's Office of Workforce Transformation
- JobsOhio
- Ohio Housing Finance Agency
- Ohio Public Library Information Network (OPLIN)
- Public Utilities Commission of Ohio
- Ohio State University Digital Agriculture

Surveys

Three surveys were developed for BEAD and DE stakeholder engagement efforts, each of which was targeted at different stakeholder groups. These surveys are the Internet Access Survey, Community Anchor Institution (CAI) Survey, and Public Housing Authority Survey.

Internet Access Survey

The Internet Access Survey had tailored questions for five different types of stakeholder entities: government entities, non-profit or community organizations, internet service providers, and other private businesses. The survey was developed in partnership with the Ohio Digital Equity manager to ensure that only one survey was needed to meet the objectives for both plans and to avoid "over-surveying." The survey's objective was to gather information about broadband infrastructure availability, affordability, digital devices and digital skills, and areas where BroadbandOhio could provide support from a range of stakeholders across the state of Ohio. The RDIAs were consulted on survey development and its distribution strategy to ensure accessibility and inclusivity.

The Internet Access Survey was primarily distributed through three channels:

1. Print surveys made available at Ohio libraries and RDIA-sponsored community events
2. Print surveys mailed to over 10,000 unserved and underserved households; included return postage
3. A digital survey link distributed at in-person and virtual BEAD and DE listening sessions, posted on Office of Development social handles, and emailed to RDIA

local networks and all stakeholders that received the above-mentioned press release via email.

RDIAs conducted additional surveys in partnership with local colleges and universities. For example, the RDIA for the Northwest region of Ohio (Toledo Lucas County Public Library) partnered with Bowling Green State University (BGSU) to send surveyors into various communities' downtown areas, where they handed out surveys and helped populations such as senior citizens, individuals with disabilities, and unhoused people to complete the survey.

CAI Survey

The CAI survey was created to better understand the technology currently in place at CAIs as well as the scale of the populations they serve and the access they provide to residents across the state of Ohio. The survey was distributed to CAIs throughout the state of Ohio via the state agencies overseeing these institutions, including the Departments of Aging, Commerce, Education, Health, Higher Education, and Public Safety, as well as the Ohio Library Council. Together, these entities reach all types of CAIs considered for funding, including colleges, schools (public and private), childcare centers, universities, libraries, hospitals, urgent care centers, public health departments, nursing homes, fire stations, and EMS stations.

Housing Authority Survey

An online survey was distributed to property developers and managers through the Ohio Housing Finance Agency (OHFA). OHFA began collecting information about wiring in multi-dwelling units (MDUs) in 2020; this survey was built to better understand existing units' size and wiring; MDU residents' connectivity challenges; and barriers property developers and managers face when trying to increase access to affordable internet in their buildings.

RDIA feedback

Feedback forms were provided to the RDIAs to facilitate data collection at ongoing sessions so that insights from these sessions could be incorporated into the BEAD and SDOP plans. Feedback forms included sample questions to use in listening sessions and space for the RDIAs to capture insights about barriers and strategies pertaining to broadband. They were also asked to provide information about any physical infrastructure and programing specific to the community participating.

5.1.4 Key takeaways

The three surveys issued as part of the BEAD-DE stakeholder engagement process are still in the market, so the insights available today come from in-person and virtual listening sessions and state agency interviews. The remainder of this section refers to information gathered at the listening sessions. State agency insights have been incorporated elsewhere in this plan, and collaboration with these parties is ongoing;

survey response data will be incorporated into the State Digital Opportunity Plan and the BEAD Initial Proposal.

Takeaways by entity type

Insights that were consistent across all regions include the following:

- Across the state, residents' access to broadband options (such as fixed wireless and fiber) vary, as do broadband costs. Contributing factors to these differences include complex regional topography, which inhibits certain broadband infrastructure options, and dated infrastructure, which hinders speed and reliability (often due to inclement weather conditions' affecting the infrastructure).
- Lack of broadband infrastructure contributes to a gap in reliable and affordable internet options for households. Residents experience extremely high broadband installation fees (e.g., over $1000 for line extension fees described in outreach to BroadbandOhio) and monthly costs, as well as frequent service disruptions. As a result, some residents opt out of purchasing internet service and travel to locations outside their homes to access the internet.
- Residents' daily life is often disrupted by unreliable internet access. They often struggle to get consistent, affordable internet that can support multiple users. Particularly impacted groups include remote workers, students, families, and farmers.
    - Residents often travel to libraries or other public places to access the internet.
    - Some residents rely on hotspots or connections with limits on data usage, making activities that require additional bandwidth or high amounts of data expensive or unfeasible.
- Lack of workforce capacity and connectivity infrastructure inhibits the deployment of broadband programs. Local organizations lack the capacity and resources to apply for and deploy broadband programs. (For example, they may lack the time to complete program applications, or they may not have sufficient digital support staff.) Additionally, many existing broadband networks cannot adequately support new programs; for example, limited at-home networks cannot support additional devices that would be provided in device roll-out initiatives.
- Digital navigators can promote community trust and facilitate digital adoption. Lack of institutional trust limits the effectiveness of benefits programs (such as the ACP) and programs to lend or give devices. Trusted digital navigators and community organizations (such as school districts and senior centers) can help to explain the ACP clearly and provide support with the complex application

process. Word of mouth among community members is highly effective in spreading awareness of the ACP and other digital benefits programs.

The below tables provide detailed findings by stakeholder entity type and by region. These findings will be combined and incorporated into the BEAD Five-Year Action Plan.

Table 4 Key findings: ISPs and private businesses

Topic	Findings
Barriers	Permitting/right of way • Railroads and pole attachments are a drain on time and investment for providers across the state. • Pole permits can take up to 18 months. • Make-ready costs can be so high that it is cheaper to go underground, which can put other utilities (gas, water) at risk. Materials • Costs associated with timelines, permitting, etc. are exacerbated by American-made requirements. Labor • The labor shortage will likely worsen. • Three challenges affect labor: 1) there is an insufficient number of training programs; 2) the industry is not marketed enough as a viable career option; 3) training people now will not provide enough people to meet demand, nor will it train them fast enough for this work. Hiring is already difficult, and all funds have not yet arrived. Challenges described by smaller providers • Match requirements (Grants and letters of credit would help.) Technology • Opinions vary on whether deployment should be almost 100 percent fiber, or if it should be a mix of fiber and wireless. Device quality • Outdated devices do not meet users' needs and can be even more complex than new ones – which is especially a problem for people who are not digitally savvy. Affordability • The uptake on the ACP has been low, despite ISP-driven marketing. Information must come from a **trusted source** (such as digital navigators) to alleviate concerns. • E-rate barriers restrict what ISPs can do in schools to promote ACP. • Individuals who cannot afford to upgrade devices struggle to complete tasks using outdated technology (job applications, standardized tests, etc.). • Fear of technology deters some populations from adopting digital tools; they have concerns about spying, sales scams, etc.

Topic	Findings
	• Some are concerned about ACP ending. Generating trust among skeptical populations is difficult when the program could cease to exist.
Programs and partners	ACP outreach • ISPs are working with third parties to share information about ACP to families who participate in the free lunch program. • Local, in-person events are most effective, for example "Turkey Tech Tailgate" (door knocking doesn't work) Digital navigators • Digital navigators can assist with ACP awareness and applications as well as with digital literacy. They can also encourage safe adoption, installation, and use of technology.
Solutions and collaboration	• Develop a "best practice" guide to help ISPs • Work with Society of Cable Telecommunications and retired telecom workers as instructors in workforce training programs • Partner with Department of Veterans Services on "from protect to tech" program to bring veterans with tech-heavy skillsets into the industry • ISPs are enthusiastic about "digital navigators." • BBOH/ODOT's streamlining permit process via centralization has had a positive impact.

Table 5 Key findings: local government

Topic	Findings
Barriers	• Municipalities historically could not apply for funding (ORBEG); BEAD criteria will remedy this. • Rural areas have a nearly impossible financial case to make to ISPs when pitching areas with low population density. • The BEAD match requirement is a barrier for small, low-income communities; they could not pay back even a 0 percent interest loan. • Broadband not only benefits citizens but also presents an opportunity to streamline operations and make the city more efficient (For example, providing utility bills online can reduce a city's administrative work by half – especially in cities like Dayton, which has duplicative systems.) • Barriers are largely determined by whether the community is rural or urban; rural communities often lack availability, while urban entities are more concerned about affordability and digital skills. • Both rural and urban areas lack providers of fast, reliable internet and/or affordable options. They feel that they are at the mercy of one provider and have no leverage.
Programs and partners	• PCs for People is available in some areas, but other areas have mainly recycled devices that cannot be refurbished. • PPPs are generally the best way for municipalities to get involved with infrastructure grants, but the challenge is having a sufficient subsidy to attract private entities. • Most schools provide devices, but a single device and/or hotspot often cannot meet an entire family's needs.

Topic	Findings
Solutions and collaboration	• A "broadband-ready guide" to help municipalities make their community more attractive to providers. • Alternate ways for PPPs to meet the matching requirement, including waivers, grants, or allowing ISP to match via in-kind services such as digital training • Allowing municipalities to apply for grants (solved)

Table 6 Key findings: Non-profits and community organizations

Topic	Findings
Barriers	Deployment • Community stakeholders expressed concern that the broadband maps show a significant number of locations as served that are truly unserved. Very few internet companies are deploying or delivering broadband in rural areas, due to the high costs and low return on investment. Topography • Rural areas' topography was cited as a barrier to broadband access and limits these areas' options among ISPs and internet services. Additionally, within neighborhoods internet connectivity often varies, leaving some homes without service. Outdated infrastructure • Much of the physical infrastructure (such as poles and wiring) across the state was installed years ago and was not built to support today's high-bandwidth, high-speed broadband service. Additionally, this outdated infrastructure often cannot withstand the impact of inclement weather. Digital literacy • For aging populations, limited digital literacy prevents broadband adoption due to fear of technology and lack of comfort with certain digital services (such as banking and healthcare). Additional technical support is required to help with digital navigation, online fraud awareness, and device utilization. Labor shortages • A shortage of substitute teachers prevents full-time teachers from attending digital skills training offered by community organizations. Lack of resources • Significant time, training, and other resources are required to improve digital adoption and literacy. Organizations noted that

Topic	Findings
	their greatest barrier is the time and support required to provide effective digital training. • Residents regularly require digital assistance or support outside traditional working hours. Individuals who work full-time jobs are sometimes unable to access programs or in-person support that are offered during the traditional workday. • Local organization leaders also noted that a lack of expertise in digital inclusion is a barrier to broadband program deployment. Participants said they were unaware of the broadband programs and subsidies available to the communities that they serve. Community outreach • Community organizations noted that barriers to more widespread adoption of programs included the inability to reach all residents who need support, a lack of trust among residents, and an inability to meet residents where they are physically located. Transportation • Transportation is a major barrier to internet access in some areas. Convenient transportation is often lacking, making it difficult for residents to access community anchor institutions for internet service.

Programs and partners	Access
	• During COVID, school districts across the state provided students with Chromebooks and hotspots to increase internet access (by placing school buses with hotspots in parking lots throughout the district, for example).
	• A local workers' union has created programs to boost adoption of broadband in rural areas. They have also purchased laptops to lend to the elderly.
	• The Ohio Connectivity Champions support residents in applying for the ACP and registering for the Northstar Digital Literacy Project.
	• The Management Council has digital navigators who regularly go to community spaces (such as jail lobbies and community centers) to help residents sign up for ACP and connect to the internet.
	• The Financial Opportunities Center (FOC) has the UNIFI Digital Connectivity Program, a four-pronged digital connectivity program consisting of:
	  ○ A lending library that lends laptops, hotspots, and tablets to local organizations (City Mission of Findlay, Women's Resource Center, and NAMI)
	  ○ ACP enrollment support services

Topic	Findings
	○ Digital literacy services to walk clients through tailored, customizable courses related to digital literacy, skills, and device use ○ An online resource center. Devices • School districts in rural regions purchase devices (such as Chromebooks) for students to facilitate their learning. • The Management Council piloted a program to lend Chromebooks and hotspots to low-income individuals. • The Ohio State University Extension received a grant for 25 iPads that can be distributed to students in a national youth program. ○ They use a train-the-trainer model in which trusted trainers go out into the community and support older adult business owners who are interested in integrating more technology into their business operations. ○ They also offer a program to teach business owners about QuickBooks' transition into a cloud-based platform. • The Ability Center of Greater Toledo used CARES Act funding to stand up a digital device-lending program that provides tablets to clients and community members. • The Education Service Center of Central Ohio purchases devices in bulk (such as Chromebooks) to lend to schools that cannot afford them. Additionally, they coordinate bulk purchasing across multiple school districts so that schools can receive better pricing on their devices. Digital skills • The Management Council has conducted digital literacy classes for elderly residents, low-income residents, and incarcerated populations ahead of re-entry. • The Ohio Consumer Counsel is promoting programs that offer digital literacy and training to people in underserved communities. • The Education Service Center of Central Ohio offers programs to digitally develop teachers' skills in under-resourced areas. • Smart Columbus provides multiple digital navigator programs. • The Ohio Small Business Development Center (SBDC) offers training in digital skills and internet safety. • The Toledo Lucas County Public Library (TLCPL) recently began the Northstar Digital Literacy Project, a free digital skills program for all community members with a library card.
Solutions and collaboration	Access • Expand program offerings and resources at community nonprofits to offer standardized digital readiness and digital skills programs

Topic	Findings
	• Provide internet services in places like churches that have built-in services and community leaders whom residents can utilize for assistance • Ensure that community anchor institutions with broadband access are strategically placed and accessible by foot (within a 10-15-minute walking distance, for example), particularly for rural regions with limited transportation options • Set up centrally located access points for residents to connect to the internet in trusted locations (such as firehouses, gas stations, schools, and senior centers) within each community • Use physical materials (such as paper copies) alongside digital materials to ensure that local organizations can share resources with residents Programming • Offer more in-home digital literacy and skills programs to facilitate accessibility (by saving travel time, removing transportation barriers, and offering greater comfort, for example), especially for older populations and individuals with disabilities • Provide technological support and digital literacy resources through multiple channels (in-person, telephone-guided, and digitally) to facilitate accessibility and individual service • Implement peer-to-peer connection and grassroots efforts to support the roll-out of digital navigation, literacy, and device programs Social determinants of health • Address data interoperability issues and data-sharing processes alongside broadband initiatives. Survey participants noted that, for industries using technological tools (such as electronic health records in healthcare), residents sometimes have difficulty sharing data across tools. Tackling this issue may also help to address some of the social determinants of good health. • Promote partnerships between local broadband-related organizations and health networks to create digital training courses in health navigation.

Table 7: Key findings: Ohio residents

Topic	Findings
Barriers	Physical infrastructure • In rural regions, residents noted that the topography and old physical infrastructure contribute to deployment issues. Much of the equipment and physical infrastructure does not function consistently in some weather conditions.

Topic	Findings
	• Residents have to rely on multiple sources of internet services given the instability of their home internet. Access • Families must take turns using their internet services, sometimes obligating them to travel to locations with public Wi-Fi (such as libraries). More access to public Wi-Fi is needed for community members. • Increased access to task-appropriate devices (such as laptops and tablets) would enable additional educational opportunities and broadband-related training. Lack of resources • Residents noted that a lack of resources inhibits digital skills development, given the significant amount of time, training, and other resources (such as one-on-one training) required to improve digital literacy and skills. Mistrust of government • In some communities, broadband and device adoption is limited by mistrust of institutions. • For the ACP and device-lending programs, community members sometimes assume that devices come with a "catch" (that is, they are not actually free) or will be used in exploitative or predatory ways (such as spying).
Programs and partners	Access • The Ohio Connectivity Champions support residents in applying for the ACP. • The Toledo Lucas County Public Library founded the Greater Toledo Digital Equity Coalition (GTDEC), which has over 50 members representing various community and professional organizations. • The Cleveland Metropolitan School District (CMSD) offers a program to provide internet access, devices, and software for students and their families. For students graduating or aging out of the program, CMSD has partnered with PCs for People to provide refurbished devices and assist families with applications for the ACP. ○ The CMSD also spreads awareness and information about the ACP to its students and their families through various distribution channels (such as social media, posters, the school library, and notes to parents). • The Digital Inclusion Program at the Cuyahoga Metropolitan Housing Authority (CMHA) shares information about the ACP at community-based events by deploying digital navigators into the community. Devices

Topic	Findings
	• Local school districts provide digital devices, such as Chromebooks, to students. • Libraries provide hotspots for residents to borrow or to serve as public Wi-Fi access points, which are especially popular with students. • Employers provide laptops and hotspots to allow for remote work. Digital skills • Rhodes State College offers digital literacy classes for individuals learning how to use certain devices. • Some small businesses provide technical and digital skills training to clients. • Digital skills courses are offered at senior facilities within the Cleveland community. • ASC3's digital navigator program helps participants apply digital training and learning in real-world environments.
Solutions and collaboration	Access: • Leverage the positioning of community anchor institutions (such as hair salons, laundromats, and coffee shops) for outreach and program delivery • Leverage community-based ISPs to ensure that community members are engaged in broadband decision-making • Use both physical (such as paper copies) and digital materials to ensure that local organizations can share resources with residents across multiple channels. • Develop comprehensive strategies for digital literacy and navigation programming to address barriers to access (by taking such steps as providing shuttle buses to training to address transportation barriers) • Form additional partnerships with farm technology companies in rural areas to help distribute targeted information to rural residents and farmers Programming • Design a variety of digital training and program offerings to provide training tailored to the needs of specific subpopulations (such as students, working adults, and seniors) • Use one-on-one digital training methods to meet residents' specific needs for digital literacy and technological support • Leverage a train-the-trainer model with trusted community leaders to provide additional training on digital skills and cybersecurity to increase adoption • Implement additional device-sharing and device literacy programs in partnership with schools, libraries, and community centers

Topic	Findings
	• Open grant eligibility to local governments to allow for more informed, targeted broadband expansion • Improve messaging and community awareness on the benefits of digital skill programs • Provide more flexible funding for residents in programs like ACP so that they can buy gently used devices, which may make high-quality devices more affordable • Promote access to devices at cheaper cost by purchasing them in bulk at a discount for schools or organizations to rent Resources • Ensure that community nonprofits providing public-facing services and programming have adequate Wi-Fi equipment (such as routers and modems) and internet access to enable digital participation in their services (such as medical clinic services, training, and live-streaming of meetings) • Providing additional funding for trusted digital navigators and key community leaders could raise awareness of programming.

Takeaways by region

Table 8 Key findings by listening session location

Region	Findings
Mt Gilead (Central)	
Barriers	Permitting/right of way • Right-of-way codes vary by city and can delay ISP efforts to expand broadband infrastructure, which is particularly challenging for railroads and state waterways. Affordability • Uptake on ACP has been low, despite ISP-driven marketing. Information needs to come from a trusted source (such as digital navigators) to alleviate concerns. • E-rate barriers restrict what ISPs can do in schools to promote ACP. • Individuals who cannot afford to upgrade devices struggle to complete tasks (such as job applications and standardized tests) using outdated technology. Digital skills/literacy • Subscribers do not know what upload/download speeds they need and do not understand whether their issues come from service problems or their router's placement, leading them to overpay for services or preventing them from taking advantage of digital tools. • Fear of technology deters some populations from adopting digital tools.

Region	Findings
Programs and partners	ACP outreach • ISPs work with third parties to share information about ACP with families who participate in the free lunch program. • Device giveaways have been tested, but they create new issues: users do not always get devices that take gig service, or they don't know how to use the device and might sell it instead. • Local, in-person events are most effective – for example, the "Turkey Tech Tailgate" event. • Digital navigators can assist with ACP awareness and applications and with digital literacy. They can encourage safe adoption, installation, and use of technology.
Solutions and collaboration	• Given the lack of standardization in right-of-way codes, ISPs could collaborate on a best-practice code that BBOH can share locally. • Expand the numbers of "digital navigators" who have a local presence and are trusted; these navigators should not be associated with ISPs.
Rio Grande (Southeast)	
Barriers	Affordability • Residents must pay $70-$100 a month for broadband from the only ISP serving their county. Unreliability • The service is not reliable (for example, it is frequently down for long periods) and does not meet the standards for high-speed internet. This impacts residents' and business owners' ability to use cloud-based platforms. Topography • In rural areas, physical infrastructure equipment (such as satellites) does not function consistently during inclement weather. Accessibility • For those who are unserved or underserved, residents have to travel long distances to access public Wi-Fi.
Programs and partners	Device distribution • School districts in rural regions distribute Chromebooks to students to facilitate learning and internet access. Digital navigators • The OSU Extension Office deploys trusted trainers into the community and supports older business owners who are interested in integrating more technology into their business operations. • The Ohio Small Business Development Center (SBDC) currently offers training on digital skills and internet safety.

Region	Findings
Solutions and collaboration	• Given the lack of at-home internet access for students, additional partnerships could be established with community anchor institutions to increase access to digital devices and the internet. • As digital literacy is often low among older adults, a train-the-trainer model with trusted community leaders can be deployed to provide training in digital skills and cybersecurity.
Cambridge (Southeast)	
Barriers	Affordability • Many residents cannot afford to keep their technology up to date (by buying new devices, for example). Additionally, residents lack understanding of the different cost options available for internet plans and devices. Access • Residents in the region, especially in rural areas, experience extremely unreliable internet service. There are "dead zones" in coverage, or the internet sometimes cuts out completely, for example. Digital literacy • A lack of digital skills and understanding, especially among senior individuals, hinders internet adoption. Many older residents are hesitant to complete digital tasks or adopt new devices (such as smartphones).
Programs and partners	Digital skills • Senior centers in the region provide digital literacy courses and workshops.
Solutions and collaboration	• Establish more partnerships with local organizations to provide digital navigators in senior centers who demonstrate device usage and help residents navigate among internet providers and plans • Offer "loaner" tablets and devices at community locations (such as libraries, schools, churches, and senior centers) to alleviate cost barriers • Broaden the variety of available internet plans and senior discounts to mitigate cost barriers, especially for low-income residents
Xenia (Southwest)	
Barriers	Infrastructure gaps • There are disparities in broadband access and connectivity within neighborhoods; certain houses are unserved despite their proximity to covered houses. • Residents are quoted extremely high fees for an ISP to begin providing service to their home. Lack of providers • Residents either have one option or, if they have multiple options, the speeds are too low to consider utilization. Privacy concerns

Region	Findings
	• Residents are reluctant to sign up for the ACP or receive devices due to fears that the government will see their data. Digital skills/literacy • Resources to help organizations educate people on privacy and general digital skills are limited; schools are also understaffed in their IT resources. • Some residents did not understand the benefits of having internet services, which prevents some from adopting those services. Affordability • Some residents hesitate to sign up for the ACP when there is no guarantee that the funds will continue.
Programs and partners	Digital navigators • The Ohio Connectivity Champions supports residents in applying to the ACP.
Solutions and collaboration	• Since internet adoption is inhibited by a lack of local resources, internet services can be provided in places like churches, which already have built-in services and community leaders. • To address reluctance to adopt internet services and devices due to government mistrust, peer-to-peer connection and grassroots efforts can support the roll-out of digital navigation, literacy, and device programs. • Wider internet availability in community institutions would give more people access to the internet and would help those without devices of their own. • Some entities, such as National Church Residences, are actively looking for partners to assist with digital skills and literacy training for their residents.
Toledo (Northwest)	
Barriers	Government mistrust • In some communities, broadband and device adoption is limited by mistrust of broadband partners who appear to represent the interests of certain systems (such as government, health care, and education) or big businesses. Physical infrastructure • Some areas within the Northwest region have outdated broadband infrastructure (such as wires, poles, lead cable, and pulp insulation) that will require updates to ensure adequate coverage. • Community members are frustrated by a lack of provider options; there is only one ISP throughout most of the Northwest region. Lack of resources

Region	Findings
	• Several organizations noted that their greatest barrier is the amount of time and support required to provide effective digital training. • Individual support is needed to accommodate various skill levels and differing digital literacy, particularly when helping someone sign up for the ACP or providing them with a device.
Programs and partners	Device distribution • The Ability Center of Greater Toledo used CARES Act funding to stand up a digital device lending program that provides tablets to clients and community members. Digital literacy • The Toledo Lucas County Public Library (TLCPL) recently established the Northstar Digital Literacy Project, a free program for all community members with a library card. ○ Additionally, they started the Greater Toledo Digital Equity Coalition (GTDEC), which has over 50 members who represent various community and professional organizations. Access • The Ohio Connectivity Champions provide support for residents to apply for the ACP and register for the Northstar Digital Literacy Project
Solutions and collaboration	• Leverage community-based ISPs to engage community members in broadband decision-making • Offer more in-home digital literacy and skills programs to expand accessibility (by saving travel time, removing transportation barriers, and providing greater comfort, for example), especially for older populations and individuals with disabilities • Local organizations have found that tablets are the most appropriate devices for digital lending and giving programs, because they are easy to obtain and suitable for people of varying digital skill levels.
Findlay (Northwest)	
Barriers	Lack of transportation • Transportation is a major barrier to internet access in the Findlay-Hancock region. Convenient transportation is lacking, making it difficult for residents to access community anchor institutions for internet service. Lack of workforce capacity • Residents often need digital assistance or support outside traditional working hours. Individuals who work full-time jobs sometimes cannot access programs or in-person support offered during the traditional work day.

Region	Findings

Programs and partners	Access
	• The Financial Opportunities Center (FOC) has the UNIFI Digital Connectivity Program, a four-pronged digital connectivity program consisting of:
	  ○ A lending library
	  ○ ACP enrollment services and connected coaching to assist clients in enrolling in the ACP service and connecting to a data or broadband plan
	  ○ Digital literacy services to walk clients through tailored and customizable courses related to digital literacy, skills, and device use
	  ○ An online resource center
	Device distribution
	• Through its lending program, the FOC has lent devices to many organizations. For example:
	  ○ City Mission of Findlay (a local homeless shelter) borrowed three desktops, a hotspot, and a laptop.
	  ○ The Women's Resource Center borrowed tablets facilitate their intake processes.
	  ○ NAMI borrowed a laptop so that clients could have access to a device while at the NAMI facility.

Solutions and collaboration	• Ensure that community anchor institutions with broadband access are strategically placed and accessible by foot (within a 10-15-minute walking distance, for example), particularly for rural regions with limited transportation options • Trusted community organizations for underrepresented populations could offer digital connectivity programs along with various other services they already provide (such as hosting an information session about ACP at the conclusion of a housing voucher briefing). • Offering instructions for ACP, digital device lending, and digital literacy programs must consider language needs; languages spoken in Northwest community include Spanish, Haitian Creole, and Ukrainian.
Cleveland (Northeast)	
Barriers	Affordability • Few affordable broadband options are available, especially for retirees or individuals who make slightly above the income limits for ACP. Mistrust • Many community members are wary of broadband programs like the ACP because they seem "too good to be true." Additionally, some individuals hesitate to trust ISPs

Region	Findings
	because the companies have not historically expressed interest in the community's basic needs and concerns. • Low-quality devices received though ACP or other giving and lending programs erode trust and discourage individuals who are seeking better device access and broadband adoption. Digital literacy • Community organizations noted that their primary challenge is breaking through clients' phobias about digital opportunities. They said that clients may not be fully aware of digital devices' value and are therefore reluctant to buy or use them.
Programs and partners	Digital literacy • ASC3's digital navigator program helps participants apply digital training and learning in real-world environments. • Digital skills courses are offered at senior facilities within the Cleveland community. Residents shared that these classes frequently have the most engaged and most excited participants. Access • The Digital Inclusion Program at the Cuyahoga Metropolitan Housing Authority (CMHA) shares information about the ACP at community-based events by deploying digital navigators into the community. • The Cleveland Metropolitan School District (CMSD) offers a program to provide internet access, devices, and software for students and their families. For students graduating or aging out of the program, CMSD has partnered with PCs for People to provide refurbished devices and assist families with applications for the ACP. • The CMSD also spreads awareness and information about the ACP to its students and their families through various distribution channels (such as social media, posters, the school library, and notes to parents).
Solutions and collaboration	• Ensure that community members can readily access support (by asking questions about devices and ACP applications, for example) • Leverage the positioning of community anchor institutions (such as hair salons, laundromats, and coffee shops) for outreach and program delivery. • Design a variety of digital training and program offerings to provide instruction tailored to specific subpopulations' needs (such as students, working adults, and seniors) • Participants noted that, among industries that use technological tools (such as electronic health records in

Region	Findings
	healthcare), residents sometimes experience limitations in data-sharing and interoperability across tools. Addressing data interoperability and sharing processes along with broadband initiatives may also help to address some of the social determinants of good health.
Youngstown (Northeast)	
Barriers	Lack of local funding • Many local organizations do not have the resources or funds to deploy basic digital literacy courses and refurbished device programs. As a result, many residents must travel to major cities to access broadband programs (like Cleveland and Pittsburgh). Device access • Many residents do not use devices because they doubt the quality of refurbished devices. Participants noted that easier-to-use devices (such as Apple products) are more expensive. Awareness of programs • Often local organizations do not have the marketing resources to ensure their broadband programs and subsidies appear early in search engine results (such as Google searches) Infrastructure • Residents, especially in rural areas, lack options in high-speed internet providers. Moreover, internet service and speeds vary greatly, depending on the location of a household within the region. Digital literacy • A lack of digital literacy and navigation skills was noted as a barrier to broadband utilization, especially among older adults and students. Many older individuals and people without digital literacy cannot complete digital tasks, or they rely on other people to get technological support. • Some residents may not understand the value of having internet services and therefore do not pursue these services. Unreliability • Participants noted that internet service is extremely unreliable throughout the region (for example, Zoom calls may drop off, or residents may be unable to send emails). Internet service will cut out in some areas for prolonged periods, leaving many residents without at-home Internet access.
Programs and partners	Digital literacy

Region	Findings
	• The Adult Basic and Literacy Education (ABLE) program provides basic digital literacy and skills courses to residents in the state. • Oak Hill Collaborative offers basic digital navigation and literacy courses. • Previously, the Farm Bureau offered digital literacy sessions for three to four hours a day to teach members how to set up and utilize devices. Device distribution • Oak Hill Collaborative has a refurbished device roll-out initiative to provide residents with lower-cost laptops. Access • Oak Hill Collaborative offers support services for residents filling out ACP applications.
Solutions and collaboration	• Implement local broadband-related public service announcements to alleviate feelings of mistrust in the community. • To ensure that local organizations can apply for broadband funding, remove any requirement that an eligible organization must have previously received funding • Offer digital literacy courses at libraries that are related to specific topics – such as cooking – to increase community participation • To boost digital literacy, encourage technicians to provide residents with digital literacy training when installing at-home internet services
Virtual (statewide)	
Barriers	Lack of infrastructure • Lack of modern infrastructure and of strong internet connectivity (covering the entire property) inhibits both economic opportunities (such as the use of advanced technology for precision agriculture, remote working, and video conferencing) and daily activities (such as telehealth, schoolwork, and streaming). • Existing services often cannot support multiple users at once. Lack of resources • Deficiency of resources and workforce capacity is an obstacle to device roll-out initiatives. Local organizations' staff members do not have the capacity to support community members with digital navigation and technical support questions. Access

Region	Findings
	• Across the state, communities have differing access to broadband options (such as fixed wireless and fiber) and varying costs for associated broadband.
Programs and partners	Device distribution • Local organizations provide devices to community members who already have internet service set up. • Local libraries developed short- and long-term hotspot distribution programs to provide residents with stable and reliable internet services. Digital skills/literacy • Local telephone providers help elderly individuals navigate their devices via telephone sessions. • The Columbus Metropolitan Library partners with Goodwill Columbus to provide technology classes. • Rhodes State College offers digital literacy classes for individuals learning how to use certain devices.
Solutions and collaboration	• Ensure that community nonprofits providing public-facing services and programming have the appropriate Wi-Fi equipment (such as routers and modems) and internet access to allow for digital participation in their services (such as medical clinic services, training, and live streaming of meetings) • Use physical (such as paper copies) and digital materials to ensure that local organizations can share resources with all residents

5.2 Priorities

The State of Ohio will prioritize its broadband-related efforts according to the 11 pillars/goals outlined above. The table below describes the specific tactics the state will use to prioritize its efforts.

Table 6: Priorities for Broadband Deployment and Digital Inclusion

Priority	Description
A1. Invest in deploying last-mile broadband infrastructure	Bring reliable, affordable, high-speed internet to all Ohioans via a competitive grant process
A2. Expand middle-mile network to facilitate last-mile deployment	Extend the reach of Ohio's OARnet network through unserved areas of the state to facilitate last-mile deployment, increase competition, and improve affordability
A3. Remove barriers to deployment and maximize asset reuse	Reduce cost barriers, streamline permitting processes (for railroad crossings, for example), and leverage existing state and local assets to support infrastructure deployment
B1. Keep pace with changing technology and demand	Ensure Ohio's broadband infrastructure always meets the highest standards of reliability and scalability

	through efficient upgrades and by upholding standards in grants and permitting processes
B2. Connect community anchor institutions to serve as digital hubs	Empower CAIs as local hubs for connectivity, digital inclusion, and innovation through access to gigabit-symmetrical service
C1. Expand telehealth access and usage via targeted programming	Expand telehealth access and usage by linking Ohio's health systems to schools and expanding the current program to include additional health priorities
C2. Expand access to remote education opportunities	Ensure all students and teachers have access to reliable internet and internet-capable devices to access digital learning at home and school
C3. Support Ohio's farmers in improving productivity by enabling digital agriculture uptake	Enhance agricultural productivity by encouraging adoption of precision agriculture by identifying use cases, establishing strategic partnerships, and expanding broadband access
C4. Enable safe and easy movement of people and goods via foundational investments to enable intelligent transportation systems	Ensure robust highway broadband access to support the deployment of smart corridors across Ohio in partnership with the Department of Transportation
D1. Support workforce development initiatives that connect Ohioans to broadband deployment and digital jobs	Partner with universities and workforce development organizations to build the broadband network, develop workers' skills for digital jobs, and enable remote work opportunities
D2. Accelerate adoption, usage, and economic empowerment via Regional Digital Inclusion Alliances	Partner with RDIAs as they engage local communities in driving digital opportunity via funding for programs that promote broadband adoption, device access, and digital skills training

5.3 Planned activities

BroadbandOhio has planned the following activities to help achieve the priorities detailed above.

5.3.1 Middle-mile infrastructure build

5.3.1.1 Midwest Regional Collaboration-Appalachia (MRC-A)

Activities supported: The Midwest Regional Collaboration-Appalachia (MRC-A) comprises state research and education networks, broadband offices, and offices of Appalachia from Ohio, Pennsylvania, West Virginia, and Kentucky. The MRC-A aims to leverage initial planning funds from the ARC ARISE program to work with the state partners, regional stakeholders, and other interested parties to determine how best to build Appalachia's middle-mile infrastructure that would connect participating states' research and education networks ("RENs"). The MRC-A also plans to identify additional stakeholders in their regions and to contribute engineering analyses to fill existing gaps in their current backbone of middle-mile infrastructure.

Expected outcomes: MRC-A aims to build Appalachia's infrastructure by architecting a large-scale, multistate, highly scalable, resilient, and redundant middle-mile network with open access, thereby ensuring that large and small providers alike can use the infrastructure to bring broadband to their areas while also leveraging connectivity to community anchor institutions (CAIs).

The multistate infrastructure will also benefit emergency preparedness and national security interests via a "Super Exchange Connectors" concept, where the states will integrate the newly created multistate Appalachian fiber route with each participating state's RENs, which will reduce RENs' dependency on large cities' internet exchange facilities to connect to the national and global internet. Additionally, the MRC-A plans to integrate state networks to connect to alternate internet exchanges in case of disaster in any one state. This will significantly curtail major risk for anchor institutions and enable resilient internet services during disasters for the millions of citizens who are collectively served in the Midwest.

Key players: State research and education networks, including the Ohio Academic Resources Network (OARnet), the Keystone Initiative for Network-Based Education and Research (KINBER), the Three Rivers Optical Network (3ROX), the Kentucky Regional Optical Network (KyRON), and the West Virginia Network (WVNET); state broadband offices and state governors' Offices of Appalachia in the four states; MRC-A members; and initiative owners.

Funding source: Appalachian Regional Commission, Appalachian Regional Initiative for Stronger Economies for planning funds ($500,000, application results pending)

5.3.1.2 Ohio middle-mile plan

Activities supported: BroadbandOhio, through the Ohio Middle-Mile Plan (OMMP), aims to create a steering committee and a grant to support the following activities:

- Enhance middle-mile infrastructure through new, underground, redundant, and resilient routes, building upon state and federal investments accrued over 35 years
- Add 702 miles to the existing 5,500 miles of statewide backbone while enabling a sustainable business model for private-sector partners
- Establish infrastructure to support and proliferate cost-effective wired and wireless last-mile connections
- Develop workforce through a vast network of education institutions in Ohio while providing specialized curriculum to support all aspects of networking and telecommunications skill sets.

The OMMP will also engage stakeholders to provide information and input regarding the OMMP program and its benefits. The OMMP will act to raise awareness of the program among CAIs and other last-mile service providers and will expand the OMMP's impact by collaboratively establishing Points of Presence (PoP) and enabling ISPs to reach unserved and underserved communities.

Expected outcomes: The goal of the OMMP is to construct a new underground fiber route that starts at Lake Erie and moves along the Ohio River towards Cincinnati. The route spans 29 counties, of which 22 are in the Appalachian region. The project will add 702 miles to the existing 5,500 miles of broadband infrastructure operated by OARnet, enhance broadband availability to over 277,825 unserved households, bring over 350 CAIs within 1,000 feet of the route, and enable at least seven last-mile ISPs who have directly responded in support of this build, as well as the 217 applicants for the ORBEG Program that could use OMMP to more cost-effectively and reliably serve the area. The OMMP will also create several workforce development opportunities throughout the state as the need for professionals to construct and operate the newly built route grows, with up to 162 credentialed and highly skilled OMMP positions expected.

Key players: BroadbandOhio (initiative owner and OMMP partner), OARnet (initiative owner, OMMP partner, and technical expertise provider), Eastgate Council of Regional Governments (OMMP partner and initiative owner), Altafiber (ISP partner), Everstream (ISP partner), Ohio Gig (ISP partner), Governor's Office of Appalachia (steering committee member), Office of Workforce Transformation (steering committee member), InnovateOhio (steering committee member), Ohio Department of Transportation (steering committee member and match provider), Ohio Department of Administrative Service (steering committee member), Ohio Department of Natural Resources (steering committee member), Ohio Department of Higher Education (steering committee member and state agency overseeing OARnet), Management Council Ohio Education Computer Network (Key Community Collaborator), Buckeye Hills Regional Council (Key Community Collaborator), Ohio Mid-Eastern Regional Educational Service Agency (OME-RESA), The Northeast Ohio Management Information Network (NEOMIN), Area Cooperative Computerized Educational Service System (ACCESS), and Southeastern Ohio Voluntary Education Cooperative's (Meta SEOVEC) information technology centers serving K-12 networking in the Ohio Appalachian region (Key Community Collaborators)

Funding source: National Telecommunications and Information Administration's Enabling Middle-Mile Broadband Infrastructure program (approximately $75 million, with application results pending), BroadbandOhio funding match (approximately $6.4 million), OARnet funding match (approximately $5.9 million), private ISP partner match (approximately $41 million), and additional funding matches

5.3.1.3 Lake-to-river broadband corridor[247]

Activities supported: BroadbandOhio allocated $500,000 toward conducting an engineering analysis necessary to complete a Lake-to-River Fiber Broadband Corridor along State Route 11. The development of a Lake-to-River Fiber Broadband Corridor was one of the key recommendations of an extensive broadband feasibility study released by Eastgate Regional Council of Governments in June 2021. The project will help eliminate the digital divide in the rural and urban areas within the region by improving middle-mile infrastructure as part of the state's ongoing middle-mile efforts. The implementation of the build-out could potentially be partially supported by the NTIA Middle-Mile Grant (if funds are granted).

Expected outcomes: The engineering analysis is a critical step towards making the Lake-to-River Fiber Broadband Corridor a reality. The engineering analysis will include a next-generation GIS fiber map that will visualize the network and its critical components. The map will depict the physical location of the fiber and other telecom infrastructure. By using network technical data as well as geographic and demographic information, the fiber map will be a blueprint for the construction of the Lake-to-River Fiber Broadband Corridor. The proposed fiber line will run nearly 100 miles and provide connectivity to existing fiber lines on I-90, I-80, and the Ohio Turnpike. This improved connectivity will positively impact over 620,000 Ohioans by improving internet access, resulting in better education, economic development, and telehealth options.

Key players: BroadbandOhio (initiative sponsor and financial supporter); Eastgate Regional Council of Governments (initiative owner); Ohio Department of Transportation (initiative

[247] https://development.ohio.gov/home/news-and-events/all-news/2022-0928-broadbandohio-announces-state-support-for-lake-to-river-regional-broadband-expansion-project

stakeholder); and Ashtabula, Trumbull, Mahoning, and Columbiana counties (initiative stakeholders)

Funding source: House Bill 2 of the 134th General Assembly (for engineering analyses, $500,000) and the National Telecommunications and Information Administration's Enabling Middle-Mile Broadband Infrastructure Program (for build-out, award amount pending)

5.3.1.4 Western Ohio infrastructure upgrade pilot

Activities supported: This project will accelerate upgrades to existing middle-mile infrastructure owned by Independent Fiber Network (IFN) in the north and western part of Ohio (100GB), which is required to accommodate additional bandwidth needs in the area.

Expected outcomes: IFN supplies bandwidth to 26 Ohio ISPs, Ohio Academic Resources Network (OARnet), Northwest Ohio Area Computer Services Cooperative (NOACSC), Southwest Ohio Computer Association (SWOCA), Miami Valley Educational Computer Association (MVECA), and several hospitals and other anchor institutions in western Ohio. Bandwidth usage and demands on the IFN network have more than doubled since the COVID-19 pandemic, and several of the ISPs that IFN serves, including OARnet and the Ohio Education Computer Network (OECN), are seeking to upgrade their networks to 100GB because of demand on their networks. IFN is the primary middle-mile provider to the area; building out and upgrading its network will improve services for end-customers.

Key players: BroadbandOhio (initiative sponsor), IFN (subgrantee and ISP)

Funding source: Coronavirus Capital Projects Fund (CPF) ($3 million, application results pending)

5.3.1.5 Bascom/Seneca County partnership[248]

Activities supported: Bascom, a rural electric telephone cooperative located in Seneca County, and North Central Electric Cooperative (NCE) have partnered to provide high-speed connectivity to 100 percent of Seneca County's residents. By pooling their resources, the partnership will build a middle-mile fiber infrastructure that will serve as the backbone of the project and will be leveraged to serve residents with fiber-to-the-home services. BroadbandOhio supports the partnership by providing funding for the construction of the middle-mile fiber infrastructure throughout the county, thereby supporting the partnership's last-mile expansion efforts.

Project planning and backend work has already begun, and construction is slated to begin in 2023.

Expected outcomes: The partnership will help build fiber-backed middle-mile infrastructure in the region, which would bring fiber-to-the-home services to all residents in the county. The model could become a blueprint for an innovative partnership that may be replicated throughout the state.

[248] https://bascomtelephone.com/community/latest-news/local-cooperatives-come-together-to-expand-broadband-access-in-rural-seneca-county/

Key players: Bascom (initiative sponsor and financial supporter), North Central Electric Cooperative (NCE) (initiative sponsor and financial supporter), BroadbandOhio (financial sponsor for middle-mile construction)

Funding source: Bascom and NCE funding; House Bill 2 of the 134th General Assembly for middle-mile construction support ($3 million)

5.3.2 Last-mile deployment

5.3.2.1 Ohio Residential Broadband Expansion Grant (ORBEG) program

Activities supported: The State of Ohio's ORBEG program, overseen by the Ohio Broadband Expansion Program Authority, supports the construction of broadband projects in unserved (less than 10/1Mbps speeds for ORBEG purposes) and underserved (between 10/1Mbps and 25/3Mbps for ORBEG purposes) areas of the state. Grants are awarded to ISPs to defray the construction costs of expanding broadband into unserved and underserved areas in Ohio, specifically for infrastructure costs and network-building efforts in areas that lack high-speed internet (minimum 25/3Mbps speeds for ORBEG purposes). The grants cover the "broadband funding gap," or the difference between the total amount of money that a broadband provider calculates as necessary to construct the last mile of a specific broadband network, and the total amount of money the provider has determined is the maximum amount that is cost-effective for the provider to invest in last-mile construction for that network.

The first round of applications for ORBEG opened on September 6, 2021 and closed on November 8, 2021.[249] Once an ORBEG application was submitted, and posted by BroadbandOhio on the program's website, a challenge could be submitted within 65 days. Challenges were due by January 12, 2022.[250] The first round of awards was announced on March 18, 2022.[251]

Expected outcomes: The first round of ORBEG funding of more than $232 million has been awarded to 33 projects submitted by 11 ISPs. These ISPs are expected to serve 43,797 households in 31 counties, 35,639 of which are presently unserved.[252] The first round of ORBEG also included a challenge process that gathered input from stakeholders to better understand the state's status quo for connectivity. This input supplements the view developed from other data sources, such as the FCC Map.

BroadbandOhio is currently applying for the U.S. Department of the Treasury Capital Projects Fund (CPF) to support a second round of ORBEG awards, which would augment BEAD broadband deployment efforts.

Key players: BroadbandOhio (administrator), Broadband Expansion Program Authority (supervising authority composed of the Ohio Department of Development, InnovateOhio, the

[249] https://broadband.ohio.gov/static/ohio-residential-broadband-expansion-grant-program-application-guide-10192021.pdf
[250] https://broadband.ohio.gov/static/challenge-process-12072021.pdf; https://broadband.ohio.gov/static/ohio-residential-broadband-expansion-grant-program-application-guide-10192021.pdf
[251] https://governor.ohio.gov/media/news-and-media/governor-dewine-lt-governor-husted-announce-new-broadband-expansion-projects-03182022
[252] https://governor.ohio.gov/media/news-and-media/governor-dewine-lt-governor-husted-announce-new-broadband-expansion-projects-03182022

House of Representatives, the Senate, and Governor appointees, respectively), awarded ISPs (subgrantees), and other ISPs (challenge process)

Funding source: House Bill 2 of the 134th General Assembly (for first ORBEG round), U.S. Department of the Treasury Capital Projects Fund (CPF) (pending, for second ORBEG round)

5.3.2.2 Cuyahoga County connectivity project

Activities supported: Through BroadbandOhio, the State of Ohio has collaborated with Cuyahoga County and PCs for People to provide in-home, high-speed internet access to roughly 25,000 Cuyahoga County households. Through this project, PCs for People will build a fixed-wireless network that can support approximately 20,000 suburban households across 77 census tracts where more than 20 percent of the population does not have home internet. In addition, a wired approach will be used for multi-dwelling units such as apartment buildings and complexes, adding up to 5,000 households to reach the network capacity of 25,000.

The project was announced on July 21, 2022.

Expected outcomes: The project supports infrastructure build-out to provide last-mile broadband connectivity to Cuyahoga County residents in neighborhoods that are some of the least connected in the county. The project will lead to the build-out of fixed-wireless broadband that will reach approximately 20,000 Cuyahoga households with affordable plans. The project will also build out wired connection to multi-dwelling units and reach an additional 5,000 households. It will provide internet services to these communities at a cost of $15 a month, and in some cases free of charge.

Key players: BroadbandOhio (initiative state sponsor), Cuyahoga County (initiative county sponsor), PCs for People (funding recipient and ISP)

Funding source: House Bill 2 of the 134th General Assembly ($9.7 million), Cuyahoga County matching funds

5.3.2.3 City of Dayton Department of Recreation broadband expansion

Activities supported: Through BroadbandOhio, the State of Ohio allocated $250,000 in funding to connect community recreation centers in the city of Dayton to high-speed internet. The funding will be used toward building the infrastructure necessary to create Wi-Fi systems at the following community recreation centers: Greater Dayton Recreation Center, the Lohrey Recreation Center, and the Northwest Recreation Center. These community recreation centers are open to the public and cost nothing to enter.

The project was announced on September 12, 2022.

Expected outcomes: This project will build the infrastructure necessary to help the City of Dayton Department of Recreation serve as a digital hub for the community. The project will allow the City of Dayton Department of Recreation to offer visitors Wi-Fi access to use their own electronic devices, create education resources for students using laptops, and provide educational support for afterschool and summer camp programming.

Key players: BroadbandOhio (initiative state sponsor), City of Dayton Department of Recreation (initiative local sponsor), Spectrum (ISP)

Funding source: House Bill 2 of the 134th General Assembly ($250,000)

5.3.2.4 East Cleveland connectivity project

Activities supported: Through BroadbandOhio, the State of Ohio has allocated financial investments for a broadband expansion project in the City of East Cleveland to provide residents with reliable, low-cost, high-speed internet. The funding will go toward building antenna towers, distributing antennas and modems to residents, and technical infrastructure.

The pilot project was announced and launched on April 7, 2021, with the first antenna tower activated on the roof of Mayfair Elementary School. Additional tower sites have been planned to go live in the coming months to increase service to the areas of the pilot program.

Expected outcomes: The pilot project will provide residents with reliable, low-cost, high-speed internet. It is aimed at connecting more than 1,000 households in its first phase, with plans to scale up access to 2,000 households. East Cleveland households will pay $15 a month for internet speeds of 50 Mbps for download and 10 Mbps for upload.

Key players: BroadbandOhio (initiative state sponsor); City of East Cleveland (initiative local sponsor); Cuyahoga County (financial supporter); Eaton Corporation (financial supporter); GE Lighting, a Savant company (financial supporter); Greater Cleveland Partnership (financial supporter); InnovateOhio (financial supporter); Microsoft (financial supporter); Case Western Reserve University (technical infrastructure assistance provider); Connect (technical infrastructure assistance provider); East Cleveland City Schools (technical infrastructure assistance provider); OARnet (technical infrastructure assistance provider); university hospitals (technical infrastructure assistance provider); PCs for People (financial supporter and ISP)

Funding source: $650,000 in financial investments from BroadbandOhio; Cuyahoga County; Eaton Corporation; GE Lighting, a Savant company; Greater Cleveland Partnership; InnovateOhio; Microsoft; and PCs for People (additional investments forthcoming)

5.3.2.5 Mt. Healthy connectivity pilot project

Activities supported: The State of Ohio, in partnership with Hamilton County, Mt. Healthy City Schools, the City of Mt. Healthy, and altafiber are working toward delivering fiber-enabled, high-speed public Wi-fi to the following apartment complexes: Clovernook Apartments, Compton Lake, Burney View, and Lake of the Woods. altafiber will also provide high-speed public Wi-Fi in Mt. Healthy City Park and the Central Business District of Mt. Healthy along Hamilton Avenue (from Kemper Avenue to Adams Road) and along Compton Road (from Hamilton Avenue to Clovernook Avenue).

The expansion project was announced on April 1, 2022. Lake of the Woods, Burney View, and the City Park were fully functional at the time of announcement. Clovernook and the Central Business District were under construction to be completed in approximately 90 days at the time of announcement.

Expected outcomes: The pilot project will provide high-speed internet to approximately 3,000 residents and create public hotspots around the city. The fiber-backed Wi-Fi build in apartment complexes specifically represents 828 apartment units that will have access to the newly built public Wi-Fi.

Key players: BroadbandOhio (initiative owner), Hamilton County (initiative local partner), City of Mt. Healthy (initiative local partner), Mt. Healthy City Schools (initiative local partner), Altafiber (initiative partner and ISP)

Funding source: House Bill 2 of the 134th General Assembly ($416,000)

5.3.2.6 Washington County/MARCS Tower pilot project

Activities supported: InnovateOhio, Ohio Department of Development, Ohio Department of Administrative Services (DAS), Washington County Commissioners, Fairfield Township Trustees, and Southeast Ohio Broadband Cooperative (SEOBC) launched a pilot to expand broadband to households in Washington County by granting SEOBC access to use Multi-Agency Radio Communications System (MARCS) towers, which will broadcast a signal to hundreds of previously unserved homes in range. MARCS towers are part of a statewide, wireless, digital communication network that allows emergency and law enforcement personnel to communicate instantly during emergencies.

The project was announced on October 4, 2021. Discussions of expanding the MARCS Tower pilot are ongoing, including discussions of tower analyses projects in Jackson County and Harrison County.

Expected outcomes: The first pilot project expanded broadband to hundreds of households in Washington County, and an additional 130 households are now able to maintain coverage after a local internet service provider planned to stop providing internet service to the area. Additional pilot phases in different counties could reach more households in need of broadband services.

The project will also serve as a model for leveraging MARCS towers in other parts of the state to expand high-speed internet access to unserved and underserved Ohioans, particularly those in the Appalachia region of the state. MARCS towers, which help emergency responders communicate in a crisis, were purchased with tax-exempt bonds, limiting the ability for private companies to co-locate equipment on the tower; however, the Ohio Department of Administrative Services (DAS) was able to convert these into taxable bonds, thereby eliminating this restriction. This working model could thus serve as a template for additional broadband expansion efforts leveraging MARCS towers.[253]

Key players: BroadbandOhio (initiative partner), InnovateOhio (initiative partner), Ohio Department of Development (initiative partner), Ohio Department of Administrative Services (DAS) (initiative partner), Washington County Commissioners (initiative partner), Fairfield Township Trustees (initiative partner), Southeast Ohio Broadband Cooperative (initiative partner and ISP)

Funding source: Ohio DAS in-kind contribution with MARCS Towers, House Bill 2 of the 134th General Assembly ($85,000)

5.3.2.7 State park lodges connectivity project

Activities supported: BroadbandOhio partnered with the Ohio Department of Natural Resources to connect the nine state park lodges with high-speed internet connectivity using OARnet infrastructure.

Expected outcomes: The effort enhanced the lodges' internet speed from as low as 50/10 Mbps speeds up to a gigabit. Faster speeds not only make lodges more competitive, but also allow lodges to be used in case of emergency, with use cases ranging from providing a field hospital or a temporary shelter to offering a place where people can go online when needed.

[253] https://governor.ohio.gov/administration/lt-governor/10042021

Key players: BroadbandOhio (initiative partner), Ohio Department of Natural Resources (initiative partner), OARnet (ISP)

Funding source: House Bill 2 of the 134th General Assembly ($2.73 million)

5.3.2.8 FCC availability challenges

Activities supported: BroadbandOhio has published and maintained a dedicated page on their website that provides step-by-step guidance, describes what to expect, and offers additional resources for Ohioans to submit challenges to the FCC availability map. The page includes a list of helpful documents, a video guide on how to submit an availability challenge, and additional web resources, including a link to the map.

For those who lack internet connectivity, BroadbandOhio has also mailed hard-copy response forms to collect more Ohioan input into the map.

Expected outcomes: By facilitating Ohio stakeholders' participation, the initiative has helped BroadbandOhio collect more accurate information to assess the status of the state's broadband availability. This information will in turn inform BEAD and subsequent broadband deployment efforts, as well as help to ensure that funds are leveraged efficiently to reach those most in need.

Key players: BroadbandOhio (initiative owner)

Funding source: House Bill 2 of the 134th General Assembly (for hard-copy response forms, $100,000)

5.3.2.9 Rural Digital Opportunity Fund project[254]

Activities supported: Winning bidders of the FCC RDOF auctions will leverage funding to bring high-speed, fixed broadband service to rural homes and businesses in census blocks that were entirely unserved by voice and broadband. The service will offer download speeds of at least 25 Mbps. ISPs were selected via an auction using a multi-round, descending clock auction format. Bidders indicated in each round whether they would bid to provide service to an area at a given performance tier and latency at the current round's support amount. Eligibility for participation was technologically neutral and open to new providers, and the bidding procedures prioritized bids for higher speeds (up to 1 Gbps).[255]

Expected outcomes: Approximately 191,000 locations were assigned in Ohio for auctions. Winning ISPs will receive funding to build out broadband connectivity in these unserved rural locations.[256]

Key players: Armstrong Telephone Company - Northern Division; CCO Holdings, LLC; Cincinnati Bell Inc; Hawaii Dialogix Telecom LLC; Mercury Wireless, Inc.; NexTier Consortium; Rural American Broadband Consortium; Rural Electric Cooperative Consortium; Windstream Services LLC, Debtor-In-Possession (winning bidder ISPs, broadband deployment implementer)

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[254] https://www.fcc.gov/document/auction-904-winning-bidders/attachment-b; https://www.fcc.gov/document/auction-904-winning-bidders/attachment-a. Funding amount and key players excludes LTD Broadband and Connect Everyone LLC (Starry), and their originally awarded amounts of $8,179,419.00 and $38,273,659.90, respectively, from the total awarded to Ohio of $ 170,038,205.10.

[255] https://www.fcc.gov/document/fcc-kicks-rural-digital-opportunity-fund-auction

[256] Figures include locations that were formerly awarded to Connect Everyone LLC and and LTD Broadband.

Funding source: Federal Communications Commission, Rural Digital Opportunity Fund ($123,585,126.20)

5.3.2.10 Wilberforce University Broadband Access project[257]

Activities supported: Wilberforce University's "Wilberforce University Broadband Access" project will expand broadband internet access on campus, create hybrid classrooms by upgrading the equipment and devices available for student and teacher use, establish new IT positions to support technological upgrades and provide Chromebooks to students, and open the campus library to members of the community so that they can use campus broadband services.

Expected outcomes: The project aims to address the significant gaps between the current state of broadband access and connectivity and the desired state of these increasingly foundational resources at Wilberforce University. As the nation's oldest private, historically black university owned and operated by African Americans, Wilberforce University's digital opportunity improvement will help to expand technology hubs, upgrade classroom technology, and increase digital literacy skills at minority-serving colleges and universities in Ohio.[258]

Key players: Wilberforce University (initiative owner and funding recipient)

Funding source: NTIA Connecting Minority Communities Pilot Program ($2,066,822.86)

5.3.2.11 Multi-County last-mile fiber

Activities supported: This project will enable the construction of fiber-to-the-home for 85,000 homes in Adams, Brown, and Clermont counties in Appalachia Ohio.

Expected outcomes: This project will blanket the counties with fiber-to-the-home so that all residents can receive adequate broadband in their homes. The project will also help connect Appalachian Ohio, which has traditionally had difficulty in deploying fiber due to high costs. Specifically, this project would provide 85,000 passes to homes in these distressed and rural counties, which would allow every home in the three counties to have adequate access to high-speed internet. The provider, Cincinnati Bell, is also an ACP provider and will offer affordable options to residents of these counties.

Key players: BroadbandOhio (initiative owner), Cincinnati Bell (subgrantee and initiative implementor)

Funding source: Coronavirus Capital Projects Fund (CPF) ($60 million, application results pending), Cincinnati Bell match (approximately $150 million)

5.3.2.12 Line extension program

Activities supported: This project will create a grant program through which people or providers can be reimbursed for line extension fees that exceed typical installation costs.

Expected outcomes: The project will help defray last-mile implementation costs for ISPs or end-consumers, thus enabling wider last-mile deployment and broadband availability.

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[257] https://www.internetforall.gov/news-media/biden-harris-administration-announces-more-175-million-internet-all-grants-61-minority

[258] https://www.internetforall.gov/news-media/biden-harris-administration-announces-more-175-million-internet-all-grants-61-minority; https://wilberforce.edu/about-wilberforce/

Key players: BroadbandOhio (initiative sponsor)

Funding source: Coronavirus Capital Projects Fund (CPF) ($10 million, application results pending)

5.3.2.13 Implementation of "Strengthening Ohio's Broadband & 5G Workforce" strategy[259]

Activities supported: Thanks to the significant public and private investments in broadband and 5G at the state and federal levels, the "Strengthening Ohio's Broadband & 5G Workforce" strategy is expected to create tens of thousands of jobs in Ohio over the next decade. To ensure that Ohio has a skilled, prepared workforce to fill these jobs, the strategy outlines a plan for increasing awareness of broadband industry careers and creating more training and education programs in the state. This strategy addresses three key issues:

- Increasing awareness of careers in the broadband industry by exposing middle and high school students to the industry through curriculum and internships, such as the High School Tech Internship Pilot Program
- Developing and supporting more education and training programs for Ohioans through activities such as identifying institutions and training providers to collaboratively develop plug-and-play, non-degree curriculum models, and creating a "Broadband & 5G Connectivity Center" housed at a large university with smaller nodes in select regions of the state
- Capitalizing on state and federal funding programs, like TechCred, Individual Microcredential Assistance Program (IMAP), and WIOA to help finance the education and training needed to supply talent for the broadband and 5G industry in Ohio.

The strategy calls for an Ohio Broadband & 5G Sector Partnership that will lead the implementation of the strategy's goals. The Sector Partnership is housed at The Ohio State University and is led by the Wireless Infrastructure Association (WIA) as the industry intermediary. WIA provides insight into the current gap in telecommunications skills and industry needs, and it ensures that the Sector Partnership's work aligns with the telecommunications industry. The Sector Partnership works to design and distribute curricula and training programs across the state and promotes career awareness to supply the industry with a skilled workforce.

Since the strategy launched in 2021, Ohio has announced 11 new programs across the state. These programs are located at career centers, colleges, and universities and will prepare participants for a variety of jobs in the telecommunications industry. The Sector Partnership will continue to lead the development and distribution of additional education and training programs across the state.

Ohio has committed through the Good Jobs Challenge $3 million in funding for the Sector Partnership's operations for calendar year 2024, including $300,000 for equipment to help support new programs across the state. Additionally, $9 million in QUEST funding from the U.S. Department of Labor will be budgeted to create regional nodes, or hubs, across JobsOhio's six-region map to support implementation of Ohio's strategy and to provide resources to local communities so they can create the talent pipeline needed for local businesses. The Ohio

[259] https://broadband.ohio.gov/news-and-events/all-news/2023-0124-husted-announces-grant-programs-to-support-ohios-broadband-5g-workforce

Department of Job and Family Services will post a competitive request for proposals on March 1, 2023, to select lead entities in several regions.

Expected outcomes: The strategy is aimed at developing a sufficient, highly skilled workforce to meet the demands of broadband deployment projects in the upcoming years. The Sector Partnership will continue to create and distribute broadband-related education and training programs and to work on advancing and scaling existing regional training programs. The partnership will also incorporate new elements into the instructional strategy and collaborate with local partners in effecting a regional roll-out. The regional nodes across the entire state will foster geographic spread so that all regions of the state can benefit from these workforce development programs. Ultimately, these efforts will help create a talent pipeline to ensure smooth broadband deployment (including BEAD efforts) and provide the training required to ensure the technical competency of the workforce supporting these projects.

Key players: Governor's Office of Workforce Transformation (initiative owner), BroadbandOhio (initiative owner), Ohio State University (initiative partner), Wireless Infrastructure Association (initiative partner), JobsOhio (initiative partner)

Funding source: Good Jobs Challenge ($3 million), U.S. Department of Labor QUEST funding ($9 million)

5.3.3 Broadband adoption and digital opportunity

5.3.3.1 State Digital Opportunity Program

Activities supported: The State of Ohio and BroadbandOhio are working to ensure that every Ohioan has access to high-speed internet. While broadband expansion projects have already increased access to high-speed internet across Ohio, affordability, access to connected devices, and digital literacy gaps have led to disparities among communities' use of this vital service.

Ohio is developing a statewide plan for achieving digital opportunity goals and closing the digital divide. Ohio's Digital Opportunity Plan will serve all Ohioans with an aim to promote meaningful adoption and use of high-speed internet service, with a special emphasis on low-income households, aging populations, incarcerated individuals, veterans, people with disabilities, people with language barriers, racial and ethnic minorities, and rural inhabitants.

As part of this planning process, BroadbandOhio established Regional Digital Inclusion Alliances (RDIAs) across five regions of the state (Northwest, Northeast, Central, Southeast, Southwest) to champion digital opportunity and inclusion locally and regionally. Regional Digital Inclusion Alliances will serve as collaborative partners to BroadbandOhio, bringing together diverse stakeholders to coordinate regional planning efforts, support digital inclusion activities, and collect local feedback to inform Ohio's Digital Opportunity Plan. In turn, BroadbandOhio will amplify local and regional digital inclusion successes and ensure that Ohio's plan meets all Ohioans' needs.

The State Digital Opportunity Planning process was kickstarted in February 2023 with a statewide Digital Opportunity Summit, where BroadbandOhio introduced regional leads for each RDIA and shared expectations for outreach and planning moving forward. Regional planning sessions are scheduled between February and April, and regional plans will be presented in Q2 2023. Funding for pilot projects will then be released, and the regional plans will be consolidated into the final State Digital Opportunity Plan in August 2023, to be submitted the next month.

Expected outcomes: BroadbandOhio and RDIAs will collect insights, opinions, and suggestions for the state's vision and strategies for achieving digital opportunity. This input will be critical to broadband deployment and adoption efforts such as BEAD.

Through these efforts, each region will build out regional digital opportunity plans, which will culminate in Ohio's Digital Opportunity Plan for the state. Pilot projects will support concrete actions toward bridging the digital divide and guide the state's future efforts for promoting digital adoption and opportunities across the state.

Key players: BroadbandOhio (SDEPG grantee and project lead), Regional Digital Inclusion Alliances (regional leads and collaborative partners of BroadbandOhio), regional and local stakeholders (initiative champions and supporters), pilot program subgrantees (pilot participants and beneficiaries)

Funding source: United States Department of Commerce, National Telecommunications and Information Administration, State Digital Opportunity Planning Grant Program

5.3.3.2 Broadband telehealth pilot project at Switzerland of Ohio School District in Monroe County

Activities supported: The first phase of the project (announced in March 2020) supported technology and infrastructure improvements throughout the district to allow for virtual mental health counseling services for students. The project created spaces within each school building that comply with federal regulations and accommodate live video and audio feeds, allowing students the opportunity to join in-demand, virtual counseling sessions during the school day. Phase one concluded in February 2021.

The findings from the pilot were developed into a "Telehealth in Schools Blueprint" to support other schools around the state as they work to duplicate this project and implement telehealth opportunities for their students.

Phase two of the pilot project connects the schools' existing fiber-optic network directly to the remote offices of mental health professionals so that students can have access to care and services beyond those of the two counselors who work in the district. The first such connection is with the pilot project partner, Southeast Healthcare Facilities.

The school district was also able to use a $500,000 grant from the Appalachian Regional Commission to extend broadband into the community as a last-mile connection point.

Expected outcomes: Switzerland of Ohio's school system currently contracts with two mental health counselors to offer in-person services to students. However, the district has over 2,000 students in eight buildings across 536 square miles, and poor cell phone coverage makes it difficult to reach counselors while they are traveling between schools. Their commute time can be as much as 60 minutes. Enabling telehealth solutions will not only save some of this lost time but also will provide mental health services at the moment they are needed. This new phase will further expand mental tele-health service offerings to students and extend last-mile connection to the community. The publication of the blueprint will share best practices to guide other school districts in launching similar telehealth projects and will amplify the success of the Monroe County pilot project.

Key players: InnovateOhio (initiative owner), BroadbandOhio (initiative owner), Ohio Department of Education (initiative partner), Ohio Department of Mental Health and Addiction Services (initiative partner), Ohio Department of Medicaid (initiative partner), Switzerland of Ohio School District (pilot participant)

Funding source: Ohio Department of Medicaid

5.3.3.3 Muskingum Valley Educational Service Center's school-based telehealth project in Appalachian Ohio [260]

Activities supported: This project will provide telehealth services to 15 Ohio school districts in six rural Appalachian counties, including Coshocton, Morgan, Muskingum, Perry, Noble, and Tuscarawas. Further, funding for the program will allow four school districts in the region to access telemedicine support for students with acute illness or chronic conditions through remote access to pediatricians and other providers.

The program was announced in May 2021.

Expected outcomes: The project aims to increase mental health services and healthcare access for rural southeastern and eastern Ohio students and families. The initiative will enable broadband expansion that will connect nearly 20,000 students to telehealth services.

Key players: InnovateOhio (initiative owner and financial supporter), BroadbandOhio (initiative partner), Muskingum Valley ESC (initiative partner), Appalachian Children's Coalition (initiative partner)

Funding source: InnovateOhio funding ($1.15 million)

5.3.3.4 Creative Housing

Activities supported: BroadbandOhio is partnering with Creative Housing, a non-profit organization dedicated to providing safe, accessible, and affordable housing to individuals with disabilities in the Columbus metropolitan area, to make homes more accessible for people with disabilities and the elderly.[261] BroadbandOhio is financially supporting internet connectivity for people who are on a DD (developmental disability) waiver, which provides specific Medicaid services to people with such disabilities. The project will allow recipients to use remote monitoring devices and an online platform that connects them to doctors and nurses who are trained to help people with DD.

Expected outcomes: The enhanced internet connectivity will bolster the use of the Creative Housing dedicated webpage, which could in turn facilitate the identification of the right support for individuals with DD. They will be able to access the services they need quickly and efficiently rather than having to explain their specific needs to providers who are not well-versed in developmental disabilities.

In the longer term, BroadbandOhio and Creative Housing intend to use the pilot's results to demonstrate that using remote supports along with an online platform improves outcomes for people with DD. While Medicaid used to pay for services that facilitated remote support, this funding has been discontinued, and Medicaid no longer pays for internet service to an individual's house. At the end of this pilot program phase, Creative Housing and

[260] https://innovateohio.gov/news/news-and-events/052621
[261] https://creativehousing.org/home/

BroadbandOhio hope to persuade Medicaid to reconsider its stance by publishing a report of the program's findings. These findings are expected to demonstrate that providing remote support and an online platform improves outcomes for people with DD.

Key players: BroadbandOhio (initiative owner), Creative Housing (initiative owner)

Funding source: House Bill 2 of the 134th General Assembly for financial support for student connectivity ($600,000)

5.3.3.5 Statewide K-12 telehealth administration with OCHIN

Activities supported: OCHIN, a nonprofit organization in equitable health care innovation and knowledge solutions, has been selected as Ohio's statewide telehealth administrator. OCHIN will help to expand crucial healthcare services for Ohio's K-12 students. As the state's telehealth administrator, OCHIN will assist BroadbandOhio in planning and developing blueprints that school administrators can use to connect students in their district with healthcare providers and counselors via real-time video-conferencing technology. The announcement was made in February 2023.

Expected outcomes: This initiative will help administrators in at least 10 districts to implement telehealth programs in their schools. Through telehealth, the project seeks to remove major barriers to healthcare access for students and to give more Ohioan students a direct line to the support they need. Moving forward, BroadbandOhio plans to establish a steering committee with other state agencies involved in launching school-based telehealth programs. This committee will oversee OCHIN's efforts.

Key players: BroadbandOhio (initiative partner), OCHIN (initiative partner), K-12 school districts (initiative partners)

Funding source: House Bill 2 of the 134th General Assembly ($2 million)

5.3.3.6 BroadbandOhio Connectivity Grant (shovel-ready school district project)

Activities supported: BroadbandOhio intends to continue the BroadbandOhio Connectivity Grant project from 2020 so that school districts can apply for money to fund school district-led projects that bring expanded connectivity where students and families have had very little broadband access. This project will be similar to the East Cleveland and Riverside buildouts that brought internet services to surrounding communities. The goal is to enable school districts to become "shovel-ready" to operate expanded broadband services autonomously after grant funding has been spent.

The grant was first announced in July 2020, and the first grant recipients were notified in September 2020.

Expected outcomes: This project would bring connectivity to a set of counties that have been unserved for several reasons, including a lack of funding for substantial broadband expansion at the school district level. With funding provided by the Coronavirus Capital Projects Fund (CPF), approximately 50 additional school districts could be connected at $200,000 per project. For example, Belpre School District could likely expand its current offering to reach 80 percent of its students for about $200,000.

As described above, BroadbandOhio has telehealth pilot programs underway in some Ohio school districts. Not only will these projects allow school districts to connect students for

schoolwork, but they can also help students' families and bring programs like telehealth to areas that need these services.

Key players: BroadbandOhio (initiative owner), Ohio Governor's Office of Appalachia (stakeholder), local providers (stakeholder), local governments (stakeholder), potential broadband customers (stakeholder), school districts (subgrantee and initiative implementor), Ohio Department of Education (initiative state supporter)

Funding source: Coronavirus Capital Projects Fund (CPF) (up to $7 million, application results pending)

5.3.3.7 Riverside Connectivity Pilot

Activities supported: The Riverside Local School District (RLSD) was awarded $121,172.93 in funding through BroadbandOhio Connectivity Grant program. RLSD used part of this funding to provide hotspots on school buses so that students without internet service at home can do their homework on the bus.

Additionally, RLSD used grant dollars to fund infrastructure that will not only provide high-speed internet access at schools and to students but also will serve the local community. BroadbandOhio, in partnership with InnovateOhio, collaborated with OARnet, WOCO (Western Ohio Computer Organization), and PCs for People to use fixed-wireless technology on school property to bring high-speed internet access to approximately 600 households in three surrounding towns: Logansville, De Graff, and Quincy. This innovative approach uses the school's infrastructure through OARnet to broadcast a wireless signal to surrounding communities through an antenna situated on a pole that overlooks the district's high school. Subscribers will pay a low upfront fee for a router as well as a low monthly fee of $15. RLSD is also subsidizing the cost of some units to help low-income households.

This innovative pilot project at Riverside Local School District provided a basis for the "Rural Community Point-of-Presence Blueprint," which aims to help other school districts in connecting students to broadband. The Riverside Connectivity Pilot is planned for expansion, with discussions ongoing to provide network coverage to surrounding communities. Planned services include a $0/month ACP internet service, technical installation support, and equipment support and warranty for onsite infrastructure and end-users.

The BroadbandOhio Connectivity Grant was launched in July 2020, and recipients were notified in September 2020. The pilot was announced in January 2021. PCs for People began to install relevant technology in the same month, and the program became operational by February 2021.

Expected outcomes: The program provided students with hotspots in school buses, and the pilot extended last-mile connectivity to local residents at a subsidized, affordable price. Now low-income households can access internet services at speeds that are twice the federal government's minimum definition of high-speed internet. Students can do their schoolwork remotely, and families can work from home. The resulting blueprint amplifies the success of the Riverside Connectivity Pilot and can serve as a best-practice guide for other school districts seeking to replicate it. The new expansion will reach more communities and extend internet service to those in need by leveraging fixed wireless networks.

Key players: BroadbandOhio (initiative partner), Riverside Local School District (initiative owner and pilot participant), InnovateOhio (initiative partner), OARnet (initiative partner, technological expertise provider, and ISP), Western Ohio Computer Organization (initiative

partner and technological expertise provider), PCs for People (initiative partner and technological expertise provider), American Tower (infrastructure provider for expansion phase)

Funding source: CARES Act (initial phase funding through BroadbandOhio Connectivity Grant, $121,172.93), House Bill 2 of the 134th General Assembly (for expansion, amount pending)

5.3.3.8 Butler County Rochester Hills student connectivity

Activities supported: BroadbandOhio partnered with Butler Tech and Altafiber to upgrade the copper internet infrastructure at the Rochester Hills trailer park to fiber-backed internet. This gives students living in the area access to a high-speed internet connection. Altafiber funded the fiber deployment project, while BroadbandOhio financially supported connecting the students to the service provided by Altafiber's infrastructure.

Expected outcomes: The entire community will have access to fiber-to-the-home services through the area where altafiber built out infrastructure. Every student who lives in Rochester Hills can receive free home internet service thanks to BroadbandOhio's financial support. This project leverages the infrastructure of a school district connected leveraging funding from ORBEG to support greater in-house connectivity for students in this area.

Key players: BroadbandOhio (initiative partner and connectivity subsidy provider), Altafiber (initiative partner, infrastructure builder and owner, ISP)

Funding source: BroadbandOhio, a division of the Department of Development, recently awarded the Butler County Educational Service Center with $95,000 in grant funding to bring high-speed internet to K-12 students living in the Rochester Hills mobile home community. Infrastructure for the project was provided by Cincinnati-based altafiber, with BroadbandOhio providing connectivity to the homes for a period of five years. Butler Tech and Monroe Local Schools were also enlisted to provide technical assistance and served as integral partners in the planning and implementation of the project.[262]

5.3.3.9 OSU Molly Caren precision agriculture project

Activities supported: BroadbandOhio is partnering with Ohio State University to create a fully operable smart field at the Molly Caren test facility near London, Ohio. The initiative will allow autonomous tractors, remote milers, remote grain bins, and other technologies to be tested in actual field conditions.

Expected outcomes: To bolster Ohio's strength and competitiveness in the agriculture industry, BroadbandOhio will leverage this pilot project and its results to promote an agricultural use case and to demonstrate what farmers can accomplish with the right technology. The partnership with OSU provides a place for showcasing the technology to both the state and the entire country at the Farm Science Review, which is hosted annually at the Molly Caren facility.

Key players: BroadbandOhio (initiative owner), Ohio State University (initiative owner)

[262] https://development.ohio.gov/home/news-and-events/all-news/2023-0424-broadbandohio-helps-close-digital-divide-for-students-in-butler-county

Funding source: House Bill 2 of the 134th General Assembly ($125,000)

5.3.3.10 Affordability and Digital Opportunity Grant

Activities supported: BroadbandOhio intends to create a new Affordability and Digital Opportunity Grant that will allow service providers to apply for funds to 1) make their service more affordable and 2) create a digital opportunity program. Specifically, the Affordability Grants will go towards the installation of infrastructure that will allow recipients to purchase internet plans that are fully covered by the Affordable Connectivity Plan. These internet services will provide speeds of at least 100 Mbps for downloads and 20 Mbps for uploads. For the digital opportunity piece of this project, internet service providers can partner with localities to assess the need for spaces where people can work, learn, and receive healthcare remotely. These spaces may be community centers or other public locations.

Expected outcomes: This project will allow ISPs to apply for grant funding to build infrastructure with the promise of offering internet packages that cost less than the ACP, or to assist in creating centers where people can learn, work, and receive healthcare remotely. The grant will help to balance availability, affordability, and digital opportunity by offering access to affordable plans across the state. Expanded broadband availability will also allow residents to leverage more digital opportunities.

Key players: BroadbandOhio (initiative owner), ISPs (sub-grantees)

Funding source: Coronavirus Capital Projects Fund (CPF) ($20 million, application results pending)

5.3.3.11 BroadbandOhio Community Accelerator Program

Activities supported: This new planning and capacity-building program helps communities to use past funding for broadband infrastructure to expand that infrastructure. The Accelerator program prepares communities to establish and implement a full-scale vision for broadband connectivity. Through more than 30 hours of free expert counseling provided by the Benton Institute and Ohio State University Extension, the program helps communities to set broadband goals, gather data, learn about available funding options, and target capital dollars to support implementation.

Expected outcomes: The BroadbandOhio Community Accelerator Program helps communities – especially smaller communities – to take advantage of past federal funding for high-speed internet. Promoting community participation will help to ensure that infrastructure dollars are spent efficiently and in the best interest of the communities they target. The project has launched its first cohort of four teams representing 11 Ohio counties.

Key players: BroadbandOhio (initiative owner), Heartland Forward (initiative partner and financial sponsor), Benton Institute (initiative implementation partner), The Ohio State University Office of Extension (initiative implementation partner), Team Defiance County (first-round participant), Team Shelby County (first-round participant), Team Tuscarawas County (first-round participant), Team Ohio Valley Regional Development Commission (OVRDC) (first-round participant)

Funding source: Heartland Forward, Connecting the Heartland initiative

5.3.3.12 FINDER tool

Activities supported: BroadbandOhio hosts the FINDER tool, an online digital asset inventory compiled from stakeholder input. The tool lists various statewide digital assets, including affordable computers and devices, free internet hotspots, and digital skills-training resources. The tool also lists locations for device donations to facilitate device refurbishment, which makes affordable devices more available. BroadbandOhio hosts the tool, compiles resource and service information collected from its information submission form and manages the asset inventory that supports the tool.

Expected outcomes: The FINDER tool is a convenient one-stop shop for people seeking digital resources and device-donation locations, which in turn helps Ohioans to leverage digital opportunities.

Key players: BroadbandOhio (initiative host and tool manager), Ohio constituents and stakeholders (resource information providers)

Funding source: BroadbandOhio administrative budget

5.3.3.13 Ongoing stakeholder engagement

Activities supported: BroadbandOhio hosts various stakeholder engagement activities, including Regional Digital Inclusion Alliances as part of its State Digital Opportunity Planning Grant efforts; the BroadbandOhio Alliance, which gathers input and shares best practices; and Broadband Expansion Authority Meetings, which oversee various state-led broadband projects.

Expected outcomes: The various stakeholder engagement activities will facilitate the creation of a broadband ecosystem in the state of Ohio by promoting the flow of ideas and best practices, as well as offering a channel to communicate and share recommendations for stakeholders. BroadbandOhio additionally has the Broadband Expansion Authority. This authority provides a platform for cross-agency coordination and alignment, which expedites broadband deployment and digital opportunities.

Key players: BroadbandOhio, various entities (see 3.2 Partnerships and 5.1 Stakeholder Engagement Process for more details)

Funding source: BroadbandOhio administrative budget

5.4 Key execution strategies

5.4.1 Execution strategies for achieving Ohio's broadband goals

The state of Ohio has identified execution strategies for each of its broadband goals (see 2.2 Goals and Objectives for details), including those that address affordability issues (per NOFO Requirement 10.e) and workforce issues (per NOFO Requirement 10.f). Strategies for each of the 11 objectives are outlined below.

5.4.1.1 Invest in last-mile infrastructure deployment

Ohio plans to bring reliable, affordable, high-speed internet to all Ohioans via a competitive grant process that encourages private-sector investment and only funds measures to close the broadband gap. We will:

- Access all available federal broadband funds, including BIL BEAD and the ARPA CPF fund, and provide any supplemental input needed to help Ohio service providers compete for USDA Reconnect and other federal funds

- Execute a competitive grant program to stimulate investment, using federal and state funding to fill any gaps
- Promote ACP uptake via partnerships with organizations that reach eligible populations, such as the Department of Education with its free lunch program and the Department of Aging
- Require subgrantees to offer low-cost plans to all ACP-eligible households in all locations they serve in Ohio, regardless of ACP funding. This requirement will make internet services more affordable within the state, in line with BEAD principles.

We expect that these efforts will allow all Ohioans to have access to an affordable plan for 100/20 Mbps speeds by 2030.

5.4.1.2 Expand middle-mile network to facilitate last-mile deployment

To expand the middle-mile network, we will leverage federal funding (Ohio Middle-mile Plan, Appalachian Regional Initiative for Stronger Economies) and public-private partnerships to extend the OARnet network (from Lake Erie toward Cincinnati along the Ohio River – 702 miles across 29 counties). This 'J'-shaped middle-mile route will expand OARnet's reach into unserved areas of the state while enhancing redundancy and resiliency. We will create open-access co-location and aggregation points along the routes so that last-mile providers can connect at market rates.

We expect these efforts to:

- Reduce the high cost of last-mile connections for end-users
- Enable more service providers to offer last-mile options, especially to the unserved and the 576,000 Ohio locations that have only one provider
- Extend access to more Ohio CAIs
- Increase network resiliency and redundancy
- Provide more options for non-discriminatory, wholesale middle-mile connectivity so that residents have more choices.

5.4.1.3 Remove barriers to deployment and asset use

Ohio has significant assets available to support broadband deployment. OARnet's 100-Gigabit-per-second fiber network is available to hospital systems, private companies engaged in research and development, select projects focused on economic development, and private data centers. The MARCS towers project lets ISPs broadcast via the publicly owned Multi-Agency Radio Communications System, allowing them to expand their reach into unserved areas.

To understand the obstacles that may prevent organizations from taking full advantage of these assets, we will launch a survey to identify regulatory pain points and existing assets that support deployment. We will ask the Common Sense Initiative to review regulations. We will then use this intelligence to develop a comprehensive plan to mitigate barriers and enable efficient deployment of reliable, affordable, high-speed internet. We will additionally facilitate coordination among state and local entities and internet service providers by creating "best practice" resources and compiling local contact information in partnership with ODOT.

Ohio is additionally exploring various means to standardize asset re-use. For instance, Ohio is in the process of seeking legislative approval for a make-ready cost subsidy program, which will lower the financial barrier for pole attachments during deployment. Ohio may also create a standard pricing list for using MARCS towers to encourage ISPs to leverage this state asset for

broadband deployment. Both efforts will help subgrantees to use existing state assets and thus reduce outlay from BEAD.

5.4.1.4 Keep pace with changing technology and demand

We anticipate that some broadband applications, such as digital agriculture, may soon require greater upload speeds than 20 Mbps. To keep up with the pace of change, we will establish a process for reviewing internet usage statistics yearly and updating speed standards for grants and permitting.[263] This process will enable us to:

- Ensure that all locations in Ohio have access to broadband that meets the highest standards of reliability, scalability, and security
- Track technological advances so that we can set new targets, even before federal mandates take effect.

We anticipate that BEAD deployment efforts leveraging fiber and licensed spectra will enhance Ohioans' access to today's highest technological standards. Ohio will make sure that subgrantees adhere to BEAD's requirements to regularly review NIST-compliant cybersecurity and supply-chain risk-management plans prior to receiving funds. This step will also strengthen the security and reliability of broadband deployment via BEAD.

5.4.1.5 Connect community anchor institutions to serve as digital hubs

To reach and support as many Ohioans as possible, we plan to fund projects that upgrade service to priority CAIs. That way, every community will have a connected CAI that offers free public Wi-Fi within five miles of every resident.

5.4.1.6 Expand telehealth access and usage via targeted programming

The benefits of expanding telehealth services in Ohio are substantial. We will pilot programs that use digital technology to integrate mental healthcare providers with primary care providers and first responders. For instance, telemedicine providers could connect remotely during primary care visits, health-related visits at schools, and crisis situations involving first responders. We will also launch outreach programs in partnership with trusted, local community groups to bring telehealth services where they are needed most (such as access points for outpatient services).

We will also collaborate with OCHIN as the State Telehealth Administrator to expand crucial healthcare services for Ohio's K-12 students. To do so, we will plan and develop blueprints that school administrators can use to connect students in their district with healthcare providers and counselors via real-time video-conferencing technology.[264]

We expect these efforts to make access to physical and behavioral healthcare easier and faster; to build trust and interest in using telehealth, thus increasing utilization rates; and to achieve more equitable health outcomes.

5.4.1.7 Expand access to remote education opportunities

We will partner with state agencies and OARnet to ensure that all Ohio schools have at least a 1 Gbps symmetrical internet connection. Ohio will also work toward identifying students who lack

[263] Example statistics sources that are publicly available and could potentially be leveraged include Cisco's annual demand forecasting and the Annual FCC Broadband Report.
[264] https://development.ohio.gov/home/news-and-events/all-news/2023-0215-broadbandohio-announces-selection-of-state-telehealth-administrator-to-expand-services-to-ohios-k-12-students

consistent access to high-speed internet connections and develop a plan to help these students maintain and sustain connectivity. Ohio will then leverage state and federal funds to provide subsidies for hotspots and digital devices for students who lack consistent access.

We expect these efforts to achieve several important outcomes:

- All students and teachers in Ohio will have access to reliable internet and internet-capable devices so that they may conduct digital learning in their homes and schools.
- Schools will leverage digital learning tools to enrich their curriculum and connect Ohio students to world-class resources.
- Enrollment and achievement will increase at Ohio's schools.

5.4.1.8 Support Ohio's farmers to improve productivity by enabling digital agriculture uptake

Through BEAD deployment efforts, we hope to extend broadband services to Ohio's farms so that 100 percent of them have high-speed internet. With this newly deployed network, we will facilitate the expansion and adoption of digital agriculture technologies and applications in rural communities. We plan to partner with Ohio State University's Digital Agriculture Department to conduct pilot projects that will implement digital agriculture use cases, such as smart irrigation and drone-assisted farming.

We expect these efforts to raise the availability and adoption of high-speed internet and digital agriculture use cases among Ohio's farms. This effort should ultimately increase agricultural revenue by reducing costs and improving harvests, and it will advance decarbonization by decreasing water and fertilizer use.

5.4.1.9 Enable safe and easy movement of people and goods via foundational investments to enable intelligent transportation systems

Through our partnership with ODOT, we will provide robust highway broadband access so that we can establish a second smart highway. Ongoing efforts include, for example, engineering analyses to support the establishment of the Lake-to-River Fiber Broadband Corridor along State Route 11. We will also commission a report that will explore the effectiveness of smart highways. We will seek to institute a policy that accelerates fiber deployment along roads during construction projects – by exploring dig-once policies, for example.

5.4.1.10 Support workforce development initiatives that connect Ohioans to broadband deployment and digital jobs

Ohio has set a multi-year strategy for developing a workforce with strong 5G and broadband capabilities. The strategy seeks to solve three key issues: lack of awareness of broadband careers, a shortage of education and training programs, and insufficient awareness of state and federal funding programs. The strategy calls for partnering with education and industry stakeholders to address all three issues. It intends to close digital opportunity gaps by developing the workers needed to execute the broadband plan and by promoting economic development through broadband-related and broadband-enabled employment opportunities. The implementation of this strategy is already underway; details can be found in 5.3 Planned Activities.

To meet the strategy's objectives, we will:

- Expand curricula and raise awareness of broadband-related occupations in middle and high school

- Connect state programs for broadband-related occupations (such as technicians and pole-climbers) to universities across Ohio to expand the execution of Strengthening Ohio's Broadband and 5G Workforce Strategy
- Partner with non-profit organizations and private companies to develop programs that will build workers' skills for digital jobs, including jobs that do not yet exist
- Promote opportunities for the remote work enabled by greater access to broadband and devices
- Encourage businesses to expand into and within Ohio to tap into the potential of newly connected workers, particularly in rural areas that previously lacked connectivity.

We expect these efforts to build a labor pool equipped to deploy and maintain the expanded broadband network. Additional coordination with subgrantees will ensure that the workforce employed for BEAD deployment will take advantage of skill-building opportunities, and that subgrantees support ongoing workforce efforts – by engaging in career awareness outreach, for example. These efforts will support programs that provide all Ohioans access to the devices, training, and tools needed to engage in the digital economy, access digital jobs, and capitalize on opportunities to work remotely.

5.4.1.11 Accelerate adoption, usage, and economic empowerment via Regional Digital Inclusion Alliances *(preliminary, to be detailed in the State Digital Opportunity Plan)*

To expand digital opportunities, in February 2023 Ohio established the Regional Digital Inclusion Alliances (RDIAs). The role of RDIAs is to convene diverse stakeholders who will coordinate regional planning efforts, support digital inclusion activities, and collect local feedback to inform Ohio's Digital Opportunity Plan in partnership with BroadbandOhio. BroadbandOhio promotes success stories about local and regional digital inclusion and ensures that the state's plan meets the needs of all Ohioans.

BroadbandOhio plans to provide grants to RDIAs to run pilots that promote broadband adoption, devices, and digital skills training. We will also encourage RDIAs to share best practices and celebrate successes. We will partner with universities to assess progress and opportunities across all dimensions of digital opportunity over time.

We expect these efforts to increase broadband adoption rates overall and among disadvantaged populations. We also anticipate boosting the percentage of Ohioans who have access to a laptop or computer and who have the skills needed to use the internet safely and effectively. We are committed to ensuring that all Ohioans have the digital devices and skills required to participate in the digital economy.

5.4.2 Additional execution strategies for the subgrantee process

Along with its key strategies to accomplish broadband-related goals, Ohio will implement strategies that facilitate compliance with BEAD requirements.

5.4.2.1.1 Participation by public-private partnerships and cooperatives

Ohio's existing constitutional and statutory authorizations allow various public entities to build public broadband infrastructure and provide service. However, the state of Ohio intends to leverage its ORBEG program as a structural umbrella for disbursing BEAD funds, and ORBEG excludes governmental or quasi-governmental entities from its definition of "broadband

provider." This exclusion restricts municipalities or municipal electric systems from participating.[265]

To comply with BEAD obligations to consider all provider types, Ohio is working to pass legislation that will allow federal requirements to prevail when federal and state regulations conflict. This step will waive ORBEG restrictions on municipal providers so that BEAD funding can be allocated. All municipal broadband providers – such as public-private partnerships and cooperatives – can then participate in the BEAD subgrantee application process and meet the needs of Ohioan residents in the areas where they operate, as noted in NOFO Section IV.B.3.b.

5.4.2.1.2 Fair labor standards and protections

Ohio will additionally adhere to BEAD-related requirements to enforce fair labor standards and protections. To that end, Ohio will explore including criteria in its subgrantee process that prioritize potential subgrantees with demonstrated records of compliance and plans to remain compliant with federal labor and employment laws. These criteria will ensure that all potential subgrantees submit relevant supporting materials attesting to their commitment to fair labor standards. Such materials may include, per the BEAD NOFO, a record of compliance with federal labor and employment laws in the past three years, plans to ensure their own and contractors' compliance with federal labor and employment laws, plans to ensure that their own and contracted workforces will be appropriately skilled and credentialed, and specific, forward-looking commitments to strong labor and employment standards and protections. These requirements will apply to new entrants into BEAD-funded projects to mitigate their lack of existing records of labor and employment law compliance.

5.5 Estimated timeline for universal service

The cost and timeline for reaching universal service considers not only the BEAD program but also other public funding projects aimed at broadband deployment. As shown in the analyses below in 5.6 Estimated Cost for Universal Service, Ohio may reach universal service from the total amount of financial funding available from BEAD and existing state and federal funding programs, as long as the state's deployment of BEAD funding is efficient and effectively encourages subgrantees to minimize BEAD outlay. Therefore, the estimated timeline for universal service assumes that considered funding programs would conclude by the time Ohio reaches universal service. Should the cost estimates differ, the timeline may vary as well.

BEAD subgrantees are required to finish network deployment within four years of receiving funds, with a potential extension of no more than 12 months. Per BEAD NOFO guidance and Ohio's submission dates, if we assume that final funding reaches ISP subgrantees by the end of 2025, deployment should conclude by the year 2029, with a potential extension into 2030 if circumstances warrant an extension per BEAD requirements.[266]

Other related public funding programs are also projected to end by the time BEAD concludes. Funding programs considered include ORBEG, RDOF, and CAFII. RDOF deployment is estimated to conclude by December 31, 2028.[267] The longest estimated timeline among ORBEG projects awarded in 2022 is five years, placing the estimated conclusion of deployment around

[265] See, for instance, the FAQ posted on BroadbandOhio's ORBEG webpage: https://broadband.ohio.gov/static/ORBEG-Frequently-Asked-Questions-11052021.pdf
[266] Assumes Initial Proposal is submitted in 2024, and first round of funding is disbursed in 2025.
[267] https://www.fcc.gov/document/rdof-eighth-authorization-public-notice

2027.[268] CAF II Auction 903 recipients are required to finish deployment within six years after the start of support, which translates to approximately 2025.[269]

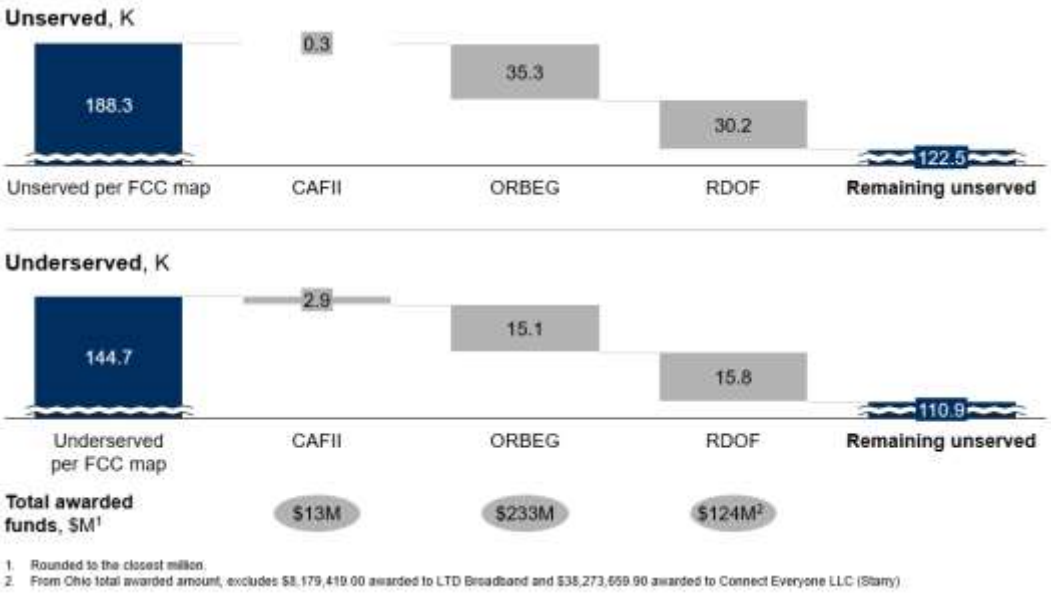
Barring significant variation between actual deployment costs and initial estimates (including factors listed in 5.6 Estimated Cost for Universal Service), Ohio is therefore estimated to reach universal service by the conclusion of BEAD in 2030.

5.6 Estimated cost for universal service

In estimating the cost for universal service in Ohio, we have used the following approach:

1. **Identify all unserved and underserved locations from the FCC Broadband Availability Maps.** As of January 31, 2023**,** the map identified 188,300 unserved locations and 144,678 underserved locations in Ohio.
2. **Exclude unserved and underserved locations that will receive funding from federal or state sources.** We have identified unserved and underserved locations that have received public funding for broadband deployment that would meet BEAD standards of broadband service. We assumed that these programs would successfully deploy broadband service in these areas and thus would not require additional BEAD funding. We have identified 65,812 currently unserved and 33,773 underserved BSLs with funding allocated from ORBEG, RDOF, and CAFII. The remaining 122,488 unserved and 110,905 underserved BSLs were assumed to require BEAD funding for broadband deployment.

Figure 39: Distribution of unserved and underserved locations[270]



[268] Awarded Application Spreadsheet, on BroadbandOhio webpage (https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1).
[269] Assumes support began in 2019. https://www.fcc.gov/auction/903#time
[270] FCC Broadband Availability Maps as of January 31st, 2023; RDOF results by state and winning bidder; BroadbandOhio ORBEG page; FCC CAFII results

3. **Determine investment cost and business case.** We have used CostQuest Associates' cost model to estimate network deployment costs and investment value for the subgrantee. For the network deployment costs, the model assumes that a network will be built to serve all locations in a service area, regardless of the current availability of broadband. We then assumed two build-out scenarios:

    a. **Greenfield build**, where all network component costs are included, and all components are assumed to incur a long-term incremental cost

    b. **Brownfield build**, where the model for fiber deployment removes middle-mile plants and most poles and conduits (relative to a greenfield build).

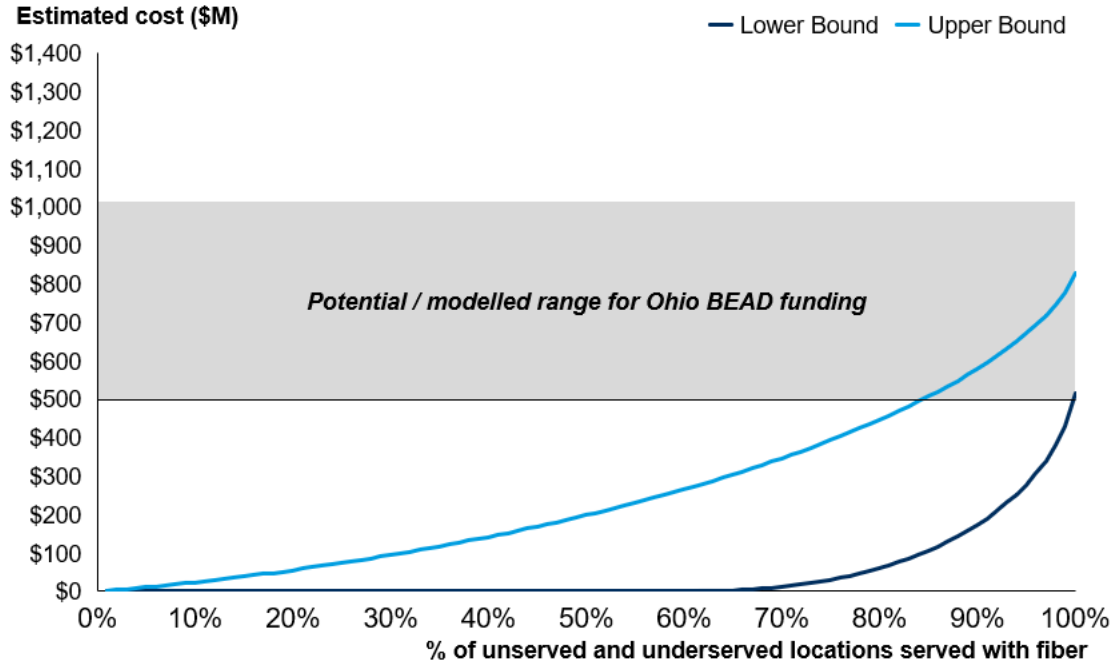
    The business case model calculates an estimated 20-year net present value for serving a BSL, assuming the average revenue per user (ARPU) is the average price of broadband services in the U.S. ($75), and that the take rate is 70 percent. The model also leverages various cost data from the FCC's CACM/A-CAM efforts, such as operating cost estimates and retirement curves for capital replacement. The NPV calculation is used to estimate potential subgrantee matches. The NPV of future cash flows reflects the assumed business case for the subgrantee, wherein a positive NPV is interpreted as a positive business case, and a negative NPV is interpreted as a deployment project in which the subgrantee will not have a sustainable business case and would thus require subsidies to attract investment.

4. **Estimate upper and lower cost range to provide universal service** as follows:

    a. **Upper bound**: The upper bound for costs is the total greenfield investment required to provide fiber access to all un- and underserved locations. The model estimates that it would require approximately $830 million to serve all unserved and underserved locations with fiber.

    b. **Lower bound**: The lower bound is the estimated subsidy required to bring the 20-year net present value of future cash flows to $0 for BSLs with negative NPVs. This estimate assumes brownfield fiber-build costs for BSLs in census blocks with fiber and greenfield fiber-build costs for BSLs in census blocks without fiber. The model estimates that it would require approximately $515 million to serve all unserved and underserved locations with fiber.

Figure 40: Estimated BEAD subsidy for fiber buildout to unserved and underserved locations, without buffer, upper and lower bounds[271]

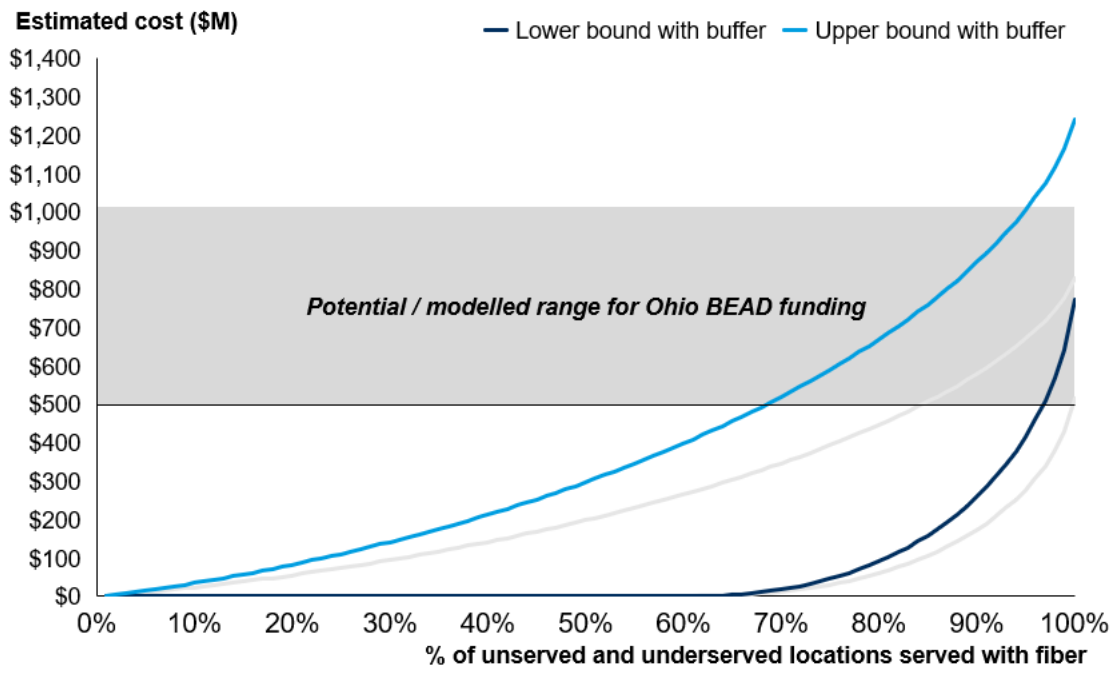


5. **Incorporate expected cost pressures.** To account for dynamic factors that may impact the cost estimates, the analysis added a 50 percent buffer to the upper and lower bounds. Expected cost pressures include labor cost increases due to rising demand nationwide for broadband buildout in a tighter labor market; a changing economic context as interest rates continue to increase since the federal legislation was passed; increased material costs due to supply chain bottlenecks; a nationwide network build and Buy America Act requirements; discrepancies in network design; lower adoption rates; high permit and make-ready costs; and feasibility in asset re-use to defray costs.

   Costs may rise further if additional BSLs to be served are identified when the state challenge process gets underway. Moreover, if existing funding program subgrantees fail to successfully deploy broadband to awarded locations, additional addresses may subsequently require more funding.

[271] FCC Auction 904 RDOF Data, FCC CAF II awardee data, ORBEG Awardee Addresses 2022, FCC Broadband Availability Maps as of January 31st, 2023

Figure 41: Estimated BEAD subsidy for fiber build-out to unserved and underserved locations, with buffer, upper and lower bounds[272]



Our analysis suggests that the upper and lower bounds of required BEAD funding for deployment are approximately $772 million and $1,242 million, respectively. This cost currently does not include the estimated BEAD funding required to serve CAIs. It also excludes the impact of potential middle-mile build-out, should middle-mile grants be awarded by the BIL Middle-Mile program, proposed ARPA CPF projects, and the ARISE middle-mile plan.

6. **Account for already allocated federal and state funds.** Funding received by Ohio applicants from the above-mentioned programs includes approximately $124 million for RDOF, $233 million for ORBEG, and $13 million for CAF II, totaling approximately $370 million.[273,274,275]

When all funds – both allocated and modeled – for unserved and underserved locations are combined, the estimated deployment cost of reaching universal service in Ohio ranges between ~$1.142 billion and ~$1.612 billion.

[272] FCC Auction 904 RDOF Data, FCC CAF II awardee data, ORBEG Awardee Addresses 2022, FCC Broadband Availability Maps as of January 31st, 2023
[273] https://www.fcc.gov/document/auction-904-winning-bidders. From Ohio total awarded amount, excludes $8,179,419.00 awarded to LTD Broadband and $38,273,659.90 awarded to Connect Everyone LLC (Starry). Numbers from RDOF results by state and winning bidder.
[274] From Awarded Applications Spreadsheet information. File found in https://broadband.ohio.gov/grant-opportunities/grant-opportunities-1/grant-opportunities-1
[275] From Connect America Fund Phase II Auction (Auction 903) results page (https://www.fcc.gov/auction/903), award amount by state found here.

5.7 Alignment

5.7.1 Alignment with Existing Broadband Plans

The State of Ohio announced the Ohio Broadband Strategy in 2019, which outlined its first set of vision and goals for the state's broadband connectivity. Over the past years, the State of Ohio has completed most of its original goals, including the establishment of the Office of BroadbandOhio under the Ohio Department of Development. Subsequently, the state has recently developed a its 2023 Broadband Strategy, which has shaped its BEAD Five-Year Action Plan. The visions, goals, and objectives from the state's Broadband Strategy are outlined in the BEAD Five-Year Action Plan, and BEAD implementation effort are guided by the strategic pillars that are described in the 2023 strategy.

5.7.2 Alignment with the State Digital Opportunity Plan

Ohio's BEAD five-year action plan was developed in close coordination and collaboration with the BroadbandOhio's Digital Equity manager. And BEAD-SDOP stakeholder engagement was conducted with both the Digital Equity manger, and the RDIAs. The State Digital Opportunity Plan, which is still in development, is aligned to and will further build on and detail the state's digital opportunity priorities and plans.

5.7.3 Alignment with other State priorities

In this section we outline key areas where broadband and digital opportunity are critical enablers of other Ohio agency strategies and priorities.

5.7.3.A Economic Development

JobsOhio: Founded 11 years ago, JobsOhio is a first-of-its-kind private economic development corporation that invests in Ohio's prosperous future, catalyzing high-growth business investments and job creation that are driving the state's ingenuity and ambitions forward.[276]

Broadband is essential to achieving economic development in Ohio and unlocking innovation. Broadband is not only considered critical infrastructure in attracting businesses to the state but is also a critical resource in attracting workers in remote roles. JobsOhio has been working in alignment with the Ohio Administration to significantly expand broadband coverage throughout the state, with the understanding that broadband coverage in Ohio would boost the economy. For instance, JobsOhio has supported the Starlink pilot program to provide satellite broadband service to central Ohioans, and partnered with Agile Networks to create Digital Access Ohio, a company dedicated to expanding high-speed internet services in traditionally underserviced areas by building, owning, and operating new fiber-backed infrastructure and partnering with local internet providers. Digital Access Ohio plans to erect 75 new broadband towers in Southeast Ohio over the next 5 years. Both of these projects are key initiatives delivered in partnership with BroadbandOhio to promote internet provision across the state.[277] Additionally, JobsOhio designated technology, cybersecurity, and advanced mobility as some of their target

[276] https://cdn.bfldr.com/AHJE351Z/at/msh33fjnvsscpsfmkw7q9mz/JobsOhio-2022AnnualReport-web.pdf
[277] https://www.jobsohio.com/digital-access-ohio

industries for economic development.[278] Toward investment attraction in this sector, JobsOhio is making significant investments, including workforce training via Ohio To Work.[279]

5.7.3.B Healthcare

Ohio Department of Health: Ohio Department of Health lists "Access to care" as one of 3 priority factors for the 2020-2022 State Health Improvement Plan (SHIP). 2 out of 3 opportunity areas within it – "Local access to healthcare providers" and "Unmet need for mental health care" – highlights enabling adoption of telehealth as one of the key strategies to achieve this goal. [280]

Toward this goal, Ohio Department of Health plans to help bolster telehealth adoption throughout the state by leveraging its telehealth efforts, existing network, and newly augmented statewide connection. The state of Ohio, through its partnership with OCHIN, will also invest in initiatives toward expanding telehealth in schools, to connect students with healthcare providers and counselors via real-time video conferencing.

Ohio Department of Developmental Disabilities (DODD): The Ohio Department of Developmental Disabilities' mission is to "[oversee] a statewide system of supportive services that focus on ensuring health and safety, supporting access to community participation, and increasing opportunities for meaningful employment."[281] The Department's 2022-2023 Strategic Plan includes "[i]mprov[ing] the coordination and delivery of services that promote positive outcomes for Ohioans with developmental disabilities and their families" as one of its three strategic goals, and lists "[e]empower[ing] individuals to live and thrive in their communities through investments in housing, technology, and employment services" as one of its supporting objectives.[282] Toward this goal, the Ohio Department of Developmental Disabilities plans to support BroadbandOhio reach relevant population segments for targeted adoption-related efforts. The Ohio Department of Developmental Disabilities additionally plans to help bolster telehealth adoption throughout the state by leveraging its telehealth efforts, existing network, and newly augmented statewide connection.

5.7.3.C Education

Ohio Department of Education (ODOE): ODOE's *Each Child, Our Future*, Ohio's Strategic Plan for Education, lists four key learning domains that support the strategy: Foundational Knowledge and Skills; Well-Rounded Content; Leadership & Reasoning; and Social-Emotional Learning. The ODOE's description of "Foundational Knowledge and Skills" states that "[e]ach child must know how to critically read, write, work with numbers and leverage technology to maximize access to future learning experiences." Foundational knowledge and skills — and technological skills in particular — are additionally listed as one of the key attributes of a high school graduate, defining "basic skills in mathematics, English language arts and technology" as

[278] https://www.jobsohio.com/industries/technology; https://www.jobsohio.com/industries/technology/cybersecurity; https://www.jobsohio.com/industries/advanced-mobility
[279] https://www.jobsohio.com/programs-services/talent; https://www.ohiotowork.com/; https://www.jobsohio.com/programs-services/innovation/innovation-districts
[280] https://odh.ohio.gov/static/SHIP/2020-2022/2020-2022-SHIP.pdf
[281] https://dodd.ohio.gov/about-us
[282] https://dodd.ohio.gov/wps/wcm/connect/gov/80a6064d-5c24-4670-a1db-2553e06371e7/Strategic+Plan+2022-23+Full.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K9I401S01H7F40QBNJU3SO1F56-80a6064d-5c24-4670-a1db-2553e06371e7-nX6iO-m

"the building blocks that enable future learning" and "[s]pecific to technology, the graduate will understand its global impact and use it to design solutions, communicate ideas and share information."[283] More specifically, ODOE's 3rd key strategy in the document specifies the importance of "[i]mprov[ing] targeted supports and professional learning so teachers can deliver excellent instruction today, tomorrow and throughout their careers," highlighting the importance for providing educators "access to options for delivering the best digital and personalized learning."[284]

Toward this goal of enhancing students' technical skills and digital opportunities, ODOE has spearheaded various efforts including its collaboration with T-Mobile and Connectivity Champions in the Ohio T-Mobile Project 10Million, which provides free hotspot to qualifying students as an effort to bolster student connectivity. Ohio Department of Education additionally plans to support BroadbandOhio reach relevant population segments (e.g., SNAP-eligible students) for targeted adoption-related efforts.

Ohio Department of Higher Education (ODHE): The Ohio Department of Higher Education has multiple strategic efforts that can support BEAD. This includes OH-TECH, which is an umbrella organization for Ohio's statewide technology infrastructure organizations, funded by ODHE: the Ohio Academic Resources Network (OARnet), the Ohio Supercomputer Center (OSC), and the Ohio Library and Information Network (OhioLINK). OH-TECH and its member organizations support higher education in Ohio by providing students, faculty, and institutions with affordable access to digital research collections, broadband internet services, and high-performance computing resources. These services are critical for workforce development and fostering innovation in the Ohio economy.[285]

ODHE additionally supports various programs aimed at equipping Ohioans with digital or technology skills, which could be bolstered by BEAD's broadband deployment and in turn enable BEAD's digital opportunity efforts. In fact, Complete to Compete Ohio, a public-private coalition aimed at raising awareness, collaborating, and providing technical assistance for greater attainment of high-value credentials and postsecondary degrees, noted the importance of "[i]ncreas[ing] affordable broadband access to unserved and underserved areas in Ohio to improve and expand effective online learning opportunities for students" in its recent action plan.[286] ODHE already has a number of programs that could capitalize on these broadband-enhanced learning opportunities, including:

- Choose Ohio First Scholarship, which provides funding to Ohio's colleges and universities to award scholarships to students desiring a certificate, associate degree, baccalaureate degree, or graduate degree in eligible STEM and STEM education fields[287];
- State Committee on Computer Science (SCCS), led jointly by ODOE and ODHE to make Ohio a national leader in computer science education and workforce pipeline[288];

[283] https://education.ohio.gov/getattachment/About/EachChildOurFuture/Final-Strategic-Plan-Board-Approved.pdf.aspx?lang=en-US
[284] Ibid.
[285] https://highered.ohio.gov/about/odhe-overview/oh-tech
[286] https://www.completetocompeteohio.org/ ; https://completetocompeteohio.org/wp-content/uploads/Bridging-Ohios-Workforce-Gap-Attainment-Plan-August-2020.pdf
[287] https://highered.ohio.gov/initiatives/affordability/choose-ohio-first/cof-overview/cof
[288] https://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Computer-Science/Resources-for-Computer-Science/State-Committee-on-Computer-Science/SCCS-report_FINAL-09-06-22-1.pdf.aspx?lang=en-US

- Ohio Educational Technology Conference (OETC), one of the premier P-20 state educational technology conferences in the country that offers a wide variety of sessions, displays, demonstrations, and learning experiences designed to showcase best practices, introduce innovative teaching strategies, explore interactive classroom environments, and highlight the implementation of new technologies to empower more effective teaching and learning;[289]
- Regionally Aligned Priorities in Delivering Skills (RAPIDS), an initiative that works toward strengthening the connections between the availability of high-quality talent and the attainment of economic development goals to bolster and diversify the state's economy; the ODHE makes equipment investments to develop and support workforce development initiatives at postsecondary institutions focusing on furthering the career aspirations of students and the economic growth of businesses in the region in core areas including Advanced & Additive Manufacturing, Healthcare, Information Technology, Cloud Manufacturing, and Smart Building Automation[290]

Toward BEAD, the Ohio Department of Higher Education plans to bolster deployment efforts with its OARnet assets, accelerate broadband-enabled talent development through its various STEM-related programs, and support CAIs to serve as digital hubs by leveraging OH-TECH's infrastructure and technical knowledge.

5.7.3.D Workforce Development

Ohio Governor's Office of Workforce Transformation (OWT): The Ohio Governor's Office of Workforce Transformation's mission is to connect Ohio's business, training, and education communities to build a dynamically skilled, productive, and purposeful workforce.[291] The OWT, jointly with BroadbandOhio, prepared the "Strengthening Ohio's Broadband & 5G Workforce" Strategy aimed at addressing labor needs for broadband and 5G.[292] The OWT additionally offers various workforce training programs that could help address the labor needs identified above as well as promote digital opportunities to more Ohioan residents. Examples include TechCred, which reimburses employers up to $2,000 for training costs incurred when one of their employees earns a short-term, industry-recognized technology credential; and the Individual Microcredential Assistance Program (IMAP), which helps Ohioans who are low income, partially unemployed, or totally unemployed participate in a training program to receive a credential at no cost.[293]

The workforce strategy, overseen jointly by OWT and BroadbandOhio, is Ohio's key initiative that will directly support BEAD by addressing potential labor gaps that broadband deployment efforts may face, leveraging existing state assets and programs to upskill and reskill Ohio's workforce adequately to meet new broadband labor demands. With the Office of Workforce Transformation, BroadbandOhio will continue to deploy the "Strengthening Ohio's Broadband & 5G Workforce" Strategy to mitigate potential labor shortage issues.

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[289] https://oetc.ohio.gov/
[290] https://highered.ohio.gov/initiatives/workforce-development/rapids; https://highered.ohio.gov/wps/wcm/connect/gov/8b0c1477-6f01-43b0-ab1f-95cc7073329c/RAPIDS_project-overview_FINAL_100819.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K9I401S01H7F40QBNJU3SO1F56-8b0c1477-6f01-43b0-ab1f-95cc7073329c-okiaOFo
[291] https://workforce.ohio.gov/about
[292] https://broadband.ohio.gov/explore-broadband/strengthening-ohios-broadband-5g-workforce
[293] https://techcred.ohio.gov/; https://workforce.ohio.gov/initiatives/initiatives/imap/imap

Ohio Department of Job and Family Services: The ODJFS is responsible for managing various vital programs that directly impact the lives of Ohioans. These include cash and food assistance, job training and employment services, childcare, unemployment insurance, children services and adoption, adult protective services, and child support programs. ODJFS' mission is to support the well-being of Ohioans by strengthening families and promoting economic stability.[294]

ODJFS' existing efforts for job training and employment services have been leveraged as part of the state's effort to address potential labor gaps for BEAD deployment. For instance, ODJFS offers the Comprehensive Case Management and Employment Program (CCMEP), an innovative program that can help low-income young adults between the ages 14 to 24 build career paths, find employment and break the cycle of poverty.[295] The program has been cited in the "Strengthening Ohio's Broadband & 5G Workforce" strategy as a vehicle to bolster youth awareness in broadband-related careers.[296] As part of the strategy, ODJFS additionally received $9M from the Department of Labor from the QUEST fund, raise awareness about broadband and manufacturing careers, recruit under-represented populations into these industries, fund new training programs (e.g., infrastructure, curricula development), and provide workforce services for QUEST participants, including career and supportive services, training (e.g., classroom tuition), and work-based learning (e.g., apprenticeships, work experience).[297] In an ODJFS CCMEP Implementation Managers Meeting on October 2022, CCMEP providers were informed to notify youth of broadband careers and training programs, establish work experiences with broadband companies, fund costs for training if not already fully funded, and provide wrap-around services to enhance the success of participants in broadband training or employment.[298] ODJFS's efforts in broadband workforce development have thus been supporting BEAD efforts by addressing potential labor gaps.

During an interview, the ODJFS representative noted additional synergies between the Department's efforts and BEAD implementation, such as bolstering home-based childcare centers via better connectivity and aiming to support same target populations, such as residents eligible for SNAP and Medicaid. BroadbandOhio and ODJFS could collaborate to support targeted outreach to residents in need of affordability solutions by connecting BroadbandOhio with other programs that work with ACP-eligible households.

5.7.3.E Agriculture

Ohio State University: Ohio State University Department of Food, Agricultural and Biological Engineering (FABE) lists digital agriculture and precision agriculture as one of its core research sub-topics within its Plant and Animal Production Engineering division. The Digital Agriculture program ranges from precision seeding and crop management to remote sensing, apps for agriculture, and data management.[299]

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[294] http://www.odjfs.state.oh.us/forms/num/JFS08017/pdf/
[295] https://jfs.ohio.gov/factsheets/CCMEP-fact-sheet.stm
[296] https://broadband.ohio.gov/wps/wcm/connect/gov/7bb60dea-a273-4622-9d0c-67e7201a8016/Strengthening-Ohios-Broadband-5G-Workforce-09072021.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K9I401S01H7F40QBNJU3SO1F56-7bb60dea-a273-4622-9d0c-67e7201a8016-odHJMRH
[297] https://workforce.ohio.gov/news/011323; https://jfs.ohio.gov/owd/CCMEP/docs/CCMEPOctober2022Webinar.stm
[298] https://jfs.ohio.gov/owd/CCMEP/docs/CCMEPOctober2022Webinar.stm
[299] https://fabe.osu.edu/research/plant-and-animal-production-engineering; https://digitalag.osu.edu/precision-ag

BroadbandOhio and Ohio State University have collaborated on the field of digital agriculture, including the OSU Molly Caren Precision Agriculture Project. BroadbandOhio and OSU plans to continue its partnership to conduct additional pilot projects focused on new digital agriculture use cases. Expanded broadband access will also enable more farms to implement digital agriculture, providing increased access to real-time data and analytics for improved herd health and crop forecasting.

5.7.3.F Transportation

Ohio Department of Transportation: In its statewide broadband access report with InnovateOhio on September 24, 2019, the Ohio Department of Transportation (ODOT) listed as one of its 5 goals "[e]nabl[ing] next-generation transportation capabilities, including autonomous vehicles, smart roadways and transportation systems, and creation of an integrated data exchange for transportation users, partners, developers and providers."[300] In the report, ODOT additionally noted that many rising transportation-related technologies, such as connected and autonomous vehicles, "require a robust internet connection to function, and numerous respondents discussed how they wanted to be a part of deployments to meet this need" and that "[i]t is clear that numerous companies are interested in utilizing existing ODOT infrastructure to increase connectivity for transportation needs."[301]

ODOT's initiatives toward this demonstrated need include DriveOhio, the state's hub for smart mobility technology on the ground and in the air. The DriveOhio mission is to create pathways for the use of smart mobility technologies that increase safety, enhance mobility, expand access, and attract, prepare, and retain Ohio's talent.[302] DriveOhio's current portfolio includes automated vehicle, connected vehicle, electric vehicle, and advanced air mobility efforts. DriveOhio's projects include the 33 Smart Mobility Corridor, a 35-mile stretch of U.S. Route 33 equipped with fiber optic cable and roadway sensors that instantaneously link researchers and traffic monitors with data generated from communication units installed in vehicles and along the roadway, serving as a real-world proving ground for automated and connected vehicle technology.[303]

Ohio Department of Transportation, with its DriveOhio efforts, plans to pilot smart transportation technology research and deployment to unlock greater digital transportation opportunities. ODOT also plans to partner with BroadbandOhio to further streamline rights-of-way, such as by providing best practices for counties and cities in development of right-of-way processes and timelines.

5.7.3.G Aging

Ohio Department of Aging (ODA): The ODA 2023-2026 State Plan on Aging regularly develops a strategic framework to provide leadership that improves and promotes quality of life and personal choice for older Ohioans, adults with disabilities, and their families and caregivers. The most recent version, stretching between the fiscal year of 2023 - 2026, outlines 6 State Plan Priorities: Community Conditions, Healthy Living, Access to Care, Social Connectedness, Population Health, and Preserving Independence. The "Access to Care" priority lists, among

[300] https://www.dot.state.oh.us/Divisions/ContractAdmin/Contracts/PurchDocs/601-20a.pdf
[301] Ibid.
[302] https://drive.ohio.gov/home
[303] https://drive.ohio.gov/programs/av-cv/33-smart-mobility-corridor

others, telehealth as one of its strategies to achieve this goal. Specifically for priority populations, the ODA lists leveraging "Virtual services, as applicable and allowable, to increase access to care" as one of its considerations for elder justice and equity. The document also highlights key COVID-19 considerations that will inform the implementation of State Plan strategies, and the list of considerations note that "Adequate internet and technology access are crucial to allow for virtual engagement through telehealth, online web platforms, and other technologies."

Ohio Department of Aging plans to leverage increased access to and adoption of broadband to expand the use of assistive technologies among aging populations. Example use cases include telehealth, digitized medical records, digital communication tools, wearables, and assistive connected devices. Ohio Department of Aging also plans to leverage existing programs (e.g., OSHIIP) and one-to-one relationships to expand awareness of ACP and digital literacy programs among eligible populations.

5.7.3.H Natural Resources

Ohio Department of Natural Resources (DNR): Ohio Department of Natural Resources is partnering with BroadbandOhio to expand the "Campfire Connect" program to increase free public Wi-Fi access at state parks that do not have entrance fees for day access. Ohio Department of Natural Resources may also partner with BroadbandOhio to deploy last mile broadband using the MARCS towers on DNR lands.

5.7.3.I Other

Ohio Department of Administrative Services (DAS): The Ohio Department of Administrative Services provides innovative solutions and supports the efficient operation of state agencies, boards and commissions.[304] As one of the four key divisions of the DAS, the Office of Information Technology (OIT) delivers enterprise information technology and telecommunication services, as well as IT policy and standards, lifecycle investment planning, and privacy and security management.[305] OIT's Infrastructure Services Division operates the IT infrastructure for the state, including the Multi-Agency Radio Communication System (MARCS).[306] The Ohio Department of Administrative Services plans to help bolster efficient BEAD deployment via enabling re-use of its physical assets, including MARCS Towers.

Ohio Public Library Information Network (OPLIN): OPLIN provides broadband internet connections and related information services to Ohio public libraries. OPLIN's primary mission is to ensure that all Ohio residents have fast, free public internet access through the 251 independent local public library systems in Ohio, as well as the use of high-quality research databases not freely available online.[307] OPLIN's FY2023-FY2025 Strategic Plan sets 2 priorities — Maintain public connections to digital information sources, and Facilitate finding, retrieving, and sharing digital information. Each priority has 2 strategies to achieve these goals: (1a) Provide and maintain safe and reliable internet connections to Ohio public library systems, (1b) Offer to assist Ohio public library systems with internal internet needs, (2a) Provide and maintain access to high-quality digital information for Ohioans, and (2b) Offer to assist Ohio

[304] https://das.ohio.gov/about/about-us/about-us
[305] https://das.ohio.gov/static/about/about-us/Annual percent20Report percent202022-web percent20version.pdf
[306] https://das.ohio.gov/about/office-of-information-technology
[307] https://www.oplin.ohio.gov/about

public library systems with digital communications and digital literacy training. OPLIN's strategies span across providing reliable internet connections, technical support to connect libraries, and offering digital courses to bolster libraries to serve as digital hubs.[308] Toward this mission, OPLIN owns and maintains the physical network that is used to connect libraries to broadband Internet.[309] OPLIN thus has existing infrastructure and digital skills programs that could be leveraged to provide better connectivity to CAIs and enable them as regional digital hubs.

Ohio Housing Finance Agency: The Ohio Housing Finance Agency (OHFA) facilitates the development, rehabilitation, and financing of low- to moderate-income housing. The Agency's programs help first-time homebuyers, renters, senior citizens, and others find quality affordable housing that meets their needs.[310] As part of its homeowner assistance programs, OHFA administers Save the Dream Ohio, an initiative that provides assistance to Ohio homeowners facing foreclosure and/or who cannot afford to pay their mortgage payments or other related housing costs — including internet service, insurance, and HOA/condo fees or common charges — as a result of economic hardship caused by the COVID-19 pandemic.[311] The Save the Dream Ohio Utility Assistance Plus (UAP) program supported 766 homeowners with housing-related costs, including internet costs, in FY2022.[312]

The Ohio Housing Finance Agency's UAP program can help augment BEAD affordability efforts by providing additional broadband subsidies. OHFA can also leverage its existing relations with households in need to raise their awareness of affordability programs.

Ohio Public Utilities Commission: PUCO regulates providers of all kinds of utility services, including electric and natural gas companies, local and long-distance telephone companies, water and wastewater companies, and rail and trucking companies.[313] PUCO does not regulate Internet service or Internet service providers; however, it does regulate multiple aspects of telecommunications, such as local telephone service, long distance telephone service, wireless telephone service and VoIP.[314]

The Ohio Public Utilities Commission could help consolidate dig requests to enable cost-efficient fiber deployment, as well as support more efficient pole attachment processes, including make-ready requirement enforcement.

5.8 Technical Assistance

Technical assistance from the NTIA could help augment BroadbandOhio's resources and capabilities in a way that could help ensure successful implementation of BEAD. Areas where such technical assistance could be helpful include but are not limited to:

- **Datasets on CAI infrastructure availability, including technologies and speeds available**: Unlike the FCC Availability Map for BSLs, there is no central source of truth to understand internet speeds for CAIs. A centralized effort by the NTIA to understand and map key CAI locations and their internet speed information would greatly help enhance

[308] https://www.oplin.ohio.gov/sites/default/files/stratPlanFY2023_0.pdf
[309] https://www.oplin.ohio.gov/internet
[310] https://ohiohome.org/about.aspx
[311] https://savethedream.ohiohome.org/
[312] https://ohiohome.org/news/documents/annualreport_22.pdf
[313] https://puco.ohio.gov/about-us
[314] https://puco.ohio.gov/utilities/telecom/resources/telecom-overview

visibility into their deployment-related needs today. With the understanding that each Eligible Entity may have different definitions for CAIs, a database of key CAIs as defined by NTIA BEAD would nonetheless be helpful.

- **Guidance for applicability of BEAD requirements in communities that have expressed they do not want broadband**: As demonstrated in 4. Obstacles or Barriers, Ohio has a significant Amish population who may not want broadband deployment for religious reasons. NTIA's guidance on how BEAD requirements may or may not apply to these regions would be helpful for ongoing planning.
- **Definition of terms and conditions under which certain subgrantee waivers may be granted**: The BEAD NOFO lists out several subgrantee requirements that may be waived by NTIA's discretion. For such waivers, NTIA's guidance, technical support for subgrantees in terms of what would be required to acquire a waiver would help enhance transparency and improve subgrantee engagement.

6 Conclusion

Ohio's BEAD Five-Year Action Plan outlines the state's guiding vision, goals, and objectives, the needs, goals, obstacles, and barriers that must be addressed to make the vision a reality, and the implementation plan and strategies which will shape our go forward approach. Leveraging the existing deployment and programmatic asset base, and in deep collaboration with the broad range of partners and stakeholders, BroadbandOhio aims to bring universal service and digital opportunity to the state of Ohio. With this Five-Year Action Plan as a guidepost, BroadbandOhio will work toward successful broadband implementation to accelerate Ohio's progress toward achieving the state's broadband-enabled vision and goals.

7 Appendices

7.1 Appendix: Asset Inventory

7.1.1 Ohio assets related to broadband deployment

Organization Name	Asset Name	Description
Ohio Department of Administrative Services[315]	MARCS (Multi-Agency Radio Communication System)	MARCS is a 700/800 MHz radio and data network that utilizes state-of-the art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio. The MARCS system provides statewide, secure, reliable public service wireless communication for public safety and first responders. MARCs towers could allow ISPs to use the publicly owned Multi-Agency Radio Communications System as broadcast sites.
Ohio Department of Higher Education[316]	OARnet	In 1987, OARnet was founded by the Ohio Department of Higher Education to provide Ohio researchers with their first online access to the high-performance computing resources of the Ohio Supercomputer Center, established that same year. Over the last 35 years, OARnet has expanded to deliver more than 5,500 miles of fiber-optic broadband connectivity, providing connectivity for more than 4,000 government and community institutions.
Ohio Department of Natural Resources	Land available for deployment	The Ohio Department of Natural Resources owns a large amount of public lands that can be used to facilitate broadband deployment when necessary. The Ohio DNR collaborates with internet service providers regarding right-of-way on public lands under DNR management to ensure efficient deployment of new broadband infrastructure.
Ohio Department of Transportation[317]	Right-of-Way E-Permitting system	ODOT centrally manages its rights-of-way and utility permits via a new online system, replacing paper MR 505 forms.
Ohio Department of Transportation[318]	OhROW (ODOT Right-of-Way)	OhROW offers geospatial mapping of ROW plans and centerline survey monuments from state highways.

[315] https://das.ohio.gov/technology-and-strategy/marcs
[316] https://www.oar.net/
[317] https://www.transportation.ohio.gov/working/engineering/real-estate/row/broadband-projects
[318] http://gis3.dot.state.oh.us/ohrow_viewer/

Organization Name	Asset Name	Description
Ohio Department of Transportation[319]	REAL OS	REAL OS is a web application to create, track, and maintain all the forms and information necessary for Real Estate ROW.
Ohio Department of Transportation[320]	ODOT Project list	ODOT publishes an information library of current and upcoming projects on the state transportation system, filterable by project name, type, status, and county.
Com Net, Inc., Horizon Telcom, OneCommunity, OARnet[321]	Ohio Middle Mile Consortium (OMMC)	Ohio Middle Mile Consortium (OMMC) is a public-private partnership to create a comprehensive statewide plan to expand broadband infrastructure to the underserved and unserved areas of the state. This plan focused on community anchor institutions such as schools, hospitals, public safety and local governments to ensure the development of an affordable and sustainable broadband program.
Ohio Department of Higher Education[322]	OARnet Last Mile Enhancement Program	OARnet is spearheading a $12.1 million Last Mile Enhancement Program to increase broadband speeds by 1,000 percent at 40 Ohio colleges and universities. Supported by the Governor's Emergency Education Relief (GEER) Fund, the program enables OARnet to work with commercial "last mile" providers to upgrade connections to the OARnet backbone from 1 Gigabit per second (Gbps) or less to 10 Gbps. The 40 institutions include community, technical and four-year colleges, and universities, both public and private, whose networks experienced unprecedented demand after the sudden shift to remote and hybrid learning models because of COVID-19.
Ohio Department of Rehabilitation & Corrections; Ohio Central School System (OCSS)[323]	Secure wireless network	A secure wireless network was built to provide access to education in prisons. The network is the foundation for the Chromebook access and was expanded to housing units, providing digital opportunities to other program areas such as mental health and recovery services.
Management Council of the Ohio Education Computer	Information Technology Centers	As non-profit public agencies created by Ohio legislature, Ohio's 18 Information Technology Centers (ITCs) work collaboratively as the Ohio Education Computer Network to serve over 1.4 million students in 980 public school districts, career centers, and community schools. As

[319] https://realos.dot.state.oh.us/
[320] https://www.transportation.ohio.gov/projects#page=1
[321] https://www.oar.net/ommc
[322] https://www.oar.net/content/last_mile_enhancement_program
[323] https://drc.ohio.gov/About/Press-Releases

Organization Name	Asset Name	Description
Network (MCOECN)[324]		Internet Service Providers for Ohio PreK-12 schools, they meet and exceed the national standard of providing every student with 100 kilobits per second of Internet bandwidth. ITCs offer a wide range of programs and services that meet the technology needs of Ohio's school districts. Among an ITCs core services are Internet connectivity, fiscal systems, INFOhio resources (digital learning content and library services), student information, and EMIS services. In addition to Ohio's PreK-12 education community, ITCs continue to serve Ohio government agencies, non-profit organizations, and communities with efficient and reliable services for over four decades.
Ohio Public Library Information Network[325]	Broadband connection	OPLIN (Ohio Public Library Information Network) provides Internet services to the public library systems of Ohio, mostly providing one broadband connection to the main library of each system, and access to the commodity Internet for any public library which routes Internet-bound traffic through OPLIN's network core in Columbus, Ohio. OPLIN provides and manages this physical network connecting libraries to the Internet; when OPLIN was established in 1995-96, the network was built from copper-wire 'T1' circuits, but in 2006, fiber-optic 'Ethernet' circuits began replacing the older T1 circuits.

7.1.2 Ohio assets related to broadband adoption

Organization Name	Asset Name	Description
4-H[326]	4-H Tech Changemakers	4-H Tech Changemakers is a unique, community-centered program that puts youth into positions of leadership by empowering them to teach digital skills to members of underserved communities across the country. 4-H Tech Changemakers gives teens the tools and support that they need to become true agents of change by teaching digital skill-building workshops to adults.
Ashbury Senior Computer Community Center, Cleveland[327]	Ashbury Senior Computer Community Center classes	The Ashbury Senior Computer Community Center offers classes on digital skills and literacy, as well as providing a digital lab with free personal tutoring.

[324] https://www.managementcouncil.org/connect/
[325] https://www.oplin.ohio.gov/internet
[326] https://4-h.org/programs/tech-changemakers/
[327] https://www.asc3.org/classes.html

Organization Name	Asset Name	Description
Benjamin Rose Institute on Aging (ESOP); Digital Aviator Program (DAP)[328]	Connecting Our Seniors to Technology (COST)	ESOP — a subsidiary of Benjamin Rose Institute on Aging — and the Digital Aviator Program (DAP) are offering older adults free computer classes through our Connecting Our Seniors to Technology (COST). Completing COST program requirements would let participants keep the laptop for free with internet for one year. The program offers free technology classes and technical support, a free laptop to keep after completing the program, internet up to 1 year, and free financial coaching.
CHN Housing Partners[329]	Free Training	CHN Housing Partners offer one-on-one or group training for new or advanced technology users. Based on participants' schedules, classes can be held at CHN Housing Partners' computer lab in Cleveland or at a location convenient to the participant (e.g., a local library).
Cleveland Codes[330]	Cleveland Codes	Cleveland Codes is the first not-for-profit coding bootcamp in Northeast Ohio. Cleveland Codes is committed to a spirit of inclusive excellence by providing high-quality training to Northeast Ohio residents.
Cleveland Public Library[331]	Digital literacy courses	The Cleveland Public Library offers in-person and online courses for digital literacy, including Digital Learn, Gale Courses, LinkedIn Learning, Northstar Digital Literacy, and Rosetta Stone.
Cleveland Public Library[332]	TechCentral	TechCentral is an innovative technology and learning center providing services to Main Library and all 27 branch locations. TechCentral offers computer classes and assistance, mobile hotspot check-out, computer reservations, a computer lab, and other services.
Columbus Literacy Council[333]	CLC Works	CLC Works offers technology literacy programs for its adult education courses, including programs for Microsoft Word Certification, Microsoft Excel Certification, Microsoft PowerPoint Certification, Adobe Premiere Pro Certification, and CompTIA IT Fundamentals Certification.

[328] https://benrose.org/-/technology-training
[329] https://chnhousingpartners.org/housing-and-community-services/technology-training-resources/
[330] http://clevelandcodes.org/
[331] https://cpl.org/eventsclasses/online-courses/
[332] https://cpl.org/aboutthelibrary/subjectscollections/techcentral/
[333] https://form.jotform.com/jreyes664/CLC-Interest-Form

Organization Name	Asset Name	Description
Connected Nation[334]	Digital Works: Creating Jobs	Connected Nations helps veterans, physical challenged, parents, senior citizens, and young adults by providing digital skills training and telework job placement assistance, working with more than 70 corporations across the U.S. while keeping tax dollars local.
Council on Aging (COA)[335]	Volunteer program	Council on Aging (COA) recruits volunteers to help older adults use technology (cell phones, tablets, and computers) to connect to resources that will help them remain independent in their homes and communities. Volunteers help clients use AddnAide, an app developed by COA and its subsidiary home52, to connect with available caregivers in their community. As of February 2023, Volunteer work will be conducted in the homes of COA clients in Hamilton and Warren counties.
Cuyahoga County Public Library[336]	Computer Training	The Cuyahoga County Public Library offers free computer training, including basic digital literacy skills to Microsoft Office Specialist Certification Prep Courses.
Cuyahoga Metropolitan Housing Authority[337]	ClevelandConnects+ initiative	ClevelandConnects+ initiative is part of HUD's national ConnectHomeUSA program that is committed to bridging the digital divide for HUD-assisted housing residents. In this program, CMHA focuses on providing access to three critical components: affordable internet connection, devices, and computer education. CMHA offers CMHA-specific affordable internet programs, free equipment, and senior computer classes, as well as a catalog of broader digital offerings along the 3 components.
DigitalLearn[338]	DigitalLearn	The Public Library Association's site, DigitalLearn.org is an online hub for digital literacy support and training. Included in DigitalLearn.org is a collection of self-directed tutorials for end-users to increase their digital literacy.

[334] https://connectednation.org/what-we-do-for-you/
[335] https://www.help4seniors.org/about/how-to-help/volunteers-needed
[336] https://cuyahogalibrary.org/classes-events/computer-classes
[337] https://www.cmha.net/residentservices/digitalinclusion
[338] https://www.digitallearn.org/cms_pages/about-digitallearn-org

Organization Name	Asset Name	Description
Digitunity[339]	Digitunity	Digitunity is a national nonprofit organization focused on enhancing device access. Digitunity's activities revolve around research, advocacy to enact policies that advance device ownership, awareness-building to drive corporate and individual donations of technology, support for device refurbishers, donation sourcing and matching, advancing digital literacy, and other related efforts.
East Cleveland Public Library[340]	Free computer classes	The East Cleveland Public Library offers free computer classes to the public and opportunities to explore emerging technologies.
Euclid Public Library[341]	Euclid Public Library	The Euclid Public Library offers a variety of introductory computer courses and One on One Computer Training sessions.
Fairfax Neighborhood Technology Center[342]	Fairfax Neighborhood Technology Center Computer Classes	Free computer training classes are offered at the introductory, intermediate, and advanced levels to area residents. The classes cover a range of topics including, Introduction to Computers, Microsoft Office Suite, and Internet/Email. The center also covers some specialty topics including Smartphones, Online Shopping, and African American Studies.
Fatima Family Center Community Computer Lab[343]	Fatima Family Center Community Computer Lab	The Computer Lab is a free resource where individuals may use a computer, access the internet, and attend introductory computer classes. Introductory computer classes are provided to the community as well as participants in our senior program, summer camp, after school program and teen programs.
Goodwill Easterseals Miami Valley[344]	Workforce training	Goodwill Easterseals Miami Valley has employment programs for adults, seniors, individuals with developmental disabilities, and youth. Programs include business skills and customer service training, digital skills, computer training, and more.

[339] https://digitunity.org/
[340] https://www.eastclevelandpubliclibrary.org/?page_id=442
[341] https://www.euclidlibrary.org/services/faxandscan
[342] https://fairfaxrenaissance.org/programs-and-services/fairfax-neighborhood-technology-center/

[343] https://www.ccdocle.org/programs/computer-lab
[344] https://gesmv.org/community-programs/job-readiness/#workforce

Organization Name	Asset Name	Description
Heights Public Library[345]	Tech Expert	Tech Trainers offer appointments for one-on-one help in the Lee Road Computer Lab (HKIC) or virtually, on computer- and digital-related questions (e.g., Microsoft Office, Zoom, etc.)
Heights Public Library[346]	Computer classes	Heights Libraries offer free one-on-one help, hands-on classes, and online tutorials for every skill level.
Jewish Family Services[347]	Digital inclusion efforts	Jewish Family Services support their clients reach economic self-sufficiency and emotional stability. As part of their services, they help address the digital divide by supporting clients acquire low-cost internet and technology so they can benefit from virtual services and trainings, as well as providing training to develop both digital life skills and job skills that help clients qualify for remote work.
JumpStart; Verizon[348]	Cleveland Learning Centers	JumpStart and Verizon are officially opening the Cleveland Learning Centers in 2022, providing community members—from youth to adults—with digital skills and entrepreneurship training, STEM education, and workforce development opportunities through advanced technology and educational resources at no cost and available in two convenient locations. The Cleveland Learning Centers will offer cohort-based programs, focused workshops, and community-based events throughout the year.
Licking County Aging Program (LCAP); East-Central Ohio Technology Users Club (ECOTUC)[349]	Computer classes	The Licking County Aging Program (LCAP) in partnership with the East-Central Ohio Technology Users Club (ECOTUC) provide a variety of computer classes for the senior citizens in the LCAP service area. These classes are taught by members of the ECOTUC in a classroom setting with 12 student computers. The classes are held in the renovated LCCS/LCAP Technology Resource Center. Classes are offered in a wide range of topics from "Computer Basics for the Total Beginner" to specialized topics such as Word Processing and Spreadsheets.

[345] https://heightslibrary.org/services/computers-and-technology/ask-a-tech-expert/
[346] https://heightslibrary.org/services/computers-and-technology/learning-heights-libraries/
[347] https://jfscolumbus.org/
[348] https://communityforwardcle.com/
[349] https://lcap.org/computer-classes/

Organization Name	Asset Name	Description
Literacy Minnesota[350]	Northstar Digital Literacy	Northstar is a program of Literacy Minnesota, whose mission is to share the power of learning through education, community building, and advocacy. Northstar Digital Literacy defines basic skills needed to perform tasks on computers and online. Online, self-guided modules assess the ability of individuals to perform tasks based on these skills. Included are basic computer digital literacy standards and modules ranging from basic computer / internet skills, Microsoft Office, and digital literacy applications (e.g., social media, Information Literacy, Career Search Skills, Telehealth, K-12 Distance Learning). Northstar allows end users to freely take the assessments from anywhere via the homepage, but individuals can instead go to an approved Northstar location and obtain the Northstar Digital Literacy Certificate when they pass assessments. Certificates provide an important credential for employment, certify end user ability to complete computer skills needed in higher education, and demonstrate their ability to use social media and online information thoughtfully.
Oak Hill Collaborative[351]	Oak Hill Collaborative Digital Advantage	Oak Hill Collaborative Digital Advantage is an initiative by the Oak Hill Collaborative to address the digital divide, with key activities revolving reducing internet costs (e.g., promoting ASP and public Wi-Fi), increasing technology access (e.g., public computer labs, computer refurbishing), and improving digital skill / literacy (e.g., free courses on digital skills).
Ohio Department of Aging; Assistive Technology of Ohio[352]	Assistive Technology support	ODA and Assistive Technology of Ohio, a non-profit organization, offers support to Ohioans who need assistive technology. AT Ohio's services include device lending and rental, computer refurbishing, training and more.
Ohio Department of Developmental Disabilities[353]	Assistive Technology	Assistive Technology can be used as a creative solution to help with a person's health and safety and can support a person's desire for more independence at home, in the community, or at work. This service enables people to use smart or electronic devices to increase their independence and reduce reliance on paid caregivers to help with a person's needs. The service also pays for

[350] https://www.digitalliteracyassessment.org/
[351] https://oakhillcollaborative.org/digital-advantage/
[352] https://aging.ohio.gov/care-and-living/caregiver-support/assistive-technology-1
[353] https://dodd.ohio.gov/about-us/resources/tech-first/AssistiveTech

Organization Name	Asset Name	Description
		consultation to make sure people are matched with the right technology to meet their needs, the appropriate equipment, and equipment training for the person as well as for their paid or unpaid caregiver.
Ohio Public Library Information Network[354]	Northstar Digital Literacy	OPLIN offers guidance on implementing Northstar locally, materials to market the program, and other technical support. Northstar focuses on basic digital literacy skills—such as using a mouse, searching on the internet, and using email—as well as advanced skills, like using Google Docs and searching for jobs online. Northstar is available to all Ohio libraries, and libraries can create learner accounts, which track online learning and the assessments completed. As Northstar testing locations, libraries can award certificates and digital badges to demonstrate skill mastery to potential employers.
Ohio State University Extension[355]	Ohio 4-H Youth Development	Ohio 4-H Youth Development offers a variety of science- and technology-related education opportunities to students, including 4-H Center Camp Tech and STEM Pathways programs.
OhioMeansJobs[356]	Career Skills	OhioMeansJobs offers tutorials to help job seekers brush up on their digital skills, including Microsoft Office programs, Adobe Illustrator & Photoshop courses, and other basic digital literacy skills.
Pathway Toledo[357]	Professional And Individual Development (P.A.I.D.) Program	The P.A.I.D. Program is designed to help participants obtain and retain employment by providing job training and job placement services necessary to help unemployed, underemployed, and hard-to-employ residents of Lucas County become self-sufficient. Offerings include, among others, Career and Digital Literacy Assessments and Training.
PCs for People[358]	Learning Center	PCs for People offer free digital skills training through classes and workshops to eligible customers in our St. Paul and Denver locations, as well as virtually across the country. Classes are offered one-on-one, in-person or online. Online classes take place on Zoom or GoogleMeet. After completing a class, you can receive a professional

[354] https://www.oplin.ohio.gov/services/northstar
[355] https://ohio4h.org/
[356] https://ohiomeansjobs.ohio.gov/job-seekers/practice-your-skills/career-skills/get-training-improve-your-skills
[357] https://pathwaytoledo.org/professional-and-individual-development
[358] https://www.pcsforpeople.org/learning-center/

Organization Name	Asset Name	Description
		certificate through Northstar Digital Literacy. Additional one-on-one support is available through the Digital Education Call Center.
Project Save[359]	Project Save computer classes	Project Save offers numerous services such as job, housing, and drug treatment referrals, healthcare information, computer classes, free furniture, and ID vouchers.
South Central Ohio Educational Service Center[360]	Southern Ohio Academy	Southern Ohio Academy is a joint effort among the school districts in the South Central Ohio Educational Service Center. It is a blended school environment located at the Scioto County Career Technical Center, offering flexible, online courses taught by highly qualified teachers. High school courses offered include electives on computer literacy, computer fundamentals, and web design.
Southern Ohio Educational Service Center[361]	Google Certified Educator Camps	Southern Ohio ESC offers training courses for educators on digital learning strategies, in-depth Google topics, and others to prepare them for the official Google Educator Level 1 and Level 2 exams. The training courses are free to SOESC Member Districts.
Tech Elevator[362]	Tech Elevator	Tech Elevator is a 14-week coding bootcamp for rapidly developing students' abilities to code. The bootcamp fully supports any career goals through their hiring network and Pathway Program™. They help individuals learn to code, define their career path, and connect them to the greater tech community, especially in Cleveland.
The Cleveland Foundation[363]	The Cleveland Foundation Digital Excellence Initiative	Launched in 2017, the Cleveland Foundation Digital Excellence Initiative works to position Greater Cleveland as a leader in digital innovation and access by investing in five areas including funding and deploying digital equity and device access, supporting digital skill development via training and outreach programs, leveraging technology for greater civic engagement, and promoting digital leadership and innovation (e.g., smart city planning, hackathon).

[359] https://www.neoch.org/cleveland-homeless-blog/covid19servicechanges
[360] https://www.scoesc.k12.oh.us/content.aspx?id=31954
[361] https://www.southernohioesc.org/
[362] https://www.techelevator.com/?amp percent3Butm_content=training_workforce percent20resource
[363] https://www.clevelandfoundation.org/grants/program-initiatives/digital/

Organization Name	Asset Name	Description
Thea Bowman Center[364]	Beginners Computer classes	Thea Bowman Center offers beginner computer classes, where students can learn the functions of a computer, computer programs; internet, email, and safety surfing the web. The Center is a Northstar Digital Literacy Technology Training Center that offers certifications upon completion of basic computer classes.
University Settlement[365]	Magic Johnson Community Empowerment Center (MJCEC)	The Magic Johnson Community Empowerment Center (MJCEC) provides access to resources and programming that educate, empower, and strengthen individuals though the innovative use of technology. The MJCEC regularly hosts classes aimed at helping community members of all ages to learn about the various uses of technology and find ways to use technology to improve their lives personally, academically, and professionally. In addition to holding classes on-site, classes and tech support were provided at four local senior high-rise apartments so residents could learn how to better utilize technology in their everyday life.
We Can Code It[366]	We Can Code It	We Can Code IT is expanding diversity in Technology and Engineering, with computer and engineering workshops for kids and adults, and coding boot-camps for adults looking to join the IT industry. They provide education and mentorship to those who are underrepresented in the area; they focus on empowering women, African Americans, and Hispanic Americans.
Wood County Committee on Aging, Inc.[367]	Computer Instructors	Wood County Committee on Aging, Inc. offers volunteer programs to teach basic Internet and computer skills to seniors with varying levels of computer familiarity. Both group classes and "one-on-one" sessions are available.
Worthington Christian Village[368]	Computer skill teaching	Worthington Christian Village offers computer skills learning opportunities to its residents via volunteer programs.

[364] https://www.theabowmancenter.org/copy-of-g-e-d
[365] https://www.universitysettlement.net/community-programs
[366] https://wecancodeit.org/
[367] https://wccoa.net/volunteers/
[368] https://wcv.org/get-involved/volunteer/

Organization Name	Asset Name	Description
Ohio State University Agricultural Technical Institute (Ohio State ATI)[369]	MS Office skills courses	OSU ATI offers Microsoft Office skill courses for a fee.
State Library of Ohio[370]	Guiding Ohio Online	Guiding Ohio Online is a State Library administered competitive LSTA (Library Services and Technology Act) grant. The purpose of the grant is to allow public libraries in rural Ohio to hire a dedicated technology trainer for their library. The technology trainer is hired as an independent contractor in a full- or part-time capacity depending on the needs of the library. Trainers can assist with computer instruction, technology-focused community outreach, one-on-one instruction, and other technology related duties. The LSTA funding covers 75 percent of the project costs; the remaining 25 percent must come from a local cash match. This cash match typically comes from the library but may come in whole or in part from a partner organization.
Cuyahoga County Public Library[371]	Cuyahoga County Public Library's Digital Navigators service	Cuyahoga County Public Library's Digital Navigators service offers one-on-one assistance to help participants with digital literacy, including connecting to the internet, getting a device, setting up a telehealth appointment, and more. Digital Navigators can also help participants find out eligibility for the Affordable Connectivity Program.
Educational Service Center of Eastern Ohio[372]	Assistive Technology	ESCEO provides Assistive Technology (A.T.) consultation and assessment services to support a student, staff member(s), parent(s), or a classroom. Support includes diagnostic services, development of education plans, consultation on purchasing / upgrading AT devices, obtaining a loan / rental AT materials, assessment of and assistance growing student's skills in communication, computer access, reading, and writing, and more.
Ohio Tech Ambassador Network[373]	Tech Ambassadors	The Tech Ambassadors program selects Ohioans statewide who use Supportive Technology themselves to serve as role models for those with developmental disabilities, offering virtual peer-to-peer mentoring sessions discussing how they use

[369] https://ati.osu.edu/computer
[370] https://library.ohio.gov/services-for-libraries/library-programs-development/guiding-ohio-online/
[371] https://cuyahogalibrary.org/services/at-your-local-branch/digital-navigators
[372] https://www.esceasternohio.org/Content2/speech-language-pathology
[373] https://ohiotechambassadors.org/

Organization Name	Asset Name	Description
		Supportive Technology at home, at school, at work and in the community.
Public Health Innovators[374]	Digital Health Strategy Services	PHI offers digital health consulting, including developing strategies for incorporating digital solutions into healthcare offering, identifying key needs for digital health in the community, digital health navigator support for patients, tailoring of digital health tools and instruments, policy advocacy, and other related services.
Connected Nation[375]	Empowering state leaders	Connected Nations supports state leaders by providing granular mapping to visualize the broadband landscape, identifying the Digital Divide, and focusing more accurately on proven strategies to close it, and developing projects designed to advance technology adoption and use.
Digitunity[376]	Digitunity	Digitunity is a national nonprofit organization focused on enhancing device access. Digitunity's activities revolve around research, advocacy to enact policies that advance device ownership, awareness-building to drive corporate and individual donations of technology, support for device refurbishers, donation sourcing and matching, advancing digital literacy, and other related efforts.
Oak Hill Collaborative[377]	Oak Hill Collaborative Digital Advantage	Oak Hill Collaborative Digital Advantage is an initiative by the Oak Hill Collaborative to address the digital divide, with key activities revolving reducing internet costs (e.g., promoting ASP and public Wi-Fi), increasing technology access (e.g., public computer labs, computer refurbishing), and improving digital skill / literacy (e.g., free courses on digital skills).
The Ohio State University College of Food, Agricultural, and Environmental	Testimony and research	OSU CFAES has conducted relevant research and testified for broadband deployment and digital opportunity for Ohio, both generally pertaining the state and for specific populations (e.g., rural population by arguing for agriculture-related use cases). Examples include CFAES' 2022 analysis, Finding the Missing Dots: An Update on Ohio Broadband Policy.

[374] https://www.publichealthinnovators.com/our-work/
[375] https://connectednation.org/what-we-do-for-you/
[376] https://digitunity.org/
[377] https://oakhillcollaborative.org/digital-advantage/

Organization Name	Asset Name	Description
Sciences (CFAES)[378]		
Connected Nation[379]	Community planning & solutions	Connected Nation supports engaging education, healthcare, business, and community organizations; developing Technology Action Plans for small towns, large cities, counties, and regions; and empowering local leaders with solutions specific to the local needs.
Greater Cleveland Partnership[380]	Digital Equity Initiative	GCP, The Cleveland Foundation, Cuyahoga County, and many others have formed a coalition of more than 70 organizations to end the region's digital divide. The group has collaborated to collect and donate devices, provide, and advocate for Broadband Connectivity, and support community-based digital navigators. GCP continues to lead the corporate and institutional campaign for device donations and the advocacy work of the broader coalition, engaging with lawmakers at every level of government on the issue of the digital divide.
MetroHealth; DigitalC; Cuyahoga Metropolitan Housing Authority; Dollar Bank[381]	Digital Connectivity Initiative	MetroHealth, DigitalC, Cuyahoga Metropolitan Housing Authority and Dollar Bank formed the Digital Connectivity Initiative, a public-private partnership aimed at bringing digital equity to Cleveland. The partnership offers low-cost, reliable broadband within MetroHealth's footprint, while providing residents with digital skills training to navigate the digital landscape. This Digital Connectivity Initiative enables MetroHealth neighbors to connect to the internet and their health care providers through video visits and health coaching.
The Ohio State University College of Food, Agricultural, and Environmental	Appalachia Cooperates Initiative	The Appalachia Cooperates Initiative (ACI) is a learning network connecting cooperative, community, business, and economic developers and advocates in Central Appalachia. The CFAES Center for Cooperatives at The Ohio State University leads the Initiative, facilitating and organizing sessions.

[378] https://cfaes.osu.edu/news/articles/cfaes-testimony-house-hearing-technology-can-benefit-rural-america; https://cfaes.osu.edu/news/articles/cfaes-report-focuses-ways-expand-enhance-rural-access-broadband-internet-in-ohio
[379] https://connectednation.org/what-we-do-for-you/
[380] https://greatercle.com/digital-equity-initiative/
[381] https://news.metrohealth.org/metrohealth-digitalc-cmha-and-dollar-bank-to-celebrate-connecting-1000-cleveland-households-to-affordable-reliable-internet/; https://news.metrohealth.org/local-partners-team-up-to-bridge-the-digital-divide-in-cleveland/

Organization Name	Asset Name	Description
Sciences (CFAES)[382]		Collaborative organizations contribute to the development of ACI strategies and learning sessions, including contributing their vast expertise in economic development, community building, and scholarship to learning sessions. Session topics have included broadband deployment in the past.
altafiber[383]	Connect our students	altafiber's Connect our Students program is an effort to close the digital equity divide, through which over 10,000 local students have been connected with free internet access for their homes.
altafiber[384]	Partnership with Butler Rural Electric Cooperative	altafiber has collaborated with BREC to expand fiber connection to all of BREC's substations and have supplied over 2,000 homes to date with access to a fiber network, allowing students and residents in rural areas to continue to participate in online activities and education.
altafiber[385]	UniCity	altafiber's UniCity smart city initiative works toward providing high-speed internet access to residents who may not be able to afford or access service otherwise; develop a digital equity strategy with connectivity, devices, and training; connect to resources such as job training, healthcare, financial health, public assistance, and more; and collect robust analytics to measure impacts.
Cox[386]	Cox Connect2Compete	Through Connect2Compete, Cox offers eligible families with K-12 students with $9.95/month 50 Mbps home Wi-Fi.
JumpStart; Verizon[387]	Cleveland Learning Centers	JumpStart and Verizon are officially opening the Cleveland Learning Centers in 2022, providing community members—from youth to adults—with digital skills and entrepreneurship training, STEM education, and workforce development opportunities through advanced technology and educational resources at no cost and available in two convenient locations. The Cleveland Learning Centers will offer cohort-based programs, focused workshops, and community-based events throughout the year.

[382] https://cooperatives.cfaes.ohio-state.edu/development-0/appalachia-cooperates-initiative
[383] https://info.altafiber.com/elevateeducation
[384] https://info.altafiber.com/elevateeducation
[385] https://unicity.altafiber.com/
[386] https://www.cox.com/residential/internet/connect2compete.html?sc_id=cr_dm_camp_z_c2c_vanity
[387] https://communityforwardcle.com/

Organization Name	Asset Name	Description
Allen-Oakwood Correctional Institution[388]	Computer Aided Instructional Laboratories (CAIL)	Allen-Oakwood Correctional Institution offers Computer Aided Instructional Laboratories (CAIL) as one of its educational services.
Chillicothe Correctional Institution[389]	Computer Aided Instructional Laboratories (CAIL)	Chillicothe Correctional Institution offers Computer Aided Instructional Laboratories (CAIL) as one of its educational services.
Cleveland Metropolitan School District[390]	Harvey Rice Computer Lab	The Harvey Rice Computer Lab has 30 new desktop computers, with a mission to extend classroom learning, prepare students for online state testing, and give students the necessary technological skills for high school, college, and career.
Cleveland Public Library[391]	Learning Commons	The Cleveland Public Library Learning Commons have collaborative work seating areas that can be reserved, with teaching walls, wireless Internet access and power, and a SmartBoard.
Cleveland Public Library[392]	TechCentral	TechCentral is an innovative technology and learning center providing services to Main Library and all 27 branch locations. TechCentral offers computer classes and assistance, mobile hotspot check-out, computer reservations, a computer lab, and other services.
Cuyahoga County Public Library[393]	Zoom Rooms	Each Cuyahoga County Public Library branch has a Zoom Room customers can book for meetings, webinars, and conferences. Zoom Rooms can accommodate up to 300 participants and can be reserved for up to 2 hours at a time. Zoom Rooms are available 24/7.
Cuyahoga County Public Library[394]	Study Rooms	Cuyahoga County Public Library has equipped study rooms with video conferencing equipment so users can meet virtually with social services, health agencies or potential employers via Zoom, Skype, MS Teams, or Google Meet. Study rooms are outfitted with a computer, speakers, microphone, webcam, and high-speed internet connection. Study rooms can be reserved up to 15 minutes before

[388] https://drc.ohio.gov/aoci
[389] https://drc.ohio.gov/cci
[390] https://www.clevelandmetroschools.org/domain/4788
[391] https://cpl.org/clevdpl/
[392] https://cpl.org/aboutthelibrary/subjectscollections/techcentral/
[393] https://cuyahogalibrary.org/services/meeting-spaces/zoom-rooms
[394] https://cuyahogalibrary.org/services/meeting-spaces/study-rooms

Organization Name	Asset Name	Description
		closing, once per day for up to 2 hours, during regular library hours.
Cuyahoga Metropolitan Housing Authority[395]	CMHA Computer Labs	CMHA residents who live at the following properties have access to a computer lab: Addison Square, Bellaire Gardens, Bohn Tower, Heritage View, Lakeview Terrace, Olde Cedar, Outhwaite Homes (Judge Harper Library), Riverview Tower, King Kennedy (Stokes Mall), and Wade Park.
DigitalC[396]	MidTown Cleveland	Located in the Cleveland Health-Tech Corridor, the Tech Hive is a program of DigitalC and offers members fast Wi-fi, in-house cafe, ample parking, day passes, dedicated desks, meeting rooms, classrooms, phone booths, & private offices.
East Cleveland Public Library[397]	Computer lab	The East Cleveland Public Library's Computer Lab and Career Center offers access to both Macintosh and Windows-based computers, the Internet, Wi-Fi, various software applications and databases. The East Cleveland Public Library computer labs are staffed by dedicated employees who are ready and available to assist patrons with their technology needs.
Euclid Public Library[398]	Euclid Public Library Computer Lab	The Euclid Public Library offers public computer access.
Fatima Family Center Community Computer Lab[399]	Fatima Family Center Community Computer Lab	The Fatima Family Center Community Computer Lab offers public computer access.
Heights Public Library[400]	Heights Public Library Computer Lab	The Heights Public Library offers public computer access.

[395] https://www.cmha.net/residentservices/digitalinclusion
[396] https://midtowntechhive.org/
[397] https://www.eastclevelandpubliclibrary.org/?page_id=442
[398] https://www.cmha.net/residentservices/digitalinclusion
[399] https://www.cmha.net/residentservices/digitalinclusion
[400] https://www.cmha.net/residentservices/digitalinclusion

Organization Name	Asset Name	Description
Lake Erie Correctional Institution[401]	Computer Aided Instructional Laboratories (CAIL)	Lake Erie Correctional Institution offers Computer Aided Instructional Laboratories (CAIL) as one of its educational services.
Lorain Correctional Institution[402]	Computer Aided Instructional Laboratories (CAIL)	Lorain Correctional Institution offers Computer Aided Instructional Laboratories (CAIL) as one of its educational services. The teachers advise, instruct, and monitor participants in a computerized, programmed focused on educational, social and life skills instruction. The Programs are intended to improve reading, math, social studies, science and writing skills, social and life skills, and prepare participants for high school diploma equivalency testing.
Madison Correctional Institution[403]	Computer Aided Instructional Laboratories (CAIL)	The Madison Correctional Institution offers Computer Aided Instructional Laboratories (CAIL) as one of its educational services.
North Star Neighborhood[404]	Reentry Resource Center	The North Star Neighborhood Reentry Resource Center will continue to provide basic services such as ID and Birth Certificate vouchers, client computer lab, referrals to community partners, and key programming.
Ohio State University Agricultural Technical Institute (Ohio State ATI)[405]	Computer lab	OSU ATI has 5 computer labs that allow instruction in advanced computer operations, including CAD. These labs also function as public computing sites when not being used by classes. Most sites are open to students on a first-come, first-served basis. Each public site offers some of the following: Windows computers, Internet access, Popular software, Black and white laser printers, Color and black & white scanners, CD-ROM drives, and E-mail access.
Rainbow Terrace[406]	Rainbow Terrace Computer Lab	The Rainbow Terrace offers public computer access.

[401] https://drc.ohio.gov/laeci
[402] https://drc.ohio.gov/lorci
[403] https://drc.ohio.gov/maci
[404] https://www.neoch.org/cleveland-homeless-blog/covid19servicechanges
[405] https://ati.osu.edu/currentstudents/computer-labs-and-services
[406] https://www.cmha.net/residentservices/digitalinclusion

Organization Name	Asset Name	Description
Scranton Road Ministries Community Development Corp. Computer Center[407]	Scranton Road Ministries Community Development Corp. Computer Center	The Scranton Road Ministries Community Development Corp. Computer Center offers public computer access (open on a limited basis).
Toledo Library[408]	Toledo Library Zoom Room	The Toledo Lucas County Public Library has a virtual Zoom Room customers can book for personal and professional meetings.
Ohio State University South Centers[409]	Computer lab	The OSU Endeavor Center has a fully functional computer training lab available for rental by the public and business partners housed within the facility.
Cleveland Public Library[410]	Hotspot device rental	Any Cleveland Public Library offers hotspot devices for rental for up to 21 days.
Cleveland Public Library[411]	TechCentral	TechCentral is an innovative technology and learning center providing services to Main Library and all 27 branch locations. TechCentral offers computer classes and assistance, mobile hotspot check-out, computer reservations, a computer lab, and other services.
Heights Public Library[412]	Heights Public Library	The Heights Public Library offers hotspot lending and tablet lending to cardholders.
Ohio Department of Aging; Assistive Technology of Ohio[413]	Assistive Technology support	ODA and Assistive Technology of Ohio, a non-profit organization, offers support to Ohioans who need assistive technology. AT Ohio's services include device lending and rental, computer refurbishing, training and more.

[407] https://www.cmha.net/residentservices/digitalinclusion
[408] https://www.toledolibrary.org/community-rooms-and-event-spaces
[409] https://southcenters.osu.edu/endeavor-center/our-facility/computer-lab
[410] https://chnhousingpartners.org/housing-and-community-services/technology-training-resources/
[411] https://cpl.org/aboutthelibrary/subjectscollections/techcentral/
[412] https://heightslibrary.org/services/
[413] https://aging.ohio.gov/care-and-living/caregiver-support/assistive-technology-1

Organization Name	Asset Name	Description
Select Cuyahoga county libraries (Garfield Heights, Warrensville Heights, Maple Heights, Southeast/Bedford Heights)[414]	Hotspot device rental	Select Cuyahoga County libraries (Garfield Heights, Warrensville Heights, Maple Heights, Southeast/Bedford Heights) offer hotspot devices for rental for up to 21 days.
The Ability Center[415]	Assistive Tech/Medical Equipment	The Ability Center's Assistive Tech / Medical Equipment program provides individuals with disability-related equipment at no cost. Devices offered include virtual devices and accessories, including Dell Inspiron, iPad, Kindle, and smart thermostats.
The Ability Center[416]	Lending Closet	Kids and adults with disabilities can test equipment through the Lending Closet Program for a short period of time. The program provides individuals with disability-related equipment at no cost. Items include virtual devices and accessories, including Kinderboard, wireless mouse, webcams, and others.
T-Mobile, the Ohio Department of Education, and the Connectivity Champions[417]	Ohio T-Mobile Project 10Million	Technology Directors in Ohio schools and parents / guardians of eligible K-12 students can apply on behalf of their school districts / student for hotspots for qualifying Ohio students to provide free hotspot.
Toledo Library[418]	Toledo Library Check out hotspots	The Toledo Library offers mobile wi-fi check-out hotspots with loans up to 21 days to holders of an adult, full privilege card in good standing.
Ohio Department of Developmental Disabilities; Ohio Developmental Disabilities Council[419]	Lending Libraries map	The Ohio Developmental Disabilities Council has identified assistive technology lending libraries across Ohio and created an interactive and downloadable map for these facilities. Lending libraries offer people with disabilities to try out different technology based on their needs before purchasing equipment (e.g., medical equipment, adaptive toys), with many programs offering lending services for free.

[414] https://chnhousingpartners.org/housing-and-community-services/technology-training-resources/
[415] https://abilitycenter.org/assistive-tech-medical-equipment/
[416] https://abilitycenter.org/lending-closet/
[417] https://www.ohio-k12.help/connectivity-champions/
[418] https://www.toledolibrary.org/mobile-wifi-hot-spots
[419] https://dodd.ohio.gov/about-us/resources/tech-first/Lending+Libraries

Organization Name	Asset Name	Description
Ohio Department of Rehabilitation & Corrections; Ohio Central School System (OCSS)[420]	Loaner Chromebooks for remote learning	CARES Act funding has been used to deploy 10,000 Chromebooks to prisons across OH to allow for remote learning during the pandemic and create personalized and modern educational opportunities.
PCs for People[421]	Affordable repair	PCs for People offer affordable repair services for computers in their store locations and offer a one-year warranty for PCs for People-provided devices.
Cincinnati Computer Cooperative[422]	Cincinnati Computer Cooperative	Since 2002, the Cincinnati Computer Cooperative has been providing children, adults, seniors, nonprofits, and schools with computers. Through donations of used computers by Greater Cincinnati businesses and individuals and a software partnership with Microsoft, a team of trained volunteers at the organization has been supplying refurbished desktops and laptops at little or no costs to these groups.
Cleveland Metropolitan School District[423]	empowerCMSD	Through the empowerCMSD program, The District provides a device for every student, connections for every family that needs internet access and tech support. Graduates leave commencement with a laptop. The program also gives CMSD students and families free access to the Microsoft Office suite of applications, including Microsoft Office, PowerPoint, and Excel. Other tech benefits and services available to CMSD students and families include interactive Clevertouch screens in every classroom and ID badges that let parents monitor their children's travel on yellow buses. The IDs double as Cleveland Public Library cards.
Cuyahoga Metropolitan Housing Authority[424]	ClevelandConnects+ initiative	ClevelandConnects+ initiative is part of HUD's national ConnectHomeUSA program that is committed to bridging the digital divide for HUD-assisted housing residents. In this program, CMHA focuses on providing access to three critical components: affordable internet connection, devices, and computer education. CMHA offers CMHA-specific affordable internet programs, free equipment, and senior computer classes, as well as

[420] https://drc.ohio.gov/About/Press-Releases
[421] https://www.pcsforpeople.org/affordable-repair/
[422] https://www.cincinnaticomputercooperative.org/
[423] https://www.clevelandmetroschools.org/Page/19479
[424] https://www.cmha.net/residentservices/digitalinclusion

Organization Name	Asset Name	Description
		a catalog of broader digital offerings along the 3 components.
Jewish Family Services[425]	Digital inclusion efforts	Jewish Family Services support their clients reach economic self-sufficiency and emotional stability. As part of their services, they help address the digital divide by supporting clients acquire low-cost internet and technology so they can benefit from virtual services and trainings, as well as providing training to develop both digital life skills and job skills that help clients qualify for remote work.
Ohio Department of Developmental Disabilities[426]	Assistive Technology	Assistive Technology can be used as a creative solution to help with a person's health and safety and can support a person's desire for more independence at home, in the community, or at work. This service enables people to use smart or electronic devices to increase their independence and reduce reliance on paid caregivers to help with a person's needs. The service also pays for consultation to make sure people are matched with the right technology to meet their needs, the appropriate equipment, and equipment training for the person as well as for their paid or unpaid caregiver.
PCs for People[427]	Affordable computers	PCs for People offer quality refurbished desktops, laptops, internet, and tech accessories to eligible individuals, as well as for nonprofit organizations.
The Cleveland Foundation[428]	The Cleveland Foundation Digital Excellence Initiative	Launched in 2017, the Cleveland Foundation Digital Excellence Initiative works to position Greater Cleveland as a leader in digital innovation and access by investing in five areas including funding and deploying digital equity and device access, supporting digital skill development via training and outreach programs, leveraging technology for greater civic engagement, and promoting digital leadership and innovation (e.g., smart city planning, hackathon).

[425] https://jfscolumbus.org/
[426] https://dodd.ohio.gov/about-us/resources/tech-first/AssistiveTech
[427] https://www.pcsforpeople.org/get-tech/
[428] https://www.clevelandfoundation.org/grants/program-initiatives/digital/

Organization Name	Asset Name	Description
Oak Hill Collaborative[429]	Oak Hill Collaborative Digital Advantage	Oak Hill Collaborative Digital Advantage is an initiative by the Oak Hill Collaborative to address the digital divide, with key activities revolving reducing internet costs (e.g., promoting ASP and public Wi-Fi), increasing technology access (e.g., public computer labs, computer refurbishing), and improving digital skill / literacy (e.g., free courses on digital skills).
Ohio Department of Aging; Assistive Technology of Ohio[430]	Assistive Technology support	ODA and Assistive Technology of Ohio, a non-profit organization, offers support to Ohioans who need assistive technology. AT Ohio's services include device lending and rental, computer refurbishing, training and more.
PCs for People[431]	Recycle Tech	PCs for People receives donated devices and assess, data-sanitize, and then refurbish and provide to families, individuals, and nonprofits in need, or recycle (zero-landfill).
Cleveland Neighborhood Progress[432]	Neighbor to Neighbor Cleveland	Neighbor to Neighbor is a door-to-door canvassing effort that helps deepen connections between local Community Development Corporations (CDCs) and their neighbors. Canvassers from neighborhood CDCs educate residents on programs they may be eligible for, as well as ask questions to understand the gaps that exist due to a lack of resources or programming that is symptom-based and not solution-based. The program in Cleveland helps collect granular, neighborhood-level data focused on internet access, technology, and smart device accessibility, and digital literacy needs.
Foundation for Appalachian Ohio[433]	Connect Appalachia Broadband Initiative Fund	In 2011, the Governor's Office of Appalachia in conjunction with Connect Ohio and Chesapeake Energy established the two-year Connect Appalachia Broadband Initiative (CABI), to address the broadband divide facing rural Appalachian Ohio. Administered by Connect Ohio, the CABI Task Force was made up of public, private, and nonprofit leaders. The CABI Fund was established at the Foundation for Appalachian Ohio in 2012 to provide support to Connect Ohio's efforts to increase broadband adoption and access in Appalachian Ohio.

[429] https://oakhillcollaborative.org/digital-advantage/
[430] https://aging.ohio.gov/care-and-living/caregiver-support/assistive-technology-1
[431] https://www.pcsforpeople.org/e-waste-pickup-removal/
[432] http://www.clevelandnp.org/neighbor-to-neighbor-cleveland/
[433] https://appalachianohio.org/grow/funds/fund-profiles/cabi-fund/

Organization Name	Asset Name	Description
Ohio Department of Developmental Disabilities[434]	Ohio's Telepsychiatry Project for Intellectual Disability	The program is aimed at reaching remote areas throughout the state or those with limited access to psychiatric services. Eligible referees could additionally receive support from the County Board to get access to necessary computer equipment and other coordination for telepsychiatry services, if not available individually.
Ohio Department of Developmental Disabilities[435]	Remote Support	Remote Support allows an off-site direct service provider to monitor and respond to a person's health, safety, and other needs using live communication, while offering the person more independence in their home. Remote Support uses two-way communication in real time (e.g., Skype or FaceTime), so a person can communicate with their providers when they need them.
Ohio Department of Developmental Disabilities[436]	Innovative Technology Solutions Project	DODD created the Innovative Technology Solutions project to increase the use of innovative technologies within service delivery and service operations for individuals with developmental disabilities. Innovative technology solutions could expand service delivery, improve business operations, or improve individual's access to transportation.
Ohio Department of Rehabilitation & Corrections[437]	Telemedicine to incarcerated individuals	ODRC offers telemedicine to provide specialty medical consults to Ohio prisons by linking ODRC institutions across the state and Medical Operations with the Franklin Medical Center and The Ohio State University Medical Center.

7.1.3 Ohio assets related to broadband affordability

Organization Name	Asset Name	Description
ExcelinEd[438]	Customizable graphics for Affordable Connectivity Program (ACP)	ExcelinEd created customizable graphics for organizations to promote ACP, where organizations can add their logos to pre-designed information flyers and share them on social media and via email.

[434] https://dodd.ohio.gov/about-us/MIID/Telepsychiatry/Telepsychiatry
[435] https://dodd.ohio.gov/about-us/resources/tech-first/RemoteSupport
[436] https://dodd.ohio.gov/about-us/resources/tech-first/Innovative_Technology_Solutions_Project
[437] https://drc.ohio.gov/correctional-healthcare
[438] https://excelined.org/policy-playbook/digital-access-equity/

Organization Name	Asset Name	Description
Connectivity Champions; Ohio Library Council[439]	ACP Promotion	Connectivity Champions serve as the point of contact for ACP promotion supported by BroadbandOhio, helping eligible Ohioans with ACP-related questions and support. Ohio Library Council supports ACP outreach efforts to improve awareness of the program.
Akron Metropolitan Housing Authority; Cuyahoga County Public Library[440]	FCC Affordable Connectivity Outreach Grant Program–Pilot Program Grants	The Affordable Connectivity Outreach Grant Program (ACP Outreach Grant Program) helps facilitate the promotion and awareness of and participation in the Affordable Connectivity Program (ACP) among eligible households. The program selected partners to serve as trusted community messengers and is providing those partners with the funding and resources needed to implement innovative outreach strategies to reach historically underserved and unserved communities in connection with their participation in two one-year ACP Pilot Programs: (1) the Your Home, Your Internet Pilot Program, which is focused on ACP outreach and application support to recipients of federal housing assistance; and (2) the ACP Navigator Pilot Program, which provides selected applicants access to the National Verifier to help low-income households complete and submit their ACP application. Akron Metropolitan Housing Authority has been selected as a partner for the Your Home, Your Internet Pilot program, while Cuyahoga County Public Library has been selected for the ACP Navigator Pilot program.
Digital Equity Coalition, RDIA	ACP Promotion efforts	As part of the state's digital opportunity efforts, Ohio's digital equity coalitions and RDIAs plan to launch ACP promotion efforts within their communities.
Ashbury Senior Computer Community Center[441]	New Hot Spot & ASC3 Low-Cost Internet Service	The New Mobile Citizen "Hotspot," powered by Sprint, is available now from ASC3. ASC3 is re-connecting previous subscribers and accepting new subscribers with the new Mobile Citizen Hot Spot Sprint Link Zone 2 4G LTE Wireless Device. ASC3 additionally provides high-quality, low-cost internet options for everyone not eligible for Lifeline or AT&T.
DigitalC[442]	EmpowerCLE+	EmpowerCLE+ is one of two initiatives of the non-profit DigitalC. At $18/month, EmpowerCLE+ brings broadband Internet of up to 50/Mbps to Cleveland's under-connected and unconnected communities. The

[439] https://broadband.ohio.gov/grant-opportunities/federal-resources-and-grants/affordable-connectivity-program
[440] https://www.fcc.gov/acp-grants
[441] https://www.asc3.org/internet-service.html
[442] https://www.empowercle.org/

Organization Name	Asset Name	Description
		initiative also offers access to computers, digital literacy training, tech support and more.
Ohio Department of Developmental Disabilities[443]	Internet Assistance Project	The Internet Assistance Project provides funding to eligible county boards of developmental disabilities to support the boards in providing internet assistance to people with developmental disabilities.
PCs for People[444]	Internet connection	PCs for People offer high-speed 4G LTE internet service solutions starting at $15 per month (or free with the ACP) for eligible individuals, via fixed wireless, mobile hotspot, or wireless access points for multi-dwelling units.
Ohio Housing Finance Agency[445]	Save the Dream Ohio – Utility Assistance Plus	Save the Dream Ohio – Utility Assistance Plus provides eligible Ohio homeowners with financial assistance to pay delinquent utility bills (e.g., gas, electric, bulk fuel, water, sewer, trash removal, internet service, and reconnection fees), property taxes, and other housing costs not included in the mortgage payment. A household may receive up to combined $10,000 in utility and/or housing cost assistance. OHFA is working with Community Action Agencies across the state to administer this component of the program.
Cincinnati Computer Cooperative[446]	Cincinnati Computer Cooperative	Since 2002, the Cincinnati Computer Cooperative has been providing children, adults, seniors, nonprofits, and schools with computers. Through donations of used computers by Greater Cincinnati businesses and individuals and a software partnership with Microsoft, a team of trained volunteers at the organization has been supplying refurbished desktops and laptops at little or no costs to these groups.

[443] https://dodd.ohio.gov/about-us/resources/tech-first/Internet+Assistance+Project
[444] https://www.pcsforpeople.org/internet/
[445] https://savethedream.ohiohome.org/resources.html#utility
[446] https://www.cincinnaticomputercooperative.org/

7.1.4 Ohio assets related to broadband access

Organization Name	Asset Name	Description
American Job Centers[447]	Comprehensive AJC resource room	Comprehensive AJCs offer free access to a resource room which includes computers with internet, telephones, and fax machines. These rooms are open to the public on a self-service basis.
Buckeye Hills Regional Council[448]	Wi-Fi Hotspots web map	The Buckeye Hills Regional Council provides a searchable, public web map of Wi-Fi hotspot locations in the region, with organization name, business hours, contact information, parking availability, and other relevant information.
Cincinnati State[449]	Guest Wi-fi	Guests of the college who do not have an active college network account could use the Guest Wi-Fi networks.
InnovateOhio[450]	Ohio Wi-Fi Hotspot	InnovateOhio offers a list of public Wi-Fi hotspot locations offered by ISPs and CAIs (e.g., universities) in OH, with address information and/or ISP webpage link that list hotspot locations.
Ohio Public Libraries[451]	Ohio Wi-Fi Hotspot	All of Ohio's public libraries have Wi-Fi available and can be accessed from the parking lot.
Ohio State University Agricultural Technical Institute (Ohio State ATI)[452]	Computer lab	OSU ATI has 5 computer labs that allow instruction in advanced computer operations, including CAD. These labs also function as public computing sites when not being used by classes. Most sites are open to students on a first-come, first-served basis. Each public site offers some of the following: Windows computers, Internet access, Popular software, Black and white laser printers, Color and black & white scanners, CD-ROM drives, and E-mail access.

[447] https://www.careeronestop.org/LocalHelp/AmericanJobCenters/american-job-centers.aspx
[448] https://buckeyehills.maps.arcgis.com/apps/MapSeries/index.html?appid=9326f57e08194927a5478b9e3958def8
[449] https://www.cincinnatistate.edu/tech-computer/wifi/
[450] https://innovateohio.gov/news/news-and-events/04042020
[451] https://oplin.org/fal/
[452] https://ati.osu.edu/currentstudents/computer-labs-and-services

Organization Name	Asset Name	Description
OhioMeansJobs[453]	Job Centers	OMJ Job Centers offer various services, including access to the internet, computers, printers, technology training, and more.
University of Toledo[454]	UTGuest Wi-Fi	UTGuest wireless network resides outside the University firewalls and only requires acknowledgement of the University acceptable use policy. No credentials are required.

7.1.5 Ohio assets related to digital opportunity

Organization Name	Asset Name	Description
Connected Marysville; Connected Dublin[455]	Route 33 Smart Mobility Corridor	The combined effort of Connected Marysville, Connected Dublin, and public and private partners created the Route 33 Smart Mobility Corridor, one of the largest deployments of connected vehicles in the country. The 33 Smart Mobility Corridor is a prime location for the testing of connected vehicle technology. The corridor is alongside one of the largest concentrations of advanced manufacturing, logistics, and automotive integrators in the Midwest. The Corridor enables the industry to work collaboratively with government and academia to safely test the future of transportation technology.
Fairfax Neighborhood Technology Center[456]	Fairfax Neighborhood Technology Center	FRDC offers Workforce Readiness assistance for residents who are seeking employment, covering resume formatting, and editing, Cover Letters, Online Job Applications, and Online Job Search.

[453] https://ohiomeansjobs.ohio.gov/job-seekers/find-a-job/local-help/local-help
[454] https://www.utoledo.edu/success/how-to/wifi.html
[455] https://www.thebetadistrict.com/us-33-smart-mobility-corridor/
[456] https://fairfaxrenaissance.org/programs-and-services/fairfax-neighborhood-technology-center/

Organization Name	Asset Name	Description
Future Plans[457]	Future Plans	Future Plans offer workforce training and career planning. It offers a variety of career path development and training tools, including a database of remote educational opportunities to help bolster skills of job seekers.
JobsOhio[458]	Ohio To Work	The Ohio Department of Jobs and Family Services, the Ohio Department of Development, the Office of Workforce Transformation, and the Ohio Department of Higher Education developed Ohio to Work, an innovative statewide initiative. Through Ohio To Work, JobsOhio unified a statewide coalition of existing workforce partners to offer customized support to job seekers through connections with training providers, career coaches and resources, and local employers in the manufacturing, healthcare, and technology industries. Now delivered regionally via local partners, Ohio To Work partners helped more than 200,000 unemployed and underemployed workers in Ohio find well-paying, meaningful employment through a variety of job training, tools, and resources. Support includes free personalized career coaching, accelerated training options, funding opportunities, and more.
JobsOhio[459]	Innovation District	JobsOhio, together with the state of Ohio and partners, is investing over $3 billion to fuel the creation of three world-class Innovation Districts in Cincinnati, Cleveland, and Columbus. Three key Innovation Districts establish Ohio as a global leader in healthcare, life sciences, and technology, bringing together three synergistic constituents: Medical and research facilities; Academic institutions focusing on STEM programs; and Private Corporations. These Innovation Districts are expected to inspire more than 47,000 new STEM graduates, fuel an estimated 60,000 new jobs, and generate up to $9 billion in annual economic impact to the state over ten years.
Jumpstart[460]	Business Workshops	Jumpstart offers focused deep-dives and group learning opportunities for growing businesses, including classes on digital marketing, social media strategy, financial projections, and other topics. Jumpstart will work to accommodate individuals with technology and/or internet connectivity challenges who would like to participate.

[457] https://futureplans.com/
[458] https://www.jobsohio.com/programs-services/talent; https://www.ohiotowork.com/
[459] https://www.jobsohio.com/programs-services/innovation/innovation-districts
[460] https://www.jumpstartinc.org/smallbiz/workshops/

Organization Name	Asset Name	Description
JumpStart; Verizon[461]	Cleveland Learning Centers	JumpStart and Verizon are officially opening the Cleveland Learning Centers in 2022, providing community members—from youth to adults—with digital skills and entrepreneurship training, STEM education, and workforce development opportunities through advanced technology and educational resources at no cost and available in two convenient locations. The Cleveland Learning Centers will offer cohort-based programs, focused workshops, and community-based events throughout the year.
Lake Erie Correctional Institution[462]	Technical (Vocational) Programs: Computer Aided Drafting (CAD) Program	Lake Erie Correctional Institution offers a 1-year program on Computer Aided Drafting (CAD) on Mechanical Drafting and Architectural Drafting, leveraging computer programs to advance their skills. Students have an opportunity to participate in community service projects, with past projects including houses for Habitat for Humanity, designing skate parks, benches, trash containers, picnic tables and signs for local communities.
Lake Erie Correctional Institution[463]	Technical (Vocational) Programs: Electronics and Computer Repair	Lake Erie Correctional Institution offers Electronics and Computer Repair as one of their Technical (Vocational) Programs.
MidTown; City of Cleveland; BioEnterprise; Cleveland Foundation[464]	Health-Tech Corridor	A collaborative effort between MidTown, the City of Cleveland, BioEnterprise, and the Cleveland Foundation to bring a cluster of growing health-tech and high-tech companies to a 1,600-acre area linking downtown and University Circle. The HTC works to attract businesses, connect them to the real estate and resources they need to grow, facilitate real estate development for businesses at all stages, tell the stories of the dynamic businesses in the area, and develop a sense of community.
North Central Correctional Complex[465]	Technical (Vocational) Programs: Computer Diagnostic and Repair	North Central Correctional Complex offers Computer Diagnostic and Repair as one of their Technical (Vocational) Programs.

[461] https://communityforwardcle.com/
[462] https://drc.ohio.gov/laeci
[463] https://drc.ohio.gov/laeci
[464] https://midtowncleveland.org/programs/
[465] https://drc.ohio.gov/nccc

Organization Name	Asset Name	Description
Ohio Department of Job and Family Services[466]	TechCred	Ohio's TechCred program reimburses employers up to $2,000 for training costs incurred when one of their employees earns a short-term, industry-recognized technology credential. A collaboration between the Governor's OWT, the Ohio Department of Higher Education, and ODJFS, a total of 1,958 employers were approved for funding for 48,632 credentials since the program began in September 2019 through August 2022. Additionally, ODJFS and the OWT teamed up to link employers whose trainings were not eligible for TechCred with Ohio's local workforce development areas for potential WIOA-funded incumbent worker training opportunities.
Ohio Department of Transportation[467]	DriveOhio	DriveOhio is an initiative of the Ohio Department of Transportation, serving as the state's hub for smart mobility technology on the ground and in the air. DriveOhio is a blend of public and private infrastructure entities that coordinate with advanced mobility technology developers to create a smart transportation system. DriveOhio connects government, industry, and academia to support research, development, testing, and deployment of innovative solutions to Ohio's mobility challenges. DriveOhio's current portfolio includes automated vehicle, connected vehicle, electric vehicle, and advanced air mobility efforts. In addition to fostering technical advancement in these areas, DriveOhio also works to ensure Ohio's regulatory environment and public policies are conducive to further technology development and adoption.
Ohio Department of Youth Services, Circleville JCF[468]	Circleville JCF programming	Circleville JCF offers several digital programs, including Career Tech Training via Career Based Intervention and Graphic Design Program.
Ohio Federal Research Network[469]	Ohio Federal Research Network	OFRN supports research and development initiatives in smart mobility technologies through a collaboration of industry, university, and NASA or AFRL partnerships.

[466] https://techcred.ohio.gov/
[467] https://drive.ohio.gov/
[468] https://dys.ohio.gov/facilities/circleville-jcf/circleville-jcf
[469] https://www.jobsohio.com/industries/advanced-mobility

Organization Name	Asset Name	Description
Ohio Governor's Office of Workforce Transformation[470]	Individual Microcredential Assistance Program	The Individual Microcredential Assistance Program (IMAP) helps Ohioans who are low income, partially unemployed, or totally unemployed participate in a training program to receive a credential at no cost. IMAP training providers cover all tuition, fees, and additional costs to help participants learn new skills and earn a credential that can lead to a good job. IMAP training providers offer both online and in-person programs, with programs including 5G and Broadband deployment, computer programming and tech-related skills, and other broadband adoption-related programs.
Ohio State University[471]	Center for Automotive Research (CAR)	OSU's Center for Automotive Research (CAR) program is focused on intelligent transportation systems, advanced vehicle safety, and sustainable mobility within a state-of-the-art Driving Simulation Laboratory.
Ohio State University Extension: Ohio 4-H Youth Development[472]	4-H Clovers CODE (Creating Opportunities Designed for Everyone)	Clovers CODE (Creating Opportunities Designed for Everyone) began in 2019 as part of the Apple Community Education Initiative and the effort to introduce youth to problem-solving, computer literacy and coding through hands-on activities.
Ohio to Work; Pathway Toledo[473]	Pathway, Inc. coach	Ohio To Work combines Pathway, Inc. resources to reach unemployed and at-risk workers in Ohio by expanding coaching and support services, career services, tools, training programs and supplementing funding options to cover training costs. Ohio To Work and Pathway, Inc. can provide any Ohioan looking for a job the tools they need to find work in the manufacturing and supply chain, technology, or healthcare industry.
OhioMeansJobs[474]	Job Centers	OMJ Job Centers offer various services, including access to the internet, computers, printers, technology training, and more.
OhioMeansJobs[475]	ApprenticeshipOhio	ApprenticeOhio offers apprenticeship programs where participants can earn a paycheck while they learn skills on the job. The program offers more than 200 training programs across many industries, including internet technology.

[470] https://workforce.ohio.gov/initiatives/initiatives/imap/imap
[471] https://car.osu.edu/
[472] https://ohio4h.org/june-2022/4-h-clovers-code-creating-opportunities-designed-everyone
[473] https://pathwaytoledo.org/ohio-to-work/
[474] https://ohiomeansjobs.ohio.gov/job-seekers/find-a-job/local-help/local-help
[475] shttps://ohiomeansjobs.ohio.gov/job-seekers/build-your-career/career-preparation/find-an-apprenticeship

Organization Name	Asset Name	Description
Operation Meraki[476]	Build - ReEngage	Operation Meraki ReEngage is a career skill, workforce development, and entrepreneurship program that focuses on transitioning Veterans to a new mission and career path. This free workshop focuses on building the skill sets that will empower Servicemen and Servicewomen to obtain meaningful careers after separating from the military, with essential skills including writing, reading, and computer use. Specific support areas range from general resume writing to specific career programs such as Fiber Technician Training.
Pathway Toledo[477]	Professional And Individual Development (P.A.I.D.) Program	The P.A.I.D. Program is designed to help participants obtain and retain employment by providing job training and job placement services necessary to help unemployed, underemployed, and hard-to-employ residents of Lucas County become self-sufficient. Offerings include, among others, Career and Digital Literacy Assessments and Training.
Transportation Research Center, Inc.[478]	Smart Mobility Advanced Research and Test (SMART) Center	Alongside Ohio Lt. Governor Jon Husted and senior state officials, the Transportation Research Center, Inc. (TRC Inc.), the largest independent automotive proving ground in North America, today inaugurated its new SMARTCenter – a state-of-the-art automated and connected vehicle-testing facility. The 540-acre SMARTCenter gives transportation innovators unparalleled opportunities to test advanced automotive and mobility technologies in a safe, secure, and repeatable real-world environment before the vehicles are deployed on public roads and highways.
Urban League of Cleveland[479]	Ohio To Work Partnership	As an Ohio To Work partner, Urban League of Greater Cleveland provides access to jobs, training, skill development, and resources including coaching and support services, assessment tools, training programs and supplementing funding options to cover training costs. Coaches can support participants with exclusive access to employers with open jobs in healthcare, Information Technology/IT, and manufacturing. Together, Ohio To Work and the Urban League of Greater Cleveland are providing job seekers the tools they need to work in the in-

[476] https://www.operationmeraki.org/build-reengage/
[477] https://pathwaytoledo.org/professional-and-individual-development
[478] https://www.trcpg.com/news-events/new-smartcenter-north-america-s-most-advanced-testing-site-for-automated-and-connected-vehicles-opens-at-transportation-research-center-in-ohio/
[479] https://www.ulcleveland.org/workforce

Organization Name	Asset Name	Description
		demand and stable industries of healthcare, IT, and manufacturing.
Urban League of Greater Southwest Ohio[480]	Employment Connections (EC)	Employment Connections comprises several successful job training programs that train participants for in-demand job skills that lead to living-wage employment opportunities in healthcare, customer service, IT, and other industries experiencing employment growth.
VANTAGE Aging and the Ohio Department of Aging[481]	Shrinking the Digital Divide for Older Ohioans	The partnership aims to address economic issues by growing digital access and skillsets for aging Ohioans who rely on sustainable employment. Leveraging the Federal Communications Commission's (FCC) Lifeline Program and VANTAGE Aging's Senior Community Service Employment Program (SCSEP), a nationally and state-funded program for low-income adults age 55 and older who are looking to re-enter the workforce, the partnership will (i) upskill individuals' digital literacy and requisite competencies with workplace digital technologies (ii) expand internet and computer access by equipping older Ohioans with computers and other technology devices (iii) better prepare older Ohioans for unsubsidized employment through increased opportunities for conducting job searches online while refining workplace competencies and skills.
CareerOneStop[482]	Certification Finder	CareerOneStop offers workforce training support, including an inventory of certificates and training resources (e.g., local community colleges that offer training courses for areas of interest) for job seekers to pursue; jobs and skills listed include computer / broadband-related offerings. American Job Centers additionally offer career consulting and support navigating CareerOneStop's database.
Cleveland Foundation, Fund For Our Economic Future, Greater Cleveland Partnership,	Cleveland Innovation Project	The Cleveland Innovation Project is a regional strategy effort launched in 2019 with a mission of strengthening technology-based economic growth and prosperity for all Greater Cleveland residents. The alliance and more than 150 business, entrepreneurial, institutional, and nonprofit leaders have developed and launched integrated initiatives

[480] https://www.ulgso.org/workforce-development275635ce
[481] https://vantageaging.org/news/shrink-the-digital-divide/
https://jfs.ohio.gov/owd/Initiatives/Docs/Ohio_PYs_2022-2023Modification.stm
[482] https://www.careeronestop.org/

Organization Name	Asset Name	Description
JumpStart, TeamNEO[483]		towards the vision of Cleveland being a leading Midwest region for technology-led growth and inclusion by 2030. To date, over $850 million has been committed to propel the initiatives by private, philanthropic, and public sources.
North Central Correctional Complex[484]	Academic programs: Cabling Technology	North Central Correctional Complex offers Cabling Technology as one of their Technical (Vocational) Programs.
North Central State College[485]	Tower Technician Program	The certificate program is a partnership between NC State College and Governor Mike DeWine's Office of Workforce Training (GOWT). North Central is one of three sites selected across the state for this new training program. The goal of the Tower Technician Program is to provide a reliable stream of qualified employees to support the expanding 5G networking needs of multiple utility providers throughout Ohio.
Ohio Department of Aging; Ohio Department of Higher Education[486]	Lifelong Learning Programs	Lifelong learning programs at Ohio's four-year universities and two-year technical colleges allow residents aged 60 and older to attend classes at little or no cost. A lifelong learning institute (LLI), or institute for learning in retirement (ILR), is a community-based organization of retirement-age people interested in continuing their educations beyond retirement. Most are sponsored by a college or university and provide non-credit academic programs developed by the members. LLIs are structured like typical college programs, with regular semesters and coursework.
OnlineU[487]	Best Military-Friendly Online Colleges	OnlineU publishes a list of military-friendly online schools, or schools that actively seeks to support current service members and their families. These online colleges and universities offer a variety of benefits and provide specific services, such as health services, counseling, financial assistance to military service members, supplemental types of aid, college credit for previous work and military experience, and others. Whether active duty, veteran, or spouse, these benefits allow individuals to prepare for their careers with a support system that understands their lifestyle and military responsibilities.

[483] https://greatercle.com/cleveland-innovation-project/
[484] https://drc.ohio.gov/nccc
[485] https://ncstatecollege.edu/lt-gov-announces-tower-technician-program/
[486] https://aging.ohio.gov/care-and-living/staying-active/staying-active-catalog/marketing-yourself
[487] https://www.onlineu.com/online-schools/military-friendly

Organization Name	Asset Name	Description
Educational Service Center of Eastern Ohio[488]	Innovation & Technology Integration Team	The ESC of Eastern Ohio Innovation & Technology Integration Team promotes the use of technologies to support student achievement in the K-12 classroom. The Innovation & Technology Integration Team provides leadership, staff development, and instructional support to all instructional and administrative staff. The team is charged with promoting a future-forward mindset for students, teachers, and staff to collectively create the conditions necessary for learning environments and pathways that prepare students to be confident and prepared to make positive contributions in an increasingly complex world of higher education and careers.
Educational Service Center of Eastern Ohio[489]	Technology Department	The Technology Department offers the needed support for a district to achieve its technology goals, assisting districts with guidance during purchasing decisions, project implementation, training, and maintenance on technology systems. The Technology Department is responsible for helping school districts integrate technology into the classroom, working with educators, administrators, and district personnel to support the district's numerous types of communication and latest innovations. Available services include User Account Creation and Maintenance, End-User Hardware and Software Support, Servers, Wireless, Telephone, Cameras, Security, Cloud Solutions, Purchasing, Inventory, and Electronic Waste Recycling.
Ohio Department of Developmental Disabilities[490]	Rapid Response System	The rapid response system (RRS) is a DODD application that helps to accelerate conversations between SSAs and technology vendors. The RRS is a gateway for county board of developmental disabilities to request a consultation with technology vendors to identify what technology solutions might be beneficial for a person with developmental disabilities. Technology vendors are able to see the requests and respond outside of the system directly to the requestors.
Ohio Public Library Information Network[491]	E-Rate information and training	OPLIN supports workshops on E-rate for public libraries each fall, supporting OH public libraries receive discounts on internet connection, wireless access and hardware that supports internet access through the E-rate program.

[488] https://www.esceasternohio.org/Content2/innovation-technology-integration
[489] https://www.esceasternohio.org/Content/technology
[490] https://dodd.ohio.gov/about-us/resources/tech-first/Rapid+Response+System
[491] https://www.oplin.ohio.gov/erateinfo

Organization Name	Asset Name	Description
Ohio Public Library Information Network[492]	Northstar Digital Literacy	OPLIN offers guidance on implementing Northstar locally, materials to market the program, and other technical support. Northstar focuses on basic digital literacy skills—such as using a mouse, searching on the internet, and using email—as well as advanced skills, like using Google Docs and searching for jobs online. Northstar is available to all Ohio libraries, and libraries can create learner accounts, which track online learning and the assessments completed. As Northstar testing locations, libraries can award certificates and digital badges to demonstrate skill mastery to potential employers.
Educational Service Center of Central Ohio[493]	Digital Teaching & Learning	As an educational solutions agency, the Educational Service Center of Central Ohio offers various technical assistance for incorporating technology and other digital aspects into education, such as software consulting, one-to-one computing guidance, Ohio Learning Hub, Game-Based Learning, and others.
South Central Ohio Educational Service Center[494]	Technology Services	SCOESC offers a wide range of IT Services to assist, support and develop their K-12 and private sector clients with custom-tailored IT solutions focused on their specific needs for success. Offerings include digital media (e.g., webpage migration), installation and support (e.g., wired, and wireless networking, infrastructure hardware selection), and comprehensive IT auditing.
Ohio Center for Autism and Low Incidence (OCALI)[495]	Assistive Technology Internet Modules (ATIM)	Designed for educators, professionals, families, persons with disabilities, and others of all ages, the Assistive Technology Internet Modules (ATIM) offer a collection of 50+ free, self-paced modules designed to help users better understand, identify the need, plan for, collaborate, and support individuals with disabilities within their school, home, community, or work using assistive and supportive technologies.
Ohio Department of Developmental Disabilities[496]	Ohio Technology First Taskforce	Technology First is an initiative to ensure that people with developmental disabilities have increased opportunities to live, work, and thrive in their homes and communities through state-of-the-art planning, innovative technology, and supports that focus on their talents, interests, and skills. To strengthen Ohio's Technology First initiative, the biennium budget for fiscal years 2022 and 2023

[492] https://www.oplin.ohio.gov/services/northstar
[493] https://www.escco.org/DigitalLearning.aspx
[494] https://www.esctech.org/
[495] https://atinternetmodules.org/
[496] https://dodd.ohio.gov/about-us/resources/tech-first/Ohio+Technology+First+Taskforce

Organization Name	Asset Name	Description
		included establishing a Technology First Taskforce charged to expand technology solutions within service delivery and operations, reduce barriers, and align state policies. The taskforce is supported by a diverse group of stakeholders who help outline recommendations for the taskforce, e.g., by identifying needs faced by people with developmental disabilities.
Community Solutions[497]	Community Solutions	Community Solutions publish research and convene stakeholders in Northeast Ohio on digital divide and broadband-related topics.
Hocking, Athens, Perry, Community Action[498]	Athens County's Coordinated Broadband Plan	Hocking, Athens, Perry, Community Action has dedicated activities for broadband in Athens County, including the broadband needs survey from the public and the Athens County Broadband Strategic Plan via a dedicated Athens County Broadband Coordinator supported by a stakeholder group.
The Cleveland Foundation[499]	The Cleveland Foundation Digital Excellence Initiative	Launched in 2017, the Cleveland Foundation Digital Excellence Initiative works to position Greater Cleveland as a leader in digital innovation and access by investing in five areas including funding and deploying digital equity and device access, supporting digital skill development via training and outreach programs, leveraging technology for greater civic engagement, and promoting digital leadership and innovation (e.g., smart city planning, hackathon).
United Way of Greater Cincinnati[500]	Northern Kentucky Digital Equity Initiative for Students	United Way of Greater Cincinnati partnered with Cincinnati Bell (renamed AltaFiber in 2022) and others to establish the NKY Digital Equity Initiative which helps provide families with high-speed internet for one year. United Way of Greater Cincinnati's NKY Digital Equity Initiative for Students has provided more than 3,700 students with access to technology and opportunities to participate in virtual learning during the COVID-19 pandemic. Since the program's launch before the 2020-21 school year, 16 Northern Kentucky school districts have benefited, and more than 1,670 homes have been connected.

[497] https://www.communitysolutions.com/
[498] https://hapcap.org/utility-services/broadband/
[499] https://www.clevelandfoundation.org/grants/program-initiatives/digital/
[500] https://www.uwgc.org/your-impact/programs-initiatives/northern-kentucky-digital-equity-initiative

Organization Name	Asset Name	Description
Hospital Council of Northwest Ohio (HCNO)[501]	Community health assessment	The Hospital Council of Northwest Ohio (HCNO) works with local hospitals, health departments and other partners to conduct community health assessments and community health improvement plans in more than 40 counties in Ohio – plus several counties in Michigan and Oregon. HCNO also provides other community health improvement services, including other reports, project management, project evaluation, coalition development, and facilitation of meetings and trainings. Reports include regional broadband subscription rates, use of internet to access healthcare, internet usage behaviors, and other information.

[501] https://www.hcno.org/community-services/community-health-assessments/