Pennsylvania Broadband Development Authority

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Pennsylvania Broadband Development Authority
November 17, 2022
10:00 AM

Keystone Building Meeting – Forest Room
&
Teams Meeting
Dial-In: +1 267-332-8737
Phone Conference ID: 931 437 277#

I.   Call to Order

II.   Approval of November 10, 2022 Meeting Minutes

III.   Adoption of the Commonwealth of Pennsylvania Statewide Broadband
        Plan

IV.   Update on Request for Proposal (RFP) for the Digital Equity and BEAD
        Planning Effort

V.   Public Comment

VI.   Adjournment

This meeting will be recorded, and your participation is your consent to being recorded.

PBDA Special Board Meeting Minutes
November 10, 2022
Microsoft Teams Meeting

Board members and voting designees in attendance:
- Representative Pam Snyder, Chair
- Dr. Kyle Kopko, Center for Rural Pennsylvania
- Joe Witmer, PUC, on behalf of Chairwoman Gladys Brown-Dutrieuille
- Senator Kristin Phillips-Hill, Secretary
- Matt Franchak on behalf of Senator John Kane
- Representative Carl Walker Metzgar
- Mark Critz, Department of Agriculture, on behalf of Secretary Russell Redding
- Dr. David Volkman, Department of Education, on behalf of Acting Secretary Eric Hagarty
- Acting Secretary Joe Lee, Department of General Services
- Zach Reber, Office of the Budget, on behalf of Secretary Ben Lukens
- Mike Hanna, Department of Community and Economic Development, on behalf of Acting Secretary Neil Weaver

Designees in attendance:
- Beth Rosentel
- Chloe Mandara
- Matt Bembenick

Department of Community and Economic Development (DCED) staff in attendance:
- Brandon Carson
- Erin Wachter
- Kalie Snyder
- Lori A. Butler
- Terri Wills
- Lori Irwin
- Rob Teplitz
- Pam Frontino
- Paul Opiyo
- Britte Earp

Guests in attendance:
- Jim Ladlee
- Harry Chrissy
- Nicole Ugarte
- Jennifer McClellan, Verizon
- Jennifer Cloonan, Frontier Communications
- Michael Stefan, Penn State University
- Pedro Romero, Verizon

I.   Call to Order

Chairwoman Snyder called the meeting to order at 9:01 AM.
Lori Butler conducted a roll call of the board members and confirmed quorum.

II.   **Approval of October 18, 2022, Meeting Minutes**

Chairwoman Snyder called for a motion to approve the minutes as presented to the board. Motion made by Senator Phillips-Hill. Motion was seconded by Dr. Kopko. Chairwoman Snyder asked for all Board members to approve or deny the motion. Motion passed unanimously.

III.   **Approval of Contract with Penn State Extension for the Broadband Availability, Access, Equity and Utilization Proposal**

Brandon Carson explained the existing Master Agreement with Penn State allows us to issue a purchase order for this specific project. He also provided a brief outline of Extension's proposed plan and cost. Brandon mentioned the warranty that was proposed in the scope of work and that the Authority will seek to amend the warranty language, for only this project and not the Master Agreement as a whole, to ensure the Authority is receiving quality work products and deliverables. He closed by acknowledging the urgency behind this work and that the challenge process for the new FCC maps will be live in a few weeks.

Chairwoman Snyder commented that we need to keep the process going and asked for any comments or questions.

Joe Witmer commented on the additional work that will need to happen as projects are funded and work is complete and asked whether we would need to extend the contract with Penn State and whether that require additional cost. Brandon commented that there may be a need for a third party in the future, but that we anticipate having GIS capacity in-house to lead that work.

Senator Kristin Phillips-Hill made a motion to approve scope of work and budget proposed by Penn State Extension, contingent on the warranty language in the Master Agreement being waived when the purchase order is issued. Dr Kopko seconded the motion. Chairwoman Snyder asked Lori Butler to do a roll call vote of each Board member for concurrence. Motion passed unanimously.

IV.   **Public Comment**

Lori Butler called for public comment, there were none.

V.   **Adjournment**

Chairwoman Snyder called for a motion adjourn and confirmed the next scheduled Authority Board meeting November 17, 2022, at the Keystone Building at 10:00 AM. Motion made by Senator Kristin Phillips-Hill. Motion was seconded by Dr. Kopko. Meeting adjourned at 9:12 AM.

Respectfully submitted,
Senator Kristin Phillips-Hill
Secretary

Pennsylvania
WORK SMART. LIVE HAPPY.

COMMONWEALTH OF PENNSYLVANIA
STATEWIDE BROADBAND PLAN

November 2022

Jim Thorpe, PA

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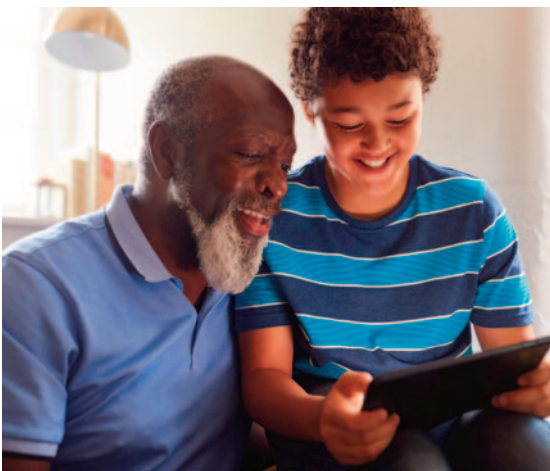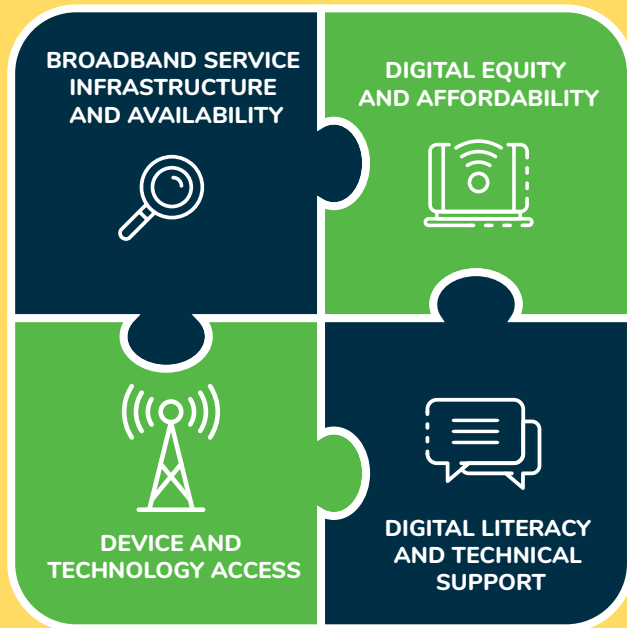
This Plan focuses on four challenge areas and opportunities for universal broadband access in Pennsylvania:

BROADBAND SERVICE INFRASTRUCTURE AND AVAILABILITY

DIGITAL EQUITY AND AFFORDABILITY

DEVICE AND TECHNOLOGY ACCESS

DIGITAL LITERACY AND TECHNICAL SUPPORT

To address both the immediate needs and long-term objectives for Pennsylvania broadband expansion that accounts for leveraging a variety of technologies across diverse geographies, the Statewide Broadband Plan (Plan) outlines goals and action steps toward achieving universal broadband access in Pennsylvania that meets or exceeds federally defined broadband speeds, in conjunction with the Pennsylvania General Assembly, industry partners, and local communities.

In developing the Plan, the Pennsylvania Department of Community and Economic Development and the Pennsylvania Broadband Development Authority (Authority) solicited extensive engagement and input from state and local agencies, state legislative leaders, broadband industry leaders, nonprofits, labor organizations, schools, intermediate units, libraries, and public members through webinars, in-person and virtual meetings, and direct outreach. In addition, the Authority established four sub-committees, each with a specific focus: Data & Mapping, Technical, Workforce & Supply Chain, and Outreach & Education. Sub-committee members were consulted and offered feedback on the Plan. Each committee will engage industry partners and subject matter experts to help advise the Authority's planning work and program implementation.

WHY BROADBAND FOR ALL?

Addressing Pennsylvania's broadband infrastructure challenges and increasing access to high-speed broadband services has been – and remains – a top priority for the commonwealth, local governments, internet service providers, non-profit organizations, and many other partners statewide. Our collective mission is *to foster and create equitable, affordable, and robust high-speed broadband infrastructure and services connecting Pennsylvania for the 21st century and beyond.*

Equal access to the internet, regardless of location or income, must be provided if Pennsylvania is to remain competitive; offer every child a quality education; access modern-day healthcare options, and provide a place for our farms and businesses to thrive and compete in a 21st-century economy. For Pennsylvania to succeed, we must close the digital divide, ensuring that every citizen and business has the access to connect to the ever-expanding digital world in which we live and work.

To foster economic growth and innovation, accessing high-speed broadband is imperative for businesses looking to remain regionally and globally competitive. Whether utilized to ensure precision agriculture, enhance daily business operations, or connect with potential new hires, broadband continues to play an essential role in today's knowledge-driven economy. As Pennsylvania seeks to attract innovative development and support business owners across the commonwealth, promoting universal access to broadband service that meets and has capacity to exceed current and future demand remains a top priority. Further, high-speed broadband connectivity is essential for local and regional economic development, supporting the growth of home-based businesses as well as providing the ability to work-from-home. The remote work environment that has emerged from the pandemic allows the people of Pennsylvania more flexibility to choose where to live, and reliable broadband availability facilitates those choices. Residents also will have the opportunity to pursue a wide range of jobs across the nation or the globe without having to move away from home.

To provide the critical infrastructure for the future, reliable built broadband is the foundation for delivering high-speed broadband, smart grid modernization, public safety, mobile wireless, and services such as fifth generation mobile capabilities (5G). Investing in critical infrastructure that is future-proof will serve the communities of Pennsylvania for generations to come.

To grow workforce development and educational achievement opportunities, high-speed broadband is integral to students, teachers, and employees. The lack of access to high-speed broadband has proven to be a substantial obstacle within the field of education, generating challenges for Pennsylvania students and faculty alike. As schools engaged in virtual learning during the COVID-19 pandemic, the digital divide became even more apparent. These limitations to learning in the classroom, at home, and in the community, place some of Pennsylvania's future workforce at a noticeable disadvantage. Online educational opportunities create expanded access to education and training, potentially breaking down geographical barriers to access.

To provide adequate, reliable emergency services, first responders require high-speed connectivity to ensure effective communication with patients and hospitals. Any delay in transmitting life-saving patient data or implementing the latest medical technology could have irreversible consequences. By expanding access and improving broadband service, emergency service providers will enhance their existing tools to ensure the health of their communities.

To enhance community health, well-being, access to health care services, and quality of life, communities increasingly look toward telemedicine to address their medical needs. These needs have grown exponentially since the emergence of the COVID-19 pandemic. Access to telemedicine services allows for both additional safety and continued service. While this is a valuable option for some households, those who lack broadband have been unable to utilize such services fully. As the state of healthcare continues to evolve, high-speed connectivity has become increasingly important to ensure that medical practitioners can effectively assess the needs of their patients.

THE CURRENT STATE OF BROADBAND IN PENNSYLVANIA

Understanding that accessibility does not equate to subscribership, the most recent Federal Communications Commission's (FCC) Broadband Deployment reports showed that approximately 640,000 to 800,000, or five percent of Pennsylvanians are "unserved", and lack access to high-speed broadband as defined by the FCC in 2014 as 25 megabits per second for downloads and 3 megabits per second for uploads[1]. At the time, this information was reported by service providers in accordance with FCC requirements according to census tracts; therefore, the reality of infrastructure deployment, affordability, and achieving the minimum "unserved" definition of 25/3 Mbps, may not be fully captured. Further, the Administration has defined a minimum speed of 100/20 Mbps as the definition of "underserved" connection speeds.

Research suggests that broader access to reliable and affordable broadband contributes to economic growth, yields higher personal incomes, and lowers unemployment rates. Additionally, it can help improve social outcomes by democratizing access to education and fostering social connections. Innovations such as telehealth can directly improve health outcomes. Yet sources demonstrate that at least 2.6 million Pennsylvania residents in 1.3 million (26%) households—including 25% of Latino and 35% of Black American Households[2]—either do not have access to or have not adopted high-speed broadband or may lack the skills to effectively use it. These disparities are driven in part by the following factors:

- **Infrastructure Availability:** Due to a lack of available infrastructure, at least 250,000 locations do not have access to 25/3 Mbps, and an additional 140,000 locations do not have access to 100/20 Mbps broadband.[3]

- **Affordability:** Prior to the establishment of the Emergency Broadband Benefit Program and the Affordable Connectivity Program (ACP), approximately 537,500 households (9.7%) did not have access to a wired low-cost home high-speed broadband subscription (ranks as 18th lowest percentage in U.S.)[4]. The ACP, coupled with other plans that are offered by many providers, provides access to high-speed broadband at low or no cost to qualifying Pennsylvanians, yet the program is undersubscribed and more can be done to increase enrollment and reduce barriers to participation.

- **Devices:** There are an estimated 1.6 million Pennsylvania households (31.2%) without a computer and smartphone (ranks as 34th lowest % in U.S.)[5]

- **Digital Literacy:** As many as 1.2 million (14.6%) adults in Pennsylvania may lack the digital literacy required to begin taking advantage of critical digital services.[6]

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1   Federal Communications Commission 2019 Broadband Deployment Report

2   U.S. Census Bureau, 2019 American Community Survey Microdata

3   Proprietary data set from CostQuest

4   U.S. Census Bureau, 2019 American Community Survey Microdata

5   U.S. Census Bureau, 2019 American Community Survey Microdata

6   National Center for Education Statistics

Though significant progress needs to occur, there have been some successes over the past several years. The Broadband Investment Incentive Program, administered by the Pennsylvania Department of Transportation, provided financial support to three service providers who participated in the FCC's CAF II Auction. These service providers will be expanding broadband connectivity to some of the most rural parts of the commonwealth. Additionally, several Pennsylvania projects have received funding through the Appalachian Regional Commission's POWER Initiative and Area Development Program, for rural broadband expansion.

In 2020, the General Assembly created the Unserved High-Speed Broadband Funding Program through Act 132 of 2020, a $10 million grant program that provides funding for the advancement of high-speed broadband services infrastructure deployment in unserved areas of this commonwealth. In March 2022, the Commonwealth Financing Authority approved $10 million for nineteen projects for nongovernmental entities to deploy middle-mile and last-mile high-speed broadband infrastructure to unserved areas. Funding will be used to acquire, construct, and prepare sites associated with deploying broadband infrastructure to unserved communities.

Act 98 of 2020 removed the requirement that mandated commonwealth rural electric cooperatives to enter into new easement agreements with each property owner for the installation of high-speed infrastructure. The law now permits companies to use existing infrastructure and utility easements to run fiber lines for the provisioning of high-speed broadband. The law also states that the attachment of broadband facilities shall not constitute a change in the physical use of the easement, nor interfere with or impair any rights of the property owner. A broadband service provider who is not an electric cooperative may access and attach broadband facilities within an electric cooperative's easement if given written permission by the electric cooperative.

In June 2021, Act 50, otherwise referred to as the Small Wireless Facilities Deployment Act was signed into law to expedite the deployment of wireless small cell facilities throughout the commonwealth. The law leverages existing infrastructure, when possible, to deploy, prescribes uniform permitting instructions, establishes a clear and predictable process for deployment, and fixes cost-based fees that will foster an environment to propel Pennsylvania faster to 5G accessibility to increase broadband connectivity and decrease broadband logjams on overwhelmed networks.

PENNSYLVANIA'S BROADBAND DEVELOPMENT AUTHORITY & FUNDING OPPORTUNITIES

In recognition of broadband's importance to the entire nation, in late 2021, Congress passed, and President Biden signed into law, the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law. This was a historic step forward toward the goal of providing broadband access to the entire country. The IIJA invests $65 billion into broadband to close the digital divide – of which Pennsylvania is guaranteed a minimum of $100 million and is expected to receive hundreds of millions in additional funding through formula or competitive funding opportunities. Additionally, the commonwealth was allocated $278,793,641 million from the American Rescue Plan Act Capital Projects Fund to allot toward broadband deployment.

To create a one-stop-shop for all things broadband in the commonwealth, prepare Pennsylvania for this historic investment, and coordinate efforts to ensure Pennsylvania receives every federal dollar possible, the Pennsylvania Broadband Development Authority (Authority) was established by Act 96 of 2021, receiving unanimous, bi-partisan support from the General Assembly.

The Authority is charged with creating a statewide broadband plan and distributing Federal and State monies for broadband expansion projects in unserved and underserved areas of the commonwealth. As the commonwealth's official broadband-specific authority, the Authority will seek to close Pennsylvania's digital divide, allowing all Pennsylvanians to get connected at home, at work, or on the road.

This newly established Authority is staffed by the Department of Community and Economic Development and is governed by an 11-member board, including the secretaries of the Pennsylvania Departments of Agriculture, Community and Economic Development, Education, General Services, and Budget; the executive director for the Center for Rural Pennsylvania; chairperson from the Pennsylvania Public Utility Commission; and four legislative members.

MISSION

To foster and create equitable, affordable, and robust high-speed broadband infrastructure and services connecting Pennsylvania for the 21st century and beyond.

VALUES

1. **PARTNERSHIP:** Promote strategic partnerships and leverage critical community anchor institutions.

2. **COMMUNITY:** Engage communities and residents to best serve their specific needs.

3. **TRANSPARENCY:** Provide accessible and transparent information regarding funding and decision-making processes.

4. **EQUITY:** Prioritize unserved populations followed by underserved populations.

5. **SUSTAINABILITY:** Ensure grantees have a viable strategy beyond initial investment to maintain, repair, and upgrade networks.

6. **ACCOUNTABILITY:** We will hold ourselves, partners, and providers accountable for agreed-upon outcomes, contractual obligations, and responsible expenditures.

VISION

A commonwealth where:

- Previously unserved and underserved populations fully enjoy the benefits and convenience of secure, high-speed broadband.

- Improved infrastructure reaches new audiences while minimizing environmental impact through planning and leveraging existing resources.

- Affordable options for connection will ensure the right fit for a variety of consumer needs.

- Robust, accurate, and timely data will guide decisions to meet current needs and position Pennsylvania to embrace emergent technology opportunities and improvements.

- A technology-neutral process that focuses on cost-efficient networks built reliably for the future demonstrates our commitment to connecting all Pennsylvanians to high-speed broadband not just today but also in the years to come.

- Trust and accountability are fostered through transparency and community engagement.

- Best Practices and Next Practices will guide expansion to ensure secure networks and devices.

- Digital literacy training is deployed based on the needs of Pennsylvanians and will be structured to ensure secure access to services for all consumers, independent of primary language or disability.

- Access to broadband and emerging technologies will accelerate better outcomes driven by STEM-based curriculum and education, digitally empowered workforces, healthcare innovation, and manufacturing automation and operational efficiencies.

There exist four core challenges facing Pennsylvanians' ability to access or adopt broadband. This section identifies the challenges and offers goals and action steps to address each challenge.

BROADBAND SERVICE INFRASTRUCTURE AND AVAILABILITY

DIGITAL EQUITY AND AFFORDABILITY

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BROADBAND SERVICE INFRASTRUCTURE AND AVAILABILITY

To improve broadband service infrastructure and availability, the commonwealth must first be confident that there is accurate data on existing broadband availability. The collection of data on current broadband availability and provided service speeds is critical in prioritizing expansion and enhancement efforts. In 2020, Congress passed the Broadband DATA Act, directing the Federal Communications Commission (FCC) to create a publicly accessible, data-based nationwide map detailing fixed and mobile broadband availability in the United States. Since then, the FCC launched the Broadband Data Collection program, which uses location-specific data from providers to build a fabric upon which fixed broadband availability data will be reported and overlaid on new Broadband Data Maps. Unlike previous data collections, which focused on census blocks, the new geocoded data will present highly precise maps of fixed broadband deployment.

The commonwealth's mapping efforts should seek to align with the FCC maps. States and the public will be able to challenge these maps with credible service availability data to help improve the maps on a regular basis, directly impacting Pennsylvania's federal funding allocation. Accordingly, the Authority should rely on the FCC's Broadband Data Maps to identify unserved and underserved locations, and should partner with providers, local governments, schools and intermediate units, and institutions of higher education to review this data, challenge it where appropriate, and determine where federal resources are most needed in an efficient and consistent manner.

To address challenges with **Broadband Service Infrastructure and Availability**, the commonwealth must:

1. **Rely on and maintain current and accurate data on unserved and underserved populations.**

    a. **Ensure grants require geo-information and that the state has the capacity to accept applications which include this information.**
    Geographic information system (GIS) mapping can be used to visually represent the local, or regional impact of the project funded. It can also be used for research and analysis, for outreach purposes, and to evaluate the results of the project. With GIS technologies, the state can create maps to describe the

geographic, demographic, and economic impacts. These maps will give the state a clear, easy-to-understand picture of where the projects are too.

b. **Conduct a gap analysis to identify unserved/underserved populations using special data analysis.**
A broadband gap analysis is essential to the development of the state or regional digital equity strategy. The analysis can be done by identifying gaps in infrastructure, areas where service providers are unable to access buildings, service disparities, areas where broadband subscriptions are low, and adoption of broadband technologies. The analysis can also highlight addressable markets, broadband coverage and penetration, connectivity, demand, supply, and investment gaps. The gap analysis should be ongoing, considering planned and in-progress efforts.

c. **Identify and verify eligible highspeed broadband infrastructure project areas.**
Applicants for state and federal grant funding programs should be required to include detailed information demonstrating the proposed project area(s) that are eligible for funding by submitting shapefile maps. Challenges to proposed locations should align with the FCC's maps and should be resolved prior to a time of open bids, so projects may be most effectively and efficiently designed.

2. **Reduce obstacles to broadband deployment.**

a. **Facilitate a comprehensive review of lease and attachment fee structures, permitting issues and other reported challenges to broadband deployment.**
Permitting, access to rights-of-way, pole attachments, railroad crossings, and other challenges need to be examined and addressed to prepare the commonwealth for an influx of federal funding and position it for shovel-ready projects.

Resources owned by local, state, and federal governments, private landowners, or other entities, requires coordination, expedited permission and, to the extent possible, streamlining to produce uniform rules and regulations. Regardless of technology deployed, various permits and permission will be required to access local, state, federal, and utility-owned land, and infrastructure assets to deploy high-speed broadband networks. Co-location opportunities along existing infrastructure, such as highway and utility rights-of-way and aboveground pole lines avoids new environmental disturbances.

b. **Consider the creation of a "Broadband Ready" program for local units of government.**
Programs such as Indiana's Broadband Ready Communities Program, North Carolinas Community Broadband Planning Playbook, and Georgia's Broadband Ready Community Designation are useful examples of programs that encourage economic development and attract broadband projects, reduce obstacles to broadband infrastructure investment and better position units of local government to respond to funding opportunities and partnerships with providers.

3. **Support sustainable, resilient, and secure operations and networks.**

a. **Apply industry best practices to ensure security of data and infrastructure.**
Major infrastructures must also be vigilant against nefarious forces whose goal is to destabilize digital networks and security systems. Professional hackers aim to cause chaos and profit from the weaknesses of cyber security infrastructure and the lack of upgrades to most vital systems. Governments and major corporations worldwide have experienced the effects of natural disasters, the ransoming of data, threats of physical attack, and the total shutdown of systems that societies depend on for everyday life. The commonwealth should continue to coordinate stakeholders as it has under the multi-jurisdictional Black Sky Steering Committee to ensure that all relevant actors can prepare, contain, and respond to such attacks while applying industry best practices to ensure the security of data and infrastructure.

b. **Consider continuity of operations planning for environmental events.**
Broadband networks are part of the DNA of resilient communities. As evidenced throughout the COVID-19 pandemic, reliable and high-speed connections are vital for education, health, safety, and economic development. Natural disasters pose ongoing threats to broadband networks across the country, underscoring the importance of centering resiliency planning in broadband deployment strategies. The state should recommend measures to improve the resiliency of broadband infrastructure before a disaster occurs, as well as actions to restore broadband infrastructure more quickly following a disaster, in addition to developing best practices for coordination among providers during and after a disaster. Moreover, employees of broadband telecommunications companies should be classified as critical or essential workers during times of federal or state emergency declarations allowing them to freely access roads to and from broadband network facilities during an emergency.

4. **Support and maintain a skilled workforce.**
    The NTIA Notice of Funding Opportunity for the Broadband Equity, Access and Deployment (BEAD) Program requires states to describe their plans for ensuring a highly skilled workforce, including proposals around partnerships, on-ramps to broadband-related jobs, and diversity.[7] To address ways to make good jobs in broadband more widely available and improve job skills training and development opportunities for the broadband infrastructure deployment workforce, the state can:

    *   Evaluate the current broadband deployment labor market in the commonwealth to assess the level of employment, wages, and obstacles to hiring and retention of a diverse workforce.

    *   Identify gaps in broadband infrastructure deployment skills (and relevant job codes) that could inhibit the pace of deployment of broadband infrastructure across the state, while simultaneously identifying community colleges, training institutes, and veterans training programs that can provide training and curriculum to address skill gaps.

    *   Present to providers and other broadband-related employers' solutions to workforce issues that are adaptable and scalable by different geographic areas and for various broadband technologies.

    *   Identify employer best practices in compensation and training that result in recruitment and retention of a diverse workforce, including approaches such as apprenticeship and wraparound services (childcare, transportation, etc.).

    *   Recommend how to attract more skilled professionals to join the broadband infrastructure deployment workforce, including by mapping the presence of underemployed workers in occupations adjacent to broadband who could more easily be trained as broadband technicians, engineers, or other technical roles.[8]

    *   Partner with and educate stakeholders on state and federal funding opportunities that benefit training and workforce development opportunities related to broadband and skills involved with infrastructure deployment, including use of BEAD funds for workforce training and development.

    *   Consult with industry and worker representatives, including labor unions, on the design of the Authority's grant application criteria to incorporate fair labor practices as one of the three primary evaluation factors for subgrantees, as required by the BEAD Notice of Funding Opportunity.[9]

    *   Encourage existing employers to develop a curriculum that would be presented to the Pennsylvania Apprenticeship & Training Council to be considered for recognition as a sanctioned apprenticeship program.

5. **Ensure minimal to no negative impact to natural resources or communities.**

    a. **Identify assets already in place.**
        Communities rely on a variety of physical infrastructures that are critical for the sustenance of lives and livelihoods, such as utility poles, buried conduits, streetlights, and towers. However, information on these assets is historically difficult to access. The new and updated FCC maps will provide the state a critical resource on which it can rely to help identify existing deployments and target key funding to unserved and underserved areas.

        The state can initiate an asset mapping and management process of collecting, organizing, and tracking data on relevant state-owned infrastructure assets, including all state-owned towers that can be utilized for broadband deployment, creating potential opportunities for providers to leverage existing assets where practical and reduce the cost of broadband deployment.

    b. **Leverage existing infrastructure and providers to facilitate broadband deployments.**
        The high cost of connecting individual customers in areas with geographic challenges or low population density can impede universal broadband goals, but it can be done with the aid of federal and state broadband funding, by diversifying partnerships and expanding broadband service provider eligibility, and maintaining Pennsylvania's commitment to technology-neutral rules for expansion projects.

        This work will require collaboration with broadband service providers and utilities, including investor-owned utilities and rural electric cooperatives, through public-private partnerships and grant programs, to extend broadband coverage. The use of existing infrastructure and rights-of-way, leasing capacity to other providers and reaching unserved rural customer bases, as well as providing expedited access to infrastructure such as poles and towers, will be critical in expanding broadband to these challenging populations.

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7   *NTIA NOFO at page 59.*

8   *How Federal Infrastructure Investment Can Put America to Work, Center for Sustainable Development at Brookings.*

9   *NTIA NOFO at pages 44 to 45.*

c. **Institute a dig-once policy requiring coordination of infrastructure projects.**
Increase the potential for broadband infrastructure deployment cost reductions by enhancing the ability of state and local government agencies to coordinate with high-speed broadband providers in accordance with the funding cycles of American Rescue Plan Act Capital Projects Fund and BEAD in the planning, construction, and maintenance of state and local roadways and the infrastructure that lies beneath. This coordination, referred to as a "dig-once" policy, has the central premise that during the construction or repair of a road or a water pipe, agencies can leverage rights-of-way to simultaneously install conduits or run fiber at a lower cost. Depending on the classification of the roadway, the Pennsylvania Department of Transportation or a local government unit would be charged with establishing a single point of contact to coordinate the deployment, construction, or maintenance of infrastructure. Public rights-of-way, particularly along highways and other transportation infrastructure, are commonly used to accommodate public utilities, and can be a useful tool for the state and local governments to adopt a dig-once policy to further expand high-speed broadband infrastructure to unserved and underserved regions of the commonwealth.

6. **Promote or adopt mitigation strategies to alleviate supply chain challenges.**
The COVID-19 pandemic had negative impacts on the operation of the global supply chain, including all aspects of broadband build. Raw materials, finished products, transportation of materials, and supply storage are significantly more expensive, and frequently in short or uncertain supply. According to the Fiber Broadband Association, lead times for required supplies are currently ranging anywhere from 10 to 71 weeks. Further, complications in the shipping process have led to price increases of anywhere from 40-100% as well as substantial delivery delays.[10] Mitigation strategies can assist companies in successful, timely deployment of broadband, helping to overcome the current supply chain challenges and provide a buffer from future challenges. The Fiber Broadband Association's report *Strategies to Mitigate Bottlenecks in the Current Fiber Broadband Supply Chain* outlines several best practices to consider:

- Relationship building and communication: Including representatives from a wider range of departments within a company in meetings so problems can be averted early in the process and developing good relationships with suppliers to promote long-term supply chain and logistics coordination.

- Capacity build-out and nearshoring: Investing in production capacity within the United States to benefit long-term availability, and to the extent possible, transferring business operations to a country closer to the U.S.

- High-level design and product substitution: Networks should be designed earlier in the buildout process so that purchases can be made as early as possible. Identifying possible product substitutions is also key.

- Training programs: To address the workforce shortage in the industry, many employers are focused on doing more in-house training and upskilling existing employees. An emphasis is also placed on rapid on-the-job training programs or supporting more formal training programs.

- Supplier diversification: Having more than one possible source for any type of product or service can help avoid bottlenecks.

- Scheduling management and forecasting: Many operators now work on five-year plans, collaborating on plans far in advance to ensure that various teams know what kind of capacity is necessary.

- Smarter technology: Some suppliers are adopting artificial intelligence to help in forecasting supply and demand. Smart technology alerts them about issues within the organization, but also external factors that could impact the availability of required materials.

- A move away from "Just in Time," and increasing storage options: Many companies now order more equipment in advance of when they need it and are expanding warehousing or arranging with distributors to store it where needed.

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10   *Shipping and Logistics Costs Are Expected to Keep Rising in 2022 - WSJ*

DEVICE AND TECHNOLOGY ACCESS

To improve access to devices and technology that will increase statewide adoption, the commonwealth must first identify the areas of need. Lack of access impedes every corner of the commonwealth and obtaining accurate data from the new maps will be crucial to putting together an effective plan for increasing access.

To address challenges with **Device and Technology Access**, the commonwealth must:

1. **Prioritize device funding according to need and return on investment.**

    a. **Identify and leverage additional funding partners to provide devices.**
    Efforts to capture the data that helps to identify unserved and underserved areas also need to identify device access gaps. Leveraging key partners could offer additional support in device and technology expansion efforts. Partners can include community anchor institutions like libraries, schools, recreation centers, intermediate units, healthcare providers, community colleges, and public housing organizations. Non-profit organizations and our Area Agencies on Aging could play a key role in outreach and connection efforts.

    b. **Investigate ability to link funding for infrastructure build to leverage existing device programs.**
    Many of the above-mentioned partners have existing programs that assist in device accessibility. Collecting information on existing programs and assets to understand what is currently available and identifying the remaining gaps can drive the amount of funding and type of programs created that will successfully expand access. The commonwealth has several state-owned assets that could be leveraged to expand existing technology into communities that need assistance.

    c. **Determine eligibility for device assistance.**
    Working in tandem with state agencies to identify existing programs that have eligibility requirements can help to pave the best path for device assistance eligibility. The FCC's Affordable Connectivity Program (ACP), Lifeline, housing programs, WIC, Free and Reduced Lunch, and SNAP are programs with existing eligibility criteria that can be mirrored or evaluated for use in determining eligibility for any future device assistance programs supported by state or federal funds.

2. **Ensure that secure devices are made available and affordable.**

    a. **Continue to leverage anchor institutions to provide rapid community broadband service.**
    Encourage and increase the use of community anchor institutions such as schools, intermediate units, libraries, recreation centers, medical facilities, and government buildings that have always served as critical connection points for last mile fiber and fixed wireless development. During COVID-19, anchor institutions often took on the role of providing wireless connections through a combination of innovative services. Public libraries have expanded Wi-Fi signals to reach outside of the building to cover surrounding parking. School districts also played a critical role in connecting students for remote learning by distributing mobile hotspots to homes, as well as equipping school buses and public transit with mobile hotspots and deploying buses in underserved communities. These initiatives can be evaluated and expanded in unserved areas.

    b. **Investigate the use of refurbished devices from unused surplus sources.**
    The commonwealth can partner with ISPs, federal government, non-profit groups, and community anchor organizations to fund and distribute secure, refurbished devices to various locations and reuse equipment in high-need areas. Existing programs including but not limited to the PA Department of General Services' Surplus Program and similar programs currently run by anchor institutions, community organizations, and private partners across the commonwealth can be leveraged to supply, inventory, and distribute low-cost refurbished devices.

    Any use of refurbished devices must ensure that all security risks are addressed, and that the device hardware/software is currently supported and maintained by the manufacturer. This could include an annual list of approved specifications that the leased or refurbished devices must meet.

DIGITAL EQUITY AND AFFORDABILITY

The internet has become an essential service in daily life for all residents of the commonwealth. The National Digital Inclusion Alliance defines digital equity as "the condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy" and further, "Digital equity suggests that all workers, learners, and communities have access to the training they need to gain relevant skills and the technology necessary to participate in our society and economy."[11]

Further, an individual or family's income is among the factors that determine whether high-speed broadband access is affordable. Across rural and urban areas with lower median household incomes, broadband subscription rates are lower than areas with higher median household incomes. Conversely, households with higher incomes are more likely to have multiple devices that enable them to go online. Accessing the internet on a cell phone only as primary means to connect to the internet can be cost prohibitive due to data caps and is a fundamentally more limited form of engagement with the internet than individuals who are accessing the internet on a desktop or laptop computer with a fixed wireline service, such as fiber or cable.

Beyond monthly service rates, factors contributing to affordability can also include contract length, activation or installation fees and equipment costs. Many internet service providers have enacted new or improved low-cost service options for low-income households, those recently unemployed, or discounted services for essential workers. Moreover, the FCC's Lifeline and ACP both offer monthly service discounts to eligible subscribers and households that reduce, and in some instances entirely remove, the cost of monthly service.

To address challenges with **Digital Equity and Affordability**, the commonwealth must:

1. **Ensure that multiple affordable service options are available.**

    a. **Collect and disseminate data on current service options and rates.**
    The state should make use of the new FCC mapping availability and requirements and should also consider the FCC's newly adopted broadband labeling requirements regarding speeds, terms, and conditions for service. One location for consumers to identify all relevant information will increase transparency and allow consumers to compare options more easily.

    Many residents do not have much choice for broadband service, and some can only access broadband through one provider. In urban areas, it is common to be limited to one cable provider and one DSL or fiber provider. In rural areas, broadband users may rely on low-speed DSL, satellite, or nothing at all. According to NTIA, DSL or satellite are no longer a viable option for reliable broadband services that can deliver minimum speeds of at least 100/20 Mbps.

    b. **Clearly define affordability looking at a variety of factors.**
    Recognizing the diversity across the commonwealth, the Authority should collaborate with industry partners and subject matter experts to properly identify low-cost options that work across varying regions. As a requirement of the Broadband Equity, Access, and Deployment (BEAD) Program, states must consult with prospective sub-grantees to define the term "low-cost broadband service option."

    To understand affordable access for all, the commonwealth should examine multiple data points including income, geography, and adoptability. The Authority should consider the role that federal Lifeline and ACP programs can play in reducing monthly service costs for eligible subscribers and households, as well as ways to expand outreach efforts and ensure eligible populations are aware of and enrolling in these programs.

2. **Ensure that affordable options are sustainable.**

    a. **Leverage private sector funding.**
    The state should consider where existing providers could share the cost of buildout and deployment in areas where broadband funding is available. The state could also consider encouraging regions (Local Development Districts and Economic Development Districts in conjunction with county, township, and municipal leaders) to develop a Public-Private Partnership (PPP) financing model that brings together investors (construction companies, banks, pension funds, infrastructure funds) and lenders (private sector banks or private financial institutions). Most government programs do not fully fund a network build, so existing providers, or private capital could complement government funding. The model adopted may entail creation of a special purpose vehicle (lending is based on the projected income from the project) and hold

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11   *National Digital Inclusion Alliance Definitions*

collateral against project assets or could award fixed-amount awards to entities that could leverage them. This private sector leverage could increase investments in local community capacity, overcome obstacles, and help communities achieve greater connectivity status and execute a clear and sustainable broadband deployment strategy for communities.

b. **Create a sustainability model/long-term plan for when federal funding is no longer available.**
The state should encourage partnerships between providers and local community leaders to create financially self-sustaining models that address the continued operation of their networks in the absence of future broadband funding. The choice of a model is a decision based on the socio-economic situation, the level of the public funding available, and the medium and long-term regional development goals. Regions can choose to take a data-driven approach to assess and drive demand and be able to tell the story about how digital infrastructure and transformation benefited the community, and in turn develop marketing strategies and tactics that identify key user and community groups, existing or available providers, and/or potential funders. This can be an ongoing process and key to driving demand, innovation, and competition. The approach should also consider long-term network sustainability, provider experience, and realizing community benefits that include new jobs, local business growth, social service benefits, and tax base increases, etc.

c. **Incentivize regional collaboration and aggregation of demand.**
Where existing providers, local government agencies, non-profits, and community institutions do not already address broadband affordability issues, the state should encourage additional subsidy support for builds or ongoing services. Regions should encourage more efficient and larger subsidized and comprehensive builds to make use of economies of scale that will best align resources to position communities for expansion of broadband infrastructure, bringing improved broadband access to the regions by acting as a vehicle for supporting providers in the region. The alignment of resources may include gathering community assets and anchor information that may support infrastructure expansions. The entities can also rely on updated labeling and speed testing from the FCC that will provide additional granular data regarding bandwidth capabilities, data speeds, consumer costs, usage, technical and customer support, and community interest and needs across the regions.

3. **Ensure transparency.**

a. **Understand full costs including short-term, long-term, and ongoing usage.**
To improve transparency of broadband data the commonwealth can create an interactive, searchable broadband map showing broadband access statewide. The state should institute efforts to advance digital equity for all—especially for people of color, the elderly, persons with disabilities, households with school-age children, small business owners, persons who live in rural areas, those living in environmental justice areas[12], and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality. Information that broadband internet service providers publicly disclose regarding their network management practices, performance characteristics, and commercial terms of their services further enables consumers to make informed choices regarding the purchase and use of such services – and the Authority can compile this publicly-available information in an accessible location online for consumers to view, which will facilitate their ability to comparison-shop when choosing broadband services from providers.

Digital equity concerns should also include a focus on the opportunity cost of slow-to-deploy projects. While funding needs are immediate, a project that does not complete connections to customers for several years risks leaving behind students who are in immediate need of remote-learning opportunities, parents in need of remote work opportunities, and elderly residents in need of telehealth opportunities. A robust understanding of the opportunity cost of a proposed project should be a consideration when reviewing proposals funded by the commonwealth.

b. **Define and clearly communicate affordability standards.**
The state can utilize data and the comprehensive research the FCC has conducted to assess affordability for families and individuals across different incomes and communities. Relying upon federal affordability standards, such as those that inform Lifeline and ACP eligibility, would help to ensure that services are accessible and equitable, reduce potential for fraud and abuse, and remedy the potential for consumer confusion. How the state defines affordability has the power to enable more inclusive access and close the digital divide.

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12   The Pennsylvania Department of Environmental Protection defines "environmental justice areas" in their Environmental Justice Public Participation Policy as "any census tract where 20 percent or more individuals live at or below the federal poverty line, and/or 30 percent or more of the population identifies as a non-white minority", based on data from the U.S. Census Bureau and the federal guidelines for poverty.

DIGITAL LITERACY AND TECHNICAL SUPPORT

Full and fair participation in this increasingly digitized society relies on access, affordability, and skills. Pennsylvania has many rural communities that lack access to high-speed, broadband. At the same time, there are areas of the commonwealth where broadband access is readily available, but individuals and families cannot afford the phones, computers, and other devices needed to engage online. While affordable access is the first step, people must also know how to use technology safely and securely.

Digital literacy is defined as the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. Efforts to build out broadband infrastructure should dovetail with efforts to address gaps in digital literacy and skills.

To address challenges with **Digital Literacy and Technical Support**, the commonwealth must:

1. **Provide training so every person can meet foundational digital literacy skills.**

   a. **Identify and support communities that have the least access to digital skills training.**
   The Digital Equity Act of 2021 was established by the Infrastructure Investment and Jobs Act with the goal of promoting meaningful adoption and use of broadband services across "covered populations," including low-income households, aging populations, incarcerated individuals, individuals with disabilities, racial and ethnic minorities, and more. Data should be used to identify both the communities currently facing the largest gaps in digital participation and the availability of digital skills training opportunities in those communities to promote equity and access. While broadband mapping efforts can highlight geographical areas that lack broadband access, digital skills training opportunities will need to be highlighted as broadband is rolled out.

   The National Governor's Association's Workforce Innovation Network recently partnered with Pennsylvania to establish a statewide definition of digital literacy, gather new data on significant digital skill gaps, assess available resources, and build an action plan to close the digital skill gap. A newly released digital skills training map will be used to identify communities that require the most assistance to gain full digital inclusion. The Authority should examine digital equity programs offered across the entire stakeholder community spectrum and identify opportunities that will help close the commonwealth's digital divide.

   b. **Differentiate between basic computer and mobile skills.**
   Digital literacy and the requisite skills to navigate a digital landscape must be inclusive of various available technologies and operating systems. While most educational environments and employment opportunities require knowledge of desktop skills, the most broadly utilized technology devices are mobile phones or tablets which require a different skill set for use. Understanding and addressing the challenges associated with both types of technology (and adapting to any future technology) is critical towards building a comprehensive digital literacy framework for the commonwealth.

   c. **Ensure that devices are accessible and usable for all individuals.**
   Accessibility is a critical, core component of expanding digital literacy and the needs of all end users must be considered. Accessibility considerations should include but not be limited to language accessibility, visual impairment, and the needs of vulnerable populations like older adults and people with disabilities to understand how to use technologies and have access to services and should be consistent with national and FCC requirements to ensure consumers have a consistent, transparent, and readily accessible experience.

2. **Develop a digital literacy plan.**

   a. **Align digital literacy efforts with the build-out of broadband infrastructure.**
   To address the digital divide effectively and equitably, several components of technology access must be considered: broadband infrastructure, devices, technical support, and digital skills and cybersecurity training. If people don't know how to use the technology safely, responsibly, and confidently, the physical infrastructure has little meaning. As the state brings broadband to new areas, rollout plans and procurement methods for services in those areas should incorporate ensuring the availability and awareness of digital literacy resources and connecting people in those areas with those resources.

   b. **Develop performance measures and consistent data collection.**
   Identifying consistent measures, effective monitoring strategies, and coordinating data collection methods across agencies and in partnership with local entities will better support identification of needs as well as

measure progress towards digital literacy goals for the state. As a measurement of progress and potential roadmap for the development of a digital literacy plan, the commonwealth should consider utilizing the State Digital Equity Scorecard[13] which shows the extent to which states are addressing digital equity.

c. **Continuously engage employers, local workforce boards, and education institutions to understand the evolving roles and uses of technology in the workplace.**
As individuals receive foundational digital literacy skills training, this same technology access may be used for job skills training to increase workforce participation and competitiveness. As technology continuously evolves, having a consistent way to increase awareness of new and changing skill needs is essential to ensuring trainings and skills stay up to date. Engaging in this on a more consistent basis will facilitate a continued and more efficient process of keeping digital skills gaps from widening.

3. **Develop a technical support network.**

a. **Identify and engage anchor institutions to provide foundational digital literacy skills training or connect people to training opportunities.**
To effectively meet people where they are—in terms of both their physical location and their readiness to engage with new technology—local institutions that have established relationships and are rooted in community development and wellbeing serve a pivotal role. Libraries may be especially well-situated to serve as anchor institutions. Depending on the community, community colleges, faith-based organizations, and other established nonprofit entities are additional examples of anchor institutions that have the resources and relationships to advance digital literacy effectively.

b. **Develop a comprehensive digital skills resource map.**
A comprehensive digital skills resource map should be compiled and searchable by region and layered with the overall statewide map depicting unserved households. This map will both inform commonwealth stakeholders of what resources are available in their local area and allow the state to invest dollars in new and existing programs providing digital literacy support. A resource map will also depict where available digital skill resources are lacking and inform which areas of the commonwealth need increased support, including new program development.

c. **Increase individualized technical assistance and coaching, including accessibility needs.**
With the wide range of basic digital skills that someone may have, tailoring training to meet the individual where they are is important to minimize boredom (if trainings are too easy) or frustration (if trainings are too hard). In addition, tailored trainings ensure wide inclusivity and can support people with disabilities who may have varied accessibility needs.

d. **Develop an ecosystem of digital navigators, to help people connect with digital skills as a core component of the digital divide.**
Digital Navigators are guides who assist community members in broadband adoption and the use of computing devices. In collaboration with anchor institutions, digital navigators across the state can serve as a point of contact to assess what a community member needs help with and direct them to those resources. Navigators should ensure digital skills are addressed in their guidance. Several states, such as Washington, can be looked at as examples.

e. **Compile and communicate resources on data security and safe online practices.**
Data security and end-user training regarding safe online practices is a critical need for increased broadband access. Users must understand how to safely navigate the internet, be able to spot scam and phishing attempts, and know how to respond appropriately if they or an online entity they interface with fall victim to a security breach. Educational resources from trusted sources should be compiled and readily available to the public and targeted outreach for vulnerable populations should be considered. High-speed broadband service providers and community anchor institutions share the responsibility for educating consumers on the importance of online security.

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13   *State Digital Equity Scorecard website.*

This State Broadband Plan is a live, iterative document. The Pennsylvania Broadband Development Authority will continuously evaluate the need to update the Plan in partnership with key state, local, and government agencies, internet service providers, nonprofits, and other high-speed broadband stakeholders, and make revisions on a periodic basis if necessary. The Authority appreciates the public input it has received during the preparation of this Plan.