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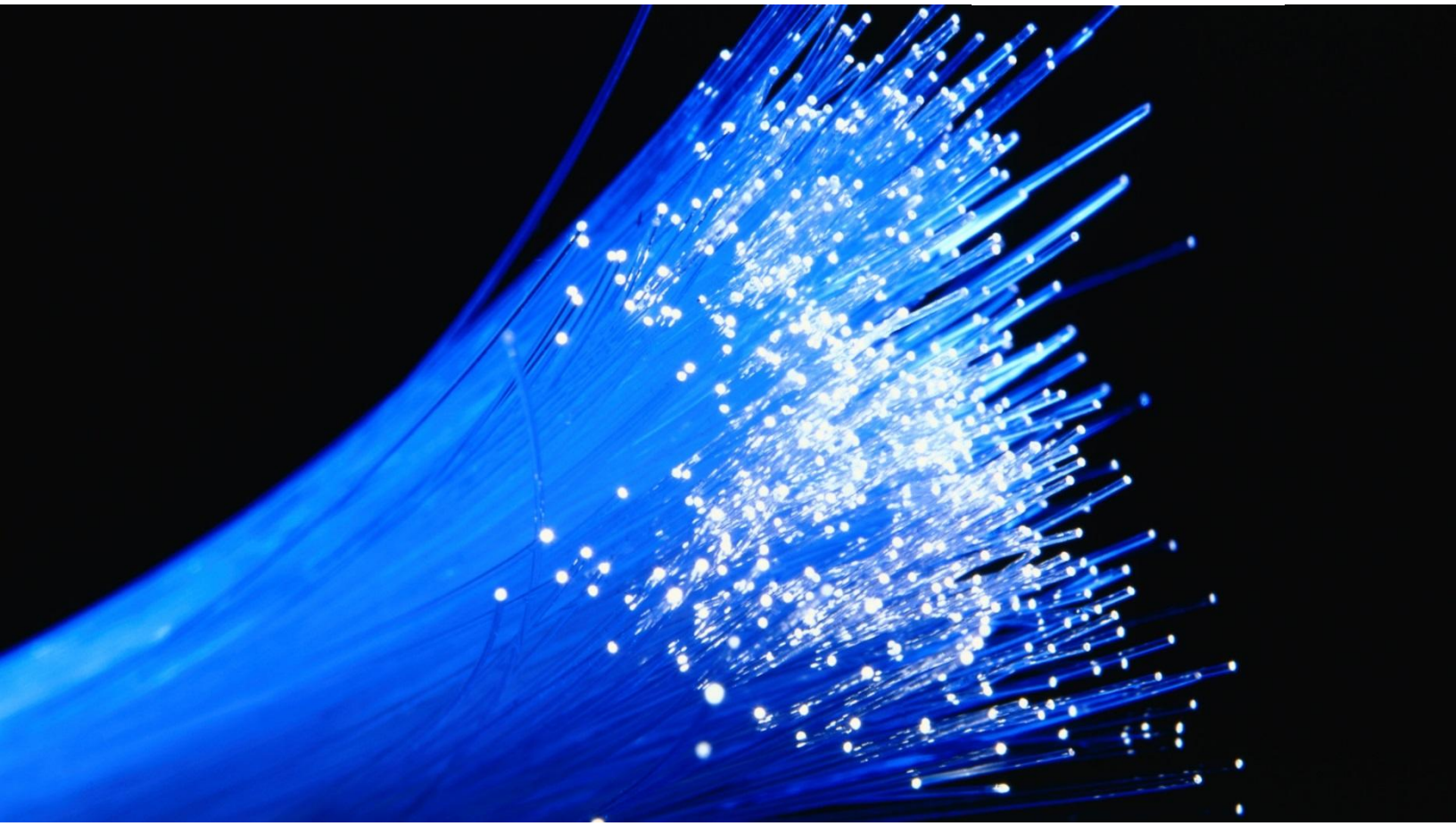

Municipal Digital Equity Plan

Prepared for the City of Boston

June 2025

Columbia Telecommunications Corporation

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1 Introduction and background

1.1 Boston's leadership in promoting digital equity and opportunity

The City of Boston has long been a leader in promoting digital equity and opportunity by addressing gaps in high-speed broadband infrastructure and by funding programs and staffing to address Boston residents' challenges in affording broadband, obtaining computing devices, and improving skills.

- During the Covid-19 pandemic, the City used the federal Emergency Connectivity Fund (ECF)[1] to invest $10 million in Chromebooks, wireless hotspots, and vouchers for wired broadband subscriptions (i.e., Comcast's low-cost program, called Internet Essentials) through the Boston Public Schools, and another $2.2 million for Chromebooks and wireless hotspots to Boston Housing Authority residents.
- Earlier, in 2018, the City launched a Digital Equity Fund to provide grants to a variety of local community groups and nonprofits, and late last year leveraged state funding to triple grants to a total of $1.4 million for 36 programs now underway.
- City facilitation also helped Verizon spur the buildout of its Fios fiber-to-the-premises (FTTP) network, ending a cable monopoly in wide areas (but not yet all) of the city.
- The City creating the role of Digital Equity Advocate in 2015 to support entities including the Boston Housing Authority, Boston Public Schools, Boston Age Strong Commission, the Boston Public Health Commission, and the Mayor's Office for Immigrant Advancement (MOIA).
- Even before that, the City funded Tech Goes Home (TGH), a nonprofit that provides training and free laptops to low-income residents, including recent immigrants. The City provided $500,000 annually to TGH starting in 2012, increased funding to $1 million annually in 2016, and awarded an additional $2 million in 2022 with help from federal funds. Over the past three years, TGH reports that 11,561 Bostonians have graduated from a program and 8,186 received devices.

Much of this was documented in the City's 2022 Digital Equity Assessment.[2]

The City faces new funding challenges. The City had been using funding from its public, educational, and governmental access (PEG) channels for the TGH grants. But PEG funds are dwindling. For this and other reasons, the City is no longer able to provide lump sum PEG funding to digital inclusion organizations.[3] But the City has found new ways to work with TGH. The organization was recently

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[1] "Emergency Connectivity Fund, FCC, https://www.fcc.gov/emergency-connectivity-fund

[2] "Boston Digital Equity Assessment," City of Boston, https://www.boston.gov/sites/default/files/file/2022/10/Boston-Digital%20Equity-Assessment-20221002.pdf.

[3] Such funds are dedicated to specific cable-related purposes. And cable franchise revenues have dropped by more than 30 percent over the past five years, straining the fund's ability to support even core PEG operations. Finally, legal guidance now requires that all grant distributions follow a competitive process.

awarded $250,000 from the Neighborhood Jobs Trust, a trust managed by the City that receives funds from large-scale construction projects.[4]

And now federal funding is drying up. Under the Digital Equity Act, Massachusetts was allocated $14.1 million in Capacity Grant funding,[5] which the Massachusetts Broadband Institute (MBI) planned to use to support existing and future digital equity programs across the state. The City of Boston had planned to apply for $1 million in funding from this source through an MBI program called Launchpad.[6] But the Trump administration declared in May that it would not fund these allocations.

1.2 Documenting current needs and opportunities

The City commissioned CTC Technology & Energy (CTC), Health Resources in Action (HRiA), and MassINC Polling Group (MPG) to document remaining gaps in high-speed broadband infrastructure and in Boston residents' challenges involving broadband affordability, computing devices, and skills—and to develop strategies to bridge these gaps.

This project was funded by MBI at the MassTech Collaborative under its Municipal Digital Equity Planning Program with State and Local Fiscal Recovery Funds (SLFRF) provided under the American Rescue Plan Act (ARPA).

This report presents findings (Section 2) and recommendations (Section 3) informed by project tasks performed over the past year, including:

- Meeting with leaders of key City departments and the BHA to document their efforts and their perspectives on future needs (Section 4).
- Analyzing the availability of broadband service, level of competition, and pricing in Boston, including the availability of low-cost programs for eligible households (Section 5).
- Researching the progress of Verizon's fiber expansion and other broadband buildouts at the BHA' 52 developments (Section 5 and Appendix A).
- Developing wiring standards and recommendations to inform the City about best practices in providing broadband solutions in public and affordable housing (Appendix B).
- Examining enrollment in the now-defunct Affordable Connectivity Program (ACP), which offered a $30 monthly subsidy on broadband service for low-income households, in order to estimate the need for future program enrollment support (Section 5.4).
- Conducting a residential digital equity survey to develop data on broadband utilization, affordability, skills, device access, and related topics (conducted by MPG; Section 6).

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[4] "Neighborhood Jobs Trust," City of Boston, https://www.boston.gov/departments/workforce-development/neighborhood-jobs-trust#how-njt-works.
[5] "Massachusetts Receives $14.1 Million in Federal Funding to Expand Digital Access," Mass.gov, https://www.mass.gov/news/massachusetts-receives-141-million-in-federal-funding-to-expand-digital-access.
[6] "Launchpad Program," MBI, https://broadband.masstech.org/launchpad-program.

- Conducting interviews and focus groups with diverse groups of residents and community organization stakeholders to further illuminate gaps in affordability, skills, and devices (conducted by HRiA; Section 7).
- Reviewing the City's Digital Equity Fund (DEF) program and its grant awards (Section 8).
- Spot-checking in-home residential broadband speeds at a small sample of Boston residences receiving services from Comcast, Verizon, and RCN/Astound to develop perspective on why speeds can vary (Appendix E).

2 Key findings

Following are key findings of this report. Recommended strategies are provided in Section 3.

2.1 Fiber broadband availability has expanded significantly in Boston, but additional efforts are needed in some Boston Housing Authority developments and other apartment complexes

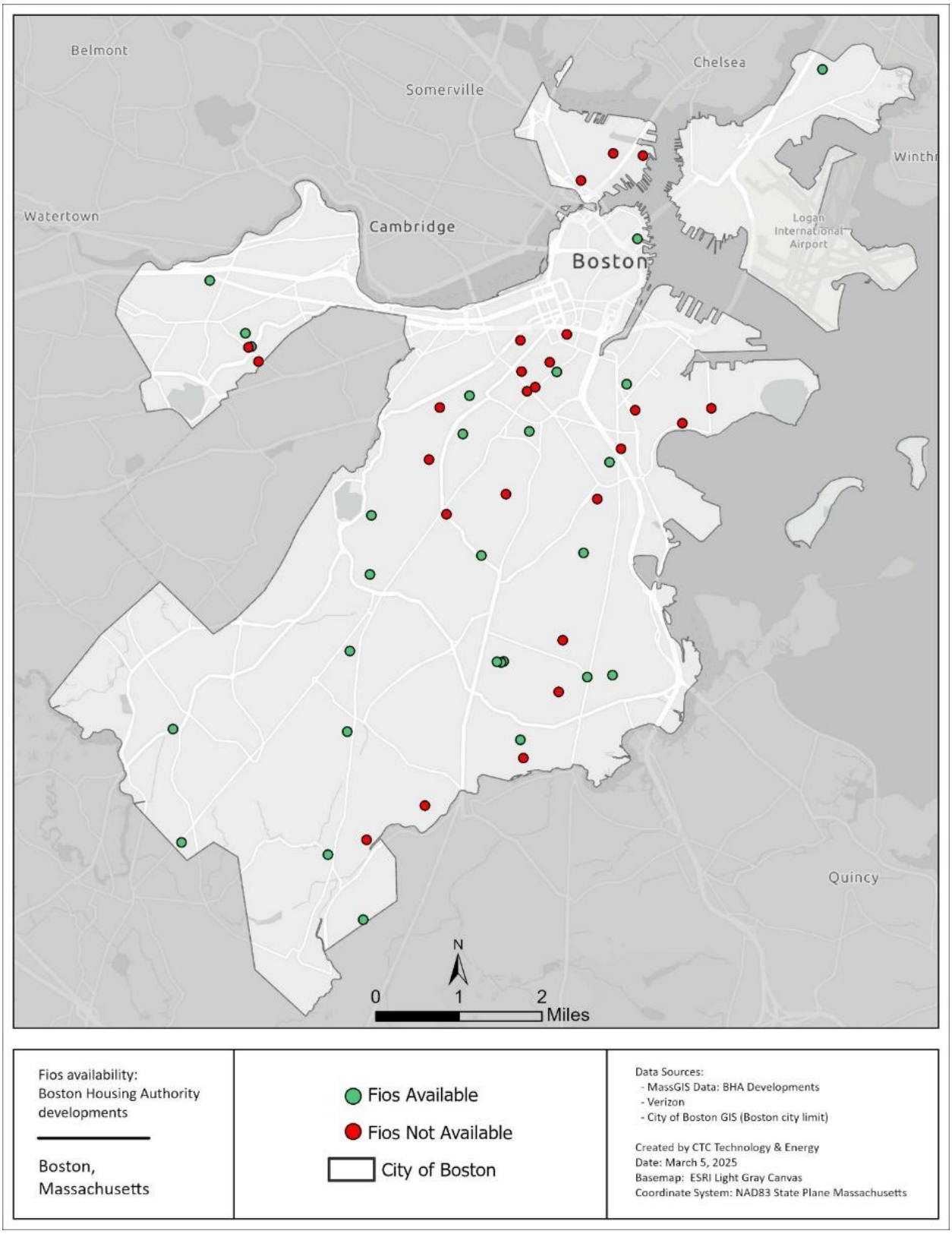
Boston has recently seen the advance of Verizon's Fios fiber-to-the-premises (FTTP) service, making best-in-class broadband infrastructure available to tens of thousands of households. The BHA and Verizon reported as part of this engagement that 27 of 52 BHA developments are now connected to fiber services from Verizon.[7] But at other sites, cable service is residents' only option for wired service. Citywide, Verizon is now able to provide fiber service to 230,350 (63 percent) of the City's nearly 364,000 housing units. Other providers provide some fiber coverage as well; 17,871 housing units by Astound, 5,522 by Starry (which also provides fixed wireless service) and 1,576 by Comcast.

Due to apartments (including many in the BHA) being for the most part the housing types not receiving service, Boston's gaps in fiber broadband infrastructure disproportionately affect low-income households. As one illustration of this issue, Figure 1 (below) shows the location of BHA sites with and without Verizon Fios service. The City's Innovation & Technology Cabinet is seeking to bring fiber infrastructure to more BHA sites. A list of these sites is provided in Appendix A.

Wiring standards developed as part of this project (see Appendix C) can serve as a resource for such efforts as the City, the BHA, and MBI work on these challenges. MBI's Residential Retrofit Program and a Metropolitan Area Planning Commission (MAPC) program, which will provide free Wi-Fi to HABC residents, will also contribute to the digital equity solution at several of these sites. But fully closing the significant fiber gaps will require engineering and procurement initiatives that would benefit from the development of a comprehensive City and BHA strategy as outlined in Appendix A.

[7] Verizon cites lack of permission from private apartment building owners and, in BHA buildings, construction obstacles such as asbestos in basements.

Figure 1: Overview of Verizon Fios fiber broadband availability at BHA sites



2.2 An estimated 78,000 Boston residential units—including many BHA buildings—only have access to one wireline provider, leaving many low-income families without a choice of providers

Comcast's near-ubiquitous cable service in Boston means all residential units have at least one wired service provider. The presence of a second wired service offerings—which creates an environment for better service offerings and speeds, thanks to competition—are available to a growing number of residents, including in areas where Verizon has built its Fios fiber and the 41 percent of Boston residential units that Astound reports it serves, as well as the small numbers of units getting fiber service from Starry. However, taking all providers into account, approximately 78,000 (21.5 percent) of residential units in Boston still have only one wireline provider. (Section 5 describes the broadband service landscape in Boston.)

Licensed fixed wireless services—from the mobile companies Verizon and T-Mobile (whose services are both called 5G Home Internet) or the fixed wireless provider Starry—are available to many of these residential units. But fixed wireless services cannot provide reliable coverage to all units, and service from mobile companies is subject to throttling during times of congestion.

At BHA buildings, some of the units lacking Fios can get residential broadband services from fixed wireless providers—but such coverage can vary by apartment location and the service is subject to throttling during tines of high mobile network demand. This analysis shows that even with multiple providers operating in Boston, many apartment residents lack competitive broadband service options and would benefit from public and private efforts to close infrastructure gaps.

2.3 The end of the FCC's Affordable Connectivity Program (ACP) left nearly 56,000 Boston households without a monthly service subsidy

ISPs in Boston all participated in the ACP, either directly or through an affiliate. The ACP provided a $30 monthly subsidy for broadband service for eligible low-income households. When the program ended in February 2024, 55,922 households in Boston were enrolled, representing 39 percent of the estimated 142,400 eligible households (see Table 1 below).

This percentage was higher than the statewide figure of 31 percent, reflecting successful efforts by the City and others to boost awareness and participation. Yet 55,922 households who once got this benefit no longer have it, and many more would qualify if it were available.[8]

Moreover, in MPG's residential survey, one in four (24 percent of) Boston households said they believe their home internet is unaffordable, and one out of three respondents on government assistance (32 percent) or living in public housing (33 percent) reported that their home internet subscription was not good enough to meet household needs or that they do not have home internet

[8] Estimates are based on 2022 American Community Survey reported data on household income, food stamp recipiency, Medicaid recipiency, supplemental security income, and public assistance income.

at all. These challenges have spurred City and BHA efforts to explore new ways to provide free or low-cost access to broadband.

Table 1: Affordable Connectivity Program enrollment and eligibility in Boston at program's end[9]

	Eligible households enrolled	Enrolled households	Eligible households	Unenrolled eligible households
Boston	39%	55,922	142,400	86,478
Massachusetts	31%	358,383	1,156,300	797,917
United States	40%	22,190,763	55,179,000	32,988,237

2.4 The City and BHA's efforts have grown substantially to meet digital equity challenges

With significant help from MBI, the City of Boston and the BHA have stepped up efforts to meet these challenges. Funding to nonprofits through the City's Digital Equity Fund have grown significantly, programmatic efforts across City departments have expanded, and in the past two years the BHA has made new hires and launched programs.

2.4.1 The City of Boston's Digital Equity Fund has grown significantly in recent years and now supports 36 entities, but future funding is uncertain

The City's Digital Equity Fund (DEF) provides support to local entities pursuing social, educational, and economic solutions to gaps in digital equity across Boston. The DEF launched in October 2017, awarding one organization $35,000 to support digital equity programming, and has expanded its awards to serve 36 local programs with total funding of $1.4 million in fiscal year 2024. (See Section 9 and Appendix C for more details on DEF awards.)

However, funding is now in doubt, because the $1.4 million was provided by a one-shot MBI grant (digital navigation work at $768,000, telehealth programming at $500,000, and device refurbishment work at $150,000). Funding for these programs will run out at the end of 2026—but needs will continue, as survey data generated by MPG and stakeholders interviewed by CTC and HRiA make clear.

2.4.2 The BHA, with support from the City, has ramped up its digital equity programming for its residents

The BHA hired a Senior Advisor for Digital Equity in 2023 and has subsequently hired two digital equity coordinators and six digital navigators. These staff members provide digital equity workshops, digital literacy computer classes (which have taken place at 10 BHA locations and provide a free Chromebook to its graduates), and tech drop-in sessions at 26 housing developments across the City. Since 2023, more than 250 housing authority residents have engaged in these programs.

[9] "ACP Enrollment and Claims Tracker," USAC, data as of June, 2024, https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/.

The BHA has also reactivated computer labs at two BHA public housing sites: Ruth Barkley and West Broadway. As part of this effort, 100 Chromebooks have been distributed to BHA residents, and 100 additional Chromebooks are being distributed. See Section 4.1 for more details.

The high demand for these programs demonstrates the need to increase these efforts.

2.4.3 Office of Workforce Development

The City of Boston's Office of Workforce Development (OWD) works to support the economic success and upward mobility of residents through job training and employment aid. In its effort to address the City's digital divide, OWD launched its Digital Literacy Initiative called DigLit, which focuses on closing digital skill and technology use gaps among individuals participating in adult education and workforce-based programs.

Building on its success to date, DigLit recently received a $1 million Community Project Funding grant[10] to expand its reach. With this funding, OWD has awarded $30,000 grants to 20 community-based organizations promoting workforce development. Some of these programs will help integrate digital literacy training into job readiness and occupational training programming. See Section 4.2 for more details.

2.4.4 The Boston Public Library is working to address Boston's digital divide with wide-ranging device lending and training programs in the face of growing demand

The Boston Public Library (BPL) is working to address Boston's digital divide with wide-ranging device lending and training programs in the face of growing demand. BPL offers several programs to address gaps in internet access and broadband affordability. As of March 2025, the BPL offered 150 hotspots and 53 Chromebook Home Connectivity Kits for short-term loan, long-term Chromebook and Wi-Fi router lending, digital skills and literacy classes, workshops, information sessions, one-on-one technology assistance services, and free Wi-Fi outside 14 of its 25 branches.

There are long waitlists for BPL's loaner devices. This high demand points indirectly to the need for increased availability of low-cost residential broadband, which will better serve the needs of residents while also easing pressure on lending programs. See Section 4.3 and its subsections for more details.

2.4.5 Boston Public Schools

The Boston Public Schools (BPS) serve more than 54,000 students in 125 schools[11] and has played a crucial role in keeping them connected through its 1:1 Chromebook program and hotspot program for student households without internet access. Additionally, BPS has an Office of Instructional and Information Technology (BPSTechnology), which focuses on: maintaining, upgrading, and expanding BPS internet infrastructure; ensuring all devices are equipped with appropriate computer applications and cloud systems; management of a BPS Help Desk and in-school technician support; digital skills support to students, teachers, and families through its digital learning program; and

[10] FY23 Community Project Funding - Ayanna Pressley

[11] "Data and Reports," Boston Public Schools, https://www.bostonpublicschools.org/about-bps/data-and-reports#:~:text=We%20educate%20more%20than%2054%2C000,come%20from%20139%20different%20countries.

management of device purchasing and maintenance of all technology used by students and teachers in school and at home.[12]

The City may consider prioritizing BPS-based digital navigators as a resource for students and their families seeking additional device and internet skills support and enrollment support in low-cost programs.

2.4.6 Age Strong Commission

The Age Strong Commission offers programs that serve senior residents across Boston and has worked to advance digital equity among this population through its efforts as co-partner of the Digital Equity Fund with the Innovation & Technology Cabinet and the Equity & Inclusion Cabinet.

In a recent survey conducted by Age Strong, it was identified that the most significant digital equity barriers among Boston's older adults are access to computers or tablets, competency in device use and digital skills, and access and affordability of home internet. Of these barriers, the survey showed that digital skills is the largest and most consequential digital equity gap for this population. See Section 4.5 for more details.

2.4.7 Wicked Free Wi-Fi and BoNet

Wicked Free Wi-Fi (WFW)—Boston's free public Wi-Fi system—includes 170 access points located in public spaces across the City and leverages the City's municipal use network, BoNet. The WFW program began in 2017 in the Grove Hall area, and has since expanded into Boston's public buildings, schools, and neighborhood business district locations reachable by the City's fiber network since its inception. The City's Innovation & Technology Cabinet is now in the midst of planning for a significant expansion of the WFW coverage area, seeking to target areas that will most benefit from this service, including low-income areas and transit users with a higher likelihood to have a limited mobile data network plan. This expansion will add approximately 30 new service locations and has an estimated cost of $313,879. See Section 4.6 for more information on this program.

2.5 Stakeholder interviews, national survey data, and a residential survey illustrate continuing affordability and device gaps, especially among low-income populations

Despite the significant efforts made by the City and other entities, substantial gaps in affordability and device access still affect Boston's low-income families and seniors, according to survey data and interviews with stakeholders.

2.5.1 Affordability and access gaps substantially affect low-income Boston residents

In data collected by the U.S. Census Bureau's American Community Survey (ACS), 10.3 percent of households—approximately 28,000 households—reported lacking either a wired or mobile broadband subscription. Further, 20.5 percent of households—equating to about 57,000 households—lack a wireline internet subscription. And 8.7 percent of households (about 24,000) rely on their smartphones alone to access the internet.

[12] "About BPSTechnology," Boston Public Schools, https://district.bostonpublicschools.org/domain/2327.

Four out of five Boston households that lack wireline internet subscriptions earn below $75,000 per year, meaning that these lower-income families are clearly the ones facing access gaps – whether in affordability or interest in these services.

The residential survey conducted by MPG for this study highlights a significant subscription gap: 22 percent of those in public housing and 25 percent of low-income populations lack a home broadband subscription. (Some of these respondents have mobile-only service.) When asked why they do not have a home internet plan, 28 percent of respondents cite the high cost of service and 14 percent cite the high cost of devices.

Reliance on mobile devices for accessing the internet was highlighted by HRIA's conversations with community organizations across Boston. See Section 6 for MPG's survey analysis. Stakeholders interviewed by HRIA reinforced the theme that households still face substantial challenges related to broadband affordability. (See Section 7 for HRiA's analysis.)

2.5.2 Device gaps

ACS data also show that 17.5 percent of Boston respondents—which equates to about 48,400 households—do not own a desktop or laptop computer, and 5.8 percent, or about 16,000 households, lack any type of device (desktop, laptop, tablet, smartphone).

In MPG's residential survey, 40 percent of unhoused people, 26 percent of public housing residents, 26 percent of low-income populations, and 23 percent of individuals with disabilities stated they do not have enough devices to meet their everyday needs for internet use.

Stakeholders interviewed by HRiA also reinforced that households face significant device gaps. In CTC's engagement with Boston Public Library (BPL), a representative shared that wait times to rent a Chromebook can exceed three weeks, and in-library desktop computer use reached 182,076 guest logins across the 482 desktops at the BPL system in 2024, which further highlights the device gaps among Bostonians.

2.5.3 Skills gaps

Many Boston residents face significant broadband and computer skills challenges. In MPG's residential survey, 30 percent of immigrant populations, 35 percent of public housing residents, and 37 percent of veteran respondents stated they lack confidence in searching or applying for a job online. When using the internet to apply for benefits, 43 percent of unhoused, 36 percent of immigrant populations, 28 percent of public housing residents, and 36 percent of veteran respondents stated they lack confidence.

These findings were reinforced by HRiA's stakeholder conversations. Representatives from neighborhood organizations and nonprofits interviewed by HRiA expressed the need for additional funds to expand their digital literacy programs to address skills gaps.

2.6 The Trump administration's decision to terminate Capacity Grant Funds is a significant loss for Boston as it plans for its future

The Capacity Grant program opened in early 2024 and had planned to allocate funding over the course of several years. Under this program, states applied for funding to support the

implementation of their digital equity plans, which were submitted to the National Telecommunications Administration (NTIA) in 2023. States were awarded funding in March 2024 based on a legislatively mandated allocation formula. This program was terminated in May 2025 by the Trump administration.

Before the program's termination, Massachusetts was awarded $14.1 million in Capacity Grant funding, of which MBI had planned to use $9.44 million for its Launchpad Program aimed to support non-profit organizations, state agencies, and local government entities, including municipalities, municipalities in their efforts to close the digital divide through two-year grants.[13]

The City of Boston submitted its Launchpad concept paper to MBI in April 2025, which detailed a request for $1 million in funding to support programs for digital navigation services, device purchasing and distribution, and digital literacy and skills workshops. Over the two years of the grant, Boston estimated that it would provide enrollment support in benefit programs and job training platforms to more than 200 people, serve 400 more with digital navigators, and deliver more than 60 digital equity workshops.

With the loss of the Capacity Grant Program, the City is seeking alternative ways to fund these programs.

[13] "Launchpad Program," MBI, https://broadband.masstech.org/launchpad-program.

3 Recommendations

The following are recommended strategies based on the data presented in this report. One of the most significant efforts the City could undertake would be to ensure that low-income families in BHA and other affordable housing sites have access to competitive low-cost or free broadband services.

Table 2: List of recommendations

Recommendation	Access and affordability	Devices	Skills
3.1: Develop a strategy for deploying best-in-class, competitive, low-cost internet services in BHA facilities and other affordable housing properties	X		
3.1.1: Pursue alternative means of connecting residents to low-cost or free broadband services to fill the gap left by the end of the Affordable Connectivity Program	X	X	X
3.2: Explore alternative funding sources to enable Digital Equity Fund recipients to continue existing efforts past 2026	X	X	X
3.3: Prioritize local funding for digital navigator programs and coordination of capacity	X	X	X
3.4: Review and upgrade computer room facilities across City departments to facilitate internet and computer access for low-income residents.		X	X
3.5: Build four additional computer rooms in BHA developments and consider expanding its Chromebook distribution program	X	X	X
3.6: Increase the inventory of the Boston Public Library's short-term device lending programs to alleviate long wait times	X	X	
3.7: Expand free Wi-Fi at community and transportation hubs to allow targeted public access	X		

3.1 Develop a strategy for deploying best-in-class, competitive, low-cost internet services in BHA facilities and other affordable housing properties

Although the Verizon fiber buildout has provided fiber competition throughout portions of the City, the company has not completed its buildout in approximately 15 percent of the City's addresses (which can include one or more apartment units). As of March 2025, only 27 of the 52 BHA communities have access to Verizon Fios. Citywide, 133,528 apartments lack Fios and 78,428 lack a second wireline provider. Many of these households face affordability challenges. The City, BHA, and MBI have made strong starts in tackling these challenges.

MBI's Apartment Wi-Fi program and Residential Retrofit Program will help some sites. The City proposes to provide backhaul through BoNet for service to community rooms and offices. But a wider and more comprehensive strategy is needed to put the City and BHA on a path to ensuring best-in-class internet service in BHA properties. The strategy would include prioritizing candidate properties, undertaking a comprehensive engineering review of these sites, developing detailed plans and cost estimates, and undertaking a procurement process to identify partners. See Appendix A for a deeper discussion of this recommendation.

3.1.1 Pursue alternative means of connecting residents to low-cost or free broadband services to fill the gap left by the end of the Affordable Connectivity Program

The end of the federal ACP—which offered a $30 monthly subsidy toward broadband bills—deepened the access challenges for low-income households in Boston given that 55,922 residents had been enrolled in the ACP and that an additional 86,478 households were potentially eligible. Accelerating enrollment efforts in low-cost programs offered by Boston's broadband providers would help close the enrollment and affordability gap. This would also ease pressure on hotspot device lending programs at the BPL and elsewhere that now patch the problem of subscription gap at homes.

Strategies the City could employ to combat this affordability gap include:

- Developing strategies for providing connectivity in BHA and other affordable housing properties
- Continuing funding for digital navigators (as budgets allow after 2026) to provide enrollment support for available low-cost broadband plans from existing providers (see Section **Error! Reference source not found.**).
- Issuing procurements for single-payer agreements with providers for targeted populations in the City (see Section **Error! Reference source not found.**).
- Request that local ISPs offer low-cost or free services to residents or donate Wi-Fi access in public spaces, building on a handful of examples of such efforts (see Section **Error! Reference source not found.**) and promote available low-cost programs. See Appendix D for details.

3.2 Explore alternative funding sources to enable Digital Equity Fund recipients to continue existing efforts past 2026

The $1.4 million supporting the City's Digital Equity Fund this year came as part of one-shot ARPA funding from MBI. These funds were transformative in supporting 36 community-based organizations (CBO) with a variety of programs. (See Section 8 for more details.) The funding is expected to sustain these programs through 2026. These CBOs already serve populations in need of broadband and computing skills assistance. If other funding sources can be found—such as from the City budget, new MBI programs, or foundations and philanthropic entities—it will make sense to continue these programs to the extent funding allows. In that case, priority should be given to organizations able to provide metrics on the success and impacts of the projects. But to the extent funding does not continue, the CBOs will need to adapt their strategies.

The end of the MBI ARPA funding is not the only blow. Federal Digital Equity Competitive Grant Program applications were submitted by the BHA, Boston Neighborhood Network Media (applying alongside other Public, Educational, and Governmental Access Channels in the region), and the Massachusetts Digital Navigation Network (MDNN)—but none were recommended for approval. And as noted above, the ACP ended last year. Additionally, MBI's Launchpad program, which was to be funded by federal digital equity capacity grants, was also cancelled by the current administration. The City had hoped to obtain $1 million to hire three digital navigators and a digital navigation coordinator.

In a financially constrained environment, the City may wish to consider other ways of supporting CBOs—such as by providing technical assistance, equipment and computers in place of some of that funding—and to find alternative funding sources for digital navigators.

3.3 Prioritize local funding for digital navigator programs and coordination of capacity

The City should allocate sustained local funding to support Digital Navigator services and program coordination focused on priority populations. Over the past two years, the City of Boston has partnered with community-serving agencies to pilot a limited but effective model for digital navigation. Through weekly, in-person sessions at the Office of Returning Citizens, one Navigator has provided formerly incarcerated residents with hands-on support for job searching, device use, and foundational digital skills. A second Navigator, working out of the Hyde Park branch of the Boston Public Library, has delivered language-appropriate instruction and assistance to newly arrived Haitian immigrants, helping participants navigate online platforms safely, search for employment, and gain access to devices.

These efforts have demonstrated both the strong demand for population-specific digital support and the effectiveness of navigator services in addressing deep structural barriers to digital access. However, with federal funding sources now unavailable, Boston risks losing this targeted capacity just as community need continues to grow. To prevent service interruptions and expand reach, the City should invest in full-time Digital Navigators and a Program Coordinator who can manage operations, ensure consistency, and align services across departments and neighborhoods. Reliable, sustained investment in this model would help ensure that residents with the greatest barriers to digital access are not left behind.

3.4 Review and upgrade computer room facilities across City departments to facilitate internet and computer access for low-income residents.

Many City departments and BHA properties have community-accessible computer rooms. Data from the MPG residential survey found that one in five respondents who did not have computers at home are using these centers, and many more could do so. The City would benefit from doing an inventory and assessment of such facilities with the goal of consolidating and upgrading them and offering coordinated, standardized programming. This work has already begun within the Innovation & Technology Cabinet.

3.5 Build additional computer rooms in BHA developments and consider expanding its Chromebook distribution program

Given that digital equity issues primarily affect lower-income Bostonians, a logical focus for the City is to support the expansion of the BHA's digital equity programming efforts. In 2023, the BHA hired its first Senior Advisor for Digital Equity, then hired two digital equity coordinators that manage all digital equity programming and six digital navigators offering direct support to residents through computer classes, tech drop-in sessions, and workshops.

Through MBI's Partnerships grant, more than 250 residents have participated in digital equity programming at the BHA since 2023, and more than 100 Chromebooks have been distributed to BHA residents.

Further investment—from funding sources that could include the state, foundations, or the BHA or City—would allow the BHA to activate more computer labs in public housing sites, and increase the number of classes, tech drop-in sessions, and workshops available to residents.

3.6 Increase the inventory of the Boston Public Library's short-term device lending programs to alleviate long wait times

The BPL has two short-term device lending programs to address persistent device and internet affordability barriers among Boston residents. As of March 2025, the BPL has approximately 150 hotspot devices and 53 Chromebook Home Connectivity Kits (providing a Chromebook, hotspot, mouse, charger, quick start guide, and bag for transportation) in circulation. Both the hotspots and home connectivity kits are available to loan for three-week intervals.

These device programs frequently have long waitlists, sometimes up to four weeks for hotspots, and are slightly shorter for Connectivity Kits. To address these long wait times, the BPL would like to replace existing Wi-Fi hotspots and purchase new ones to double its number of devices in circulation to 300. It would also like to replace existing and purchase new Chromebook Connectivity Kits to increase its supply to 100. Although these short-term loan programs are a temporary solution, they offer significant relief to Bostonians facing affordability challenges.

BPL's hotspots also can provide a bridge to residents' enrollment in low-cost service programs at home. Households are often required to stop their internet service for up to 90 days before being eligible to enroll in a low-cost subscription such as Comcast's Internet Essentials. Hotspots can be used during this period, which would enable residents to access service while meeting Comcast's enrollment requirement.

Expanding BPL's hotspot inventory would cost about $450,000, with $45,000 coming from the City of Boston, assuming that the federal E-Rate program pays the remaining 90 percent—a provision that is in some doubt given the change in administration in Washington. (See Section 9.3.3.)

3.7 Expand free Wi-Fi at community and transportation hubs to allow targeted public access

Wicked Free Wi-Fi (WFW) is a free, public Wi-Fi system the City of Boston operates over BoNet to provide outdoor connectivity for residents. It has grown substantially since its launch in 2014 and recently was expanded through Boston's 20 neighborhood Main Street nonprofit programs with an additional 130 access points. The City is ready to deploy even more access points and anticipates spending $1 million on between 30 and 50 buildings, predominantly community centers, for inside wiring and rooftop access points to further expand the reach of the free Wi-Fi network.

Stakeholders shared that being able to connect to the internet at mass transit hubs and public spaces would increase safety and connectivity with their community. Making internet connectivity available in broader spaces throughout the City could also increase access to healthcare for unhoused people.

4 City departments have significantly expanded digital equity programming over the past several years, but more funding is needed to continue these efforts

CTC engaged with City departments and the BHA as part of this engagement to determine the extent of current programming and any information on needs and plans.

4.1 Boston Housing Authority

The BHA was established in October 1935 and is the largest housing authority in New England, providing housing and rental assistance to approximately 32,000 residents (or 9 percent of people in the City). The BHA owns and oversees approximately 10,000 public housing units across 56 developments in the City—32 of which are designated for seniors and residents with disabilities, and 24 are for low-income families—housing more than 17,000 City residents. The BHA also administers nearly 15,000 Tenant-Based Section 8 vouchers.

The BHA has two full-time Digital Equity Coordinators who oversee digital equity programming, as well as six digital navigators that offer support to BHA residents through computer classes, tech drop-in sessions, and workshops. Coordinators and navigators are both funded positions by the City through MBI's Partnerships Program. Navigators are paid as a stipend, while the coordinators are fulltime positions.

The BHA offers digital literacy computer classes at West Broadway, Fairmount, Franklin Field Family, Mary Ellen McCormack, Ruth Barkley, Archdale, Mildred C. Hailey, Washington Manor, and Doris Bunte. To meet BHA's digital equity goals, five courses run per quarter. These classes are either one or two hours long, run for six to eight weeks, and have a class capacity of 10 students per course. At the end of each course, graduates receive a laptop, headphones, and notebooks.

These classes are funded until December 2026 using grant money received by the City through MBI's Partnerships Program. Digital literacy classes focus on teaching essential digital skills, allowing BHA residents to enhance their confidence in using technology and navigating the internet. Participants learn to use their devices safely, safeguard their personal information, and utilize the internet for daily tasks.

Pre-and post-class surveys are conducted to gauge participants' comfort and confidence regarding the course material. This feedback helps instructors tailor content to better meet participants' needs and track skill improvement. Training facilitators also encourage participants to establish at least one learning goal at the start of each class and identify specific skills they wish to learn or enhance.

The BHA also offers tech drop-in sessions, which provide personalized one-on-one technology support to residents. Digital navigators assist residents with technology, skill, and internet-related questions which may include computer troubleshooting, password resets, identifying affordable internet options, enrollment and application assistance, and how to use email or other applications like Google and Microsoft Suites.

These sessions are often one to two hours with two or three staff (digital equity coordinators and navigators) on site. These sessions have taken place at the following BHA developments: Lower Mills, Doris Bunte, Spring Street, St Botolph, Patricia White, West 9th Street, Holgate, Foley,

Annapolis, Ausonia, Torre Unidad, Davison, J.J. Meade, Bellflower, Peabody, Hampton House, General Warren, Frederick Douglass, Eva White, Washington Manor, Pond Street, Fairmount, West Broadway, Mildred C. Hailey, Commonwealth and Archdale.

All computer classes and tech drop-ins are held on-site in existing housing authority community rooms or computer labs. To promote inclusivity, interpreters and translated materials are offered to residents who speak or read languages other than English. Three workshops have also been hosted by the BHA virtually, as an opportunity for residents to learn about topics related to digital equity and literacy. To date, the topics have included cybersecurity and how to protect your identity online, how to use and operate social media, and a general information session on basic skills.

To date, more than 250 residents have engaged in digital literacy programs offered by the BHA. With MBI funding, the BHA has provided 100 Chromebook laptops to BHA residents since 2023 and is in the process of distributing an additional 100 laptops. The BHA has also reactivated two computer labs at BHA public housing sites, at Ruth Barkley and West Broadway.

The City previously worked with the housing authority to wire 17 housing developments with BoNet in community rooms and offices and have plans underway to do four additional sites: Monsignor Powers, West Broadway, Gallivan, and Franklin Field Elderly.

4.2 Office of Workforce Development

In an increasingly digital economy, access to digital skills is essential for economic mobility. The City of Boston's Office of Workforce Development (OWD) is committed to ensuring residents have the digital literacy needed to succeed in education and the workforce. Launched in 2021 in partnership with World Education and initially funded by the American Rescue Plan Act, OWD's Digital Literacy Initiative (DigLit) aimed to bridge digital skill gaps and enhance technology integration in adult education and workforce programs.

The first phase of DigLit supported the Adult Literacy Initiative (ALI), a network including 25 Boston-based Adult Basic Education (ABE) programs serving over 3,000 adult learners. Through coaching, one-on-one technical assistance, and financial support, DigLit helped programs embed digital skills training into their workforce instruction. This effort led to the creation of the EdTech Strategy Routine Library, a free, open-access resource offering a comprehensive collection of tools designed to help adult education providers strengthen digital literacy instruction and empower learners.

Building on this success, DigLit recently received $1 million, which will, in part, support 20 community-based organizations offering job readiness and occupational training, including efforts to ensure more residents can access high-quality digital literacy instruction.

Selected programs (see list below) will participate in workshops, webinars, and coaching sessions, using funds for staff training, program improvements, hiring digital skills instructors, enhancing IT support, and technology purchases to benefit participants. These investments will lay the foundation for long-term digital inclusion in Boston's workforce development ecosystem.

Table 3: OWD grant awardees

Organization name	Program
Asian American Civic Association	Building Energy Efficient Maintenance Skills (BEEMS) and Weatherization Training
BCNC (Boston Chinatown Neighborhood Center)	CustomerFIRST
Breaktime United, Inc.	Job Readiness
Bridge Over Troubled Waters	Job Readiness
Catholic Charitable Bureau of the Archdiocese of Boston, Inc.; El Centro Adult Education Program	IT/Tech Training for ESOL
Community Workshops, Inc. aka Community Work Services	Basic Introduction to the Digital Environment (BIDE)
Digital Ready	Green Tech Pathway
Dorchester Bay Economic Development Corporation	Bridges to Green Jobs
Immigrant Family Services Institute, Inc.	Adult Education and Workforce Development Program
International Institute of New England	Pre-Apprenticeship Construction and Facilities Maintenance Program (MNPAP) + Ready, Set, Service! (RSS) Training Program
Jamaica Plain Community Centers Adult Learning Program	CNA Training for ESOL
Julie's Family Learning Program	Job Readiness
The Loop Lab	Media Arts Apprenticeship
Maverick Landing Community Services (MLCS)	Job Readiness
Mothers for Justice and Equality	Job Readiness
New England Center for Arts & Technology (NECAT)	Culinary Training
Operation ABLE of Greater Boston, Inc.	Medical Office Skills Training Program
Somali Development Center (SDC) Boston	Job Readiness
St. Stephen’s Youth Programs	Ladders of Opportunity - Early Childhood Educator & Paraprofessional Training
The YMCA of Greater Boston	Property Management & Medical Office Employment Programs

4.3 Boston Public Library

The Boston Public Library (BPL) is comprised of the Central Library in Copley Square and 25 branches across the neighborhoods of Boston, serving nearly 4 million visitors per year and millions more online, demonstrating how digital equity, access and inclusion are central to BPL's mission. The programs and resources available at all locations include expanding Wi-Fi and computer access and device lending programs as described below. In addition to in-person resources, the library offers a multitude of digital resources (e.g., bpl.org/stream-and-download/ and bpl.org/online-resources/).

4.3.1 Outdoor Wi-Fi

The BPL has expanded its Wi-Fi to provide a stronger signal outside fourteen branches, giving patrons free internet access on BPL property. The rollout of the external wireless access points began in September 2020 amid the pandemic and prioritized neighborhoods having lower at-home broadband adoption and where outdoor seating was available. The branches include Brighton, Codman Square, Connolly, East Boston, Egleston Square, Grove Hall, Honan-Allston, Hyde Park, Lower Mills, Mattapan, Parker Hill, Roxbury, South End, and West Roxbury.

Funding for this initiative was supported by the Boston Public Library Fund.

4.3.2 Short-term device lending

BPL has offered Wi-Fi hotspots for about eight years and had 150 devices circulating at the time the library system provided data to CTC. The hotspots help bridge the digital divide by providing free, reliable internet access that patrons can take to any location. The lending period is for three weeks, but demand is very high, and individuals face significant wait times of up to four weeks to obtain one. Pending a new contract stemming from E-Rate eligibility for Wi-Fi hotspots, BPL plans to double the size of this program to satisfy ongoing demand. However, hotspots are a temporary solution to address household internet needs. To address BPL's hotspot demand over the coming years, there must be an increased investment in enrollment support in low-cost broadband programs and expansion of free public Wi-Fi in the City.

As of March 2025, BPL had 53 Chromebook Home Connectivity Kits in circulation, which are available for loan for three-week intervals. These kits include a Chromebook with integrated LTE data service, a mouse, charger, and a quick start guide, distributed in a BPL carrying case. While BPL continues to offer public computer access at all library locations, Connectivity Kits extend this service into patrons' homes and neighborhoods, on a schedule that works for them. BPL hopes these kits will help Bostonians job hunt, learn new skills, or simply connect with friends and family. Patrons can place a hold and check out a Wi-Fi hotspot or Connectivity Kit by calling 617.536.5400 or by visiting bpl.org/hotspot or bpl.org/chromebook.

The lifespan of a Home Connectivity Kit is approximately one year, and as demand for these kits continues, BPL is working with the Boston Public Library Fund to secure grants to increase its supply by 50 kits so that there are at least 100 in circulation.

Note: This section was adapted from https://www.bpl.org/news/boston-public-library-launches-new-initiatives-to-bridge-the-digital-divide/

4.3.3 Long-term device lending

Now in its final year of operation, the Long-Term Device Lending (LTDL) program was rolled out in December 2021 through the use of the Emergency Connectivity Fund (ECF) and in close partnership with the BHA and the Mayor's Office of New Urban Mechanics (MONUM). The program was designed to reach adult patrons who have unmet digital connectivity needs for devices not just for a few weeks, but for an indefinite amount of time. Partnerships were leveraged to target key demographics that may or may not be aware of BPL's resources. Physical mailings were sent to approximately 9,000 BHA residents to inform them about the program.

LTDL home Wi-Fi router data service was extended through June 30, 2024. The 6,000 distributed Chromebooks will reach end-of-life and the LTDL program official close in August 2025.

4.3.4 Community learning

The BPL also offers classes, workshops, and info sessions on a wide range of topics, including computer and digital skills training for personal and professional development. Library staff are available for one-on-one technology assistance on a drop-in basis during regular branch hours or by appointment, and computer classes are available to register for on the BPL's website.

For more in-depth computer training, patrons can also register for the Tech Goes Home program, which strives to ensure that all residents of the City of Boston are equipped with the tools, training, and access to support 21st-century skill development. Participants who complete 15 hours of training in the program may be eligible to receive a free Chromebook as well as 12 months of free internet service in their household.

4.4 Boston Public Schools

Boston Public Schools (BPS) serves more than 54,000 Boston students in 125 schools[14] and has played a crucial role in keeping them connected to reliable high-speed internet and devices.

Boston Public Schools has a recent history of advocating and providing resources to close the digital divide felt among BPS students and their families. Most notably, during the Covid-19 pandemic, all students received a personal Chromebook device, 10,000 hotspots were disseminated to students without internet access, and 3,000 Comcast Internet Essentials vouchers were provided to students and their families.

Currently, BPS has an Office of Instructional and Information Technology (BPSTechnology), with departments that focus on five areas: infrastructure, device applications, service desk and technician support, digital learning, and technology business operations. These teams provide the following services:[15]

1. Infrastructure Team: Manages the maintenance, upgrades, and expansion of BPS internet and data services.

[14] "Data and Reports," Boston Public Schools, https://www.bostonpublicschools.org/about-bps/data-and-reports#:~:text=We%20educate%20more%20than%2054%2C000,come%20from%20139%20different%20countries.

[15] "About BPSTechnology," Boston Public Schools, https://district.bostonpublicschools.org/domain/2327.

2. Applications Team: ensures that all technology has appropriate education-based applications through cloud and in-house data systems.
3. Service Desk Team: includes technicians that provide in-school support, and operates the BPS Help Desk located at Bolling Building, which is accessible by phone calls or walk-ins.
4. Digital Learning Team: supports students, teachers, school leaders, families, and central office staff by identifying needs and goals for using technology to enhance teaching and learning.
5. Technology Business Operations Team: focuses on the purchasing and maintenance of technology used by students and teachers in school and at home.

To build on these efforts, the City of Boston might consider prioritizing digital navigators at Boston Public Schools as a strong resource to offer students and their families device and internet skills support, assist households without home internet enroll in low-cost programs, and for further identifying and tracking ongoing digital equity gaps among this population.

4.5 Age Strong Commission

The Age Strong Commission is a City department serving senior residents through various programs and community-based initiatives. Age Strong has been instrumental in its digital equity advocacy for Boston's aging population, particularly through its efforts as a co-partner of the Digital Equity Fund with the Innovation & Technology Cabinet and the Equity & Inclusion Cabinet.

Recently, the Age-Strong Commission conducted a digital equity survey of providers and human service agencies, including aging services organizations, faith-based communities, immigrant-serving organizations, neighborhood associations, and senior housing providers. This survey received responses from a cross-section of 43 organizations that serve thousands of older adults across the City. From the survey and other research, Age Strong emphasized that digital equity gaps remain among older adults in Boston for three primary reasons:

(1) lack of understanding and skills to use technology,

(2) lack of broadband connection,

(3) lack of devices.

Of these three reasons, digital skills and literacy remain the largest and most consequential digital equity barrier for this population.

Community based organizations (CBOs) play a significant role in connecting Boston's older population by identifying individuals who are not connected to the internet and organizing opportunities for digital skills and technology training. Older adults have shared that learning looks different depending on the individual, and training that is too advanced can be a deterrent. Skills trainings of varied levels—and in a variety of languages— helps keep older residents engaged.

To reach older residents, the Commission relayed that advertisements at medical offices, banks, and houses of worship can be important, especially for the socially isolated. It can also help to leverage family connections, like communicating with adult children about programs for their elderly

parents. Some partners have found ongoing end-user support after formal instruction to be a crucial part of supporting older residents. Communication in a variety of different ways (written, digital, oral) and in different languages is important. And these communications should reach older people where they go, potentially including medical offices, houses of worship, hairdressers and barber shops, grocery stores, senior centers, community centers, direct mail, and newspapers.

4.6 BoNet and Wicked Free Wi-Fi

Wicked Free Wi-Fi (WFW) is Boston's free public Wi-Fi system, operated by the Innovation & Technology Cabinet. It offers connectivity for residents through public spaces and is enabled by BoNet—the city's municipal use network. The Innovation & Technology Cabinet (formerly DoIT) launched WFW, Boston's Public Wireless Network eight years ago with more than 170 access points, initially in the Grove Hall area, as an effort to close the digital divide. The City expanded WFW into Boston's public buildings, schools, and neighborhood business district locations reachable by the City's fiber network.

In April 2022, the City began planning expansion of WFW coverage by analyzing locations that would serve residents who stand to benefit most: low-income transit users with a higher likelihood to have a limited mobile data network plan. The expanded network will provide a high-quality public Wi-Fi experience in some of Boston's most traveled squares; about 30 locations in total.

The City is planning to design and implement a mesh network in the selected locations to create a consistent, reliable experience in public blocks or squares.

5 Fiber broadband is expanding in Boston, but significant gaps in competitive service remain—and affordability challenges deepened with the end of the ACP

The following section was prepared in 2024 and submitted to MBI and the City as an initial required deliverable in the MBI study process. It provides an analysis of current broadband conditions in Boston related to infrastructure availability, level of competition, uptake of services (and of available subsidies) by residents, and device ownership. Data is based on publicly available information from the U.S. Census Bureau, the American Community Survey (ACS), and the Federal Communications Commission (FCC). The FCC data used in this section was accurate as of January of 2024.

5.1 Key findings

- **The Boston market has nearly ubiquitous wireline broadband coverage.** The National Broadband Map reports that Comcast offers cable broadband above 100/20 Mbps to nearly every address in the City (97.8 percent of all units). Comcast asserted that virtually all premises are served (or serviceable within seven to 10 days) except in exceptional circumstances where a contribution is necessary to bring service to a location. Verizon's Fios services reportedly serve approximately 230,250 (or 63.3 percent of) units. Additionally, Astound reports a service area that covers just over 41 percent of all Boston residential units.

- **Although Verizon has built fiber widely in Boston, it has not been able to complete its buildout at all BHA developments.** The BHA reported as part of this engagement that only 27 developments—of 52 total—are now connected to fiber services from Verizon because of conduit access or presence of asbestos. The City and BHA are seeking to ensure all BHA units have access to state-of-the-art, fiber-based broadband through possible wiring retrofit grant funds from MBI, and a strategy to establish vendor-neutral infrastructure to incentivize more providers to offer services.

- **Many residents have access to fixed wireless services.** T-Mobile, and to a lesser extent Verizon, offer fixed wireless home services (leveraging the networks previously used only for mobile service) in many areas of Boston. These services provide a relatively affordable option, but with the significant caveat that performance of these networks is dependent on individual subscribers' distance from wireless facilities, and the data speeds may be cut (or "throttled") by these providers during times of congestion. Notably, the data show fixed wireless service areas do not reach certain low-income areas in the City. All told, FCC data show that approximately 231,151 (or 63.5 percent of all) Boston residential units can receive T-Mobile's licensed fixed wireless services, 182,802 (or 50.1 percent of) units can receive Verizon's fixed wireless, and 126,710 (34.8 percent of) units can receive access to Starry's service, at served speeds of 100/20 Mbps, at varied speeds.

- **DSL service is not offered at the same speeds across Boston.** In addition to cable service, just over half of Boston units still have access to Digital Subscriber Line (DSL) internet access service offered by Verizon. This service relies on Verizon's aging copper network infrastructure and provides extremely limited data transmission speeds that fall well below broadband thresholds. Data reported by Verizon to the FCC shows that service performance

is uneven, with most addresses (approximately 120,362 units) getting only between 0.2/0.2 Mbps (or 200 Kbps) and 10/1 Mbps and others (68,523 units) getting between 10/1 Mbps and 25/3 Mbps. Regardless of the speeds provided to its DSL customers, Verizon charges the same for the service and requires a bundled voice home phone line, resulting in customers that receive slower speeds paying the same rate as those with higher speeds.

- **The cost of broadband subscriptions is a major challenge for lower-income Boston residents.** Affordability is an issue for many residents in the City. According to the ACS, most of the households lacking an internet subscription are lower-income households. Of the 20.5 percent of households that lack a wireline internet subscription, the great majority of those are low-income families. After accounting for the number of households at different income brackets, an estimated 81.4 percent of the Boston households that lack wireline internet subscriptions earn below $75,000 per year, meaning that these lower-income families are clearly the ones facing gaps – whether in affordability, digital skills, or interest in these services.
- **Subscription and device gaps also represent a challenge for Boston residents.** According to ACS data, 5.8 percent of households do not own a computing device and 17.5 percent of households in Boston do not own a desktop or laptop computer device—which presents an obvious barrier to internet adoption. Moreover, 10.3 percent of households lack any type of internet subscription, and that number increases to 20.5 percent when looking at wired internet only. These gaps suggest that even though Boston appears to be fully "served" by offerings at broadband speeds, other factors (affordability, skills, and device access) can create digital divides within the City.
- **Adoption of FCC's Affordable Connectivity Program (ACP), which has recently ended, was higher than the state but less than the nation.** The ISPs in Boston all participated in the ACP, either directly or through an affiliate. ACP paid a $30 monthly subsidy for broadband service for eligible low-income residents. As of December 1, 2023, FCC data indicate that 48,923 households in Boston were receiving the ACP subsidy—or 34 percent of the estimated 142,400 households eligible for the program.[16] This was higher than the statewide figure of 31 percent but below the national figure of 40 percent. This enrollment rate had steadily increased in the last year of the ACP—enrollment rates for eligible households were as low as 23 percent in January 2023, and had jumped to 30 percent in June 2023, and may reflect the positive results of recent City efforts to boost awareness and participation.
- **Both Comcast and Verizon affirmed as part of this engagement that they offer identical service offerings, service quality, and pricing everywhere they serve in Boston.** Those offerings top out at 1.2 Gigabit per second (Gbps) download/35 Mbps upload for Comcast and up to 940 Mbps download/880 Mbps upload for Verizon Fios. The service territories,

[16] Estimates are based on 2022 American Community Survey reported data on household income, food stamp recipiency, Medicaid recipiency, supplemental security income, and public assistance income.

service offerings, and pricing of these major fixed broadband providers appear in the body of the report.

5.2 Boston has ubiquitous wired broadband coverage from Comcast with growing competition from Verizon

This report used data from the FCC and websites of broadband providers operating in Boston to collect market data on residential broadband pricing, availability, and level of competition.

Comcast provides high-speed internet service to nearly all addresses in the City. Verizon offers fiber, which provides symmetrical service (upload speeds are the same as download speeds) to approximately 85 percent of Boston addresses, and DSL service offered over its legacy copper network. Fixed wireless services (distinct from mobile services) are available from Verizon Wireless and T-Mobile to many households.

Table 4 provides the number of locations reported as served based on FCC data for Boston by technology and provider. FCC data are based on reports of service availability from service providers and show a total of 85,840 broadband serviceable locations (BSL), which generally means addresses (which may contain one or more units or apartments in Boston), and 363,878 serviceable units.[17] Table 5 provides an analysis of the broadband service landscape in Boston.

Served speed is defined as a minimum of 100/20 Mbps. Underserved is defined as reported speeds of between 25/3 Mbps and 100/20 Mbps.

Table 4: ISPs in Boston (FCC data as of January 2024)

Tech	ISP	Boston Broadband Serviceable Locations (BSL)		Boston Units	
		Total BSLs: 85,605		Total units: 363,878	
Cable	Xfinity	85,065	99.4%	355,864	97.8%
	Astound	46,307	54.1%	151,660	41.7%
Fiber	Astound	1,808	2.1%	17,871	4.9%
	Starry	76	0.1%	5,522	1.5%
	Verizon	72,464	84.6%	230,350	63.3%
	Xfinity	104	0.1%	1,576	0.4%

[17] The FCC Broadband Data Collection reporting uses the term "broadband serviceable location (BSL)" to represent address level information. A BSL is shown as a single served address for locations that may have more than one household or unit, as is the case with duplexes and multi-tenant or apartment buildings. In cases where an address or location is serviced by a single provider or technology, an assumption can be made that the same is true for all households or units at that location.

Tech	ISP	Boston Broadband Serviceable Locations (BSL)		Boston Units	
		Total BSLs: 85,605		Total units: 363,878	
Licensed Fixed Wireless	Verizon	Served: 8,231 Underserved: 9,956	9.6% 11.6%	Served: 106,426 Underserved: 76,376	29.2% 20.9%
	T-Mobile	Served: 20,781 Underserved: 35,373	24.3% 41.3%	Served: 101,929 Underserved: 129,222	28.0% 35.5%
	Starry	Served: 9,392	11.0%	Served: 126,710	34.8%
DSL/ Copper	Verizon (10/1 Mbps & 0.2/ 0.2 Mbps)	11,305 at 10/1 19,099 at 0.2/0.2	13.2% 22.3%	68,523 at 10/1 120,362 at 0.2/0.2	18.8% 33.1%

Table 5: State of high-speed broadband competition in Boston (FCC data as of January 2024)

Service availability		Boston BSLs	Boston units
Served addresses where 100/20 or greater is available (wireline only)	**From two or more wireline providers**	77,283 (90.28%)	278,648 (76.58%)
	Addresses in competition areas that can get fiber	73,135 (85.43%)	244,785 (67.27%)
	From only one provider (lack of competition)	7,880 (9.21%)	78,428 (21.56%)
Served addresses by licensed fixed wireless only		70 (>0.1%)	1,913 (.50%)
Underserved addresses that cannot receive 100/20 service but can get at least 25/3 (wireline or licensed fixed wireless)		1 (>0.1%)	1 (>0.1%)

Service availability	Boston BSLs	Boston units
Unserved addresses that cannot get 25/3 (wireline or licensed fixed wireless)	371 (0.43%)	4,888 (1.34%)
Total locations	85,605 BSLs	363,878 Units

5.2.1 Cable service

Figure 2 shows Comcast's cable service availability in Boston. There are only 257 BSLs, or 8,104 residential units, without Comcast service.

Astound (formerly RCN), is a smaller cable provider in Boston. Astound is the operator of RCN Telecom Services LLC, Grande Communications, Wave Broadband and enTouch Systems.

Astound's presence in Boston—offering cable TV, high-speed internet and telephone services—has provided residents with a limited competitive choice for cable, internet and telephone services in their service areas. Under existing Boston license terms, Astound has supported Public, Educational or Governmental (PEG) access cable channels, and provided fiber to the City's network.

Figure 3 shows Astound's residential cable service availability in Boston. In total, there are 46,459 (or 54.1 percent of all) BSLs, and 151,660 (or 42.7 percent of all) residential units, which are served by Astound's cable service at or above 100/20 Mbps.

Figure 2: Comcast (Xfinity) service availability in Boston

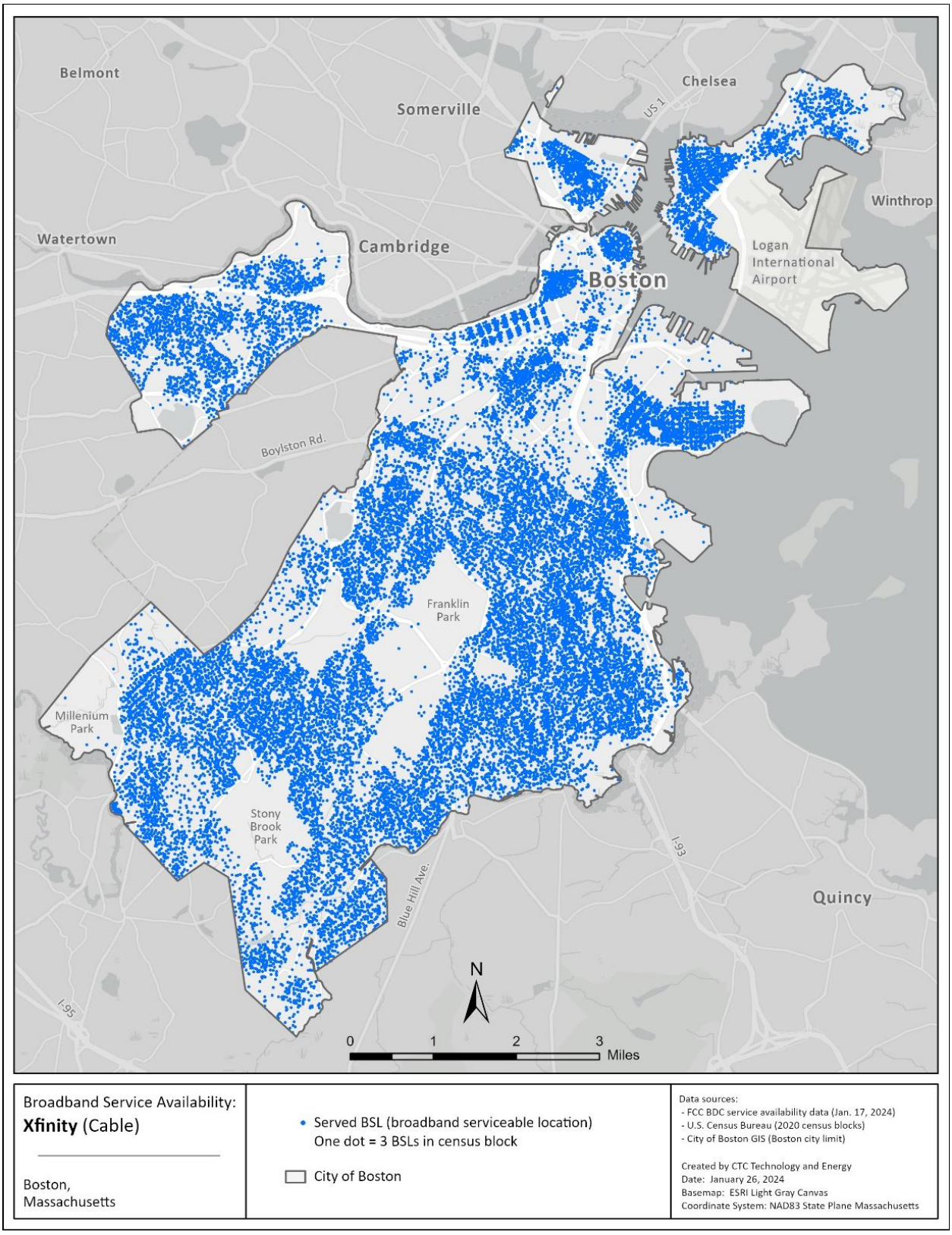
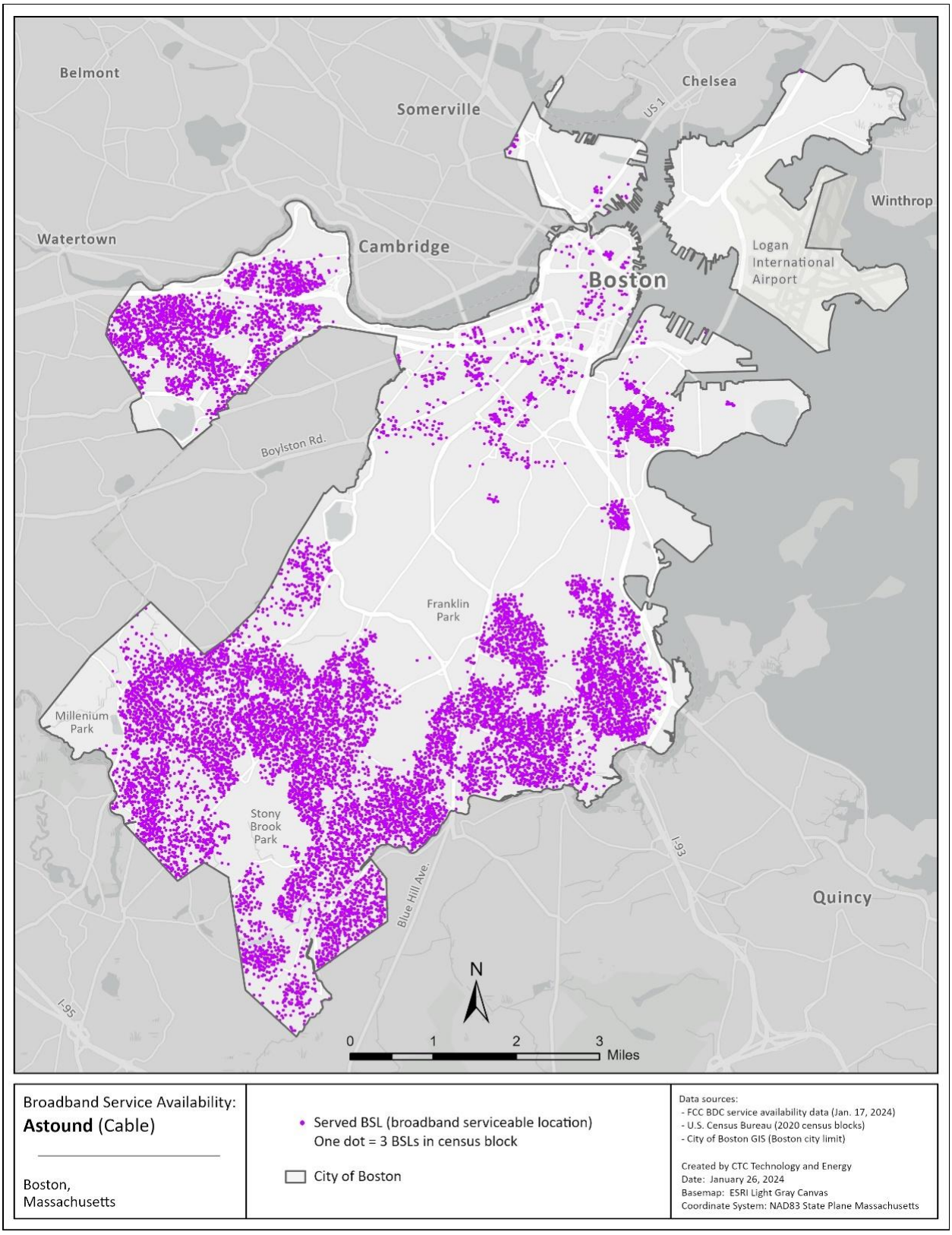


Figure 3: Astound Cable service availability in Boston



5.2.2 Fiber service

The majority of fiber service in the City of Boston comes from Verizon Fios, which serves approximately 230,350 (or 63.3 percent of) units in the City as reported by Verizon to the FCC.

Until early 2016, Verizon was only offering DSL over its copper phone lines. But following a Boston-Verizon cooperation agreement in early 2016[18] aimed at improving wireless and wired service, Verizon began building out its fiber-to-the-premises (FTTP) fiber service and connecting customers.

In its engagement with CTC, Verizon affirmed that it offers the same service levels, service quality, and pricing for Fios internet to all premises it serves, whether single-family homes, apartments, condos, or public housing units. Figure 4 (below) illustrates the areas where Fios internet is offered.

Verizon has been making efforts to offer its fiber services ubiquitously in Boston but has yet to reach approximately 36.7 percent of residential units in the City. Verizon has not been able to complete its build out at 25 (of 52) BHA developments.

Astound's residential fiber service is limited in Boston, serving only 1,822 BSLs across the City, which is approximately 2 percent of all locations. When viewing its fiber coverage in terms of residential units, Astound reportedly serves approximately 17,871 units, which is approximately 4.9 percent of all residential units in the City. Figure 5 (below) shows locations where Astound fiber is available.

5.2.3 DSL service

Figure 6 (below) shows Verizon's DSL coverage in Boston, according to FCC data. In total, there are 30,556 BSLs (or 188,885 residential units) that can receive this service, but speeds are limited; 11,305 BSLs (or 68,523 units) can receive speeds up to 10/1 Mbps, and approximately 19,099 BSLs (or 120,362 units) can only receive speeds of up to 0.2/0.2 Mbps, making all locations and units unserved. Verizon no longer offers DSL services to new customers and continues to migrate customers still on copper-based services to fiber-based options when interested.

[18] Verizon and City of Boston, "Verizon/City of Boston - Cooperation Agreement," March 24, 2016, https://www.cityofboston.gov/images_documents/Boston-Verizon-cooperation_tcm3-53269.pdf.

Figure 4: Verizon Fios fiber service availability in Boston

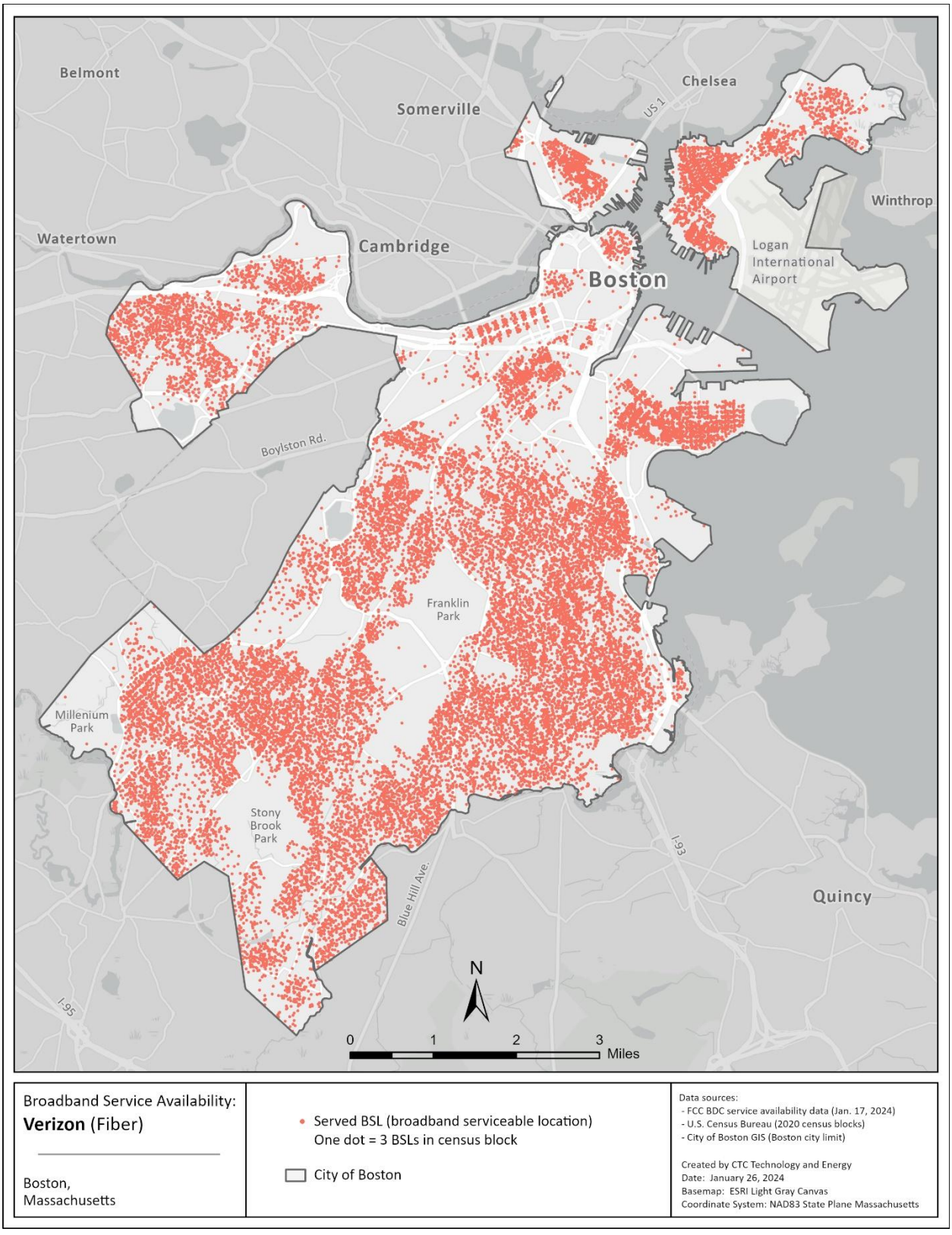


Figure 5: Astound fiber service availability in Boston

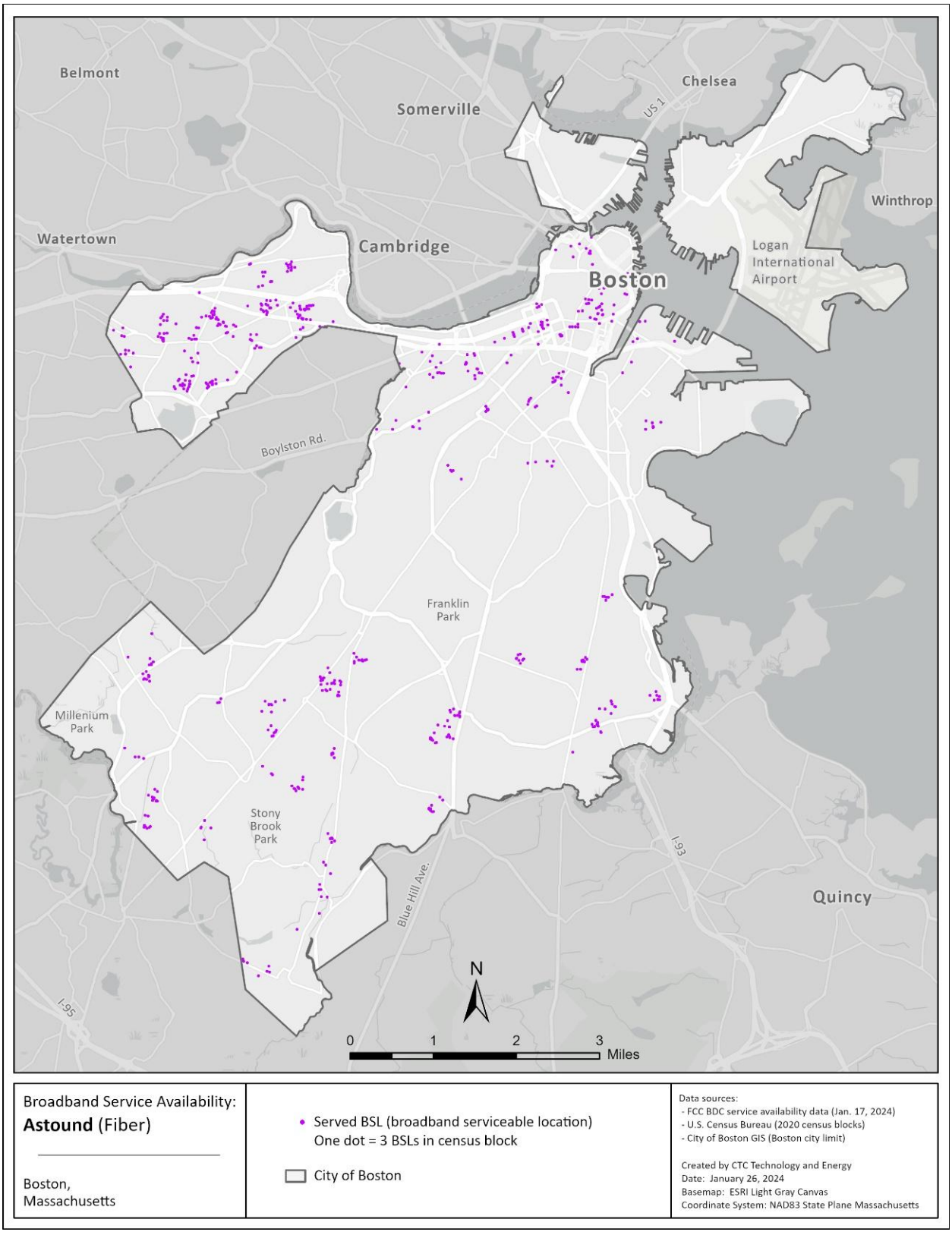
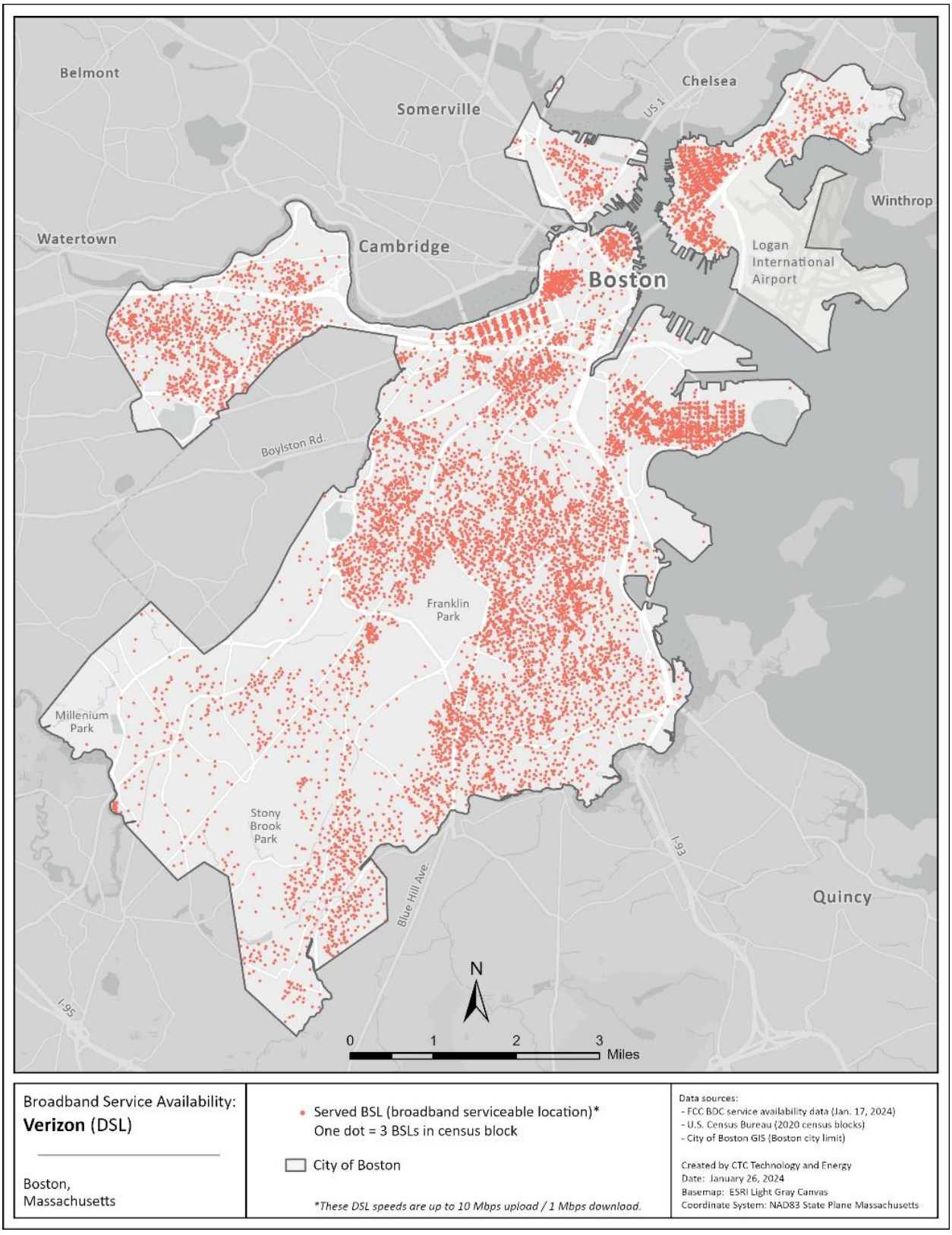


Figure 6: Verizon DSL coverage in Boston[19]



5.2.4 Fixed wireless service

Residents have the option to subscribe to "5G Home Internet" services from Verizon, T-Mobile, and Starry. These are called licensed fixed wireless or LFW because they use licensed spectrum under the exclusive control of the respective companies. The FCC notes that mobile wireless providers have been making these offerings an increasingly attractive alternative to services such as Comcast's, with more competitive pricing.[20] Yet these remain a complement of, and not a full replacement to, wired services such as those offered by Comcast, Verizon Fios, and Starry Fiber. Providers can throttle or reduce capacity in favor of mobile voice and data traffic during times of congestion. And the delivered speeds can vary greatly depending on distance from the wireless equipment or interferences in the line of sight in the environment.

The FCC data shows that approximately 231,151 units (or 56,154 BSLs) in Boston can receive service from T-Mobile, 126,710 units (or 18,187 BSLs) can receive service by Verizon Wireless, and 126,710 units (or 9,392 BSLs) are served by Starry. While all locations served by Starry are at or above 100/20 Mbps, this is not the case with T-Mobile and Verizon, with only 106,426 units receiving Verizon at served speeds, and 101,929 units receiving served speeds from T-Mobile.

Figure 7, Figure 8, and Figure 9 (below) show the respective coverage areas of Verizon, T-Mobile, and Starry's "5G Home Internet" services. (In all figures, each dot represents three addresses and is placed randomly within a census block.)

This reported coverage may overstate actual fixed wireless service availability and speeds in Boston. The quality of the coverage will vary significantly depending on how far away the location is from the equipment or whether there are barriers that could block or weaken a signal such as trees and buildings. Many premises may not receive the reported level of service on a consistent basis.

Figure 9 includes both Starry's fixed wireless and fiber coverage. As mentioned above, the FCC reports that Starry's fixed wireless services covers 126,710 units (or 9,392 BSLs) in Boston, while its fiber service covers 5,522 units (or 77 BSLs) in the City.

[19] The maps in this report depict FCC broadband reported data by census block and place dots in random locations representing locations served by DSL within the census block. Each dot represents five locations within the census block. Only those census blocks with 3 or more locations served by DSL will show any dots.

[20] 2020 Broadband Deployment Report, para 11.

Figure 7: Verizon's licensed fixed wireless coverage in Boston

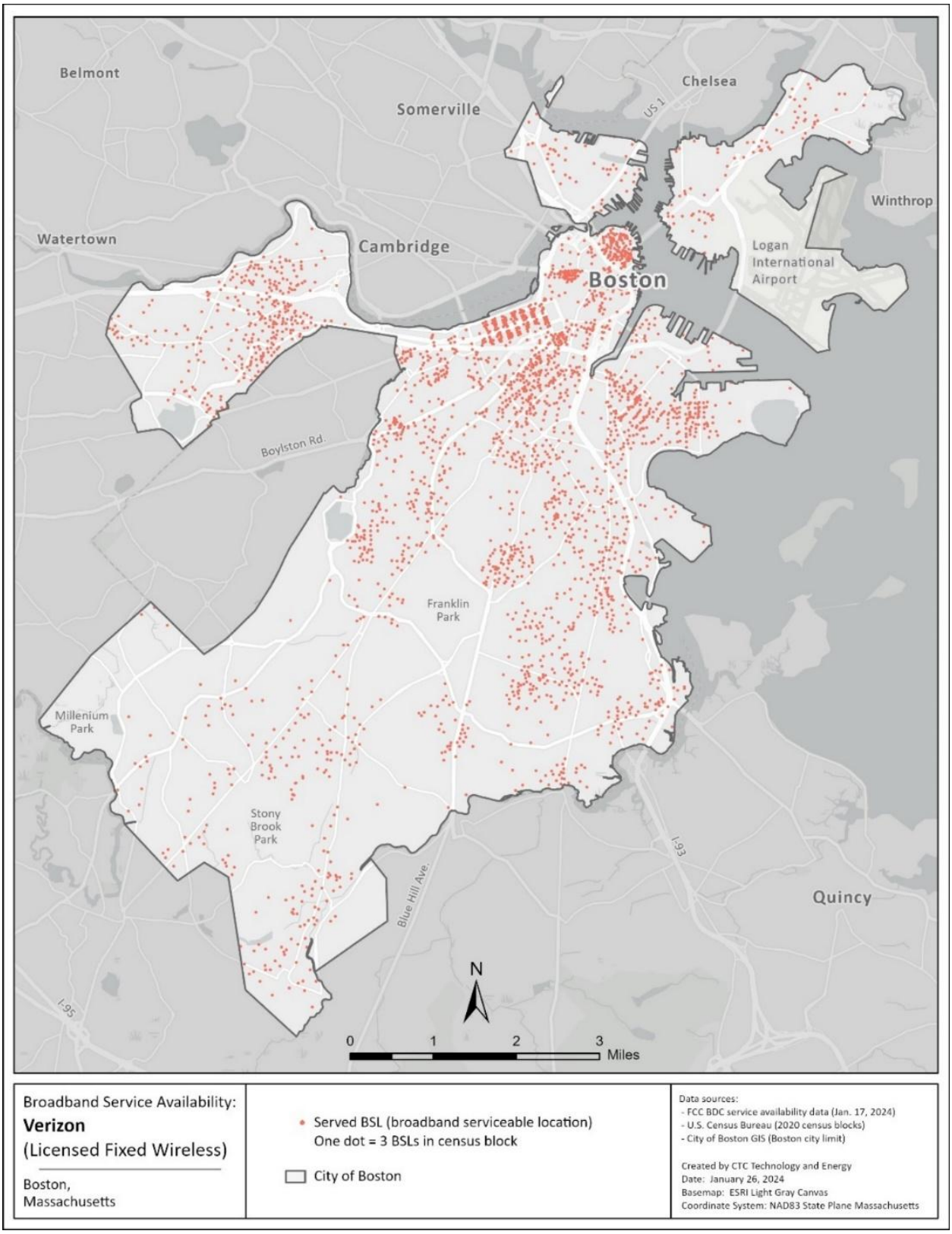


Figure 8: T-Mobile's licensed fixed wireless coverage in Boston

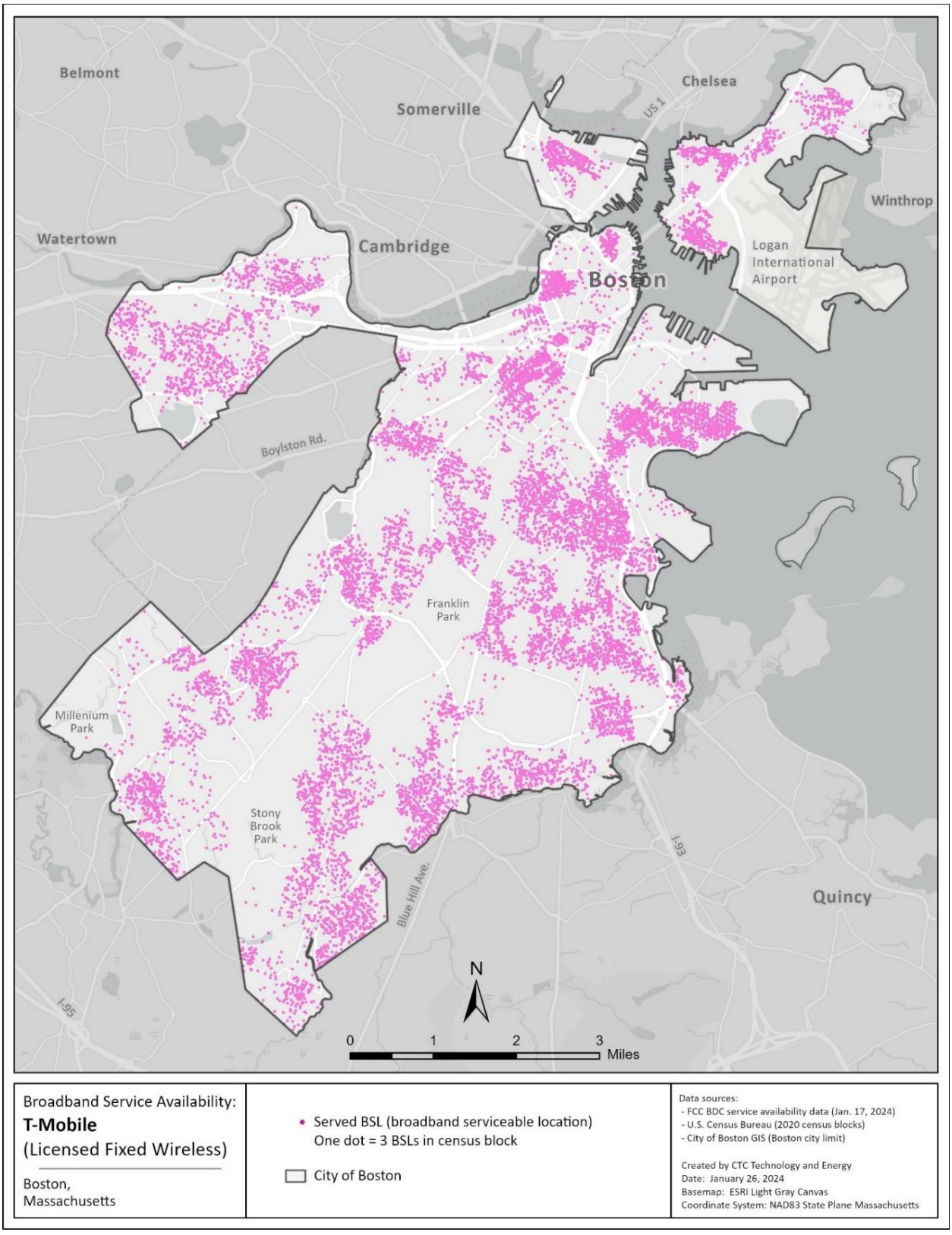
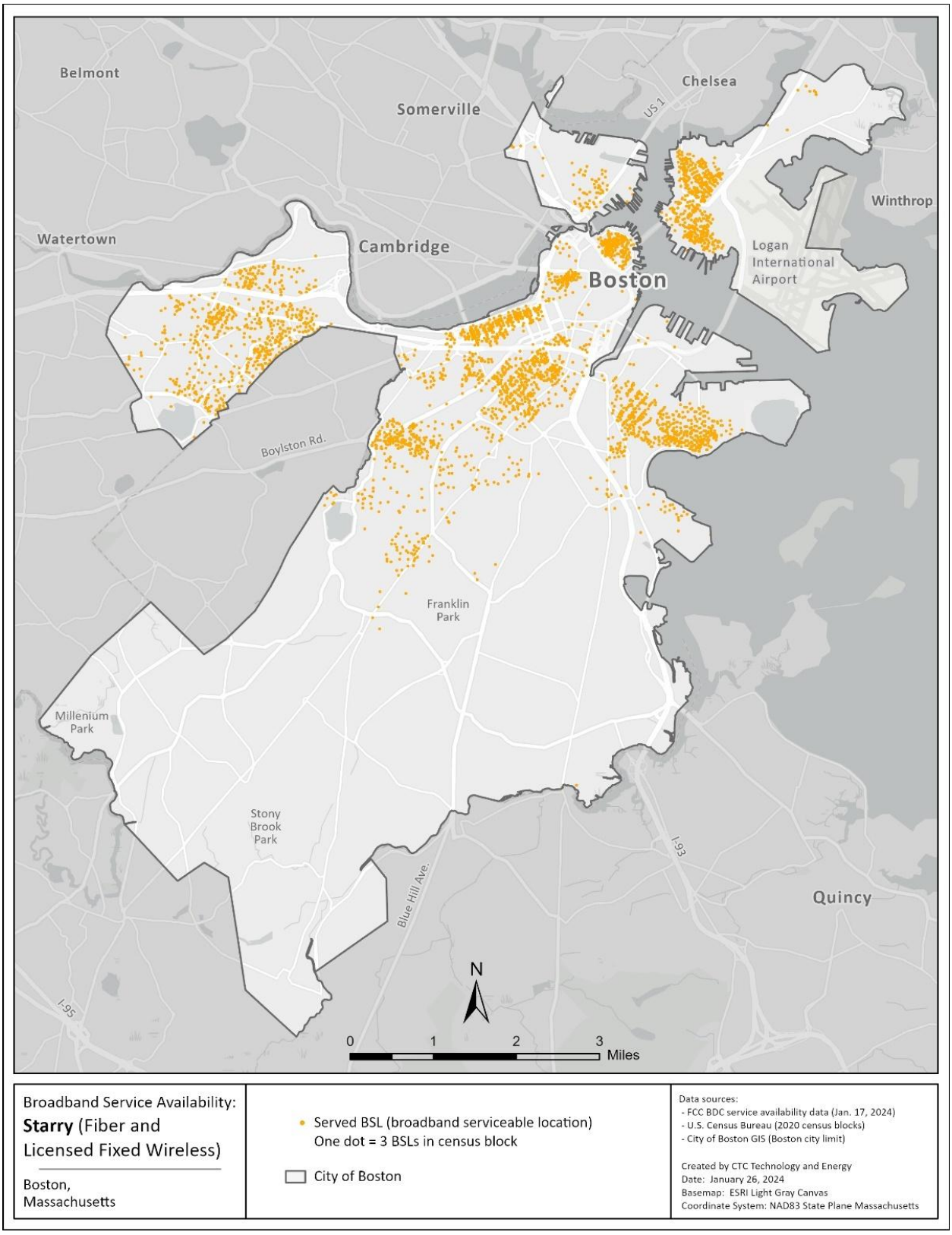


Figure 9: Starry's reported fiber and licensed fixed wireless coverage in Boston



5.3 Broadband subscription gaps are more prevalent in low-income areas

While Boston does not have significant gaps in network investment, there are still some potential issues, especially affordability—which may limit internet access.

5.3.1 Broadband service affordability issues

The U.S. Census Bureau collects data on a variety of topics in its American Community Survey (ACS). Demographic data from the survey was overlaid with broadband adoption figures. Figure 10 (below) shows areas in Boston where relatively higher percentages of the population do not have a home broadband internet subscription, according to 2017-2022 American Community Survey estimates, the most recent federal data offering this level of detail.

While this data does not reflect Boston's efforts to address digital equity from the beginning of the pandemic to January 2024, it highlights areas most in need of additional efforts. The Census data also does not indicate whether a lack of subscription is by choice, affordability obstacles, or other reasons, but additional device availability and income information will help to sort through these adoption issues.

Figure 11 (below) reflects the percentage of households without a computer by census block. ACS data show that approximately 1,500 households opt to use a tablet only, and over 21,500 households use a smartphone as their only type of device.

Throughout the City, internet subscription rates tend to decrease as the number of households below the poverty level increases (as shown in Figure 12, below).

Figure 10: Percentage of households without a broadband subscription (cable, fiber, or DSL)

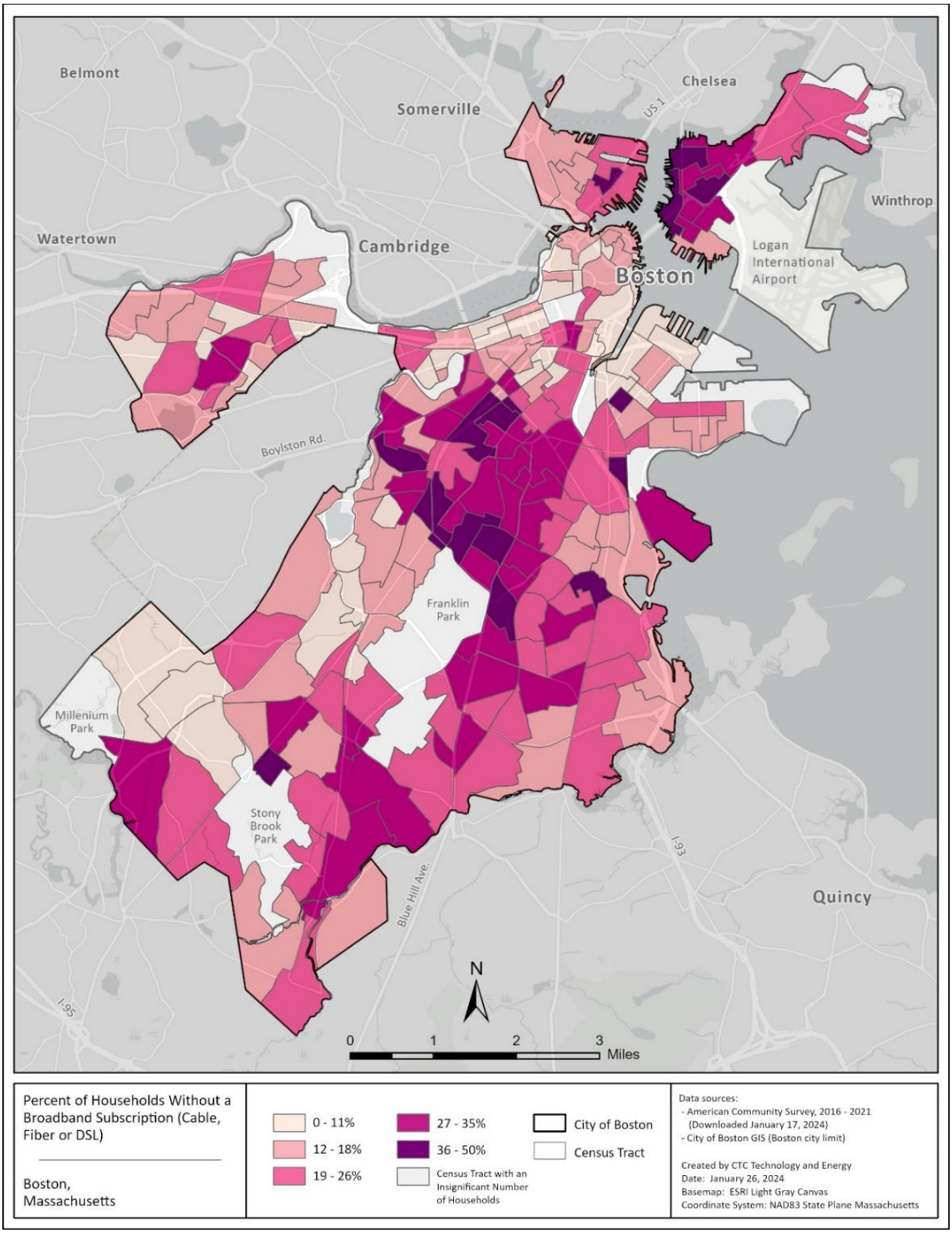


Figure 11: Percentage of households without a computer

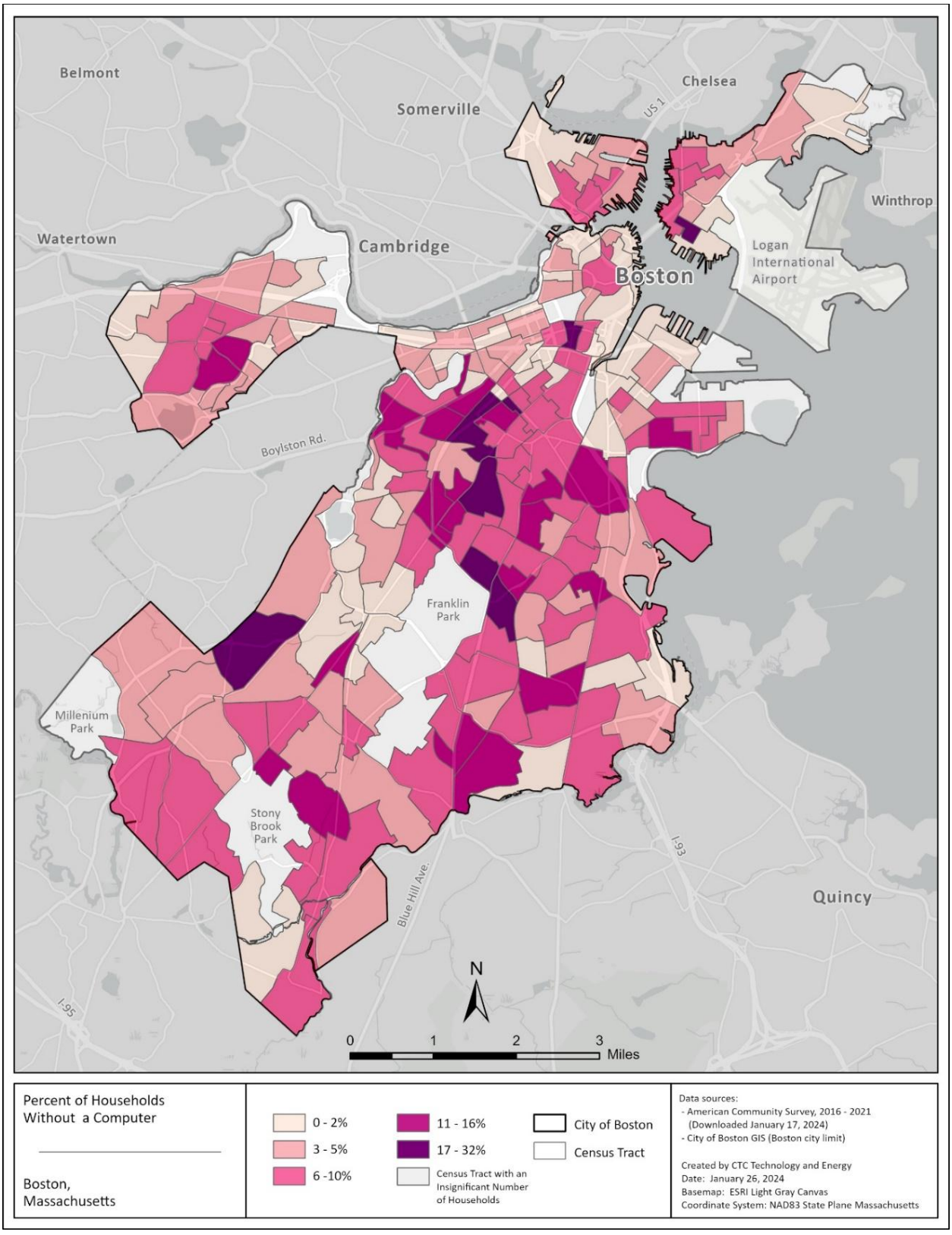
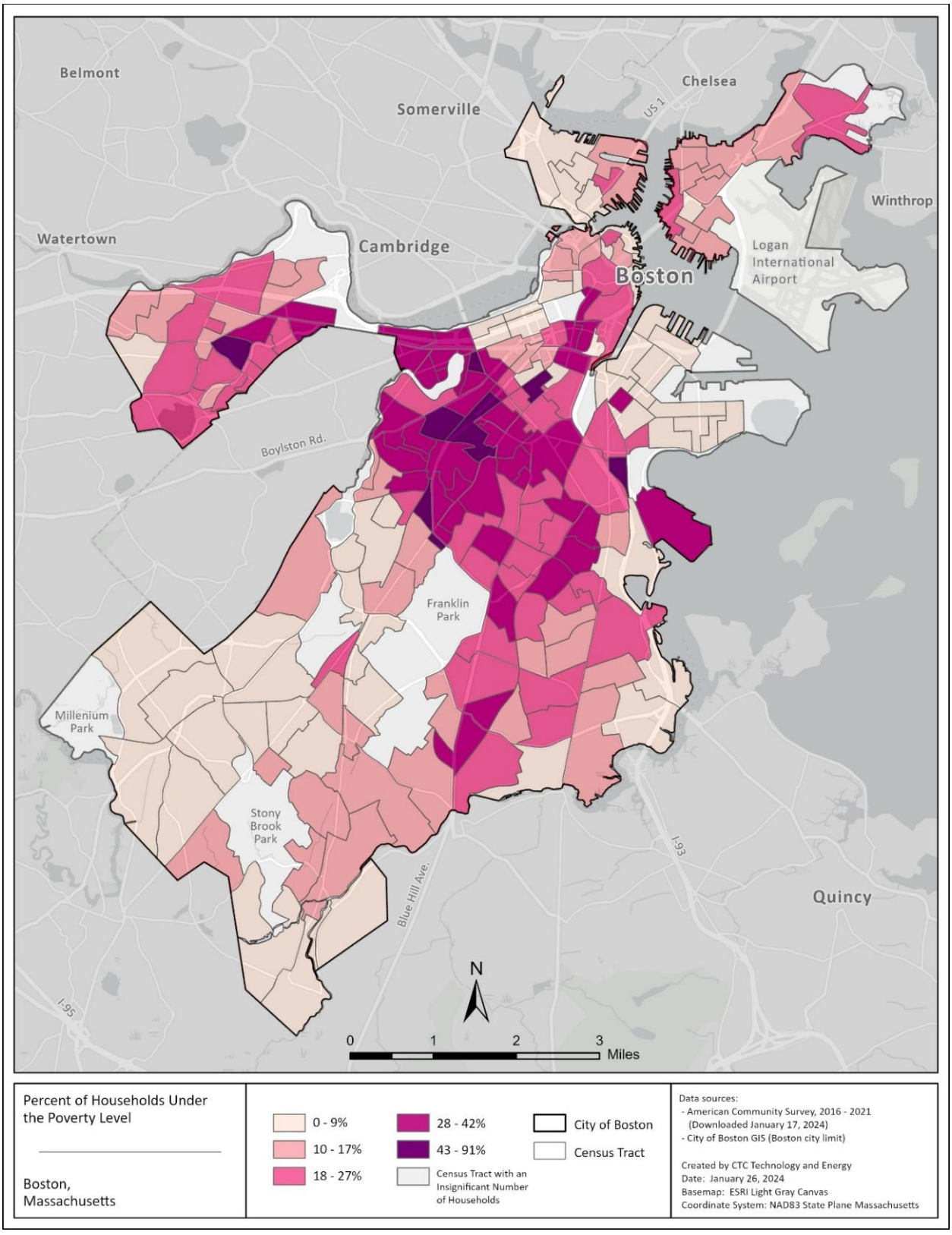


Figure 12: Percentage of households under the poverty level



5.3.2 Approximately 21,504 Boston households rely on mobile services alone

As shown in Figure 14, ACS survey data shows that roughly 8.7 percent of (or 21,504) Boston households reported solely using a cellular internet service for broadband connectivity at home. Some consumers who rely on cellphone data plans use their smartphones to connect to wireless hotspots and connect other computing devices to the internet.

The FCC has repeatedly noted that mobile service is an inadequate substitute for fixed broadband services;[21] however, an estimated 15 percent of U.S. adults continue to rely on their smartphones and mobile data plans as the only source of home broadband connectivity[22] – a trend that is more common among young adults and low-income households[23] and that is reflected here in Boston.

5.4 The ACP participation rate in Boston was 34 percent, which is higher than the rate for the state

The Affordable Connectivity Program (ACP provided a monthly subsidy toward some home internet subscriptions and presented an opportunity for many low-income residents to purchase a quality broadband subscription more affordably. Funding for this program was discontinued as of February 7, 2024. It is still important to look at enrollment rates for this program to understand how many Boston low-income customers could benefit from such programs, including available low-cost programs from local ISPs in the future.

On the final day of the ACP, estimates based on FCC data reported by zip code show that roughly 55,922 City households were receiving the ACP subsidy—which is about 39 percent of the estimated 142,400 eligible households in the City.[24] This rate is higher than the state (31 percent), and just below the national figure of 40 percent. Additionally, from January 2023 to February 7, 2024, Boston increased its total enrollments by 16 percent or approximately 23,041 households, which may reflect the positive results of City interventions designed to increase enrollment. This data is shown in Table 6.

Lack of enrollment among eligible households might have been due to a lack of awareness of the program and a challenging sign-up process; many eligible residents may have needed to go to a library or other location with internet access just to begin the registration process.

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[21] For example, 2020 Broadband Deployment Report, para 11.
[22] Andrew Perrin, "Mobile Technology and Home Broadband 2021," Pew Research Center, June 3, 2021, https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/.
[23] Andrew Perrin, "Mobile Technology and Home Broadband 2021."
[24] Estimates of total number of eligible households are based on 2021 American Community Survey reported data on household income, food stamp recipiency, Medicaid recipiency, supplemental security income, and public assistance income.

Table 6: ACP enrollment in Boston[25]

	Eligible households enrolled	Enrolled households	Eligible households	Unenrolled eligible households
Boston (Jan 2023)	23%	32,881	142,400	109,519
Boston (June 2023)	30%	42,421	142,400	99,979
Boston (Dec 2023)	34%	48,923	142,400	93,477
Boston (end of ACP)	39%	55,922	142,400	86,478
Massachusetts	31%	358,383	1,156,300	797,917
United States	40%	22,190,763	55,179,000	32,988,237

5.5 Although the ACP has ended, qualifying Boston residents have access to some low-cost broadband programs

Broadband providers in Boston participated in the now-expired ACP, either directly or through affiliates, and some still offer their own low-cost programs. When the discounts are combined, these programs have enabled qualifying low-income residents to receive service at no cost. (Mobile plans have also been ACP-eligible, but each household can only use ACP once—so if a household has enrolled using the benefit for a mobile plan, they cannot get the benefit again for a home plan.)

Those who do not qualify for a discounted plan must pay a minimum of $77 a month after the promotional price expires for reliable wired broadband speeds. For example, residents can obtain initial pricing from Comcast of $25 per month but these prices rise sharply following the promotional period.

The ACP program has stopped accepting new enrollments as of February 7, 2024, and has stopped providing this broadband discount to existing ACP participants as of April 2024. Residents currently enrolled in this program will need assistance navigating and pursuing alternative low-cost internet service options.

5.5.1 Service offerings and prices by internet service provider

5.5.1.1 Comcast service offerings and prices

Table 7 shows Comcast's service offerings in Boston. Options that had been free with ACP and/or are designed for eligible low-income residents are shaded green.

[25] "ACP Enrollment and Claims Tracker," USAC, data as of December 31, 2023, https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/.

Table 7: Comcast's advertised service plans in Boston

Package	Internet speed	Monthly Cost	Notes
Internet Essentials	50/10 Mbps	$9.95	Available to eligible low-income customers following an application process and subject to certain conditions. Internet Essentials also includes added benefits; customers can purchase a refurbished computer for $149.99.[26]
Internet Essentials Plus	100/20 Mbps	$29.95	Available to eligible low-income customers following an application process and subject to certain conditions. Internet Essentials also includes added benefits; customers can purchase a refurbished computer for $149.99.
NOW Internet 100	100/10 Mbps	$30	Requires self-installation and activation of refurbished gateway. Payments must be made online only via credit, debit, or prepaid card. Autopay and paperless billing required. Unlimited data. Pricing subject to change.
NOW Internet 200	200/10 Mbps	$45	Requires self-installation and activation of refurbished gateway. Payments must be made online only via credit, debit, or prepaid card. Autopay and paperless billing required. Unlimited data. Pricing subject to change.
Connect	150/10 Mbps	$25 for the first 24 months, then $77 plus $15/mo. router rental fee	Pricing is guaranteed for 12 months. No term contract. Includes $10/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.
Connect More	300/10 Mbps	$35 for the first 24 months, then $77 plus $15/mo. router rental fee	Pricing is guaranteed for 24 months. No term contract. Includes $10/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.
Fast	500/10 Mbps	$45 for the first 24 months, then $92 plus $15/mo. router rental fee	Pricing is guaranteed for 24 months. No term contract. Includes $10/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.

[26] "Comcast Broadband Opportunity Program," Comcast, https://www.xfinity.com/support/articles/comcast-broadband-opportunity-program (accessed January 2024).

Package	Internet speed	Monthly Cost	Notes
Superfast	800/10 Mbps	$60 for the first 24 months, then $97 plus $15/mo. router rental fee	Pricing guaranteed for 36 months. No term contract. Includes $10/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.
Gigabit	1000/20 Mbps	$70 for the first 24 months, then $102 plus $15/mo. router rental fee	Pricing guaranteed for 36 months. No term contract. Includes $20/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.
Gigabit Extra	1200/35 Mbps	$80 for the first 12 months, then $107 plus $15/mo. router rental fee	Pricing guaranteed for 36 months. No term contract. Includes $20/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card.

5.5.1.2 Astound service offerings and prices

Astound offers three main plans as shown in Table 5. There is a large difference in price between their discounted rate and their non-promotional rate. Astound customers who sign up for their plans are offered the promotional rate for the first year of service, however, after this first year their rates will increase by nearly $100 per month.

Table 8: Astound's advertised service plans in Boston

Internet speed	Monthly Cost	
50/10 Mbps (Internet First)	$9.95	Eligible households must be: • A participant in public assistance programs like the National School Lunch Program, housing assistance, Medicaid, SNAP, SSI, and others • Students under federal assisted aid programs can qualify for Internet First by supplying an award letter. • Must not be subscribed to Astound services within sixty (60) day period immediately prior to applying
150/20 Mbps (Internet First)	$19.95	
300/20 Mbps	Discounted price $25.99/mo.; regular price $143.99/mo.	Discounted price is available for the first year of service. Price does not include $12/month for equipment rental or $79.95 installation fee.
600/20 Mbps	Discounted price $35.99/mo.; regular price $148.99/mo.	Discounted prices are available for the first year of service. Price does not include $12/month for equipment rental or $79.95 installation fee.

940/20 Mbps	Discounted price $45.99/mo.; regular price $153.99/mo.	Discounted price is available for the first year of service. Price does not include $12/month for equipment rental or $79.95 installation fee.

5.5.1.3 Verizon service offerings and prices

Verizon's DSL service is no longer being offered to new customers in Boston. It was offered at a flat charge of $40/month regardless of the network performance and speeds delivered to the household. Verizon further requires a bundled home phone voice service subscription at $34.99, effectively making its DSL service $74.99 to Verizon customers regardless of the speeds being provided. Verizon's DSL service and bundled home phone plan is almost the same price as Comcast's non-promotional prices for a plan with far faster speeds.

FCC service availability data, shown in Table 1 above, demonstrate that 11,378 Boston households may be receiving service at 10/1 Mbps and that 19,178 households are receiving significantly below even these speeds at 0.2/0.2 Mbps. This speed variation could be a result of whether the residence is located closer to Verizon's central network equipment. (Verizon's own marketing materials state that the service could provide download speeds between 1.1 Mbps and 15 Mbps but also states that the majority of customers will only receive 1.1 to 3 Mbps and that rates are only good for one year.)[27] Table 9 shows the service plans CTC was able to find in Boston.

Table 9: Verizon's advertised DSL service plans in Boston

Package	Internet download speed	Monthly cost	Notes
DSL High-Speed Internet	1.1 to 3 Mbps or 3.1 to 7 Mbps	$40	Either speed requires an underlying land line service at $34.99/month. Customers may use their own router or purchase one for $99.

Table 10 shows Verizon Wireless' 5G Home Internet service plans. Verizon does not require users to subscribe to Verizon Wireless mobile plans to get these 5G Home Internet options, but significant discounts are only available if the fixed wireless service is bundled with a wireless plan and handset. These plans include a Verizon Forward program (shaded green) which can provide a $30 per month discount to any eligible low-income households.

[27] Verizon DSL Internet: Talk and surf at the same time, https://go.verizon.com/residential/high-speed-internet (accessed November 20, 2023).

Table 10: Verizon Wireless' advertised fixed broadband service plans in Boston

Package	Internet speed	Monthly cost	Notes
5G Home Internet	50/5 Mbps	Discounted price $35/mo.; regular price $60/mo.	$10 discount available with Autopay and paperless billing. $15 discount when bundled with postpaid Verizon cellular plan and 5G phone. Pricing guaranteed for 24 months. Wireless Router and $50 Amazon gift card included. Pricing for wireless plan and phone not included here.
5G Home Internet Plus	80/10 Mbps	Discounted price $45/mo.; regular price $80/mo.	$10 discount available with Autopay and paperless billing. $25 discount when bundled with postpaid Verizon cellular plan and 5G phone. Pricing guaranteed for 36 mos. Wireless Router, whole-home internet, and choice of Echo Show or $200 Amazon gift card included. Pricing for wireless plan and phone not included here.
5G Home Internet (Verizon Forward Program)[28]	85/10 to 300/20 Mbps	$30 discount to regular price of subscriptions	Eligibility includes Federal Pell Grant recipient within the last year, qualify for Lifeline (through participation in SNAP, Medicaid, or have income be 125% below FPL), and WIC. If enrolled in ACP, a transfer of an active ACP to Verizon Forward is allowed; wireless router included; available to existing customers. Can use Lifeline discount if applicable.

Verizon's Fios fiber plans are generally less expensive than those offered by Comcast for similar download speeds, as shown in Table 11 (with the low-income program shaded in green). Additionally, Fios offers symmetrical download/upload speeds regardless of plan.

Table 11: Verizon Fios' advertised service plans in Boston

Package	Internet speed	Monthly cost	Notes
Fios 300 (Verizon Forward Program)	300/300 Mbps	$49	The $30 ACP subsidy and Verizon discount brought the cost to $0.
Fios 300	300/300 Mbps	$49.99	Pricing guaranteed for 24 months. No term contract. Router included. Possible $99 set up fee, location dependent.
Fios 500	500/500 Mbps	$69.99	Pricing guaranteed for 36 months. No term contract. Router included. Possible $99 set up fee, location dependent.

[28] "Verizon Forward," Verizon, https://www.verizon.com/discounts/verizon-forward/.

Package	Internet speed	Monthly cost	Notes
Fios 1 Gig	940/880 Mbps	$89.99	Pricing guaranteed for 48 months. No term contract. Router included.

5.5.1.4 T-Mobile wireless service offerings and plans

T-Mobile did not participate in ACP directly for either its 5G Home Internet or mobile data plans. Only T-Mobile affiliates – Metro by T-Mobile and Assurance Wireless – participated in ACP and offered discounts on mobile data plans. Boston residents that qualified for ACP were required to sign up with prepaid provider Metro by T-Mobile for 5G Home Internet and could apply the ACP discount to the bundled 5G prepaid mobile plan. Metro by T-Mobile offers a 5G Home Internet plan and a mobile prepaid voice and data plan for $50 a month. Assurance Wireless does not offer fixed wireless home internet.

Table 12 shows pricing for T-Mobile's 5G Home Internet service plan at $50/month for 5G Home Internet-only service. T-Mobile will provide 5G Home Internet at $30/month if it is bundled with a cellular plan that costs between $60-100/month for a single line.[29] T-Mobile prices its 5G Home Internet plans regardless of provided speeds.

T-Mobile did not participate in ACP directly for either its 5G Home Internet or mobile data plans.[30] Only T-Mobile affiliates – Metro by T-Mobile and Assurance Wireless – participated in ACP and offered discounts on mobile data plans. Boston residents that qualified for ACP were required to sign up with prepaid provider Metro by T-Mobile for 5G Home Internet and could apply the ACP discount to the bundled 5G prepaid mobile plan. Metro by T-Mobile offers a 5G Home Internet plan and a mobile prepaid voice and data plan for $50 a month.[31] Assurance Wireless does not offer fixed wireless home internet.

Table 12: T-Mobile's advertised home internet service plan in Boston

Package	Internet speed	Monthly cost	Notes

[29] T-Mobile Home Internet, https://www.t-mobile.com/home-internet/plans?INTNAV=tNav%3APlans%3AHomeInternetPlan (accessed November 19, 2023).
[30] "Taking part in ACP- through both Assurance Wireless and Metro by T-Mobile – is just one way that T-Mobile demonstrates its commitment to bringing wireless access to everyone," T-Mobile Newsroom, Press Release, February 8, 2023, https://www.t-mobile.com/news/community/t-mobile-expands-acp; See also, T-Mobile website, "T-Mobile is proud to participate in the new federal Affordable Connectivity Program, which offers internet service payment assistance to eligible households. We're making the program available through Metro by T-Mobile and Assurance Wireless." https://www.t-mobile.com/brand/affordable-connectivity-program?INTNAV=fNav%3AAdditionalSupport%3AAffordableConnectivityProgram.
[31] Metro by T-Mobile 5G Home Internet, https://www.metrobyt-mobile.com/plans/home-internet (accessed November 19, 2023). Customers that are not participating in autopay will pay $25/month. Customers must also purchase a modem for a one-time fee of $49.99.

5G Home Internet	75/20 Mbps*	$30 mo. for T-Mobile 5G Wireless customers; $50 mo. for 5G Home Internet service only	Pricing includes a $5/mo. autopay discount. $30 service is only available to customers with a T-Mobile 5G phone and plan offered between $60-100/mo., plus the cost of a handset. Gateway router provided at no charge but one-time $35 device connection charge at sign up.

* Speeds are estimated and rounded. Quoted download speeds were 76-245 Mbps with claims that 50% of customers experience speeds in this range and the remaining customers could receive service faster or slower than this range. Upload speeds were quoted as 21-40 Mbps.

5.5.1.5 Starry's service offerings and plans

Starry offers several tiers of service, including symmetrical service at its lowest speed tiers. Table 8 summarizes these offerings.

Starry reported that approximately 12,000 premises can receive service in the Boston metropolitan area, approximately half of which are in low-income housing, including in one BHA building—Ausonia. Residents of such developments are automatically eligible for the low-cost "Starry Connect" service for $15 monthly.

The company defines such developments as ones where at least 90 percent of the units are owned by a public housing authority, are subsidized by federal, state, or local dollars, or are income-restricted or rent-regulated/stabilized under a local or state or federal affordability program, or officially classified as workforce housing by a local housing agency.

In terms of historical pricing, a Starry representative said the company has not changed its pricing for its basic 200 Mbps plan ($50) since launch but has added additional speed tiers (both lower and higher) at different prices.

Starry filed for bankruptcy in 2023 but has successfully exited its Chapter 11 Restructuring as of August of that year. During this restructuring process, Starry continued to operate as normal and remains in operation across its five markets today in Boston, New York, DC, Denver, and Los Angeles.

Table 13: Starry's advertised home internet service plan in Boston

Service	Advertised download/upload speeds	Monthly price (non-promotional)	Notes
Connect	30/30 Mbps	$15.00	Only available in Starry Connect Communities (public and affordable housing)
Starry 200	200/50 Mbps	$45.00	Unlimited data, no installation fees, no early termination fee, $9 modem rental.
Starry 300	300/50 Mbps	$65.00	Unlimited data, no installation fees, no early termination fee, modem included.

Service	Advertised download/upload speeds	Monthly price (non-promotional)	Notes
Starry 500	500/50 Mbps	$75.00	Unlimited data, no installation fees, no early termination fee, modem included.
Starry 800	800/50 Mbps	$85.00	Unlimited data, no installation fees, no early termination fee, modem included.
Starry 500*	500/250 Mbps	$70.00	Promotion for 1st year - $60 per month *250 Mbps upload availability dependent on site capacity (i.e. internal building infrastructure)
Starry 800	800/250 Mbps	$80	Promotion for 1st year - $70 per month
Starry Gigabit	1Gig / 50 Mbps	$85	Promotion for 1st year - $75 per month
Starry Gigabit*	1 Gig / 250 Mbps	$85	Promotion for 1st year - $75 per month *250 Mbps upload speed availability dependent on site capacity (i.e. internal building infrastructure)

5.5.1.6 NetBlazr's service offerings and plans

NetBlazr, offers three service plans, Concierge Internet (one payment), Concierge Internet (monthly payment), and Standard Internet. Table 14 summarizes the services offered.

In May 2022, NetBlazr became an ACP provider. To encourage ACP participants to enroll in Netblazr's services, the company launched a 300/300 Mbps ACP offering for $30 per month, making it free to residents who get a $30 monthly ACP credit.

Now that ACP has finished, NetBlazr does not have a reduced-price service for individual low-income households but has done bulk deals to provide low cost or no cost services in several subsidized housing complexes.

Table 14: Netblazr's advertised home internet service plan in Boston

Package	Internet speed	Monthly cost	Notes
Concierge Internet (Month-to-Month)	500 or 1000 Mbps	$59.95	No rate hikes, free installation. Speeds determined by location of service.

Package	Internet speed	Monthly cost	Notes
Concierge Internet	500 or 1000 Mbps	$50	No rate hikes, free installation. Speeds determined by location of service. This plan uses an annual payment system rather than a monthly one.
Standard Internet	100 or 300 Mbps	$39.95	No rate hikes, free installation. Speeds determined by location of service.

5.6 Beyond low-cost programs, ISPs offer a variety of other programs and philanthropic efforts

Some service providers in Boston have made capital contributions to the City and local nonprofits in an effort to close the digital divide.

5.6.1 Verizon

Verizon has contributed more than $6 million in funding and support for digital equity efforts in Boston, including $2.5 million in in-kind contributions to the City in the form of Smart City support during COVID for hotspots and tablets to BPS households, seniors in public housing and others in need of digital connectivity.

In 2016, the City of Boston announced a partnership with Verizon to conduct a pilot project to provide traffic condition monitoring supported by network infrastructure the provider was already installing in Boston. This was an in-kind contribution to the City that Verizon agreed to as the company was upgrading its local 4G LTE network and expanding Fios internet and cable service to all neighborhoods in Boston. This pilot project also included Verizon's contribution of $100,000 to the City, which was used to support a mobile hotspot lending program at BPL.

This pilot led to an expanded partnership between Boston and Verizon. In 2018, Verizon and the City signed a 10-year agreement where Verizon committed to expanding its wireless small cell network to boost network speed and capacity to lay the foundation of improved services in the City while continuing to collaborate with Boston on intelligent surveillance, intelligent city lighting, traffic condition monitoring, and other smart city applications. As part of this agreement, and as noted above, Verizon also committed to contributing $1 million to the Boston Digital Equity Fund. Additionally, in response to the pandemic, approximately $2.5 million of the $4.7 million committed to funding these smart city applications was reallocated to fund hotspots and data plans to support Boston Public School students.

5.6.2 Comcast

Comcast shared that 37,500 Boston residents had enrolled in the Internet Essentials program from 2011 through December of 2023; the company did not provide current active enrollment numbers. Comcast provides an Internet Essentials help line in English and Spanish. The online application is available in seven languages and printed material is available in 34 languages.

Comcast also partnered with local Boston organizations to provide free Wi-Fi to community spaces. Comcast now operates 36 of these free community Wi-Fi spaces (known as "Lift Zones") in the City. Additionally, the company provides free Wi-Fi service in 35 BHA common areas and maintains a commitment to provide a level of free service to Boys & Girls Clubs in Boston and across the Commonwealth. Comcast also provides free Wi-Fi service to BCNC at 38 Ash Street, Mattapan Tech, BGCB HQ and Project 351.

Comcast also works with local organizations to distribute laptops to Bostonians in need in partnership with Tech Goes Home, ETHOS, BPL, Boston Chinatown Neighborhood Center, and Harvard Street Community Health Center. In October 2024, Comcast donated $50,000 to the Boston Public Library Fund to double the number of Connectivity Kits available to Boston residents with a library card.

Over the past two years Comcast has provided over $200,000 and more than 200 computers to Tech Goes Home's digital inclusion program. In October of 2023 the company provided $70,000 to fund a digital navigation program at Boston nonprofit ETHOS along with laptop computers for 125 seniors served by the organization.

Comcast has provided computers to students in the last three basic digital literacy classes delivered by the Timothy Smith Network at The Veterans Outreach Center at Harvard Street Community Health Center and to adult learners in Boston Chinatown Neighborhood Center's Adult Education Program.

Since the last publication of this report, Comcast has contributed more than 7 million dollars in cash and in-kind support to Boston based organizations with a particular focus on supporting digital equity focused inclusion and workforce development at organizations such as Tech Goes Home, The Urban League of Eastern MA, Boston Chinatown Neighborhood Center, The Fund for Boston Centers for Youth and Families, The Boston Public Library Fund, and Save the Harbor.

5.6.3 Starry

Starry has partnered with the BHA to provide free community-area Wi-Fi access at Ausonia—a 100-unit senior living community. Starry deployed access points to each of the community's common areas, and on hallways of each of the floors. Starry also donated five computers for a designated computer lab for Ausonia residents.

In addition to its project with BHA at Ausonia, Starry also provides its Starry Connect service in thousands of affordable housing units located in the City of Boston.

5.7 American Community Survey data reveal that low-income Boston residents face gaps in subscriptions and device ownership

Data on internet adoption and device ownership is important to fully understand the nature of the digital divide in Boston. ACS survey data show that Boston lags the state and national averages in internet adoption and device ownership. While high-speed broadband services are available throughout Boston, many households do not subscribe or own devices necessary to fully use these services—and those lacking subscriptions or devices are largely lower-income households.

The ACS is conducted yearly and nationwide by the U.S. Census Bureau. However, it is important to note a five-year sampling period (2016 – 2022)[32] that may not accurately illustrate most recent trends.

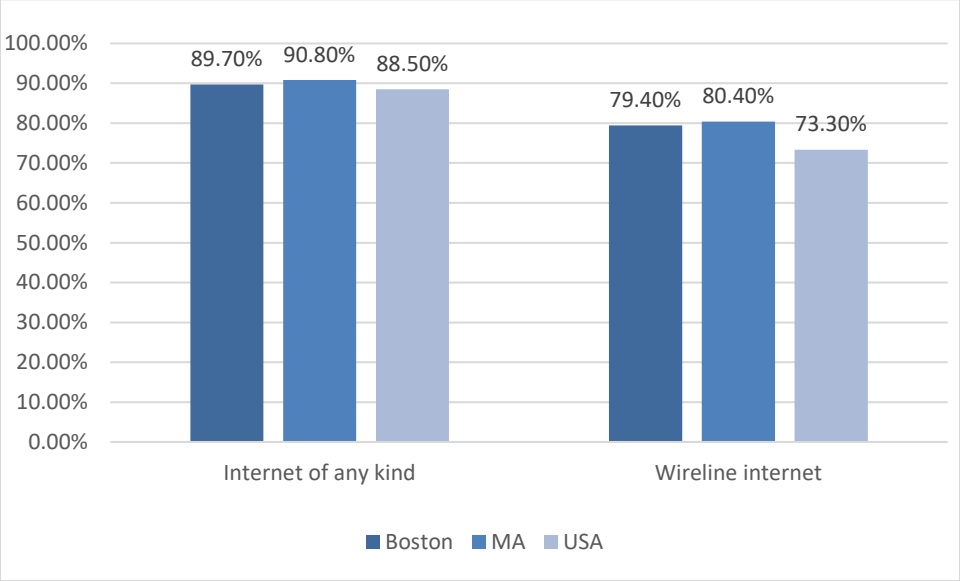
A preliminary analysis of the ACS data found that in Boston:

- 20.6 percent of households lack a wireline internet subscription.
- 81.4 percent of households that lack a wireline internet subscription earn less than $75,000 annually.
- 17.5 percent of households do not own a desktop or laptop computer device.

5.7.1 Boston lags the state and leads the national adoption rates for residential internet subscriptions, but low-income residents face the most significant gaps

According to ACS data, 89.7 percent of Boston households subscribe to residential internet services. Most of these subscriptions, 79.4 percent, are via wireline technology (fiber, cable, or DSL). The city slightly lags the state but leads the nation in both of these metrics, as shown in Figure 13.

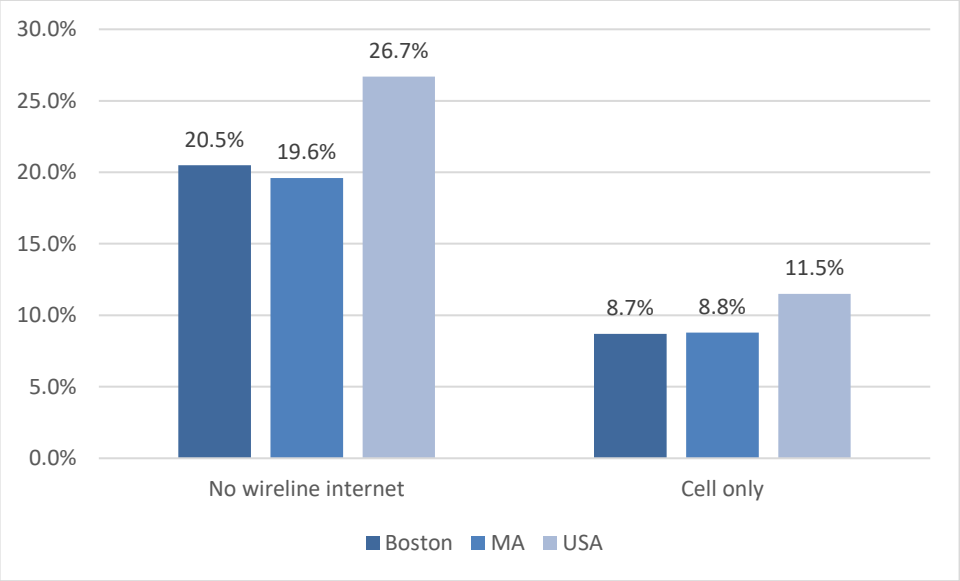
Figure 13: Internet subscription rates in Boston compared to the state and nation



Internet adoption rates are relatively low in Boston, with an estimated 56,800 (or 20.5 percent of) households lacking residential wireline internet service (Figure 14). Of those households without wireline service, roughly 24,077, or 8.7 percent are using only a cellular internet service from their homes. Lower income households may use their cellular connection and smartphone in lieu of a more robust connection. However, reliance on cellular service will not enable all members of a household to participate in the digital economy because of data caps and the potential for the service to be throttled in times of mobile network congestion.

[32] The U.S. Census Bureau does not release data for communities the size of Boston for sampling periods less than five years to keep margins of error to a minimum.

Figure 14: No access to wireline internet and mobile-only subscriptions compared to the state and nation

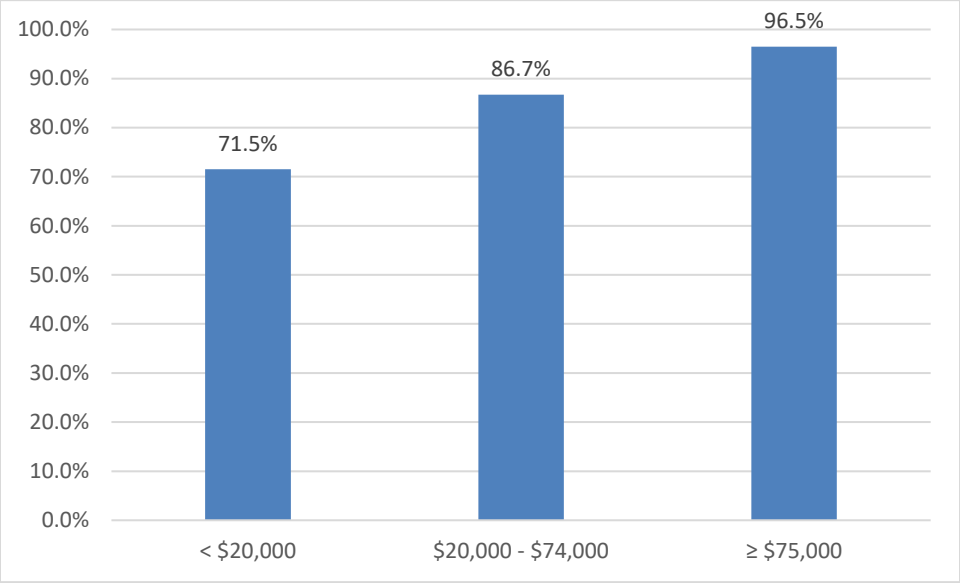


5.7.2 Most Boston households that lack wireline internet access earn less than $75,000 per year

In Boston, most of the households lacking an internet subscription are lower-income households. Whereas 96.5 percent of households making more than $75,000 subscribe to wireline internet services, only 86.7 percent of households making between $20,000 and $75,000, and 71.5 percent of those earning $20,000 or less do so.[33] After accounting for the total number of households without a broadband internet subscription across all three income brackets, an estimated 81.4 percent of (or 23,251 out of 28,553) households without an internet subscription earn less than $75,000 per year. Figure 15 shows subscription rates by income bracket.

[33] For both of these income brackets, some households are likely able to afford service yet choose not to purchase it because they simply are not interested. For this reason, a 100 percent subscription rate does not represent the ideal or goal rates for any given population.

Figure 15: Wireline internet subscription rates by income level



5.7.3 Boston matches both state and national device ownership rates overall, and only 5.8 percent of households lack device access

ACS data show that 94.2 percent of households in Boston own one or more computing devices, a figure that is nearly the same as both state (94.3 percent) and national (94.0 percent) figures. Access to affordable devices that meet a household's needs is a critical element of the effort to expand broadband access to any community. Looking across different types of devices, including desktop, laptop, smartphone, and tablet ownership, Boston's ownership rates show that the City matches the state and leads the nation in desktop or laptop ownership, leads the state and nation in smartphone ownership, but lags the state and nation in tablet and other devices (Figure 16).

Figure 16: Device ownership rates in Boston compared to the state and nation

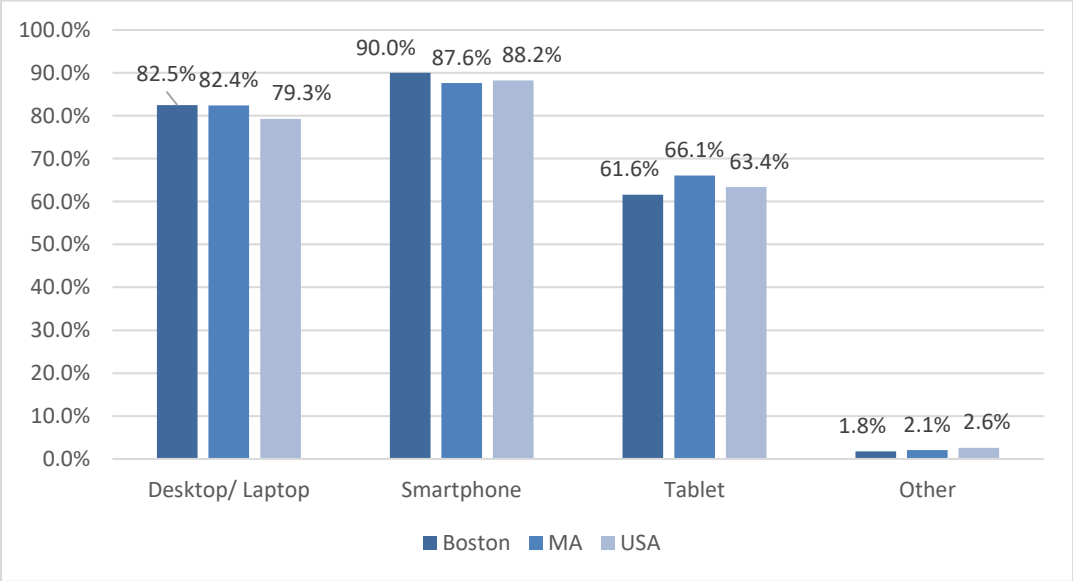
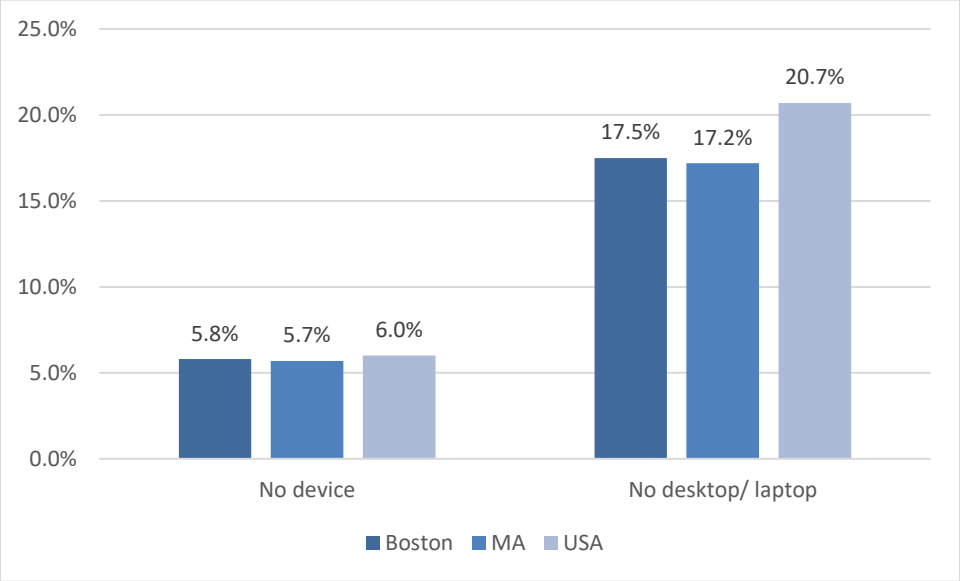


Figure 17 shows that 5.8 percent of Boston households lack a device, which is nearly the same as the state and national averages of 5.7 percent and 6 percent, respectively. Additionally, 17.5 percent of households in Boston do not have a laptop or desktop leaving these residents to rely on smartphones or tablets and making it difficult to fully engage in the digital economy or successfully learn and work from home.

Figure 17: Lack of devices in Boston compared to state and national averages



Additional device barriers may exist even after device ownership numbers are improved. For households with many individuals, a single desktop or laptop will likely not deliver sufficient capacity for all members of the household to meaningfully use the internet. Further, ownership of a device is not sufficient to ensure full access to the benefits of broadband. Many households will require digital literacy training and access to technical support to maximize the benefits of these services.

6 Survey documents significant gaps in access, skills, and devices among low-income residents of Boston

MassINC Polling Group (MPG) was engaged as part of this study to conduct a multi-step survey research program to gather data about resident opinions and experiences as they relate to digital equity.

Digital equity is critical to the health of modern societies given direct impacts on economic opportunities, education, and quality of life. Access to digital resources ensures that all residents can participate in the modern economic system, reach their educational goals, and access essential services. Understanding the extent and nature of digital inequities through comprehensive survey programs such as this one allows policymakers and community organizations to develop targeted interventions. This survey provides valuable insights into the current state of digital access in the City of Boston and identifies key areas requiring attention.

When it comes to measuring and analyzing digital equity, there are a range of potential frameworks. For the purposes of this report, we are using a conventional digital equity model with three main elements: 1) internet access, 2) device access, and 3) digital literacy and skills. The main sections of this report are based on these elements, with questions from the survey related to each topic area. The data outlined in each section provides an in-depth look at how residents of the City are experiencing these components and offers insight into gaps where policy leaders could focus.

Any survey offers near infinite ways of grouping response data. For this report, we focus on priority populations for digital equity, as defined by stakeholders from the City of Boston who guided the survey process. The tables throughout the report show the results broken out by these groups, allowing decision makers to focus on the needs and experiences of the groups most impacted by digital equity concerns. Survey questions used to identify the groups and the number of respondents are shown in Table 15.

Table 15: Priority groups matched with survey questions and answers

Group description *(response count total)*	**Survey question (response option)**
Immigrant populations *(n=332)*	Were you born on the island of Puerto Rico, in the United States, or in another country? (Another country)
People who speak languages other than English *(n=422)*	What languages are spoken regularly at home? (Selected any language other than English)
School-aged families *(n=330)*	How many children under the age of 18, currently live in your household? (1 or more)
People in public housing / restricted housing units* *(n=766)*	Do you live in affordable housing? Affordable housing is defined as housing subsidized by a housing authority, paid for through a voucher, or in a building run by a private developer (Yes)
Seniors/Older adults *(n=264)*	What is your age? (Age 60+)
Low-income populations *(n=335)*	Last year, what was your total family income from all sources, before taxes? (Under $40K)
LGBTQ+ community *(n=156)*	Which of the following best describes you? (Selected any LGBTQ+ identifier)

Group description *(response count total)*	**Survey question (response option)**
Black community *(n=331)*	How would you describe your race or ethnicity? (Black alone or in combination)
Latino community *(n=320)*	How would you describe your race or ethnicity? (Latino alone or in combination)
People with disabilities *(n=232)*	Do you identify as a person with a disability? (Yes)
Veterans *(n=59)***	Did you serve on active duty in the U.S. Armed Forces? (Yes)
Indigenous community *(n=35)***	Do you belong to a North American Indigenous, Native, or Tribal group? (Yes)
Unhoused people *(n=28)***	Do you live in affordable housing? (I am currently unhoused and do not have a home to live in)
People on government assistance programs* *(n=983)*	Do you receive or take part in any of the following government programs? (Yes to any)
Formerly incarcerated people *(n=58)***	Were you ever formerly incarcerated? (Yes)

* The figures for people in public housing/restricted housing units and those who receive government assistance includes a large number of responses collected by community-based organizations and the BHA. All other response groupings are exclusively drawn from the representative survey.

** Sample sizes for some priority groups were small, as indicated in this table and survey results shown in the report. Given the important of these groups to city leaders, results are shown for all priority groups, but caution is strongly recommended when interpreting the results for any group with under 100 responses.

6.1 Key findings

Digital access is essential to an equitable modern society. Digital access is not a privilege, it is a necessity for participating in a broad range of everyday activities. But despite the importance of opportunities to participate in the digital world, the survey finds many within Boston remain cut off from the opportunities offered by equitable access. While large majorities have sufficient access, it is by no means universal. For example, while the vast majority of residents (85%) report sufficient internet at home, one in four lower income households do not have sufficient internet. Similarly, although 84% of the general population report having sufficient devices, just 69% of those in households with annual income less than $25,000 say the same. Digital skills follow the same pattern, with gaps in confidence related to using the internet for tasks such as job applications and telehealth. The dynamics are prevalent across a range of population groups, outlining the challenge facing city leaders as they work toward digital equity.

- **Among the priority groups, some are further behind on digital equity metrics.** Four specific groups are below 80% in terms of home internet service and sufficient devices for internet use: people on government assistance programs, people in public housing, low-income households, and people who are formerly incarcerated. In terms of digital skills, other groups are most impacted. Seniors, veterans, immigrants, public housing residents, and Latino residents are the least likely to express confidence in their ability to complete a range of online tasks. Many of these groups overlap considerably.

- **Many residents in priority populations lack internet access.** The vast majority of respondents (85%) report having home internet service. However, several priority populations are less likely to have this access. Among low-income residents, only 75% have home internet. Among formerly incarcerated residents, just 71% report access. Among public housing residents and Latino residents, 78% in each group say they have a home internet plan.
- **Speed and connectivity are also concerns for many.** About three-quarters (76%) of Boston residents say they have home internet and that it works well enough to meet their needs. This drops to 64% among both low-income and Latino residents, many of whom cite connectivity and speed issues. Among all residents, 25% say they have internet but that they frequently experience low connection speeds, while 22% say they frequently experience dropped connections.
- **Affordability is also a major concern.** Overall, 24% of Boston residents have internet access but express concerns about its affordability. Many others lack home internet altogether due to the high cost of service and rely instead on their cell phones for internet. Among those without home internet, the primary reasons cited include using their cell phone for internet access and concerns over the cost of service.
- **Many do not have access to the devices they need.** While 84% overall indicate their households have access to the necessary devices for internet use, some priority populations are less likely to say so. Formerly incarcerated residents (65%), unhoused residents (60%), residents of public housing (74%), and low-income residents (74%) are less likely to report having sufficient devices.
- **Gaps in confidence limit some users' online experiences.** Overall, most respondents feel at least somewhat confident using the internet for a range of purposes, though far fewer feel "very confident" (46% to 71%). Confidence in telehealth usage is far lower among senior / older adults and veterans. The groups least likely to express confidence on a range of tasks are seniors / older adults, veterans, Latino residents, people in public housing, immigrant residents, and residents who speak languages other than English.
- **Digital skills classes could help close some of the gaps**. Just 32% of residents say they have taken digital skills classes, but 47% would be interested if they were free. More would prefer online classes (62%), but others say they would like in person classes (38%) or in person support (25%). Classes on fixing computer issues and internet safety drew the greatest interest.

Table 16: Key metrics for selected priority groups

		Live in pub. housing		Receive gov. assistance		Low income		Formerly incarcerated		Latino / Hispanic		Seniors (60+)	
Key Metric	**All**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Have home internet service	85%	78%	90%	77%	91%	75%	92%	71%	88%	78%	87%	86%	84%
Have cell plan	88%	84%	92%	82%	94%	83%	92%	80%	89%	87%	88%	91%	77%
Have internet, good enough	76%	62%	81%	64%	82%	64%	84%	58%	78%	64%	78%	76%	73%

		Live in pub. housing		Receive gov. assistance		Low income		Formerly incarcerated		Latino / Hispanic		Seniors (60+)	
Key Metric	**All**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Have internet, unaffordable	24%	19%	27%	24%	25%	21%	26%	14%	24%	18%	25%	24%	23%
Have internet, experience low connection speeds	25%	33%	24%	29%	24%	26%	25%	43%	24%	25%	25%	26%	22%
Have internet, experience dropped connections	22%	30%	20%	25%	21%	22%	23%	34%	22%	26%	22%	22%	23%
Have enough devices	84%	74%	90%	73%	91%	74%	91%	65%	87%	82%	85%	85%	83%
Taken digital skills classes	32%	43%	28%	35%	27%	28%	35%	43%	31%	33%	31%	30%	37%
Interested in free digital skills classes	47%	66%	41%	61%	37%	61%	43%	75%	46%	47%	47%	47%	47%

*Note: Exact numbers of respondents in priority populations can be found in the previous table or in the following tables.

6.2 Elements of digital equity

The remainder of this report is organized around tables digging into the three main elements of digital equity: Internet access, device access, and digital literacy and skills. Affordability is an important consideration when it comes to digital equity and is woven through the other three elements.

The three pillars of digital equity we focus on are as follows along with the definitions that guided the development of the survey as well as this report.

1. Internet access: Affordable, accessible, and reliable high-speed home internet service is available.
2. Device access: Individuals have access to well-functioning devices and technical support.
3. Digital literacy and skills: Individuals have digital skills to support their ability to meaningfully use the internet in their daily lives.

Responses to key items are shown both for all residents as well as each of the 15 priority groups identified by city officials.

6.2.1 Internet access

Definition: Affordable, accessible, and reliable high-speed home internet service is available.

Table 17: Internet access at home and by mobile phone data plan

Which of the following plans do you currently have? A data plan for a cell phone. A home internet service plan. Asked of all respondents:

Group description	Have phone data plan	Have home Internet service
Overall *(n=1109)*	88%	85%
Immigrant populations *(n=332)*	84%	80%

Group description	Have phone data plan	Have home Internet service
People who speak languages other than English *(n=422)*	87%	80%
School-aged families *(n=330)*	91%	90%
People in public housing/restricted housing units *(n=766)**	84%	**78%**
Seniors/Older adults *(n=264)*	**77%**	84%
Low-income populations *(n=335)*	83%	**75%**
LGBTQ+ community *(n=156)*	86%	84%
Black community *(n=331)*	83%	82%
Latino community *(n=320)*	87%	**78%**
People with disabilities *(n=232)*	80%	79%
Veterans *(n=59)***	**77%**	86%
Indigenous community *(n=35)***	**77%**	85%
Unhoused people *(n=28)***	**73%**	NA
People on government assistance programs *(n=983)**	82%	77%
Formerly incarcerated people *(n=58)***	80%	**71%**

** Throughout the report, the analysis of people in public housing/restricted housing units and those who receive government assistance includes a large number of responses collected by community-based organizations and the BHA. All other response groupings are exclusively drawn from the representative survey. **Caution: Small sample sizes*

Among all respondents, access to both phone data plans and home internet service are over 80%. But there are several groups among whom access gaps exist.

- Among those in lower income households, 75% say they have a home internet plan, compared to 85% of residents overall. Similarly, 71% of formerly incarcerated people say they have a home internet plan.
- Among respondents who are unhoused, 73% say they have a cell phone plan. Additionally, about three quarters (77%) of veterans, indigenous residents, unhoused people, and seniors / older adults are less likely to say they have a cell phone plan.

Table 18: Home internet service quality

Which of the following plans do you currently have? A home internet service plan. How well does your home internet service work?
Includes all residents

Group description	Have it, good enough	Have it, not good enough	Don't have it
Overall *(n=1109)*	76%	9%	12%
Immigrant populations *(n=332)*	69%	10%	18%
People who speak languages other than English *(n=422)*	69%	11%	18%
School-aged families *(n=330)*	76%	12%	8%
People in public housing/restricted housing units *(n=766)*	62%	13%	19%
Seniors/Older adults *(n=264)*	73%	10%	14%
Low-income populations *(n=335)*	64%	10%	20%
LGBTQ+ community *(n=156)*	76%	6%	13%
Black community *(n=331)*	69%	11%	17%
Latino community *(n=320)*	64%	12%	20%
People with disabilities *(n=232)*	68%	11%	20%
Veterans *(n=59)***	70%	14%	8%
Indigenous community *(n=35)***	67%	13%	15%
Unhoused people *(n=28)***	NA	NA	NA
People on government assistance programs *(n=983)*	64%	11%	19%
Formerly incarcerated people *(n=58)***	58%	12%	28%

***Caution: small sample sizes*

Overall, 76% of city residents say they have internet service at home and that their plan is good enough to meet their needs. There are a range of priority groups where sufficient access is less common.

- Low-income households (64%) and Latino residents (64%) are the least likely of any priority group to say they have home internet and that it is good enough to meet their needs.
- In many of the priority populations, 20-40% say they either do not have internet access or that it is not good enough to meet their needs.
- Among low-income respondents, Latino residents, people with disabilities, and those formerly incarcerated, at least 1 in 5 do not have home internet.

Table 19: Internet affordability among those with home internet

Which of the following plans do you currently have? A home internet service plan. How would you describe the affordability of your home internet service?
Includes all residents

Group description	Have it, Affordable	Have it, unaffordable	Don't have it
Overall *(n=1109)*	60%	24%	12%
Immigrant populations *(n=332)*	59%	19%	18%
People who speak languages other than English *(n=422)*	60%	19%	18%
School-aged families *(n=330)*	67%	22%	8%
People in public housing/restricted housing units *(n=766)*	57%	19%	19%
Seniors/Older adults *(n=264)*	57%	23%	14%
Low-income populations *(n=335)*	53%	21%	20%
LGBTQ+ community *(n=156)*	60%	22%	13%
Black community *(n=331)*	59%	19%	17%
Latino community *(n=320)*	58%	18%	20%
People with disabilities *(n=232)*	46%	31%	20%
Veterans *(n=59)***	65%	21%	8%
Indigenous community *(n=35)***	64%	18%	15%
Unhoused people *(n=28)***	NA	NA	57%
People on government assistance programs *(n=983)*	52%	24%	19%
Formerly incarcerated people *(n=58)***	54%	14%	28%

***Caution: small sample sizes*

Affordability is a major concern to many residents when it comes to home internet service. Overall, just 60% say they have affordable home internet access while 24% say it is unaffordable.

- People with a disability (46%), low-income residents (53%), and those formerly incarcerated (54%) are least likely to say they have affordable home internet.
- Across all priority groups, affordability is a common concern. With the expiration of the ACP program, we should expect the financial burden of home internet service to continue to grow.

Table 20: Internet connection experiences, low or dropped connections

Which of the following plans do you currently have? A home internet service plan. How often do your experience each of the following with your home internet connection?

Group description	Have home internet, frequently experience l*ow connection speeds*	Have internet, frequently experience d*ropped connections*
Overall *(n=1109)*	25%	22%
Immigrant populations *(n=332)*	24%	23%
People who speak languages other than English *(n=422)*	25%	23%
School-aged families *(n=330)*	34%	30%
People in public housing/ restricted housing units *(n=766)*	33%	30%
Seniors/Older adults *(n=264)*	22%	23%
Low-income populations *(n=335)*	26%	22%
LGBTQ+ community *(n=156)*	30%	24%
Black community *(n=331)*	29%	22%
Latino community *(n=320)*	25%	26%
People with disabilities *(n=232)*	30%	22%
Veterans *(n=59)***	30%	29%
Indigenous community *(n=35)***	37%	30%
Unhoused people *(n=28)***	NA	NA
People on government assistance programs *(n=983)*	29%	25%
Formerly incarcerated people *(n=58)***	43%	34%

**Asked of all respondents*

***Caution: small sample sizes*

Overall, about a quarter say they have internet but that they frequently experience low speeds and dropped connections.

- Among formerly incarcerated residents, 43% report frequent low connection speeds.
- Similarly, 34% of school-aged families experience the same challenges, perhaps due to the higher demand on internet capacity due to larger household sizes.
- Those in public housing (33%) and indigenous residents (37%) also report more problems with low connection speeds than other groups.

Table 21: Reasons for no home internet plan, among those without home internet

What are the reasons you do not have an internet service plan at home?
**Percents among those who said they do not have home internet.*

Reason	% of non-internet users (n=152)
I access the internet using my cell phone	33%
Service is too expensive	28%
I can't afford a device to use the internet	14%
I don't want to use the internet	6%
I am concerned about online privacy or safety	5%
I don't feel confident using the internet	5%
Service is not available in my area	3%
Other	25%
Don't know / refused	4%

When residents who do not have a home internet service plan are asked why, key reasons include the cost of the service or reliance on their cellphone for access. This includes 152 respondents, which makes it impossible to break down these results further.

Table 22: Affordable Connectivity Program enrollment and familiarity

Have you heard about the Affordable Connectivity Program (ACP) that provides discounted internet service for low-income households? Are you currently enrolled in the Affordable Connectivity Program (ACP)?
Asked of all respondents

Group description	Heard of ACP	Enrolled in ACP
Overall *(n=1109)*	37%	12%
Immigrant populations *(n=332)*	31%	7%
People who speak languages other than English *(n=422)*	33%	12%
School-aged families *(n=330)*	42%	17%
People in public housing/restricted housing units *(n=766)*	56%	28%
Seniors/Older adults *(n=264)*	41%	10%
Low-income populations *(n=335)*	47%	24%
LGBTQ+ community *(n=156)*	40%	16%
Black community *(n=331)*	41%	12%
Latino community *(n=320)*	36%	10%
People with disabilities *(n=232)*	54%	22%
Veterans *(n=59)***	40%	13%
Indigenous community *(n=35)***	75%	48%
Unhoused people *(n=28)***	NA	NA
People on government assistance programs *(n=983)*	50%	24%
Formerly incarcerated people *(n=58)***	73%	43%

***Caution: small sample sizes*

Congress has not voted to fund ACP going forward. The program was familiar to many members of the priority population groups and was broadly utilized among some.

- The ACP was well known, with more than half of residents in many of the priority groups saying they have heard of the program.
- Had the program continued, there would have been significant opportunity to communicate to priority groups and to enroll more residents.

6.2.2 Device access

Definition: Individuals have access to well-functioning devices and technical support.

Table 23: Access to enough devices

Does everyone in your household have access to the devices they need to meet their everyday needs for internet use? (Computers, smartphones, tablets, or other internet enabled devices)?
Among all respondents

Group description	Have enough devices
Overall *(n=1109)*	84%
Immigrant populations *(n=332)*	81%
People who speak languages other than English *(n=422)*	83%
School-aged families *(n=330)*	85%
People in public housing/restricted housing units *(n=766)*	74%
Seniors/Older adults *(n=264)*	83%
Low-income populations *(n=335)*	74%
LGBTQ+ community *(n=156)*	81%
Black community *(n=331)*	80%
Latino community *(n=320)*	82%
People with disabilities *(n=232)*	77%
Veterans *(n=59)***	76%
Indigenous community *(n=35)***	85%
Unhoused people *(n=28)***	60%
People on government assistance programs *(n=983)*	73%
Formerly incarcerated people *(n=58)***	65%

***Caution: small sample sizes*

A large majority (84%) report having access to enough devices to meet their everyday internet needs, but access is less common among some priority groups.

- Unhoused and formerly incarcerated residents in Boston are less likely to report having enough devices in their household, with 60% and 65% respectively saying they have enough.
- Across priority groups, there are significant opportunities for expanding access to sufficient devices to meet every day needs.

Table 24: Type of device, among internet users

Which of the following devices do you use regularly to access the internet? Select all that apply. Among all respondents

Group description	Cell	Desktop	Laptop	Tablet	Other
Overall *(n=1109)*	87%	30%	66%	41%	4%
Immigrant populations *(n=332)*	86%	25%	55%	31%	6%
People who speak languages other than English *(n=422)*	88%	27%	61%	39%	5%
School-aged families *(n=330)*	92%	35%	67%	56%	3%
People in public housing/restricted housing units *(n=766)*	86%	24%	48%	39%	4%
Seniors/Older adults *(n=264)*	75%	32%	53%	35%	5%
Low-income populations *(n=335)*	85%	23%	51%	33%	5%
LGBTQ+ community *(n=156)*	87%	26%	74%	42%	6%
Black community *(n=331)*	81%	28%	59%	39%	4%
Latino community *(n=320)*	86%	27%	53%	37%	4%
People with disabilities *(n=232)*	81%	27%	60%	39%	5%
Veterans *(n=59)***	76%	34%	67%	45%	6%
Indigenous community *(n=35)***	74%	35%	53%	45%	3%
Unhoused people *(n=28)***	89%	8%	49%	43%	2%
People on government assistance programs *(n=983)*	85%	26%	52%	43%	4%
Formerly incarcerated people *(n=58)***	85%	30%	43%	42%	6%

***Caution: small sample sizes*

Cell phones are the most common device used regularly to access the internet (87%), followed by laptops (66%). Desktop computers are the least common.

- Across most priority groups, there is a split on who uses a laptop or not to access the internet. If they're not using a laptop, a cellphone is most common.
- Less than half of unhoused individuals, people in public housing, and those formerly incarcerated, use a laptop to access the internet.

6.2.3 Digital literacy and skills

Definition: Individuals have digital skills to support their ability to meaningfully use the internet in their daily lives.

Table 25: Confidence in internet use

How confident would you feel using the internet for each of the following? (Very + somewhat confident) Asked of all respondents.

Group description	Search / apply for a job	Health care/ telehealth	Participate in local community	General internet search	Transpo info.	Apply for benefits	Average
Overall *(n=1109)*	78%	82%	78%	91%	86%	75%	82%
Immigrant populations *(n=332)*	70%	78%	69%	86%	80%	64%	75%
People who speak languages other than English *(n=422)*	73%	78%	65%	88%	81%	67%	75%
School-aged families *(n=330)*	83%	87%	79%	93%	88%	78%	85%
People in public housing/ restricted housing units *(n=766)*	65%	75%	69%	86%	77%	72%	74%
Seniors/Older adults *(n=264)*	53%	73%	71%	84%	75%	61%	70%
Low-income populations *(n=335)*	70%	76%	69%	89%	83%	72%	77%
LGBTQ+ community *(n=156)*	84%	84%	78%	94%	88%	77%	84%
Black community *(n=331)*	80%	82%	82%	89%	81%	77%	82%
Latino Community *(n=320)*	68%	75%	66%	84%	77%	65%	73%

Group description	Search / apply for a job	Health care/ telehealth	Participate in local community	General internet search	Transpo info.	Apply for benefits	Average
People with disabilities *(n=232)*	73%	84%	81%	91%	82%	77%	81%
Veterans *(n=59)***	63%	73%	72%	80%	78%	64%	72%
Indigenous community *(n=35)***	69%	81%	80%	92%	76%	61%	77%
Unhoused people *(n=28)***	67%	84%	72%	89%	89%	57%	76%
People on government assistance programs *(n=983)*	67%	78%	74%	87%	82%	72%	77%
Formerly incarcerated people *(n=58)***	76%	84%	77%	88%	84%	73%	80%

***Caution: small sample sizes*

Majorities feel confident in using the internet for a broad range of uses.

- Overall, residents feel most confident in using the internet for general search activity.
- On average, seniors / older adults, veterans, Latino residents, and residents of public housing are least likely to express confidence in their ability to perform a range of internet tasks.

Table 26: Taken digital skills classes

Have you ever taken any classes to improve your digital skills (these could be computer skills, navigating the internet, certain programs, etc.)?
Asked of all respondents.

Group description	Have taken classes
Overall *(n=1109)*	32%
Immigrant populations *(n=332)*	27%
People who speak languages other than English *(n=422)*	30%
School-aged families *(n=330)*	33%
People in public housing/restricted housing units *(n=766)*	43%
Seniors/Older adults *(n=264)*	37%
Low-income populations *(n=335)*	28%
LGBTQ+ community *(n=156)*	29%
Black community *(n=331)*	36%
Latino Community *(n=320)*	33%
People with disabilities *(n=232)*	36%
Veterans *(n=59)***	40%
Indigenous community *(n=35)***	52%
Unhoused people *(n=28)***	21%
People on government assistance programs *(n=983)*	35%
Formerly incarcerated people *(n=58)***	43%

***Caution: small sample sizes*

Overall, about a third (32%) of respondents have taken digital skills classes.

- People in public housing, indigenous residents, and those formerly incarcerated more likely to say they have taken classes.
- Unhoused people, immigrants, and low-income residents are least likely to report having taken classes.

Table 27: Interest in free digital skills classes?

Would you be interested in digital skills training if it were offered free of charge?
Asked of all respondents

Group description	Interested	Not interested
Overall *(n=1109)*	47%	44%
Immigrant populations *(n=332)*	52%	40%
People who speak languages other than English *(n=422)*	48%	41%
School-aged families *(n=330)*	66%	23%
People in public housing/restricted housing units *(n=766)*	52%	43%
Seniors/Older adults *(n=264)*	47%	46%
Low-income populations *(n=335)*	61%	30%
LGBTQ+ community *(n=156)*	43%	48%
Black community *(n=331)*	60%	32%
Latino Community *(n=320)*	47%	44%
People with disabilities *(n=232)*	52%	37%
Veterans *(n=59)***	53%	41%
Indigenous community *(n=35)***	69%	31%
Unhoused people *(n=28)***	70%	25%
People on government assistance programs *(n=983)*	61%	26%
Formerly incarcerated people *(n=58)***	75%	25%

***Caution: small sample sizes*

About half of respondents are interested in digital skills courses (47%), if they were offered free of charge. Populations most interested in digital skills classes are school-aged families, low-income households, Black residents, indigenous residents, unhoused residents, residents on government assistance and those formerly incarcerated.

Table 28: Digital skills class interests

What kinds of digital skills topics would you be most interested in? Among all respondents. Top 6 responses shown.

Group description	Fix computer issues	Internet safety	Download new software	Basics of computer	Navigate internet	Use social media
Overall *(n=1109)*	27%	20%	17%	14%	13%	12%
Immigrant populations *(n=332)*	24%	18%	15%	18%	15%	14%
People who speak languages other than English *(n=422)*	24%	19%	18%	18%	14%	13%
School-aged families *(n=330)*	30%	25%	21%	14%	13%	18%
People in public housing/restricted housing units *(n=766)*	41%	39%	32%	31%	27%	25%
Seniors/Older adults *(n=264)*	23%	20%	16%	19%	14%	14%
Low-income populations *(n=335)*	39%	24%	23%	23%	19%	14%
LGBTQ+ community *(n=156)*	27%	14%	13%	10%	10%	10%
Black community *(n=331)*	33%	23%	19%	18%	16%	15%
Latino Community *(n=320)*	26%	20%	21%	21%	17%	14%
People with disabilities *(n=232)*	37%	22%	23%	22%	20%	15%
Veterans *(n=59)***	21%	23%	16%	10%	15%	22%
Indigenous community *(n=35)***	45%	35%	35%	28%	32%	32%
Unhoused people *(n=28)***	40%	13%	12%	16%	17%	7%
People on government assistance programs *(n=983)*	39%	30%	27%	28%	23%	19%
Formerly incarcerated people *(n=58)***	43%	34%	28%	23%	17%	16%

***Caution: small sample sizes*

Among those interested in digital skills classes, fixing computer issues would be most popular. The other classes of greatest interest were internet safety, downloading new software, basics of using a computer and general internet searching. Indigenous residents, people in public housing, formerly incarcerated people, and those receiving government benefits were most interested in digital skills classes.

6.3 Survey methodology

6.3.1 Questionnaire

The questionnaire was designed collaboratively by teams from The MassINC Polling Group, HRiA, CTC, and the City of Boston. It followed the general contours of the survey conducted by the Massachusetts Broadband Institute in municipalities across Massachusetts. The overall topics included internet access, device access, digital literacy, and skills.

6.3.2 Base survey

The main element was a representative survey of 1,109 residents of Boston. This included a base sample of 700 respondents as well as an oversample to reach a total of 300 each of Black and Latino residents of the City. The survey was administered via a combination of live telephone interviewing, text to web interviewing, and online surveys. The approximate questionnaire length was 16 minutes when conducted by live interviewer, and 9 minutes when conducted online.

Final results were weighted to match target population parameters for the City of Boston both within race and ethnicity and for the City as a whole. Population parameters were drawn from a variety of sources including the American Community Survey, MAPC, and elsewhere. The credibility interval for the survey is approximately 3.5 percentage points at a 95 percent confidence level inclusive of the design effect.

The survey was conducted as a part of a larger project in collaboration with CTC, HRiA, and the City of Boston. Funding for the project was provided by the Massachusetts Broadband Institute. The questionnaire was offered in Arabic, Cape Verdean Creole, English, French, Haitian Creole, Portuguese, Russian, Simplified Chinese, Somali, Spanish, Vietnamese, and Traditional Chinese.

6.3.3 Community-based surveys

To dig deeper on digital equity issues among priority populations, a community-based survey process was conducted alongside the representative survey. Community based organizations across Boston assisted MPG in distributing the questionnaire to target populations and obtained an additional 508 responses from their constituents, members, and service recipients. The survey was available in paper as well as online and was distributed in ways best fit for each organization. The questionnaire and all outreach materials were offered in Arabic, English, French, Haitian Creole, Portuguese, Russian, Simplified Chinese, Somali, Spanish, Vietnamese, and Traditional Chinese.

For the purposes of this report, tables showing residents living in subsidized housing and those receiving other benefits include *both* the community survey and the representative survey. Results for all other population groups include only the representative survey.

7 Boston stakeholders report that successful digital equity programs could be expanded if funding allowed

As part of this study, Health Resources in Action (HRiA) conducted stakeholder meetings to hear from a diverse group of residents and community-based organizations to relate their experiences and share their recommendations involving digital access, devices, and literacy. This section was independently produced by HRiA and submitted to the City by HRiA in the fall of 2024.

The City of Boston identified and shared the following priority populations with which HRiA should engage:

- Seniors/older adults
- Immigrant populations
- People who speak languages other than English (LOTE)
- Low-income populations (i.e., people who receive government assistance through programs such as SNAP, WIC, MassHealth/Medicaid, SSP, and Supplemental Security Income)
- Black community
- Indigenous community
- Youth
- People in public housing/restricted housing units
- Families of school-aged children
- People with disabilities
- LGBTQIA+ community
- Formerly incarcerated people
- Veterans
- Unhoused people

7.1 Key findings

HRiA prepared this summary of key findings. The findings from HRiA's stakeholder sessions echo findings from the survey, engagement with City departments, and other data sources described in this study.

- **More programs are needed to provide free or reduced-price mobile devices for priority populations.** Engaged stakeholders expressed the need for a reliable mobile device for accessing general services, health care, and community resources, and for sharing information. The City of Boston could consider supporting ongoing programs and/or implementing a free or reduced-price program for mobile devices in partnership with trusted community organizations.
- **Promoting participation in existing device subsidy programs would free up City resources for other digital equity efforts.** There is a great need for the City of Boston to

allocate resources and staff that can support digital equity-specific needs, ranging from devices and internet services to digital skills programs. One potential effort can include funding for CBOs to support internet access discounts, free and/or reduced-price devices, and digital literacy programs for the devices.

- **The loss of the Affordable Connectivity Program has been a loss for many low-income residents in Boston**. Some ISPs offer free, low-cost and discounted internet access, yet as the Affordable Connectivity Program has ended, it is important for the City of Boston to work closely with ISPs to continue to offer free, low-cost and discounted service for residents to continue or enroll in internet access. To this end, the City's efforts at sharing information about internet accessibility discounts for residents is valuable.
- **Continue the partnership with the BHA providing free Wi-Fi access to residents of public and affordable housing in the City of Boston.** With the support of the MBI Residential Retrofit Program, BHA will continue to identify connectivity needs and engage residents in support of overall digital and technological literacy for better residential health, socialization and opportunities for growth.
- **A significant number of CBOs across the City are working to address the digital needs of residents.** The City has an exceptional track record of working with CBOs to engage within the City's wide range of communities. Programs funded through the Digital Equity Fund and partnerships like Tech Goes Home and Boston Neighborhood Network Media champion collaboration and success in community-based work. Given this track record, we recommend continuing to develop this framework. We recommend that the City of Boston continue to invest in this work and to work with CBOs to formulate strategies for further improvement to the process.
- **Greater investment in digital literacy programs with diverse training topics related to digital access and devices is needed.** While many digital literacy programs include basic computer training and internet classes, it is recommended to invest in classes that teach more than just basic skills. The diverse digital literacy programs to invest in should also be offered on different days throughout the week, at multiple times during the day, and within the community, for easy access. The diverse digital literacy programs should include classes on:
    - Functions and essential apps of a smartphone
    - How to set up a phone and download an app
    - How to use a smartphone to operate essential services such as DTA connect, MyChart, Telehealth, SSI, online banking, job seeking, ESOL classes, or just basic information searching

7.2 Engagement methodologies

HRiA implemented these engagement methodologies.

7.2.1 Focus groups

In partnership with community-based organizations, HRiA hosted eight focus groups reaching 88 focus group participants representing the priority populations listed above. Partner organizations included: Boston Lesbigay Urban Foundation, Ethos, Inquilinos Boricua en Acción (IBA), Leaders through Education, Action & Hope (LEAH) Project, Somali Parents Advocacy Center for Education (SPACE), Vietnamese American Civic Association (VACA), and Zumix.

7.2.2 Key informant interviews (KII)

HRiA interviewed 10 leaders at the following entities and/or community-based organizations: Age Strong Commission, Boston HealthCare for the Homeless, the BHA, Boston Lesbigay Urban Foundation, Boston Public Schools, Boston Public Health Commission, Disability Policy Consortium, Inquilinos Boricua en Acción, Mattapan Food and Fitness Coalition, Native American LifeLines Boston, and Veterans Collaborative.

7.3 Summary of discussions and digital equity activities and priorities

HRiA prepared the following summaries of its discussions.

7.3.1 Age Strong Commission

The Age Strong Commission is a department of the City of Boston that serves senior residents through various programs and community-based initiatives. The Commission has been instrumental in its advocacy for digital equity for the City's aging population, including as a co-partner of the Digital Equity Fund along with the Innovation & Technology Cabinet and the Equity & Inclusion Cabinet.

The Age Strong Commission supports seniors/older adults in the City of Boston through dedicated staff for digital access, partnering with digital skills trainings programs such as Tech Goes Home at Senior Centers, and allocating funding to partners throughout the City under their "Expanding Engagement Funds" to decrease social isolation of older adults. Some of the allocation of funding is supporting digital skills trainings for seniors/older adults.

7.3.2 Boston HealthCare for the Homeless

Boston HealthCare for the Homeless ensures, unconditionally, equitable and dignified access to the highest quality health care for all individuals and families experiencing homelessness in the City of Boston. This access includes over 40 satellite sites with medical clinics, mobile health care programs, and respite.

Digital access and connectivity are key for the homeless population, specifically mobile devices so case managers can be in touch with their program participants and as safety measures specifically to the LGBTQIA+ population facing violence and domestic violence survivors.

7.3.3 Boston Housing Authority

The BHA has supported the City in its digital equity efforts through the purchase and distribution of laptops and tablets, expansion of free Wi-Fi in community spaces, and offering information about the Affordability Connectivity Program with the use of CARES Act funding allocated to the BHA. During the beginning of the pandemic, the BHA conducted a survey of residents and found that about

a quarter of BHA residents were not connected to broadband, particularly residents who were elderly or who had limited English proficiency.

The BHA has continued to work to reduce these gaps and explore opportunities to support connectivity, digital literacy, and equipment. BHA is currently in partnership with MBI on the Residential Retrofit Program to investigate internet wiring standards and how to improve infrastructure for internet access in their buildings. One of the wiring projects at BHA includes installation of BoNet Fiber in their community rooms, management offices, and tenant organization offices, ensuring residents in these locations have internet access. There are about four to five housing developments moving forward within this installation project.

BHA staff are also providing internet, device, and literacy access programs in partnership with local colleges, universities, and Little Brother Friends of the Elderly to seniors/older adults in their disabled buildings and family sites. The staff under the Resident Opportunity Self-Sufficiency (ROSS) Program of the Little Brother Friends of the Elderly are supporting BHA sites with this program and support in 5-6 family housing developments. These classes are offered at a basic level of instruction of computer usage in English, Spanish, and other languages, including interpretation in Chinese, Cape Verdean Creole, and Portuguese. Along with the classes, BHA staff offer to do a tech one-on-one or drop-in for residents (providing basic assistance with technological questions residents may have). Examples of questions include how to fix their email, phone and how to set up a Google Doc. This program was made possible by the Massachusetts Broadband Institute Digital Literacy Initiative to establish and implement digital literacy training programs to ensure target populations have the requisite skills to use devices, online resources, and digital tools. For BHA the target population is seniors and people with disabilities.

One of the challenges with providing these classes has been finding a vendor to fulfill the needs. BHA released a Request for Proposals to host and/or manage the classes, but standards and needs have not been met. BHA shared that the capacity of vendors is low because many potential vendors are already offering similar programming outside of BHA. Therefore, BHA had to rely on volunteers and resident ambassadors to meet the needs. Resident ambassadors and resident board members participate in professional development to volunteer on the program, which includes giving opportunities to learn how to create newsletters, navigate the BHA website, and other literacy topics as needed for their leadership in the program and overall engagement in the community. Another challenge has been language accessibility, specifically for the Patricia White development site as most of the population speaks Russian and BHA does not currently have interpreters to meet all accessibility needs. BHA's goal is to continue the computer classes program, expand to all housing developments and find volunteers to support the current in-house management. ARPA resources funded these computer classes and BHA continues the search of finding additional funds to continue the computer classes.

7.3.4 Boston Lesbigay Urban Foundation

The Boston Lesbigay Urban Foundation mission is the development of strong, sustainable, LGBTQIA+ community functions and relationships in the City of Boston. They are committed to improving social and emotional outcomes for the black/brown/latinx LGBTQIA+ community by providing wellness support, services, and trauma informed care.

Since its creation in 2020 to support the LGBTQIA+ community in Boston to have equitable access to COVID related needs, the Boston Lesbigay Urban Foundation has become an integral and trusted organization to support the LGBTQIA+ community. Due to the digital connectivity and access need during the creation of the organization, during programming events, Boston Lesbigay Urban Foundation was able to conduct overall outreach about the programs to support residents, specifically seniors/older adults, families of incarcerated individuals and LGBTQIA+ couples/family members.

7.3.5 Boston Public Schools

Boston Public Schools (BPS) has been a partner in the City of Boston's digital equity efforts for years. Most recently, at the start of the COVID-19 pandemic, BPS worked with the Innovation & Technology Cabinet (formerly DoIT) to quickly distribute 55,000 Chromebooks to students so that they could attend their classes virtually. Moreover, 10,000 hot-spots and 3,500 Xfinity Internet Essentials subscriptions were given to BPS families to provide internet connectivity for those in need during the pandemic. In partnership with Senator Ed Markey, Mayor Michelle Wu secured $12 million from the Emergency Connectivity Fund, $10 million of which was allocated for Chromebooks and internet connectivity for roughly 20,000 BPS families.

While the federal Affordable Connectivity Program (ACP) existed, it provided a $30/month internet discount for eligible populations including those who received free school breakfast and lunch, which applied to every BPS student. The City utilized BPS's "Family Liaisons" to disseminate information about the program to school families. The City was able to share information about the ACP in over 11 languages to each of the 119 schools and assist any family that reached out for application assistance. Even though the ACP has ended, the City is still utilizing BPS's Family Liaisons and events such as open houses to share key digital equity resources, which include information about affordable internet subscriptions, devices, and computer classes.

7.3.6 Boston Public Health Commission

The Boston Public Health Commission (BPHC) is an independent public agency providing a range of health services and programs in Boston with the vision where all residents live healthy, fulfilling lives free of racism, poverty, violence, and other systems of oppression.

Under the BPHC Division of Chronic Disease and Prevention Control, staff provide training to early childhood educators. Many of the educators themselves access the training on mobile devices. The training is offered in a cohort model and involves virtual learning activities, including worksheets and small group breakouts. Most of the participants find it challenging to engage as many do not have access to a computer and connect to the training with their mobile device. Program staff need to find

and share locations where people can use a computer, and where they can access a printer for the worksheets. Participants text BPHC staff images of the completed work from the cohort.

Supporting digital and technical needs has been a key part of engagement for this program and BPHC overall. In 2011, when BPHC opened vaccine clinics, staff had to support seniors and others to reschedule their vaccine appointments. Other engagement approaches of the program include using social media content to support both colleagues at BPHC and early childhood educators participating in the program.

7.3.7 Disability Policy Consortium

The Disability Policy Consortium's (DPC) mission is to ensure the voices of people with disabilities are heard on key issues, to support the health of the disabled community through participatory research and expert policy analysis, and to empower grassroots disability leaders to transform their communities. With their experience in policy analysis and empowerment of leaders to transform their communities, they have created spaces and opportunities to help shape, share, and change language on accessibility, specifically around digital connection. One suggestion is to expand the language of asking individuals during virtual events, meetings, convenings, "what are your communications needs" instead of "what accommodations do you need" to lessen the stigma on people identifying any disability when they may not feel comfortable doing so.

From digital engagement experience and engagement with disability leaders and community, DPC has adapted to learn from leaders in communities and staff to engage the community digitally in multi-modal ways. Information should be provided in multiple channels/modes, including symbols, icons, and words with simple literacy access in mind. Their engagement process has been successful with community resources such as libraries, faith-based communities, and events.

DPC has seen mobile text messaging as a "game changer" in community engagement around digital access and devices. Overall, DPC poses to the City of Boston high-level planning and strategic questions such as how investments in digital access, devices, and literacy are achieving the overall goal of meeting people where they are to ensure they have access to and the ability to use the resources needed to thrive in today's online world. DPC encourages the City of Boston to share the process of accessibility for digital content in the City and to identify what guidelines are being followed.

7.3.8 Inquilinos Boricua en Acción

Established in 1968, IBA is a non-profit organization whose original mission focused on addressing the displacement of low-income Puerto Rican families due to urban development in the South End neighborhood of Boston. Over the past half-century, IBA has grown into a dynamic Community Development Corporation that cultivates and preserves culturally diverse affordable housing communities and provides low-income residents with opportunities to reach their full potential through innovative programmatic offerings.

A key part of the fiscal year 2021 programming was IBA's digital equity services. Through this program, IBA provided families and individuals technology workshops and one-on-one technology

assistance in addition to WIFI connection to those residents who did not have access. One of the biggest technological challenges the program addressed was the complex problem related to poverty and age. Only 34.66% of those who are over the age of sixty-five feel being able to access and confidently use digital technology. 99% of IBA's residents are considered low to moderate income, and 91.8% have a household income of less than $30,000. Due to the challenges of poverty, the individuals that IBA serves often struggle to have their basic needs met, including their need for both access to reliable technology and the knowledge of how to use that technology. Without tech access, these individuals are limited in their ability to communicate, access online resources, and engage with the wider world. This problem became even more prevalent during the COVID-19 pandemic, during which many resources and much social interaction became accessible only via the internet. During the beginning of the COVID-19 pandemic in 2020, many individuals who were actively engaged in IBA's wellness and/or social programming were unable to attend program events due to their inability to access and/or confidently use digital platforms such as Zoom, Facebook Live, etc.

In a 2020 survey conducted to assess community needs during the COVID-19 pandemic, 21% of the residents reported technology challenges (having adequate access to necessary technology, confidently knowing how to use technology, etc.) as a key concern, allowing IBA to identify the need for technology workshops and coaching. One of the topics that came up most frequently is support surrounding technology access and use. It is from here that IBA developed the Digital Equity Program. The Digital Equity Program offered four monthly classes for two hours offering topics such as how to use a keyboard, mobile device, social media, how to register for emergency systems, and support in applying for the ACP program and more. The program also offered free internet for one year for a maximum of 80 residents. IBA had between eight and 12 participants per class. IBA was also able to continue to establish their computer center and got a recent donation of new laptops from the Timothy Smith Network.

7.3.9 Leaders through Education, Action & Hope (LEAH) Project

The Leaders through Education, Action & Hope (LEAH) Project's mission is to promote the power of young people, especially Black, Indigenous, and People of Color (BIPOC) youth, to diversify the science, technology, engineering and math (STEM) fields. Through paid STEM internships, dynamic college and career readiness programming, and meaningful youth leadership opportunities, LEAH cultivates the confidence of youth and equips them with the skills and connections they need to thrive. LEAH engages youth through digital platforms including mobile devices such as texting, emails, and social media.

7.3.10 Mattapan Food and Fitness Coalition

Mattapan Food and Fitness Coalition (MFFC) was founded in 2006 by a group of Mattapan residents who were concerned about the health of the Mattapan Community. MFFC focuses on food access and nutrition education, physical activity, youth development, built environment, and community empowerment. MFFC empowers Mattapan residents to advocate for improvements in their community by providing employment, volunteer opportunities, leadership opportunities and educational programs.

Engagement of residents is a key driver of the work of MFFC. During the pandemic, MFFC had to adapt to internet usage and connection for residents, volunteers, and staff to continue their educational programming. Another adaptation was to secure funding to provide language accessibility virtually, specifically in Haitian Creole and Spanish, and software costs to engage the community. MFFC is looking to share and make available professional development for their staff and is interested in expanding partnership to learn about how digital literacy can support employability with residents and volunteers they engage with.

7.3.11 Native American LifeLines Boston

Native American LifeLines Boston promotes health and social resiliency within Urban American Indian communities through trauma informed care and culturally centered behavioral health, dental, outreach and referral services. As part of the Urban American Indian program contracted through the Indian Health services, a federal trust and treaty obligation to provide healthcare to Native Americans across the US, Native American Lifelines Boston focuses on supporting federally and state recognized tribal members and their descendants with a service area including New England.

Native American LifeLines Boston engages their community through in-person events, Pow Wows, other events related to services, and phone calls to build trust and then engages digitally as needed. Most of the community members are in Boston and neighborhoods outside of Boston due to housing instability. Engaging community members virtually has been an adaptation. During the pandemic digital participation was high, however, for some of the unhoused community members, it was challenging to connect due to not having a consistent connection with their mobile device. During the pandemic, Native American LifeLines Boston, in a partnership with Verizon, offered free tablets for community members who were receiving their health services, including behavioral services. This program started during the pandemic and due to a contracting issue, the program is currently on pause.

Native American LifeLines Boston is interested in connecting and partnering with the City of Boston for digital services available for their community members, including educational programs, virtual family friendly engagement options such as virtual museum visits to share with staff and clients, points of contact within the City of Boston to share with their staff and clients based on needs within the City, and connecting with health care providers who are American Indian to work with in their services.

7.3.12 Somali Parents Advocacy Center for Education (SPACE)

Somali Parents Advocacy Center for Education (SPACE) mission is to support, educate, and empower parents to be better advocates for their children with disabilities in schools, in healthcare, and in their community. Working directly with the Somali speaking population in Boston, SPACE, offers support programs on Disability Advocacy, Health Literacy, and Mental Health Resources. These programs take place both in-person and virtually for their community members.

Working directly with mostly women who are homemakers, digital literacy has been an ask and big need during programming and overall engagement for SPACE. Many program participants rely on

their family members for support with teaching technological terms, devices, and access to internet. SPACE is driven by community-led engagement, including language accessibility, advocacy, and is very open to digital equity programming and partnerships.

7.3.13 The Greater Boston Veterans Collaborative (GBVC)

The Greater Boston Veterans Collaborative (GBVC), founded in 2014, encourages community, building strategic coalition, and fostering a data-driven understanding of the needs of the military and veteran community. GBVC's approach to their mission brings together service providers to learn about their programming and to make referrals to the military and veteran community of services available to them. Over the course of five (5) years, GBVC met in person with service providers and organized events every other month, engaging over a thousand (1,000) people. An ask from the engagement was to create a digital infrastructure for collaboration between service providers to use for more effective outreach. Therefore, GBVC created a digital infrastructure including a calendar of events, information about service providers and agencies, and a shared Slack. The digital collaborative commenced in 2016, which was helpful for ongoing communication during the pandemic.

This digital infrastructure continues to be the principal place for all service providers and referrals to continue outside of in-person events or engagement opportunities, specifically during the pandemic as they had to host more frequent meetings to support the military and veteran community. One of the challenges and adaptations that GBVC has had to offer includes digital literacy teachings to service providers/agencies who did not have any digital infrastructure and/or digital outreach experiences. The adaptation included incorporating trainings during monthly virtual gatherings, providing ideas on digital infrastructure and/or outreach tools, and evaluating and adapting the digital infrastructure as needed to better serve the service providers to engage in it. Part of the digital infrastructure included making referrals to provide the military and veteran community with digital devices, as one service provider they engaged with was offering free devices to veterans including iPads. Another resource shared was how veterans can access their VA benefits by receiving an iPad or tablet for their medical needs.

GBVC is looking to secure more funding to continue to support the digital infrastructure they currently have, build a research plan with collective impact of service providers and with more staff capacity, and would like to build up existing resources into a mobile application and a military and veteran facing website for more engagement. The direct engagement with the military and veteran community would include more local coverage of equity and storytelling of what veterans are doing, what they are dealing with, and resources they can use.

7.3.14 Vietnamese American Civic Association, Inc. (VACA)

Vietnamese American Civic Association, Inc. (VACA), aims to promote and support family self-sufficiency and well-being, and to facilitate community empowerment amongst the Vietnamese population of Boston and Greater Boston. VACA offers social and immigration services, ESL, Civic Engagement, Youth Programming, Community Health, Housing Counseling and Naturalization Services.

VACA offers their services and programming both in person and virtually and have built a trust within the Vietnamese-speaking community as a central hub space for connecting to services. VACA is looking to increase their services to include digital literacy as part of their case managers and staff have been supporting the community with one-on-one digital access and device questions and needs.

7.3.15 Zumix

Zumix empowers young people to build successful futures for themselves, transforming lives and community through music, technology, and creative employment. Through their programming, youth in Boston can learn musical, technological, and creative skills for professional and personal development. Through youth leadership opportunities, Zumix has been able to manifest and embrace the needs of youth and technological outlets for creative opportunities such as a radio station, musical gatherings and events and overall civic engagement.

8 The City of Boston has been investing in local nonprofits that are dedicated to addressing the City's digital divide through the Boston Digital Equity Fund

Boston's Digital Equity Fund offers funding to support the City's nonprofits, community-based organizations, and other entities with starting or expanding device refurbishment and access, digital literacy and tech support, and digital navigation programming. Since its first year, which provided one award to a single nonprofit, this fund has grown to include 36 local entities with a total award pool of just over $1.4 million (see Table 29). The most recent round of Digital Equity Fund awards were funded by MBI's Digital Equity Partnerships Program.

Table 29: Digital Equity Fund awards by year

Year	Number of programs funded	Total award amount for following year
2018	1	$35,000
2019	3	$100,000
2022	19	$478,900
2023	36	$1,418,000

The Digital Equity Fund began in 2017, with one award of $35,000 that was received by Castle Square Tenants Organization so it could offer paid internships to students and offer audio/visual college courses. The second round of grants was distributed in 2019, received by La Alianza Hispana, Mujeres Unidas Avanzando, and South End Technology Center, to help these nonprofits advance their digital equity goals. This Digital Equity Fund award pool had increased to $100,000. In 2021, the Digital Equity Fund had grown to offer a combined $500,000 in grant funding to 19 community-based organizations. (See Appendix C for further details on past DEF award amounts and recipients.)

On October 2, 2023, the City of Boston launched its newest round of the Digital Equity Fund, which aimed to support three critical areas for combating the City's digital divide:

1. Efforts to improve telehealth programming,
2. Device refurbishment programming, and
3. Digital navigation work.

By focusing on these three pillars of digital access and inclusion, the City of Boston's main goal for this round of DEF awards was to ensure that local entities have the necessary funding to provide immediate and direct technical and online support to residents.

As part of the 2023 Digital Equity Fund, the Innovation & Technology Cabinet distributed a total of 36 awards in Fall 2024 totaling $1,418,000. The two largest grant awards were awarded to Boston Medical Center Corporation and Franciscan Children's for $250,000 each, to expand their telehealth services. This will allow both entities to provide better onboarding support and expand their telehealth software and will allow staff to provide education and training to patients on how to access and use healthcare services online. The need for expanded telehealth services and education is significant. Throughout HRiA's stakeholder engagement with priority populations (see

Section 7), many residents expressed a lack of confidence and ability in successfully accessing healthcare apps on their smartphones and computers. The two DEF telehealth awardees will be specifically addressing this need. These telehealth grants will cover two years of programming, offering targeted navigation support so that residents can schedule and attend appointments online, access their personal health information and updated charts, and receive a wide range of healthcare supports at home through their mobile device or computer.

Further, three organizations have received $50,000 each to expand their existing device refurbishment programming. Through these awards the City aims to increase device access for Boston residents, provide new opportunities for residents to enter the technology field, increase digital literacy rates and internet subscriptions, and add new device refurbishment partnerships across the City. Finally, there are 31 organizations receiving a combined $768,000 in awards for their digital navigation work. Through these grants, the City hopes to improve digital skills rates across the City, increase internet subscription and device ownership rates, and increase the availability and diversity of computer and skills classes across the City.

Table 30 below provides a full breakdown of the DEF's 2023/2024 award recipients, award amounts, and a brief description of each entity's programs.

Table 30: Recent Digital Equity Fund Awards

DEF area	Organization name	Brief grant description	Award amount
Telehealth	Boston Medical Center Corporation	• Expand its THRIVE Digital Equity program by hiring one additional digital health navigator to assist patients facing telehealth access issues. • Offer in-house digital health literacy training based on insights from THRIVE Digital Equity program, aiming to improve digital health tool access. • This initiative is dedicated to ensuring equal access for all our patients to BMC's digital tools, including our patient portal, "MyChart," and a telehealth platform.	$250,000
Telehealth	Franciscan Children's	• Significantly expand availability of pediatric behavioral outpatient therapy. The proposal has three elements: 1) launching a group therapy telehealth program, which is an essential care modality with limited availability; 2) improving digital access through providing digital health navigators, real-time interpreter services, and digital risk assessments and 3) providing more seamless patient and family experience through automated patient reminders, enabling hospitals to reach more patients and families over the next two years with telehealth.	$250,000

DEF area	Organization name	Brief grant description	Award amount
Device refurbishment	Computers 4 People	• Utilize existing partnerships with Boston-based non-profits and schools to nominate under-resourced individuals and provide them with free refurbished devices allowing for greater access to education, telehealth, workforce, and more.	$50,000
Device refurbishment	Mattapan/ Greater Boston Technology Learning Center, Inc.	• This funding will help to expand Mattapan Tech's "Earn to Learn" program to include 10 more youths over two years, and fund additional part-time employees (20 hours/week), essential materials (digital components and software licensing), and stipends for apprentices. • Earn to Learn focuses on hands-on training in tech support for Black and Brown individuals aged 16-18. The curriculum, developed with CompTIA, covers troubleshooting, repair, network installation, and more. Participants engage in pro-bono work for non-profits, refurbishing devices collected from various sources for donation to families in need.	$50,000
Device refurbishment	TEK Collaborative	• With this grant, TEK Collaborative will scale their device distribution efforts in the City of Boston, as they have been doing since early 2023. • The organization will work with locations of the Boston Public Library to create natural device distribution points for the community and will hold regular device distribution events at library locations.	$50,000
Digital Navigation	A Healthier Democracy/ Link Health	• Link Health's project aims to bridge the digital divide, addressing the critical social determinant of health—internet access—in marginalized communities. • Leveraging strategic partnerships with Community Health Centers, the organization actively provides technology support, including helping residents enroll in affordable internet plans.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Allston Brighton CDC	• ABCDC's Resident Services staff provide free programming to the 1,000+ low-to-moderate income (LMI) residents in ABCDC's affordable housing buildings. • This grant will support a comprehensive outreach program and digital training to reduce the digital divide and increase enrollment in services to improve digital access.	$23,000
Digital Navigation	Asian American Civic Association (AACA)	• This grant will enable the AACA to provide 50 clients with Digital Navigation services over the course of four quarters at its Multi-Service Center. This includes enrollment and application assistance into Xfinity's Internet Essentials program, which provides affordable internet low-income households.	$25,000
Digital Navigation	Boston Center for Independent Living (BCIL)	• BCIL will provide 150 persons with disabilities with key technology to facilitate their use of laptops, PCs, tablets, and smartphones. • This builds on the DEF project that BCIL operated in 2021-2022, which successfully distributed 170 pieces of equipment to consumers with disabilities. • BCIL will target, but not exclusively serve, residents of Dorchester, Roxbury and Mattapan.	$25,000
Digital Navigation	Boston Lesbigay Urban (BLU) Foundation	• BLU's Creating Access, Resources, and Education (CARE) program will navigate 1500 LGBTQIA individuals (households) through low-cost broadband internet services, screen participants for other needed services, and make referrals. • BLU will conduct outreach initiatives to help members of the LGBTQ+ community to understand the need to enhance computer skills and learn how to be safe online. Access to digital literacy classes and support staff from BLU are necessary to continue efforts for flattening the digital divide.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Boston Senior Home Care	• Funds will be used to hire a full-time Tenant Resource Counselor/Digital Navigator (TRC/DN) for our Supportive Housing Program (SHP) The TRC/DN will identify residents without internet access, enroll them in affordable internet plans, offer Tech Goes Home's technical training program, and offer ongoing connectivity and technical support for 0.5 FTE. The remaining 0.5 FTE will assist with SHP services and support. • Approximately 70% of Boston Senior Home Care residents do not have internet service and would require technical training and support. Even those with the resources and skills need support to access and navigate the internet, devices, telehealth services, and communicate with loved ones.	$25,000
Digital Navigation	Buddhist Tzu Chi Foundation (Tzu Chi)	• This funding will help to support Tzu Chi's efforts to mitigate digital inequity among low-income Chinese-speaking households and older adults in Boston. • In conjunction with Tzu Chi's ongoing Home Buddy project, the foundation will provide training on how to navigate online platforms, and education on internet security during home visits. • Tzu Chi volunteers provide companionship, assist with application form completion, and offer guidance on selecting suitable and low-cost internet providers, and devices (laptops, tablets, or desktop computers).	$25,000
Digital Navigation	Central Boston Elder Services (CBES)	• This funding will be used to help CBES develop online and hard copy of curricula and instructional materials for digital literacy programming. Programming will include an introduction to technology, how to use devices (including how to Facetime, Ichat, Google Meet, and Zoom), how to browse the web, and how to operate email. It will also support organizational capacity to further refine and expand capabilities of CBES and partners to deliver quality computer instruction for elders and disabled populations.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	East Boston Community Council (EBCC)	• This project will reduce the Digital Divide for English Language Learner students and their families. EBCC will purchase 10 tablets for distribution to students in need, and staff/Digital Navigators will provide digital training and low-cost program enrollment assistance as needed. This project will address the disconnect that English Language Learners in East Boston and their families have with technology.	$30,000
Digital Navigation	East Boston Social Centers (EBSC)	• EBSC's Active Adults program has an increased demand for activities through Zoom for our home-bound elders. These elders are generally low-income, and many are socially isolated. Zoom activities include chair yoga, coffee hours, crafts, a variety of "talks" on topics important to them, and other activities that can be provided through this platform. By providing these older adults with the devices and training to use platforms such as Zoom, we will combat social isolation and enable them to communicate with loved ones, utilize online resources, and more.	$23,000
Digital Navigation	EDEN (Empowered and Dedicated to Edify the Nation)	• This funding will support the "Digital Empowerment for Families: Bridging the Tech Gap for Homeless Single Mothers and Youth" project. This project aims to enhance existing programs and services by integrating a robust, hybrid model of technology and audiovisual training. This initiative is specifically designed for single mothers experiencing homelessness, focusing on providing access to technology and the internet, and equipping them with essential digital skills for today's increasingly digital world.	$25,000
Digital Navigation	Fathers' UpLift	• Fathers' UpLift works with many men in re-entry, in recovery, in financial difficulty, and/or who are facing other significant obstacles and challenges in their lives. • This project will address the challenge of accessibility to devices and adequate internet connectivity required to engage meaningfully with online tools and resources by funding the acquisition of laptop devices and having third-party Digital Navigator consultants guiding connectivity through enrollment to affordable internet options.	$23,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Harvard Street Neighborhood Health Center, Inc.	• Through this program, Harvard Street will improve digital equity for its underserved community by distributing entry-level laptops or tablets to individuals and families and by funding a part-time Digital Navigator to act as a learning coach for the following: ○ Signing up for Patient Portal, ○ Use of the online scheduling system, ○ User of other health and social services online tools e.g. sign-up for housing vouchers in Boston, ○ Education on how to operate a device.	$23,000
Digital Navigation	Hawthorne Youth and Community Center Inc. (HYCC)	• The Digital Equity Grant project at HYCC will improve access to affordable and reliable internet for low-income and elderly BIPOC Roxbury residents through the dissemination of information about affordable internet options, assistance with applications at community events, and distribution of laptops to those in need.	$20,000
Digital Navigation	Immigration Family Services Institute, Inc. (IFSI)	• This funding will support IFSI's existing digital literacy computer classes, which is a part of its Adult Education and Workforce Development program for new immigrants. • At least 30% of students in IFSI's digital literacy classes do not have reliable devices (tablets, laptops, desktops or even smartphones). To address this issue, IFSI collaborates with Tech-Goes-Home which provides free Chromebooks to 10 to 30 students per semester, however, more devices are needed. The Digital Equity grant will help more IFSI students receive devices.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Inquilinos Boricuas en Acción (IBA)	• This funding will help to support IBA's Resident Services Program (RSP), which facilitates bilingual (Spanish/English) digital equity programming, offering both group digital equity workshops and personalized, one-on-one technology coaching to its residents. • RSP's digital equity programming addresses the compounding challenges of a) inequitable access to technology, and b) inequitable access to knowledge surrounding technology use. These two issues act as barriers to digital equity for many of IBA's 1,200 affordable housing community members.	$30,000
Digital Navigation	International Institute of New England (IINE)	• IINE will hire a Digital Navigator to establish procedures and best practices for assistance, provide training for English for Speakers of Other Languages (ESOL) instructors and case management staff, and conduct targeted outreach both within their client base and externally. • IINE will assist participants in completing internet subscription sign-ups and provide Chromebooks, along with training on their use, email access, and the Zoom platform.	$25,000
Digital Navigation	Jackson Mann Community Center (JMCC)	• JMCC's digital navigation project aims to offer four additional services to adult residents in Allston-Brighton and students who are currently enrolled in its Adult Education Program: 1) In partnership with Tech Goes Home, 6 TGH sessions, 2) push-in digital literacy workshops to ESOL and HSE students, 3) Tech Support hours, and 4) internet service sign-up assistance events. • This project addresses the technology challenges associated with digital literacy and access to computers.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Lena Park Community Development Corporation, Inc	• With this funding, Lena Park will launch the "New DEAL Project – Digital Equity, Access and Learning!" and will offer: 1) enrollment into affordable internet plans, 2) workplace and workforce development classes, 3) digital features and technical skills development classes, 4) software usage and troubleshooting development classes, 5) implement “Tech Goes Home” for our senior population, and 6) device distribution.	$25,000
Digital Navigation	Maverick Landing Community Services (MLCS)	• With funds from this grant, MLCS will expand its existing Tech Goes Home (TGH) programming, so that more residents (in particular low-income low digital literacy immigrants, subsidized housing tenants) can receive this digital literacy training in East Boston and the wider Boston community. • This will help residents, many of whom are English Second Language, build technology skills necessary to apply for employment or pursue career advancement.	$25,000
Digital Navigation	Mission Hill Health Movement (MHHM)	• MHHM aims to connect residents with existing community resources, such as the Boston Public Library and the Timothy Smith Computer Center, to help residents use their digital devices. This funding will recruit volunteers to provide pop-up computer/phone education hours at community locations. It will also make hot spots available for short term use to Mission Hill Residents and provide basic tablets for Seniors to connect to the internet.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Mothers for Justice and Equality, Inc.	• MJE seeks funding to support its existing and robust Digital Equity program. This grant will support the purchase of 100 Chromebooks for client use, expanding existing digital skills programs to add an Advanced Digital Literacy 102 class, ongoing staff support, and outreach efforts. • This project will build upon initiatives to support clients with technology and internet access needs. Client computer needs include devices for training classes, to search and apply for jobs, applying for housing assistance, obtaining personal records to support citizenship, and other tasks. • With this program, MJE clients will gain access to technology they need to obtain sustainable employment and gain computer literacy skills that will be beneficial to their future career opportunities.	$25,000
Digital Navigation	Nigerian American Multi-Service Association (NAMSA)	• For seniors and struggling families in the African immigrant community in Boston, integrating measures that address social determinants of health and inclusive health are critical to wholistic care and wellbeing. • NAMSA's "Bridge-The-Gap" project promotes digital inclusion for seniors and job search/placement support services for new immigrants, unemployed householders and graduates of NAMSA's CNA training program. • Located at the NAMSA Service Center, the project provides group and individualized support to seniors, low-income families, the unemployed and new immigrants with skills for effective digital navigation and access to digital tools. Trainings and case management support services helps to ensure that participants get timely job placements.	$23,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	North End Community Health Committee Inc. (NECHC)	• NEW Health's digital equity project will assist low-income and public housing residents in Charlestown with accessing digital devices and reliable internet services. • On-staff community health workers will act as digital navigators to assist residents in exploring internet services and provide them with devices as needed. This project addresses access to digital devices and internet services for low-income public housing residents served by NECHC.	$25,000
Digital Navigation	Nuestra Comunidad Development Corporation	• As Nuestra CDC prepares to open its first Technology Center in 2024 at the Dudley Crossing development in Roxbury. This funding will support its build out of digital and technical services and training, including enrollment into affordable internet subscriptions, financial literacy workshops/classes, computer classes, and online rental assistance. • This grant will enable Nuestra CDC to hire a full-time Technology Program Coordinator who would oversee the new Technology Center.	$23,000
Digital Navigation	One Bead	• This funding will support the hiring of a new part-time employee who will serve as a digital navigator. This individual will oversee One Bead's digital onboarding process, conducting calls with parents and guardians to ensure they have the resources and technology training to support their child's engagement in One Bead's virtual programming. • This will address the digital divide (usage, access, and generational gaps) that disproportionately impacts communities of color in Boston.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	PowerCorpsBOS	• This project aims to provide essential digital navigation support to underemployed and unemployed PowerCorpsBOS corps members, empowering them with the skills needed to thrive in the digital age. • Additionally, this funding will support internet access, by ensuring consistent and reliable internet connections for disadvantaged youth participating in PowerCorpsBOS, addressing a critical aspect of the challenge and facilitating their access to online resources and opportunities.	$20,000
Digital Navigation	Rian Immigrant Center (RIC)	• The majority of students who are newly enrolling in Rian's Education and Career Services Department have few or no digital literacy skills. • Grant funding will be used to support the growth and development of RIC's Digital Literacy Orientation curriculum and Laptop Loaning Program, reducing the digital divide for more than 130 immigrant adults accessing our education and career services in the academic year.	$25,000
Digital Navigation	Southwest Boston Senior Services dba Ethos	• The Digital Aging program provides Boston's seniors with individualized and small group training on how to use their technology tools. Staff and volunteers teach participants how to access the internet and use online services and resources. • This funding will help to support ongoing efforts to assist eligible Boston seniors with computer ownership/access, digital literacy and skill building training, and education and enrollment support on low-cost internet/broadband programs and services.	$30,000
Digital Navigation	Urban League of Eastern MA	• The Digital Navigators project will address various technology challenges, including digital literacy gaps, lack of access to technology resources, and barriers to adopting digital tools and platforms. • Through personalized assistance and support, digital navigators will help individuals and small businesses become more proficient in using technology effectively for their needs.	$25,000

DEF area	Organization name	Brief grant description	Award amount
Digital Navigation	Vietnamese American Initiative for Development - VietAID	• This funding will support digital navigation services to help eligible clients and constituents sign up for affordable internet subscriptions, and purchase devices for residents who require them. • Many clients at the VietAID community center are more comfortable working alongside case service providers and may not have access to computers or internet service at home. Having a bilingual direct services team helps individuals fill out applications and follow up with other service providers in healthcare, public benefits, social security, housing, and more.	$25,000

9 Digital equity funding landscape

To implement strategies recommended in this report, the City and its stakeholders can potentially leverage certain state and federal funding sources.

9.1 MBI's Municipal Digital Equity Implementation Program is available to municipalities for amounts up to $100,000

MBI launched its $6 million direct grant program—the Municipal Digital Equity Implementation Program (MDEIP)—for municipalities to access funds to implement programs proposed through this and similar reports.[34]

The one-time grant of up to $100,000 is intended to help municipalities make local digital equity investments and execute projects that will increase access, adoption, and usage of the internet.[35] Applications are reviewed by MBI on a rolling basis. Any municipality that has participated in the Municipal Digital Equity Planning Program or has a pre-existing local digital equity plan or related document can apply for this implementation funding. The City of Boston can start its application for these funds immediately, using this report and ongoing conversations with local organizations as a guide.

This funding can go toward six areas of digital equity:

1. Digital literacy
2. Devices
3. Education, outreach, and adoption
4. Public space improvements
5. Apartment Wi-Fi
6. Connectivity for economic hardship

Municipalities interested in applying for this digital equity implementation opportunity must complete a two-step application process after submitting a digital equity study to MBI.[36] The final deadline for submissions is July 31, 2025.

The total award amount in the first round of MBI's implementation grant was $1.3 million, which was split among 18 municipalities. Examples of funded projects include the following:

Watertown: The City of Watertown has put its funding toward one initiative for the Watertown Housing Authority. With its implementation funds, the City will support up to two years of operating

[34] Municipal Digital Equity Implementation Program, MBI Massachusetts Broadband Institute, https://broadband.masstech.org/digital-equity-implementation.
[35] "Municipal Digital Equity Implementation Program", MBI, https://broadband.masstech.org/digital-equity-implementation.
[36] "Municipal Digital Equity Implementation Program," MBI, https://broadband.masstech.org/digital-equity-implementation.

expenses to match against the apartment Wi-Fi program (see Section 9.2.3 for more information) in Watertown Housing Authority units.

Lynn: The City of Lynn put its funding toward three initiatives:

1. Lynn Community TV received funding for Wi-Fi support and upgrades, and digital literacy training for the community.
2. New American Association of Massachusetts (NAAM)—a nonprofit that primarily serves refugees, political asylees, and migrants—received funds to purchase devices to distribute to its NAAM community that attend its free English as a second language (ESL) classes.
3. Pathways—a nonprofit organization that provides adult education, skills training, and English literacy classes—received funds to support the development of an eight-week class curriculum that will serve 15 individuals per cohort.

New Bedford: The City of New Bedford has put its funding toward two initiatives:

1. The New Bedford Council on Aging (COA) is receiving support from this grant to equip its new computer lab with the necessary devices and staffing to offer digital literacy classes. In total, this grant funds the purchase of 12 desktop computers, 12 monitors, and a smartboard; and hiring of a digital literacy and skills instructor.
2. The Global Learning Charter Public School (GLC) opened a science, technology, engineering, art, and math (STEAM) Education building for its high school students, with a Thinkabit Lab on its first floor. Funding is being dedicated to the growth of the Thinkabit Lab, to support the acquisition of new equipment, software licenses, professional development for staff, and the employment of part-time trainers or stipends for existing GLC employees.

Fairhaven: The Town of Fairhaven has put its funding toward three initiatives:

1. The Millicent Library and Fairhaven Council on Aging are receiving funds to develop their partnerships with Tech Goes Home (TGH). TGH is an organization that partners with schools, healthcare providers, and community organizations to provide curated technology-based support through device distribution, internet access, digital literacy, and education. Through its “train-the-trainer” approach to digital literacy education, students are provided with a device for personal use after successful completion of their course at a community partner location.
2. Community Connections—a nonprofit community agency that offers support to adults with disabilities—is receiving funding to purchase 12 new devices to satisfy the demand by residents who participate in the organization’s Workplace Readiness Curriculum, which teaches individuals how to write a resume, apply for a job, and learn how to be a positive and helpful employee.
3. Fairhaven TV (FHTV) is receiving funds for the purchase of audio assistant devices that can serve up to eight individuals at one time.

Other municipalities are using their round one grant funds to support various local entities and municipal projects. See Table 31 for a full list of all participating municipalities' initiatives and program plans.

Table 31: Summary of Municipal Digital Equity Implementation Program awardees (round one)

Initiative area	Municipality	Entities/programs receiving funds
Digital literacy programs	Charlton	Library
	Somerville	Somerville Housing Authority
	Montague	Council on Aging
	Adams	Library and Council on Aging
	Lanesborough	Library and Council on Aging
	Worcester	Library
	Peabody	Citizens Inn Shelters
	Easthampton	(E-Media, LFA)
	Fairhaven	Library and Council on Aging
	Lynn	Lynn Community TV and Pathways
	New Bedford	Council on Aging and Thinkabit Lab
Device purchasing and distribution programs	Charlton	Library
	Florida	Florida Public Schools
	Cheshire	Library and Council on Aging
	Adams	Library and Council on Aging
	Lanesborough	Library and Council on Aging
	Worcester	Library
	Greenfield	Library
	Easthampton	E-Media
	Fairhaven	Community Connections and Fairhaven TV
	Lynn	New American Association of Massachusetts
	New Bedford	Council on Aging and Thinkabit Lab
Education,	Somerville	Somerville Housing Authority

Initiative area	Municipality	Entities/programs receiving funds
outreach and adoption programs	Pittsfield	Wayfinding and Digital Equity Ambassador
	Greenfield	Accessibility of public resources
	Peabody	Citizens Inn
	Lynn	Lynn Community TV
Public space improvement programs	Pittsfield	Public park
	Cheshire	Transfer station hotspot
	North Adams	Library
	Adams	Library and outdoor center
	Lanesborough	Library and Council on Aging
	Lynn	Lynn Community TV
Apartment Wi-Fi programs	Greenfield	Greenfield Housing Authority
	Watertown	Watertown Housing Authority
	Peabody	Citizens Inn Shelters

9.2 MBI's Digital Equity Partnerships Program supports nine organizations across the state, some of which have directly supported the City of Boston

MBI's Broadband Innovation Fund addresses immediate and ongoing digital equity needs and has awarded nine organizations across the state with funding necessary to implement various initiatives. Some of these efforts can indirectly benefit the City of Boston, as noted below.

In September 2022, MBI issued an RFP soliciting partnerships with interested Regional Planning Agencies, Philanthropic Foundations, public and nonprofit service providers, and other organizations across the state to facilitate the implementation of programs that address six key areas of digital equity:

1. Digital literacy,
2. Wi-Fi access,
3. Public space modernization,
4. Connectivity for economic hardship,
5. Device distribution and refurbishment, and
6. Education, outreach, and adoption.

In 2023, MBI announced it was awarding funds through the Broadband Innovation Fund to nine partners: AgeSpan, Baystate Health, City of Boston, Tech Goes Home, Massachusetts League of Community Health Centers, Metropolitan Area Planning Council, Metro North Workforce Investment Board, UMass Lowell, and Vinfen. Each partner has a defined scope of services, and their programs will be in operation through June 30, 2026. To varying degrees, the City of Boston or its residents can benefit from some of the programs, as noted in the following subsections.

9.2.1 City of Boston

The City of Boston was awarded $5 million in grant funding directed to the BHA to support residents seeking affordable and dependable internet connectivity, and to other community organizations that support telehealth programs in Boston and establish workforce development programs through refurbishing distributed devices. A portion of this grant will also go toward the expansion of the City's publicly accessible Wicked Free Wi-Fi network, and to expand the City's Digital Equity Fund.[37]

9.2.2 Tech Goes Home

Tech Goes Home's goal is to support residents in Massachusetts to receive access to the digital tools, skills, and connectivity they need to thrive. In April 2023 it was announced that Tech Goes Home would be receiving a grant of $4.5 million to address four critical areas to close the digital divide:

1. Connectivity for economic hardship,
2. Digital literacy,
3. Device distribution and refurbishment, and
4. Education, outreach, and engagement.

Through MBI's Partnership Program, 16 local entities in Brockton, Chelsea, Everett, Lawrence, Lowell, Lynn, Malden, New Bedford, Pittsfield, Quincy, Revere, Springfield, and Worcester have partnered with Tech Goes Home to advance digital education and device gaps by providing digital tools, skills, and connectivity necessary to thrive.[38]

Local entities that are interested in offering digital literacy education and device distribution programs can still partner with Tech Goes Home directly. To get started on this process, interested local entities can complete this partnership inquiry form.[39]

Although the City of Boston is not receiving direct funding from MBI's Partnership Program for Tech Goes Home programming, the City has provided resources and facilitated partnerships between Tech Goes Home and many Boston entities. Through City funding, partner sites across Boston offered 124 digital literacy courses that were completed by 1,679 individuals between January 1,

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[37] "$5 Million in New Grant Funding to Expand Digital Equity," MBI, https://broadband.masstech.org/news/5-million-new-grant-funding-expand-digital-equity.
[38] "Massachusetts Awards $14 Million to Address Digital Divide," MBI, https://broadband.masstech.org/news/massachusetts-awards-14-million-address-digital-divide.
[39] "Partnerships," Tech Goes Home, https://www.techgoeshome.org/becoming-a-tgh-site.

2024, to September 30, 2024, alone. During that time, the City also facilitated 15 instructor orientation courses, training 214 staff on how to effectively teach digital literacy classes.

9.2.3 Metropolitan Area Planning Council

MBI has partnered with the Metropolitan Area Planning Council (MAPC), to award $5.6 million for the Apartment Wi-Fi program. This program allows MAPC to provide procurement support, capital expense funding, and funding for the first year of operating expenses to provide free Wi-Fi internet access to residents living in roughly 2,400 public and affordable housing units in Massachusetts. The effort targets residents most likely to face barriers to connectivity—those experiencing housing insecurity who have access to broadband but cannot afford it.[40]

As of February 2025, and with the support from the City, the BHA has applied for and signed the contracts to proceed with implementing this program at three BHA sites: the Alice H. Taylor Apartments and Ruth Lillian Barkley Apartments. Boston's housing authority can apply for additional housing developments to participate in this program by expressing interest at this link.

9.2.4 Vinfen

In April 2023, eight entities (Beth Israel Deaconess Medical Center, Boston Center for Independent Living, Clinical Support Options, Open Sky, Riverside Community Care, Advocates, Behavioral Health Network, and Vinfen) comprising the Human Services Alliance for Digital Equity, received $4.3 million to increase digital inclusion among low-income people with physical disabilities, intellectual and developmental disabilities, and serious mental health conditions. The alliance deploys 15 technology navigators to help people obtain digital devices, develop digital skills, and enroll in low-cost broadband programs. The technology navigators collaborate with people served in their homes and in service settings. Individuals are primarily served through a closed referral system, meaning individuals who are usually engaged with any participating entity's programs first are able to receive this technology navigation service as well. Two participating entities are based in Boston and directly support the City's residents: Beth Israel Deaconess Medical Center and Boston Center for Independent Living.

9.2.5 Mass League of Community Health Centers

The Mass League is a recipient of MBI's Digital Equity Partnership grant, using its funding to help hire and staff a digital navigator at 12 community health centers across the Commonwealth. Two participating health centers are located in Boston: Fenway Health, and Harvard Street Neighborhood Health Center.

Mass League has an established digital navigation program under the FQHC (federally-qualified health center) Telehealth Consortium (FQHC Telehealth Consortium – Bridging the Health Equity Divide), which was founded during the pandemic as a partnership between C3 ACO and the Mass League. Community Health Centers serve the most underserved and diverse populations in healthcare, so the services are provided by and at the health centers for their patients in need.

[40] "Smart Growth and Regional Collaboration: Apartment Wi-Fi," MAPC, https://www.mapc.org/our-work/expertise/digital-equity/apartment-wi-fi/.

Through this partnerships program, navigators assist health center patients with low-cost internet enrollment. Each health center also chose what digital health tools they would focus on, which could be telehealth, remote patient monitoring, or enrollment in patient portals with the goal that if patients are digitally engaged in their care, they will have healthier outcomes. Fenway Health's digital navigator concentrates on remote patient monitoring and patient portal enrollment. At Harvard Street, the health center's navigator is prioritizing patient portal enrollment, web-based scheduling, registration kiosk kickoff and training, and increased video-based appointments.

9.2.6 AgeSpan

AgeSpan is a statewide organization supporting more than 230 age- and dementia-friendly communities, including Boston. (Age-and dementia friendly communities are municipalities that have infrastructure, programs, and policies geared to assist older people or people with dementia. Boston is included on the state's list of 230 such municipalities.[41])

AgeSpan supports MBI as part of the Statewide Digital Equity Plan Working Group and collaborates with various partners to promote inclusion of older adults in state and local digital equity planning and programs, working to connect aging services (councils on aging, affordable senior housing, aging service access points) to other partners doing this work including colleges, libraries, and housing partners.[42]

Areas of focus for this program include providing tablets, offering training to help blind and visually impaired individuals, offering educational programs to protect against online fraud online, and helping boost enrollment in low-cost broadband programs. The eight counties involved in this program include Suffolk County, and there are two participating entities—Little Brothers-Friends of the Elderly, and Mass Law Reform Institute—that are based in Boston.[43]

One model is a Digital Access Program that offers a free tablet device, training on how to operate the device, and free data plans for individuals without broadband access in their home for up to a year. More details on this program, which is offered on the North Shore, can be found at this link.

9.2.7 Metro North Workforce Investment Board

The Metro North Workforce Investment Board was formed to set and oversee workforce policy in the Metro North region of Massachusetts. The goal of the board is to ensure federal and state funds are efficiently and appropriately applied to workforce development programs and initiatives that serve the needs of the region and its residents.[44] In 2023, the Board received an award of $4.1 million to expand its digital equity initiatives by hiring and training 32 digital navigators and providing employment and career counseling, providing 1,500 refurbished laptops, 300 hotspots, and

[41] "Examples of age- and dementia friendly community characteristics," Mass.gov, https://www.mass.gov/info-details/examples-of-age-and-dementia-friendly-community-characteristics.
[42] "About Us," AgeSpan, https://agespan.org/about-us/.
[43] "Healey-Driscoll Administration Awards $20 Million to Boost Digital Equity," MBI, https://broadband.masstech.org/news/healey-driscoll-administration-awards-20-million-boost-digital-equity.
[44] "Home," Metro North Workforce Investment Board, https://masshiremetronorth.org/.

providing internet access and IT support to recipients.[45] These digital navigators are stationed at 16 local and regional partner organizations and serve 39 Cities and Towns in and around Metro North. Boston is not included in this list.

9.2.8 UMass Lowell

A $4 million grant was awarded to UMass Lowell to lead a digital equity initiative serving Leominster, Fitchburg, Lowell, Haverhill, and Lawrence, and communities in Merrimack Valley, Northern Worcester County and the North Shore. Partnering with 13 other higher education community entities, UMass Lowell is providing technical skills, support and training for student digital navigators, and project management resources. Through this grant, UMass Lowell will also be improving multiple public facilities with broadband service, creating a multi-tiered digital literacy and navigation initiative that establishes a regional help desk at UMass Lowell and advances new digital literacy programs, distributing 1,200 new or refurbished devices, and expanding low-cost broadband outreach and adoption programs at six community-based organizations.[46]

9.3 Other funding opportunities are available to the City of Boston

9.3.1 Residential Retrofit Program

The Residential Retrofit program deploys fiber at public and affordable housing properties to replace deficient wiring and infrastructure through grants to qualified ISPs who will install, own, and maintain equipment.47 This program is operated by MBI using Capital Projects Fund money. Three BHA developments are participating in this program. As of February 2025, and with the support from the City, the BHA has applied for and signed the contracts to proceed with implementing this program at various developments (see Appendix A).

9.3.2 Municipal Fiber Grant

The Massachusetts Division of Local Services is offering municipalities the opportunity to apply for the Municipal Fiber Grant program, which offers assistance for the construction of municipally-owned fiber networks. Through this grant, the state hopes for municipalities to achieve certain goals of improving operations or improving disaster recovery and resiliency. Examples of this may include prevention of cyber security risks in local government, providing room for growth in internet bandwidth as municipalities grow, and supporting various infrastructure that rely on dependable technology for municipal needs including public safety, radio, and emergency operations centers.[48] All fiber built must be owned by the municipality, and awards are up to $250,000 per individual

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[45] "Healey-Driscoll Administration Awards $20 Million to Boost Digital Equity," MBI, https://broadband.masstech.org/news/healey-driscoll-administration-awards-20-million-boost-digital-equity.

[46] "Healey-Driscoll Administration Awards $20 Million to Boost Digital Equity," MBI, https://broadband.masstech.org/news/healey-driscoll-administration-awards-20-million-boost-digital-equity.

[47] "Residential Retrofit Program," MBI, https://broadband.masstech.org/retrofit.

[48] "About the Municipal Fiber Grant Program," Mass.gov, https://www.mass.gov/info-details/about-the-municipal-fiber-grant-program.

municipality, or $500,000 for multi-jurisdictional municipalities. The current grant window (as of the writing of this report) opened on March 10, 2025, and will close on April 10, 2025.[49]

9.3.3 E-Rate

The Federal Communications Commission's E-Rate program can bring discounted services to schools and libraries in the area. The Federal Communications Commission's E-Rate program was created in 1996 to enhance access to advanced telecommunications and information services for all public and nonprofit elementary and secondary school classrooms and libraries.[50] E-Rate is one of four programs comprising the Universal Service Fund (USF) and is funded by fees paid by telecommunications companies to fulfill the Congressional goals of universal service.

E-Rate is a $4.27 billion federal funding program managed by the Universal Service Administrative Company (USAC) that approves and provides subsidy discounts for telecommunications and information services for schools and libraries. In late 2023, the FCC made the latest addition to the list of eligible services by approving subsidies for Wi-Fi services on school buses as an eligible expense to help close the "homework gap" for students with limited broadband access at home.

Eligible schools and libraries identify goods or services they need and submit a request for competitive bids to USAC, which then posts these requests on its website for vendors. After reviewing vendors' bids, the school or library selects the most cost-effective eligible products and services using price as the primary factor. It then applies to USAC for approval of the purchase.

Funds are awarded as discounts ranging from 20 to 90 percent of the eligible costs and discount levels are based on the poverty level of the schools. Rural schools and libraries may also receive a higher discount. Recipients must pay a portion of the service costs. Often, schools and libraries will form consortia to centralize and manage the E-Rate application, reporting, and budgeting processes with a central point of contact.[51]

Eligible schools and libraries in Massachusetts received $10.1 million in E-rate disbursements in 2023.[52] The Massachusetts Board of Library Commissioners[53] tracks E-Rate participation by libraries and library networks and provides information and resources about the program. The Department of Elementary and Secondary Education's Office of Digital Learning provides similar outreach and education for schools.[54] While Massachusetts does not manage a state-wide consortium, several of the state's library networks and school districts participate in E-Rate.

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[49] "Municipal Fiber Grant Program FAQ," Mass.gov, https://www.mass.gov/info-details/municipal-fiber-grant-program-faq.
[50] Universal Service Administrative Co., E-Rate, https://www.usac.org/e-rate/.
[51] Universal Service Administrative Co., E-Rate, Consortia, https://www.usac.org/e-rate/applicant-process/before-you-begin/consortia/.
[52] Universal Service Administrative Co., E-Rate FRN Status Tool FY2016+, https://opendata.usac.org/E-Rate/E-Rate-FRN-Status-Tool-FY2016-/8xzh-ytkh.
[53] E-rate in Massachusetts Libraries, https://mblc.state.ma.us/programs-and-support/e-rate/index.php.
[54] Technology Planning and Sustainability, E-Rate, https://www.doe.mass.edu/odl/planning-funding/E-rate/.

The E-Rate application window opened for Fiscal Year 2025 on January 15 and closed on March 26, 2025. Interested entities should monitor USAC's E-Rate website for any future announcements on next year's application schedule.

Appendix A: Recommended strategic planning process for providing broadband options in BHA and other affordable housing sites

Lack of affordable access to broadband affects large numbers of low-income Boston households. In MPG's residential survey, one in four (24 percent of) Boston households said they believe their home internet is unaffordable, and one out of three respondents on government assistance (32 percent) or living in public housing (33 percent) reported that their home internet subscription is not good enough to meet household needs or that they do not have home internet at all.

Increasing competition is important, but given the end of the Affordable Connectivity Plan, affordability will continue to be a challenge. And programs like Comcast's Internet Essentials are notoriously hard to enroll in, requiring an application process and no Comcast subscription for the previous 90 days—a high bar.

An infrastructure gap is also evident. Although Verizon has extended its Fios fiber services across the City, 25 BHA sites do not have access yet. Many of those developments may have access to 5G Home Internet from Verizon or T-Mobile, but a site survey would be required to determine how well this service works at each site.

Table 32 provides details by site, and

Figure 18 maps BHA sites that do and do not have Verizon Fios service. Other sites only have Comcast service and potentially some level of 5G Home Internet fixed wireless service. As noted in the table, five sites are benefitting from MBI-funded wiring retrofits (with funding going to Comcast) and two are getting Wi-Fi networks installed.

Providing free broadband to people in subsidized housing would substantially reduce the City's accessibility and connectivity gaps. The City and BHA would benefit from pursuing a comprehensive strategy to find the most cost-effective and sensible path to achieving its goals. This section outlines what that process could look like.

Table 32: Fios availability at BHA developments

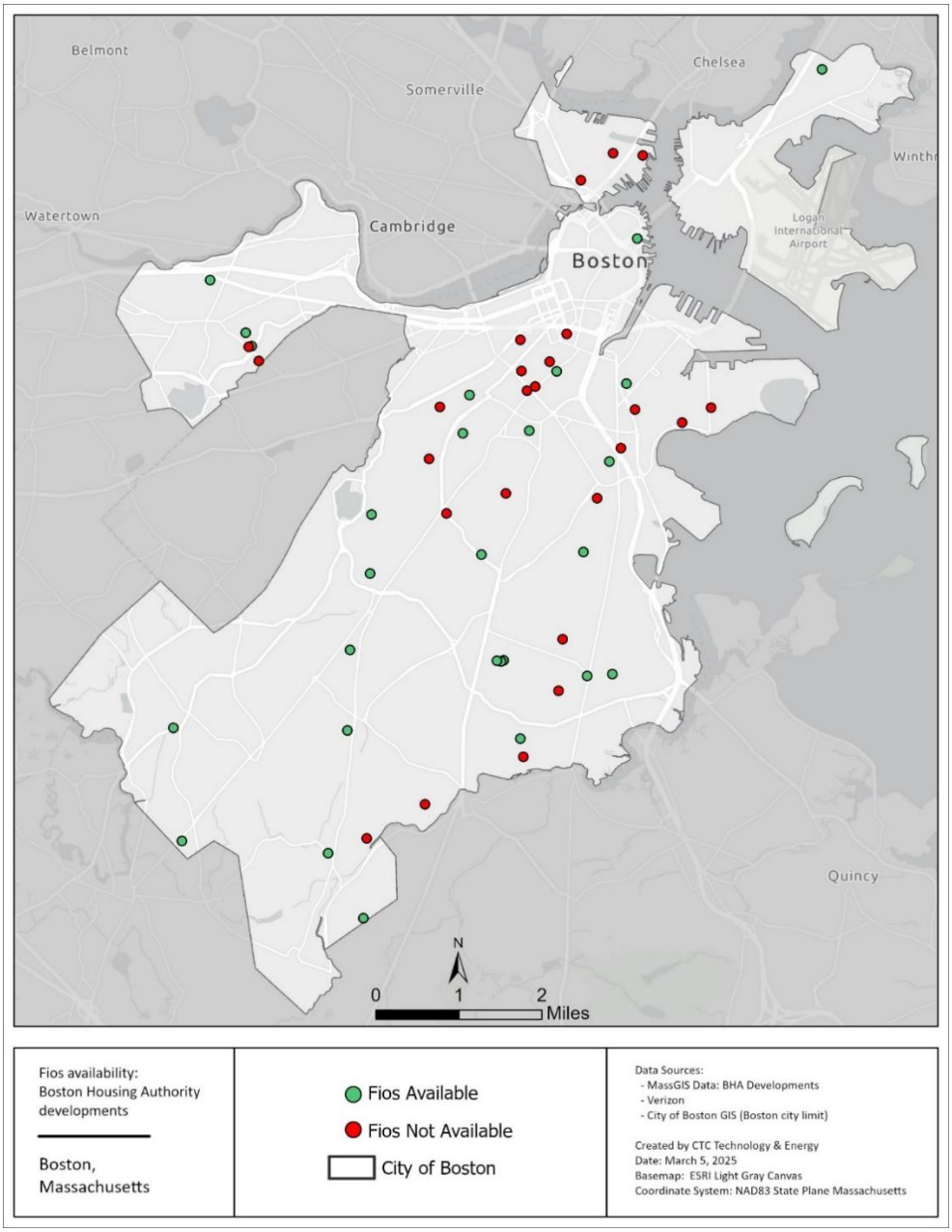
BHA site	Address	Verizon FiOS fiber available?	MBI grant recipients for infrastructure	Total units
Basilica	106 13th Street Charlestown, MA 02129	No		5
Charlestown	82 Walford Way Charlestown, MA 02129	No		1,104
Eva White	440 Tremont Street Boston, MA 02116	No		102
Foley Apartments	199 H Street South Boston, MA 02127	No		96
Frederick Douglass	755 Tremont Street Roxbury, MA 02118	No		78
Gallivan Boulevard	115 Standard Street Mattapan, MA 02126	Yes		251

BHA site	Address	Verizon FiOS fiber available?	MBI grant recipients for infrastructure	Total units
Hampton House	155 Northampton Street Boston, MA 02118	No		78
Highland Park	50 Highland Ave. Roxbury, MA 02119	Yes		26
J.J. Meade Apartments	11 Melville Ave. Dorchester, MA 02124	No		40
Mary Ellen McCormack	10 Kemp Street South Boston, MA 02127	No		1,016
Mission Main	43 Smith Street Boston, MA 02120	No		259
Monsignor Powers	120 L Street South Boston, MA 02127	No		68
Orient Heights	38 Vallar Road East Boston, MA 02128	Yes		179
Patricia White	20 Washington Street Brighton, MA 02135	No		44
Pond Street	29 Pond Street Jamaica Plain, MA 02130	Yes		77
Washington Manor	1701 Washington Street Boston, MA 02118	No	MBI Residential Wiring Retrofit – Comcast	82
Washington Street	91-95 Washington Street Brighton, MA 02135	No		363
**Alice H. Taylor Apartments	260M Ruggles Street Mission Hill, MA 02120	Yes	MAPC Apartment Wi-Fi Program	285
Archdale	75 Archdale Road Roslindale, MA 02131	Yes		100
Ausonia Apartments	185 Fulton Street Boston, MA 02109	Yes		114
Bellflower	24 Bellflower Street Dorchester, MA 02125	Yes		
Commonwealth	31 Jette Ct Brighton, MA 02135	Yes		278
Commonwealth Elderly	4 Fidelis Way Brighton, MA 02135	Yes		116
Fairmount	43 Bow Street Hyde Park, MA 02136	Yes		202
Faneuil Gardens	266 North Beacon Street Brighton, MA 02135	Yes		258
Holgate Apartments	129 Elm Hill Ave. Roxbury, MA 02121	Yes		81
Malone Apartments	11 Gordon Ave. Hyde Park, MA 02136	Yes		102

BHA site	Address	Verizon FiOS fiber available?	MBI grant recipients for infrastructure	Total units
Orchard Gardens Estates	25 Ambrose Street Roxbury, MA 02119	Yes		66
Pasciucco	330 Bowdoin Street Dorchester, MA 02122	Yes		92
Peabody Apartments	1875 Dorchester Ave. Dorchester, MA 02124	Yes		103
Rockland Towers	5300 Washington Street West Roxbury, MA 02132	Yes		69
Roslyn Apartments	1 Cliffmont Street Roslindale, MA 02131	Yes		119
**Ruth Barkley Apartments	1472 Washington Stret Boston, MA 02118	Yes	MAPC Apartment Wi-Fi Program	414
South Street	15 St. Rose Street Jamaica Plain, MA 02130	Yes		132
Spring Street	23 Spring Street West Roxbury, MA 02132	Yes		104
Annapolis	52 Sumner Street Dorchester, MA 02125	No		56
*Codman Apartments	784 Washington Street Dorchester, MA 02124	No	MBI Residential Wiring Retrofit – Comcast	102
Davison Apartments	101 Davison Street Hyde Park, MA	No		47
Doris Bunte Apartments	1990 Columbus Ave. Roxbury, MA	No		165
Franklin Field Family (Federal)	91 Ames Street Dorchester, MA 02124	Yes		346
Franklin Field Elderly	91 Ames Street Dorchester, MA 02124	Yes		64
Franklin Field Family	91 Ames Street Dorchester, MA 02124	Yes		40
General Warren	47 Washington Street Charlestown, MA 02121	No		96
Groveland	15 Mary Moore Beatty Circle Mattapan, MA 02126	No		48
*Hassan Apartments	705 River Street Mattapan, MA 02126	No	MBI Residential Wiring Retrofit – Comcast	100
Martin Luther King Towers	280 MLK Blvd. Roxbury, MA 02119	No	MBI Residential Wiring Retrofit – Comcast	104
Mildred C. Hailey Apartments	30 Bickford Street Jamaica Plain, MA 02130	No		779

BHA site	Address	Verizon FiOS fiber available?	MBI grant recipients for infrastructure	Total units
St Botolph Apartments	70 Saint Botolph Street Boston, MA 02116	No		132
Torre Unidad	80 W Dedham Street Boston, MA 02118	No	MBI Residential Wiring Retrofit – Comcast	199
West 9th Street	185 West 9th Street South Boston, MA 02127	No		84
West Broadway	81 Orton Marotta Way South Boston, MA 02127	Yes		484
Ashmont	347 Ashmont Street Boston, MA 02124	Yes		54

Figure 18: Verizon Fios availability at BHA developments



Set goals for connectivity and establish the order of priority for locations to receive connectivity

The process starts by establishing a goal. An example goal would be to extend fiber services to residents of BHA locations, with a likely starting minimum of 100 Mbps symmetrical service (scalable to far higher speeds) to each apartment and office plus free Wi-Fi coverage for all common areas at the properties. The goal could include imposing only a nominal fee (such as $10 or $20 monthly) to tenants or waiving fees altogether if the BHA or the City, with any potential grant help from MBI or other, can absorb the capital costs and ongoing operating expenses for bandwidth, help desk service, customer equipment installation and replacement.

The cost estimation process could express costs in terms of the per-unit, per month for providing this service over 20 years, considering capital cost amortization, ongoing operating costs, and any revenue derived from tenant fees.

The next step would be to set priorities on which properties should be upgraded, using criteria that could include:

- Lack of Verizon Fios or other competitive broadband option at the site
- Site not subject to a current MBI/MAPC Wi-Fi installation or other initiative
- Proximity to BoNet points of presence
- Number of apartments served
- Income levels and other needs of the resident population

Conduct comprehensive engineering assessment at the candidate properties

Once the priority list has been established, City and BHA staff and a qualified inside/outside plant (ISP/OSP) staff member or consultant would conduct site visits to collect information and develop the work plan and cost estimate based on the construction characteristics and infrastructure available at each site. The analysis would document the following:

- Age and condition of the building;
- Type of building (e.g. high-rise, garden style);
- Location and type of any existing wireline service and the associated ISP;
- Location of any communication room(s) and any inter-floor communications infrastructure;
- Location and type of providers' equipment at the point of ingress into the property;
- Type of internal wiring (copper, Cat5e, Cat6, Cat6a, coax, fiber) from the ISPs demarcation point to each residence and common area;
- Type (make/model) of any residential unit network interface device (NID) and location (wall, ceiling, exposed, hidden);
- Location of common areas and any associated NIDs;
- Sample test results for cable integrity;
- Sample test results for current internet speeds (randomly selected across units and common areas); and
- History of any renovations to determine age of any internal cabling that cannot be observed. Buildings built before 1980 may use outdated (RG-68 rather than RG-6) cabling. Any coax cabling older than 10 years would require replacement.

This individual or team could then develop a turnkey plan for the candidate projects that includes all on-site construction and engineering management, installation, and implementation services (labor and materials), engineering diagrams, field documentation and as-built drawings, and quality control. Once the plan is approved by BHA, the individual or team would produce bid specifications

for purposes of a public procurement to arrive at an accurate cost estimate, which—together with estimated operating costs—could be expressed as a per-unit, per-month cost.

Develop broadband wiring standards and specifications

The City of Boston has expressed a desire to ensure that future affordable housing construction projects be built to accommodate wiring for best-in-class broadband service, and to share this knowledge with the BHA. CTC developed wiring standards to assist the City and furnished this report to the City in late 2024; see Appendix B. It provides an overview of the technical challenges around broadband cabling in MDUs, proposes a schema for evaluating and rating existing or proposed cabling infrastructure, and provides proposed technical specifications for installation of MDU cabling infrastructure in greenfield or retrofit deployments.

Consider network design parameters and specifications for connectivity at affordable housing sites

The following are examples of potential network design parameters and specifications.

- Each property could connect via the property's point of entry to the nearest BoNet point of presence (POP) using 48 count fiber optic cable.
- All properties would be upgraded to include one or more fully configured Distribution Nodes (DNs) with dedicated power circuits capable of delivering a minimum of 100 Mbps symmetrical service to each dwelling unit.
- The DNs will be used to distribute a minimum of symmetrical 100 Mbps service using Cat6A twisted pair cable to each dwelling unit, common area wireless access points (WAP) and any management offices.
- Each dwelling unit will contain a fully configured WAP that will be used by the resident to access the internet.
- Fully configured WAPs will be deployed in all common areas to provide free Wi-Fi service to residents and visitors.
- The total number of devices within each property will be determined by the number of floors, units, and common areas.
- The City, BHA, or vendor selected through a procurement process would configure all DNs and WAPs to ensure provision of at least100 Mbps symmetrical connectivity.

Build awareness and facilitate signups by residents

Even after a new BHA/City infrastructure is established, tenants will continue to have other options for receiving broadband service. To ensure awareness and use of the new low-cost or free high-speed service, the City or BHA could:

- Run sign-up events and informational sessions at key times when construction is nearly finished and service is activated, and then schedule quarterly or biannual promotional events

- Offer healthy snacks at all events to encourage attendance and host some events in languages other than English as needed.
- Develop a short training for seniors to learn how to access free online training through Public Libraries and Senior Planet by AARP[55], how to digitally download materials from public libraries, and how to use the Senior Planet tech help hotlines.
- Establish a helpline for ongoing support.

A procurement process will provide the most accurate cost estimate based on then-current market conditions.

[55] Senior Planet from AARP, https://seniorplanet.org/.

Appendix B: Wiring standards

The City of Boston has expressed a desire to ensure that future affordable housing construction projects be built to accommodate wiring for best-in-class broadband service, and to share this knowledge with the BHA as the BHA undertakes potential wiring retrofits and apartment Wi-Fi network construction in the coming months under Massachusetts Broadband Institute grant programs. This report will become a section of the MBI-funded Municipal Digital Equity Plan but is being shared earlier to assist the City and BHA in these timely efforts.

This report:

- Provides an overview of the technical challenges around broadband cabling in MDUs;
- Proposes a schema for evaluating and rating existing or proposed cabling infrastructure for purposes assessing its ability to facilitate advanced broadband services and competition; and
- Provides proposed technical specifications for installation of MDU cabling infrastructure in greenfield or retrofit deployment scenarios.

The in-building broadband challenge

Even with newer construction, it is not uncommon for developers of MDUs to defer responsibility of installing the cabling necessary to deliver broadband services to private providers. Where this cable infrastructure is owned by the provider, it may not be accessible to competitive providers to deliver services to residents. Even where the in-building wiring is owned by the building owner, it may not be designed in a manner that is conducive to supporting broadband services by more than one provider.

The primary challenges to broadband service delivery and competition in MDUs are as follows:

- Existing cabling does not have the capacity to support advanced broadband services
- In-building cabling is owned by a single incumbent provider and not available for use by competitors
- Cable type and architecture are not suitable for competitive access
- The building lacks adequate pathways for new cabling

Where one or more of these factors exist, the cost to deliver service may be prohibitive. The result can be a lack of broadband service or lack of competition and consumer choice.

Telephone wiring generally lacks the capacity to deliver broadband services

Standard telephone wiring in most MDUs generally consists of one or more pairs of insulated copper conductors, typically manufactured as twisted pairs to reduce electrical noise. It is generally comprised of smaller gauge (thickness) wire and is designed to lower overall mechanical and material standards compared to most types of data cabling, making it unsuitable for transmission of higher frequencies carrying large amounts of data over long distances.

It is true that some workarounds have been developed, such as Very High-speed Digital Subscriber Line (VDSL) in its many variants and, more recently, G.Fast, as standardized by the International

Telecommunication Union Telecommunication Standardization Sector (ITU-T). But these technologies are generally not consistent with the standards of most broadband providers, and perhaps more importantly, are not reliably able to provide gigabit or near-gigabit speeds except over very short distances of typically less than about 100 feet. Effective capacity with these technologies drops off steeply as distance increases.

High-capacity data wiring is rarely installed by a building owner for use by competitive providers

Structured data cabling infrastructure using one of several variants of high-capacity wiring, such as Category 5e (Cat5e) or Category 6 (Cat6) unshielded, twisted pair (UTP) wire, is commonly used for local data networking and broadband service delivery in some residential and commercial MDUs. This type of cabling, consisting of multiple twisted pairs of wires, can reliably support gigabit speeds over distances of 300 feet. Moreover, it tends to be installed in a manner advantageous to supporting competitive access, providing dedicated "home run" connections back to common aggregation points throughout a building.

However, where it exists, it tends to be allocated for use by the building owner, is not installed in sufficient quantity or to all residential units or is installed and owned by an incumbent provider.

Coaxial cable is typically installed in a manner that precludes competitive access

High-capacity coaxial cable can support gigabit broadband services but is commonly installed in a manner that precludes access by competitive providers even if not owned by an incumbent provider. Operators of cable television networks supporting broadband services with cable modems have traditionally installed coaxial cable both for service drops to single family homes and within MDU structures and can support high-capacity data transmission over relatively long distances.

Coaxial cabling infrastructure installed throughout an MDU cannot generally be shared by multiple providers. The architecture of this infrastructure tends to limit its use to a single incumbent provider due to the passive splitters, and sometimes active amplifiers and taps, placed at various points throughout the building to distribute signals to individual units, which does not provide "home run" connections from individual residential units at aggregation points that can be readily accessed by a competitive provider. As each provider using this type of technology leverages the same or overlapping frequencies, with capacity of the coaxial cable shared by all connected subscribers, it is not feasible for a competitive provider to gain access to a dedicated connection to a given residential unit over this same infrastructure.

Pathways for new cabling and provider equipment is often not readily available for the installation of new broadband infrastructure in MDUs

A competitive provider seeking to install new broadband infrastructure in an MDU must gain access to the building and have reasonably accessible pathways for new cabling. Particularly in large MDU structures, there can be long distances between a suitable building entry point and the right-of-way, necessitating access to existing conduit or the costly installation of new conduit.

Once inside the building, a new provider is likely to require indoor space to place equipment at a suitable demarcation point, potentially requiring access to electricity for active provider equipment. Physical space is seldom allocated or managed by the building owner in a manner that facilitates the needs of multiple service providers.

And finally, the provider will require physical pathways in which to place conduit and/or cabling to extend from this demarcation point to each residential unit, which includes riser pathways between floors in multi-story MDUs. Lack of available and accessible pathways in risers, dropped ceilings, and/or existing conduits requires more costly construction of new cable pathways, sometimes necessitating specialized molding or raceway to minimize aesthetic impact.

Proposed rating schema for MDU broadband readiness

In this section, we present the City of Boston a schema for rating the ability of multi-dwelling unit (MDU) structures to support delivery of competitive broadband services. In this context, broadband readiness facilitates competitive broadband options and affordability of broadband services to residents.

The proposed rating schema is based on an evaluation of two main attributes of the existing broadband infrastructure: 1) on-premises connectivity, including the cabling, conduit pathways, and physical space for provider equipment, and 2) accessibility of the property to providers as required for connections between the MDU and a last-mile network.

The following sections discuss these evaluation criteria in more detail before presenting the proposed rating schema.

Property access

A last-mile provider whose network passes an MDU must be able to gain access to the property. In addition to access agreements that might be required by the property owner, the technical approach can be as simple as placing an aerial fiber cable from an existing utility pole or traversing a short segment of existing underground conduit from a manhole, communications vault, or utility pole in the right-of-way to an appropriate entry point for the building. In more complex configurations, new conduit and underground vaults may need to be placed throughout a development consisting of multiple structures to reach each building entry point, as might be the case in a large development of garden style, low-rise apartments.

An ideal configuration capable of readily supporting service upgrades or the entrant of a competitive provider would consist of existing conduits owned by the building owner or otherwise available for use by a broadband provider on an open access basis.

For purposes of this discussion, open access does not necessarily imply free or unrestricted use of the building owner's infrastructure – rather, we apply the term of open access in reference to any conduit infrastructure, cable raceway, or cable infrastructure available for use by a "qualified provider" on a first-come, first-served basis for free or at a non-discriminatory rate. In the context of City-owned properties, a qualified provider might be one that is able to meet federal technical guidelines for provision of broadband service (i.e. minimum service speeds of 100 Mbps downstream and 20 Mbps upstream) or any other standard for which the City determines is appropriate to efficiently make use of a scarce resource.

Building rooftops might function as another important access point for providers seeking to deliver services to an MDU, particularly high-rise apartments, using fixed wireless backhaul connections. Space to place antennas, usually mounted to sleds that do not require physical penetration of the

rooftop structure, and access to a building entry point with a contiguous pathway to the building riser cable pathways is sufficient to facilitate provider connectivity.

Physical space for provider equipment

The main distribution frame (MDF) and intermediate distribution frame (IDF) are telecommunications industry terms for the points at which communications cables are terminated for purposes of cross-connecting and for connectivity to network equipment. Depending on the physical media and network architecture, these locations may house active electronic components, such as signal amplifiers, network switches, and network terminals, or passive equipment, such as patch panels, radio frequency (RF) splitters, and optical splitters.

The MDF is the point at which connections to outside networks interface with a building's internal cabling – specifically, the point at which the last-mile broadband provider's network connects to an internal network or cabling infrastructure providing distribution throughout the building. The MDF provides space for equipment and termination of cable connections from the provider's last mile network, usually housed in a single equipment rack, and electrical service for electronics that certain types of providers may require to power equipment.

The MDF should provide riser conduit or sleeves providing cable pathways to IDFs on floors above the MDF. The IDF provides a termination point for connections to the MDF and aggregation of connections to each residential unit. Similar to the MDF, the IDF should provide space for provider cable terminations and equipment and electrical service for provider electronics. In the case of FTTP deployments, power may not be required in the MDF or the IDFs, containing only passive optical splitters and fiber termination panels.

Generally, the equipment used by last-mile providers to serve MDUs is similar to what is deployed in the field to serve single family dwellings - environmentally hardened and requiring no special climate control provisions. Particularly for FTTP deployments, MDFs and IDFs need only provide a physically secure space that is relatively protected from the elements and access to electrical power to support certain types of network technologies and equipment – for example, amplifiers for cable operators using hybrid fiber-coax (HFC) and remote Optical Line Terminal (OLT) shelves or Ethernet switches for FTTP in larger MDUs.

On-premises connectivity

On-Premises connectivity within an MDU consists of the cabling, cable pathways, and physical space for equipment available to broadband providers to deliver broadband services to residents.

The most flexible configuration consists of small diameter conduits running from each residential unit to the corresponding IDF, which can be used to readily place a service drop consisting of a small fiber cable, coaxial cable, or UTP data cable. For greenfield deployments, placement of a single strand fiber cable in the conduit will accommodate the needs of FTTP providers and can be used by most traditional cable operators who have adopted fiber-based solutions for MDUs and newer system upgrades.

Even if containing a previously installed coaxial or other type of cable, an FTTP provider can place a new fiber drop in the microduct or conduit to a resident subscribing to their service without

disrupting services to subscribers of existing providers if the conduit is available on an open access basis and not owned by the incumbent provider.

In lieu of conduit between the IDF and the residential unit, buildings equipped with multiple types of high-capacity copper wiring (i.e. a Cat6 cable and coaxial cable) that are available to a provider on an open access basis can facilitate service delivery by most providers. Most FTTP providers are cable of leveraging electronic devices, typically a specialized Optical Network Unit (ONU) to convert between native FTTP signals to coaxial or UTP cable to deliver gigabit or faster services.

MDU broadband readiness scoring matrix

Table 33 summarizes the MDU Broadband Readiness Scoring Matrix schema based on the criteria discussed above, with tiers ranging from A to F in order of most advantageous (A) to the least advantageous (F) in terms of broadband readiness. This schema is intended to facilitate a meaningful shorthand reference to MDU broadband infrastructure in the form a two-part rating for On-Premises Connectivity and Property Access (i.e., “A/A,” B/A,” etc.).

Table 33: MDU broadband readiness scoring matrix

Rating Tier	MDU Broadband Readiness	
	On-Premises Connectivity	**Property Access**
A	Open access conduit (including microduct) or raceway between each unit and a corresponding IDF or MDF; IDF or MDF having physical space and electrical power available for up to three competitive providers **And / or** Single strand of single mode fiber terminated between each unit and an IDF or MDF available for provider equipment placement on an open access basis **And** Minimum two 4-inch riser conduits between the MDF and IDF(s), as applicable, available on an open access basis	Two or more physically diverse conduit entry points to the building MDF from a carrier-neutral vault / manhole located in the right-of-way, each consisting of at least two 2-inch or larger conduit available on an open access basis. In the case of high-rise MDUs, one entry point can include rooftop access for fixed wireless backhaul connections.
B	Cat6 (or better) 6 cable terminated between each unit and an IDF or MDF available on an open access basis **And / or** Coaxial (RG-6) cable terminated directly between each unit and IDF or MDF with no intermediate passive or active splitters, amplifiers, or taps and available on an open access basis	One conduit entry point to the building MDF from a carrier-neutral vault / manhole located in the right-of-way consisting of at least two 2-inch or larger conduit available on an open access basis
C	Two or more connections of either Coaxial (RG-6 or RG-59) or Cat6 (or better) cable serving each unit accessible only to the incumbent cable or telco internet providers	Two or more conduit entry points to the building MDF owed and available exclusively to incumbent providers.
D	Coaxial cable (RG-6 or RG-59) serving each unit and accessible only to the incumbent cable internet provider	A single conduit entry point to the building MDF owed and available exclusively to an incumbent provider.
F	Telephone wiring (Cat3) or no wiring	No existing building entry pathway.

Recommended MDU cabling infrastructure specifications for greenfield deployments

This section presents a set of baseline specifications for deployment of broadband infrastructure in MDUs, as part of a greenfield deployment or substantial renovation, aligned with the top tier for broadband readiness described in previous sections. As each MDU presents its own unique design requirements and considerations, these specifications are presented as functional guidelines. In all cases, designs should be compliant with applicable industry standards and local codes, including:

- ANSI/TIA/EIA 758 (latest reference)
- ANSI/TIA/EIA 568 (latest reference)
- ANSI/TIA/EIA 569 (latest reference)
- BICSI Customer-Owned Outside Plant Design Manual (latest edition)
- BICSI Telecommunication Distribution Methods Manual (latest edition)
- International Building Code
- International Mechanical Code
- National Electric Code (NEC)
- Applicable State, County, and local municipal codes

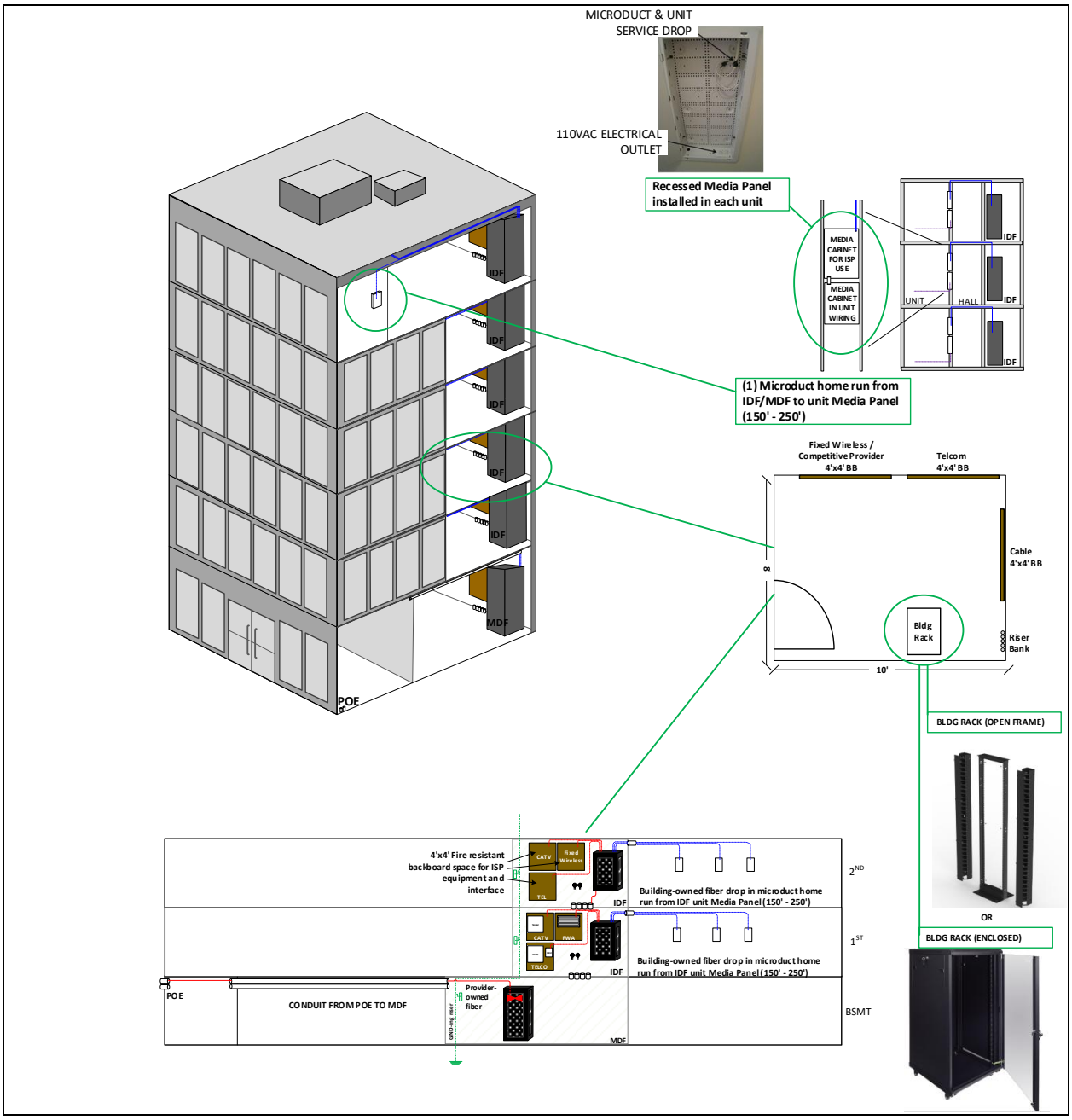
Overview of MDU broadband configuration

The recommended specifications for broadband infrastructure in MDUs focuses on providing open access cabling pathways and space for broadband provider equipment that is technology and vendor neutral. The recommended infrastructure is comprised of the following key components:

- ***Point of entry (POE) conduit pathway and vault*** – consisting of a minimum of two (2) four-inch conduits extending from the MDF to a large underground communications vault (4' x 4' x 4') located on the property as close to the right-of-way line as possible
- ***Main Distribution Frame (MDF)*** – indoor space having approximate dimensions of 8 feet x 10 feet providing secure space for provider equipment and equipped with fire resistant wall-mounted backboards and dedicated electrical circuits
- ***Intermediate Distribution Frame (IDF)*** – indoor space connected vertically to the MDF via riser conduit pathways and having approximate dimensions of 8 feet x 3 feet providing secure space for provider equipment and equipped with fire resistant wall-mounted backboards, dedicated electrical circuits for provider equipment, and fiber termination panels for horizontal service drop cables.

- ***Riser conduits*** – conduit stubs between vertically stacked MDF and IDFs facilitating provider cable connections between the MDF and each IDF, ideally consisting of three or more four-inch conduits
- ***Horizontal conduits to residential units*** – a minimum of one dedicated flexible conduit / microduct (0.5-inch / 13 mm diameter) running between each residential unit and the nearest IDF or MDF providing a pathway for fiber service drops, and optionally an additional 0.75-inch or larger conduit for secondary coaxial or UTP data cable(s).
- ***In-unit media panels*** – recessed, in-wall media panel in each residential unit for termination of conduit and broadband cable from the IDF, storage of cable slack, placement of provider customer premise equipment (CPE), and cross-connections between any in-unit wiring.
- **Fiber optic service drop cables** – single strand, single mode fiber drop cable installed and terminated between the in-unit media panels in each residential unit and the corresponding IDF / MDF.

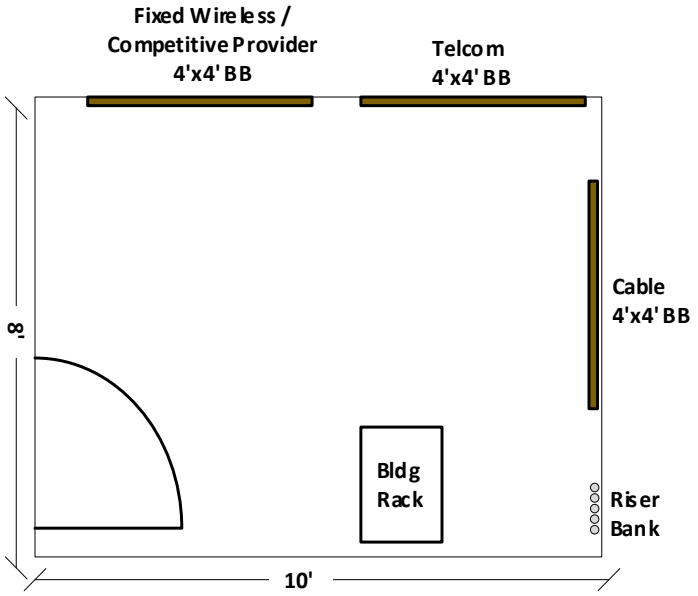
Figure 19: Overview of Recommended MDU Broadband Components



MDF and IDF requirements

The MDF and IDF provide a physically secure point for termination of provider and building owner cables, provider equipment, power for provider equipment. The MDF should nominally have dimensions of 10 feet by 8 feet to accommodate up to three competitive providers (Figure 20). Each IDF should have minimum dimensions of 3 feet by 8 feet (Figure 21).

Figure 20: MDF / Large IDF Layout

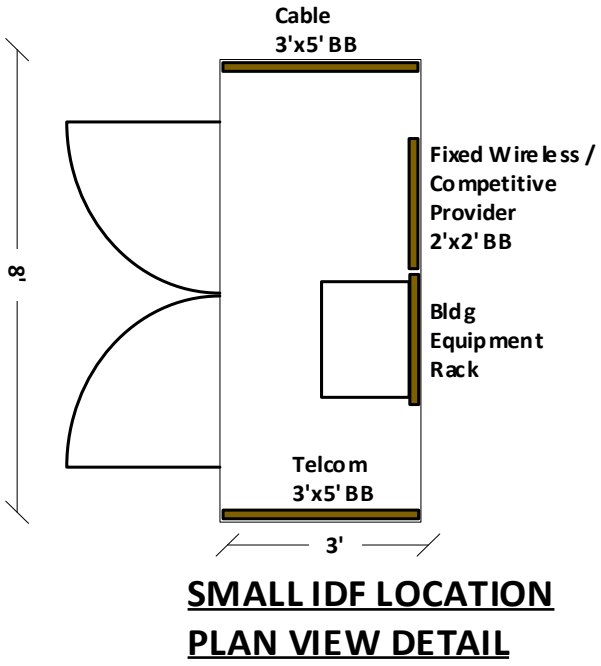


Conduits providing building access for the providers terminate in the IDF. A minimum of two 4-inch conduits should be placed between the MDF and an open access vault located as close to the right-of-way near the service feed locations of other utilities as possible and having dimensions of approximately 4 feet (length) by 4 feet (width) by 4 feet (depth) to accommodate provider splice enclosures and cable slack loops. Ideally, each MDF is fed from two diversely routed conduit paths to two diverse building points of entry (POE).

The MDF should have the following key characteristics:

- A minimum of three 110VAC circuits terminated on quad outlets
- Three ¾-inch fire resistant plywood backboards, each having dimensions of 4 feet by 4 feet, mounted securely to wall studs for cable termination panels and equipment mounting
- Four 4-inch conduit riser sleeves to the adjacent IDF
- Locking door
- Floor-standing or wall-mounted equipment rack providing a minimum of 42 rack units for standard 19-inch rack-mountable equipment to house riser cable termination panels

Figure 21: Small IDF Layout



Conduits or microducts providing access to each residential unit terminate in the IDF. Each IDF should have the following key characteristics:

- A minimum of three 110VAC circuits terminated on quad outlets
- Three ¾-inch fire resistant plywood backboards, each having dimensions of at least 2 feet by 2 feet, mounted securely to wall studs for cable termination panels and equipment mounting
- Four 4-inch conduit riser sleeves to the adjacent IDF / MDF
- Locking door
- Floor-standing or wall-mounted equipment rack providing a minimum of 26 rack units for standard 19-inch rack-mountable equipment to house riser cable termination panels

In-unit cabling components and pathways

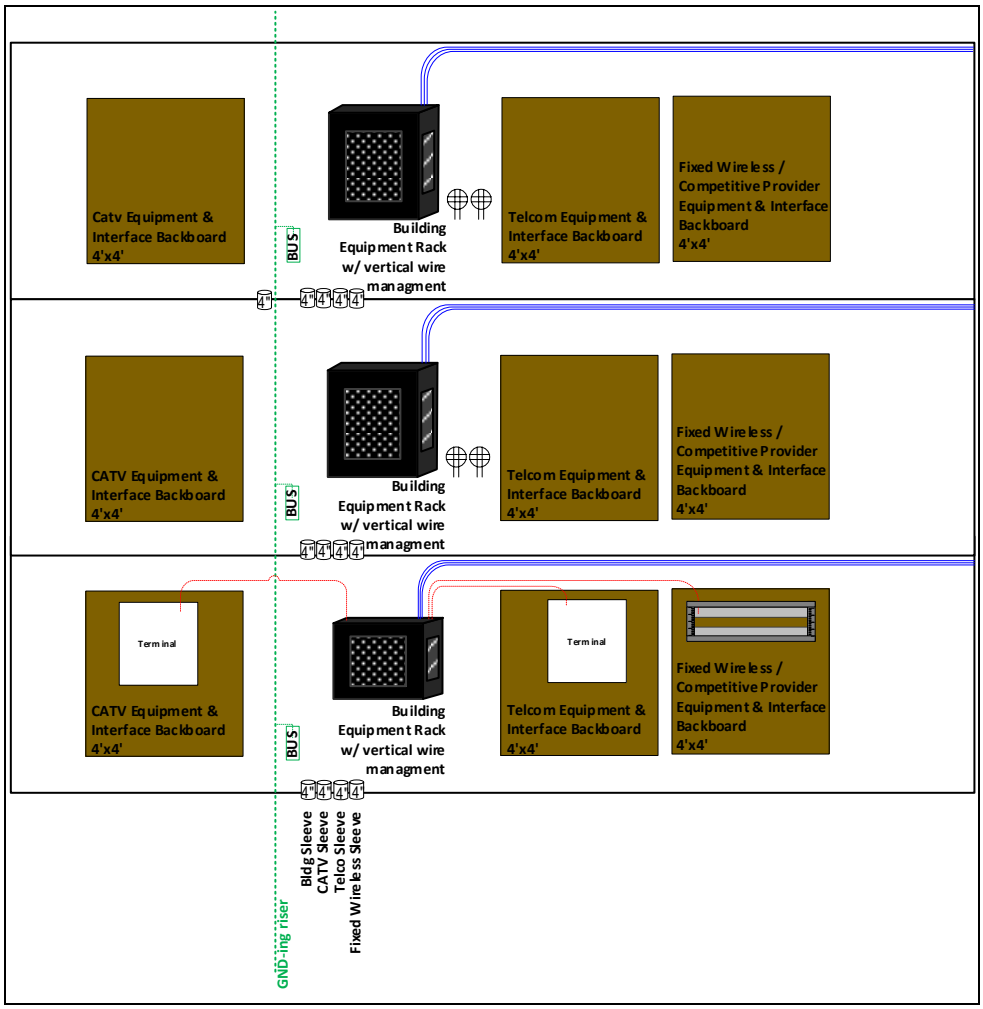
Each unit should be fed from the corresponding IDF or MDF with a minimum of one dedicated flexible conduit / microduct (0.5-inch / 13 mm diameter) providing a pathway for fiber service drops, and optionally an additional 0.75-inch or larger conduit for secondary coaxial or UTP data cable(s) (Figure 22). The material selection and conduit configuration will vary based on the building characteristics but generally will be comprised of individual high-density polyethylene (HDPE) flexible conduits.

In larger MDUs, multi-cell microduct products containing multiple individual innerduct pathways may be terminated in intermediate pull boxes from which individual conduits will be run to the individual residential units.

All ducts should contain pre-installed pull tape or pull string and should be installed with sweeping bends adhering to the minimum unsupported bend radius specified the manufacturer, but no less than a 13-inch bend radius. A total of no more than nine 90-degree bends, or 16 45-degree bends, should be maintained along all conduit paths between conduit termination points to facilitate cable pulling.

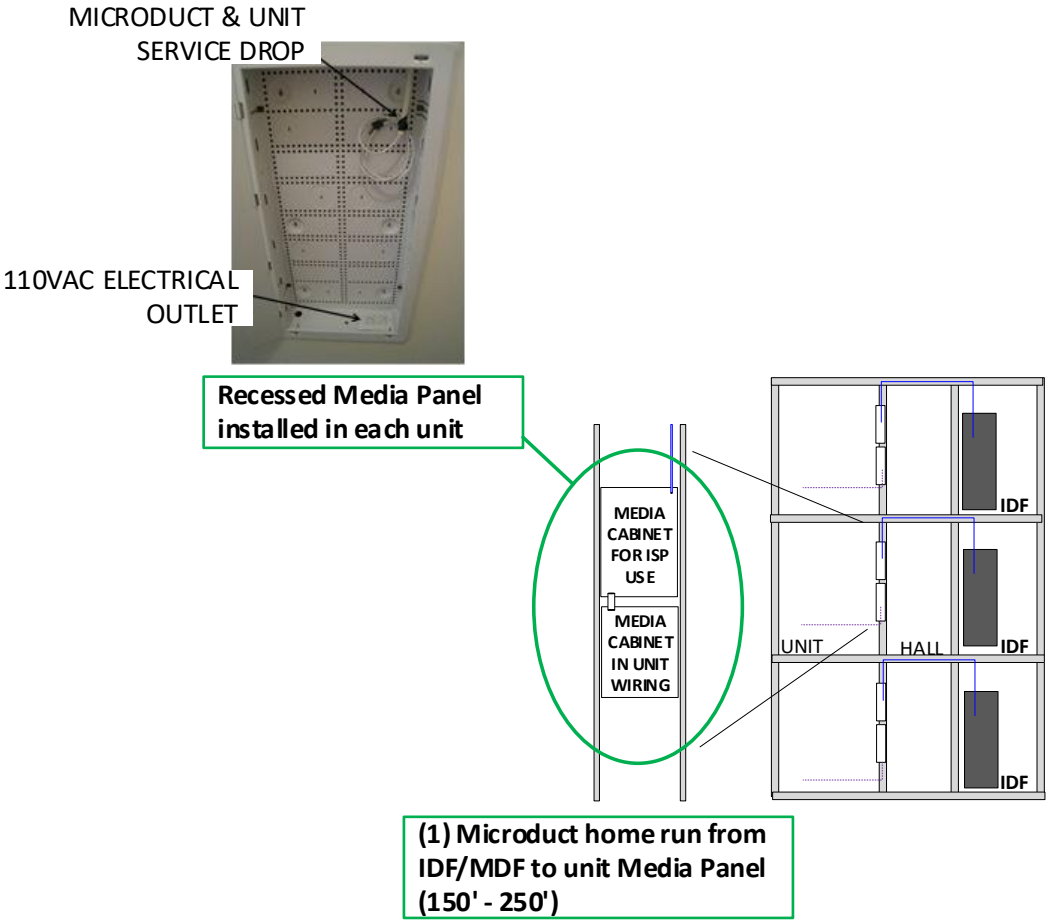
Conduit pathways between each unit and the corresponding IDF should be limited in total length to 250 feet.

Figure 22: Conduit Pathways to Residential Units



Conduits should be terminated in each residential unit within a recessed, wall-mounted media panel having dimensions of approximately 21 inches (height) by 14 inches (width) by 3.5 inches (depth) (Figure 23). The media panel should provide knockouts on the top and bottom surfaces for conduit entry and should provide mounting for a duplex outlet. Each media panel should be equipped with a single duplex, 110 VAC electrical outlet to supply power for provider CPE.

Figure 23: In-Unit Conduit and Cable Termination



A single-strand fiber optic drop cable should be run between the media panel in each unit and the corresponding IDF or MDF according to the following guidelines:

- Single mode, single strand fiber drop cable compliant with both ITU-T G.652.D and ITU-T G.657.A2/B2
- Terminated using an SC/APC connector and bulkhead within a fiber entry box located in the media panel containing a minimum of 4 feet of cable slack storage

Terminated in the IDF using SC/APC or LC/APC connectors installed within a rack-mounted fiber termination panel located in IDF the equipment rack

Appendix C: Summary of past Digital Equity Fund awards

Organization/ program name	Fiscal Year	Initiative goal	Target population	Grant dollars funded
Castle Square Tenants' Organization	2018	Creating a technology audio/visual college course	Local high school students	$35,000
La Alianza Hispana	2019	Leveraging partnerships by providing social, educational, and health services, and technology resources	Boston's Latino community	$100,000 for all three programs
Mujeres Unidas Avanzado	2019	Providing technology resources	Latinas from a disadvantaged background, including low-income and formerly incarcerated	
South End Technology Center	2019	Facilitating the use of technology in a variety of ways	Residents of organization who are at an increased risk of joblessness	
Allston Brighton Community Development Corporation	2022	Offering bilingual in- person technology education courses and devices	Older Bostonians in the organization's affordable rental portfolio	$6,586
Boston Center for Independent Living	2022	Providing 150 of the organization's residents with technology, including hotspots	Persons with disabilities at four of the organization's locations	$28,000
Boston Higher Education Resource Center	2022	Increasing access to devices and training	High school and college English Language Learner (ELL) students	$25,000
Boston Project Ministries	2022	Implementing a user- centered tool to help people connect to digital platforms	Older Bostonians	$7,250
Castle Square Tenants' Organization (CSTO)	2022	Building digital skills among the organization's residents	Older Bostonians who are residents of the organization	$16,164
Central Boston Elder Services	2022	Providing tablets, training, internet access, and ongoing user-support	Low-income, elderly residents of the organization	$35,000

Organization/ program name	Fiscal Year	Initiative goal	Target population	Grant dollars funded
Center for Community Health Education Research and Service	2022	Improving self- management of diabetes by increasing self-efficacy with technology	Older African-American/Black and Latinx (AA/BL) adults	$35,000
Codman Square Neighborhood Development Corporation	2022	Expanding existing workforce training programs	Organization residents and surrounding community members	$35,000
East Boston Community Council	2022	Providing internet services at home, internet training, and devices	ELL students	$35,000
Ethos	2022	Improving social interaction with innovation in information delivery and technology access	Older Bostonians	$10,000
Found in Translation	2022	Providing equipment and technology literacy training to better participate in the interpreting profession	Students and alumni of the program	$30,354
Harvard Street Neighborhood Center	2022	Facilitate telehealth access through equipment and training	Residents of the organization	$35,000
Mothers for Justice and Equality	2022	Providing 200 Chromebooks and monthly unlimited Wi-Fi access cards	Residents of three communities in Boston	$33,246
Neighborhood of Affordable Housing	2022	Distributing technology equipment and internet access	Families in the East Boston community	$28,000
Prince Hall Community Corporation	2022	Implementing a 15-hour training program, and distributing devices and internet access assistance	Older Bostonians	$35,000
St. Mark Community Education Program	2022	Recruiting and training 20 multilingual volunteers to offer at least 30 free digital skills courses in different languages	Workers who are unemployed or underemployed	$26,400
Victory Programs	2022	Enhancing existing mobile prevention team and providing internet access	Clients of the organization	$24,000
X-Cel Education	2022	Providing basic to intermediate computer skill trainings	Older Bostonians	$5,000
Zumix	2022	Providing media training	Boston's youth	$35,000

Appendix D: Low-cost broadband programs and other ISP resources

The City of Boston has five major internet providers: Comcast, Verizon (Fios and 5G Home Internet), Astound, Starry, and T-Mobile. All but T-Mobile offer low-cost broadband subscriptions to eligible households. Low-cost programs can provide significant relief to the 55,922 households that were previously receiving the ACP discount, and to the additional 86,478 households that were eligible. Boston can utilize existing local resources, including the housing authority's digital navigators and digital equity coordinators to support residents with their enrollment in these low-cost programs. Additionally, recipients of City Digital Equity Fund monies could prioritize undertaking similar efforts.

Low-cost programs offered by ISPs in Boston are detailed below.

Table 34: List of low-cost broadband programs in Boston

ISP	Program	Speed	Cost/month (non-promotional)	Eligibility
Astound	Internet First (50)	50/10 Mbps	$9.95	• Participation in public assistance programs like the National School Lunch Program, housing assistance, Medicaid, SNAP, SSI, and others • Students under federal assisted aid programs can qualify for Internet First by supplying an award letter. • Must not be subscribed to Astound services within sixty (60) day period immediately prior to applying
	Internet First (150)	150/20 Mbps	$19.95	
Comcast	Internet Essentials	75/10 Mbps	$14.95	• Participation in public assistance programs including housing assistance, Medicaid, SNAP, SSI, TANF, LIHEAP, WIC, Federal Pell Grant, VA Pension, Tribal Assistance • Must not be subscribed to Comcast services within ninety (90) day period immediately prior to applying • No outstanding Comcast balance
	Internet Essentials Plus	100/20 Mbps	$29.95	
	Internet Now 100	100/10 Mbps	$30.00	All households are eligible for Comcast Internet Now, except for customers who: • Subscribe to other Xfinity services (except Xfinity Mobile). If you want to downgrade from Xfinity Internet to NOW Internet, household must remove all other Xfinity services (except Xfinity Mobile). • Have Bulk Video, Bulk Internet, Managed Wi-Fi or Wi-Fi Ready service. • Are located at fiber properties.
	Internet Now 200	200/10 Mbps	$45.00	
Starry	Connect	30/30 Mbps	$15.00	Must be a resident of public and affordable housing.
Verizon	Forward	N/A	$30 discount to regular price of subscriptions	Must be a Federal Pell Grant recipient within the last year, qualify for Lifeline (through participation in SNAP, Medicaid, or have income be 125% below FPL), and WIC. Verizon Forward is available to existing customers. Can use Lifeline discount.

Examples of single-payer agreements with ISPs

Single-payer internet arrangements—in which a City or another entity pays a defined population's monthly internet bill through a bulk purchase agreement with an ISP—are readily embraced by many ISPs. Boston could consider a single-payer agreement with a local ISP. Boston could begin this

process by issuing a request for information (RFI) from providers in the City to identify who would be interested in partnering with the City. Successful examples of this approach include:

- **Cambridge Public Schools:** The City of Cambridge recognized that the cost of internet was a barrier to a home broadband subscription for many families with young children. To combat this, Cambridge Public Schools (CPS) partnered with Comcast to offer free internet service to eligible CPS households.[56]

  The City purchased hundreds of pre-paid vouchers for one-year subscriptions to Comcast's Internet Essentials program, which at the time was 50/10 Mbps that would otherwise have been $9.95 per month (recently, Comcast increased its service speed to 75/10 Mbps service and its monthly price to $14.95). See Table 3 above for more information.

- **Chicago Connected:** The National Digital Inclusion Alliance notes that through a single-payer program called Chicago Connected, more than 40,000 Chicago Public School students and their families have received broadband subscriptions since 2021.[57] Chicago Connected has become nationally recognized as a successful model for other entities nationwide.[58]

- **San Francisco/Monkeybrains**: The City operates the "Fiber to Housing program," which provides free internet to low-income San Francisco residents, through the Department of Technology and in partnership with the local internet provider Monkeybrains. Fiber to Housing began in 2018 and leverages existing municipal fiber resources and private sector partnerships to operate the program.[59]

- **Cruzio Equal Access Program:** Cruzio started its Equal Access program in California at the beginning of the pandemic, and the company has raised nearly $1 million for projects to cover both infrastructure and discounted services. The Equal Access project provides connectivity to students and their families who may not be able to afford internet service. Completed projects are in the City of Santa Cruz, Live Oak, and Pajaro Valley (all located in Santa Cruz County).[60] These projects were completed through a partnership between Cruzio, the County Office of Education, and Community Foundation Santa Cruz County, as well as the Housing Authority of the County and the Central Coast Broadband Consortium.

ISPs digital equity efforts and programs in Boston

ISPs in Boston have made contributions to Boston entities and local nonprofits in an effort to address the City's digital divide.

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[56] "Internet Essentials Program," Cambridge Public Schools, https://www.cpsd.us/internet_essentials_program.
[57] "Chicago Connected," Chicago Public Schools, https://www.cps.edu/strategic-initiatives/chicago-connected/.
[58] "What Are Single Payer Agreements?" NDIA, www.digitalinclusion.org/blog/2020/08/28/what-are-single-payer-agreements
[59] "Monkeybrains and Fiber to Housing," Monkeybrains, https://www.monkeybrains.net/MB_fiber_to_housing.pdf.
[60] "Previous Projects," Equal Access Santa Cruz, https://equalaccesssantacruz.com/previous-projects/.

Verizon contributed more than $6 million in funding and support for digital equity efforts in Boston, including $2.5 million in in-kind contributions to the City during the pandemic for hotspots and tablets to Boston Public School households, seniors in public housing, and others in need of digital connectivity. Verizon also committed to contributing $1 million to the Boston Digital Equity Fund (see Section 5.6.1 for more information).

Comcast said 37,500 Boston residents enrolled in the Internet Essentials program from 2011 through December of 2023. This is the number of cumulative enrollments, without deletions from households moving or canceling service over that 12-year period. As such, the actual number of currently enrolled is lower, perhaps significantly so, but Comcast does not share current enrollment numbers. There is an Internet Essentials help line in English and Spanish; the online application is available in seven languages and printed material is available in 34 languages.

Since 2022, Comcast has also contributed more than $7 million in cash and in-kind support to Boston-based organizations with a particular focus on supporting digital equity focused inclusion and workforce development at organizations. These programs include: partnering with local Boston organizations to provide free Wi-Fi to 36 community spaces known as "Lift Zones"; delivering free Wi-Fi in 35 BHA common areas and in the Commonwealth's Boys & Girls Clubs; donating devices to Tech Goes Home, ETHOS, BPL, Boston Chinatown Neighborhood Center, and Harvard Street Community Health Center to help address the City's persistent gaps in device ownership; and donating $50,000 to the Boston Public Library Fund to double the number of Connectivity Kits available to Boston residents with a library card (see Section 5.6.2 for more details).

Starry has also partnered with the BHA to provide free community-area Wi-Fi access at Ausonia—a 100-unit senior living development. Starry deployed access points to each of the community's common areas, and in hallways on each floor. Starry also donated five computers for a designated computer lab for Ausonia residents (see Section 5.6.3 for more information).

These programs have made an impact in Boston—however, more collaboration is needed between the City and Boston's ISPs to ensure that residents are gaining access to an internet service that they can afford. For example, Comcast could choose to share current data. And all providers could work more closely with City services departments and the BHA to provide direct education and assistance on enrollment in the ISPs' low-cost broadband programs. They could also make additional philanthropic donations for the expansion of Wi-Fi access in public spaces and community centers.

Appendix E: Speed test analysis

ctc technology & energy

engineering & business consulting

To: City of Boston

From: CTC Team

Re: Results of in-home speed tests at homes of City employees

Date: December 19, 2023

The City of Boston commissioned CTC to assist in conducting broadband speed tests at certain Boston residences served by Comcast, Verizon, and RCN/Astound as a way to spot-check performance of local broadband providers.

The homes were all of City employees who responded to an email request seeking volunteers. A representative from the City connected a piece of custom hardware (a small computer known as a Raspberry Pi, supplied by CTC) into the user's router by means of an ethernet cable, and provided power from a wall outlet.

The device then automatically conducted tests every 30 minutes of upload speed, download speed, and latency using the Ookla service for this purpose. Initially, devices were installed in 23 homes. Five were disconnected or did not report data for other reasons, leaving 18 sets of test data for analysis.

This memo and accompanying slide deck provide the results of these tests.

Context for understanding test results

Internet service providers offer residential service "up to" a specified level of speeds, expressed in megabits per second (Mbps). With residential service, bandwidth on a given node of the network is shared across multiple households, meaning that the network is not always able to deliver the maximum speed all the time.

(Commercial customers, for whom even short speed dips or network outages can be costly, can seek costly "service level agreements" promising specific performance levels and response times, but this is not how residential service works.)

Instances of slow speeds or service interruptions can have many causes. Some can be the fault of the provider, such as oversubscription or network outages. There are also potential problems inside the residence: Wi-Fi interference, malware on a computer, poorly configured or outdated routers, multiple users sharing bandwidth, loss of power, or degraded wiring in the building or residential unit.

All providers offer tutorials on these issues. For example, Comcast provides information on network management, sources of performance problems, and methods for checking and updating a home router here: https://www.xfinity.com/networkmanagement.

The testing method used in Boston eliminated Wi-Fi attenuation or interference as a cause of performance issues, because the device was plugged into the router. Conducting regular tests allowed a chance to see if poor results occur regularly. But while the testing methodology might reveal problems it cannot definitively diagnose them.

Further diagnoses, beyond the scope of this study, could include:

- Evaluating the user-supplied equipment and its configuration
- Evaluating usage patterns in the home (or potential usage by others if the network is not secured)
- Evaluating the computer for presence of programs using bandwidth
- Confirmation of subscription speed
- Testing cabling in the walls
- Testing cabling at the point it enters the building
- Testing nearby residential units to see if problems are more systemic.

Test results

The accompanying slide deck provides the individual test results for each residence. For most sites, results are presented for a common four-week period from April 23 to May 19, 2023.

Ten sites demonstrate clearly adequate test results. Ten test sites were getting adequate service, with most tests reporting at least 80 percent of the subscribed speeds and often at or above 100 percent of the subscribed speed. However, some of these households had individual tests at slower speeds, some of which were extremely slow. As noted above, these slower datapoints could have a number of causes.

Four tests at sites taking service above 600 Mbps could not be tested fully by this methodology. Four test subjects were taking service at levels higher than 600 Mbps, limiting our analysis given that the CTC-supplied devices cannot test at higher than this speed. However, given the strong speeds reported, these sites likely are receiving adequate service.

One Verizon site had poor test results, but this was likely caused by the customer's router. Tests at 43 Clifford Street, served by Verizon Fios, were consistently below subscribed speeds. The subscriber reported 200/200 service—a level confirmed on his Verizon bill—but uploads never got above 100 Mbps. Download speeds fluctuated considerably but were always below 100 Mbps. The resident reported using his own router, the "DLink AC1200 Dual Band DIR-822." This router has Ethernet interfaces that effectively throttle the speeds at 100 Mbps. This explains the source of these slow speed results.

One Comcast site had inadequate performance that was regularly below 80 percent of subscribed speed.

Tests of Comcast service at 153 Boylston Street showed numerous datapoints that were somewhat below 80 percent of subscribed speeds. This stood out among the tests. Diagnosing the cause of these slower tests would require further analysis. The causes could be regular heavy network usage

by other devices attached to the home network, oversubscription on that node of the Comcast network, or another cause.

Two potential mistakes in reports of subscription speed were noted. The user at 240 Heath Street reported his Verizon subscription as 200/200 Mbps, but the test results suggested the service was actually at 300/300 Mbps and was adequate at that speed. The opposite situation presented itself at 232 Parker Hill Avenue, where the user reported 400/400 Mbps service but the tests showed a ceiling of 300/300 Mbps service. In this situation, it is possible that there was a mistake in the report of the subscription speed. It is also possible that a router issue is capping service at 300/300 Mbps. A service call to Verizon is recommended.

Some long latency results were noted but may be occurring outside the providers' networks. There were some instances of spikes in latency times, but this seemed to be occurring at the same time on more than one provider. It is possible that something is causing a delay that is closer to the Ookla server—but is not on any of these providers' network—which would explain why it would show up across providers. The test methodology cannot isolate the part of the transmission path where congestion is causing longer latency times.

Advice for consumers

To the extent the City has the ability to provide advice to consumers, two useful pieces of advice are:

1. Review your providers' guidance on how to configure and use the network, and where to place the Wi-Fi router. As part of this, ensure that your modem and router is up to date and is able to deliver the subscription speeds. Call the provider to confirm.
2. Think twice before upgrading to a faster subscription speed. In attempts to fix perceived problems, consumers sometimes seek to upgrade. But such a move triggers higher costs and may provide little additional value because the problem is not a lack of headroom but transient congestion on the local network or problems in the user's home network or computer.