Digital Equity Plan

Produced by the Metropolitan Area Planning Council (MAPC) for Everett, Chelsea, and Revere, MA

October 2022

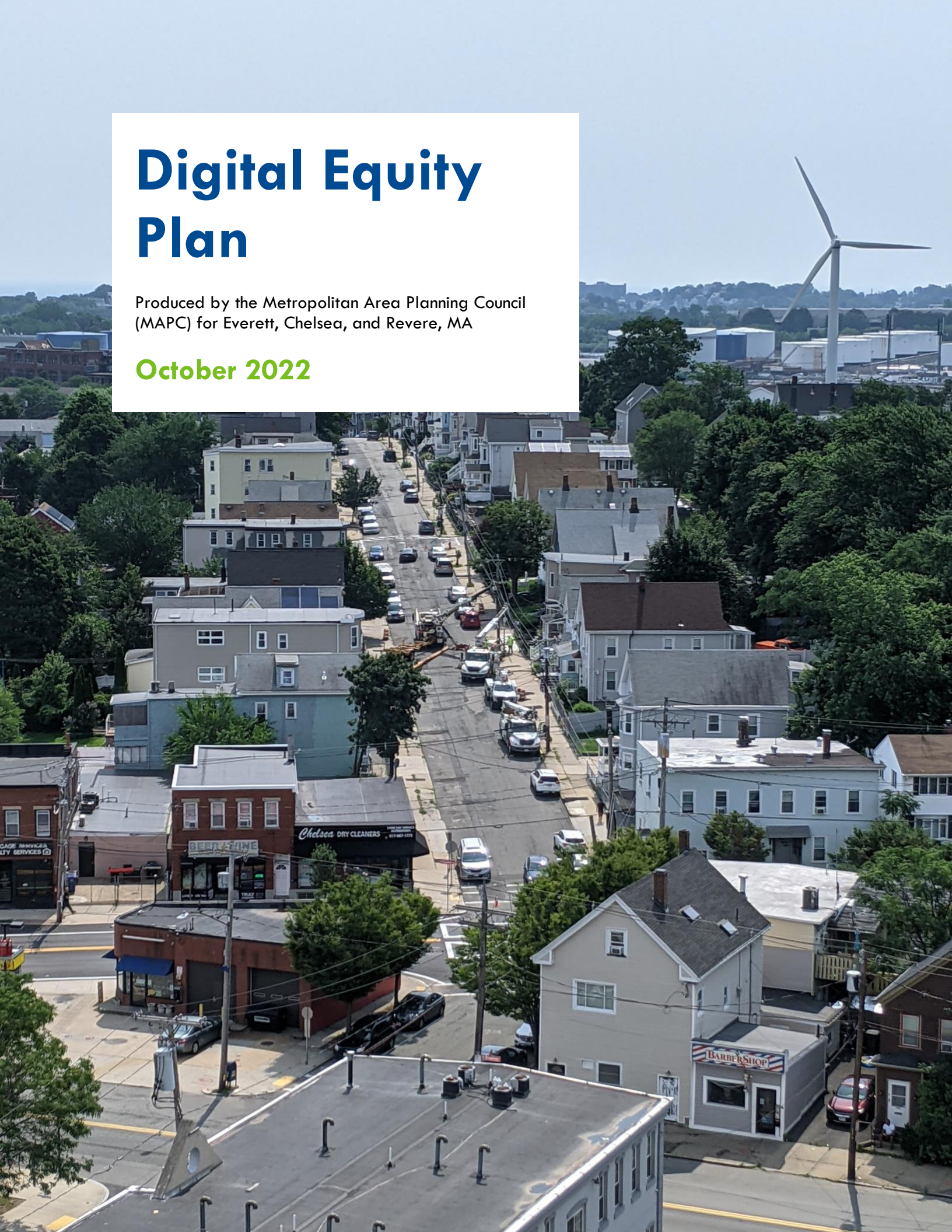


Table of Contents

TABLE OF CONTENTS 1

EXECUTIVE SUMMARY 3

Key Findings 6

Key Recommendations 8

DIGITAL EQUITY PLAN: EVERETT, CHELSEA, & REVERE 10

Digital Equity for all is achievable. 10

INTRODUCTION 10

DIGITAL EQUITY PLANNING PROCESS 11

Project Purpose 11

Community Advisory Team 12

Plan Timeline and Deliverables 12

HISTORY & BACKGROUND 13

Defining “digital equity” 13

Who owns the internet? 14

EXISTING CONDITIONS 16

Communities at a Glance 16

Demographics 16

Connection 16

Devices & Literacy 18

Service & Affordability 19

Infrastructure 24

COMMUNITY NEEDS ASSESSMENT 27

Survey Respondent Demographics 27

Key Findings 28

CONCLUSIONS 34

Invest in infrastructure, equity, and policy. 34

ACTIONS TO TAKE 35

Guiding Principles for Community Digital Access and Equity 35

Immediate 36

Intermediate 40

Long Term 42

APPENDIX 45

How does the internet function? 45

Internet ownership models review 45

Glossary of terms 45

Additional resources 45

ACKNOWLEDGEMENTS 46

Executive Summary

For most residents of Greater Boston, access to the internet may seem ubiquitous, if not inescapable. 5G signals on the phone, free Wi-Fi in cafés, high speed home connections, and fast computers put the whole digital world in easy reach. Full digital access allows people to work, learn, socialize, organize, and express themselves in ways that are not only convenient, but increasingly essential. Digital access doesn't just happen, though—it is enabled by infrastructure systems that provide connections to the internet, as well as social systems that equip residents with the money to buy computers and the skills to use them. Unfortunately, there are also systemic inequities in who are served by fast, affordable connections, who can afford a good laptop, and who has the "digital literacy" to get online safely and productively.

Like many other elements of our society, these inequities are felt most by people of color, low-income households, people whose first language is not English, and people from abroad. Data show that these groups are less likely to have a home internet connection and computer and more likely to have trouble affording and using the internet. Interviews with residents highlight key challenges: People described the challenges they face with choppy and unstable connections during remote school, having to cancel their internet subscription because it was too expensive, running out of data at the end of the month, and seniors who were taken advantage of by online scams. The disproportionate impact of these systems on vulnerable communities reinforces other types of injustice.

THE PLANNING PROCESS

In 2021, the cities of Chelsea, Everett, and Revere asked the Metropolitan Area Planning Council to create the Commonwealth's first regional digital equity plan, with the financial support of the Massachusetts Broadband Institute. For this effort, MAPC defines Digital Equity as the condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.

A regional approach was taken because the digital divide crosses municipal boundaries, and the solutions require coordinated efforts. Through a comprehensive planning process, MAPC evaluated available data, coordinated a digital access survey with over 2,000 responses, attended school district meetings, held focus groups in multiple languages, evaluated existing infrastructure, and worked closely with municipal staff and executive leadership to fully understand not only the symptoms, but the root causes of digital inequities. This plan outlines those findings and sets a path forward for these municipalities and others to improve not only digital connectivity and use, but the economic, health, and social well-being of all residents. We hope it may also serve as a resource for others developing digital equity plans elsewhere in the Commonwealth.

LIMITED CHOICE, LIMITED INFRASTRUCTURE

MAPC's analysis found substantial barriers to full digital access in these three municipalities. First, residents in these communities don't have much choice when it comes to "wireline" internet providers: it's either Comcast or RCN. Comcast dominates the market, serving over 60% of surveyed households in Everett and Revere and over 80% of surveyed households in Chelsea. With little competition to choose from, most customers are stuck paying whatever the cable companies are charging, which is often too much for many lower-income households: over 70% of survey respondents reported that they had cancelled internet subscription because it was too expensive. Almost half of the lowest-income households (earning less than $20,000 per year) report they don't have an internet subscription at home, relying on phone plans, public Wi-Fi, or nothing at all.

MAPC also found that despite being densely populated and at the core of the region, the infrastructure in these communities is insufficient to meet current needs. The cable providers' fiber optic networks—which are essential for truly high-speed internet—serve only some neighborhoods. As a result, at least one third of households must rely only on copper cable, DSL, or wireless service for their internet. Where fast connections are available, they come at a premium. Cost-conscious households usually end up with a cheaper plan and slower speeds. The lack of modern infrastructure is reflected in the quality of service: speed test data show that nearly two in five households are connected at speeds that don't even meet a very minimal definition of "broadband" (25Mbps download), much less what was advertised for their plan. The proliferation of smartphones and high-speed cell services isn't guaranteed to close the gap—even 5G remains inadequate for many applications due to high latency, and laptop computers remain essential for tasks such as preparing a resume or writing a school report.

CLOSING THE DIGITAL DIVIDE

Fortunately, there is already much underway to close this digital divide. The Affordable Connectivity Program (ACP) helps tackle the affordability problem with subsidies for low-income households. School districts provide laptops and wireless hotspots so that students can stay connected. Community-based "digital navigators" help their neighbors use technology, while gaining important skills and experience. Municipalities such as Chelsea, Everett, and Revere are making plans and investments to provide Wi-Fi, devices, and training.

Our research found much that can be done to advance and scale these efforts. As of 2022, just 21% of Massachusetts households eligible for the ACP have signed up for the benefit (25% in Chelsea, 18% in Everett, and 19% in Revere). Stakeholders say that more outreach, a simpler process, and language accessibility are all needed to achieve more widespread adoption. In addition, our outreach found there is an unmet need for digital literacy training that meets people where they are, in terms of location, language, and needs.

While the ACP is a great benefit for the households that receive it, individual subsidies are not an effective long-term solution to broadband affordability when there are so few options available in many neighborhoods. Other approaches are needed to fundamentally change the quality and price of internet service. One option is to deploy

free Wi-Fi networks in areas of high need, such as public housing and affordable housing developments. With high-speed broadband wireless available in every unit, residents get great service at no cost.

At a broader level, there is a need to enable greater competition in the marketplace of Internet Service Providers so that customers have more choices. A "public utility" model of broadband access may be necessary to accomplish this. When a municipality or public agency owns a fiber optic network serving every neighborhood, there's no monopoly based on the physical connection. Customers pay for the actual costs of the fiber connection and then have many options for internet service providers, helping to lower subscription costs. Preliminary plans underway in Chelsea and Revere suggest that public utility fiber connections to every home could be paid for at half the monthly cost for basic cable internet service available today.

A MUNICIPAL & REGIONAL APPROACH

Cities and towns have a key role to play when it comes to digital equity. They can start with creating a digital equity plan such as this one: map out assets and needs; identify key community partners; and adopt appropriate strategies for closing the gap. Those strategies might include a range of short- and long-term actions, including establishment of a Digital Equity Officer position to coordinate work across multiple departments and outside entities. Installation of in-unit Wi-Fi in affordable housing is one near-term step that can drastically increase quality and reduce cost for those most in need. Based in part on this study, Chelsea and Revere have already signed contracts to install "apartment Wi-Fi" at two housing authority sites with a combined 178, 2- and 3-bedroom units.

Another near-term, low-cost strategy is to adopt a policy requiring installation of fiber-ready conduit when repairing or reconstructing local roadways; each segment of conduit put in place this year reduces the cost and disruption of fiber optic lines at a later date. Municipalities can also lay the groundwork for long-term investments through a municipal broadband feasibility plan that assesses the finances, feasibility, and phasing of a "public utility" fiber optic network. With such a plan in place, cities and towns will be well-positioned to compete for broadband funds that may become available through federal infrastructure programs.

Municipalities should also look outside city or town hall for valuable guidance and partners. School administrators, housing authorities, nonprofits, community organizations, workforce boards, and community colleges each have a unique relationship with communities of concern for digital equity. These partners have a role to play in ensuring community needs are heard and addressed in Digital Equity Plans, as well as in implementing plans through outreach, training, or device distribution.

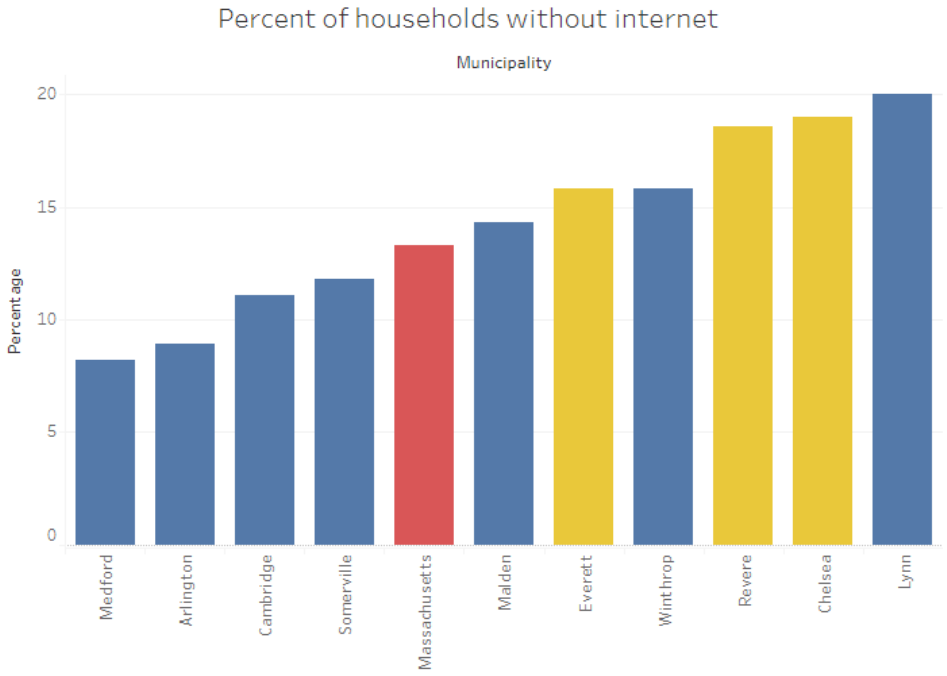
Regional collaboration is also important to advancing digital equity. By working together, cities and towns can understand the broader landscape of internet service provision and needs. Multi-municipal partnerships with regional nonprofits may enable those organizations to serve cultural or immigrant communities that are spread across multiple cities and towns. A "community of practice" among municipal staff focused on digital equity could provide a venue for those staffers to share successes, challenges, and lessons

learned. Where legislative or state actions are needed, joint municipal advocacy will be essential to getting changes adopted in law or policy.

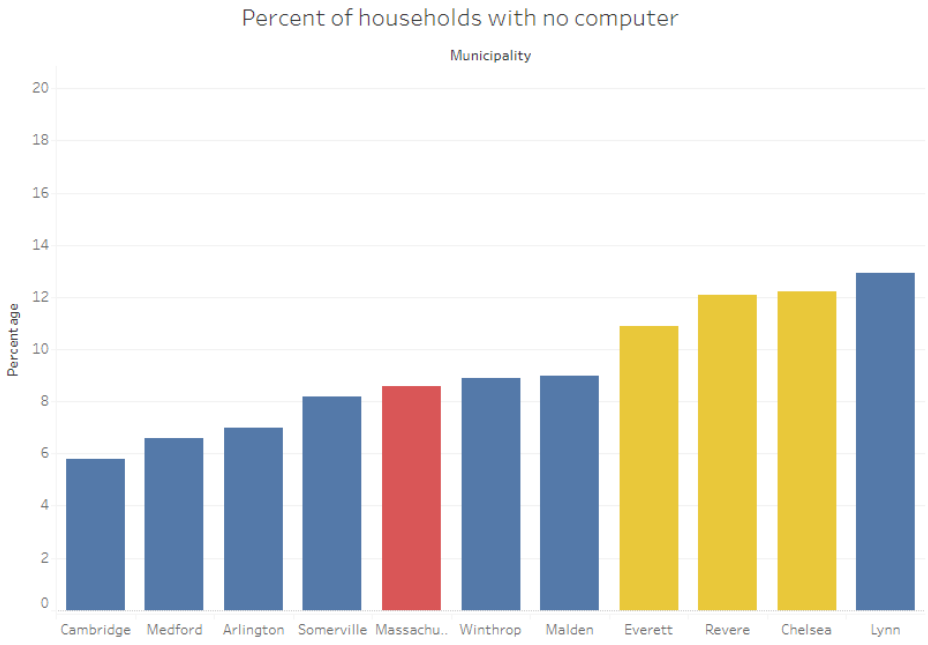
This report on conditions in Chelsea, Everett, and Revere shows that the digital divide is both persistent and ever-changing. Fortunately, there are many opportunities to close the gap: a new statewide Digital Equity Fund, administered by MBI, will provide resources for planning and implementation. Upcoming federal infrastructure dollars may be available for creation of municipal Wi-Fi and broadband networks. And an emerging cadre of community-based and regional organizations is making efforts to link digital equity with workforce training, lifelong learning, and community empowerment. Together, we can create true Digital Equity in Massachusetts.

Key Findings

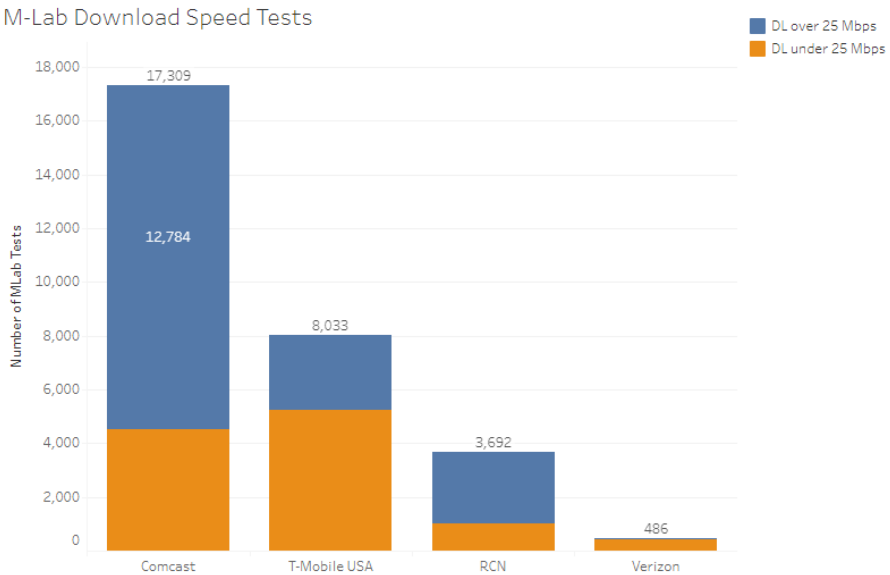
There are still many households unconnected to the internet. 15% of residents in Chelsea, Everett, and Revere don't have access to the internet at home—a total of 8,600 households. Among the poorest households (those earning $20,000 or less per year), this number jumps to 42.3% in Chelsea, 30.2% in Everett, and 35.5% in Revere. Affordability is a big challenge—70% of survey respondents said they had to change or cancel their internet subscription because it was too expensive. Monthly subscription costs in the three cities start at about $30 for the most basic plans.



Many households lack the devices necessary for full digital participation. Nearly one in nine households in the three cities doesn't have a laptop or desktop computer. While mobile devices may someday be capable of connecting residents to a full set of services, not having a device today can leave households unable to work remotely, attend virtual classes, or access government benefits and services.

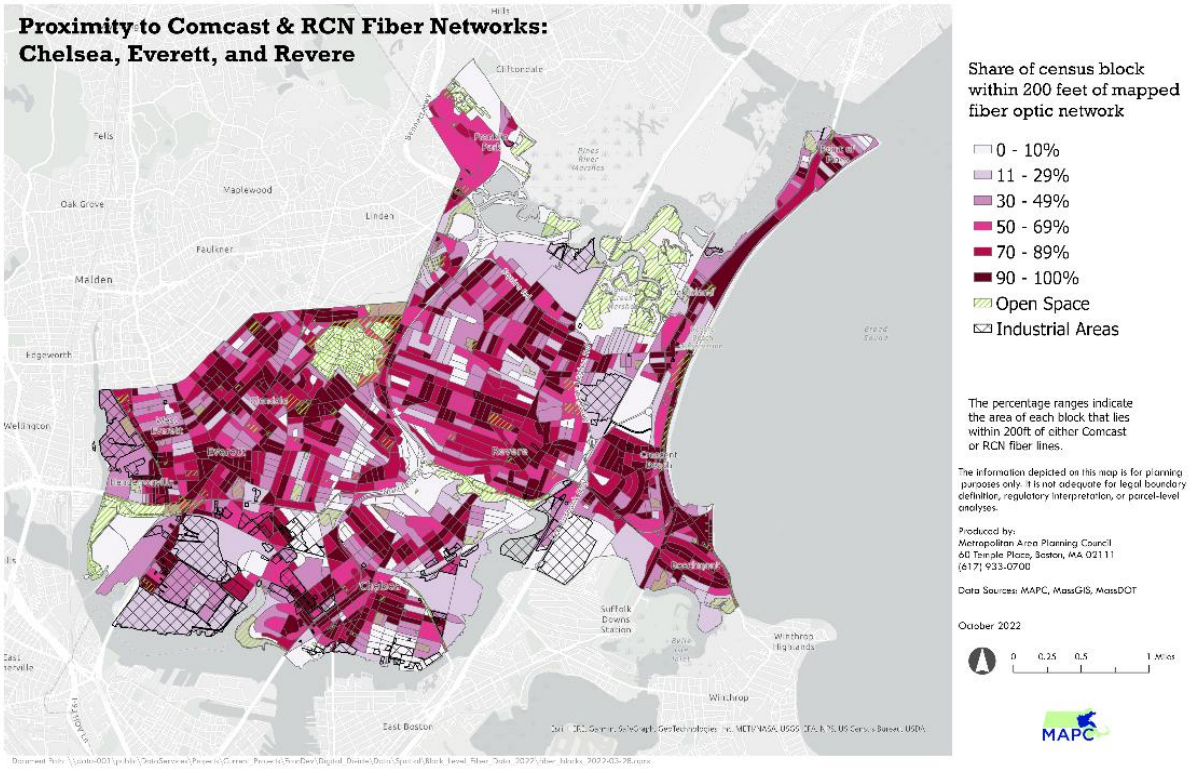


Many households that are connected aren't getting broadband speeds, even when that's what they are paying for. Speed test data from show that one third of addresses are getting service that is less than 25 Mbps download, a bare minimum definition of "broadband" speeds. This figure includes a quarter of Comcast subscribers who are presumably subscribed to plans that promise 50Mbps or higher.



Residents have few choices for "wireline" internet service and many are not even served by modern connections. Comcast has a near-monopoly on internet service in the three cities, serving more than 60% of survey respondents in Everett and Revere, and over 80% in Chelsea where it is the only cable company. The fiber optic networks of the two companies are far from comprehensive—at least one third of households are beyond the

reach of fiber service, meaning they have to rely on copper cable, DSL, or wireless service.



Key Recommendations

We make the following key recommendations:

1. Apartment Wi-Fi

As part of the State's Economic Recovery Plan, the Massachusetts Broadband Institute has made funds available, through MAPC, to support Wi-Fi deployments to help connect individuals, families, or small businesses with sustainable internet access in Chelsea, Everett, and Revere.

2. Municipal Broadband planning

Municipalities can, through the Build Better Broadband grant program funded by Connect Humanity, evaluate and provide cost estimate analysis for future public infrastructure investments. It will be important to further identify where public infrastructure investments can be leveraged to equitably close the digital divide.

3. Device distribution

   Through device refurbishment and training/distribution programs like Tech Goes Home, access to devices can be improved.

4. Digital Navigators

   Digital Navigators can be embedded in municipal offices, healthcare facilities, schools, libraries or other CBO's to provide direct technology and resource support to the community.

5. Digital Equity Officer

   Municipalities could hire a shared digital equity officer modeled after similar positions across the country. This position could be a joint position across municipalities that is focused on the implementation of digital equity initiatives and strategies.

6. Collect information from telecom providers

   Municipalities can use the Cable Franchise Agreements they hold with incumbent Internet Service Providers to access information about existing infrastructure, and use that information to

7. Dig Once/conduit policies

   Municipal investments in fiber can be coupled with Dig Once policies that mandate additional conduit be installed during construction or repair. Installing conduit throughout public rights-of-way can lower costs for providing broadband service in the future.

Digital Equity Plan: Everett, Chelsea, & Revere

Digital Equity for all is achievable.

Equity is the condition of fair and just inclusion in society. Equity will exist when those who have been most marginalized have equal access to opportunities, power, participation, and resources, and all have avenues to safe, healthy, productive, and fulfilling lives. As the COVID pandemic has highlighted, being able to access an internet connection is an essential utility that enables access to opportunities, power, and full participation in society. MAPC conducted a comprehensive planning process with the cities of Chelsea, Everett, and Revere to produce this plan. This plan outlines findings and sets a path forward for these municipalities, and others, to improve the economic, health, and social well-being of all community residents through digital connectivity.

Introduction

In March of 2020, the COVID-19 pandemic upended daily life in Greater Boston and around the world. Unemployment rates spiked, schools were closed, and those with the ability to work or attend school virtually were forced to reorient themselves to a completely digital environment. Reliance on this digital environment exposed many of the inequities that have existed in accessing these digital tools and resources. While some transitioned to online work or learning seamlessly, others faced big challenges. Many of those challenges relate to digital access. For example, slow and unreliable internet connections made it hard for many students to fully participate in online school. Some families were reliant on data-limited cellular plans that might run out by month's end. Many residents were not familiar with how to use the internet and digital tools, limiting their access to resources and making them vulnerable to scams and malware. And for a large share of the population, they simply didn't own a computer. These barriers put people at a disadvantage in education, jobs, health, and civic and community participation.

Municipal leaders and staff in Chelsea, Everett, and Revere recognize that they have a critical role to play in ensuring that residents and businesses have access to reliable, high-speed, and affordable internet service, along with the skills and tools to use it. The three municipalities engaged the Metropolitan Area Planning Council to create the Commonwealth's first regional digital access plan. A regional approach was taken because the digital divide crosses municipal boundaries, and the solutions require coordinated efforts. Through a comprehensive planning process, MAPC evaluated available data, coordinated a digital access survey with over 2,000 responses, attended school district meetings, held focus groups in multiple languages, evaluated existing infrastructure, and worked closely with municipal staff and executive leadership to fully understand not only the symptoms, but the root causes of digital inequities. This plan outlines those findings and sets a path forward for these municipalities and others to improve not only digital connectivity and use, but the economic, health, and social well-being of all residents. We hope it may also serve as a resource for others developing digital equity plans elsewhere in the Commonwealth.

Digital Equity Planning Process

Project Purpose

The purpose of this report is to establish a framework for understanding and addressing the digital access challenges in Chelsea, Everett, and Revere. While Massachusetts already has a strong track record of tackling rural broadband issues, not as much attention has been paid to underserved urban communities, especially Gateway Cities (defined by the State Legislature as a group of 26 midsize urban centers that anchor regional economies around the state). There is little guidance and few proven strategies for closing the gaps in these communities, necessitating a planning process that brings in new information and new approaches. Given the challenges facing these municipalities and their residents, it is also particularly important to develop a plan centered around user needs and capabilities and scaled to fit the capacity of municipal staff and other local implementers.

MAPC envisions that the participating municipalities can use the findings and recommendations of this report for three major areas of work: advising capital investments, supporting program design, and informing policy change. We also hope that this report can serve as a template for other Gateway Cities interested in developing digital access plans, so they can save time and effort on such planning processes.

The plan goals are as follows:

ADVISE CAPITAL INVESTMENT

The American Rescue Plan Act and the Infrastructure Investment and Jobs Act have created substantial resources for capital investment in broadband infrastructure. Massachusetts is setting up a $50 million Digital Equity Fund to help address gaps in digital equity. Municipalities will have discretionary resources, as well as the opportunity to apply for state and federal grants to invest in infrastructure. There are many things these resources could be used for: fiber optic networks, wireless access points, subscription subsidies, devices, and more. This plan aims to provide a framework within which municipalities can make sound decisions for future investments.

INFORM POLICY DECISIONS

Municipalities have modest regulatory power in the permitting and licensing of internet service providers and in technologies that enable internet access. This includes administering cable franchise agreements, permitting 5G infrastructure, and licensing right-of-way use for cable and fiber infrastructure. This plan shows how that regulatory power can be used to improve digital access in a community. Municipalities can also be powerful advocates for policy changes at the state level; the findings in this plan can help to inform this advocacy, and the recommendations include changes that must be made by legislative or regulatory entities.

IDENTIFY PROGRAM NEEDS

Achieving and maintaining digital equity will be an ongoing effort, not a one-time action. As technology changes and needs evolve, many communities will continue to face social and

systemic barriers to digital access. Municipalities have a key role to play in funding, convening, and coordinating cross-sectoral and multi-organizational efforts in this space. This plan identifies programming that can build local capacity and help close the digital divide.

Community Advisory Team

MAPC firmly believes that to achieve outcomes that enhance the wellbeing of a community, a plan must include that community's perspectives and participation. This is the bedrock of any design that centers users and their needs. It is also the respectful way to work with communities, and in particular, communities that have historically been marginalized.

This plan has benefitted greatly from the community advisory teams that met throughout this process to provide feedback and respond to proposed strategies and data analysis. The teams were extremely helpful in distributing and completing the community needs assessment. It provided perspectives that informed the plan's vision and goals and shaped the focus and framing of this plan. These stakeholders will also have a role to play in implementation; they should be actively engaged by municipal staff as they move the plan into action. Jump to Community Organizations acknowledgements »

Plan Timeline and Deliverables

Existing Conditions (February–April 2021)

Assess current internet service providers and their service offerings. Identify and analyze existing data sources to better understand community devices and internet access.

Deliverable: Map of publicly owned digital infrastructure, including broadband fiber, telephone poles, cell towers, public Wi-Fi, data centers, etc.

Deliverable: Slide deck outlining the cities' existing level of service and public infrastructure. Data files and code in standard formats used in the analysis.

Community Needs Assessment (April–June 2021)

Assess internet availability, device access, and digital literacy among specific populations in Everett, Chelsea, and Revere. With community partners, identify specific internet functions needed in daily life, current ability to use them, and barriers or challenges to doing so.

Deliverable: Data and analysis from the digital community needs assessment. Outline implications of this assessment for use in future recommendations.

Infrastructure and Technology Evaluation (June–August 2021)

Determine the state of digital infrastructure. Analyze the extent to which private Internet Service Providers (ISPs) have invested in the community and identify gaps in private service infrastructure. Evaluate relevant infrastructure elements as recommended by the cities and partners.

Deliverable: Data and analysis related to the inventory of digital infrastructure in the cities. Outline implications for future investment based on current infrastructure.

Deliverable: Technical memorandum outlining the relevant regulations and permitting for digital infrastructure.

Deliverable: Technical memorandum outlining major findings regarding strategic investment opportunities and policies that would improve digital infrastructure in the city.

Plan Development and Review (September 2021–September 2022)

Synthesize earlier phases of work to inform policy, program, and capital investments that address specific barriers and needs

Deliverable: Public document of key digital needs and issues in the cities of Everett, Chelsea, and Revere outlining the vision for digital access, and specific strategies that will be needed to meet the vision.

Deliverable: Final report, presentation to working group of findings, strategies, and an evaluation framework.

History & Background

Defining "digital equity"

Digital equity exists when all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.

Achieving digital equity is more than providing decent Wi-Fi. It's an interconnected challenge that includes three main elements: an adequate device (computer or tablet) a good broadband connection to the internet, and the "digital literacy" necessary to use the internet safely, effectively, and confidently. These are the three legs of the digital access stool. Unfortunately, many residents in Chelsea, Everett, and Revere face chronic, structural, and longstanding barriers to full digital access. Solutions and interventions must not only resolve isolated challenges but be part of a larger web of actions rooted in systemic and social justice.

ADEQUATE COMPUTING DEVICE

To use the internet for critical personal services such as education, healthcare, job searches, and other online applications, people need a computing device with adequate functionality. The proliferation of smartphone technology has helped millions gain access to the communications benefits of the internet, but smartphones can't fully substitute for personal computing devices such as a laptop, desktop computer, or tablet. Students need full-size

screens and keyboards for schoolwork. Many essential websites or applications are not available or optimized for smartphones and phones can be easily lost or damaged. For these reasons and others, it is important to ensure residents can acquire and maintain a dedicated personal computing device that meets their needs.

AFFORDABLE, RELIABLE BROADBAND CONNECTION

Users have a good experience on the internet when they can connect to online resources and transfer data (both uploads and downloads) fast enough to facilitate video conferencing and accomplish other tasks with minimal loading time. This requires an internet connection that has the bandwidth necessary to support modern web applications and services. Digital access suffers when households can't afford a high-speed plan, when connections are unreliable or "throttled" by service providers, when in-building wiring or hardware (such as modems and routers) is inadequate or outdated, or when the needs of multiple users in a household overwhelm the available bandwidth. It is essential to ensure that all households have access to a connection fast enough to meet their needs, and to ensure that this connection is something they can afford without sacrificing other essential needs.

DIGITAL LITERACY SKILLS TO SAFELY AND EFFECTIVELY NAVIGATE THE INTERNET

While many people navigate the internet effectively on a daily basis, others are not familiar with how to use the internet and digital apps, limiting their access to resources and making them vulnerable to scams, misinformation, and malware. The National Digital Inclusion Alliance (NDIA) defines digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills." These skills and knowledge encompass the ability to use a computing device, to navigate the internet, to be a smart consumer of information, and to avoid danger online. Today, such skills are essential to operate a device, obtain an email address, apply for a job, communicate with a doctor, and connect with family members. Ensuring that all residents have these skills requires programs, educational materials, and other support that must be tailored to the needs of individual communities and subgroups.

Who owns the internet?

SEE APPENDIX: How does the internet function?

No one "owns" the internet. The technology infrastructure that is used to send bits of data across the globe has many different owners and many different operators. Various distributed networks with different models of ownership, management, and regulation connect to form the larger Internet. Some entities own the massive "server farms" on which websites and applications live and operate; others own the connections between these farms and the portals which link them together; others own and operate the wires, fiber optic cables, or satellites that connect individual devices to the internet; and some companies exist simply to provide that connection. And of course, property owners and residents are often responsible for in-building wiring and hardware (such as modems) that are the critical final

links in the network. Understanding the landscape in Metro Boston is essential to planning for better connectivity.

In the cities of Chelsea, Everett, and Revere, corporate entities own and operate almost all the fiber optic lines, cable lines, telephone poles, and other physical network infrastructure. These same entities are the exclusive Internet Service Providers (ISPs) for households using this infrastructure to access the internet.

There are also some ISPs such as Starry and netBlazer which lease infrastructure from other companies or strategically deploy their own physical infrastructure. More information about the service providers in Chelsea, Everett, and Revere can be found in the existing conditions section.

[Broadband] isn't a luxury; it's now a necessity, like water and electricity.

- President Biden

Corporate monopolies on wireline internet connections are not the only model for local internet access. As this map of community and municipal networks from the Institute for Local Self Reliance shows, there are other models of ownership and operation here in Massachusetts. In some, more rural parts of Massachusetts municipalities have been able to provide resident service through publicly owned broadband networks. To do this, they often leverage the organizational structure and authority of special public entities called municipal power and light plants. These municipally-owned but financially independent entities, originally conceived of to provide electricity, are empowered to build and operate broadband networks as well. This model of public ownership and public operation is commonly used where no private company is willing to invest in wired connections of very low density areas.

There are other ownership and operation models emerging elsewhere and being explored in Massachusetts. The "Open Access" model allows for one entity to own the network infrastructure, while one or more other entities provide internet access over that network. This approach, being considered in both Quincy and Fairhaven, MA, allows municipalities to direct public investment into publicly owned infrastructure without committing them to become an internet service provider. Municipalities, public entities, or a company could own the infrastructure, such as fiber, and let ISPs compete to deliver service to businesses and residents. With such a model, municipalities can ensure residents and businesses are equitably connected with infrastructure. By allowing multiple ISPs to provide service across the publicly owned network, this model can provide more choice for residents and lower costs due to ISP competition. The UTOPIA Fiber initiative in Utah is one example of an open access network being implemented now.

Detailed descriptions of different models of ownership and operation, along with examples, can be found in the Internet Ownership Models Review. As the recommendations of this plan

describe there are short-term actions that can be taken by Chelsea, Everett, and Revere to explore the cost-benefit analysis of introducing a different model to address the connection struggles being faced by residents.

Existing Conditions

Communities at a Glance

The current configuration of internet infrastructure and services in Chelsea, Everett, and Revere is not designed to advance digital equity. When a single corporate entity controls the wireline connections to all households and serves as the sole ISP over that network, they have limited incentive to provide competitive prices or expand true broadband infrastructure to low-income neighborhoods with less ability to pay, much less allow other ISPs to use that network.

Digital access is influenced by many demographic factors: having a limited household income, living with a high number of individuals per household, not understanding the language in which guidance or marketing materials are produced, and having limited experience using the internet can all make it harder for people to purchase and afford a subscription, buy a device, or know how to use it. This section provides basic demographic information about the three municipalities as well as information from the American Community Survey about device access, broadband connections, and digital literacy.

Demographics

Chelsea, Everett, and Revere are some of the most racially diverse communities in Massachusetts, and their residents face many barriers to digital access.

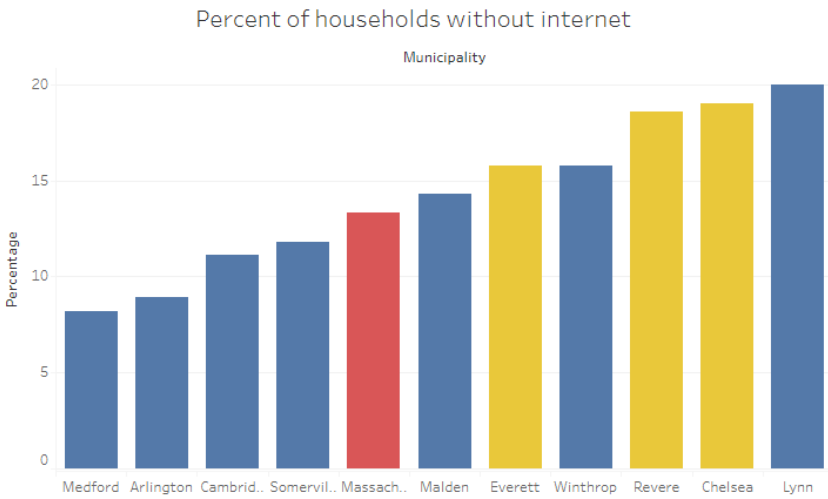
For example, the median household income of the three municipalities is $56,802 (Chelsea), $65,528 (Everett), and $62,568 (Revere), as compared to the Commonwealth of Massachusetts as a whole at $81,215[1]. In fact, more than 20% of households in the three cities are categorized as "extremely low income," meaning they make less than 30% of Median Family Income as defined by the Department of Housing and Urban Development.

Furthermore, a substantial share of households in the three cities are made up of more than four people. Larger households with more internet users require more bandwidth to handle the demands of multiple people using the internet simultaneously. When this bandwidth isn't available due to hardware or limited-speed plans, work and school performance may suffer. This interactive chart compares the three cities to Massachusetts and the MAPC region, demonstrating how there are many intersecting layers of disadvantage for residents.

Connection

[1] American Community Survey, 2016-20

One source of data on internet connections is the American Community Survey. The current survey asks, "At this house, apartment, or mobile home - do you or any member of this household have access to the Internet?"



Responses to the 2016 – 2020 ACS indicate that 12.7% of households in Everett do not have internet access, 15.7% in Revere, and 17% in Chelsea—a total of around 8,600 households. As a whole, only 9.8% of households in the MAPC region lack access to the internet, with fewer than 9% of households in nearby (and wealthier) municipalities such as Arlington and Cambridge going without internet.[2]

Of those households that do have access to the internet, not all of them have an internet subscription at their home. Instead, many residents rely solely on a smartphone and their phone plan's data allowance to connect to the internet. Between 7% and 13% of households in these three cities reported using only a smartphone to access the internet[3].

Relying only on a smartphone and a data plan has major limitations for residents. Cellular data plans often have monthly data caps and exceeding these caps may result in slower speeds or extra charges. Through this plan's community engagement process, during the pandemic, parents shared their experiences of having their children participate in remote schooling relying on cell phone hot spots or data plans. Parents shared that because of the cell phone data caps, by the end of the month their children were not able to attend classes because the family plan had run up against the data limit. While the local school districts have provided hotspots and devices to ensure students could stay connected, these are stopgap solutions that don't address the structural barriers to affordable broadband connections.

The 8,600 without internet subscriptions are not distributed equally across demographic and income groups. Households with an income less than $20,000 per year are 4 times more likely to not have an internet subscription. In these communities, 42% of households making under $20,000 that are not connected to the internet[4]. Affordability is a significant factor

[2] American Community Survey, 2016-20
[3] Ibid.
[4] Ibid.

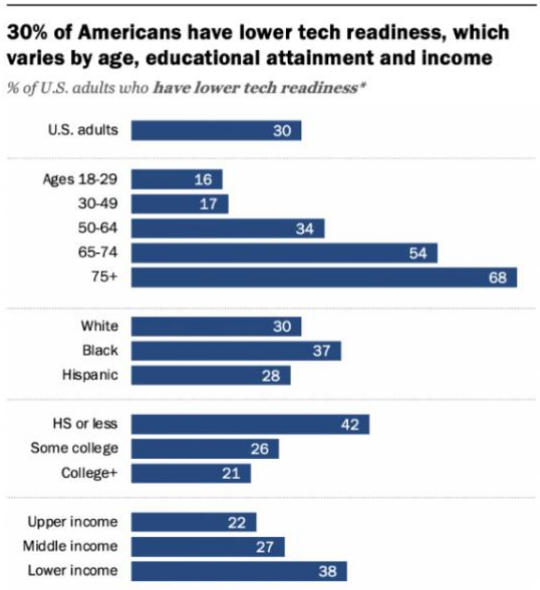
in why households are disconnected, as is explored further in the Affordability and Community Needs Assessment sections or this plan.

Devices & Literacy

DEVICE OWNERSHIP

While computers seem nearly ubiquitous these days, device access is far from universal in these three cities. According to the 2015-19 American Community Survey, 11% - 12% of households in Chelsea, Everett, and Revere reported that they did not have a desktop or laptop computer. While mobile devices may someday be capable of connecting residents to a full set of services, not having a laptop or desktop device today can leave households unable to work remotely, attend virtual classes, or access government benefits and services.

30% of Americans have lower tech readiness, which varies by age, educational attainment and income



Pew 2021

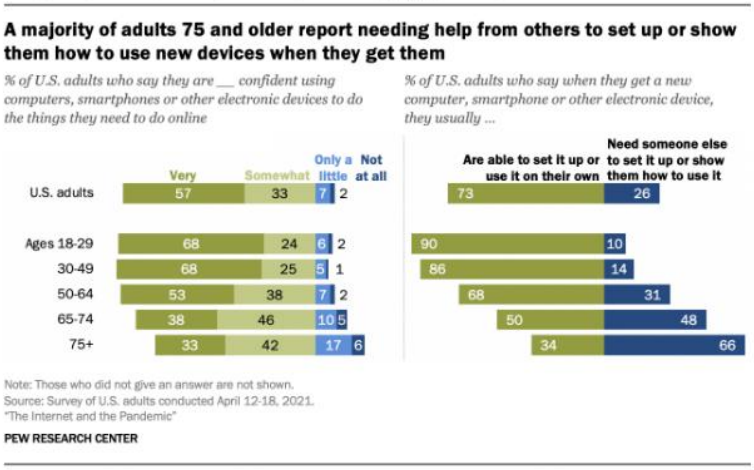
DIGITAL LITERACY

As essential as it is to have an adequate device and good connection to the internet, it's just as necessary to have the skills and ability to use them effectively.

While the ACS does not provide information about digital literacy, there are other sources that provide context for understanding local needs. A 2021 Pew Research Center study found that 30 percent of adults are not "tech ready," meaning they need support to set up or navigate a new computer, smartphone, or other electronic device, or they have little to no confidence in their ability to use those devices to do the things they need to do online.

This same survey found that digital skills gaps differ by age group. Older adults are more likely to have a harder time setting up or using a new device. Connecting with trusted individuals that can provide technical support or guidance is one way of addressing this gap in digital literacy.

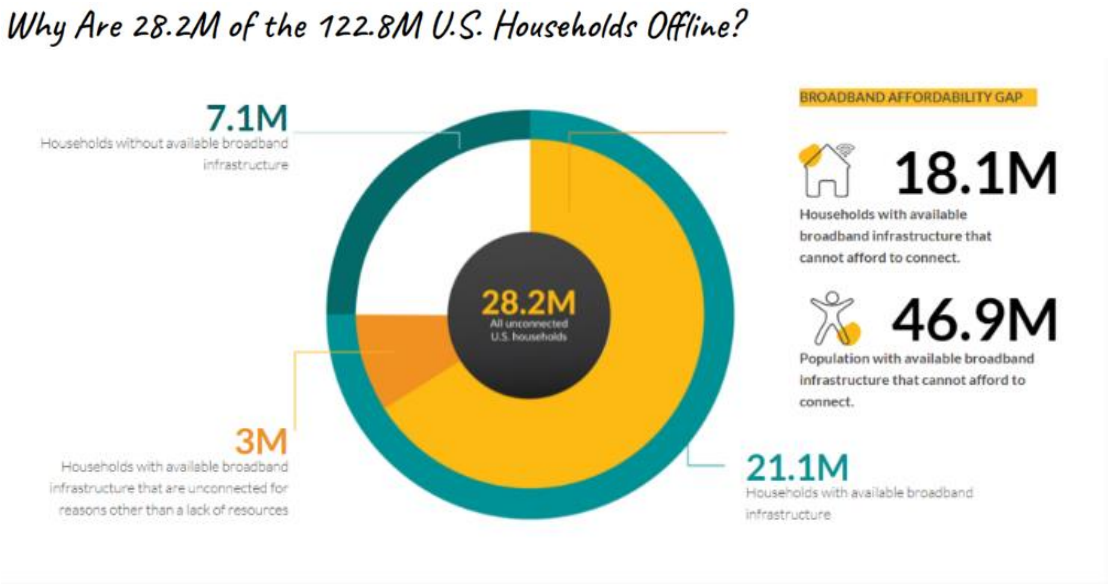
A majority of adults 75 and older report needing help from others to set up or show them how to use new devices when they get them



Service & Affordability

Why are households offline?

As noted above, between 12.7% and 17% of households in Chelsea, Everett, and Revere are not connected to the internet. What are the barriers causing these households to be offline? Advances in technology and expansion of networks over the past decades have reduced the offline population of US adults from 48% in 2000 to 7% in 2021[5]. The national nonprofit Education Superhighway has released a report[6] that categorizes the reasons US households lack internet access. This report estimates there are 28.2 million unconnected households across the US. While a portion of these households (11%) have chosen not to connect, and another 25% do not have the available infrastructure to connect, the vast majority of the unconnected households (64%), cite **affordability** as the reason why they are not connected.



As is true nationally, affordability is a central reason why households in Everett, Chelsea, and Revere are not connected. The challenge of affordability is something that effects both urban and rural areas. As our Community Needs Assessment Survey further illustrates, the cost of internet services dramatically impacts the lives of residents in our communities.

How much does broadband service cost?

To assess the affordability problem locally, MAPC collected information about the cost of broadband services available in Everett, Chelsea, and Revere. This is not a simple question to answer, since not all service plans are available at every address across the study area, availability changes often, and a given service plan may not cost the same for every customer.

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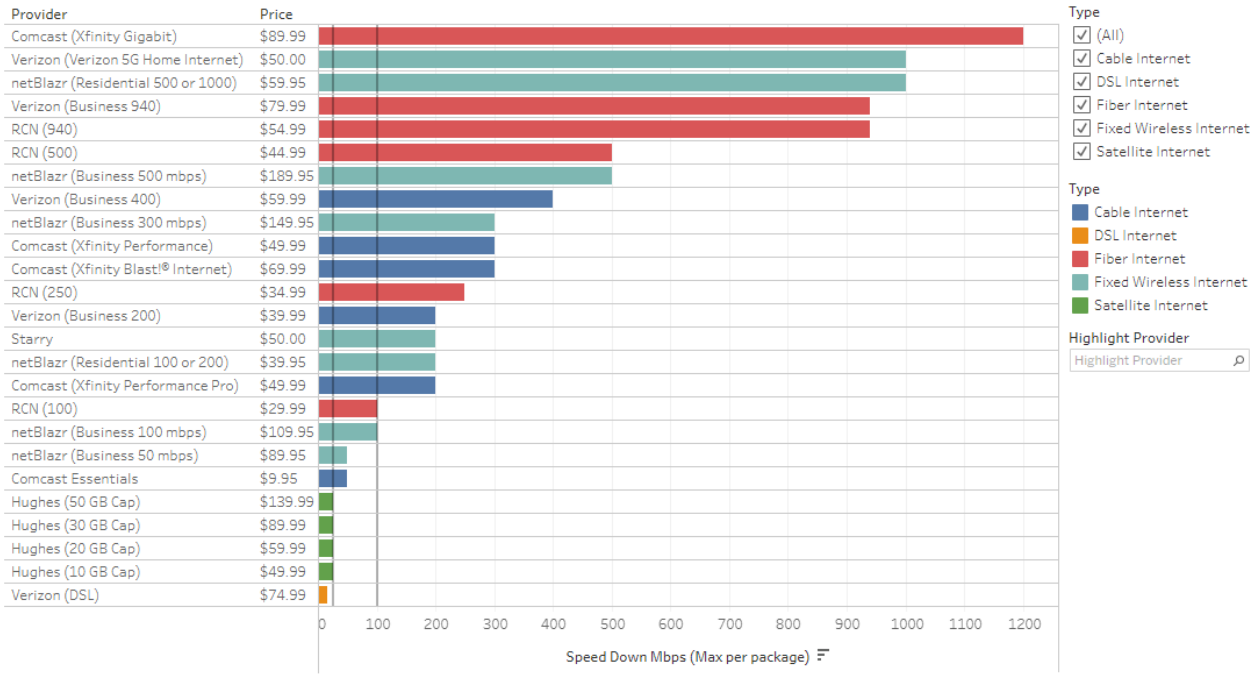
[5] Pew Research Center

[6] "Bridging the Broadband Affordability Gap," Education Superhighway

In the chart below we list the services packages that can be found at a sample address in Everett in 2021. This chart gives a snapshot of the ever-changing residential service advertised prices. The commercial providers Crown Castle, FirstLight, Windstream, and Comcast Business are not included in this chart.



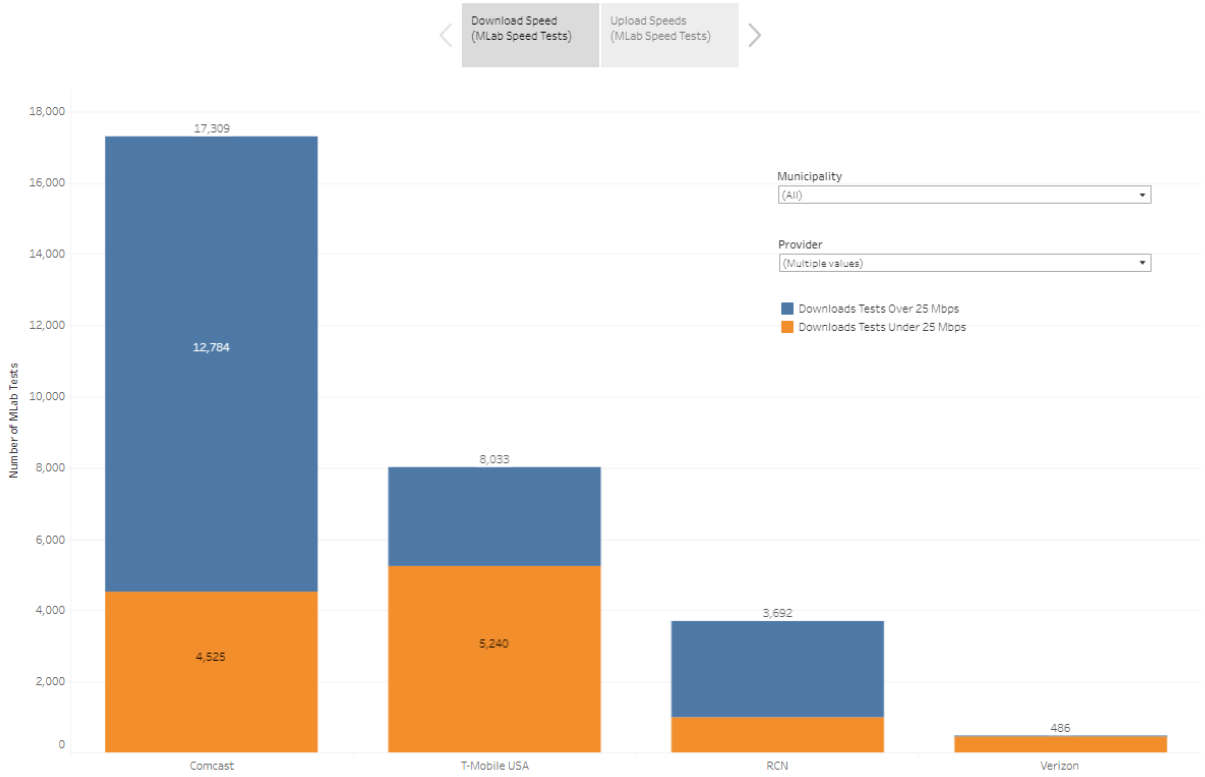
When evaluating these costs, it's important to note that service plans are generally offered and sold based on maximum levels of speed, which may not represent typical conditions. While all the advertised service plans listed above, apart from DSL, are above 25 Mbps download and 3 Mbps upload, users may not be consistently experiencing those speeds.

What are the effective speeds of internet service?

Since typical internet speeds don't always achieve the advertised level of service, it's worth examining other sources of data about internet speed in the communities. Speed tests offer one way of understanding the experience of those connecting to the internet. These tests are a diagnostic measurement tool that measure how long it takes packets or bits of information to traverse the internet to and from a user. The results, in terms of observed upload and download speeds when the test was conducted, provide valuable insight into understanding a user's experience. MAPC collected data from two different speed test services that make their data publicly available. Neither serve as "stress tests," in which multiple browser tabs, competing with streaming video and video calls might test the limits of a user's computer and connection.

Speed" in speed tests is measured in megabits per second (Mbps). "Broadband" speeds, as defined by the Federal Communications Commission (FCC) are those of at least 25 Mbps download and 3 Mbps upload (otherwise known as 25/3). The FCC provides a guide that outlines the connection speed needed for individual activities. Participation in activities such as telehealth, remote schooling, and virtual work is contingent on having speeds that a proportion of households are not consistently experiencing. It should be noted that the 25/3 definition dates from 2015 and is rapidly becoming outdated as more bandwidth is needed to meet new needs; the American Rescue Plan Act and Infrastructure Investment and Jobs Act legislation reference new thresholds of up to 100/100 Mbps, indicating that targets for broadband speed should be higher than the current 25/3 standard.

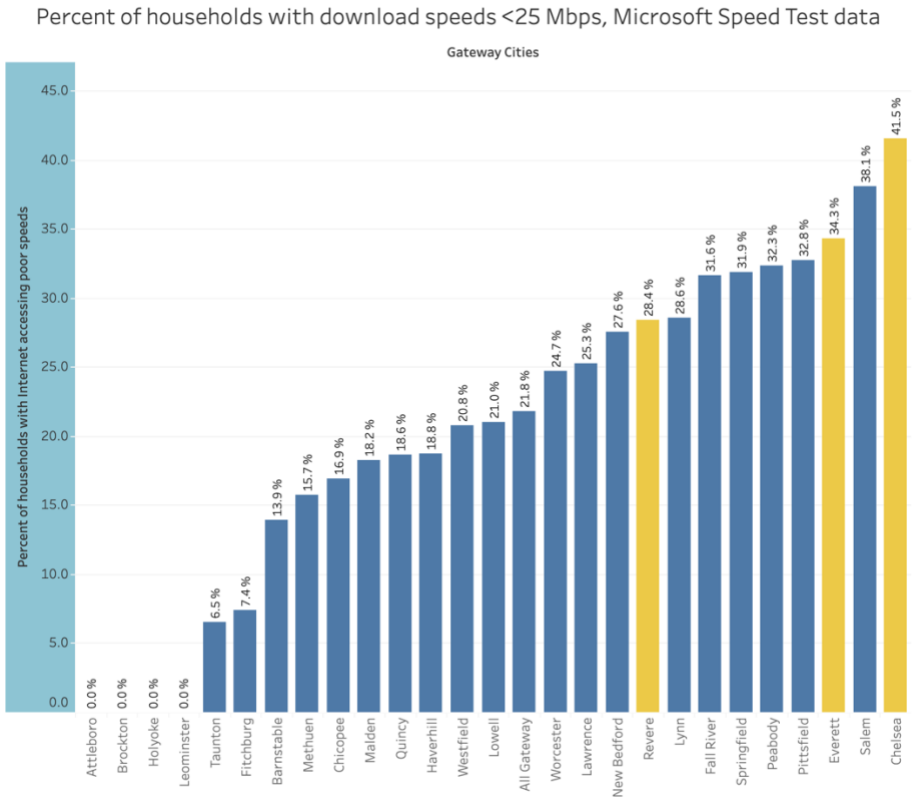
The chart below shows speed test results for users in Everett, Chelsea, or Revere, who have tested their internet speed using the service M-Lab (the featured Google search result for the term "speed test.") The chart shows that more than one quarter of Comcast subscribers experienced download speeds of less than 25 Mbps.



Another speed test source recently made publicly available is from Microsoft. Microsoft analyzed how long it was taking individuals to download software from the internet, and have made the results available as aggregated zip code level results for the entire country. This national picture indicates that 120.4 million Americans are not using the internet at broadband speeds. This is a staggering number of individuals and households that are not being served well by the current market and infrastructure.

Looking at estimates for Chelsea's zip code, 42% of households did not experience broadband speeds when downloading Microsoft products. Across all three cities, a large

portion of users are not experiencing broadband speeds (28.4% in Revere and 34.3% in Everett), compared to 26.3% of households statewide. This stands in contrast to areas of the state where most users downloading Microsoft products are doing so at broadband speeds. Notably, residents of Gateway cities across the state often share a common struggle to connect and use the internet at reliable broadband speeds—and even among Gateway Cities, Chelsea, Everett, and Revere experience below-average speeds.



Have subsidies closed the broadband affordability gap?

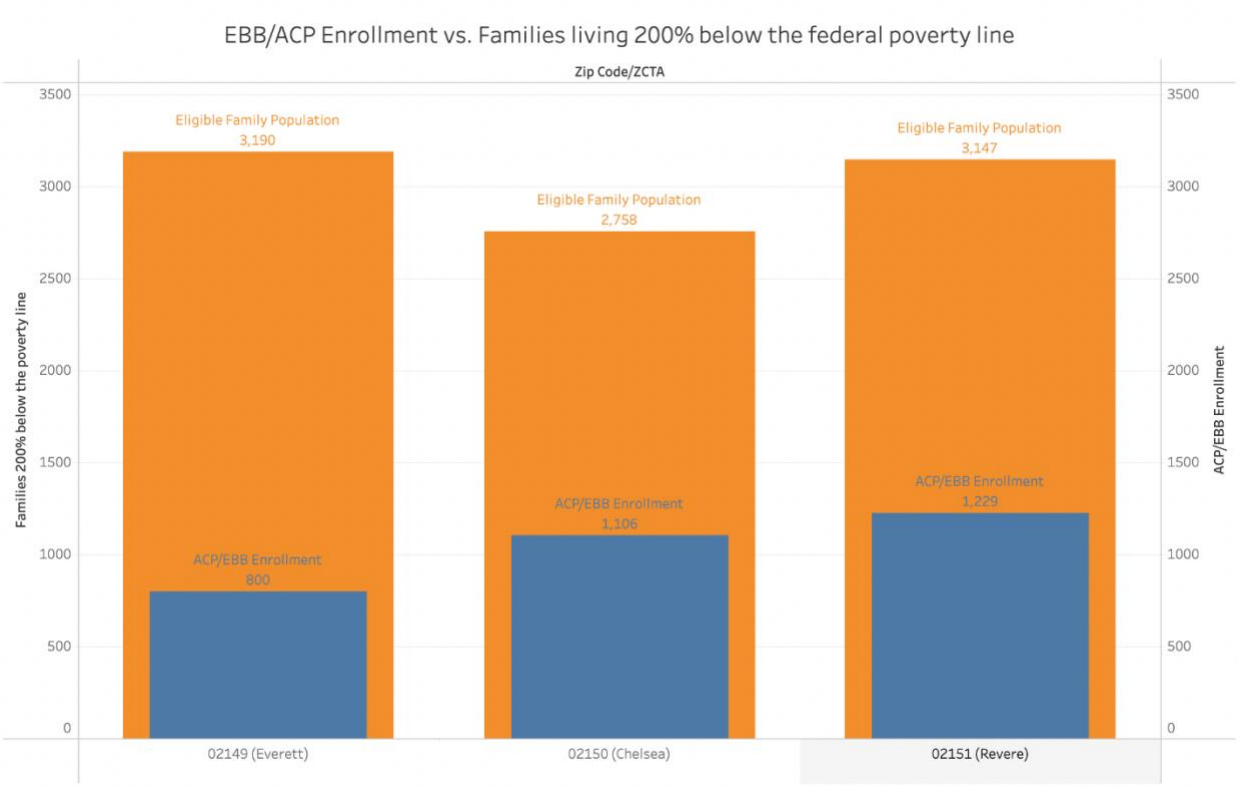
There are already numerous public programs intended to address the broadband affordability gap; however, none have been completely effective at removing the cost barrier for low-income households. Federal rules and subsidy opportunities have motivated or required most major providers to offer discounted and subsidized plans. Comcast's Internet Essentials model is the most widely known and is used by 42% of the residents we surveyed. To qualify, Comcast requires applicants to have no debt with the company, have not been a Comcast Internet customer for 90 days prior, and be a participant in one of several social assistance programs such as SNAP, free or reduced school lunch, Pell grants and others. If a customer is qualified, they are eligible for service with speeds up to 50 Mbps download and 10 Mbps upload for $9.95/month + tax. Recently, Comcast added another plan, Internet Essentials PLUS, for 100 Mbps download and 10 Mbps upload, for $29.95/month + tax.

Participating in these programs comes with challenges. Stakeholders and survey respondents reported difficulty with the application process independent of the internet provider,

upselling when signing up, and other concerns when enrolling in subsidized plans. Despite the efforts of schools and non-profits like Tech Goes Home, the total enrollment in the Comcast Internet Essentials program is limited. Comcast reported to MAPC that in 2020 there were 1,900 households in Chelsea, 1,800 in Revere, 1,300 in Everett enrolled in the program.

Other internet service providers in the three cities (Starry and netBlazr) have implemented a model of qualifying affordable housing properties through the sponsor organization rather than individuals who live there for discounted service, but those companies have much smaller service areas. These income-eligible programs can be difficult to learn about, because they are often not prominently listed alongside other plans on broadband comparison sites like BroadbandNow, Highspeed Internet, AllConnect, or Broadband Research, which appear among the top Google search results for "broadband plan comparison."

In addition to corporate income-eligible programs, recent federal recovery and investment funding has been made available as subsidies to reduce the cost burden of an internet subscription. Modeled after the Lifeline phone program, the federal government began offering a subsidy directly to consumers in the American Rescue Plan Act (ARPA) of 2021. The Emergency Broadband Benefit offered qualifying households a $50 subsidy for broadband service and a $100 rebate for device purchases. Rebranded as the Affordable Connectivity Program (ACP) in January 2022 and taking effect on March 1 of the same year, Congress reduced the benefit to $30, but extended the length of the once-temporary program. MAPC estimates that 34% of eligible households in Chelsea, Everett, and Revere are currently taking advantage of the ACP subsidy.



Infrastructure

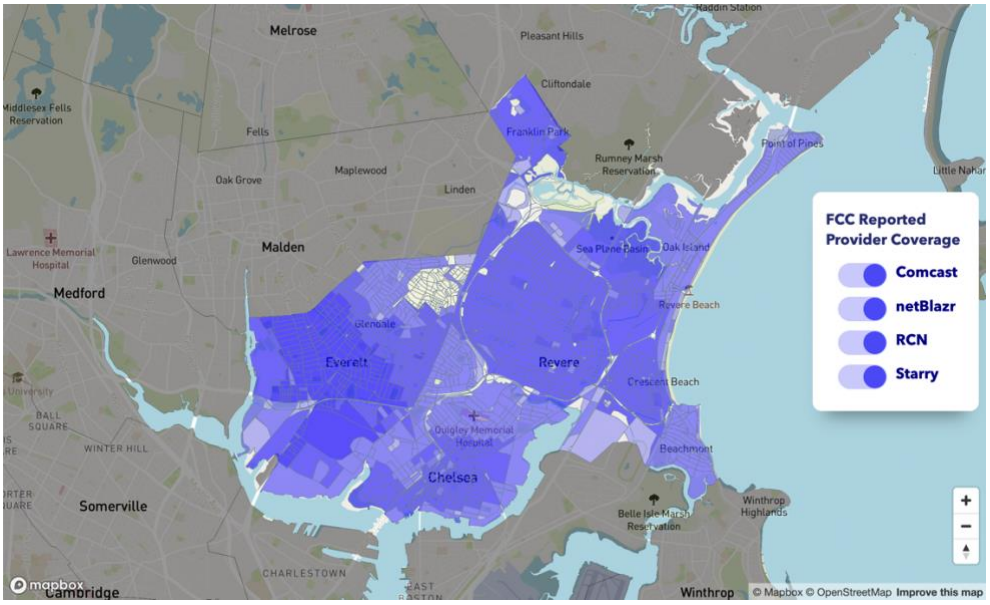
Another source of data is the required federal self-reporting done by internet service providers. The FCC requires that ISPs self-report service coverage twice a year online through Form 477. The data from these filings gives one picture of internet connection across the country. While the data is open and available, it can overstate the services available in a given area due to data and reporting limitations.

The data is reported at a census block level. A census block is a federal unit of geography that can contain clusters of many buildings. Some census blocks in Everett, Chelsea, and Revere contain more than 50 residential buildings. If one address in a census block is serviced by an ISP, the whole census block is reported as a serviced area. There are instances in which ISPs do not provide service to households even within their service area, likely due to insufficient return on the investment required to make the connection.

Complicating the question of coverage, Form 477 is self-reported by providers and does not include levels of service offered. Providers are only asked to report the highest levels of speed (Mbps download and upload) provided in each census block. What is not reported is the different service levels available, and their relative costs. The FCC is working to implement "Broadband Nutrition Labels," but current information about speed and cost is limited to Form 477 data. Only the ISPs know the details of which addresses are served, which are not served, and where the infrastructure is. This level of detail is not reported to the FCC, nor regularly reported by other state or local requirements.

Form 477 data lists the available providers and what technology is prevalent in a given area. Of the 24 reporting providers in these cities, 15 providers report they can provide 100 Mbps download speeds or greater. ISPs that can provide those speeds use a mix of fiber, fixed wireless, and cable technologies. Comcast, RCN, Starry, and NetBlazr are the four major providers serving a substantial portion of Everett, Chelsea, and Revere—the other twenty providers serve a very limited area or customer base (certain businesses or institutions). Verizon provides high-speed residential fiber options (FIOS) elsewhere in the MAPC region, but does not provide any broadband service to census blocks in Everett, Chelsea, or Revere—they only provide legacy DSL technology available in these cities.

The Form 477 data showing census block coverage of the four major providers is shown on the map below. Where the provider layers overlap, customers may have multiple options for internet service. It's worth mentioning again that a provider reporting via Form 477 that it serves a given census block is no guarantee that all residents have or could even subscribe to that provider.



FCC Form 477: Reported Provider Coverage Map

The specific type of wiring or fiber optic cables that provide service have a major influence on internet speeds, cost, and ease of connection. Fiber-optic wiring provides a dramatic and generational advancement as compared to the copper coaxial cables that replaced the prior copper telephone wiring.

To understand what neighborhoods are served by fiber as compared to copper, Everett, Chelsea, and Revere leveraged their Cable Franchise agreements to obtain line-level data that identified the network of fiber and coaxial of the two major residential providers, Comcast and RCN.

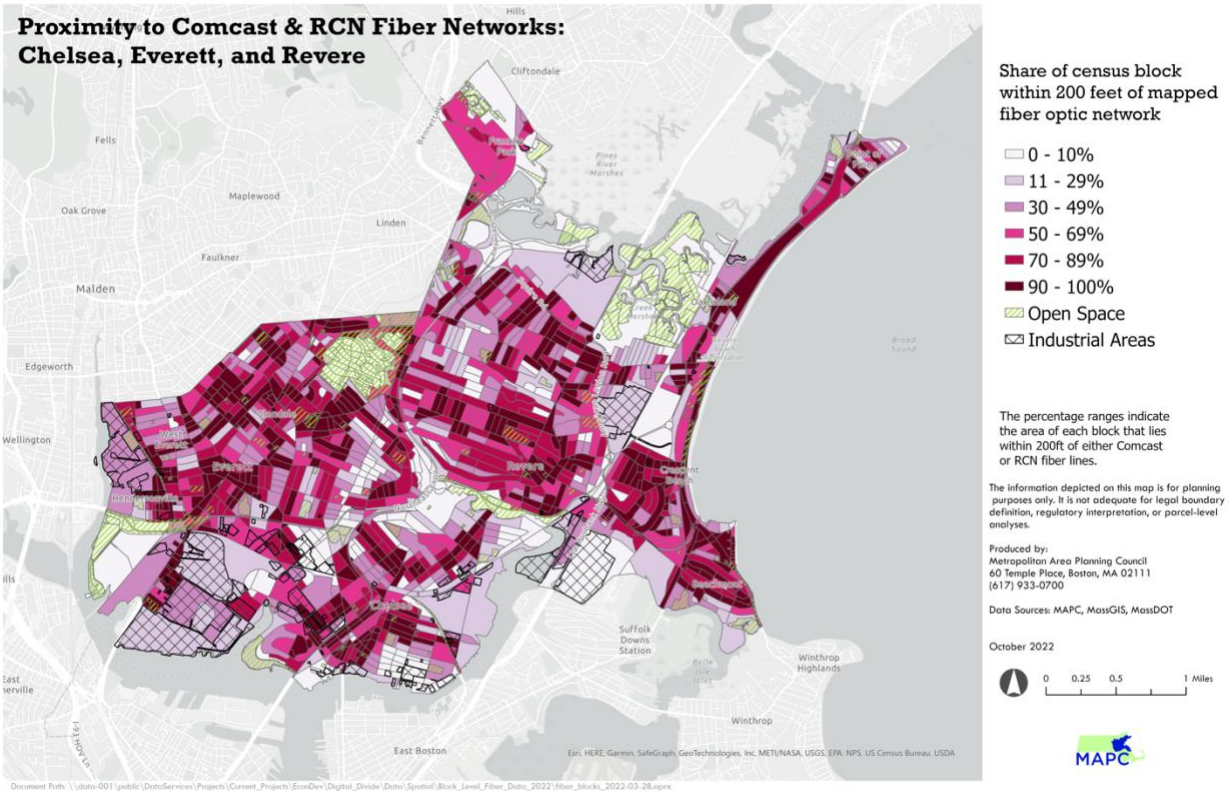
Coaxial wiring is the dominant wiring technology in place in the communities today. The wiring within homes has also relied on copper cabling for many decades. The standard and ubiquitous nature of this technology allowed cable companies across the country (in these cities, Comcast) to pivot in the 1990s, enabling the copper coaxial network that provided cable television to be used to provide internet services. These established networks and provided them with a competitive marketplace advantage over potential competitors like telecom companies, who did not have the same physical networks into people's homes. It also naturally limited new competitors from entering the marketplace, because they would have to start a new network "from scratch."

Today, Comcast and RCN's networks do not rely solely on coaxial technology, they also include fiber, in what is called a hybrid coaxial-fiber network. The copper coaxial cable is the major limiting factor in being able to provide faster speeds and more reliable service. Symmetrical download and upload speeds of 100 Mbps are rarely achieved with coaxial cable technology. While these speeds may be technically possible under ideal, controlled circumstances, and incremental advancements can help improve the speeds to coaxial cable wiring, its physical properties do not compare with the broadband potential provided by fiber optic cables.

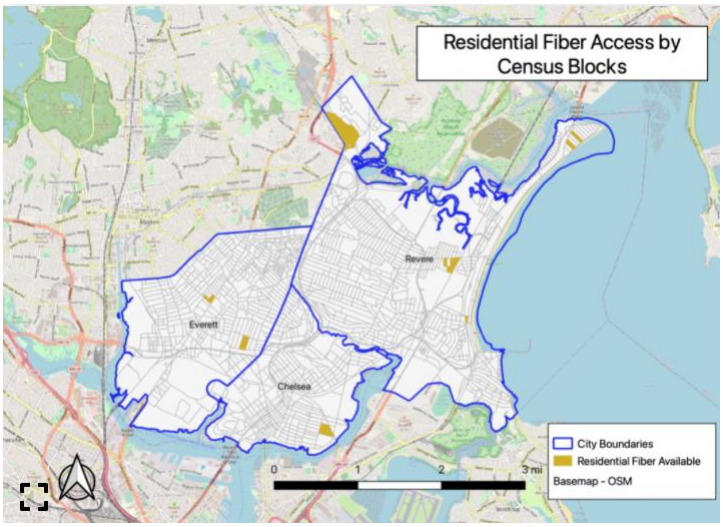
Upon request from the three cities, RCN and Comcast provided detailed maps of their cable and fiber service networks. MAPC mapped these networks and estimated the number of households within 200 feet of a mapped fiber line (a threshold chosen as a reasonable upper limit of a service connection for such dense urban communities). The resulting map depicts the estimated likelihood that a home in each census block is within that 200-foot threshold; it shows that access to fiber is very uneven through the three cities. Some neighborhoods have good fiber coverage that provides access to most houses; others have fiber that serves only certain streets. Overall, MAPC estimates that 34% of residents in the three cities live further than 200 feet from a fiber optic line. Chelsea has the greatest share of residents without access to fiber (42%) while Everett has the lowest share (30%). MAPC's analysis did not find evidence that people of color and low-income residents are disproportionately underserved by the fiber network within each city. However, the incomplete coverage in this "majority minority" portion of the region does have disparate impacts when compared to universal coverage of fiber access in wealthier municipalities.

Cable Franchise Agreements

As mentioned above, fiber mapping is made possible through language in the cable franchise agreements municipalities have with cable providers that operate services within a city. This is a critical touchpoint between municipal governments and private internet service providers and has (along with the permitting process for deploying infrastructure) historically shaped the deployment of services.



If we look at Comcast and RCN's networks today in these communities, there is significantly less fiber wiring than copper coaxial wiring. When fiber is installed to a home or other premises, the final connection from the street to home is often referred to as "the last mile," or as a home fiber "drop." This video from ILSR does a great job visualizing this process for a single-family home. Today, that final "drop" or run of wiring is almost exclusively made with coaxial cable. In fact, the main residential providers in the area (Comcast, RCN, Starry, and netBlazr) together only report 9 census blocks that contain a last-mile internet connection made directly via fiber optic cables.



Community Needs Assessment

To further understand the specific experiences of residents in the three communities accessing and using the internet, MAPC worked with community partners on a community needs assessment. The assessment was designed to identify key daily activities for which the internet was used, assess residents' current level of digital literacy, and identify barriers or challenges impacting their ability to use the internet.

MAPC worked with the community advisory team to complete this assessment through a series of one-on-one stakeholder interviews, focus groups, and a comprehensive survey of over 2,000 residents. The survey was conducted through the summer and fall of 2021. The survey was distributed through multiple municipal and community channels, and was conducted online, in person, and via phone outreach.

Survey Respondent Demographics

In total, MAPC collected 2,165 surveys: 793 surveys from Chelsea residents, 388 from Everett residents, and 825 from Revere residents. The key findings in this plan will summarize the total of the three communities, but specific community-level findings can be viewed using the data visualizations embedded below.

LANGUAGE

The digital access survey was translated into 5 languages spoken widely in the three cities: Spanish, Haitian Creole, Brazilian Portuguese, Arabic, and Khmer.

- 1,068 responses were recorded in English
- 1,045 responses were recorded in Spanish
- 36 responses were recorded in Arabic
- 15 responses were recorded in Brazilian Portuguese
- 1 response was recorded in Haitian Creole
- 0 responses were recorded in Khmer

RACE & ETHNICITY

1,404 respondents identified their race or ethnicity within the survey.

- 23% of respondents who responded identified as White
- 3% as Black
- 1% as AAPI
- 69% as Hispanic/Latinx
- 5% as Arab

HOUSEHOLD SIZE

Respondents to the survey represented a diverse cross section of family types and household sizes within the three communities.

- 40% of respondents live in a household with 5 or more people
- 45% of respondents live in a household with 3 or more adults
- 54% of respondents live in a household with at least one child
  - 42% of those respondents have two children
  - 22% have three or more children

AGE

The significant majority of respondents surveyed fell in either the 19-35 or 36-65 age range.

- 4% of respondents were between the ages of 10-18
- 34% of respondents were between the ages of 19-35
- 59% of respondents were between the ages of 36-65
- 3% of respondents were age 66 and above

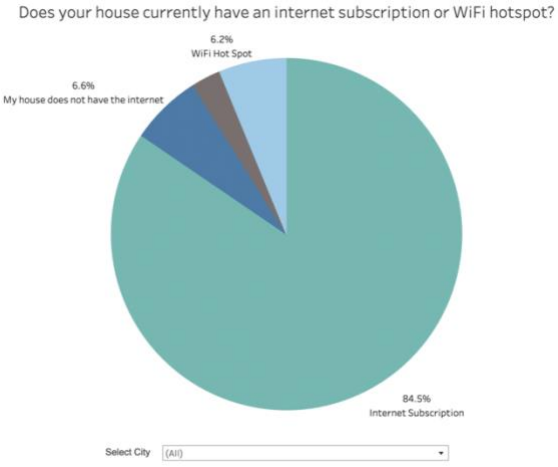
Key Findings

ACCESS

Ensuring that residents are able to access internet services that meet their needs, at an affordable price is a major component of digital access. The following key findings summarize respondents' experience and perspective on internet subscriptions, internet affordability, and internet reliability.

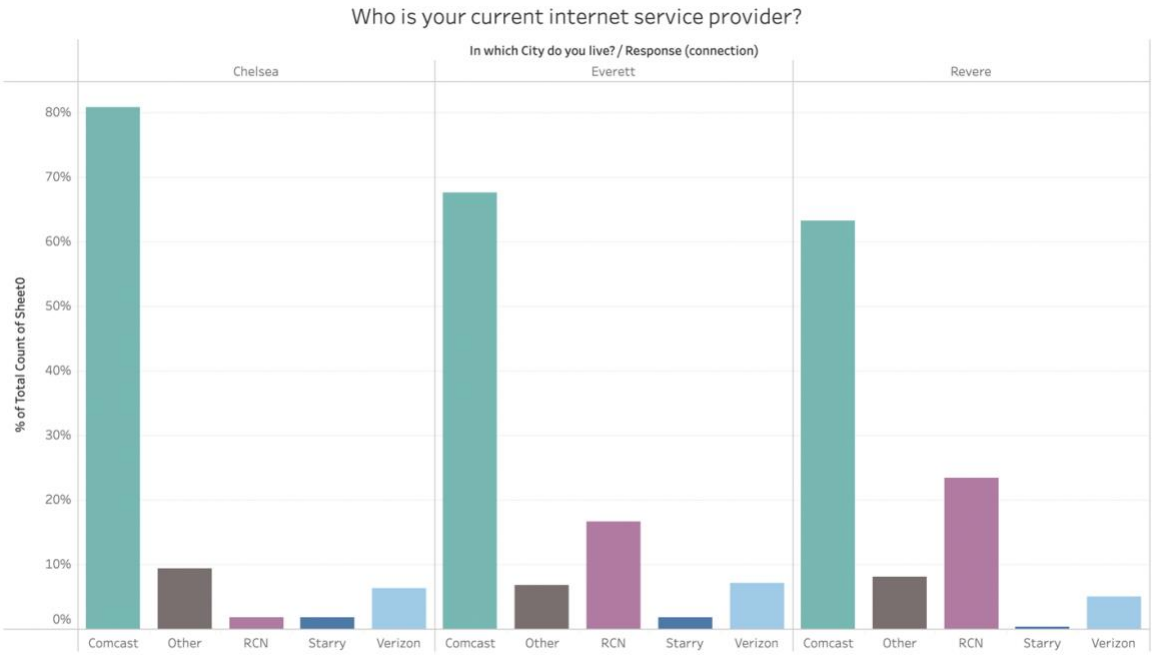
INTERNET SUBSCRIPTIONS

15.5% of survey respondents do not have a subscription to internet service at their home, slightly lower than what is reported in the American Community Survey (18%) but still a significant number of individuals. About one third of the population who do not have a home internet subscription connect to the internet using stopgap solutions such as a phone cellular data plan and/or a wireless hotspot that uses cellular data to provide limited internet to connected devices.



However, unlike most home internet subscription plans, many cellular plans have monthly data caps, limited cell reception, and limited speeds that may not make viable alternatives. The prevalence of cellular data or hotspot use may in part be because programs offered at schools, libraries, or community groups have made them free and available; additionally, a home internet subscription may be one of the expenses that a household with limited income is forced to do without.

The majority of survey respondents in the three cities are Comcast subscribers. In Chelsea, where Comcast is the only cable ISP, 80% of respondents used Comcast. As highlighted in the infrastructure section, RCN is an available competitor in Revere and Everett. In those cities, Comcast is the provider for 63% and 68% of survey respondents, respectively. Meanwhile, 17% of respondents in Everett and 23% of those in Revere use RCN internet service.



Across all three communities, 5% to 7% of respondents are using Verizon DSL, a service that provides sub-broadband speeds. Wireless ISP providers such as Starry are available in all three communities, but have limited market penetration, with fewer than 2% of survey respondents using Starry. These findings highlight the near monopoly that Comcast holds in the three municipalities, especially Chelsea. While the FCC data above shows that other services such as RCN, Starry, and NetBlazr are nominally available in most neighborhoods, it is clear that lack of awareness, connection costs, subscription costs, or other factors prevent these services from being significant alternatives to Comcast.

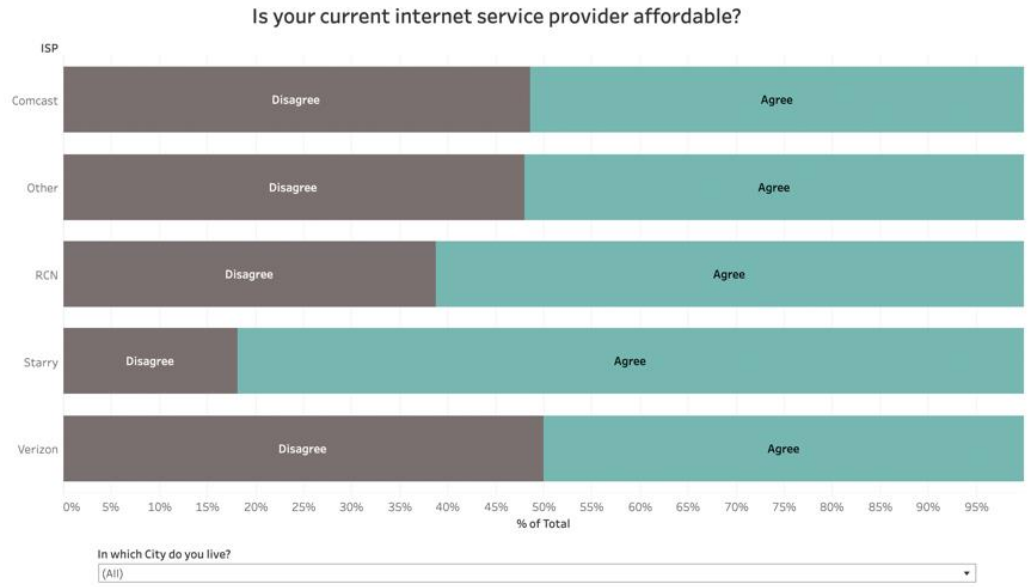
AFFORDABILITY

About half of all survey respondents don't feel that their internet service is "affordable," and 70% of survey respondents have had to change or cancel their internet subscription because it was too expensive. Subscribers to RCN were slightly more likely than Comcast subscribers to indicate that their internet was affordable – 60% versus 50%. This result suggests that lack of availability or lower quality of service—not subscription cost—limits RCN's market share in comparison to Comcast. While Starry serves under 2% of respondents, the vast majority (82%) of respondents using Starry indicate that their internet is affordable.

"Necesitamos que el costo del internet sea mas justo"

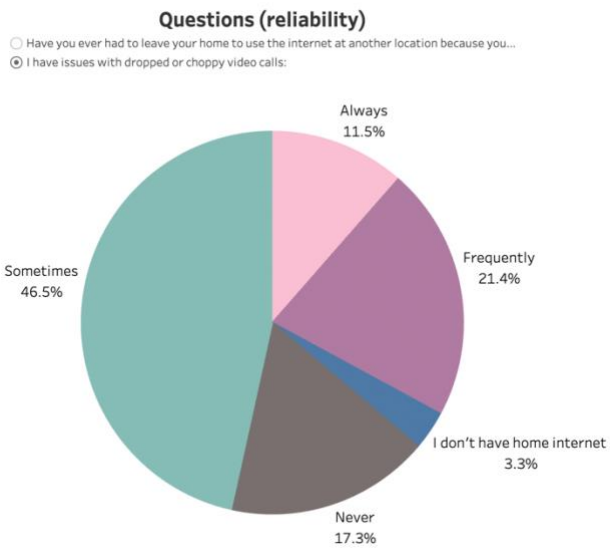
"We need the cost of the internet to be fairer"

– Survey respondent



RELIABILITY

The quality and reliability of internet service is a problem for over one-third of households. 37% of survey respondents have had to leave their home to use internet at another location because the internet connection at their home is unreliable. Earlier in the infrastructure section, it was noted that many households in these cities (up to 42%) were not experiencing the minimum definition of broadband, impacting the utility and reliability of their service. This survey is another clear example of the current state of service impacting residents, forcing them to leave their homes to find an adequate internet connection. When 33% of respondents indicate that they always or frequently have issues with dropped or choppy video calls, they cannot rely on home internet for remote work, school, or healthcare.



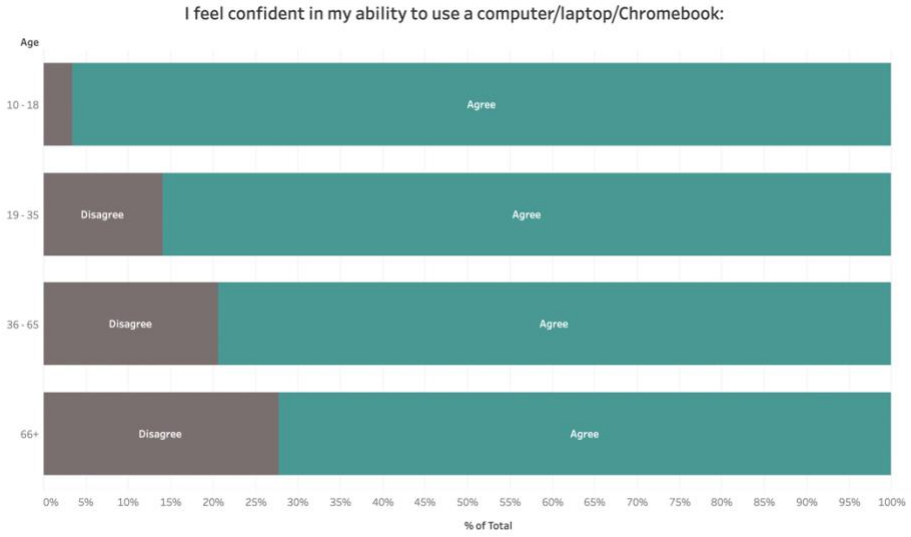
Respondents who indicated that three or more people needed to use the internet at any given time for work or education were more likely to experience choppy or dropped video calls.

DIGITAL LITERACY

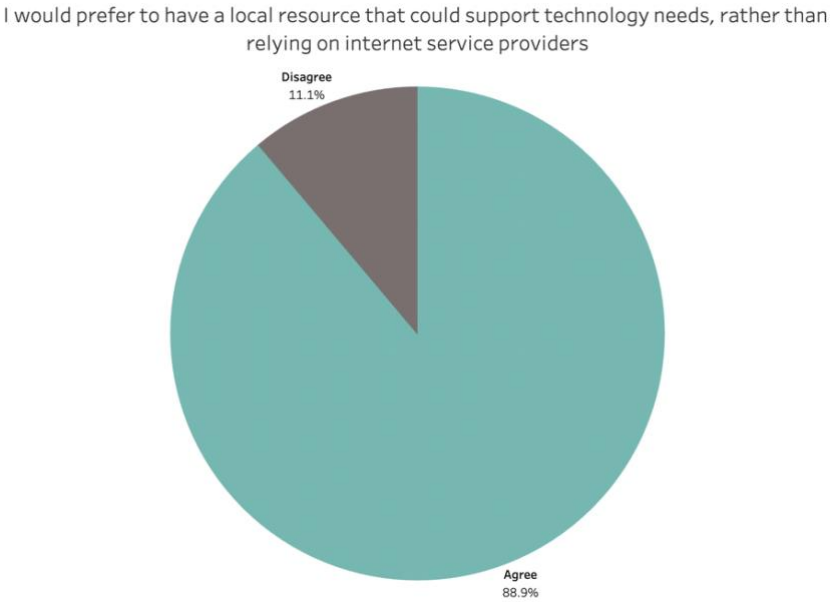
Digital literacy skills are needed to effectively use devices and the internet to find, use, and communicate information. These are both cognitive and technical skills. These skills are a foundational element of digital access and are frequently observed as the most difficult of the three legs of the stool to address due to different levels of experience with technology, language barriers, and other issues.

USE OF TECHNOLOGY

82% of survey respondents indicate that they feel confident in their ability to use a desktop computer, laptop, or Chromebook. It is encouraging that a high percentage of respondents felt confident in their abilities. To better understand those that indicated they were not confident, we can explore responses by language and age. Fewer respondents who took the survey in a language other than English were confident their abilities: of those who expressed a lack of confidence, 70% took the survey in Arabic, 72% in Spanish, and 37.5% in Portuguese. Younger respondents responded with higher levels of confidence than older respondents. Beyond device use, a smaller portion of respondents felt comfortable solving issues related directly to internet connectivity. Survey respondents in languages other than English also exhibited less confidence in resolving internet connectivity issues. Similarly, that number increased in higher age brackets.



SUPPORT SYSTEMS AND TRAINING

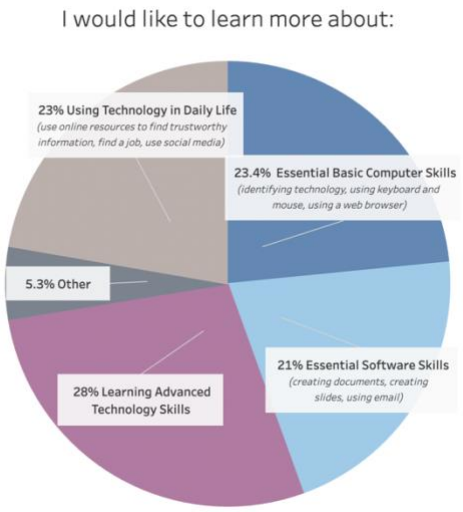


Overall, 90% of respondents indicated that they would prefer to have a local resource that could support technology needs, rather than relying on internet service providers. In addition to preferring local resources there may be opportunities to encourage and support the growth of local trained professionals. 63% of respondents indicated they would be interested in a career in Technology or IT. Further, higher percentages of respondents in languages other than English indicated that they would be interested in careers in technology or IT if training were available.

When asked which digital skills respondents would like to learn more about, about a third of all respondents indicated interest in all the following topics:

- Essential/basic computer skills (identifying technology, using keyboard and mouse, using a web browser)
- Essential software skills (creating documents, creating slides, using email)
- Using technology in daily life (use online resources to find trustworthy information, find a job, use social media)
- Learning advanced technology skills

This was particularly true for those who responded in Spanish, among whom twice as many respondents indicated an interest in those same skill areas.

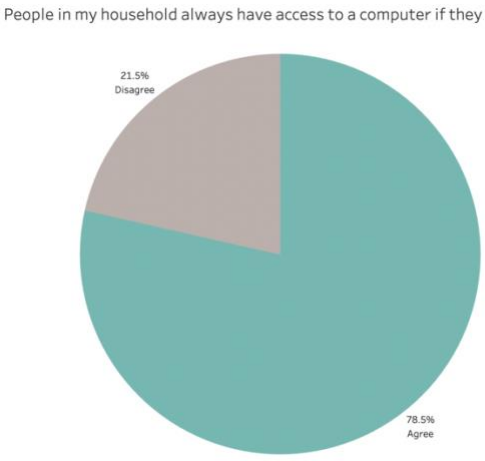


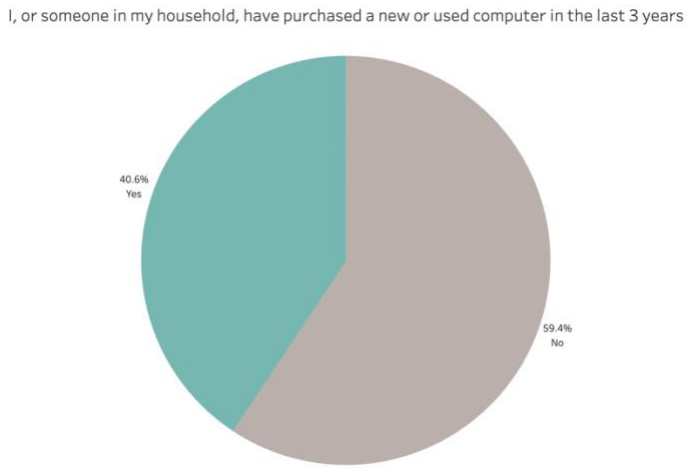
DEVICE ACCESS

In order to utilize the internet for critical personal services such as education, healthcare, job searches, and online applications, individuals need a computing device with a certain speed and functionality. The proliferation of smartphone technology has helped millions of individuals gain access to the communications benefits of the internet but is not a substitute for a personal computing devices function.

COMPUTERS

One-fifth of households don't have always have access to a computer when they need it. 41% of respondents have had to buy a new computer in the last three years. Many of

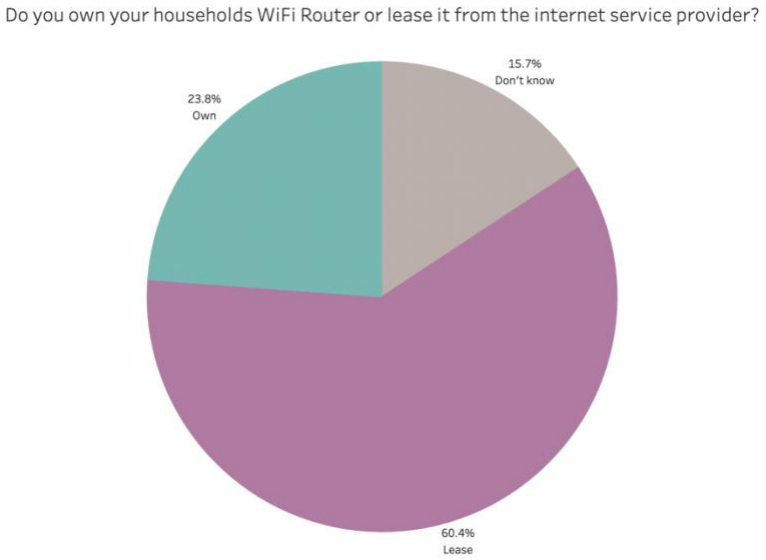




those individuals had to buy a computer to either replace an older computer, or because their household did not have an existing computer.

ROUTERS

60% of respondents lease a Wi-Fi router from an internet service provider.



Conclusions

Invest in infrastructure, equity, and policy.

We make the following conclusions about Digital Equity in Everett, Chelsea, and Revere:

One ISP holds a near-monopoly on internet service for residents of Chelsea, Everett, and Revere. Whether through lack of awareness or availability, most households have very little to no choice in their internet provider.

Neither Comcast nor RCN (nor the two of them combined) provide true broadband service to the cities. At least one third of households are not served by fiber optic service.

The quality of internet service does not meet what is advertised.

Despite the incomplete fiber network and the lack of options for most residents, **the private ISPs have shown little interest in building new infrastructure in the cities that could provide additional options.** The return on investment for new fiber networks in these low-income communities is seen by ISPs as too low to make the necessary infrastructure investments.

Subsidies for internet subscriptions for low-income households are at a stopgap measure at best that will increase access only as long as financial resources are available. They do little to incentivize ISPs to expand their networks.

A publicly owned or open-access fiber network would provide residents with a choice of Internet Service Providers, fostering competition in the market and driving prices down. Municipalities should take steps to establish such networks, including setting up legal entities to own and operate fiber utilities; developing strategic plans for rollout of such networks; and seeking resources to build them out. This is a mid- to long-range strategy that will reduce dependence on privately-owned utility companies.

In the near-term, **municipalities can provide reliable, low-cost, high-speed options in targeted areas through the provision of open-access wireless networks.** Priority sites could include public housing sites, subsidized low- and mixed-income housing, and other public properties in neighborhoods with a high concentration of low-income and disconnected households.

Digital Equity cannot be achieved solely by providing connectivity. Any viable solution must also address digital literacy and device access through interventions and tools such as digital navigators, training and device access initiatives like Tech Goes Home, etc. Municipalities should also take steps to institutionalize and link digital equity actions within their municipality and across borders.

Existing practices can also be reformed at a policy level, by advancing ideas like "dig once" policies to increase the quantity of municipally owned fiber or fiber conduit infrastructure. Using existing cable franchise agreements, cities can improve municipal access to data on existing infrastructure and address any inequities that the data shows.

Actions to Take

Guiding Principles for Community Digital Access and Equity

On its way to establishing short, medium, and long-term recommendations, MAPC and the community advisory committees involved in this process identified a set of guiding principles designed to achieve a community vision for digital access and equity. The recommendations in the following section are designed to be responsive to these principles, and any future planning efforts should revisit and build upon these established principles.

- **Remove barriers** that prevent universal access to reliable and high speed (100/100 Mbps) internet.
- **Augment the capacity** of key stakeholders such as IT departments, school districts, libraries, community-based organizations, and municipal staff to address the digital divide.
- Ensure that all residents who desire to improve their digital literacy have a **pathway to educational opportunities** at a range of skill levels, offered in community-appropriate languages and settings.

- **Promote and facilitate competition** among internet service providers offering broadband service by advancing open-access fiber networks which can be accessed by multiple competing ISPs.

Below are actions that can be taken to address digital access and equity challenges facing these three communities. These recommendations range from immediate, intermediate, and long-term investments that can be made. These actions can build on each other to better and more sustainably connect residents and individuals in these communities.

Immediate

BRIDGE TO BROADBAND

Recommendation: **Participate in Education Superhighway Bridge to Broadband Program Pilot**

Timeframe: Immediate (Fall 2021 – Winter 2022)

Status: Completed

Type: Connection

Primary Actor: School District

Description: This program is a facilitated data exchange between school districts and Internet Service Providers. The Massachusetts Department of Elementary and Secondary Education, in Partnership with Education Superhighway, established a pilot in MA in which school districts could establish data exchanges through data-sharing agreements brokered by the Student Data Privacy Alliance. Everett, Chelsea, and Revere were added to the initial pilot program and are now able to identify which students are not currently able to access to a wired internet connection from an ISP serving the community.

Next Steps:

- Complete data exchanges.
- Use this data to support school-based efforts aimed at connecting unconnected students and households.
- Advocate for ways to expand data exchanges that respect data rights and privacy beyond schools to support broader community connection efforts.

BUILD BETTER BROADBAND GRANT APPLICATION

Recommendation: **Apply for funding to support regional strategic and financial planning of public infrastructure.**

Timeframe: Immediate

Status: Underway

Type: Connection

Primary Actor: Municipal Staff, MAPC

Description: To support the equitable expenditure of federal funds municipalities and MAPC can submit a regional application for the Build Better Broadband grant funded by Connect Humanity. This grant will fund work to evaluate and provide cost estimate analysis for future public infrastructure investments. It will be important to further identify where public infrastructure investments can be leveraged to equitably close the digital divide.

ESTABLISH MUNICIPAL POWER AND LIGHT PLANT

Recommendation: **Establish a municipal or cooperative power and light plant as a body to coordinate efforts and secure funding for future investments.**

Timeframe: Immediate

Status: Immediate / Underway

Type: Connection

Primary Actor: Municipal Staff, MAPC

Description: To support the equitable expenditure of federal funds, municipalities can establish power and light plants through approval by city councils and public vote. These entities are prerequisites to municipal ownership of assets, or operation of networks. Even if a municipality or group of municipalities chooses to not become directly responsible for managing internet assets, the municipal power & light plant entity in Massachusetts should be established. This work should be coordinated with other efforts in the cities related to microgrids or power networks as this same legal structure of a municipal power and light plant needed to the fiscal oversight entity.

HOUSING AUTHORITY WI-FI PILOT

Recommendation: **Establish Wi-Fi deployments as part of Massachusetts Broadband Institute Gateway City Wi-Fi Grant**

Timeframe: Intermediate (Summer 2021 – 2024)

Status: Immediate / Underway

Type: Connection, Digital Literacy

Primary Actor: Housing Authority, Municipal Staff

Description: As part of the State's Economic Recovery Plan, the Massachusetts Broadband Institute has made funds available, through MAPC, to support Wi-Fi deployments to help connect individuals, families, or small businesses with sustainable internet access in Chelsea,

Everett, Revere, Malden, and Quincy. The goal of these deployments is to provide broader internet access in communities that face barriers to connectivity.

Through enhanced Wi-Fi availability, this program aims to connect more individuals, families, and small businesses with sustainable internet access for daily use. The MAPC team has explored a first round of installations at public housing properties in Chelsea and Revere. These networks will provide in-unit access to high-speed internet, leveraging network hardware installed in public spaces such as stairwells and hallways. The internet service will be provided through the procurement of a high-speed, commercial-grade internet connection. The ongoing costs of this service will be maintained by the municipalities after one year of service coverage by MAPC.

MAPC's second round of grants will focus on building the capacity of stakeholders within the region to focus on digital access, equity, and inclusion. MAPC is exploring relationships with community colleges and other community stakeholders to establish in-house digital stewardship programs – a model in which students or other individuals would receive specialized training in community organizing and networking technology/management and apply their training by building community networks with local stakeholders and partners.

Next Steps:

- Continue efforts to establish free Wi-Fi at pilot public housing properties in each community.
- Connect with community members to learn from these pilot connection installations.
- Identify funds to continue the program if deemed successful by residents.

HOST DIGITAL NAVIGATOR PROGRAM

Recommendation: **Participate in Youth Works Digital Navigators Program**

Timeframe: Immediate

Status: Underway

Type: Digital Literacy

Primary Actor: Municipal Staff, Community Organizations

Description: Through this planning process, it was revealed that there were significant gaps in local capacity to help residents navigate the various public benefit resources related to digital access. There is an opportunity to address this issue, in partnership with MetroNorth Workforce Investment Board. With funding available through the State's Commonwealth Corporation YouthWorks program, and with additional corporate support from Comcast. With these combined funds, the MetroNorth Workforce Board was able to hire the National Digital Inclusion Alliance to train and support 15 young people, aged 17 – 21, in Everett, Revere, and Malden to provide digital resource navigation support.

Digital Navigators can be embedded in municipal offices, healthcare facilities, schools, libraries or other CBOs to provide direct technology and resource support to the community. This is the first youth-focused digital navigators program in the country. Youthworks staff are currently hiring navigators and working with municipalities to house and support the young adults. Additional support from municipalities and CBO's will be needed to make connections between new capacity and those that need support.

Next Steps:

- Connect residents to new service
- Add to training and City communications
- Expand and strengthen if successful

EXPAND TECH GOES HOME PARTNERSHIP

Recommendation: **Support Tech Goes Home programing opportunities**

Timeframe: Immediate

Status: Potential

Type: Digital Literacy

Primary Actor: Municipal Staff

Description: One local organization that has been providing language-appropriate training since its founding in 2000 is Tech Goes Home (TGH). In partnership with other community-based organizations across Greater Boston, TGH trains learners through courses that focus on digital skill building. In addition to the skills training, TGH courses also provide learners with a Chromebook and 12 months of internet service through the Comcast Internet Essential program.

Next Steps:

- Adopt brand as policy and assess funding requirements.

ANALYZE PROVIDER NETWORK MAPS

Recommendation: **Leverage Cable Franchise to map existing network infrastructure**

Timeframe: Intermediate

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: As a potential local technical assistance funded project with MAPC, to further expand on the analysis that comes from fiber and cable mapping data provided by ISPs.

Next Steps:

- Apply to local technical assistance grants for potential project establishment
- Partners with other cities request maps as allowed in cable franchise agreements

Intermediate

HIRE DIGITAL EQUITY OFFICER

Recommendation: **Hire a Regional Digital Access and Equity Officer**

Timeframe: Intermediate

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: Municipalities hire a shared digital equity officer modeled after similar positions across the country. This position could be a joint position across municipalities that is focused on the implementation of digital equity initiatives and strategies.

Next Steps:

- Connect with MAPC Regional Cyber officer work to explore hiring model
- Compile a list of similar positions and job descriptions

DIG ONCE POLICY

Recommendation: **Establish Dig Once Policy**

Timeframe: Intermediate

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: Municipal investments in fiber can be coupled with Dig Once policies that mandate additional conduit be installed during construction or repair. This conduit

throughout public rights-of-way allows for future providers to thread fiber in that area, lowering costs for providing broadband service and making a community more attractive for broadband providers hoping to break into a new market or expand their existing operations. Other municipal construction of repair projects for water or sewer pipes, along with roads and sidewalks presents an additional opportunity to incentivize fiber installation.

Next Steps:

- Review other municipal Dig Once Policies

DIGITAL EQUITY FUND

Recommendation: **Establish a Digital Equity Trust Fund**

Timeframe: Intermediate

Status: Potential

Type: Digital Literacy, Device, Connection

Primary Actor: Municipal Staff

Description: A Digital Equity Trust would be a continuing funding source to support local efforts to address digital divide issues. This could include an application process for community groups to take on broadband work, in the shape of local hotspots, larger area networks, adoption campaigns, skills training, and tech career programs.

Next Steps:

- Establish trust through legislative action
- Develop governing body and process for applications

DEVICE REFURBISHMENT PROGRAM

Recommendation: **Support the Creation of a Tech Refurbishment Center**

Timeframe: Intermediate

Status: Potential

Type: Device

Primary Actor: Municipal Staff

Description: A Tech Refurbishment program would divert e-waste, enable skill-building, and provide low-cost options for devices in the community.

Next Steps:

- Coordinate with private sector partners, school districts, and workforce boards

LEVERAGE MUNICIPAL ROOFTOP ASSETS

Recommendation: **Inventory and release procurements for use of municipal assets.**

Timeframe: Intermediate

Status: Potential

Type: Connection

Primary Actor: Housing Authority, Municipal Staff

Description: Rooftops of municipal buildings could be leveraged by internet service providers like Starry and netBlazer to provide competitive options. In addition to rooftops, sheds, buildings and other street furniture or City-owned lots could be used for in-the-field cabinets, edge computing/mini data centers or other equipment necessary for broadband infrastructure. Building off Request for Proposals from neighboring communities (such as in Cambridge), procurements could leverage public assets to obtain sustainable maintenance funds while enabling the expansion of subsidized internet access programs for residents.

Next Steps:

- Inventory and RFP municipal roofs, focusing on tall or elevated properties.
- Inventory and RFP other spaces advantageous to existing or planned broadband infrastructure
- Draft request for information or proposals that would lease rooftop or other spaces.

Long Term

ALIGN CAPITAL INVESTMENTS

Recommendation: **Explore and Align Municipal Infrastructure Investments**

Timeframe: Long term

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: Building on the infrastructure investments that have already been made by Everett, Chelsea, and Revere to connect municipal buildings and assets, there is an opportunity to align future investments and maintenance. The Division of Local Services has established a Municipal Fiber Grant Program that opened for the first time in March of 2020. Structured like other competitive Community Compact grants, this program allows more funds to go towards multi-jurisdictional projects up to a maximum of $500,000 may be awarded to a project. This is an opportunity to address deficiencies in municipal networks identified in reports (like Chelsea's Dewsbury report) while establishing robust fiber option networking to support network monitoring, cyber security, records management, and backup and recovery. Cohesive and collaborative inter-municipal network connection also creates opportunities to gain economies of scale by aggregating internet bandwidth purchases and the associated security infrastructure.

Next Steps:

- Identify priority municipal infrastructure needs
- Draft application(s) for Municipal Fiber Grant program

EXPAND ON COMMUNITY TV RESOURCE

Recommendation: **Reposition Community TV as a Digital Resource Hub**

Timeframe: Long term

Status: Potential

Type: Digital Literacy, Device

Primary Actor: Community TV Staff, Municipal Staff

Description: Local cable stations could leverage existing equipment, knowledge, and space for digital content production and skill development.

Next Steps:

- Establish an advisory board to develop a strategic plan for local access stations

STANDARDIZE SMALL CELL PERMITS

Recommendation: **Adopt a standard small cell permitting policy and practice.**

Timeframe: Long term

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: Municipalities currently approve or deny small cell permit applications of providers looking to build internet infrastructure. This process is not currently standard across municipalities. A shared understanding of guidelines and concerns could go a long way in clarifying processes and incentivizing safe and community approved investments.

Next Steps:

- Review other municipal small cell permit applications and process
- Draft and establish guidelines drawing on successful practices and community input

BROADBAND CONSUMER PROTECTION

Recommendation: **Support and advocate for local needs in current federal rule related to broadband**

Timeframe: Intermediate

Status: Potential

Type: Connection

Primary Actor: Municipal Staff

Description: Create a task force to create policy recommendations to submit to state and federal entities to shape broadband policy and investment.

Suggested policies to explore:

- Broadband Nutrition Label with detail comparable information.
- Advocate for new definition of broadband 100/100.
- Advocate that competition requires at least 3 providers.
- Advocate for federal funding to be distributed equitably and to consider affordability gap not just access gap
- Advocate for a clear and easy to use system municipalities and local government will have to file complaints / grievances on Behalf of Residents New FCC rules put onus on gov to submit/prove speed / price issue with provider

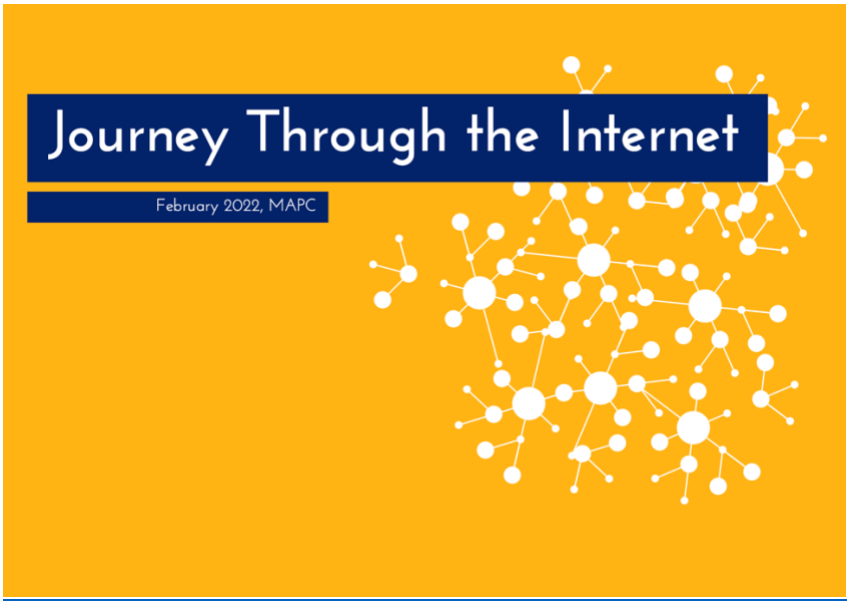
Next Steps:

- Recruit members and establish charter/goals for group

Appendix

How does the internet function?

To understand what actions and responsibilities could be taken to close the digital divide, it's important to look at the internet ownership model that exists today. The internet is comprised of many technologies, each playing a part in transferring information as bits across the globe and to your screen. An overview of how the internet works can be found in these slides:



Internet ownership models review

An overview of internet ownership models can be found at this link.

Glossary of terms

A glossary can be found at this link.

Additional resources

A list of additional resources can be found at this link.

Acknowledgements

MAPC is very grateful to the community advisory teams that met throughout this planning process to provide feedback and respond to proposed strategies and data analysis. The groups were extremely helpful in distributing and completing of the community needs assessment. It provided perspective that informed the plan's vision and goals and shaped the focus and framing of this report. Ultimately, it will be this set of stakeholders that will implement the goals of the plan.

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FUNDING

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