

MBI
MASSACHUSETTS
BROADBAND INSTITUTE



at the MassTech
Collaborative

Commonwealth of Massachusetts

Five-Year Action Plan

Broadband Equity, Access, and Deployment (BEAD) Program



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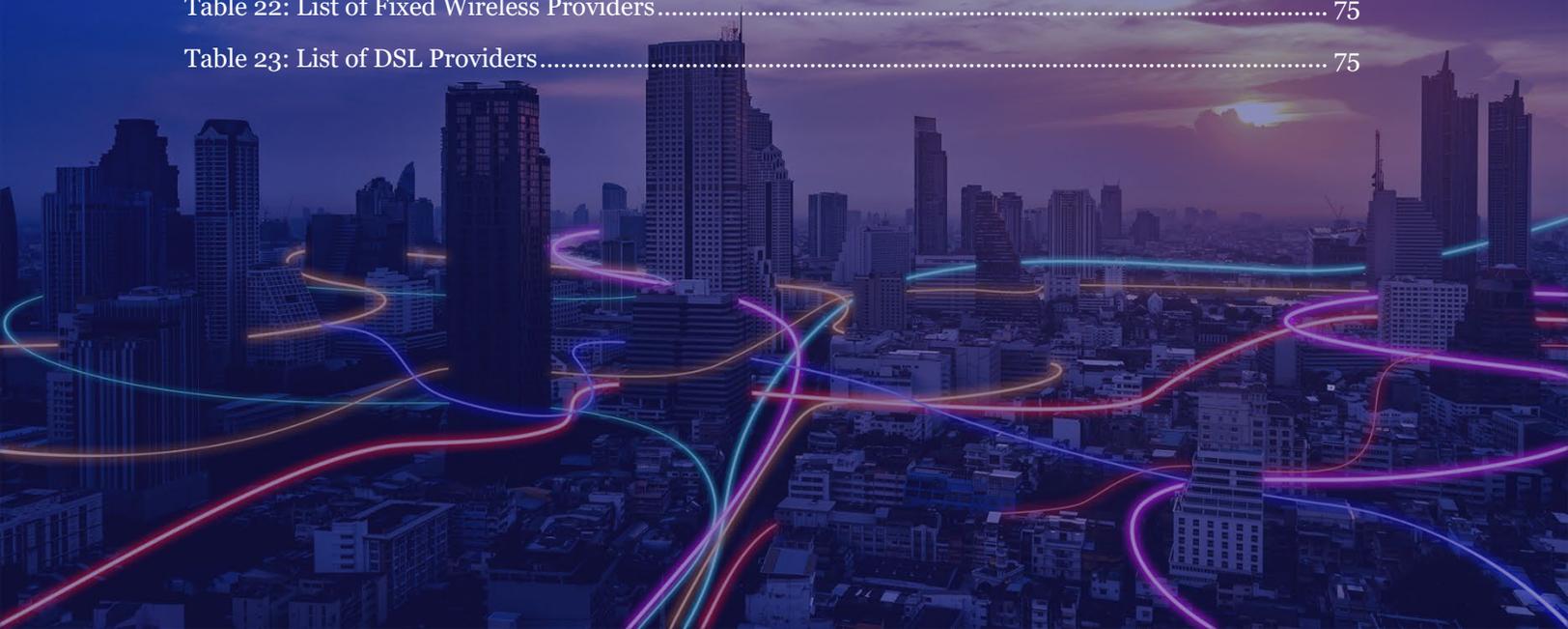


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1 Executive Summary

1.1 Background on Broadband in the Commonwealth

Massachusetts Broadband Institute (“MBI”), a division of Massachusetts Technology Collaborative (“MassTech”), is the State Broadband Office for the Commonwealth of Massachusetts (“Commonwealth”, “State”). Under the leadership of Governor Maura Healey, Lieutenant Governor Kim Driscoll, and supported by the Executive Office of Economic Development (“EOED”), the primary mission of MBI is to extend affordable, robust, high-speed Internet access to homes, businesses, schools, libraries, medical facilities, government offices and other public places across Massachusetts. Access to high-speed broadband internet has become an essential requirement for economic growth, education, healthcare, and overall quality of life. Massachusetts has recognized the importance of broadband connectivity and has made substantial progress in expanding access.

The Current State of Broadband: Due to Massachusetts’ deep focus and investment to deploy broadband and internet accessibility, almost 99% of the Commonwealth is considered served today. Based on version 2.0 of the [FCC National Broadband Map](#), just over 20,000 Broadband Serviceable Locations (“BSL”) remain unserved or underserved. Of those locations, approximately 18,000 lack broadband deployment commitments of at least 100/20 Mbps, representing less than 1% of all serviceable locations in the Commonwealth. However, these 18,000 locations still experience lack of connectivity, creating a digital divide that hinders residents’ ability to fully participate in today’s connected world. In addition, they are highly dispersed across the State with many of them located in small groups in low density areas in markets that currently lack competition. These locations will continue to be MBI’s primary focus.



With a strong foundation of broadband investments to date, and new sources of funding on the horizon, the Commonwealth of Massachusetts has a once in a generation opportunity to close the digital divide for all residents. Massachusetts is in a unique position to leverage proven broadband deployment models and



invest unprecedented amount of federal broadband funding through the Infrastructure Investment and Jobs Act’s (“IIJA”) Broadband Equity, Access, and Deployment Program (“BEAD”). This is the state’s moment to address remaining coverage gaps, while pursuing the larger goal of digital equity. This Five-Year Action Plan (“Plan”) addresses physical infrastructure and potential non-deployment opportunities with the overarching aim of achieving universal service.

1.2 Investment to Date

Massachusetts has a well-established track record of developing and implementing broadband infrastructure and digital equity programs. MBI and the Executive Office of Economic Development (“EOED”) have expended over \$75 million in funding programs over the past several years as outlined below:

Infrastructure Programs

- **MassBroadband 123 Network** is an open access, fiber-optic middle mile network that is owned by MBI and connects 123 communities with more than 400,00 households in western and north-central Massachusetts to the internet.
- **Last Mile Programs:** MBI and EOED managed grant programs supported by state bond funds that are expanding broadband access to at least 96% of residents in 53 Last Mile Towns in Western and Central Massachusetts, including 44 unserved towns and 9 towns with substantial gaps in coverage.

Digital Equity Programs

- **Wi-Fi Expansion and Access Programs:** MBI supported wireless access projects to provide unserved communities in western and central Massachusetts with connectivity through outdoor Wi-Fi hotspots. This program was later expanded to include community wireless access projects on Cape Cod.
- **Mass Internet Connect:** MBI, in partnership with the MassHire one-stop career centers, assisted more than 12,000 unemployed job seekers who faced technology barriers by providing support to access the internet, devices, or digital literacy resources.
- **Digital Equity Programs:** MBI supported digital equity pilot projects that responded to the needs of Massachusetts residents during the Covid-19 pandemic. These pilot projects provided a framework that informed the Digital Equity Partnerships Program. MBI manages this program along with the Municipal Digital Equity Planning Program. Both programs are active and supported with American Rescue Plan Act (“ARPA”) funds.

Broadband Mapping

- **Statewide Broadband Map:** Funded by a planning grant from the U.S. Economic Development Administration (“EDA”), MBI launched a statewide broadband coverage map that incorporates MBI’s database of broadband serviceable locations in the Commonwealth and coverage data from providers. MBI has added digital equity indicators and demographic information to the map.

These investments have laid the groundwork for future expansion and underscore the importance of equitable access to broadband for all residents. As noted above, MBI continues to spearhead a range of related initiatives and programs that can be leveraged to support the successful implementation of the BEAD program.



1.3 Purpose of the 5-Year Action Plan

A central objective of the Five-Year Action Plan is to provide a detailed response to the requirements set forth in the guidance issued by the National Telecommunications and Information Administration (“NTIA”). It serves as a guide towards creating a collaborative, safe, and sustainable system of universal connectivity to allow every person in the state to enjoy full personal, civic, and economic participation throughout their lives.

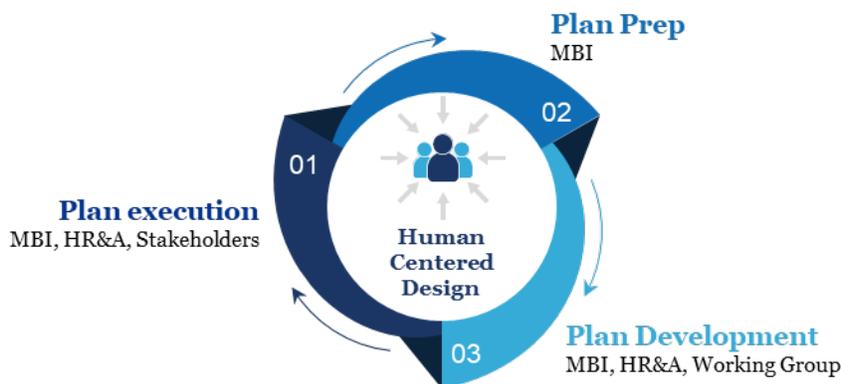
This plan embodies a comprehensive and cohesive strategy that establishes the foundation for the Commonwealth to maximize the investment of BEAD funds by uniting a diverse range of stakeholders, including government agencies, private sector collaborators, community organizations, and the residents who will benefit from expanded broadband access. Through transparent and efficient use of federal funds and leveraging of existing infrastructure, Massachusetts is committed to achieving its vision by implementing the priorities and key strategies identified in this Plan.

This Plan is aimed at strategically amplifying broadband deployment in a coordinated manner with other federal programs, especially the federally funded but state-implemented broadband initiatives being supported by the ARPA Capital Project Fund, to ensure widespread access and connectivity across the state. At its core, this Plan embodies the Commonwealth's unwavering dedication to principles of equity, inclusivity, and the fundamental acknowledgment that broadband access is a basic right, not a luxury.

1.4 MBI's Approach

MBI's approach to addressing the challenges of broadband expansion and BEAD planning is outlined below:

- **Stakeholder engagement:** MBI is running a stakeholder engagement process that will serve as a cornerstone of its detailed BEAD implementation plan that will build off of the Five-Year Action Plan and be memorialized in the forthcoming Initial and Final BEAD Proposals. This process has been structured to ensure ongoing interaction with a diverse range of stakeholders, including local communities, service providers, regulatory bodies, and advocacy groups throughout the BEAD implementation.



- **Gaps and needs, and obstacles and barriers assessment:** MBI has undertaken a needs and gaps assessment, which looks at the current broadband landscape, identifying the extent of underserved and unserved areas within the state. Leveraging its mapping efforts, MBI has charted connectivity gaps, showing areas that lack robust broadband infrastructure. This analysis will continue to be revised and



will form the foundation for the upcoming BEAD program design and implementation plan. It will provide MBI with actionable data enabling to pinpoint key obstacles and barriers to execution with precision.

- **Implementation plan:** MBI developed an implementation strategy that will serve as a roadmap for overcoming the identified challenges. This Plan includes a clear set of priorities, key strategies, and targeted activities to overcome the obstacles and barriers identified in this Plan.

MBI's holistic approach recognizes that addressing the digital divide requires not only technical solutions but also community engagement, partnerships, and a commitment to social equity. This Plan will be further updated in the Initial Proposal to reflect the Commonwealth's ongoing efforts to collect feedback from key stakeholders and populations, especially the underrepresented and unserved/underserved, through its stakeholder outreach and engagement efforts.

1.5 Summary of Findings

Based on the FCC National Broadband Map, there are 20,124 unserved and underserved locations in the state. Of those, the Commonwealth estimates that approximately 10,975 unserved and 7,408 underserved locations are eligible for BEAD funding and that the remaining 1,741 have Federal Funding commitments from other federal Broadband programs. One of the main challenges that MBI faces in extending coverage to the wide geographically distributed unserved and underserved locations that constitute small clusters of need is potential lack of market interest. MBI will address this challenge through structured sequencing of the BEAD subprograms with careful consideration for the nature of the sub programs (clustered projects vs line extensions) during application evaluation.

While the Commonwealth does not foresee significant obstacles and barriers in implementing its BEAD programs, it anticipates the following to be areas of concern: 1) rising costs due to inflationary pressures, 2) ensuring accuracy of data and mapping information, 3) supply chain issues related to devices and equipment critical for internet service providers, and 4) the potential overlap between the implementation of both BEAD and CPF programs.

Based on the above, MBI has developed an initial implementation strategy and plan and begun to delineate the activities that it will conduct under the BEAD program. More details on those activities will be forthcoming as part of the Initial Proposal, and as further feedback is received from the stakeholder engagement process.

1.6 Looking Towards the Future

MBI has ambitious plans for the coming years to continue financing and overseeing broadband deployment in pursuit of universal broadband access. Key elements of the plan include:

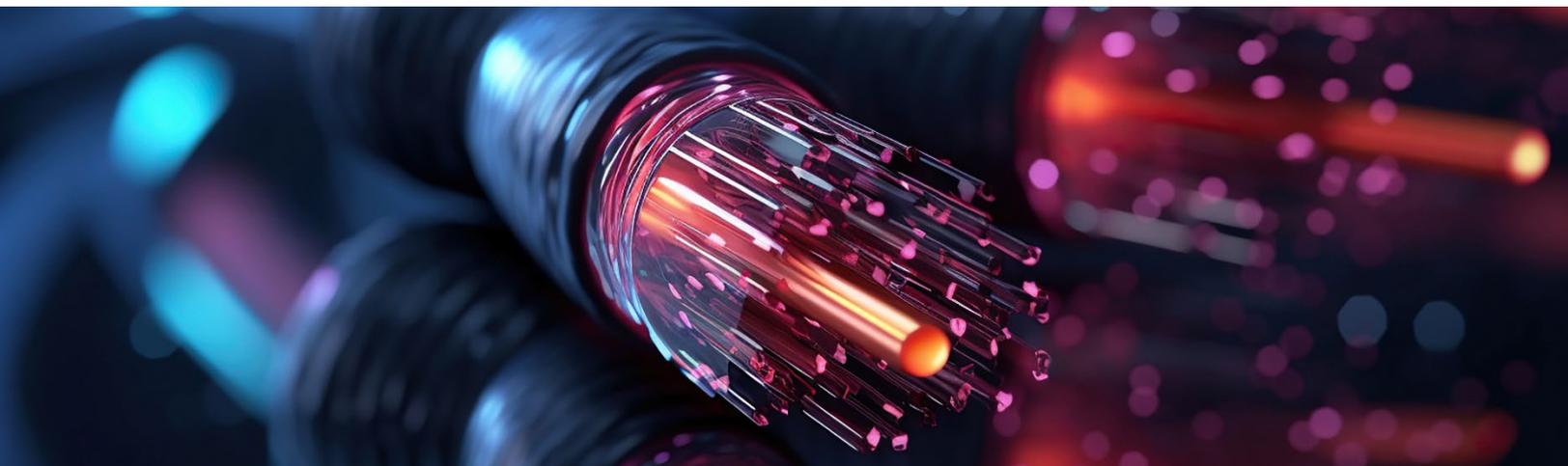
- Identifying key priorities aligned with the BEAD framework, particularly targeting the unserved first, then underserved and community anchor institutions (CAIs) through the prioritization of end-to-end fiber.
- Integrating and aligning the CPF, BEAD, and Digital Equity programs to ensure that there will be no improper funding overlaps between programs and public funds are disbursed effectively to maximum impact.



- Focusing on sustainability that reflects foresight and responsibility. MBI recognizes that the BEAD program is about building networks that can thrive over time and contribute to the state’s continued growth.
- Continuing to develop accurate mapping of the state’s broadband landscape and conducting a transparent challenge process to address any data inaccuracies and ensure that every community, no matter how remote, is accounted for.
- Maintaining comprehensive stakeholder and community outreach initiatives that ensure communities remain active participants in shaping the Commonwealth’s plans.
- By implementing the Five-Year Action Plan, Massachusetts aims to maintain its momentum as a leader in digital inclusion and connectivity. The state's commitment to equity, collaboration, and innovation will drive the success of this Plan, ensuring that every resident has the tools and resources needed to thrive in the digital age. As Massachusetts works towards universal broadband access, it will create a more connected, empowered, and prosperous future for all its residents.
- Coordinating funds from CPF and BEAD, rectifying inaccurate coverage data collected by the FCC, and promoting job creation are crucial. Additionally, Massachusetts is increasingly focused on digital equity, and will leverage collaboration between BEAD and the Digital Equity programs already underway to bridge gaps in internet adoption and meaningful use, as it strives to empower an inclusive workforce to flourish in the face of increasing online opportunities and challenges.



MBI intentionally connected planning efforts between the State Digital Equity Plan (“SDEP”) and the BEAD Five-Year Action Plan. While linked to separate funding sources, the planning efforts are closely aligned and related. MBI is leading coordinated processes that include public engagement efforts and strategic planning to support both plans. In reading this Plan, you will see references to the Massachusetts State Digital Equity Plan. Both plans are essential in advancing the Commonwealth's broadband and digital equity goals.





2 Overview of the Five-Year Action Plan

2.1 Vision

In the vibrant landscape of Massachusetts, the Massachusetts Broadband Institute will ensure every resident has universal access to reliable, high-quality, and affordable broadband, unlocking a world of opportunities for economic growth, educational advancement, public safety, and improved healthcare access across the Commonwealth. We believe that connectivity is not just a service; it is the very foundation of progress and prosperity for all our residents.

MBI has prepared this Five-Year Action Plan to highlight the deep focus and investment by the Commonwealth to deploy broadband and provide internet access to all and show how the implementation of the BEAD Program will dovetail with MBI's other existing and planned activities over the coming years.

MBI is dedicated to pairing broadband deployment with its comprehensive digital opportunity efforts, recognizing that true connectivity goes beyond internet access—it's about empowering our communities with the tools, skills, and confidence to maximize the value of online resources. Firstly, we will build our broadband infrastructure to deliver internet speeds of at least 100/20 Mbps to all unserved and underserved locations, irrespective of topographical barriers or rural populations. Secondly, we will support digital opportunities, by focusing on accessibility, quality of service, and digital literacy which are essential factors in closing the internet adoption gap across our communities.

The benefits of high-quality internet connectivity extend far beyond convenience. It impacts our economy, education, emergency response and climate priorities. As we pursue this vision, we are committed to ensuring that affordability, devices, and digital literacy are not overlooked. Everyone should have the means to leverage online resources productively and confidently.

2.2 Goals and Objectives

Acknowledging that broadband and digital equity challenges have been amplified by COVID-19, MBI is pursuing a proactive approach in ensuring broadband access and opportunities for those who need them the most. In Massachusetts, approximately over 98% of BSLs have access to broadband, ranking the Commonwealth as the 5th highest state in the U.S. Given this high accessibility rate, Massachusetts Broadband Institute intends to translate its strategic pillars of access, quality of service and adoption into direct impact on all facets of civil life by focusing on specific outcome areas.

MBI has launched a robust stakeholder engagement process to directly hear from the communities and coordinate closely with the Commonwealth of Massachusetts' administration, state legislature, municipalities, internet service providers, community-based organizations, residents and other key stakeholders to address any remaining gaps. From this process, MBI has identified the strategic outcome areas stemming from the three strategic pillars that it will be focusing on through the implementation of the BEAD program. The below figure provides a snapshot of MBI's approach to its goals and objectives.

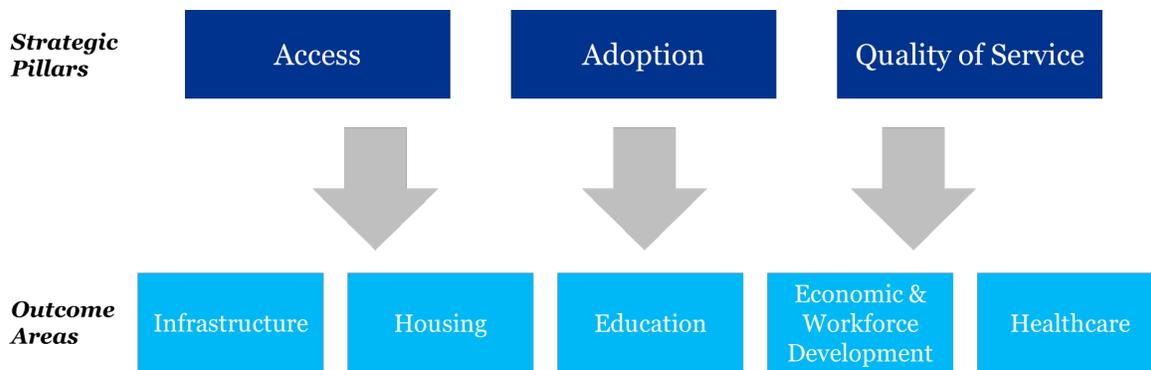


Figure 1: Goals and Objectives Approach

This stakeholder engagement process will continue throughout the development of the BEAD Initial and Final Proposals and implementation of the BEAD program and will further refine the goals and objectives outlined below.

Infrastructure

- Assess the gaps in coverage in the state including pocket locations along town edges, low-density areas, and low-income urban neighborhoods and create targeted programs to address these gaps.
- Collaborate with internet service providers and communities to leverage resources and create a competitive and sustainable market for broadband services.
- Increase enrollment in and availability of low-cost affordability broadband service options throughout the state.

Housing

- Improve access to affordable and reliable broadband service for residents in public housing and deed-restricted affordable housing developments.
- Work with service providers, public housing authorities, government agencies to reduce digital inequalities among all commonwealth regions.
- Create programs that provide support to residents in obtaining and effectively using affordable devices such as computers and tablets, to ensure digital access and proficiency for all.

Economic and Workforce Development

- Work with small business groups to promote access to critical data and applications via broadband access, promoting small business growth, increasing productivity, and reducing costs.
- Work with labor groups, contractors and providers to identify technical skills required for continued economic growth in the broadband sector and promote programs and initiatives to ensure that there is an appropriately available and skilled workforce that meets the needs of industry and reflects the diversity of the communities in which broadband networks will be constructed.
- Invest in expanding the capacities and availability of digital navigators and promote their usage among historically underrepresented communities.
- Enable telecommuting options for businesses and workers, supporting a more flexible workforce and reducing commuting demands which will consequently reduce carbon footprints.



- Identify and address gaps in training and apprenticeship programs to promote IT and other technology-related skills by providing on-the-job training and classroom instruction to equip residents with the skills and knowledge required for a career in broadband-related sectors.

Education

- Ensure families with school-aged children have access to high-speed internet and sufficient devices to meet the needs of family members.
- Develop and implement programs aimed at promoting digital literacy and digital skills training for individuals and organizations, with a particular focus on underrepresented and marginalized communities. These programs should evolve as technology advances to ensure ongoing digital inclusion.

Healthcare

- Invest in high-speed internet access to enable telehealth and remote patient monitoring services for all Commonwealth residents.
- Promote the use of broadband-enabled devices and applications for remote health monitoring, allowing patients to manage chronic conditions from home and reducing the strain on healthcare facilities.
- Utilize broadband connectivity to disseminate health-related information, resources, and public awareness campaigns to improve overall health outcomes and empower communities to make informed decisions about their well-being.



3 Current State of Broadband and Digital Inclusion

3.1 Existing Programs

MBI has a well-established track record of developing and implementing broadband and digital inclusion programs in the Commonwealth. As a result, MBI is well-positioned to plan and deliver on the BEAD program. Furthermore, MassTech, the agency that houses MBI, is already spearheading a range of related initiatives and programs, including cybersecurity, that are important to the success of the BEAD program. MBI can leverage these initiatives to further promote the implementation of the BEAD program.

This section looks at the current and historical state of broadband activities within MBI. Tables 1 through 5 provide a brief description of activities carried out by MBI and MassTech, current and future staff at MBI, as well as contractor support and available funding sources.

3.1.1 Current Activities that the Broadband Program/Office Conducts

Table 1: Current Activities that the Broadband Program/Office Conducts

Activity Name	Description	Intended Outcome(s)/Relevance
<u>Municipal Digital Equity Planning Program</u>	The program provides consulting services at no charge to towns and cities to support the development of municipal digital equity plans that promote a better understanding of the needs of residents and the state of broadband and digital inclusion in the community.	Intends to guide municipal decision-making and investments as well as support municipalities to submit grant proposals to existing or forthcoming state or federal programs to support digital equity activities
<u>Digital Equity Partnerships Program</u>	The Digital Equity Partnerships Program designates qualified organizations as Partners to implement six digital equity initiatives that meet the goals outlined in the Commonwealth’s ARPA COVID recovery legislation (codified as Chapter 102 of the Acts of 2021), that created a \$50 million fund to bridge the digital divide.	Partners will work with local and regional organizations to implement digital equity projects.
<u>US Department of Treasury, Coronavirus Capital Projects Fund (“CPF”)</u>	<p>Gap Networks Grant Program: This grant program will address gaps in broadband infrastructure where reliable broadband service is currently unavailable.</p> <p>The Residential Internet Audit and Upgrade program: The program focuses on identification and remediation of issues</p>	These programs aim to expand access to high-speed internet service to locations that lack access to reliable broadband service.



Activity Name	Description	Intended Outcome(s)/Relevance
	negatively impacting the quality of residential internet service.	
<u>MassBroadband 123 Network</u>	Operated by a contracted network operator, the MassBroadband123 Network is an open access, fiber-optic middle mile that connects 123 communities in western and north-central Massachusetts to the internet. The project was funded with \$44.3 million of state funds and \$45.4 million in federal funds.	Provide wholesale services to local Retail Service Providers. The network directly connects approximately 1,100 Community Anchor Institutions, including government buildings, schools, libraries, hospitals, public safety facilities, and wireless communication towers.

The activities listed in Table 2 below represent prior programs conducted by MassTech and MBI, which will build upon lessons learned to support the effective deployment of the BEAD program.

Table 2: Past Activities that the Broadband Program/Office Conducted

Activity Name	Description	Intended Outcome(s)/Relevance
<u>Last Mile Programs</u>	<p>The Last Mile Programs are designed to support and co-invest in residential broadband access projects in Last Mile Towns that lack any residential broadband service, and towns that are partially served by cable. This program supported a variety of solutions, including public-private partnerships, municipally owned fiber-to-the-premise networks, and regional collaborations.</p> <p>The Commonwealth invested approximately \$59 million in state bond funds in these broadband infrastructure projects.</p>	<p>Deploy Last Mile networks in 44 unserved communities in western and central Massachusetts that lacked access to broadband service.</p> <p>As of August 2023, 39 of the 44 unserved towns have completed and fully operational broadband networks serving at least 96% of all residents.</p>
<u>Last Mile Network Extensions</u>	The program provided \$4 million in funding to expand internet access to homes and businesses in nine towns with substantial gaps in coverage.	The program extended broadband access to over 1,300 locations across the nine partially served towns, thereby raising the overall coverage level to 96% or above in each of the nine municipalities located outside the Boston and I-495 area.



<p><u>Mass Internet Connect</u></p>	<p>The program was launched to assist unemployed job seekers during the COVID-19 pandemic who faced technology barriers by providing support to access the internet, Chromebooks, or digital literacy training.</p>	<p>The program supported more than 12,000 customers from all 16 MassHire regions across the state. The program also piloted digital navigator services at certain MassHire Career Centers. have been referred to programs to address technology barriers. Since its inception, the program has given out 586 referrals for internet subsidies, distributed 5,609 Chromebooks, and referred 1,583 customers to digital literacy resources and direct support from a digital navigator.</p>
<p><u>Expansion of Wi-Fi Hotspots in Unserved Communities</u></p>	<p>The program was launched in April 2020 as a response to the COVID-19 pandemic to provide unserved communities in western and central Massachusetts with critical connectivity through community Wi-Fi hotspots while construction was ongoing for broadband networks to be built through the state’s Last Mile program.</p>	<p>The program supported community Wi-Fi hotspots in 26 Last Mile Towns.</p>
<p><u>Gateway Cities Wi-Fi Hotspots & Digital Equity Program</u></p>	<p>The program was established in 2020 as part of the Commonwealth’s COVID- 19 Economic Recovery Plan. The program supported Wi-Fi hotspots and digital equity pilot projects.</p>	<p>Create and manage wireless access projects, which include indoor and outdoor Wi-Fi hotspots and other digital equity initiatives in Gateway Cities. Wi-Fi hotspots were also supported on Cape Cod.</p>

3.1.2 Current and Planned Full-Time and Part-Time Employees

Currently, MBI has eight employees with a plan to increase that number to 14 by early 2024. MBI’s approach is to have a dedicated team that focuses on both infrastructure related (BEAD) and digital equity (State Digital Equity Planning and Capacity Grant) programs. **Figure 2: MBI Organizational Chart** below provides an overview of the Institute’s team structure, including planned positions.

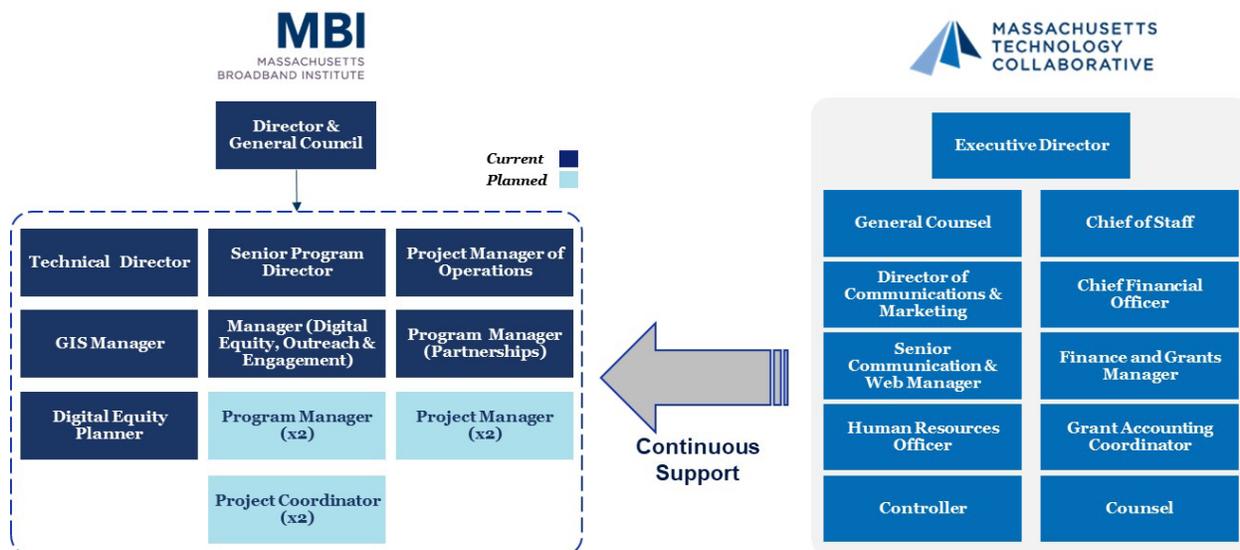


Figure 2: MBI Organizational Chart

As a division of MassTech, MBI has access to a range of services that can support its operations. These services include financial, legal, communications, and administrative support. By leveraging these resources, MBI is better equipped to pursue its business objectives and deliver value to the state.

Table 3: Current, Planned, and Proposed Full-Time and Part-Time Employees below represents an indicative view of MBI’s staffing plan and resource needs. As MBI develops the Initial Proposal, we will undertake an organizational analysis to assess additional needs both in terms of internal staffing and external contractor support; tables below will be updated to reflect such analysis.

Table 3: Current, Planned, and Proposed Full-Time and Part-Time Employees

Current/ Planned	Full-Time/ Part-time	Position	Description of Role
Current	Full Time	Director & MBI General Counsel	Provide program design creation, general programmatic and financial oversight; coordination and approval of performance and other required federal reporting data; coordination with stakeholders, host meetings with telecom and other program partners, oversee and interpret data analysis on broadband access and deployment, and be responsible for overall program and project execution, and the evaluation of results.
Current	Full-Time	Technical Director	Provide technical expertise related to evolving broadband technologies ranging from fiber to fixed wireless to support program development and deployment.



Current/ Planned	Full-Time/ Part-time	Position	Description of Role
Current	Full-Time	Senior Program Director	Support the development of goals, metrics and programs; oversight of state and federal grant funds in accordance with applicable rules and guidelines; and establishing and maintaining operational protocols and practices.
Current	Full-Time	GIS Manager	Support all technical analysis and mapping activities
Current	Full-Time	Program Manager, Partnerships	Program development and stakeholder outreach and coordination of digital equity and broadband programmatic activities.
Current	Full-Time	Manager, Digital Equity, Outreach & Engagement	Support the strategic planning of the community engagement effort and play a lead role in executing that strategy in collaboration with consultants and Working Group stakeholders.
Current	Full-Time	Project Manager of Operations	Oversee all operations related to the deployment of projects and monitoring progress.
Current	Full-Time	Digital Equity Planner	Support the implementation of stakeholder outreach and community engagement activities and tracking of projects.
Planned	Full-Time	Project Manager (x2)	Support the technical deployment of projects and oversee all elements of the associated program.
Planned	Full-Time	Project Coordinator (x2)	Support the Program Managers in their oversight and coordination of all program activities.
Planned	Full-Time	Program Manager (x2)	Supports programmatic implementation and oversight and coordination among programs.

3.1.3 Current and Planned Contractor Support

Table 4: Current and Planned Contractor Support below provides a summary of current and anticipated third-party support that MBI is and will be receiving throughout the BEAD Program.

Table 4: Current and Planned Contractor Support



Current/ Planned	Time	Position	Description of Role
Current	2.0 FTE	Program design and implementation support	KPMG provides MBI with program design, planning, compliance, and subgrant process development.
Current	1.0 FTE	Program design and implementation support	Connected Nation will assist KPMG in providing planning and implementation support to MBI
Current	1.0 FTE	Geospatial Support	AppGeo provides support with geospatial needs for the BEAD program and other similar applications.
Current	0.5 FTE	Community Engagement Support	ASG provides support in community engagement and outreach activities
Current	1.5 FTE	Stakeholder engagement process support	HR&A provides digital equity and stakeholder management support to MBI, including support with organizing and running digital equity working groups and regional meetings.

3.1.4 Broadband Funding

It is worth noting that the Commonwealth, with the support of MBI and EOED, has implemented a number of funding programs over the past several years including but not limited to the 1) Broadband Extension Program which was a \$4 million grant program to extend broadband service in eligible Western Massachusetts communities with existing but limited cable infrastructure, 2) the Last Mile Infrastructure Grant Programs totaled \$55.2 million to expand broadband connectivity in 44 unserved Last Mile Towns, the 3) the design and construction of the MassBroadband 123 Network which was funded with \$89.7 million from the Broadband Technology Program (“BTOP”) and state bond funds, and 3) \$5 million in state match through MBI for the OpenCape network that leveraged a \$32 million BTOP grant to construct a communications network on Cape Cod.

Table 5: Current Broadband Funding below provides a description of current funding programs and their sources for broadband deployment in Massachusetts.



Table 5: Current Broadband Funding

Source	Purpose	Total	Expended*	Available
<u>U.S. Economic Development Administration (“EDA”)</u>	The purpose of this federal grant is to conduct a statewide broadband coverage and service quality gaps project.	\$1 million	\$1 million	\$0
<u>American Rescue Plan Act (“ARPA”) Capital Projects Fund</u>	1) The Gap Networks Grant Program focuses on “connecting the unconnected” and households that do not have access to wireline internet service offering at least 100 Mbps download speed/20 Mbps upload speeds, prioritizing the lowest reported speeds.	\$152.8 million	\$372,166	\$152.4 million
	2) A second program will focus on identification and remediation of issues negatively impacting the quality of residential internet service for eligible residents.	\$22.5 million	\$0	\$22.5 million
<u>Broadband Equity, Access, and Deployment Program (“BEAD”)</u>	Build networks that connect unserved and underserved locations and provide high speed internet to community anchor institutions.	\$147.4 million	\$168,149	\$147.2 million
<u>Broadband Innovation Fund</u>	1) The Digital Equity Partnerships Program is focused on the implementation of digital equity projects and to address statewide digital equity gaps. 2) The Municipal Digital Equity Planning Program enables municipalities, or other local bodies of government, to engage in planning activities related to digital equity and bridging the digital divide.	\$75 million	\$2.4 million	\$72.6 million



<p><u>NTIA Tribal Broadband Connectivity Program</u></p>	<p>Provide grants to support broadband deployment and adoption in tribal communities.</p>	<p>\$9.1 million</p>	<p>N/A</p>	<p>N/A</p>
<p><u>FCC Rural Digital Opportunity Fund (“RDOF”)</u></p>	<p>RDOF supports broadband networks in rural communities across the country.</p> <p>RDOF Phase I began in 2020 and targeted over six million homes and businesses in census blocks that are entirely unserved by voice and broadband with speeds of at least 25/3 Mbps. Phase II will cover locations in census blocks that are partially served, as well as locations not funded in Phase I.</p>	<p>\$3.4 million</p>	<p>N/A</p>	<p>N/A</p>
<p><u>FCC Connect America Fund – Phase II Auction</u></p>	<p>The federal universal service high-cost program (also known as the Connect America Fund) is designed to ensure that consumers in rural, insular, and high-cost areas have access to modern communications networks capable of providing voice and broadband service, both fixed and mobile, at rates that are reasonably comparable to those in urban areas.</p> <p>The program fulfills this universal service goal by allowing eligible carriers who serve these areas to recover some of their costs from the federal Universal Service Fund.</p>	<p>\$11.1 million</p>	<p>N/A</p>	<p>N/A</p>
<p><u>Connecting Minority Communities Pilot Program</u></p>	<p>The Connecting Minority Communities Pilot Program supports Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and Minority-Serving Institutions (MSIs). Its goal is to help these organizations buy Internet service and equipment. It also provides funding to hire and train information technology personnel.</p>	<p>\$2.9 million</p>	<p>N/A</p>	<p>N/A</p>

*includes amounts expended through June 30, 2023



N/A Indicates that the Commonwealth of Massachusetts does not administer the grant program.

3.2 Partnerships

MBI serves as the clearinghouse for broadband funding and programs on behalf of the Commonwealth. MBI recognizes the value partners and stakeholders bring to successful planning efforts. To that end, MBI has developed a partnership framework and identified three types of partner groups. Partners provide MBI with guidance, market feedback, decision-making support, contribution of complimentary assets, funding and/or programs, and implementation support for the BEAD program and digital equity programs. Each layer of the framework is nested and build upon each other.

Figure 3: Partnership Framework shows a visual representation of the framework. Partners are classified into three categories: core, government, and enabling based on the partner’s nature, authority, policy making role, and expertise among other factors.

MBI in the next few months will work with these partners and stakeholders to refine the framework and include clear roles and responsibilities and develop design making guidelines that will assist in the planning and implementation of the BEAD program.

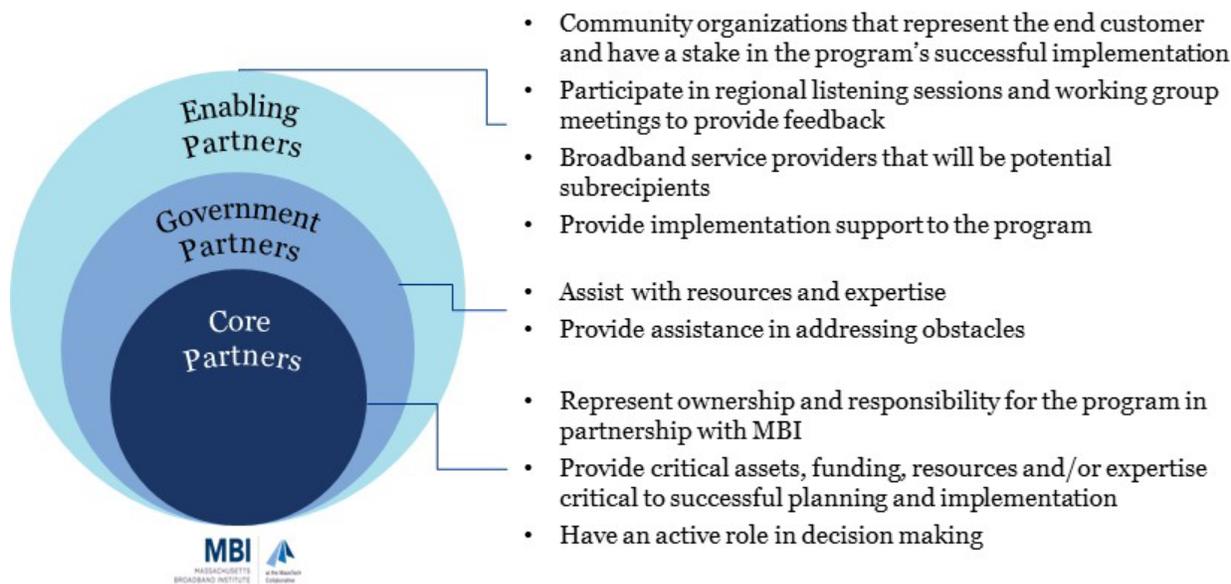


Figure 3: Partnership Framework

3.2.1 Core Partners

Core Partners represent the program ownership and responsibility for the BEAD program in partnership with MBI. These partners have an active role in decision making, including in the design and



implementation of broadband programs for the Commonwealth. They also provide assets, funding, resources and/or expertise critical to successful planning and implementation.

Table 6: List of Core Partners

Core Partners	Description
Governor /Lt. Governor Office	<ul style="list-style-type: none"> Provides policy direction and leadership on programmatic priorities and deployment of resources.
Executive Office of Economic Development	<ul style="list-style-type: none"> Prioritizes economic opportunity for residents, collaborative leadership in communities, and an environment that supports job creation and business growth. Recipient of BEAD funding. Contracts with MassTech/MBI for BEAD implementation. Monitors MBI activities for compliance with BEAD requirements.
Executive Office of Administration and Finance	<ul style="list-style-type: none"> Approves bond funds and shapes MBI's activities Develops and executes cost-effective public policy initiatives and services that ensure the financial stability, efficiency, and effectiveness of state and local government.
Massachusetts Technology Collaborative	<ul style="list-style-type: none"> Approves funding awards and shapes MBI's activities Strengthens the competitiveness of the tech and innovation economy by driving strategic investments, partnerships, and insights that harness the talent of Massachusetts.
Massachusetts Legislature	<ul style="list-style-type: none"> Provides any necessary legislation towards BEAD and Digital Equity implementation. Provides guidance and leadership.

3.2.2 Government Partners

Government partners are those entities that are or will be the key to assisting with resources and/or expertise in relation to the program to achieve the program goals within the timeframe specified by the National Telecommunications and Information Administration (“NTIA”). They also provide assistance in addressing potential obstacles and barriers identified in this document.

Government partners include organizations and associations that represent the following: local, county, city, and regional government; state agencies, and other similar organizations.

Table 7: List of Government Partners

Government Partners	Description
Cities and Municipalities	<ul style="list-style-type: none"> Offers useful perspectives on the diverse connectivity requirements of the various cities and communities within the state.
Local Government	<ul style="list-style-type: none"> Provide valuable insights into the connectivity needs of Massachusetts's many and varied communities



Government Partners	Description
Executive Office of Elder Affairs	<ul style="list-style-type: none"> EOEA is dedicated to ensuring older adults and their caregivers within the Commonwealth have the resources they need to live and thrive in the community of their choice.
Executive Office of Housing and Livable Communities	<ul style="list-style-type: none"> EOHLC is committed to increasing housing availability and affordability in all regions, including funding distribution to municipalities, overseeing state-aided public housing, and operating the state's EA family shelter.
Executive Office of Energy and Environmental Affairs	<ul style="list-style-type: none"> Provides support and coordination with regarding to environmental permitting
Department of Elementary and Secondary	<ul style="list-style-type: none"> Represents technology and broadband interests on behalf of elementary and secondary schools across the Commonwealth, including the use of E-rate funding.
Executive Office of Education	<ul style="list-style-type: none"> Plays an important role in accessing covered and vulnerable populations through local schools. Possesses experience with the federal programs such as the E-rate, which provides a reduction on internet connection services for schools and libraries.
Massachusetts Department of Telecommunications and Cable	<ul style="list-style-type: none"> Regulates telecommunications and cable industries following all regulatory and statutory requirements imposed by the federal government and the Commonwealth of Massachusetts
Executive Office of Health and Human Services	<ul style="list-style-type: none"> Seeks to promote health, resilience, and independence of the residents served, including how technology and broadband can increase services and access to healthcare
Executive Office of Technology Services and Security	<ul style="list-style-type: none"> Provides secure and quality digital information, services, and tools to customers and constituents when and where they need them.
MassDevelopment	<ul style="list-style-type: none"> MassDevelopment specializes in financing tools (development funds, tax-exempt bonds, loans and guarantees), real estate services (planning permitting, and development), and key initiatives (i.e., defense sector, gateway cities, and manufacturing industry).
Executive Office of Labor and Workforce Development	<ul style="list-style-type: none"> Manages the Commonwealth's workforce development and labor departments to ensure that workers, employers, and the unemployed have the tools and training needed to succeed.



Government Partners	Description
MassHire Department of Career Services	<ul style="list-style-type: none"> Works with MBI and others to ensure job seekers are provided information and opportunities to the necessary technology devices and internet access for "getting people back to work".
City of Boston Department of Innovation and Technology	<ul style="list-style-type: none"> MBI Digital Equity Partner.
Tribal Nations	<ul style="list-style-type: none"> Represents the needs of the state's tribes given that they may have unique challenges that can be addressed through the BEAD and Digital Equity programs.
Massachusetts Department of Correction	<ul style="list-style-type: none"> Facilitates collaboration with the targeted populations to identify their digital needs and develop potential future workforce accordingly.
Massachusetts Department of Transportation	<ul style="list-style-type: none"> Provides supports in terms of right of way access and the necessary permitting.
Department of Public Health	<ul style="list-style-type: none"> Can provide insights into data related to covered populations.

3.2.3 Enabling Partners

Enabling partners include a variety of community organizations that represent the end-customer and have a stake in the successful implementation of BEAD. Enabling partners will provide implementation support and participate in state and regional planning sessions and working group meetings to provide feedback. Enabling partners may also represent potential Program subrecipients such as broadband service providers.

Table 8: List of Enabling Partners

Enabling Partners	Description
Internet Service Providers	<ul style="list-style-type: none"> Deploy new broadband networks to unserved and underserved populations; more detailed listing of the internet service providers is in Appendix A: Broadband Providers.
Covered Population Organizations	<ul style="list-style-type: none"> Provides MBI with information and context for addressing the covered populations they serve
Community Anchor Institutions	<ul style="list-style-type: none"> Provides critical services to their communities
Workforce Development Organizations	<ul style="list-style-type: none"> Ensures that Massachusetts has a well-trained workforce (unions, educational entities, trade associations, etc.) that can use information



Enabling Partners	Description
	and communications technology to guarantee the timely deployment of broadband infrastructure in the short term and to grow Massachusetts's economy into the future.
New England Connectivity and Telecommunications Association	<ul style="list-style-type: none"> • A nonprofit industry association representing internet service providers, television providers, and content creators across New England, including Massachusetts.
Massachusetts Municipal Association	<ul style="list-style-type: none"> • MMA serves as the voice of the 351 cities and towns across Massachusetts in the areas of energy and the environment, fiscal affairs, municipal and regional administration, personnel and labor relations, and public works, transportation and public utilities.
Healthcare Organizations	<ul style="list-style-type: none"> • Including Baystate Health/Alliance for Digital Equity, Vinfen (on behalf of Human Services Alliance for Digital Equity), and Mass Health Aging Coalition as MBI Digital Equity Partners.
Workforce Investment Boards	<ul style="list-style-type: none"> • Workforce Investment Boards support worker training programs and job placement services. • Including MetroNorth Workforce Investment Board as a MBI Digital Equity Partner.
Regional Planning Agencies	<ul style="list-style-type: none"> • RPAs promote smart growth and regional collaboration as stewards of strategic development and planning. • Including Metropolitan Area Planning Council as a MBI Digital Equity Partner.
Non-Profit Organizations	<ul style="list-style-type: none"> • Including Tech Goes Home, Incorporated as a MBI Digital Equity Partner.
Higher Education Institutions	<ul style="list-style-type: none"> • Including University of Massachusetts Lowell as a MBI Digital Equity Partners.

3.3 Asset Inventory

As the BEAD program launches in the Commonwealth of Massachusetts, MBI seeks to achieve universal broadband access in the state, however MBI does not have to start from a blank slate. For many years, extensive efforts have been underway to close the digital divide in the Commonwealth. MBI is prepared and ready to utilize BEAD funding to continue closing the digital divide. Over the last several years, MBI has developed many assets, that the state can leverage, including both "hard" assets, such as physical infrastructure, and "soft" assets, such as institutions, organizations, and the habits of the population.

Several pieces of legislation, both at the federal level and within the Commonwealth, have enabled MBI to develop a comprehensive program to bolster investments in broadband infrastructure and digital equity. Please refer to Section 3 for more details on these funding authorizations and programmatic activities.



3.3.1 Broadband Deployment

Broadband Deployment can be encouraged by several different types of assets. A highlight of those assets is shown in **Table 9: Asset Inventory** below.

Table 9: Asset Inventory

Asset Type	Description
Privately Owned Towers	Privately owned wireless infrastructure (i.e. – cell towers) is widespread in Massachusetts. Wireless technology plays a crucial role in the efficient, rapid, and widespread deployment of mobile and fixed wireless broadband technology, serving as a backbone of modern telecommunication networks.
Publicly Owned Middle Mile	<p>To facilitate broadband expansion, MBI built and owns a 1200-mile fiber optic cable broadband network called MassBroadband 123, which connects communities in western and north central Massachusetts to the internet. It is an open-access, carrier-grade middle-mile broadband network operated through a contracted Network Operator.</p> <p>MBI provided \$5 million in state matching funds to OpenCape Corporation, a nonprofit organization headquartered on Cape Cod, to leverage a \$32 million federal BTOP grant for middle-mile infrastructure to expand connectivity options on Cape Cod.</p>
DOT Right of Way	Through the MassDOT Right of Way Bureau, the Massachusetts Department of Transportation (MassDOT) coordinates the acquisition of real property for state transportation projects. It provides development opportunities for infrastructure deployment of wireless and wireline telecommunications facilities and renewable energy generation/transmission facilities on properties and rights-of-way (collectively, "Real Property") under the ownership, care, custody, and/or control of MassDOT. Among the primary objectives of the department has had a long-held objective to "stimulate economic growth by expanding broadband access to the citizens of the Commonwealth."
Fire Towers	Massachusetts Forest Fire Control Program manages 42 operating fire towers, serving as vantage points for spotting fires and located in advantageous spots for wireless broadband services.
State/Municipally Owned Infrastructure	Include Schools, Public Housing, Municipally Owned Buildings, Other State-Owned Vertical Assets.

With the increasing demand for high-speed Internet, wireless cell towers offer a scalable and effective solution for broadband expansion as a complement to wireline platforms, particularly in remote and



underserved areas. They extend coverage and capacity, allowing Internet Service Providers (“ISPs”) to reach a larger population where distance and costs make physical wireline networks harder to sustain.

The flexibility of wireless tower infrastructure allows for rapid expansion and adaptation to evolving technological advancements, making them instrumental in accommodating the ever-increasing data requirements of the modern world. Wireless towers enable emerging technologies like 5G, which is providing faster data speeds, lower latency, and enhanced connectivity for a host of applications commonly referred to as the “Internet of Things” or IOT, ranging from smart cities to autonomous vehicles.

To further promote efficient utilization of these critical vertical assets, government should coordinate with the owners of private tower portfolios. This would allow for improved planning by state and local broadband planning groups and foster better cooperation among telecom providers.

This will advance co-location, where multiple wireless providers share the same tower infrastructure. Co-location improves land use, reduces the environmental impact of tower installations, and lowers deployment costs and time for carriers. To accommodate new carriers or improved equipment and technology, existing towers can be modified with reasonable extensions of height, new fiber, or electrical capacity in a fraction of the time required for new tower construction.

Municipal Fiber Grant Program:

It is a competitive grant program that supports the closing of critical gaps that exist in municipal networks. This program focuses on connecting municipality-owned facilities that will support municipalities in achieving many critical goals associated with municipal fiber networks, including (but not limited to) growing risk and incidences of cyber security exploits in local government, growing public expectation that online transactions are made available, growing reliance on technology to ensure continuity of government and disaster recovery and expectation that municipal employees should be able to collaborate regardless of physical location.

Last Mile Broadband Projects

In 2016, EOED and MBI built a flexible framework that would help all 44 unserved and 9 partially served Last Mile towns in western and central Massachusetts achieve broadband access, allowing for a range of project models, including multi-town collaborations, locally owned networks, and public-private partnerships. Project models allowed for many technology and operational choices as long as they met core speed, affordability, and sustainability standards. The Commonwealth has invested approximately \$59 million to support broadband infrastructure in its Last Mile towns¹.

The map below represents the status of last-mile broadband projects across Massachusetts as of August 1, 2023. The map differentiates towns according to four categories: (1) towns with fully complete and operational networks, (2) towns with partially operational networks that are still in construction, and (3) previously served towns not included in the program.

¹ Source: Massachusetts Broadband Strategic Plan

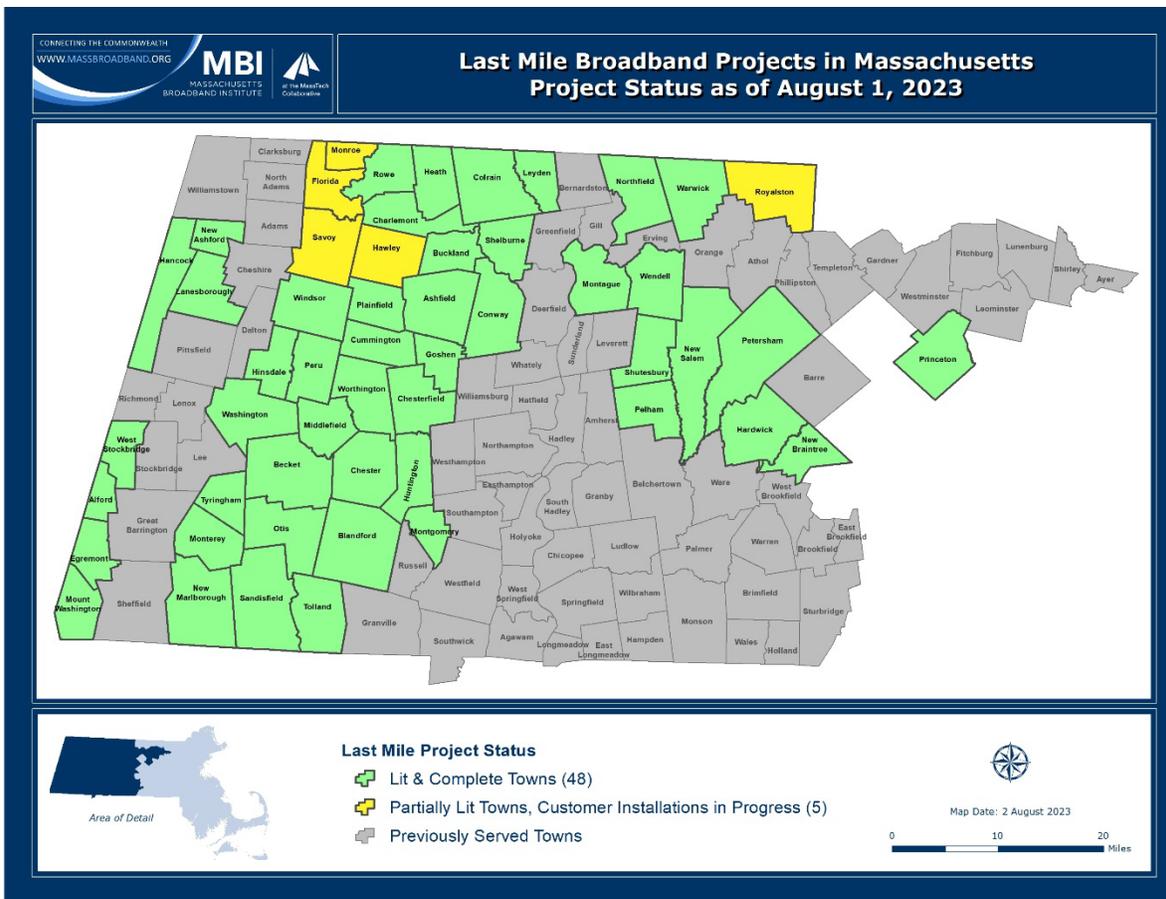


Figure 4: Last Mile Broadband Projects in Massachusetts – Project Status as of Aug 1, 2023



Middle Mile Infrastructure

MassBroadband 123 Network

MBI constructed the middle mile network in 2013 and 2014 to serve as a building block for the region. The MassBroadband 123 service territory encompasses more than one-third of the geographic area of Massachusetts, depicted in the map on the following page with the network route. The project was funded with \$44.3 million of state funds and \$45.4 million in funds through the federal BTOP grant program. The MassBroadband 123 network is currently operated by Local Linx, consisting of approximately 1,200 miles of fiber, covering more than one-third of the geographic area of Massachusetts, which has more than 400,000 households and businesses and more than a million residents. **Figure 5** below represents the geographic area served by MassBroadband 123.

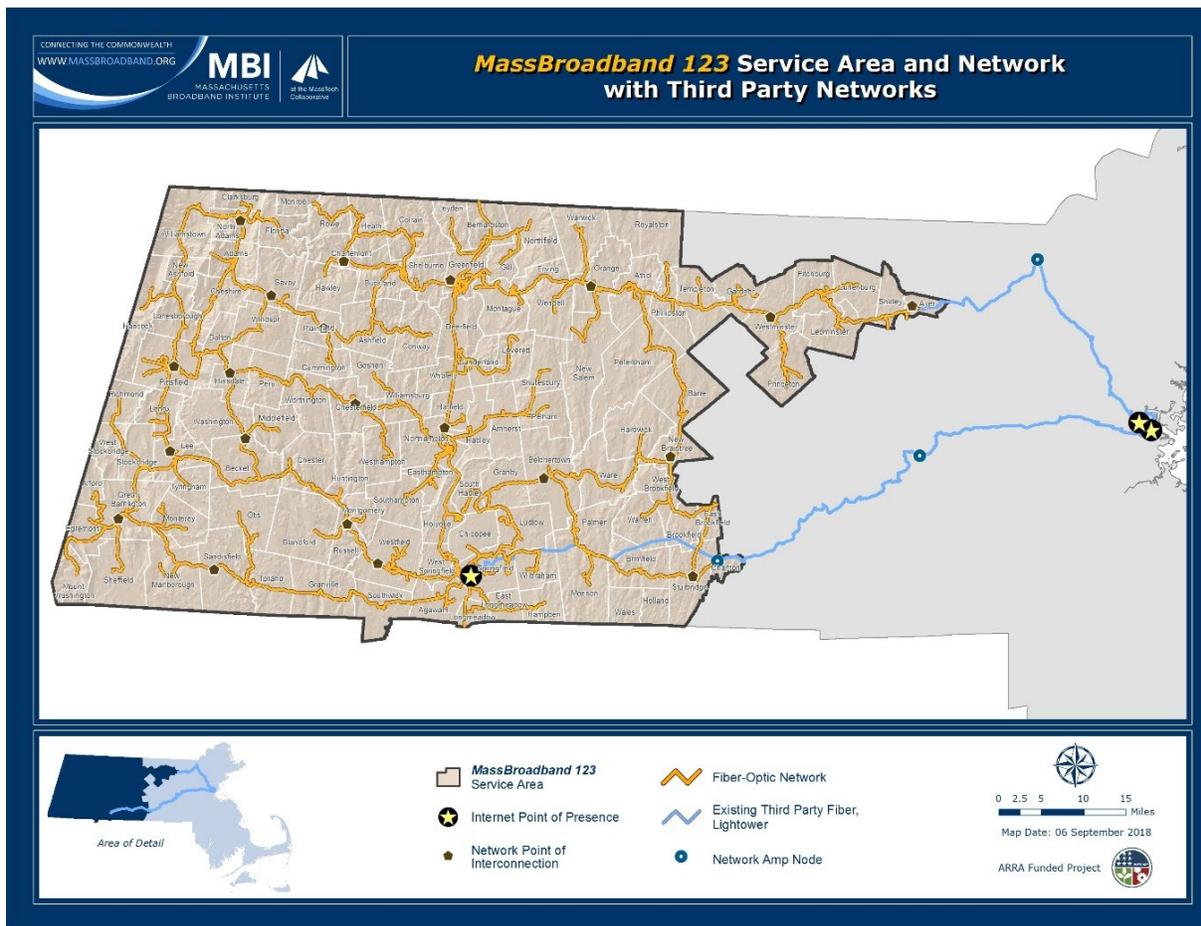


Figure 5: MassBroadband 123 Network Map

MBI provided \$5 million in state matching funds to OpenCape Corporation, a nonprofit organization headquartered on Cape Cod, to leverage a \$32 million federal BTOP grant for middle-mile infrastructure to expand connectivity options on Cape Cod.

OpenCape utilized state and federal funding to construct a middle-mile communications network to expand broadband access throughout Cape Cod, the Islands, and the South Coast. The 350-mile open access network, operated by OpenCape, was built to support southeastern Massachusetts's economic, educational, public safety, and governmental needs.



Workforce

A critical asset for the state in implementing the BEAD program is a particular component of the Massachusetts workforce, including workers who can design networks, dig trenches, splice fiber, climb towers, and in general, perform all the functions that are needed to construct networks, from inception through the delivery of internet service to customers. NTIA has found Massachusetts has no significant projected deficits, although there are a few job classifications that may have negative rates. Additionally, three separate job classifications were noted as surpluses.

In some cases, these workers can be recruited from out of state, especially near state borders, so the relevant labor pool is not precisely coextensive with the Massachusetts population. However, Massachusetts should not expect to recruit heavily from other states since other states will be implementing the BEAD program simultaneously and will have elevated demand for the same kinds of workers. Worker demand will be impacted by the mix of technologies that are ultimately used to meet the statewide BEAD demand. For example, end-to-end fiber deployments involve a different combination of occupations and skills than fixed wireless deployments.

Broadband Adoption

Across Massachusetts, broadband adoption is higher than the national average, with 89.6% of households in Massachusetts with broadband Internet adoption compared to 87.0% nationwide. Additionally, 93.5% of households in Massachusetts have a computer, compared to a slightly lower number nationwide, 93.1%. However, an analysis of covered populations tells a different story and will be addressed in detail in the State Digital Equity Plan.

When broadband adoption is analyzed at the local level, 61 towns and cities across Massachusetts have home broadband adoption rates above 90%². The top twenty towns and cities with their adoption are listed in **Table 10: Adoption Rate by Top 20 Towns and Cities in Massachusetts** below:

² ACS 2017-2021 5-Year Estimates



Table 10: Adoption Rate by Top 20 Towns and Cities in Massachusetts³

Adoption Rate by Top 20 Communities					
Rank	Community	Adoption Rate	Rank	Community	Adoption Rate
1	Northborough	98.5%	11	Wilmington	95.1%
2	Cochituate	97.3%	12	Needham	95.0%
3	Maynard	97.1%	13	Reading	94.8%
4	Sharon	97.0%	14	Burlington	94.7%
5	Marblehead	96.9%	15	Arlington	94.6%
6	Lexington	96.7%	16	Raynham Center	94.6%
7	Hingham	96.2%	17	Belmont	94.5%
8	Pinehurst	95.8%	18	Brookline	94.4%
9	Newton	95.7%	19	Medfield	94.4%
10	Franklin Town	95.3%	20	Swampscott	94.3%

A further examination of broadband adoption across Massachusetts at the community level shows that even in the communities with the lowest broadband adoption, there is still strong broadband adoption at the household level. In the Massachusetts community with the lowest adoption, still, three out of four households have a broadband Internet subscription. While barriers and digital equity efforts are addressed elsewhere, adoption rates are critical considerations for broadband providers when examining the economics of broadband expansion. Massachusetts is fortunate to have high adoption rates across the Commonwealth compared to other states' communities. The bottom 20 communities for broadband adoption are listed in **Table 11**.

³ ACS 2017-2021 5-Year Estimates



Table 11: Adoption Rate by Bottom 20 Cities and Towns in Massachusetts⁴

Adoption Rate by Bottom 20 Communities					
Rank	Community	Adoption Rate	Rank	Community	Adoption Rate
96	Worcester	85.9%	106	Bliss Corner	83.4%
97	Pittsfield	85.8%	107	Chelsea	82.4%
98	Gardner	85.3%	108	Lowell	82.3%
99	Southbridge Town	85.3%	109	Holyoke	81.1%
100	Webster	85.3%	110	New Bedford	80.7%
101	Brockton	85.1%	111	Springfield	78.0%
102	Holbrook	85.1%	112	Lawrence	77.1%
103	Lynn	84.0%	113	Adams	76.4%
104	North Adams	84.0%	114	Fall River	76.3%
105	Taunton	83.9%	115	Spencer	74.9%

¹ ACS 2017-2021 5-Year Estimates

Broadband Affordability

A primary reason why many households across Massachusetts have access to broadband yet do not subscribe is that they feel they cannot afford to pay for the service each month. Regardless of the actual percentage of a household's monthly budget that the broadband service requires, households have many other needs, such as food and shelter, that are more critical to survival. For that reason, many may choose to go without home internet service.

Increased subscribership for an ISP, in turn, helps to cover the fixed costs of building and operating networks and thereby promotes deployment and availability. Affordability programs such as the Affordable Connectivity Program and Lifeline Program, therefore, not only raise take rates in served areas but also help to strengthen the business case for broadband expansion.

⁴ CS 2017-2021 5-Year Estimates



Affordable Connectivity Program



Several government programs exist to make home internet more affordable and reduce the gap between access and adoption rates. The Affordable Connectivity Program (“ACP”), created by the Infrastructure Investment and Jobs Act, provides a monthly \$30 discount towards internet subscriptions and a one-time \$100 discount towards an internet-enabled device for all eligible households. Household eligibility is determined either by household income (below 200% of federal poverty guidelines) or through participation in other federal or tribal assistance programs (like SNAP, Medicaid, or Federal Housing Assistance). Eligible households must be informed of the program and take action to sign up.

According to estimates produced by Education Superhighway (divided by the number of total households derived from the 2021 ACS), 38.4% of households in Massachusetts are eligible for the ACP. Of those eligible, just 30.5% of households have enrolled in the ACP.

An in-depth analysis of ACP adoption in Massachusetts’ can be found in Section 3.4.3 Broadband Affordability.

3.3.2 Broadband Access

Community Anchor Institutions

Community Anchor Institutions (“CAIs”) are eligible for funding under the BEAD program where coverage is less than 1 Gbps. MBI is working with groups across the state to collect and identify CAIs and their connectivity rates.

As part of the development of the Initial Proposal Volume I, MBI will conduct a thorough review of the definition of community anchor institutions as provided by the NTIA. Through discussions with Core Partners, MBI may also consider identifying additional institutions that meet the criteria for CAI status. To ensure comprehensive coverage and equitable distribution of broadband resources, MBI plans to implement a tiered approach to the CAI definition. Each tier will progressively encompass a more expanded range of institutions that can be classified as CAIs.



The MBI team will conduct a detailed analysis for each tier, taking into account factors such as the number and geographic location of CAIs, as well as the availability of funds after addressing the needs of unserved and underserved areas. Based on this analysis, MBI will carefully select the most suitable definition for CAIs to maximize the impact and reach of broadband initiatives.

Moreover, MBI recognizes the importance of public input and transparency in this process. During the public comment period for the Initial Proposal, MBI will actively seek feedback from relevant institutions and stakeholders to ensure that all eligible institutions meeting the CAI criteria are appropriately included in the definition. This collaborative approach will help guarantee that broadband access is extended to all key anchor institutions that play vital roles in community development, education, healthcare, and other essential services.

By refining the CAI definition through a strategic, data-driven, and inclusive approach, MBI will conduct analysis to determine whether the facilities reside in an area with adequate broadband coverage and whether the CAI can be used to support equity activities. These CAIs can assist the BEAD program not only through public access but also as anchor tenants in new broadband network expansion projects. MBI has been working with groups across the state to collect and identify community anchor institutions.

Wireless Hotspots

Wireless hotspots located at public housing facilities and other public areas can play a key role in bridging the digital divide for low-income residents by providing them a free or low-cost option for access broadband internet. Wi-Fi hotspot locations will allow residents access for better job opportunities, online training and educational opportunities, health care services, entertainment options, and many other essential services that will allow for an improved quality of life. By offering connectivity options to some of the most vulnerable populations, public housing facilities will empower their residents to overcome their socioeconomic barriers and better realize the opportunity and economic potential of the digital economy.

Multiple efforts have been undertaken across Massachusetts to help with broadband access among nonadopters, both a public and private locations.

Wi-Fi Hotspot Expansion

MBI and the MassBroadband 123 network operator, Local Linx, worked with Westfield Gas and Electric and other local ISPs to offer indoor and outdoor Wi-Fi hotspots free of charge to unserved municipalities that lack broadband access. The program was established in April 2020 as a response to the COVID-19 pandemic to provide unserved communities in western and central Massachusetts with critical connectivity through outdoor Wi-Fi hotspots while waiting for broadband networks to be built through the state's Last Mile program.

Gateway Cities Wi-Fi Hotspots and Digital Equity Program

The Gateway Cities Wi-Fi Hotspots & Digital Equity Program was established in 2020 as part of the Commonwealth's COVID-19 Economic Recovery Plan. Its purpose was establishing and maintaining wireless access projects, including indoor and outdoor Wi-Fi hotspots, and supporting digital equity projects in Gateway Cities. A Wi-Fi hotspot is a physical location where people can access the internet via a wireless local area network ("WLAN") with a router connected to an ISP. Additional digital equity projects to provide digital literacy, devices, and personal cellular hotspots have been a part of this program.

Several MBI-supported wireless access pilot projects were launched through a partnership with the Essex County Community Foundation, including a mesh wireless project that is providing free internet access to residents of the Point neighborhood in Salem; upgrades of internet capacity to 1 gigabit in public libraries

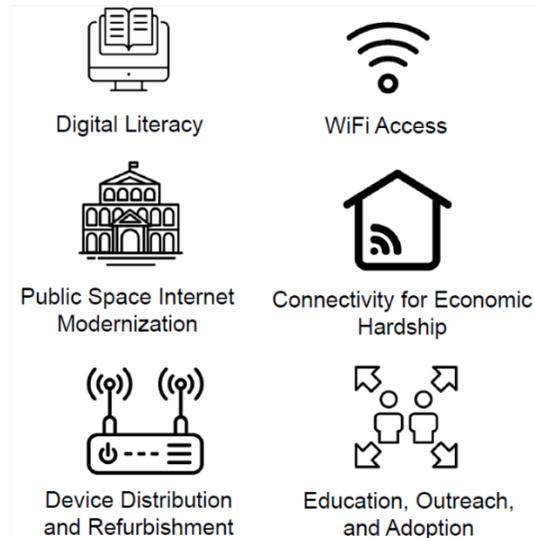


in Lynn, Peabody, and Salem; telehealth navigators at two community health centers in Essex County; and the deployment of cellular hotspot devices and Chromebooks to families transitioning from shelters to permanent housing. MBI is also launching wireless broadband access pilot projects at Chelsea and Revere's low-income and senior public housing buildings through a partnership with the Metropolitan Area Planning Council.

3.3.3 Digital Equity

Digital Equity Partnerships Program

The Digital Equity Partnerships Program is designating qualified organizations as Partners to implement digital equity projects that meet the goals outlined in the Commonwealth's ARPA COVID recovery legislation (codified as Chapter 102 of the Acts of 2021), that created a \$50 million fund to bridge the digital divide. Partners will work with local and regional organizations to implement digital equity projects in six program areas:



- Digital Literacy
- Connectivity for Economic Hardship
- Public Space Internet Modernization
- Education, Outreach and Engagement
- Device Distribution
- Device Refurbishment
- Apartment Wi-Fi

The eight partners approved to date are summarized in **Table 12: Partnerships** below based on their focus on the six program areas, along with program descriptions.

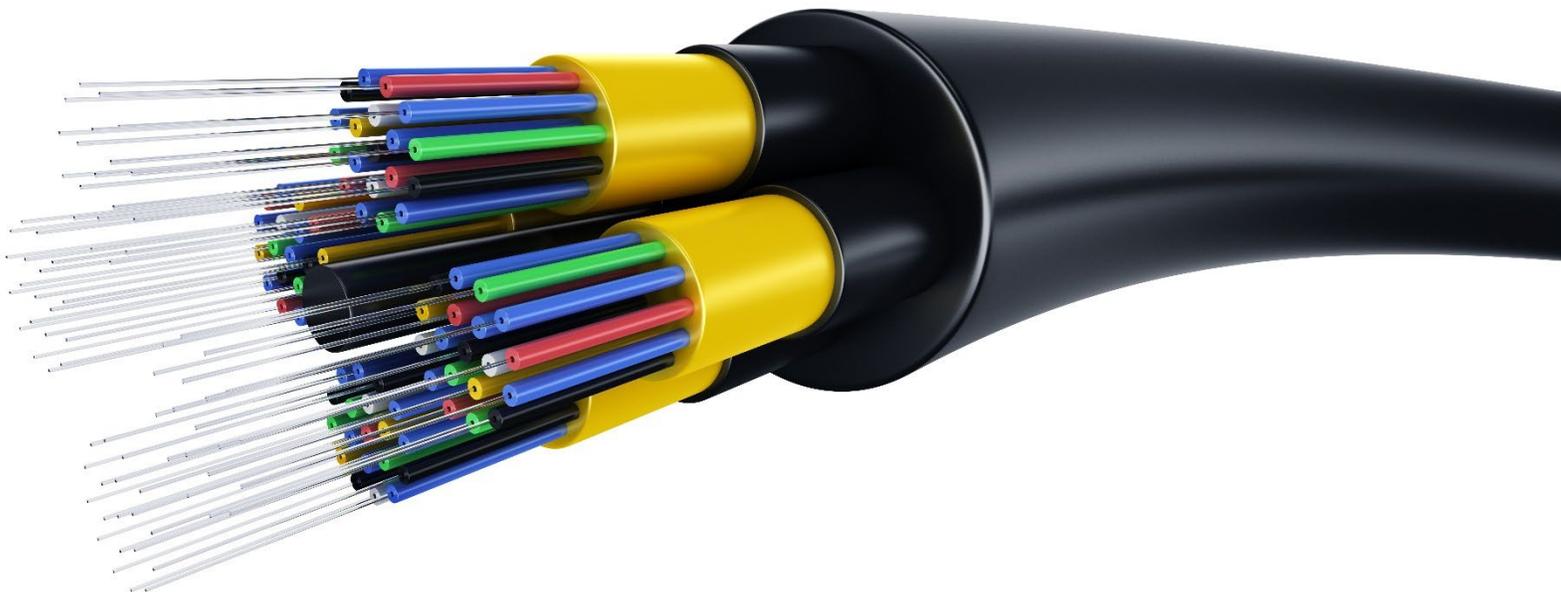




Table 12: Partnerships

Entity	Digital Literacy	Connectivity for Economic Hardship	Public Space Internet Modernization	Education, Outreach, and Engagement	Device Distribution	Device Refurbishment	Apartment Wi-Fi
Baystate Health/ Alliance for Digital Equity	Focus	Focus	Focus	Focus			
City of Boston Department of Innovation and Technology	Focus	Focus	Focus	Focus	Focus	Focus	
Mass Health Aging Coalition	Focus			Focus			
MetroNorth Workforce Investment Board	Focus	Focus		Focus		Focus	
Metropolitan Area Planning Council							Focus
Tech Goes Home, Incorporated	Focus	Focus		Focus	Focus		
University of Massachusetts Lowell	Focus	Focus	Focus		Focus	Focus	
Vinfen (on behalf of Human Services Alliance for Digital Equity)	Focus	Focus		Focus	Focus		
Total Count of Partners by Program Area	7	6	3	6	4	3	1



Baystate Health/Alliance for Digital Equity

The Connectivity Initiative will partner with the two Continuum of Care networks serving western Massachusetts to provide mobile hotspots to unhoused and housing-insecure individuals and households. The Modernization Initiative will establish a defined grant program to community nonprofit and community-facing municipal projects. Education and Outreach will build upon an existing pilot of “ACP Helper” organizations to deepen and scale ACP outreach and enrollment throughout western Massachusetts. In the case of Digital Literacy, the Alliance is implementing an array of initiatives targeting various eligible populations in need of digital skills and training.

City of Boston Department of Innovation and Technology (DoIT)

The City of Boston, through its Department of Innovation and Technology (DoIT), is a Digital Equity Partner. Boston DoIT’s goal is to ensure that economically disadvantaged households in Boston have access to a wide range of digital equity support and services. DoIT intends to grow its Digital Equity & Inclusion Coalition of social service agencies, community-based organizations (“CBOs”), community development corporations (“CDCs”), city agencies, Boston Housing Authority, Boston Public Schools and independent schools, healthcare organizations and community health centers. Boston shares the mission of MBI is to extend affordable, robust broadband to all homes, businesses, schools, libraries, medical facilities, government offices and other public places throughout the City.

Massachusetts Healthy Aging Collaborative, via AgeSpan (“MHAC”)

The focus areas of MHAC are Digital Literacy and Education, Outreach and Adoption. Device distribution, while not a focus, is a component to support these efforts. MHAC is creating a community where older adults can age in place, have access to resources and services, and feel connected to their communities. Dementia Friendly Communities, which sprouted from the White House Conference on Aging, employs a separate framework and process, but in Massachusetts, these movements are aligned and promoted as “better together” with a merged set of focus areas. The aligned framework includes both “technology” and “equity.”

MetroNorth Workforce Investment Board

Under a proposed Digital Equity Partnerships Grant, the MetroNorth Workforce Investment Board would expand its ongoing digital equity initiatives through a new effort known as the Digital Justice, Equity, Diversity, and Inclusion (JEDI) Consortium. The JEDI Consortium would provide an interconnected set of services to a) recruit, hire, train, and support a cohort of 32 Digital Navigators (“DNs”) to serve each of the Priority Communities and the two MassHire regions; b) provide tiered digital literacy classes (above the basic level) at the Career Centers and at community-based organization (“CBO”) partners within the Priority Communities; c) provide 1,500 high quality refurbished Microsoft Laptops (Windows 10), 300 hotspots, peripherals, and internet access and IT support to service recipients, with a focus on residents of the Priority Communities; and d) partner with the CBOs and Priority Communities to provide broad-scale community outreach about the JEDI Program and ACP enrollment.

Job training and employment opportunities for DN and Refurbishment Technicians would be embedded in the program structure. Digital Navigators would be provided with comprehensive career counseling and placement services, and the MassHire Partners would proactively collaborate with potential business partners who can commit to hiring Digital Navigators and Device Technicians post-grant.

Metropolitan Area Planning Council



The Metropolitan Area Planning Council, together with its partners at Education Super Highway and HR&A Advisors, are implementing a place-based approach to digital equity, providing free high-speed internet access to residents of public and affordable housing in communities throughout the Commonwealth. While digital equity is a challenge that goes far beyond the individual household, apartment complex, or municipality—and requires more than just Wi-Fi access to solve—broadband speed internet in the home is foundational, not only for digital equity, but for housing equity as well.

Tech Goes Home, Incorporated (“TGH”)

Tech Goes Home (“TGH”) is prioritizing the advancement of digital equity to reach 4,000 constituents in 13 Gateway Cities with digital literacy training, devices, and connectivity. TGH’s mission is to empower communities to access and use digital tools to overcome barriers and advance lives. Working in partnership with schools, libraries, healthcare providers, and community organizations, TGH opens up access to digital devices, internet connectivity, and digital skills training to support individuals and families so they can pursue economic mobility, support academic achievement, access critical resources, and engage with their communities and loved ones. Its project covers the following focus areas: Digital Literacy Initiative, Device Distribution and Refurbishment Program, Connectivity Initiative for Economic Hardship, and Education, Outreach, and Adoption.

University of Massachusetts Lowell

The University of Massachusetts Lowell, along with its higher education and community partners (sub awardees: Fitchburg State University, Making Opportunities Count, Essex County Community Foundation), will provide the student workforce and cultural competency to drive outreach and engagement programs and then support the roll out the wraparound digital services and/or training. The UMass Lowell team will provide the technical skills, student Digital Navigators model, project management resources, procurement expertise, and the other capacities needed for success. Together, these resources will be effectively deployed to address five out of the six program areas – Wi-Fi access, public space modernization, digital literacy, device distribution and refurbishment, education, outreach and adoption – targeting the key areas of broadband network access to both residences and public spaces, digital device distribution and digital literacy training.

Vinfen (on behalf of Human Services Alliance for Digital Equity)

Vinfen and program partners view digital inclusion services as an essential part of its organizations’ missions to promote clients’ recovery, resiliency, skill development and self-determination. Today, emerging from the pandemic, we find ourselves in a world where technology access and digital skills are no longer a luxury: they are a necessity to maintain social connection, engage in lifelong learning, obtain essential medical and behavioral health care, manage finances, and navigate the community. Digital equity work is crucial to ensuring that people with disabilities are part of an equitable and resilient pandemic recovery as there exists a digital divide that is particularly acute for people with disabilities.

Asset Collection

To support statewide planning for digital equity and ensure that the MBI is up to date on ongoing digital equity and inclusion efforts across the state, MBI issued an Asset Inventory tool to catalog existing “assets” – programs, organizations, plans, or individuals working to advance digital equity and inclusion. As of August 2023, MBI has captured 84 assets to date related to Digital Equity. These assets will be reviewed, mapped, and included in the Statewide Digital Equity Plan and BEAD Initial Proposal.



3.4 Needs and Gaps Assessment

3.4.1 Broadband Deployment

Background

The Federal Communication Commission (“FCC”) is administering the creation and publishing of two datasets which support States to evaluate the relative distribution of available broadband service. These two datasets are known as the Broadband Service Location Fabric and Broadband Data Collection Fixed Service Data or “BSL” and “BDC” for short. The BSL dataset defines the universe of Broadband Serviceable Locations for which BEAD funding can be allocated to improve broadband service. The BDC data contains the service provider's brand name, broadband technologies in use by the service provider, and the download and upload speeds provided by each provider and technology pairing at BSL location. Both the BSL and BDC data are refreshed on a 6-month rolling basis to reflect the changing availability in provider service and refinements to the BSL location data resulting from FCC’s challenge processes.

The IIJA started, and the BEAD Notice of Funding Opportunity (“NOFO”) has reinforced, a new definition of “reliable” broadband service as either (a) fiber, (b) cable, (c) DSL, or (d) licensed fixed wireless, as well as a definition of three broadband service tiers: (a) Served, meaning that internet service is available by reliable broadband technologies at 100/20 Mbps speeds or faster, (b) Underserved, meaning that internet service is available by reliable broadband technologies at speeds of at least 25/3 Mbps but less than 100/20 Mbps, and (c) Unserved, meaning that internet service is not available by reliable broadband technologies even at speeds of 25/3 Mbps. In view of the new policy salience of these thresholds, FCC maps have been adjusted to classify available service in terms of these tiers. In the FCC maps, if either of the provider reported download or upload speeds do not clear the FCC’s speed thresholds for any service class, the BSL service classification would fall to the next lower tier in which the reported speed is categorized. The shorthand notation for broadband service speed uses a forward slash delimiting the download and upload speeds components starting with the download speed and followed by the upload speed. Each number is also accompanied by the appropriate abbreviation of the service rate, usually denoted in megabits per second. (100/20 Mbps). **Table 13: High/Low Limits by FCC Service Class** presents the high and low limits for each of the FCC service classes.

Table 13: High/Low Limits by FCC Service Class

Unserved		Underserved		Served	
0Mbps/ 0Mbps	<25Mbps/ <3Mbps	25Mbps/ 3Mbps	<100Mbps/ <20Mbps	100Mbps/ 20Mbps	No Limit

Broadband Landscape

Massachusetts has a substantial number of residents that have high-speed internet access; however, **Figure 6: Service Coverage 100/20 Mbps** further highlights the challenge the Commonwealth faces in addressing many smaller gaps in service which are widely distributed. Generally, Western Massachusetts has less access to 100/20 Mbps levels of service than Eastern Massachusetts.

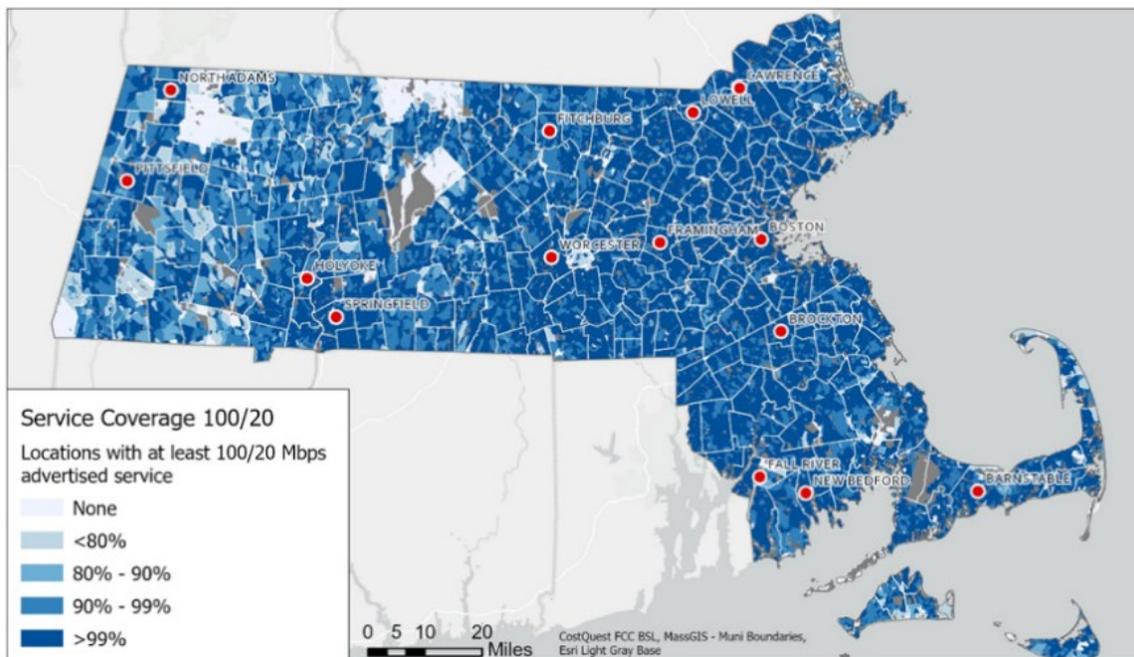


Figure 6: Service Coverage 100/20 Mbps⁵

One issue that needs to be highlighted though is that 6 municipalities in the western and central part of the state and one in the SE currently show most of their Census blocks being unserved based upon the Version 2 of the BDC filing (Warwick, Royalston, Mount Washington, Petersham, Savoy, Hawley, and Gosnold). These are Last Mile Towns that have long been known by MBI and much effort has been expended to improve service in these regions. Charter has been awarded RDOF funding to reach locations in Warwick, Royalston and Savoy. Based upon State data and grants administered by MBI, Petersham and Mount Washington have been built out with Fiber-to-the-Home networks which would reclassify the municipalities as Served and varying percentages of the other municipalities currently have access to at least 25Mbps/3 Mbps Licensed Fixed Wireless service classifying them as Underserved. The State’s most current broadband data can be viewed on the Massachusetts Broadband Map. It is MBI’s hope that this new service will be reflected in Version 3 of the BDC data. Massachusetts’ ongoing efforts to maintain highly accurate broadband maps will help it to target BEAD funds accurately to meet the remaining broadband coverage needs.

BEAD Eligibility

Based upon version two of the BSL and BDC data and past distribution of federal funding to support broadband expansion, 0.95% of the BSLs (18,383) in Massachusetts are likely eligible (Underserved or Unserved) for BEAD funding. Due to the wide availability of high-speed broadband service, 98.96% of BSLs are classified as Served and therefore not eligible for BEAD funding. The remaining 0.09% of BSLs in the State are currently under existing Federal Funding commitments from CAF and RDOF programs.

Since the BEAD program provides funding to BSL’s that are not currently receiving federal funding, existing commitments must be removed from the list of unserved and underserved BSLs in order to derive an indication of which Massachusetts BSLs would be BEAD eligible if the BEAD subgrantee selection process

⁵ Figure 7 data sources – CostQuest FCC BSL data, MassGIS Municipal Boundaries



were launched today. By excluding all unserved and underserved locations that are within an RDOF or CAF II funding block (see **Figure 8: Federal Funding** below) and therefore ineligible for funding, we can derive a tentative count of the BSLs that are currently on track for BEAD eligibility, although many may cease to be BEAD eligible by virtue of getting scheduled service commitments before the BEAD subgrantee selection process launches. Currently, existing funding commitments exclude 1,741 BSLs from BEAD eligibility, leaving 18,383 still on track to be targeted. **Table 14: MA BSL Service Eligibility Counts and Percentages** provides a breakdown of the eligible and ineligible BSLs. The Federal Funding commitment are under review and MBI will continue to refine the counts as more research is done in preparation for the challenge process. Funding data used in this analysis is from USAC for CAF II and FCC for RDOF. Additional Tribal Broadband Connectivity Program areas require further definition and are not included in the current analysis.

Figure 7: Preliminary BEAD Eligible Broadband Serviceable Locations below highlights the distribution of tentatively BEAD eligible locations across the state. Some of the obvious clusters disappear, making the distribution of points even more disparate.

Table 14: MA BSL Service Eligibility Counts and Percentages

Funding Eligibility	Count of BSLs	Percentage
Not Eligible (Served)	1,923,672	98.96%
Not Eligible (Funded)	1,741	0.09%
Total Not Eligible	1,925,413	
Eligible (Underserved)	7,408	0.38%
Eligible (Unserved)	10,975	0.56%
Total Eligible	18,383	

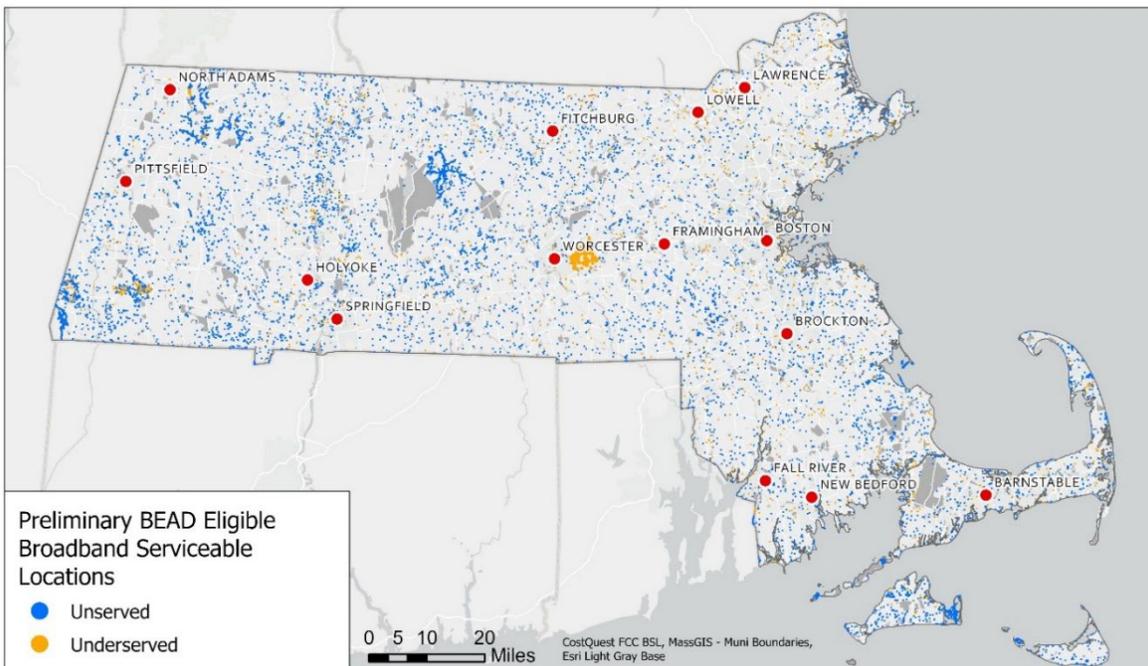


Figure 7: Preliminary BEAD Eligible Broadband Serviceable Locations

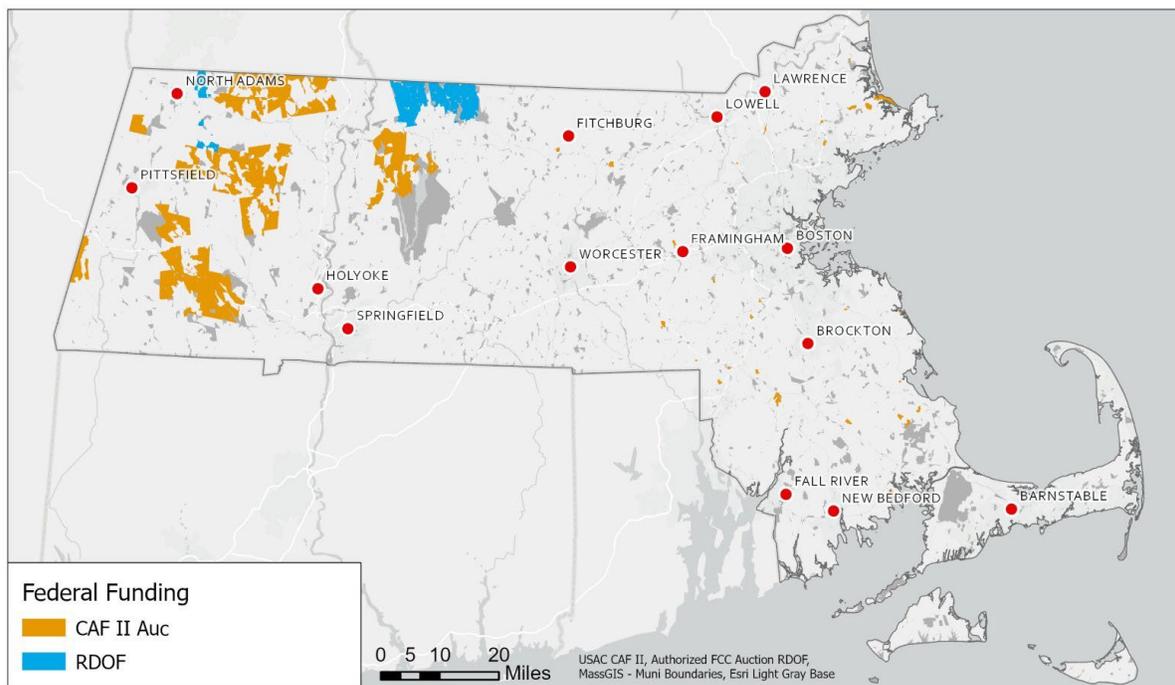


Figure 8: Federal Funding⁶

⁶ Figure 8 data sources – USAC CAFII blocks, Authorized FCC Auction RDOF, MassGIS Municipal Boundaries



Service Gap Identification

Clustering

Economies of scale at the project level make it likely that ISPs will prove to be more inclined to deploy new broadband services to densely packed groups of unserved or underserved BSLs, due to the ratio of potential consumers per mile of deployed infrastructure. We have therefore conducted a density-based spatial clustering of applications with noise (“DBSCAN”) algorithm, using a minimum cluster size threshold of 25 unserved and underserved BSLs, to identify BSL clusters where opportunities for clustered BEAD-funded deployment projects of substantial size exist. **Table 15: Count of Broadband Serviceable Locations by Cluster** below summarizes the results of the analysis. The operation clustered 65% of the total number of unserved/underserved BSL in Massachusetts into 88 unique clusters across the State. The clusters shown as green points in **Figure 9: Broadband Serviceable Locations by Cluster** represents just over 13,000 BSLs. The other 35% of unserved/underserved BSLs are more isolated in individual or very small groups. A notable challenge with the clustering approach is that clustered BSLs could cross municipal boundaries which could need to be served by multiple providers reducing the potential interest for providers. MBI plans to further evaluate the ranges of densities for these clusters to inform their final decision-making process.

Table 15: Count of Broadband Serviceable Locations by Cluster

Type	BSL Count
Clustered	13,082
Unclustered	7,039

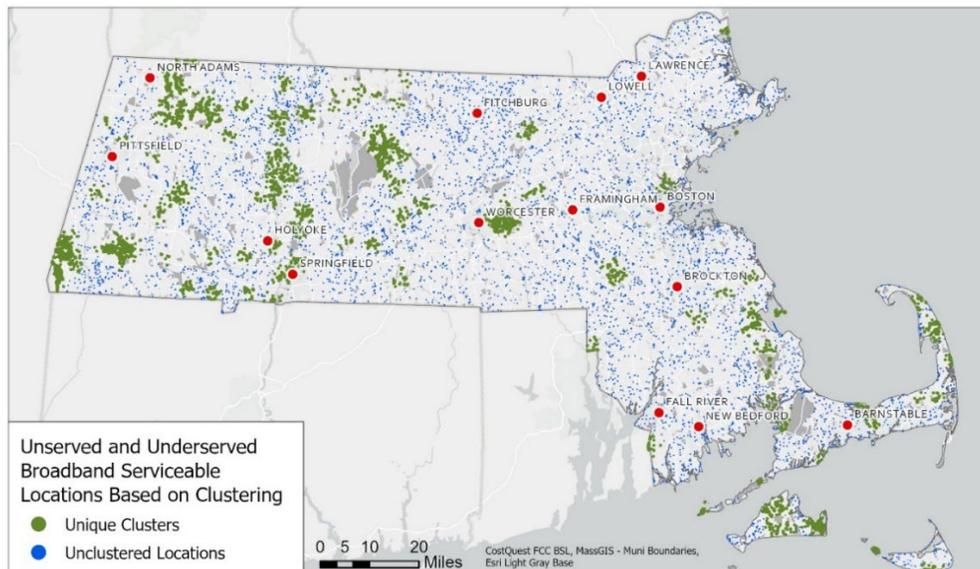


Figure 9: Broadband Serviceable Locations by Cluster⁷

⁷ Figure 9 data sources – CostQuest FCC BSL data, MassGIS Municipal Boundaries



The larger clusters of unserved and underserved BSLs are mostly located in Western Massachusetts, which is also where the bulk of Federal funding commitments have been made, as shown in Figure 10. Specifically, the RDOF and CAF funding programs have substantial footprints in Western Mass. Most of the CAFII projects are complete but may not be represented in Version 2 of the BDC and the RDOF projects are scheduled to deliver service to even more unserved and underserved BSLs. These BSLs can therefore be omitted from being targeted as eligible by the BEAD program.

Competition to deliver High Speed Service

Access to Broadband is also influenced by the competition in the market between ISPs, where competition can drive down the cost for quality broadband access. At a State level, the eastern half of Massachusetts has more providers than the western half of the state. However, there are pockets of Western Massachusetts, around populated town centers, where more providers operate.

The map in **Figure 10: High Speed Access Competition** below brings together both provider volume and the associated speeds provided by ISPs within a Census block to visualize quality broadband access. Specifically, the map presents the percentage of BSLs within a Census block which have access to broadband speed at or exceeding 100/20 Mbps by 2 or more providers. There is broad access to 100/20 Mbps service, however in just over half of the municipalities in the state have little to no competition.

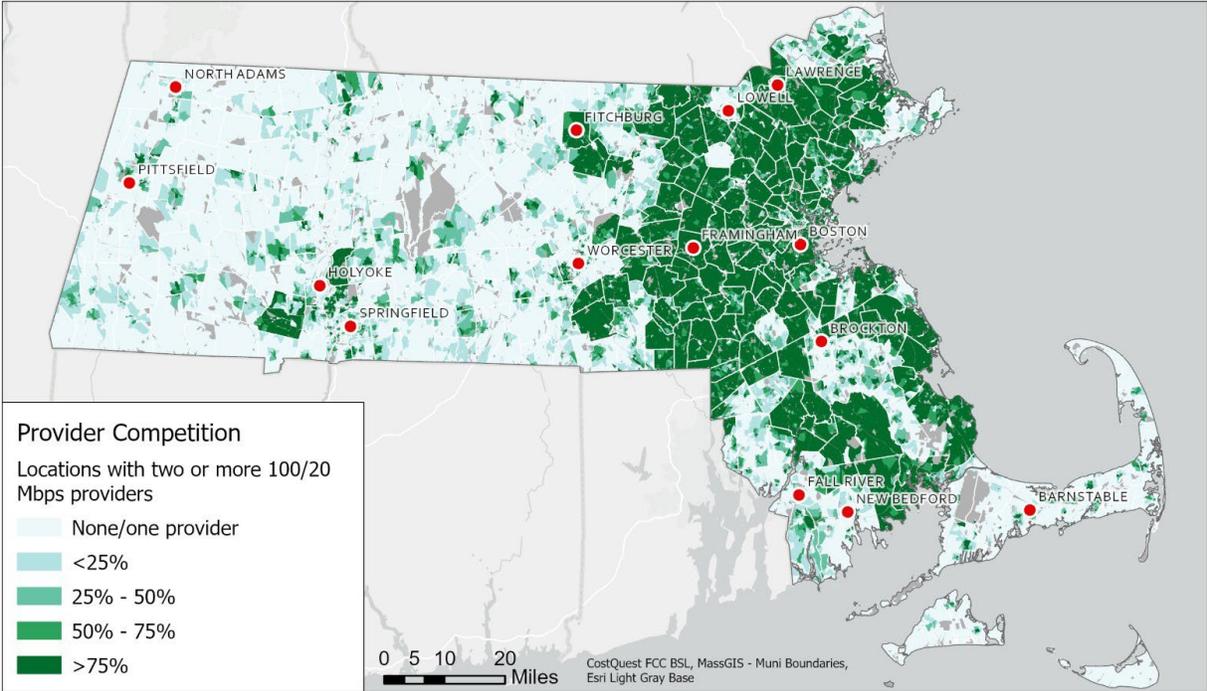


Figure 10: High Speed Access Competition⁸

3.4.2 Broadband Adoption

Since closing the digital divide involves not only deploying infrastructure but achieving widespread adoption, **Figure 11: ACS Internet Subscriptions Survey (“ACS”)** to shed light on Massachusetts’

⁸ Figure 10 data sources – CostQuest FCC BSL data, MassGIS Municipal Boundaries



progress towards achieving this goal. ACS data is available on a five-year rolling basis, with the minimum level of granularity at which statistically valid results can be calculated being the Census block group. Most Census block groups in Massachusetts have adoption rates of 80% or higher.

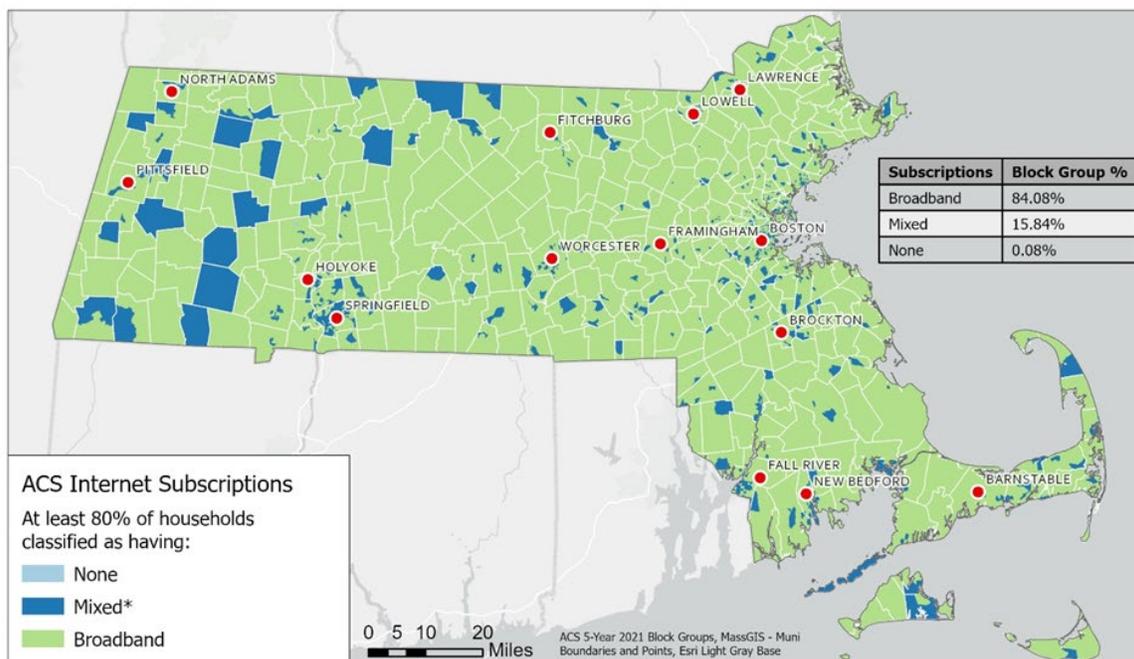


Figure 11: ACS Internet Subscriptions⁹

This map was created by joining the 2021 5-year ACS Block Group Internet Subscriptions table (B28002) to Block Group geometry. Percentages were calculated based on total households that subscribe to one of the 4 categories - broadband of any kind, dialup, none (no subscription, or no internet). If the percentage of broadband, dial up, or none is greater than or equal to 80% in any given block group, then it is given the designation of broadband, none, dial-up or “mixed”. “Mixed” is where it could have any percentage below 80% of either broadband, dial up, or none. No block group in the state has 80% or more households with dialup. The “mixed” areas in Figure 12 represent areas where either poor coverage or relatively low subscription propensities on the part of households have led to a situation in which less than 80% have home high-speed internet subscriptions. Some of the census block groups in western Massachusetts with low adoption rates are Last Mile Towns that completed projects after the period of the ACS data.

3.4.3 Broadband Affordability

Broadband connectivity does not strictly rely on access. A common barrier to home internet adoption is affordability. The historical narrative surrounding unconnected households is that there is a lack of infrastructure, but according to Education Superhighway; 18 million of the 28.2 million unconnected households in the US are offline simply because they cannot afford internet connection. Despite the availability of low-cost broadband plans, 64% of unconnected US households still find difficulty connecting to high-speed internet.

⁹ Figure 11 data sources – ACS 5-Year 2021 Block Groups, MassGIS Municipal Boundaries and Points.



The Affordable Connectivity Program (“ACP”) is an FCC benefit program that aims towards broadband connectivity by ensuring households can afford connection. The ACP was created by the Infrastructure Investment and Jobs Act in 2021 and provides a discount of up to \$30 per month toward internet service for eligible households and \$75 per month for eligible households on qualifying or former tribal lands. Additionally, the program also provides a one-time discount of up to \$100 to eligible households for internet device purchases, such as laptops, desktop computers, or tablets on the terms that the consumer co-pays more than \$10 and less than \$50. Eligibility for these programs is determined by household income, with a cap at 200% Federal Poverty Guidelines, and/or participation in other federal assistance programs such as SNAP or Medicaid.

Lifeline is another major federal program that assists in broadband connectivity for low-income households. The program is run by the Universal Service Administrative Company (“USAC”) and funds households based on poverty and government program participation. Lifeline offers up to \$9.25 off the cost of phone, internet, or bundled services for eligible households. This rate increases up to \$34.25 per month for eligible households on tribal lands with the addition of a one-time \$100 first-time connection benefit.

The Education Superhighway provides data on estimated eligible and enrolled households at a statewide level and the American Community Survey 5-year estimate shows total household counts per county. According to these Education Superhighway eligibility estimates, divided by the ACS estimated total households in Massachusetts, 38.4% of households in MA are eligible for ACP assistance. Of those eligible, 30.3% of households have already enrolled in ACP. **Table 16: ACP Enrollment in United States (and Territories)** below represents the percentage of households that subscribe to the ACP, using eligibility numbers from Education Superhighway and enrollment numbers from USAC’s ACP Enrollment and Claims Tracker (with data as of July 10, 2023).

Overall, Massachusetts ranks 30th in the country in terms of ACP participation.

Table 16: ACP Enrollment in United States (and Territories)

Rank	State	Eligible	Enrolled	Percent Enrolled
1	Puerto Rico	610,055	962,129	63.4%
2	District of Columbia	55,179	104,893	52.6%
3	Louisiana	474,380	904157	52.5%
4	Ohio	1,001,324	1,984,218	50.5%
5	Kentucky	403,791	846290	47.7%
[...]				
10	Wisconsin	894,005	372,758	41.7%
20	Mississippi	595,397	215,966	36.3%
30	Massachusetts	1,042,310	315,466	30.3%
40	Washington	1,124,956	289,985	25.8%
52	North Dakota	114,650	14,104	12.3%



Table 17: Lowest ACP Enrollment (by City) in MA below shows those cities with the lowest ACP adoption in the state of Massachusetts, collected from the Education Superhighway.

Table 17: Lowest ACP Enrollment (by City) in MA

City	Adoption Rate	Eligible Households	Enrolled Households
Boston	31%	131417	40205
Worcester	62%	42567	26499
Springfield	53%	37673	20057
New Bedford	39%	23766	9240
Lowell	33%	23651	7734
Fall River	40%	23585	9412
Brockton	55%	18601	10173
Lynn	34%	18577	6299
Quincy	25%	15899	3971
Lawrence	58%	15168	8823
Somerville	12%	14981	1868
Cambridge	25%	14584	3578
Haverhill	24%	14341	3483
Revere	24%	11850	2853
Methuen	22%	10250	2224
Chicopee	68%	10187	6888
Malden	27%	9773	2620
Taunton	33%	9617	3186
Medford	12%	9341	1142
Framingham	20%	9123	1854

Households are deemed eligible based on poverty guidelines and/or participation in federal assistance programs. The ACS 2017-2022 5 Year Estimate provides data on household incomes and estimates of households below the 200% poverty line but does not provide information on households participating in federal assistance programs. Due to these limitations, an estimate of eligible household data is not available at a county level or zip code. To visualize ACP participation, **Figure 12: ACP Enrollment by Zip Code** shows the percentage of enrolled households per total zip code households as of May 2023. ACP Enrollment



data is sourced through USAC’s ACP Enrollment and Claims tracker and divided by the ACS 5 2017-2020 5 Year Estimate data. The figure shows the highest ACP participation in zip code 01610 (58.1%) and 01608 (56.8%), both in the city of Worcester, and zip code 01105 (55.2%) in Springfield. All three zip codes are in urbanized areas of Massachusetts or in areas that have statistically lower income levels. There are several zip codes with 0% participation, many of which are in areas of higher income (02564 in Nantucket) or areas with very small population counts (02713: 18 households).

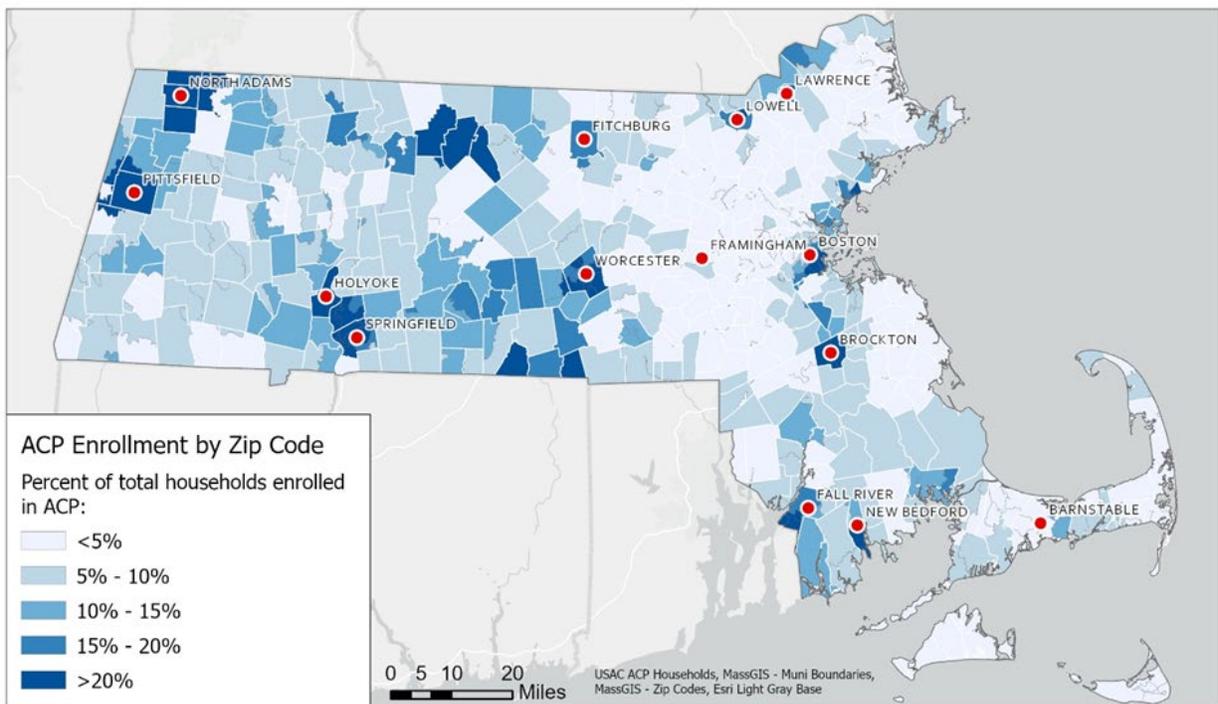


Figure 7: ACP Enrollment by Zip Code¹⁰

3.4.4 Broadband Access

As outlined in Section 5.1, MBI has launched a robust stakeholder engagement process that will continue for the next few months and feedback related to access will be assessed as part of the process to identify any gaps and needs with respect to access.

3.4.5 Digital Equity

Digital equity needs and gaps are harder to define than broadband coverage needs and gaps, because this is an emerging policy area that deals in many phenomena that are either inherently difficult to measure, or simply have not been well-measured to date. Research from MBI’s parallel digital equity workstream generated the Venn diagram in **Figure 13: Device Ownership vs. Subscribership** below describing device ownership, subscribership behavior, and the way these aspects of digital disadvantage overlap, such that an estimated 11% of Commonwealth residents have neither a computer nor an internet subscription in their household.

¹⁰ Figure 12 data sources – USAC ACP Household data, MassGIS Municipal Boundaries and ZIP Codes

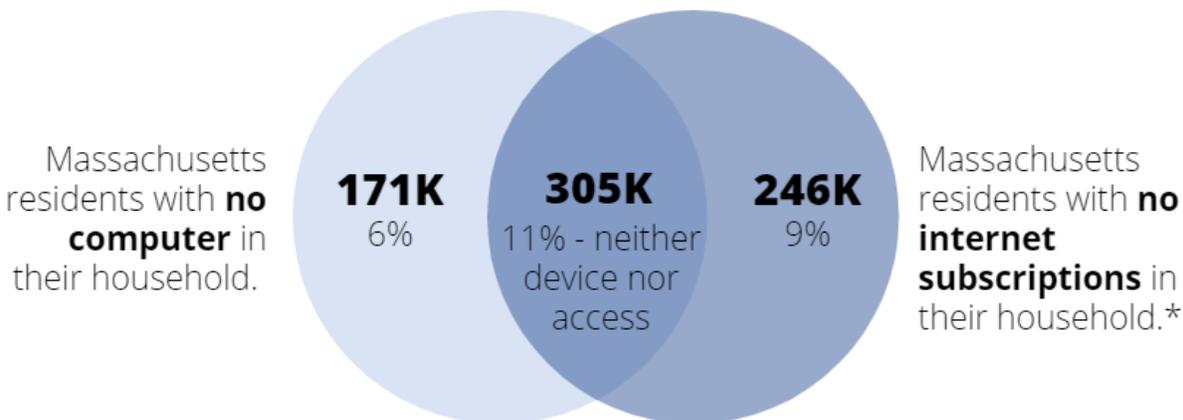


Figure 8: Device Ownership vs. Subscribership

We look forward to the ongoing elucidation of other aspects of the digital equity gap as this work proceeds.

3.4.6 Key Takeaways

The following are key observations inferred from the needs and gaps assessment:

Eligible Unserved and Underserved Baseline: Based on BDC Version 2 and accounting for Federal Funding commitments from CAF and RDOF programs, the Commonwealth estimates 10,975 unserved and 7,602 underserved eligible for BEAD funding. These BSLs are primarily located in Western Massachusetts concentrated in the six municipalities of Warwick, Royalston, Mount Washington, Petersham, Savoy, and Hawley – which have been the focus of MBI’s infrastructure expansion efforts over the last several years. Specifically, based on MBI’s data and mapping efforts, Petersham and Mount Washington have Fiber-to-the-Home network built the effect of which is yet to not yet reflected in BDC Version 2.0. Charter has been awarded RDOF funding to serve BSLs in Royalston.

Improved BSL identification through the State Challenge Process: To address the issue above and to improve the quality of data to identify critical gaps, the Commonwealth intends to leverage the State Challenge Process. Given the known lag in service reporting in the BDC service data, MBI will encourage those known ISPs with new service offerings to challenge the service levels defined in the BDC data. The State Challenge Process is also MBI’s opportunity to evaluate the NTIA’s model guidance relative to the most appropriate fixed technology to meet the needs of the remaining underserved and unserved locations in Massachusetts.

Opportunities and Gaps: BDC Version 2.0 demonstrates dispersion of unserved and underserved locations throughout the Commonwealth. Further, the clustering analysis demonstrates that opportunities for contiguous BEAD-funded deployment projects of substantial size account for about 65% of all eligible locations; under the right program structure and sizing of matching requirements, these locations represent opportunities for ISPs to serve these markets. On the other hand, 35% of unserved/underserved BSLs are more isolated in individual or very small clusters that poses a challenge to drive market interest. MBI will address these challenges through structured sequencing of the BEAD subprograms with careful consideration for the nature of the sub programs (clustered projects vs line extensions).



4 Obstacles or Barriers

MBI is still in the early stages of analyzing BEAD program implementation prospects with a view to foreseeing and resolving major obstacles or barriers that the program will face. That said, Massachusetts does not foresee any prohibitive obstacles to its achievement of the BEAD program’s principal objective of universal broadband access at 100/20 speeds. The vast majority of the state already enjoys good broadband coverage, and funding, from CPF, BEAD, and other programs such as RDOF and CAF II, is abundant. Nonetheless, some complications and difficulties lie ahead on the path to a statewide solution for universal broadband access.

4.1.1 Escalation of Subsidy Cost Per Location as Deployment Reaches the Hardest Areas

We foresee considerable escalation of the subsidy cost per location of grant-funded broadband deployments, as Massachusetts builds out to the last remaining unserved and underserved locations. These are generally very remote and difficult to serve, which is why they have not been addressed yet.

Moreover, as shown in section 3.4, the disparate and scattered character of these locations, which are mostly small clusters or single locations, may raise costs through a lack of economies of scale at the project level. The diffuse character of the remaining coverage gaps poses a challenge for administering a grant program. When only individual locations and small clusters remain to be served, projects designed to close gaps, although allowable since BEAD has no minimum project footprint, may face a disproportionate amount of overhead cost related to the administration of a government grant, relative to the size of the projects.

4.1.2 Data Quality Limitations

The quality of broadband data is a major barrier to the achievement of universal broadband access. FCC coverage data are based on provider self-reporting. Providers may in some cases (a) lack incentives or resources to measure the quality of their coverage accurately, (b) misstate their actual coverage footprint or the speeds they can provide, or (c) simply make errors while processing and uploading their data. There is a danger that faulty data will result in a failure of the BEAD program to target locations that are in fact in need of broadband upgrades.

For more than a year, Massachusetts has been active in broadband mapping and has learned a good deal about the actual state of broadband coverage across the state. Our information does not always agree with what is reported in the FCC maps. Some of these discrepancies are noted in other sections of this Plan. Making sure that the coverage data used to define program eligibility is accurate, so that it neither fails to identify any real coverage gaps nor misidentifies coverage gaps in ways that would lead to unintentional subsidized overbuilding, will be critical to achieving satisfactory results from the BEAD program.

4.1.3 Pole Attachments and Other Permitting Issues

Massachusetts’s current pole attachment process is less streamlined than those of some other states, and may pose challenges for expanding broadband during the BEAD deployment in areas where broadband solutions have been elusive hitherto. Massachusetts has pending legislation that would create a “One Touch Make Ready” (“OTMR”) system, but it has not passed, causing Massachusetts to be the only New England state without such a policy. If passed, the bill might reduce costs and delays for broadband deployments.



Other challenges related to permitting include the special environmental permitting requirements of the BEAD program. Additionally, the increased demand for permits as CPF and BEAD accelerate deployment is a risk factor that must be taken into account.

4.1.4 Supply Chain Challenges

Since 2020, the prices of a wide variety of components required for broadband deployment, starting with fiber-optic cable, have become more volatile and expensive, creating challenges for ISPs wanting to build and expand networks. While a supply side response to mitigate these supply side constraints is underway, demand side pressures can be expected to increase dramatically as the BEAD program accelerates broadband deployment in every state.

It may help here if much of the remaining broadband deployment needed to achieve universal broadband access in Massachusetts is carried out with CPF funds that are expected to begin to be awarded in 2023. Most BEAD projects nationwide will not be awarded earlier than 2025, so Massachusetts ISPs with CPF grants will have an opportunity to get a head start in securing the materials they need to deploy.

4.1.5 Weather

Broadband deployment can be significantly affected during the winter months due to various weather conditions. One of the primary reasons for this is ground freezing, which makes digging trenches and laying cables challenging. This can cause construction delays and higher costs. Apart from ground freezing, heavy snow, and ice can make it difficult to access worksites and transport equipment, further adding to delays and costs. Considering the risks of winter weather when planning and deploying broadband infrastructure is essential. Frost in Massachusetts can sometimes penetrate several feet underground.

In addition to the weather issues with deploying underground, there are also issues with trying to construct aerial plant in winter months. The first problem is trying to set anchors in the ground to support the strand infrastructure. Second is the depth of snow in the easement, which gets in the way of the crews. Finally, it can be hazardous for crews to work in extremely cold weather. All that said, crews can construct small extensions in winter months, primarily to reach a single business, or a hospital. But unless the weather conditions are conducive, it is not usual practice to build any significant aerial plant in winter months.

4.1.6 Match Requirements and Commercial Sustainability

A key issue that the BEAD program implementation will need to focus on throughout is commercial sustainability.

Both the CPF and the BEAD programs are one-off subsidies to capital investment. They do not provide ongoing support for projects when the capital investment phase is complete. There is a risk that broadband networks whose construction was subsidized will not be able to pay their own bills *ex post*, and will ultimately shut down to stop losing money. This risk is lower when the project involves a relatively small extension of existing infrastructure to reach unserved BSLs.

Related to this is the BEAD match requirement of 25%. In some parts of Massachusetts, we anticipate that there may be difficulties in inducing ISPs to raise private matching capital to deploy to low-density areas where expected customer revenues are low and expected operating and maintenance costs significant. MBI will evaluate options to address situations where the 25% match may be an obstacle to BEAD program participation. However, where there is an issue, heightened scrutiny of long-term revenue and cost



projections may be necessary to address a heightened risk of eventual network abandonment if the ISP foresees no adequate return even on a 75% subsidized investment.

4.1.7 Making Federal Programs Work Together

A serious challenge for BEAD planning is the concurrent launch of the Gap Networks Grant Program funded by CPF, whose ultimate footprint is not yet known. This problem is discussed further in section 5.3.

4.1.8 Capacity Building

In order to execute the CPF and BEAD programs, the MBI needs to build capacity as described in Section 3.1.2.

4.1.9 Workforce Needs

The NTIA's analysis of Massachusetts telecommunications workforce revealed a few small gaps in the workforce needed for broadband deployment, with the supply of software engineers, trenchers, structural engineers and inspectors falling slightly short of anticipated needs. To address the gaps identified so far may not require major effort, but MBI will seek to confirm this assessment through industry engagement, to make sure no critical workforce gaps exist that have not yet been identified. If so, MBI has strategies to quantify workforce gaps and address them through partnerships with training providers. More detail about MBI's workforce contingency plans is provided in Appendix B: BEAD Workforce Planning.

4.1.10 Digital Equity

While serious, these access challenges, and the MBI's decisions and activities to address them, will ultimately affect only the small minority of Bay Staters who are still unserved or underserved. Meanwhile, the MBI and its partners and stakeholders are well into the process of wrestling with the next great challenge: digital equity, and the promotion of full-fledged online flourishing to the whole population of Massachusetts. As mentioned above, research conducted as part of the parallel digital equity planning workstream has found that:

- 17% of Massachusetts households have no computer in their household
- 20% of Massachusetts households have no home internet subscription
- 11% of Massachusetts households have neither a computer nor an internet subscription at home
- Many Commonwealth residents find internet service difficult to afford.

In some cases, the lack of a home internet connection reflects a smartphone-only lifestyle. This may be adequate for some, but in general, we expect it to prove detrimental to skills and opportunities, and we would like to see the share of the population in this situation minimized. The digital equity planning workstream, currently underway, needs to, and has begun to, generate critical insight about the nature of these problems and the options for addressing them that build on MBI's existing programs.

While digital equity needs and gaps are larger than the remaining infrastructure challenge and are the subject of the separate dedicated workstream of the State Digital Equity Capacity Grant, they affect BEAD as well, because adoption and use of internet service within the footprint of BEAD-funded networks are critical to the sustainability and maintenance of the networks.

See also Section 3.4.5 Digital Equity for more about Massachusetts' digital equity assets and needs and gaps.

4.1.11 Key Takeaways

Massachusetts is close to achieving universal broadband access, but the last steps are among the most challenging. MBI will need to deal with escalating costs as deployment reaches to the hardest-to-serve places in the state, and with the scattered nature of the remaining broadband coverage gaps, many of which consist of single locations or very small clusters. It will need to induce ISPs to participate in the BEAD program and commit to deployment projects for areas that have historically been financially unappealing for deployment, and make sure that the deployments are commercially sustainable after the BEAD subsidy to upfront build has run its course. It will need to layer funds from multiple sources, especially CPF and BEAD, reconciling different requirements and making sure they are coordinated and complementary. All this needs to be done even as Massachusetts continues to improve its broadband coverage data quality, checking FCC maps against local information and correcting them where needed, to make sure that no one gets deprived of the broadband access that 21st-century Americans need simply because of inaccurate coverage data.

At the same time, Massachusetts will continue to pivot to the larger challenge of digital equity. While broadband access is a prerequisite for full digital inclusion, it is only the first step, and only adoption and meaningful use of the internet can unlock the full potential of the networks being built to contribute to human flourishing. The BEAD program and the Digital Equity program can work together to better understand and quantify the need for digital equity, to identify organizations and policy interventions that help meet the needs in a scalable way, and to fund their discovery, progress and expansion so that the digitally empowered lifestyles that so many Americans now take for granted can become the experience of all. Digital equity is particularly crucial for the modernization of Massachusetts' workforce, at a time when remote work is becoming more common, professional jobs overwhelmingly require online competency, and training and job search is increasingly conducted online.



5 Implementation Plan

5.1 Stakeholder Engagement Process

In the pursuit of digital equity and broadband access, Massachusetts has adopted a robust and inclusive stakeholder engagement process. Recognizing the importance of collaboration and community involvement, the state has organized various events and initiatives to ensure that the strategies implemented are locally informed, equitable, and beneficial to all segments of the population. Leveraging extensive external engagement and building upon prior work, Massachusetts is taking proactive steps to bridge the digital divide and create a connected future for its residents.

As part of the Commonwealth's Broadband investment strategy, MBI's Internet Access and Digital Equity Programs and Partnerships will continue to ensure broad stakeholder engagement and public participation:

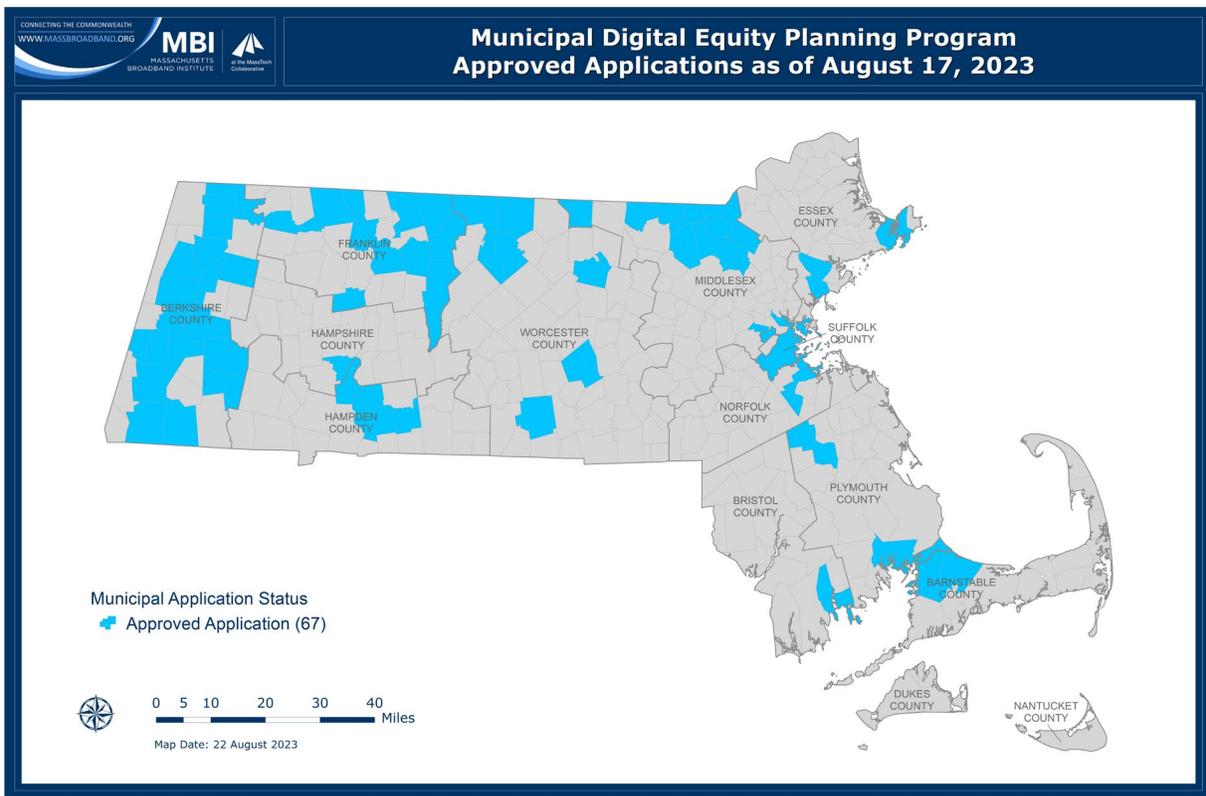


Figure 9: Municipal Digital Equity Planning Program

- **Municipal Digital Equity Planning Program:** MBI launched the Municipal Digital Equity Planning Program to enable municipalities, or other local bodies of government, to engage in planning activities related to digital equity and bridging the digital divide. The early municipal plans will feed up into the Statewide Digital Equity Plan.
- **Digital Equity Practitioner Group:** MBI convenes a group of digital equity practitioners working on the ground throughout the Commonwealth, that meet to discuss notes from the field, programmatic updates, and pose questions regarding best practices.



- **Digital Equity Partnership Program:** Partners provide insights into the regions and populations that they serve and help to promote the statewide digital equity survey and asset mapping tool.
- **Community Based Organization Grantees:** MBI requested services and qualifications from community-based organizations to plan and facilitate activities that support a human-centered engagement process for DEA and BEAD statewide planning efforts, as well as future implementation activities under these programs.

These programs are partnerships will be leveraged to carry out a comprehensive stakeholder engagement process that will consist in addition to the above of the following workstreams: Statewide Digital Equity Survey, Digital Equity Working Group, Interagency Collaboration, Partnership Inventory, Participatory Planning and Covered, Populations Touchpoints, Individual meetings, listening sessions and focus groups, and Tribal Engagement as described in **Table 18: MBI Stakeholder Engagement Tactics** below.

Table 18: MBI Stakeholder Engagement Tactics

Workstream	Overview	Outcome
Statewide Digital Equity Survey	MBI has published a survey that is open to all residents of the Commonwealth.	The survey will provide direct resident feedback on barriers to internet access, affordability, and adoption
Digital Equity Working Group	These touchpoints are meant to inform the development of the BEAD and Digital Equity Plans and set long-term pathways for implementation success.	Set a unified vision required by the DEA and BEAD plans, aligning stakeholder engagement, input, and feedback into the vision.
Interagency Collaboration	MBI is convening a group of representatives from each of the executive branch secretariats to support collaboration around broadband and digital equity planning and implementation activities.	Leverage resources and expertise in executive branch secretariats and departments to support planning and implementation of federally funded programs.
Partnership Inventory	The Partnership Inventory is a relational, Airtable database that tracks engagement activities by organizations involved in the planning process. The inventory includes municipal planning consultants, community-based organizations, regional planning partners, and state agencies.	Track engagement events per covered population, and hosts of focus groups and listening sessions. Ability to analyze and align partner capacity with implementation plan by geography, objective, and covered population.



Workstream	Overview	Outcome
Participatory Planning and Covered Populations Touchpoints	Touchpoints to communicate broadband deployment and digital equity planning priorities, needs, and critical context to stakeholders in their focus geographies.	Collect input from diverse groups of stakeholders that is necessary for the development of a unified vision for BEAD and DEA, and for the implementation plan including stakeholder engagement and partnerships.
Listening Sessions and Focus Groups	MBI will convene regional listening sessions and smaller, targeted focus groups for covered populations and underrepresented communities.	Collect feedback through these sessions to identify gaps and needs within communities and populations.
Tribal Engagement	Engage with the two federally recognized tribes within Massachusetts: the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribes.	Identify any Tribal-specific gaps and needs related to broadband that can be addressed through BEAD and Digital equity finding.

EOED and MBI are responsible for the oversight and integration of all broadband and digital equity initiatives throughout the state. To guide and advise these planning efforts, a Digital Equity Working Group was formed in March of 2023.

The Working Group is composed of leaders from across Massachusetts to offer specific topic area expertise, such as higher education, labor groups, and economic bureaus, and represent target populations as defined by federal funding guidelines and MBI’s programs, such as Women’s groups, Tribal Councils, and Senior organizations. A full member list of the Digital Equity Working Group can be found in Appendix C: Digital Equity Working Group Members.



Since then, MBI has launched a successful summit & stakeholder engagement initiative that includes the following:

- June 13 Summit in Worcester:** On June 13, Massachusetts held a transformative summit in Worcester, bringing together over 250 stakeholders from diverse backgrounds. This event marked one of the largest gatherings of its kind for broadband in the state, providing a platform for attendees to



share their insights, experiences, and challenges related to digital equity and broadband access. The summit served as a rallying point, fostering enthusiasm and commitment among participants to address the digital divide collaboratively



- **Listening Sessions:** To ensure locally informed solutions, Massachusetts has planned Listening Sessions in at least seven regional locations. These sessions will be hosted in municipalities enrolled in the Digital Equity Planning program, where community engagement plays a pivotal role. By actively involving local stakeholders, including counties, municipalities, Tribes, community organizations, colleges, technical schools, ISPs, and other providers, MBI aims to understand the unique challenges faced by each community. This approach empowers local residents to participate in shaping broadband deployment strategies that cater to their specific needs.
- **Focus Group Sessions:** To reach and represent covered populations and underrepresented communities, Massachusetts is conducting over 20 focus group sessions in partnership with Community Based Organizations. These organizations are instrumental in bridging the gap between the state and underserved communities, including those living at or below 150% of the federal poverty level, aging individuals, incarcerated individuals, veterans, individuals with disabilities, individuals with a language barrier, individuals who are members of a racial or ethnic minority group, rural residents, and new Americans. Through these sessions, the state gains crucial insights into the challenges faced by these populations, enabling the development of targeted and effective policies

Figure 15: Digital Equity Working Group Activities below highlights the timeline of completed and planned activities with the Digital Equity Working Group for Q3 and Q4 of 2023, and the planned development of a State Digital Equity Plan (“SDEP”) to run concurrently with the BEAD implementation process. As such, feedback and insights from the Digital Equity Working Group were considered in the development of this Action Plan.



	Jun	Jul	Aug	Sep	Oct	Nov - Jan
Digital Equity Working Group		WG Mtg #3: Visioning	Outcome Area Subgroup Meeting	WG Mtg #4: Measurable Objectives & Implementation Framework	WG Mtg #5: Draft Plan Review	
SDEP Drafting	Data collection with partners				Draft Plan for Working Group	Draft SDEP for Public Comment; Finalize SDEP
Public Survey	Deploy Public Survey with partners with focus on Covered Populations					
Interviews + Focus Groups	Host Focus Groups statewide with focus on reaching Covered Populations					
Listening Sessions	Listening Session #1 in Worcester		Listening Session #2 in Brockton	To Be Scheduled		

- Activities to be conducted in partnership with Digital Equity Partners & RPAs
- MBI-led activities

Figure 10: Digital Equity Working Group Activities

By elevating the engagement of stakeholders across all of its broadband programs, MBI has the unique opportunity to not just comply with the federal requirements but to use its federal funding to create a comprehensive, integrated approach to stakeholder engagement and local capacity building.

Building upon the principles of extensive and inclusive external engagement, Massachusetts is committed to maintaining strong relationships with a diverse array of stakeholders throughout the state. The state recognizes the vital role played by municipalities, Tribes, community organizations, colleges, technical schools, ISPs, and other providers, each of whom works closely with their respective communities. These stakeholders possess valuable knowledge of the challenges and unique solutions required in their areas.

5.2 Priorities

As outlined in the prior section, the Commonwealth has launched a robust stakeholder engagement process that will continue through the next few months. While feedback is still being collected, the process established priority sectors for the Commonwealth focusing on infrastructure, housing, economic and workforce development, education and healthcare. Tentatively, the Commonwealth of Massachusetts expects to pursue these sector priorities subject to further updates from the stakeholder engagement process and compliance with BEAD statutory requirements.

Table 19: Commonwealth of Massachusetts Priorities

Priority Sector	Description
Infrastructure	<ul style="list-style-type: none"> • Address Connectivity Gaps to achieve Universal, 100% Coverage • Foster Resource Partnerships
Affordability	<ul style="list-style-type: none"> • Promote Affordability • Achieve 60% ACP Participation by Eligible Households
Housing	<ul style="list-style-type: none"> • Improve Broadband Access in Public and Affordable Housing, ~100,000 Units with Reliable Internet Service



Priority Sector	Description
	<ul style="list-style-type: none"> • Address Digital Inequities • Develop Access Programs
Economic and Workforce Development	<ul style="list-style-type: none"> • Promote Technical Skills • Expand Digital Navigators • Promote Telecommuting and Remote Work • Promote Standardized Technical Skill Building Programs
Education	<ul style="list-style-type: none"> • Expand Connectivity and Close the Homework Gap • Promote Digital Literacy Proficiency
Healthcare	<ul style="list-style-type: none"> • Support Telehealth Accessibility • Promote Remote Health Monitoring • Encourage Health Education and Awareness

To execute a compliant implementation of the BEAD program, Massachusetts will structure its plans to be consistent with the following built-in BEAD prioritizations:

- **Unserved first.** Consistent with the BEAD NOFO, Massachusetts will make sure that it has a deployment solution for all “unserved” locations lacking access to 25/3 internet service before it begins to make any firm commitments of BEAD funds to projects that target deployment to any “underserved” areas that have 25/3 but lack 100/20 access.
- **Prioritization of end-to-end fiber.** The BEAD NOFO defines “priority broadband projects” as end-to-end fiber and requires states to fund them in preference to projects relying on other technologies if they are not too expensive. MBI will prioritize fiber projects accordingly, and in view of the abundant funding from the BEAD and CPF programs, MBI anticipates that a statewide broadband solution in Massachusetts will require little or no reliance on technologies other than fiber.
- **Gigabit service for all community anchor institutions.** Consistent with the BEAD NOFO, Massachusetts will seek to identify all community anchor institutions that facilitate broadband access for the public and expand access to gigabit service.

The Commonwealth’s BEAD program priorities will follow the federal requirements and be designed for agility and responsiveness to first augment CPF funded project areas and any other remaining coverage gaps and second to support expanded adoption and digital equity programs if possible. The ongoing digital equity planning process will inform our BEAD planning and decision-making about potential use of BEAD funds beyond deployment.



5.3 Planned Activities

MBI has begun to plan the activities that it will conduct under the BEAD program, but stakeholder consultations are ongoing. More detailed information about MBI's planned activities for BEAD implementation will be forthcoming as part of the Initial Proposal a few months from now.

The MBI has extensive plans for the coming years to continue financing and overseeing broadband deployment throughout the state in pursuit of the goal of universal broadband access, leveraging multiple funding sources, while also continuing a campaign to promote broader digital equity goals, in partnership with local governments and community organizations with a grassroots presence. The BEAD program is an exciting addition to MBI's portfolio of projects. It represents an opportunity and provides an impetus to definitively address the infrastructure side of the digital divide, while dovetailing with and potentially providing spillover funds for a wide variety of digital inclusion activities through the State Digital Equity Capacity Grant program.

5.3.1 A Multifaceted Digital Equity Campaign

During the next five years, and probably beyond, MBI and its partners will continue to carry out a multifaceted digital equity campaign aimed at closing the digital divide beyond the infrastructure gap to include adoption, devices, skills, and other topics.

The ongoing work of these programs, and the conversations, connections and experiences emerging from them will help Massachusetts design and implement an innovative and impactful State Digital Equity Plan.

5.3.2 Mapping

MassTech Collaborative will continue to improve its geospatial intelligence about broadband coverage across the state, building on the success of the MBI Portal that was launched in 2022. Thanks to this project and portal, Massachusetts arguably has more insight than the FCC about actual broadband serviceable locations and broadband service availability in many areas of Massachusetts, and it can leverage this extra insight to continuing to improve the accuracy of the FCC's maps. While an EDA grant that initially supported statewide broadband coverage and service quality gaps research has largely run its course, MBI will continue its mapping efforts with other funding sources and seek to leverage this experience to design a geospatially well-informed implementation of the BEAD program.

5.3.3 BEAD Implementation

A key task for MBI in the coming years will be to implement the BEAD program. This will involve:

- The submission of an Initial Proposal in December 2023, after a public comment period, which presents a preliminary list of BEAD eligible locations, a challenge process, a subgrantee selections, and other sections to meet many different requirements.
- The execution of a challenge process, estimated to occur in Q2 of 2024.
- The execution of the subgrantee selection process, estimated to launch in Q3 2024. This should result in a complete statewide solution to all remaining broadband coverage gaps, charting a course to universal broadband access by reliable technologies at 100/20 or faster (hopefully 100/100).
- The submission of the statewide solution to the NTIA in a Final Proposal, expected to be due in June 2025 - one year after NTIA approval of the Initial Proposal.



- The monitoring of BEAD subgrantees' obligated deployments, culminating in a final report to NTIA no later than one year after all funds are expended.

MBI's implementation of the BEAD program needs to be fully compliant with BEAD program rules, as well as highly coordinated with other programs that will be engaged in active grantmaking for broadband deployment in the near future, with substantial overlap between the planning and implementation timelines, especially CPF. For more information on the estimated timeline for BEAD implementation, see section 6.5.

5.3.4 Integrating the Planning and Administration of BEAD and CPF

As described in section 3.4, the state of Massachusetts has an estimated 12,522 locations that are still unserved, and 7,602 locations underserved by reliable broadband. The US Treasury's Capital Projects Fund (CPF) program is providing \$175 million for broadband expansion, which Massachusetts is using to fund the Gap Networks Grant Program and a quality-of-service program. While the Gap Networks Grant Program will have substantial funding available to close many of the remaining gaps, the program will take several rounds to fully implement.

This creates a special challenge for the BEAD program in Massachusetts, because available guidance does not appear to clarify how BEAD and CPF should coordinate when they are conducting grantmaking rounds and issuing awards concurrently. The BEAD program will be designed to avoid duplicative funding of areas already scheduled to receive service in close coordination with CPF planning. The details of this coordination remain in development, but many aspects of these respective, complementary programs will be considered. For example, one of the requirements for Initial Proposal, Volume 1, is a complete list of BEAD eligible unserved and underserved locations. This list would then serve as the target list for which the state would accept broadband grant proposals from ISPs. A statewide competitive process would then receive and select among broadband deployment projects proposing to serve those areas. However, if the Commonwealth's CPF program awards broadband grants after the Initial Proposal are submitted and approved, those locations would then need to be omitted from BEAD eligibility.

Highly coordinated, joint administration of the BEAD and CPF programs will be needed to ensure that federal funds are cost-effectively used to close the remaining broadband coverage gaps with no overlap. This would involve some nuances, since some applicant ISPs may be interested in one program or the other, but not both. Applicants who can deploy to 100/20 but not 100/100 could apply for BEAD but not CPF, while applicants unwilling to introduce a special "low-cost option" might opt for CPF and not BEAD. Over the next few months, MBI will study the options and explore with federal partners how CPF and BEAD could best coordinate efforts to achieve universal broadband access statewide.

As the Gap Networks Grant Program continues, MBI will launch a competitive broadband grant program using BEAD funds, which will (a) prioritize unserved over underserved locations, (b) use an Extremely High Cost Per Location Threshold to regulate the degree of fiber prioritization, (c) require a 25% match, (d) provide for geospatial de-conflicting of projects, (e) define and require BEAD subgrantees to offer a low-cost option, (f) use a rubric to compare projects when multiple projects offer to deploy in the same areas, and so forth. If CPF fully closes the remaining broadband coverage gaps, or if CPF leaves some gaps but only a portion of BEAD funds are required to fill them, MBI will face a further decision about what to do with BEAD funding over and above what is required to achieve universal broadband access.

A rich stakeholder engagement process is already underway, as part of the digital equity planning workstream, to define the state's priorities for broadband and digital equity, and the outcomes of these



deliberations will inform MBI's decisions about what to do with any BEAD funds over and above what is needed to achieve universal coverage. It is too early to describe the outcomes of those deliberations, but MBI anticipates that they will mature and be ready to articulate as part of the Initial Proposal.

5.4 Key Execution Strategies

MBI continues to refine its strategic thinking with respect to the best way to execute the BEAD program, with a view to complementing other programs, effectively setting a course for universal broadband access, and pursuing a larger agenda of digital equity priorities as resources permit. But a number of strategic considerations must be borne in mind as the MBI proceeds to implement the BEAD program amidst its larger portfolio of programs and projects. These include:

- Coordinating multiple broadband funding programs to advance towards a universal coverage goal,
- Tracking the resiliency and sustainability of federally funded broadband expansion projects to ensure a permanent solution to broadband coverage gaps,
- Encouraging the use of existing infrastructure and assets,
- Maximizing public sector participation and the use of public-private partnerships,
- Reducing barriers and streamlining deployment,
- Promoting digital equity and inclusion while prioritizing geographically challenge, economically distressed, and historically underrepresented areas, and
- Developing strategies to raise awareness and improve adoption through marketing and communication.

More details about some of these are outlined below.

5.4.1 CPF and BEAD Complementarity

With respect to strategy, a key consideration for the MBI, as discussed above, is to make BEAD dovetail with CPF as seamlessly as possible. For example, it is likely that some ISPs will want to apply for both CPF and BEAD, not to get double funding but to maximize their chances of getting funding from at least one source. It would be helpful if ISPs in this situation could use a single application for both programs, however this may not be possible given the differing requirements of both programs.

5.4.2 Data-Driven Decision-Making

MBI will seek to make the key BEAD policy decisions in a data-driven way. In particular, in setting the Extremely High Cost Per Location Threshold, MBI will analyze available data on deployment costs to see whether BEAD funds, coming on top of CPF, will be sufficient to deploy fiber to the entire state of Massachusetts. If so, MBI will seek to set the Threshold at a level sufficient to secure fiber deployments to all addresses.

5.4.3 Maximize the Use and Reach of Federal Funds

MBI wants to get value for taxpayer money by covering only the funding gap between reasonable private investment and total capex project cost, and not to subsidize excess profit. In order to incentivize ISPs to develop cost-effective projects and mobilize appropriate private matching capital, MBI will seek to foster a



competitive process, maximizing participation through effective promotion and a streamlined application process.

While affordability is an important priority, MBI also wants to take into account the risk that the burden of special pricing arrangements for BEAD subgrantees will reduce participation in the program by providers, while contributing to broadband affordability only for a small minority of the Commonwealth's citizens. MBI will therefore seek to define the BEAD low-cost option in a manner that aligns as much as possible with existing pricing practices in the broadband industry. Fortunately, many ISPs already offer low-income broadband options to income-constrained customers.

5.4.4 Mapping and the Challenge Process

MBI wants to maximize its certainty that all broadband coverage gaps have been identified so that they can be addressed. To achieve this, it plans to build on existing broadband mapping efforts in Massachusetts with a participatory and user-friendly challenge process.

5.4.5 Lead with Digital Equity and Inclusion

In Massachusetts, the pursuit of universal broadband access is a goal that will only touch a small percentage of the state population directly, because broadband access is already nearly universal. But the larger agenda of digital equity, including not only availability but other modes of access, increased adoption, meaningful use and online flourishing, addresses aspects of the digital divide with a much larger footprint. Therefore, as MBI's experience so far suggests, it will be easier to mobilize the public to engage on the larger questions of digital equity, while digital equity planning can also create opportunities to solicit information about any remaining broadband coverage gaps. Moreover, as increased digital awareness induces people to subscribe to and value home internet service more, ISPs can look forward to increased customer revenue by deploying to the few still unserved and underserved areas, motivating faster deployment and mitigating the need for subsidies.

5.4.6 Ensure Commercial Sustainability

As discussed in section 4, the current influx of federal subsidies for broadband deployment promises to close all broadband coverage gaps in Massachusetts, and it is to be hoped that the solution is permanent, and coverage gaps do not re-emerge. However, this cannot be taken for granted. It is possible that networks might be built, and then fail to be maintained, for various reasons but especially because customer revenues turn out to be insufficient to cover operating and maintenance expenses. Engagement with industry and close scrutiny of incoming grant applications will be the first steps in ensuring that broadband networks built with subsidies to capex remain in business for the long run.

5.4.7 Leverage Community Involvement

Massachusetts has a strong track record of mobilizing communities for broadband and digital equity projects. MBI will utilize this experience and these connections to mobilize communities with broadband coverage gaps to play a role in planning for and deciding how their coverage needs will be met. Communities can have unique insights about aspects of ISP performance that are not visible in public datasets, and MBI will seek to mobilize affected communities to leverage these insights to influence which ISPs' broadband solutions are selected to bring them high-speed internet service.



5.5 Estimated Timeline for Universal Service

Massachusetts estimates that universal service will be achieved by 2030. **Figure 16: Estimated Timeline for Universal Service** below outlines Massachusetts’s estimated timeline for completing BEAD activities.

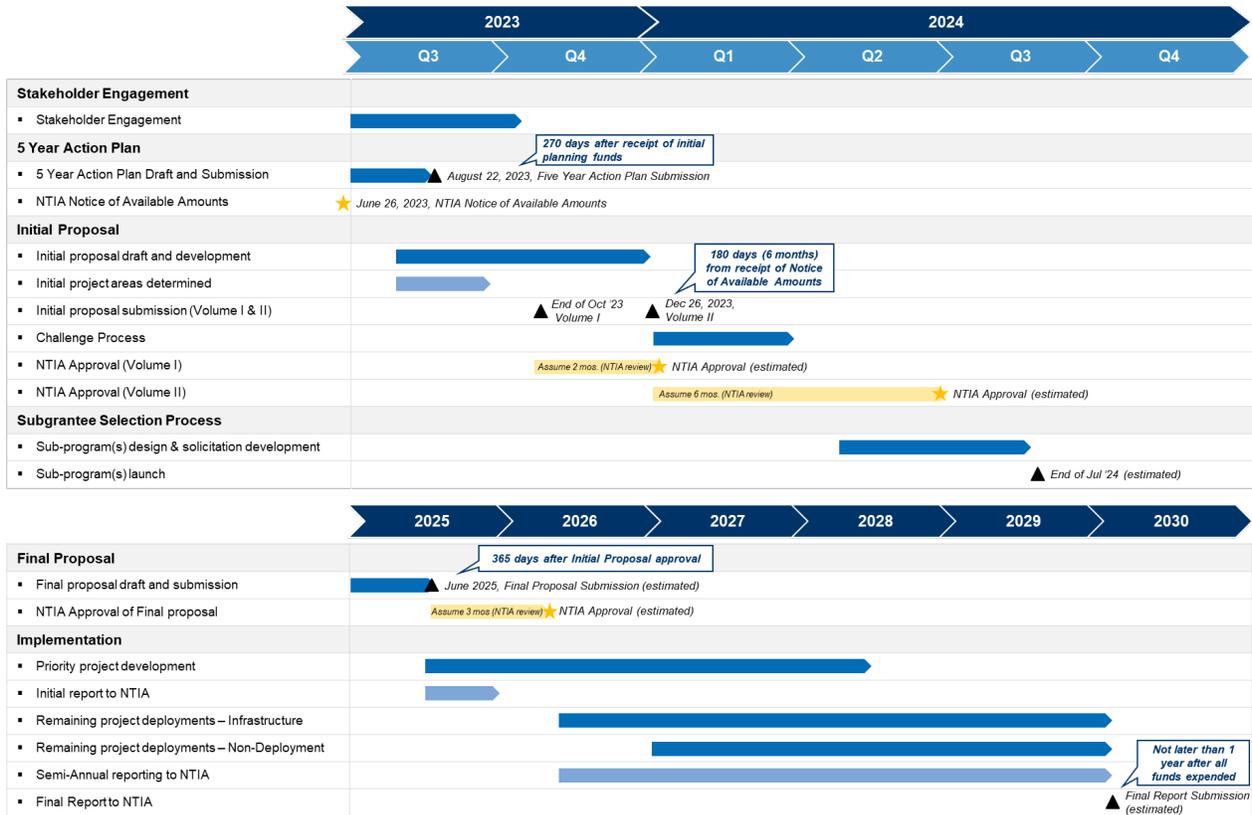


Figure 11: Estimated Timeline for Universal Service

Pending the BEAD submission and approval process, MBI anticipates distribution of BEAD funding to begin in 2024, with priority project construction to begin in 2025. Given the expected timelines above, Massachusetts’s seeks to achieve universal service across the Commonwealth by early 2030.

5.6 Estimated Cost for Universal Service

It is Massachusetts goal to connect the likely eligible 18,343 unserved and underserved BSLs with future proof broadband connectivity to ensure the productivity of its residents and constituents well beyond the conclusion of the BEAD program. Fiber optic infrastructure can deliver well over the FCC’s 100MB/20MB “Served” threshold and therefore is currently the best technology selection to deliver on the future proof broadband connectivity goal. As discussed above, the State of Massachusetts has been allocated \$147,422,464 in BEAD funding, over and above the CPF funding, to connect these BSLs and help reduce the additional non-infrastructure related barriers to broadband access. The approach to generating cost estimates outlined below will help define how much of the available funding is required for deployment and what remains for Digital Equity efforts.

The actual cost to connect these BSLs will be determined by a complex set of market forces, the risk appetite of the individual broadband service providers, and proximity of each BSL to existing fiber infrastructure.



Developing a model which accounts for these complex dimensions above is not cost-effective, in view of the expected imminent provision of cost estimation data from market leader CostQuest Associates to MBI by the NTIA. But as the requirement for a cost estimation exercise in this document remains, we have explored methods by which we can estimate costs with data that is currently available. We can look at historical data points and analyze spatial relationships within the available FCC data to generate a range of potential costs per BSL.

As one basis for broadband deployment cost estimation range, the State of Massachusetts may leverage the FCC's 2020 Rural Digital Opportunity Fund program's reserve auction pricing limits. The RDOF program was very successful in soliciting proposals from the same providers which the BEAD program seeks to encourage participation. Given the interest generated by the RDOF program, it is reasonable to consider the RDOF reserve pricing to inform the BEAD cost estimation process. That said, cost increases from 2020, the significant number of defaults by RDOF winners, and the low number RDOF awards in the State will be weighed closely when using this historic data point to support any extrapolated cost estimate efforts.

As a second basis for cost estimation, the State may use the distance between Unserved and Underserved BSLs to Served BSLs with Fiber broadband service. These distances will approximate the amount of Fiber infrastructure required to connect these unserved and underserved BSLs and a range of costs for fiber deployment per foot will be applied to these distances to estimate a cost to deliver fiber to each location.

The process starts by identifying the closest Served location with checks on the relationship to ensure water bodies are not being crossed. Next, the drive distance along a road network is calculated between the two points to better represent the potential linear distance of fiber cable required to connect the unserved or underserved location to the existing fiber network. When multiple unserved and underserved points reference the same served location and they are within 2500 feet of each other, the relative bearing of these connections are compared to identify when a common strand of fiber would likely be used to connect the many of the related locations. If the connecting lines' bearings are within the +/- 45 degrees, the candidate with longest over road distance is kept and the adjacent candidate(s) are given fiber distances equal to their BSL distance to the nearest road centerline. Finally, a price per foot of fiber is applied to the calculated fiber deployment distances based upon a set of rural and urban characteristics to help compensate for the increased challenges and expense of laying fiber in more rural areas.

Having a range of cost estimates available is helpful when you can't fully account for all the dimensions which drive cost in a single model. Using CostQuest cost modeling data, the MBI plans to compare how each of these potential cost estimate data points and methods vary at the BSL level. Where large cost estimate differences are found, effort will be dedicated to understanding the conditions which are driving the estimates apart and when possible, identify supporting data which can be used to better refine where these large cost estimates differences are found. The variance in cost geographically in aggregate across urban, rural, and municipal boundaries is of particular interest. MBI plans to compare these aggregate costs against estimated costs in the most recent proposals for broadband deployment to help evaluate what the market rate is for Fiber deployment. The result of these cost-estimate efforts will be further outlined in the coming Initial Proposal.



5.7 Alignment

MBI intends to align the BEAD program with other program initiatives that will support the implementation of the BEAD program. This section provides an overview of other key initiatives within the state that MBI expects to be in alignment with the BEAD program.

For the purposes of the 5-Year Action Plan, MBI has identified a number of state plans and efforts that jointly enable and support the objectives listed in this document. In addition, the development of the BEAD Five-Year Action Plan was done concurrently with the development of the State Digital Equity Plan. For instance, the stakeholder engagement work consisting of listening sessions, group meetings, and surveys are being structured and carried out with both plans in mind as well as the BEAD Initial Proposal. Output from the stakeholder engagement process that occurs after submission of the Five-Year Action Plan will be reflected in the BEAD Initial Proposal.

MBI is aligning with other local priorities and initiatives such as goals of an integrated public health and health care system (Mass State Health Improvement Plan), elimination of racial disparities in higher education (Mass. Department of Higher Education), and the delivery of broad economic opportunities and a high quality of life for all Massachusetts residents (HUD Annual Consolidated Plan).

While the below list of state plans is not exhaustive, this section highlights key strategies across various sectors that impact the objectives of the Five-Year Action Plan, including economic development, education, workforce development, environment, health, and infrastructure. By identifying how each plan supports the BEAD Plan, MBI is ensuring that all efforts targeting the broadband sector are working together rather than competing to achieve universal connectivity.

5.7.1 Economic Development

State Economic Development Plan

Governor Maura Healey, Lt. Governor Kim Driscoll, and Economic Development Secretary Yvonne Hao convened the first meeting of the Economic Development Planning Council at the Massachusetts State House. The council, comprised of leaders from diverse backgrounds and regions, will hold engagement sessions this spring and summer to gather public input on the state's economic development needs and opportunities. The council will then develop a four-year strategic plan to guide Massachusetts' economic policy. The plan will set long-term goals, define major initiatives and programs, and establish measurable benchmarks. The council will submit the final plan to the Legislature and the Joint Committee on Economic Development and Emerging Technologies after holding a public hearing and obtaining final approval from the governor. The plan will be published in writing and online by December 31, 2023.

Urban Agenda Grant Program

The Urban Agenda Grant Program, administered by EOED, aims to support economic progress and foster stronger urban neighborhoods across Massachusetts. The program is centered on collaborative work models that leverage unique local assets and address community-specific commercial and quality-of-life challenges. The program provides competitive funding to local partnerships through Community One Stop for Growth, using a collaborative review process for grants in community and economic development. Certain project categories, such as entrepreneurship, small business development, and workforce development, receive priority within the program's funding priorities.

Eligible applicants include municipal governments and nonprofit organizations in Massachusetts cities and towns aiming to create or expand community-based coalitions and develop/execute coalition-based



projects. Prioritization is awarded to projects situated in urban communities with a median household income below 90% of the state average, and the program will give special consideration to initiatives that align with the recommendations mentioned in the 2018 reports released by the Governor's Black Advisory and Latino Advisory Commissions.

Community Empowerment and Reinvestment Grant Program

The Community Empowerment and Reinvestment Grant Program is a flexible grant initiative administered by the Executive Office of Housing and Economic Development to support local partnerships in communities facing economic challenges such as incarceration, recidivism, poverty, and underrepresented populations. The program seeks community-led proposals that respond to community-defined economic opportunities and build leadership, collaboration, and capacity at the local level. The program will provide general operating grants primarily to projects focused on education, training, small business development, and social support services to reduce justice system involvement. The program will not fund capital projects or purchases. The initiative aligns with the Commonwealth's economic development plan, which prioritizes equitable opportunity and the Governor's Black and Latino Advisory Commissions' recommendations to advance equity and increase economic outcomes in disadvantaged communities.

Community One Stop for Growth

The Community One Stop for Growth is a single application portal that streamlines the experience for applicants seeking community development grant programs that make targeted investments based on a Development Continuum. It allows communities to be considered for more than one grant program simultaneously, provides guidance and state partnerships for feedback, and removes redundant legacy program processes to streamline the application experience. The One Stop benefits communities through collaborative review and enhanced state awareness and support for community development goals. For the FY24 Round, twelve programs will be administered through the Community One Stop for Growth by the Executive Office of Economic Development, Executive Office of Housing and Livable Communities, and MassDevelopment. The Development Continuum represents the life cycle of a major community development endeavor and includes five distinct categories related to preparing for growth and catalyzing specific projects.

5.7.2 Education

FCC's E-Rate Program

The FCC's E-Rate program provides discounts on telecommunications, internet access, and internal connections for eligible schools and libraries, ranging from 20 to 90 percent based on poverty level. With funding from the Universal Service Fund, the program aims to expand Wi-Fi access and support new digital learning technologies. Eligible entities submit bids to the Universal Service Administrative Company (USAC), who issue funding commitments and reimburse approved discounts to vendors or applicants.

To participate, eligible schools or libraries identify their needs and submit requests for competitive bids to the Universal Service Administrative Company (USAC). After selecting the most cost-effective eligible products or services and applying to USAC for approval, funding commitments are issued to eligible applicants. A vendor providing the selected services then submits requests for reimbursement of the approved discounts to USAC.

Sustaining Progress in Access and Equity: EdTech Strategic Planning Guide



The Massachusetts Department of Elementary and Secondary Education, in collaboration with the MA Educational Technology Administrators Association (METAA), the MA BESE Digital Learning Advisory Council (DLAC), and other stakeholders at the state and national level, has created this document to guide district and school leaders in Massachusetts. In response to the COVID-19 pandemic, districts and schools have made significant investments in technology and infrastructure over the past year. With additional funding opportunities available, this is an unprecedented moment for school systems to make meaningful and strategic investments in educational technology to enhance student learning in the years ahead.

The guidance offered in this document aims to support and encourage districts to harness the power of educational technology. Drawing on decades of experience and research, the guidance includes recommendations on how to build on what has worked and adjust what has not. It is important to note that this guidance was not created in isolation from each district's unique context, mission, vision, and priorities for learning. Rather, it is designed to supplement and complement district instructional visions and related budget planning, providing insights and suggestions to guide planning for the future of EdTech in districts and schools across Massachusetts. District administrative teams are encouraged to collaboratively review this information to chart the path forward for their district. This document is intended for district administrative teams including superintendents, directors of educational technology (EdTech), school business officials, and other leaders who participate in district strategic planning.

2015-19 Equity Plan

The 2015-19 Equity Plan, which was mandated by the US Education Department, was developed to address the disparities in student access to excellent teachers and principals across Massachusetts. The plan was created with input from a diverse group of stakeholders, including teachers, district leaders, parents, and representatives of English Learners and Students with Disabilities. The Department of Elementary and Secondary Education was responsible for administering the plan, and it identified four key strategies aimed at addressing gaps in student access to educators in the state.

These strategies included changes to the process for approving Educator Preparation Programs, monitoring of program outcomes, support for implementation of the new evaluation system, and tools to improve the teaching of diverse student populations. The Equity Plan also highlighted several ongoing initiatives at DESE aimed at improving student access to outstanding educators across the state.

Safer Schools and Communities Initiative

The Safer Schools and Communities Initiative is a program that provides \$2,910,000 in one-time funding to K-12 school districts, educational collaboratives, and charter schools for the purpose of enhancing security and safety measures. The program aims to improve campus security using equipment and technology. The Office of Grants and Research, in collaboration with the Executive Office of Public Safety and Security and the Department of Elementary and Secondary Education, manages the initiative. The program gives priority to applicants who can demonstrate the greatest need for security measures and propose cost-effective solutions to address high-priority gaps or weaknesses. Additionally, schools that are actively working to create a safer and more supportive environment for students and staff will also be considered.

The Early Education and Out of School Time (EEOST)

The Early Education and Out of School Time (EEOST) Capital Fund is a program that provides funding for large group early education and out-of-school time programs to make critical capital improvements to enhance health and safety. The FY23 EEOST Capital Fund special round will be awarding grants between



\$200,000 and \$500,000 to eligible organizations to offset expenses incurred for capital improvements to early education centers or out-of-school time care facilities that were made after January 1, 2022. The Early Education and Care (EEC) department will be managing and administering the special grant round.

The EEOST funding is specifically intended to be used for renovations that improve health and safety standards, such as enhancements to outdoor play spaces, improvements to heating, ventilation, and air conditioning (HVAC) systems, reconfiguration of indoor spaces including classrooms, gross motor rooms, and bathrooms, and emergency repairs and system upgrades that affect occupant health and safety. Physical environment modifications, including accessibility or other improvements to support children and adults with special needs, are also eligible for funding.

5.7.3 Workforce Development

MassTalent

MassTalent is a program aimed at connecting employers to qualified workers in high-growth industries such as life sciences, clean energy, and advanced manufacturing. The program streamlines government resources and proposes historic investments in early education, apprenticeships, and workforce development initiatives. The program includes Pathmaker, funded through the Massachusetts Life Sciences Center, which supports new training partnerships between life science companies and training providers to create free 8- to 10-week training programs accessible to students and adults with a high school education and no previous experience. The program also plans to reauthorize the Massachusetts Life Sciences Initiative, a groundbreaking public-private partnership for scientific and economic advancement in the state.

Training Opportunities Program

The Training Opportunities Program (TOP) allows individuals to receive unemployment benefits while attending full-time, approved training for new job skills. The program requires that the individual file a claim and is eligible for unemployment benefits, and that obtaining new skills is essential to finding a new job. The training must be intensive, full-time, and completed within two years, with a focus on vocational, technical, or basic skills. It also requires job placement opportunities, proven success in placing trainees, and must help in securing a new job. The training varies by type, and the minimum requirement for vocational/industrial training is 20 supervised class hours per week. Payment for the training is not covered, and the trainee needs to find available scholarships or grants.

Apprenticeship for Veterans

The Apprenticeship for Veterans program allows eligible individuals to use their G.I. Bill benefits and enter a registered apprenticeship program to learn skills in various fields. The program offers a combination of on-the-job training and related schooling approved by the Massachusetts Division of Apprentice Standards. This program benefits employers, employees, and the local economy. The MassHire Department of Career Services (MDCS) and the Department of Unemployment Assistance (DUA) administer the program.

Massachusetts Skills Capital Grant Program

The Massachusetts Skills Capital Grant Program provides funds to eligible schools and institutions to enhance vocational-technical education and training programs in alignment with economic and workforce development priorities. This grant program aims to increase the number of skilled workers and improve the skills of students and those facing employment barriers. Eligible applicants include educational institutions, businesses, nonprofits, industry associations, and community-based organizations. Grants



range from \$50K to \$500K for FY24 and up to \$1.5M for multi-year awards. The program prioritizes increased capacity, creating new programs, and equipment utilization in partnership with other organizations.

Trade Adjustment Assistance

The Trade Adjustment Assistance (TAA) program helps workers who have lost their jobs due to foreign trade to quickly rejoin the workforce by providing them with competitive and marketable skills for today's competitive work environment. The program's benefits are administered by MassHire Department of Career Services (MDCS) and Department of Unemployment Assistance (DUA).

Workforce Regional Labor Market Blueprints

The Workforce Regional Labor Market Blueprints initiative, administered by the Workforce Skills Cabinet, entails leveraging regional partners to address talent gaps and needs in the area. The Blueprint process facilitates the coordination and optimization of localized efforts, bolsters employer connectedness, and contributes to the development of new state-level strategies or improves existing ones.

Workforce Skills Capital Program

The Executive Office of Labor and Workforce Administers the Workforce Skills Capital Program, which offers funding to purchase and install equipment and perform any required related improvements and renovations, fostering vocational and technical training that enhances and augments career and technical education. The goal is to create high-quality, well-aligned career pathway programs that correspond to regional economic and workforce development priorities and address demands in high-growth industries.

Additional programs that MBI is planning to leverage for the benefit of the communities include:

- **Workforce Training Fund:** The Massachusetts Workforce Training Fund Program is designed to enhance workforce development in Massachusetts by improving the skills of both newly hired and current employees. The program provides funding for companies to deliver training to their employees, enabling them to enhance or gain new skills that are relevant to their current or future positions. The Workforce Training Fund Program provides training grants to Massachusetts employers up to \$250,000 per application, allowing them to tailor their training programs to their specific needs. Ultimately, the program's primary objective is to enhance the skills of employees and bolster the economic capacity of Massachusetts businesses.
- **HireNow:** HireNow is a workforce development program aimed at facilitating the swift hiring and training of new workers, consequently providing more employment opportunities. The program offers eligible employers a \$4,000 per-employee grant, which can be used as a signing bonus or to cover the cost of training expenses. HireNow aims to help employers attract the talent needed to fill staffing gaps while also creating job openings for unemployed or underemployed residents.

5.7.4 Environment

Massachusetts Clean Energy and Climate Plan for 2025 and 2030 (2025/2030 CECP)

The Massachusetts Clean Energy and Climate Plan for 2025 and 2030 (2025/2030 CECP) is informed by the 2050 Decarbonization Roadmap to ensure the Commonwealth is on a net-zero greenhouse gas emissions pathway by 2050. The program outlines sector-specific policies, strategies, and goals designed to reduce greenhouse gases across different areas such as transportation, buildings, electricity generation, industrial emissions, and non-energy emission sources. This comprehensive plan maximizes the state's



capability to achieve a future in which homes, vehicles, and the electric power grid can operate with minimal reliance on fossil fuels and protect natural and working lands to enhance carbon sequestration.

This effort expresses the state's confidence that Massachusetts can lead the clean energy transition and simultaneously promote economic growth. As a result, the program is expected to yield a well-paying job market, improved public health, reduced consumer costs, and better quality of life for all residents. Ultimately, the 2025/2030 CECP represents a critical step towards implementing sustainable practices that can effectively address climate change while promoting long-term sustainable economic growth in the Commonwealth.

Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)

The Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) is an innovative and first-of-its-kind program that integrates climate change impacts and adaptation strategies with hazard mitigation planning. The program has been approved by FEMA and is set to be effective from 9/19/2018 through 9/18/2023. Furthermore, it fulfills two critical requirements, updating the 2013 Massachusetts State Hazard Mitigation Plan and fulfilling the requirements for the Executive Order 569 climate adaptation plan, ensuring that it's consistent with state policy.

SHMCAP anticipates and responds to natural hazards and disasters associated with climate change across the Commonwealth, using projected changes in temperature, precipitation, sea levels, and extreme weather events to proactively mitigate the risks. By taking an innovative approach to climate change-related issues, SHMCAP program enables the Commonwealth to proactively reduce the risks associated with natural hazards and the negative impacts of climate change.

Municipal Vulnerability Preparedness (MVP) Program

The Municipal Vulnerability Preparedness (MVP) grant program is designed to provide crucial support to Massachusetts cities and towns as they plan for climate change resiliency. The program provides funding to communities to conduct vulnerability assessments and develop actionable resiliency plans. By completing the MVP program, municipalities become certified as MVP communities, making them eligible for MVP Action Grant funding and other support opportunities. Through strategic planning and robust action, the program seeks to enhance communities' abilities to mitigate the risks associated with natural hazards and climate change effects.

5.7.5 Health

Massachusetts Health Policy Commission (HPC)

The Massachusetts Health Policy Commission (HPC) is an independent state agency devoted to promoting a transparent, accountable, and equitable healthcare system. Its primary mandate is to monitor healthcare spending growth in Massachusetts and provide data-driven policy recommendations regarding health care delivery and payment system reform. The agency has fully integrated and embedded health equity principles in its work, with a goal of eliminating health inequities, which it recognizes as integral to achieving better care at a lower cost for all residents. The HPC prioritizes promoting diversity, equity, and inclusion within its workplace and aligning with partners to promote health equity.

Children's Behavioral Health Initiative (CBHI)

The Children's Behavioral Health Initiative (CBHI) is a critical system of state-funded behavioral health services developed by the Commonwealth of Massachusetts to assist MassHealth children with their behavioral, emotional, and mental health needs and support their families with integrated behavioral health



services and a community-based system of care. CBHI recognizes the importance of a comprehensive, community-based system of care that is tailored to the individual needs of the child and family, as well as the significance of partnering with child and family serving state agencies, providers, and payers. Overall, CBHI's system of care underscores the importance of promoting sustainable practices that prioritize equitable access to healthcare resources, especially for vulnerable communities, on the journey towards achieving resilient, sustainable communities.

5.7.6 Infrastructure

MassWorks Infrastructure Program

The MassWorks Infrastructure Program offers a critical source of capital funds to municipalities and other eligible public entities, mainly for public infrastructure projects, such as increasing housing production and job creation, contributing to the long-term strength and sustainability of the Commonwealth. Administered by the Executive Office of Economic Development, the program seeks to help communities achieve success and stimulate economic development through direct and immediate job creation and supporting economic development activities in distressed areas.

The program's top priority is to focus on multi-family housing production in optimally located walkable, mixed-use districts that contribute to the creation of direct and immediate job opportunities or boost economic development in vulnerable or distressed regions. As the State invests in more funding requests, the program plays a key role in promoting infrastructure development across the Commonwealth.

The Infrastructure Investment Incentive Program (I-Cubed)

The Infrastructure Investment Incentive Program (I-Cubed) is a crucial component of Massachusetts' infrastructure development agenda that is designed to spur job growth and promote long-term economic prosperity. The program is an innovative public-private partnership that facilitates large, complex infrastructure projects in the state. I-Cubed finances significant new public infrastructure improvements that are required to support a major new private development. By utilizing the I-Cubed program, the state has been able to invest in large-scale infrastructure projects that can further expand economic growth and help increase the well-being of Massachusetts residents.

The State of Massachusetts recognizes the importance of effective coordination and alignment in achieving its broadband goals outlined in the 5-Year Action Plan. MBI intends to facilitate close communication between the teams responsible for both plans, ensuring shared objectives and overlapping aims are addressed efficiently. By utilizing a shared project dashboard, engaging stakeholders collectively, and aligning data gathering, the state aims to maximize the impact of its funding opportunities and empower local organizations to develop detailed plans to increase digital access. Furthermore, MBI is committed to supporting the broadband initiatives covering tribal areas and covered population, promoting respectful engagement, collaboration, and the alignment of deployment efforts to ensure the optimal utilization of available resources.

5.8 Technical Assistance

MBI acknowledges and appreciates NTIA's help in providing technical assistance and hopes they can continue to assist by offering guidance and informative webinars on the topics outlined in the BEAD NOFO. Topics that NTIA may want to consider include:

- Treatment of Multi-Dwelling Units and Overbuild infrastructure



- Fund distribution procedures
- Guidance on determining Extremely High Cost Per Locations
- Grant application development
- Guidance on cybersecurity
- Guidance on resiliency standards

Given the potential timing overlap between the implementation of the MBI's Gap Networks Grant Program and the BEAD program, NTIA assistance will be critical in facilitating coordination between the CPF and BEAD programs. Their assistance can aid MBI in identifying potential areas of overlap and optimal allocation of funds to maximize the impact of both programs. By working closely with NTIA, MBI is committed to developing strategies that promote successful implementation of the CPF and BEAD programs and ensuring that both programs achieve their intended goals and maximize their benefits to Massachusetts residents.

If there are additional areas that require NTIA support, MBI will not hesitate to seek guidance from NTIA.

5.9 Key Takeaways and Next Steps

In summary, MBI will focus on the following key areas in implementing the BEAD Program.

Integration of BEAD and Digital Equity Programs: The MBI plans to spearhead a highly participatory policymaking process over the coming years, which leverages strong alignment with other agencies and initiatives to complete the buildout of infrastructure for universal broadband access, while also creating insight, momentum, and impactful practical work to promote digital equity. While some BEAD program design decisions must be made early and then locked in, ongoing and growing digital equity planning and capacity building efforts can be used to continue to mobilize stakeholders and communities in a way that will also strengthen the BEAD program, helping to mobilize applicants, monitor project performance, and provide impactful and relevant uses of any surplus BEAD funds. The pursuit of digital equity will require and mobilize ongoing interagency coordination and engagement, so that the plans and activities of a wide variety of policymakers, program administrators, and frontline staff can be informed and shaped by the large and multifaceted digital equity mission of bringing 21st-century online flourishing within reach of everyone. This network of engaged stakeholder network will, in turn, help to ensure that BEAD-funded infrastructure is well utilized and helps the Commonwealth achieve its vision.

Coordinated Execution of BEAD and CPF: MBI will need to reconcile the slightly different goals and substantially different guidance of the CPF and BEAD programs in order to execute a highly coordinated, joint administration of the programs to use both funding sources cost-effectively in complementary ways, so as to identify and close the many small coverage gaps scattered across the state. To the extent possible, a careful sequencing whereby CPF funds are awarded and the areas they will cover are known before BEAD grant application windows open would help to prevent any collisions of CPF and BEAD projects. The feasibility of such sequencing depends on many factors, including the timing of NTIA's approval of Massachusetts' Initial Proposal and the speed with which MBI is able to launch, carry out and complete its CPF program. Alternatively, there are scenarios in which BEAD and CPF grant application windows are open simultaneously and MBI will work to harmonize the grant application processes to the extent feasible.

Continued Stakeholder Engagement: The robust stakeholder engagement process that MBI has launched will provide critical feedback and community input to MBI to further understand the community



needs and obstacles and help refine its implementation plan. For example, ongoing stakeholder engagement will also be critical to ensuring that broadband coverage maps, which are well known to be only imperfectly accurate, are continually scrutinized and steadily improved, so that no one falls victim to mapping inaccuracies that bar them from eligibility to get much-needed help from broadband deployment programs like CPF and BEAD. Through ongoing assessment of a variety of digital equity needs, MBI can keep communication channels open with the public to be alerted to the specific problem of non-availability or inadequate speed of internet connections due to the absence of appropriate infrastructure.

Long Term Commercial Sustainability: The fact that both CPF and BEAD only fund the capex costs of networks, while at the same time the ACP, which can cover ongoing costs by helping consumers pay their bills, currently lacks a sustainable funding source, adds a level of uncertainty to the broadband landscape. In light of this, MBI plans to require information about commercial sustainability in its BEAD application materials and may scrutinize this information for plausibility in cases of doubt. The MBI’s multifaceted digital equity campaign should help secure the commercial sustainability of BEAD networks by raising subscribership rates and the willingness and/or ability of customers to pay for service.

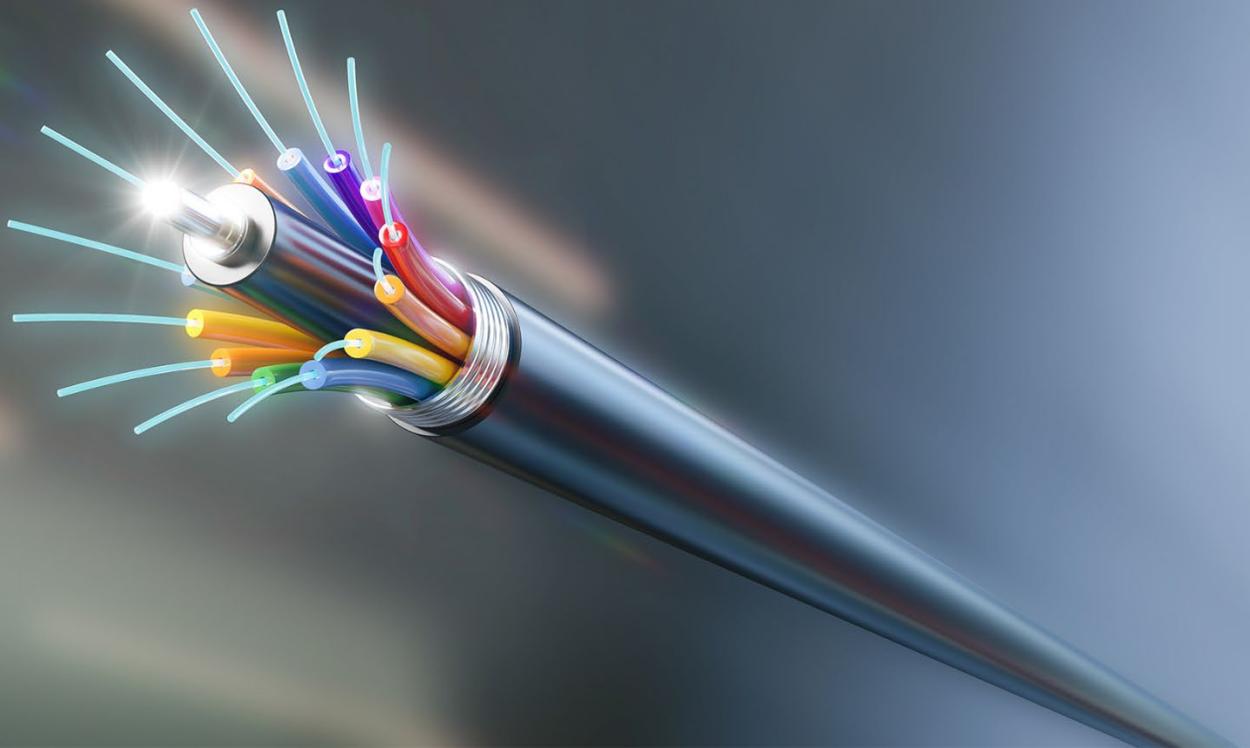
Workforce: Throughout this process, MBI’s activities will both create new demands on and contribute to the skills and opportunities of Massachusetts’ workforce. Based on preliminary data and analysis from NTIA, Massachusetts may have a lesser need than some states to look upstream and strengthen the workforce pipelines that supply the skills that the physical deployment of broadband infrastructure requires. Massachusetts’ broadband deployment needs are relatively small, and available workers in most of the needed occupations appear to be sufficient. These initial findings will be tested through further analysis and stakeholder engagement with a variety of industry, labor and education stakeholders. By contrast, promoting digital equity effectively and comprehensively at the grassroots level will require more dedicated workers and/or alter the job descriptions of many existing workers, especially in public-facing service roles that involve a need and/or provide an opportunity to teach digital skills to people who may have been slow to adopt and fallen behind. In turn, as digital equity efforts help digitally disadvantaged people to get online and upskill, Massachusetts can look forward to a more engaged, productive, and versatile workforce, fueling self-reliance, inclusion, innovation, development

6 Conclusion

MBI's Five-Year Action Plan stands as a powerful testament to the commitment of the Commonwealth of Massachusetts in ensuring equitable and comprehensive broadband access for all residents. Building on the existing efforts, initiatives, and programs, this plan envisions a digitally connected future where every citizen can thrive.

MBI recognizes the importance of collaboration and by engaging a diverse group of stakeholders, including government bodies, private sector partners, community organizations, and individuals, MBI will ensure a holistic strategy for broadband deployment. This approach will aim at reaching underserved and unserved areas, ensuring connectivity to all, regardless of location. In addition, by leveraging existing resources and fostering public-private partnerships, MBI aims to dismantle barriers and cultivate digital skills.

MBI underscores its commitment to creating resilient, prosperous, and connected communities. By embracing the lessons and successes MBI has experienced to date, the Five-Year Action Plan paints a picture of a future where reliable high-speed internet becomes a basic utility, enabling every resident to not only function but thrive in the digital age. This roadmap serves as a guide for the Commonwealth towards a digitally equitable future, where opportunities are universally accessible, barriers are dismantled, and the transformative potential of connectivity is harnessed for the betterment of all.



7 Appendices

7.1 Appendix A: Broadband Providers

Internet Service Providers are essential to broadband expansion. While existing grant recipients will be identified in the asset section, it is important to identify providers that represent those who currently provide broadband-related services across Massachusetts.

The ISPs listed below are residential providers and included by technology for all fixed broadband service providers, according to the beta version of the [Massachusetts Broadband Map](#).

7.1.1 Cable Providers

Table 20: List of Cable Providers

Cable Broadband Providers
Charter Communications
Comcast Cable Communications, LLC
Cox Communications, Inc.
Norwood Light Broadband
RCN BecoCom LLC, dba Astound Broadband
Shrewsbury Electric & Cable Operations (SELCO)

7.1.2 Fiber Providers

Table 21: List of Fiber Providers

Fiber Broadband Providers
Comcast Cable Communications, LLC
Concord Light Broadband
Fiber Connect LLC
Greenfield Community Energy & Technology (GCET)
Hub66, Inc
LeverettNet, dba South Hadley Electric Light Department (SHELD)
Matrix Connected Fiber
Mount Washington Broadband Network, dba Crocker Communications
RCN BecoCom LLC, dba Astound Broadband
Redburn Infrastructure LLC, dba Massivemesh Networks
Richmond Telephone Company



Fiber Broadband Providers
Shrewsbury Electric & Cable Operations (SELCO)
South Hadley Electric Light Department (SHELD), dba Fiberspring
Starry, Inc.
Sterling Municipal Light Department
Taunton Municipal Lighting Plant
ShutesburyNET, dba South Hadley Electric Light Department (SHELD)
Verizon Communications Inc., dba Verizon New England Inc.
Westfield Gas & Electric, dba Whip City Fiber

7.1.3 Fixed Wireless Providers

Table 22: List of Fixed Wireless Providers

Fixed Wireless Broadband Providers
Fitchburg Fiber LLC
CRC Communications, LLC, dba GoNetspeed, dba WiValley
Greenfield Community Energy & Technology (GCET)
Hilltown Networks
Hub66, Inc
Mid-Hudson Data Corp.
MvWiFi LLC, dba Chappy WISP
netBlazr Inc.
Starry, Inc.
T-Mobile USA, Inc.
Verizon Communications Inc., dba Verizon New England Inc.
Warwick Broadband Service

7.1.4 DSL Providers

Table 23: List of DSL Providers

DSL Broadband Providers
Granby Telephone, LLC dba GoNetspeed



7.2 Appendix B: BEAD Workforce Planning

The BEAD Program has several workforce requirements that eligible entities must meet. These requirements ensure that the BEAD Program benefits all Americans, including those from historically underserved communities.

In implementing the BEAD program, MBI will adhere, and/or monitor subgrantee adherence, to the following workforce requirements of the NOFO:

- **Compliance with federal labor and employment laws.** MBI will comply with all applicable federal labor and employment laws, including equal employment opportunity, wage and hour, and occupational safety and health.
- **Skilled workforce activities.** MBI will identify workforce development activities to ensure that a skilled workforce is available to support the deployment of broadband infrastructure. These activities will include training programs, apprenticeships, and job fairs.
- **Equitable training and workforce development activities.** MBI will ensure that its workforce development activities are equitable and accessible to all Americans, including those from historically underserved communities. This may include providing transportation assistance, childcare, and other support to help workers participate in training programs.
- **Safe workplaces.** MBI will ensure that their workplaces are safe for all workers. This includes providing training on safety protocols, using safe equipment, and maintaining a safe work environment.

As we look forward to MBI's BEAD program implementation as a comprehensive, meticulously planned journey to bolster broadband infrastructure across the Commonwealth, the workforce planning work within the broader BEAD implementation work can be identified as part of each of four distinct yet interlinked phases:

- **Planning:** The journey starts with thorough planning and developing a comprehensive broadband plan. This plan pinpoints unserved and underserved areas, prioritizes deployment based on factors such as population density, economic viability, etc., and outlines how the BEAD funds will be strategically allocated and used. At this stage, as part of the needs assessment and stakeholder engagement that MBI will conduct, MBI will consider supporting robust workforce development programs, exploring partnerships as needed to ensure that an adequate workforce will be available to carry out the broadband deployment activities that the BEAD program requires to achieve its universal broadband access goal. The state's plan will be communicated to NTIA for approval in the Initial Proposal.
- **Deployment:** With the Initial Proposal approved, the grantmaking process leading to actual deployment begins. This involves making grants to qualified ISPs in return for commitments to build or upgrade broadband infrastructure, primarily focusing on reaching the unserved and underserved areas identified in the planning phase. ISPs need to foresee, when preparing and submitting deployment proposals for grant funding, that a multi-skilled workforce will be available to execute the deployment. To the extent that existing or foreseeable gaps in the available workforce are identified through industry engagement, articulated into the Initial Proposal, and targeted to be addressed by new or existing thorough training program to equip workers with the necessary technical skills and safety practices, some of these training activities will be launched and conducted at this time. MBI will strive



to track any training activities catalyzed as part of the BEAD implementation and update the NTIA about them in the Final Proposal that is expected to be delivered in early-to-mid 2025.

- **Adoption:** As deployment activities get completed in the late 2020s, some jobs created by the deployment investments themselves may phase out or need to pivot into operational and maintenance work. At the same time, as MBI's focus continues to shift to adoption, a different workforce component, with skills and activities oriented towards helping people get online and acquire digital skills, will become increasingly relevant not only to the larger impact of the BEAD program and the closure of the digital divide, but also more narrowly to securing universal broadband access on a lasting basis. To foster a digital inclusion workforce of people in a wide variety of organizations and occupations who, in various ways, make broadband more affordable, accessible, and beneficial to all Bay Staters, particularly those from historically underserved communities, is a task primarily for the State Digital Equity Plan (SDEP) rather than the BEAD program to lead on (although there is a possibility that some BEAD funds not needed for achieving universal broadband access may increase the budget expendable to implement the SDEP). MBI will maintain visibility to these workers and help BEAD subgrantees to leverage them to ensure that Digital Equity Act covered populations, as well as others, are aware of and can access available broadband services, especially the new broadband services that will become available in currently unserved and underserved areas thanks to BEAD investments.
- **Monitoring and Evaluation:** The final phase of the lifecycle involves tracking the progress of the BEAD Program, ensuring that it is meeting its goals, and continually improving the process based on collected data, stakeholder feedback, and evolving industry trends. Here again, because we expect MBI's capacity to scrutinize every bit of physical infrastructure built to be limited, and even more because some aspects of service availability are necessarily more visible to customers than to any public official, MBI may rely on a multi-pronged approach that includes digital inclusion workers identified and trained as part of the implementation of the SDEP, and embedded in a wide variety of organizations with an organic grassroots footprint, to help assess the completeness of the BEAD-funded broadband deployments, and hold ISPs accountable for the fulfillment of the obligations they have accepted as BEAD subgrantees.

Focus on the planning phase, MBI aims to create a collaborative platform engaging partners from diverse domains, including workforce development, education, and economic development. Activities conducted during this phase, with an emphasis on those related to workforce, will include the following:

Stakeholder Identification and Engagement

MBI understands the vital role that diverse stakeholders play in the planning and execution of the BEAD program. Therefore, our first step is to identify a core set of business stakeholders that will inform MBI's plans and activities over time, which may include leaders from the broadband industry, representatives from the public workforce system, key decision-makers from relevant government agencies, and representatives from Minority and Women-owned Business Enterprises (MWBEs). Incorporating perspectives from MWBEs is crucial for diversity but also for gaining unique insights and broadening the program's economic impact. MBI acknowledges the unique insights MWBEs can provide and their vital role in our procurement processes, reinforcing our commitment to diversity and broadening the program's economic impact. Our goal is to incorporate a wide range of perspectives and expertise to drive the success of the BEAD program.

These industry, business, and MWBE stakeholders should be ready to play a critical role in helping MBI to identify workforce gaps that may need to be addressed in order to enable the BEAD program and its



subgrantee ISPs to achieve the universal broadband access goal. While we do not anticipate finding large workforce gaps, in view of the analysis that NTIA has done, it will be important to check this finding against industry experience and solicit input on whether there are critical workforce gaps in Massachusetts that have been missed so far.

Facilitation of Stakeholder Collaboration:

After identification, MBI will facilitate a collaborative environment where these stakeholders can convene. Meetings, workshops, and communication channels will be established to encourage a steady flow of information, ideas, and feedback among the group. These sessions will allow stakeholders to share their experiences, insights, and expectations, thereby helping MBI align its strategic planning with the real-time needs of the business community and the broadband sector. Specific policies will be implemented to actively include MWBEs, particularly in procurement opportunities, enhancing their participation and contribution to shaping the BEAD program. Their unique challenges and experiences, past, present and anticipated, especially with respect to workforce availability and qualifications, will inform the program's strategic planning and foster inclusivity and equity.

Labor Market Analysis and Workforce Development:

Understanding the business landscape within Massachusetts that aligns with the BEAD lifecycle is a critical element for MBI. Our comprehensive evaluation process will provide insights into the businesses' structure and distribution, aiding us in creating a robust workforce ecosystem that supports the BEAD program. Furthermore, the insights and guidance from these stakeholders will directly inform MBI's workforce development strategies. Understanding the skills required by businesses with a special focus on MWBE suppliers will allow MBI to design training programs, apprenticeships, and other workforce initiatives that are relevant and responsive. The stakeholder group will be instrumental in identifying emerging skills needs, validating training curricula, and promoting the programs within their networks, thereby fostering a highly skilled workforce prepared for the future of work. To the extent that gaps are identified, MBI's approaches to addressing these gaps may include the following:

- **Identification of Key Occupations and Skills:** MBI may initiate a needs assessment process, with due rigor and depth, to identify key roles and skills essential for the successful deployment of BEAD. This will be based on extensive data analysis, industry trend reviews, and consultation with subject matter experts. The identified roles will be categorized into specific BEAD occupation groups for a more structured approach to training program development.
- **Regional Analysis by NAICS Code:** MBI may delve into a regional analysis of businesses, employing the North American Industry Classification System (NAICS). This system will enable us to identify key businesses integral to the BEAD deployment within specific sectors such as telecommunications, construction, IT services, and more. This classification extends beyond identification; it will help us understand the business size, providing insights into their operational capacity and scalability potential. The regional analysis will also involve a geographic component, enabling us to map out businesses based on their location. This geospatial information will prove invaluable in logistical planning, resource allocation, and overall execution of the BEAD program. Particular attention may need to be paid to the following industries:
 - **Fiber Contractors:** Businesses in this sector play a key role in constructing and upgrading the physical infrastructure required for broadband expansion. They are responsible for laying down the fiber-optic cables that form the network's backbone.



- **Managed Service Providers (MSPs):** MSPs are vital for overseeing the day-to-day operations of the broadband network, offering services like network management, system administration, and security.
- **Low Voltage Cabling Installers:** These professionals specialize in installing and maintaining the cabling required for data and voice communication systems, including broadband internet.

We will identify key businesses within these sectors, evaluate their size and operational capacity, and geographically map them to support logistical planning and resource allocation.

- **Location Quotient Analysis:** Another tool for gauging the concentration of these industries within Massachusetts compared to other New England states, which may be utilized inasmuch as serious workforce gaps are indicated by industry is location quotient analysis. The location quotient offers insight into the relative concentration of an industry in a region compared to a larger geographic area. In this case, it will help us understand the density and significance of our key sectors in Massachusetts. This analysis will highlight sectors of strategic importance to the BEAD deployment and aid in creating targeted strategies for these sectors.
- **Assessing Businesses as Local vs. Regional Serving:** A crucial factor to bear in mind will be distinguishing businesses based on their operational scope - whether they primarily serve local (within Massachusetts) or regional (outside Massachusetts and vice versa) customers. This classification will help us understand the reach and impact of these businesses, enabling us to engage them effectively in the BEAD program based on their operational span. There is a possibility that Massachusetts may have an adequate resident workforce for broadband deployment activities, and yet nonetheless encounter workforce difficulties because the BEAD program generates escalated demand for broadband deployment workers in neighboring states, causing Massachusetts' workers to commute or relocate elsewhere. MBI does not anticipate this problem with high likelihood, but it must be borne in mind as a risk factor.
- **Minority and Women-Owned Business Enterprises (MWBE) Assessment:** MBI understands the imperative of promoting diversity and inclusion within all operations, particularly within our supplier and vendor base. We will incorporate an MWBE assessment in our evaluation process as part of this commitment. This will help us gauge the representation of MWBEs within the relevant sectors, devise effective strategies to engage them and ensure these businesses are well-positioned and prepared to contribute to the BEAD program.

This strong arsenal of business evaluation options puts MBI in a strong position to effectively engage with a diverse range of businesses throughout the BEAD lifecycle on workforce issues, with a view to fostering inclusivity and facilitating the creation of robust broadband infrastructure across Massachusetts.

Vision for a Skilled Workforce

MBI recognizes well-trained professionals' essential role in effectively deploying the BEAD program. Therefore, we will seek to discern the adequacy of existing training programs and be alert for possible needs to improve or expand them. If such needs are indicated, MBI will work in partnership with various stakeholders to facilitate the development and delivery of training that meets the telecommunications industry's broadband deployment needs. Understanding that our workforce is a critical input to efficient and effective deployment of BEAD, these training programs will be structured to support the technical and operational requirements of key occupations in the telecommunications sector. Our efforts will focus on



enhancing existing skills and developing new competencies, to the degree and in the manner that the latest industry trends, practices and skills gaps indicate.

In parallel to any new workforce development activities, inputs from these business stakeholders will also help ensure alignment between the educational system and industry needs. Such alignment may be fostered through collaborations with unions, worker organizations, community colleges, public school districts, supportive services providers, universities, and vocational training providers to infuse industry-relevant curricula and create robust talent pipelines. The stakeholder group will provide valuable input in designing these programs and also facilitate internships, industry visits, and other experiential learning opportunities that give students a real-world understanding of the industry. Our approach includes the following focal points:

- **Assessment of Existing Training Programs:** With respect to any workforce gaps identified by industry, MBI will review existing training programs related to the BEAD deployment phases and look for opportunities to advise and assist in modification, recruitment, or expansion. Programs of interest include technical training programs for fiber optics installation, network management, broadband service provision, and quality assurance. We will also examine broader courses focusing on project management, stakeholder engagement, and compliance with regulatory requirements.
- **State of Training in Massachusetts:** Relatedly, MBI may map out the training landscape in Massachusetts, identifying institutions that offer relevant training, the nature of the training, and the capacity of these institutions. We will also consider the geographical distribution of training facilities and the barriers to accessing these facilities.
- **Gap Analysis and Curriculum Development:** MBI workforce analysis may seek to identify gaps between existing training provisions and the skillsets required for the BEAD deployment phases.
- **Partnerships for Training Development and Delivery:** Any efforts that MBI catalyzes to address broadband deployment workforce gaps will depend heavily on strong relationships with various partner stakeholders such as the following:
 - **Educational Institutions:** We may partner with universities, community colleges, and vocational schools to develop and deliver relevant training programs.
 - **State Secretariats of Labor and Education:** Collaboration with these departments will help align our training programs with state policies, standards, and funding opportunities.
 - **Industry Associations:** Associations like the Fiber Broadband Association, Wireless Infrastructure Association, and others can provide valuable insights, resources, and partnership opportunities.
 - **Local Workforce Development Boards:** These boards can provide insights into local labor market conditions and help align training initiatives with workforce needs.
 - **Registered Apprenticeships and Pre-Apprenticeships:** MBI will leverage Registered Apprenticeships and Pre-Apprenticeships in partnership with community colleges, labor unions, and industry stakeholders to provide hands-on training for key roles. These apprenticeships will offer learning opportunities from industry, providing exposure to real-world scenarios and challenges.
 - **Inclusivity in Training:** We will also pay attention to inclusivity, ensuring that training programs are accessible to diverse groups, including minorities, women, and underserved communities.



7.3 Appendix C: Digital Equity Working Group Members¹¹

Name	Title	Entity
Susan Adams	Vice President of Health Informatics team	Massachusetts League of Community Health Centers
Carol Allman-Morton	Executive Director	Berkshire Community College
Jay Ash	CEO	Mass Competitive Partnership
Virginia Benzan	Director of Racial Justice Advocacy	Mass Law Reform Institute
Tricia Canavan	Executive Director	The Tech Foundry
Emilio Dorcely	CEO	Urban Edge
Linda Dunlavy	Executive Director	Franklin Regional Council of Governments
Ben Forman	Director of Research	MassINC
James Fuccione	Senior Director	Mass Healthy Aging Collaborative
Santiago Garces	Chief Information Officer	City of Boston
Tom Golden	City Manager	City of Lowell
Kristen Gowin	Executive Manager	Electrical Contractors Association of Greater Boston
Denise Jordan	Executive Director	Springfield Housing Authority
James Lonergan	Director	Massachusetts Board of Library Commissioners
Joseph Lopes	Executive Director	Greater New Bedford Workforce Investment Board
Ron Marlow	Director of Workforce Development and Alternative Education	Acton for Boston Community Development

¹¹ <https://broadband.masstech.org/digital-equity-programs/digital-equity-working-group>



Name	Title	Entity
Paul Matthews	Executive Director	Worcester Regional Economic Bureau
Derek Mitchell	Co-Founder and President	LEADS
Dan Noyes	CEO	Tech Goes Home
David Podell	President	MassBay Community College
Pam Reeve	Chair	The Women's Edge
Frank Robinson	Vice President of Public Health and Community Relations	Baystate Health/Western MA Alliance for Digital Equity
Leo Sarkissian	Executive Director	The Arc of Massachusetts
Scott Scharffenberg	Executive Director	Roca Inc.
Kim Shellenberger	Vice President, Integrated Care and Innovation	Vinfen
Q.J. Shi	Director	Asian Business Empowerment Council
Steve Smith	Executive Director	Cape Cod Technology Council
Victoria Torres	Manager of Advocacy & Organizing	Latinos for Education
Kyle Toto	Public Affairs Specialist	VA Boston Healthcare System
David Weeden	Deputy THPO/Tribal Councilman	Mashpee Wapanoag Tribal Council
Tim Wilkerson	President	New England Cable & Telecommunications Association (NECTA)

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