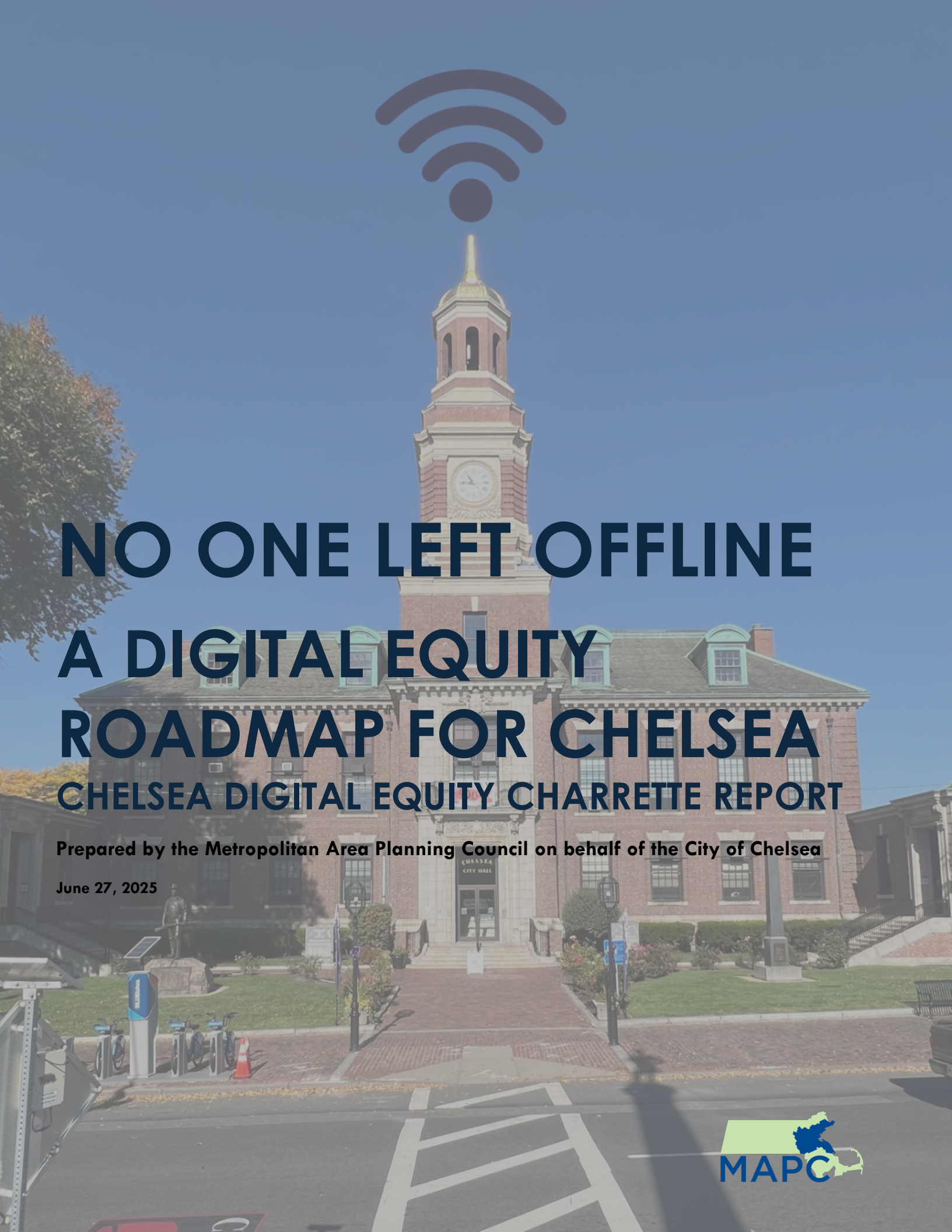

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A DIGITAL EQUITY ROADMAP FOR CHELSEA

CHELSEA DIGITAL EQUITY CHARRETTE REPORT

Prepared by the Metropolitan Area Planning Council on behalf of the City of Chelsea

June 27, 2025

WHY DIGITAL EQUITY PLANS MATTER?

*A **digital equity plan** ensures everyone in a community has access to technology, skills, and opportunities, bridging the digital divide and fostering inclusivity.*

Digital equity plans build stronger, more inclusive communities where everyone can thrive in the digital age.

Here's why they matter:

For Municipal Officials:

1. ***Better Decisions**: Provides insights to guide smart investments in technology.*
2. ***Targeted Resources**: Focuses efforts where they're needed most.*
3. ***Economic Boost**: Supports a skilled workforce and attracts businesses.*
4. ***Improved Services**: Ensures all residents can access essential online services.*

For Community Residents:

1. ***Quality of Life**: Makes healthcare, education, jobs, recreation and social participation more accessible.*
2. ***Equal Access**: Offers tools and skills for education, jobs, and participation.*
3. ***Empowerment**: Engages residents in shaping their digital future.*
4. ***Connection**: Reduces isolation by linking people to resources and community.*

CONTENTS

ACKNOWLEDGEMENTS

The Chelsea Digital Equity Plan was created in partnership with the City of Chelsea Department of Housing and Community Development, with input from residents and community partners. Supported by the Massachusetts Broadband Institute (MBI) at the MassTech Collaborative through the Municipal Digital Equity Planning Program. Funding was provided by the Massachusetts ARPA State Fiscal Recovery Fund. The Metropolitan Area Planning Council acknowledges and appreciates the contributions of all involved. This Chelsea Digital Equity Plan Charrette Report reflects the collaborative efforts of numerous individuals and organizations, whose expertise and community knowledge were instrumental in the planning process.

City of Chelsea Staff:
Karl Allen, Senior Urban Planner for Economic Mobility
Ben Cares, Director of Housing and Community Development
Ramon Garcia, Chief Information Officer
Bladimir Hernandez, Parks and Open Space Manager
Omar Miranda, Civic Design Strategist

Chelsea Housing Authority:
Gilda Cerna, Supportive Services Coordinator
Matthew Frank, Director of Operations

Chelsea Public Library:
Lisa Mucciarone, Director

Community-Based Organizations:
La Colaborativa
- Nelson Montesinos, Digital Navigator
- Catherine Torres, Digital Navigator

MACIR, Inc. (Mass. Association of Computer and Internet Resources)
Chelsea Community Connections

Regional Planning and Support:
Massachusetts Broadband Institute (MBI)
MassHire Metro North Workforce Board
Mystic Valley Elder Services

Community Members:
Residents — all the Chelsea residents who participated in the public forums, focus groups, interviews, and surveys, and shared their valuable insights and experiences.

Metropolitan Area Planning Council team:
Sam Berlus, Community Engagement Specialist
Alexa DeRosa, Regional Planning Data Analyst II
Anagha Devanarayanan, Digital Equity Planner
Javier Gutierrez, Director of Community Engagement
Gwendolyn Hellen-Sands, Regional Housing Planner II
Gloria Huangpu, Community Engagement Planner II
Stephen Larrick, Digital Manager
Carlos Javier Montañez, Principal Planner
Will Pfeffer, Civic Technologist
Emily Wanzer, Lead for America Fellow

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EXECUTIVE SUMMARY

In 2022, the Metropolitan Area Planning Council published a regional Digital Equity plan for the cities of Chelsea, Everett, and Revere. A regional approach was taken because the digital divide crosses municipal boundaries, providing opportunities for cross-community coordination on a shared vision. Progress and implementation, however, often happens at the municipal level, with interventions grounded in local context and driven by city hall. So, when the City of Chelsea expressed interest in revisiting digital equity issues via a planning charrette process to update the existing plan with a focus on actionable recommendations to benefit Chelsea residents most impacted by the digital divide, MAPC was eager to support.

The MAPC Digital Equity Planning team facilitated charrette workshops in December 2024 and April of 2025, engaging Spanish speakers, service providers, and municipal officials in conversations about the biggest barriers to broadband adoption, device access, and digital literacy, and about what could be done to address those barriers.

The resulting report presents an update to the 2022 Digital Equity Plan, providing additional data and context specific to Chelsea, and presenting findings and recommendations developed from the charrette workshops. Importantly, this report recommends specific action items as part of a digital equity implementation plan for Chelsea, with a focus on those items that are most feasible in the short term.

BRIEF OVERVIEW

- This report updates the Chelsea portion of the **prior regional Digital Equity Plan** for Chelsea, Everett, and Revere, highlighting the critical need to bridge the digital divide. **Access to the internet is crucial for education, healthcare, economic opportunities, and civic participation.**
- This charrette report summarizes key findings from community engagement and data analysis, with **updated recommendations** to improve digital access and equity for all Chelsea residents.
- **The digital divide disproportionately affects vulnerable populations such as low-income households, seniors, individuals with disabilities, those with limited English proficiency, and those with lower educational attainment.**

Photo by MAPC Digital Equity Team

INTRODUCTION

Digital equity is central to helping individuals and families access adequate social, economic, and civic opportunities today. This section provides background context on Chelsea's existing digital inclusion work and introduces key concepts that define digital equity, digital equity's alignment with other core community values, and how the digital divide creates needs across the region.

As with many parts of the country, Chelsea experiences challenges including a lack of access and of sufficient bandwidth to carry out daily life online, lack of meaningful competition, high costs for internet plans, a lack of online resources and trainings in languages other than English, and a lack of digital skills.

These concerns were at the forefront of developing a collaborative approach across the region to enhance existing services, break down barriers, and close the digital divide across the region. In 2024, the City of Chelsea joined the Massachusetts Broadband Institute's Municipal Digital Equity Planning program and engaged the Metropolitan Area Planning Council (MAPC) in updating Chelsea's first neighboring community Digital Equity Plan.

Using a process that included quantitative data collection, stakeholder interviews, and a community workshop, MAPC, seeks to outline the current state of digital equity at the municipal level and tie together strategies to address gaps in digital equity related to infrastructure, device access, and literacy for the benefit of all residents of Chelsea.

WHAT IS DIGITAL EQUITY?

This plan describes existing conditions, community needs, and a vision and recommendations for digital equity in Chelsea. But first, what is digital equity?

> *"Digital equity is a 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, employments, lifelong learning, and access to essential services."* -National Digital Inclusion Alliance (NDIA)

Digital equity means that everyone has access to the online opportunities and resources that they need, regardless of socio-economic status or location. It means that everyone has an equitable opportunity to participate in society and the economy, access education and training, and participate in civic life.

For further information on how Digital Equity intersects with key municipal priorities such as housing, economic development, health, education, etc., see Appendix 5: Making the Case for Digital Equity.

DIGITAL EQUITY FRAMEWORK: THREE PILLARS

In discussing and analyzing digital equity in Chelsea, this plan adopts the common framework of the "three pillars" of digital equity. The **three pillars of digital equity — internet access, devices,** and **digital literacy** — form the foundation for ensuring that all individuals and communities can fully participate in the digital world:

1. **Internet Access**
   Equitable digital participation begins with access to **affordable, reliable, high-speed broadband**. This connectivity is essential for education, employment, healthcare, and civic engagement. Without it, individuals face major barriers to modern life (Digital Promise; CDLE). For the purposes of this report, internet access is also considered a basic requirement of adequate housing.
2. **Devices**
   People need **affordable, functional, internet-enabled devices**—such as computers, tablets, or smartphones—that meet their needs for work, learning, and accessing services. Devices are a key component in bridging the digital divide (CDLE; Digital Inclusion.org).
3. **Digital Literacy**
   Digital literacy involves the **skills and knowledge required to use technology effectively**—from operating devices and navigating the internet to evaluating online information and using digital tools. Ongoing training and support are vital to ensure meaningful participation in the digital world (Digital Promise; CDLE; Digital Inclusion.org).

Together, these pillars address the structural barriers that prevent equitable participation in the digital age. Focusing on internet access, device availability, and digital literacy training enables communities like Chelsea to work toward **comprehensive digital equity**.

FINDINGS

Chelsea residents face big challenges when it comes to internet access and digital inclusion. Overall, Chelsea needs faster, more affordable internet, better digital skills training, and more access to devices —especially for older adults, immigrants, and low-income residents.

According to the American Community Survey (2019-23), Chelsea has a population of about 38,319 people. However, according to some local estimates the real number **might be closer to 50,000** due to a high number of chronically undercounted population groups. Two of three Chelsea residents are **Latino (66%)**, and nearly half were **born outside the U.S. (47%)**. Many families have **low incomes** — over 1 in 5 households earn very little with about **23%** of people living in **poverty**. Internet access is limited for some — **19% of households don't have wired internet, and 13.5% use only smartphones** to get online. Around 1 in 5 residents (19%) speak **limited English** at home. Many households (22%) receive public assistance. Chelsea's median household income is $72,220, and about 13% of residents have a disability.

For detailed information about MAPC's planning process and methods, refer to Appendix 3: Planning process

PEOPLE FIRST: OVERVIEW OF COMMUNITY NEEDS

The main issues raised by the community include **slow and unreliable internet connections, high costs, and a need for resources to learn digital skills**. Other important points included a desire for more **shared community spaces** and better **access to devices,** a need for **tech support** and **trustworthy information,** plus **advocacy** for better service and prices.

The following summarizes key findings from interviews and community workshop participants. These findings are available in more detail in Appendix 1: Community needs assessment.

TOP COMMUNITY CONCERNS:

- **Internet Connection:** This was the most frequently raised theme by community participants. Many reported unstable or weak connections, slow internet speeds (sometimes varying by time of day), and dropped connections. A significant issue was that if multiple household members tried to use the internet simultaneously, it would not function properly. Some observed that the actual internet speed was much worse than advertised. The limited choice of internet service providers, with **Comcast being the only option** for most households, was a source of frustration. Some residents were even considering changing to only using cell phones due to difficulties with home internet. There is a clear demonstrated need and demand for reliable at-home internet in Chelsea.
- **Digital Literacy:** This was another major theme, with community participants expressing a strong need and desire for computer skills and learning opportunities. Many needed basic skills to perform tasks like checking work hours or sick time online and relied on friends, neighbors, and family members for assistance. There was also a desire among parents to gain skills to better support their children with school technology and homework. The evident strong need for basic skills classes and the enthusiasm for learning more were key findings.
- **Affordability:** The high cost of internet plans was a significant barrier for many residents. Some households had to choose between paying for internet or cable (which is still a key source of news and information for households with lower levels of digital literacy). Multiple individuals reported paying around or over $100 per month for internet service and worried about affording this cost in retirement. Some with discount plans found the speed to be too slow. Interestingly, affordability was mentioned only once in stakeholder interviews, suggesting a potential gap in the perception of this issue between the community and service providers. Approximately half of the participants at one table in the community workshop did not have home internet at all because it was too expensive.
- **Affordable Connectivity Program:** The Affordable Connectivity Program (ACP) was a federal subsidy program which provided a $30 monthly subsidy to people who qualified for other social services, such as nutrition

assistance, heating assistance, Medicaid, free/reduced school lunch, etc. This program was initially funded by Congress as a COVID-era recovery program, with a finite budget. It was not re-funded, and when the program ran out of funding in May 2024, 2,440 households in Chelsea lost access to the assistance program. The end of ACP represents an **annual loss of $878,400**, felt exclusively by the lowest-income Chelsea residents.

OTHER IMPORTANT THEMES RAISED BY THE COMMUNITY:

- **Community Spaces:** Residents expressed a desire for more places to gather, especially in small groups.
- **Supporting Parents & Children:** Many need better internet and digital skills to support their children's education.
- **Basic Needs:** Community members recognized internet access as essential for many basic needs, such as attending meetings, receiving important information, accessing healthcare communications and resources, and using employee portals.
- **Device Access:** Even when households had a computer, sharing it could be problematic, highlighting the need for multiple devices in intergenerational households. Issues with old, incompatible technology and router problems were also noted. There was a high demand for devices in Chelsea.
- **Technical Support & Security:** Residents expressed confusion about finding information on benefits and programs, a lack of trust regarding online information, and a need for accessible professional help with technical issues. Building relationships is important in this area.
- **Advocacy:** Some participants called for the City of Chelsea and others to advocate for discount plans and better internet speeds. There was a feeling that these issues were systemic and needed to be escalated.
- **Free Public Wi-Fi:** The availability of free public Wi-Fi in indoor and outdoor locations was suggested.

THEMES MORE PREVALENT IN STAKEHOLDER INTERVIEWS:

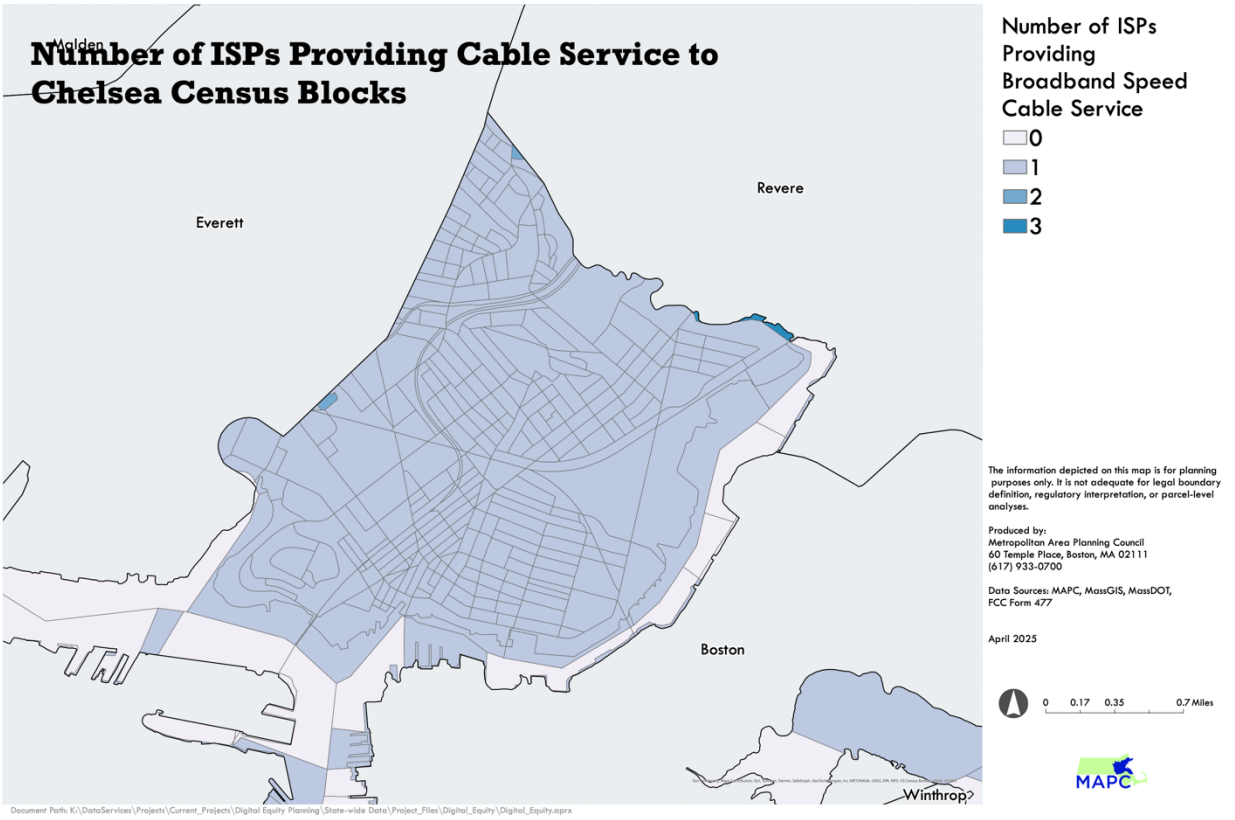
- **Existing Resources:** Partners mentioned existing resources more frequently than community members, potentially indicating a need for better communication about available programs.
- **Outreach:** Stakeholders emphasized the importance of culturally relevant communication methods, such as WhatsApp, given Chelsea's large Latinx population. La Colaborativa noted that many community members are proficient only with social media platforms like Instagram and Facebook.
- **Language Access:** While mentioned only once by the community during the charrette, language access was discussed more in stakeholder interviews. One person saw it as the biggest barrier, and others noted a lack of resources in languages beyond Spanish and English, such as Haitian Creole and Somali.
- **Staff Capacity:** Stakeholders mentioned staff capacity limitations more often than community members, with both La Colaborativa and Tech Goes Home reported to be at capacity.

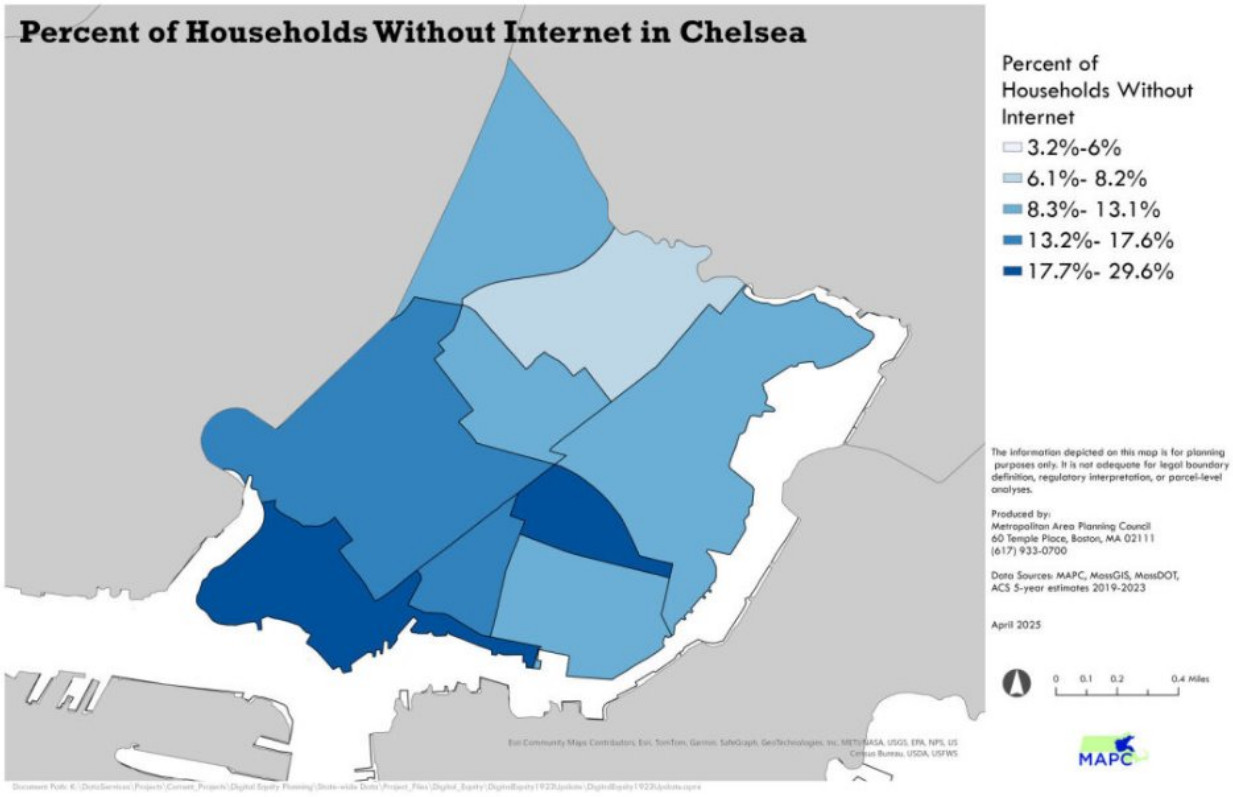
BY THE NUMBERS: INTERNET SERVICE AVAILABILITY IN CHELSEA

In Chelsea, Comcast has a near monopoly and serves 100% of Broadband Serviceable Addresses (BSLs). Two providers (Starry and T-Mobile) also provide Fixed Wireless service to a limited number of addresses in Chelsea. There is no residential fiber internet service available in Chelsea.

According to both the data available and resident feedback, choice is extremely limited. In our outreach, no residents or stakeholders mentioned any fixed wireless provider as a viable option (or one they were aware of). Most residents either

had a cable internet connection from Comcast, or did not have a home connection at all (mostly due to affordability concerns).





These findings and underlying data are available in more detail in Appendix 2: Existing conditions.

RECOMMENDATIONS

There are steps that the City of Chelsea, other public-sector agencies, and community-based organizations can take to close the Digital Divide in Chelsea. The following recommendations are primarily focused on actions that can be taken by the municipal government but can also act as a roadmap for other stakeholders to help achieve Digital Equity in Chelsea.

INTERNET INFRASTRUCTURE

Investing in better infrastructure could help bridge the Digital Divide in Chelsea. Access to high-quality infrastructure is a crucial first step to achieving Digital Equity. While most of the internet infrastructure in the United States is owned by private companies, municipal governments also have a role to play in both improving equitable access, resolving market failures, and creating the conditions needed for true market competition. Potential action steps include:

- Develop a business plan/next steps for implementing the Chelsea Digital Access Plan vision developed by EntryPoint and Biarri in 2023. That plan was funded by Connect Humanity and developed concurrently with the regional Digital Equity plan.
- Evaluate different legal frameworks for providing municipal broadband service or for increasing municipally owned infrastructure, including options such as the creation and use of a Municipal Light Plant and a Municipal Enterprise Fund.
- Evaluate and catalog existing city-owned "dark" fiber and city-owned conduit. Re-evaluate and improve implementation of Chelsea's existing Dig Once policy, including evaluating options for installing city-owned fiber infrastructure in conduit that has already been installed.
- Explore public space Wi-Fi leveraging municipally owned network infrastructure and utility poles, starting with existing municipal facilities, business corridors, and open space. Look for other opportunities in common gathering spaces. Incorporate research from Chelsea's ADA compliance documentation and open space plan.
- Encourage multifamily building owners and anchor institutions to engage with MBI and state resources to improve infrastructure.

Challenges associated with these recommendations include:

- Funding: infrastructure projects can be expensive
- Capacity: any action in this area will require oversight and management by municipal staff

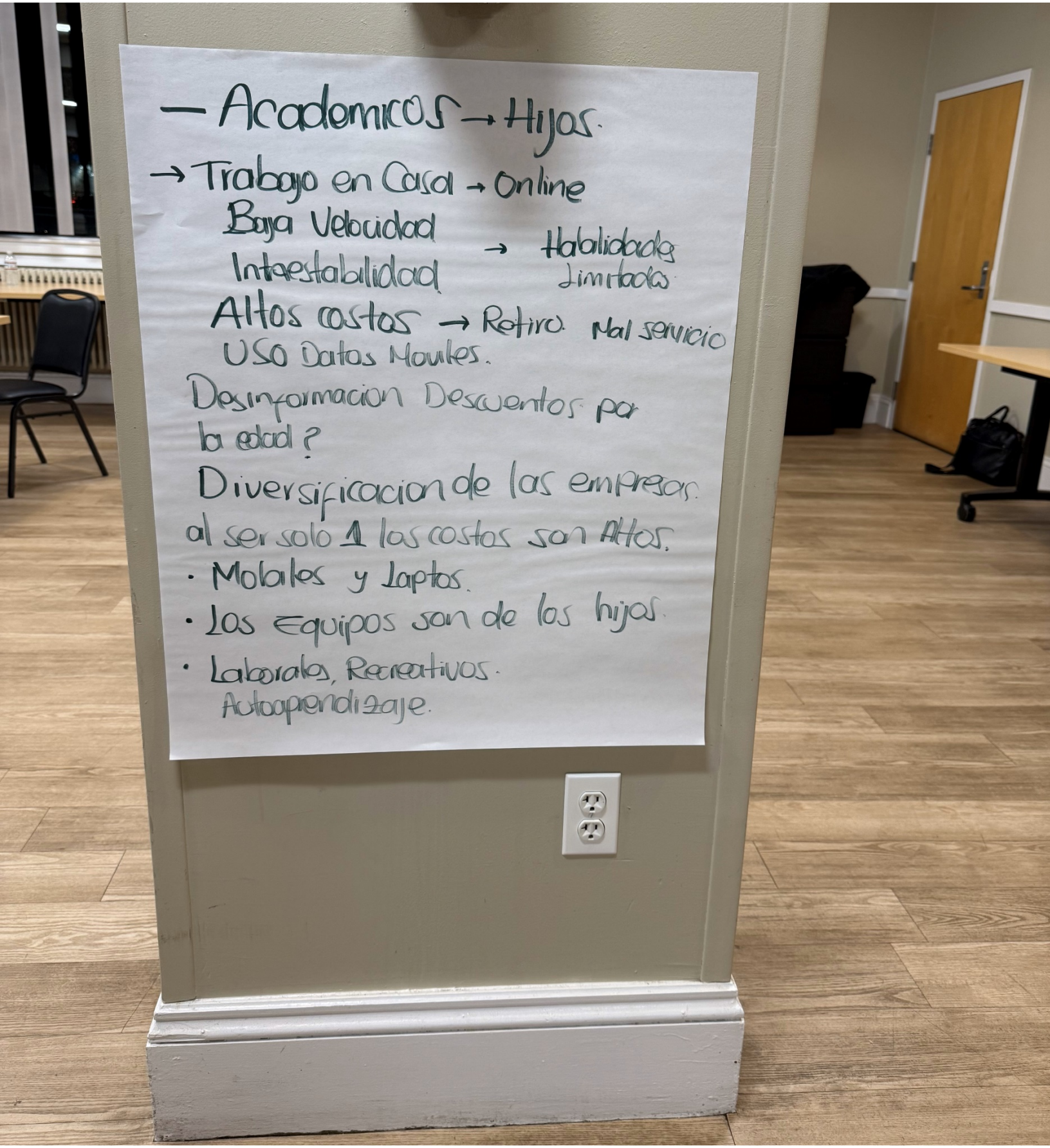
MUNICIPAL CAPACITY AND SUPPORT

The City's ability to pursue infrastructure (or any other) recommendations is dependent upon staff capacity and resources. The city could enhance its own capacity to meet these challenges in several ways:

- The City of Chelsea's Cable Television Advisory Board, responsible for overseeing regulation and responding to resident complaints and suggestions for both Cable television and internet service, is dormant. The city should re-activate this board and actively recruit interested residents to serve on it. The city should also amend the city ordinance to include reference to internet in addition to cable television. Other communities such as Cambridge use their Community TV organization to promote digital literacy.
- Any additional programs or infrastructure projects the City of Chelsea takes on will impact staff capacity. The City should evaluate capacity needs, especially within the Information Technology department which will likely be most impacted by additional network infrastructure projects.

Challenges:

- Adding capacity either to the IT department or to staff a Cable Television board could have budget implications if new staff are to be hired.


— Academicos → Hijos.
→ Trabajo en Casa → Online
Baja Velocidad
Intestabilidad → Habilidades limitadas
Altos costos → Retiro. Mal servicio
USO Datos Moviles.
Desinformacion Descuentos por la edad?
Diversificacion de las empresas.
al ser solo 1 los costos son Altos.
• Moviles y Laptos.
• Los Equipos son de los hijos.
• Laborales, Recreativos.
Autoaprendizaje.

GATHERING SPACES

We heard from both community-based organizations and residents that the lack of public gathering spaces in Chelsea limits their ability to effectively provide/access services:

- The City of Chelsea could both promote awareness of and evaluate/improve access to existing public spaces (municipal buildings, schools, senior center, library, etc.)
- These spaces could serve as both a home for computer classes, digital navigator services, etc., and as network nodes for public Wi-Fi
- Develop best practice guide for anchor institutions who want to provide an open guest network for community use

Challenges:

- Physical/geographic limits to available space present challenges to actually increasing the amount of available public space; the city could meet this challenge by rethinking how existing public space is used to better meet community needs.

SUPPORTING AND AMPLIFYING COMMUNITY RESOURCES

Chelsea and the Metro North region are home to a robust, community-based Digital Equity ecosystem, led by the Mass. Digital JEDI Consortium. The City should work to promote, extend, and support these existing community resources:

- La Colaborativa employs Digital Navigators who provide support to Chelsea residents.
- Tech Goes Home provides free devices to people in need (but demand far exceeds supply).
- Expand educational offerings at Chelsea Community Schools to include more digital literacy programming.
- Public library – build awareness around services offered, such as their public computer workstations, public Wi-Fi network, & space.
- The City of Chelsea IT department is already working to wipe and refurbish staff devices which are being replaced and provide those devices to the library and other organizations for resident use. The IT department should expand this program, especially in support of Chelsea Housing Authority residents and community-based organizations.
    - Using this internal initiative as a model, the City should develop partnerships with large employers in and near Chelsea to provide refurbished laptops to residents in need.

Challenges:

- Matching residents to resources provided by third parties can be challenging and inefficient. Partnering directly with community-based organizations that offer digital equity services and are more likely to have direct relationships with residents will be key in overcoming this challenge.
- Despite robust CBO ecosystem in Chelsea and the Metro North region, resource constraints still exist. Where possible, the City should support these residents as they seek funding to expand and sustain their digital equity programming.

APPENDIX 1: COMMUNITY NEEDS ASSESSMENT

Through a combination of qualitative research (interviews and a community workshop) and evaluating demographic and other data, MAPC developed a clear picture of the support needed by Chelsea residents.

MOST IMPACTED POPULATION GROUPS:

The digital divide does not affect everyone equally. In Chelsea, population groups most impacted include:

- Older residents
- Non-English-speaking residents
- New immigrants
- Residents with disabilities
- Low-income residents
- Immigrant-owned businesses
- Job seekers
- Students and parents

KEY COMMUNITY FINDINGS:

Community participants touched on many topics related to internet access and use. MAPC staff identified 14 themes that they noticed were repeated the most frequently. At the community charrette, **internet connection** (with 27 comments), **digital literacy** (with 22 comments), and **affordability** (with 16 comments) came up the most. These three themes are detailed below along with direct quotes from participants.

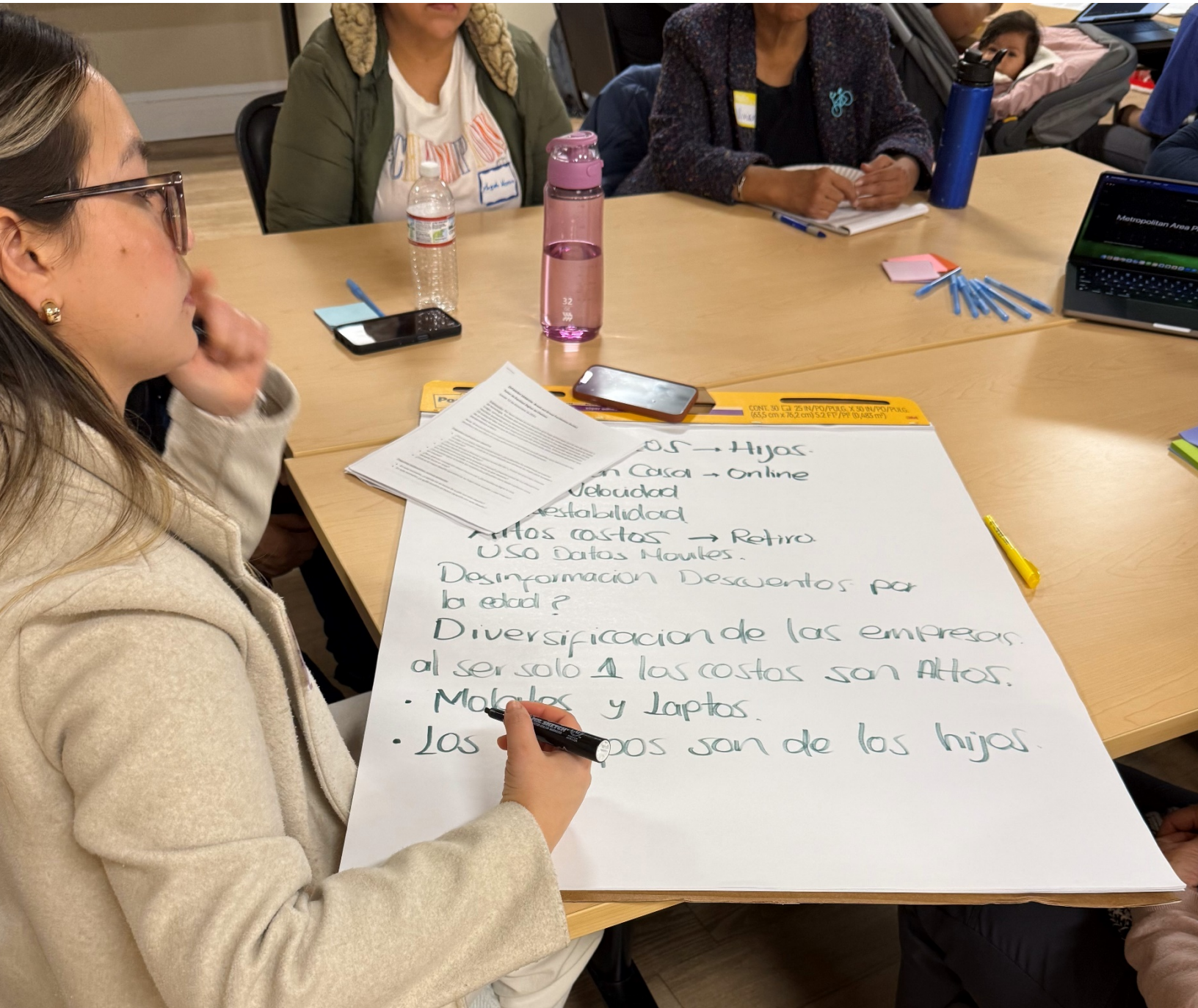
At the community workshop, a need for more **community spaces** came up, as people are looking for more places to gather in small groups. Multiple people also brought up ways that they need better internet and skills to **support their children** – some needed better internet connection so both of their children could do work at the same time, and others wanted to learn how to use computers and school technology better so they could help their kids with homework. These themes were both raised 10 times at the charrette. When discussing the internet, people were aware of how essential it is for many **basic needs**. Community members raised this 8 times, sharing that they need internet to attend meetings about their children, to receive important information through email, to be able to access communications from their doctor and to research their medicines, and to use employee portals to keep track of hours.

Device access was a theme discussed in the community workshop and also prevalent in stakeholder interviews, mentioned 7 and 8 times respectively. At the charrette, people shared that even if their child has a computer in the home, they are often not able to share it for fear of messing up their work, highlighting the need for at least two computers for intergenerational households. Another issue was old technology that is not compatible with recent software. Through the interviews, multiple organizations brought up the high demand for devices in Chelsea. Router problems, though connected to the internet connection theme, also came up in the conversations about devices, as having the right equipment for your home is also an access issue.

During the charrette, 5 people called on the City of Chelsea and other organizations to make and influence change, encouraging **advocacy** for discount plans for internet and devices and better internet speed. One person called on the "Mayor" of Chelsea to take more interest in these issues, and another person suggested convening groups to communicate and unite. In the workshop debrief call, there was an acknowledgement that these problems are systemic and that there is a need to go beyond digital literacy programs. In Chelsea, many people contributing feedback felt that these issues merit being escalated, particularly as such a large majority of residents lack good internet connection.

Another theme mentioned in the workshop and interviews was technical support and security (5 comments each). A few community members expressed confusion around where to find information about benefits, discounts, and programs. There was some lack of trust expressed around knowing what is true or not, and a concern about older people trusting their credit cards to others, emphasizing that building and strengthening relationships is an important part of this work. Others wanted accessible professional help to resolve technical issues.

Some themes came up more in the interviews than during the charrette. Partners named **existing resources** 13 times, compared to 4 who named it in the charrette, potentially aligning with the need for more communication about programming. This theme of **outreach** came up 5 times in interviews, with an emphasis on using culturally relevant modes of communications such as WhatsApp, considering the large Latinx population in Chelsea. La Colaborativa shared that many of their community members come to them with only proficiency in social media, like Instagram and Facebook. They also shared that their **programs and staff are at capacity**, and as they have been adding more classes of various levels, there is less time for open office hours. Municipal staff shared that Tech Goes Home is also at capacity. **Free public Wi-Fi** came up came up 3 times at the charrette and 6 times during interviews, where people suggested indoor and outdoor locations. Interestingly, **language access** only came up once during the charrette, but it was talked about more during stakeholder



interviews, where one person saw language access as the biggest barrier, and another recognized that there aren't many resources in languages other than Spanish and English, such as Haitian Creole and Somali.

The following table details the qualitative themes identified by MAPC staff across resident comments during the workshop and during stakeholder interviews:

Theme	Total comments	At workshop	In interviews
Internet Connection	31	27	4
Digital Literacy	30	22	8
Affordability	17	16	1
Existing Resources	17	4	13
Device Access	15	7	8
Community Spaces	15	10	5
Supporting Parents & Children	11	10	1
Basic Needs	11	8	3
Technical Support & Security	10	5	5
Advocacy	9	5	4
Free Public Wi-Fi	9	3	6
Staff Capacity	7	2	5
Outreach	6	2	5
Language Access	6	1	5

INTERNET CONNECTION

Most, if not all, attendees of the community workshop had stories about barriers to accessing home internet connections. Many comments connected with other themes, but 16 comments were solely about the strength and quality of internet service in Chelsea. People talked about their connection being unstable or weak, the internet being slow (sometimes at certain hours), the connection dropping, and having bad service at home. Multiple people said that if two people were using computers at the same time, the internet wouldn't work or would only work for one person, which was a problem particularly for households with multiple people in school and/or working from home. Two people spoke about having to move around their router to different areas in their home. At one table, many agreed that the internet speed they receive is worse than advertised. Some expressed frustration that there is only one service provider available in Chelsea:

> *Yo llevo 5 años viviendo este. Cuando yo intenté poner internet en mi casa, me dijeron que no, que esa colonia donde yo vivo no calificaba para Internet. Ok. Yo vine. Compré la compañía de móvil tampoco sirvió. Sirvió, quizá un medio mes, ya se quedaba ya no da, Entonces. la única compañía que está que Chelsea supuestamente da es Comcast. Yo pienso que tiene que haber más proveedores.*

I have been living in this area for 5 years. When I tried to get internet in my house, they told me no, that the neighborhood where I live did not qualify for internet. I tried a mobile internet company, but it didn't work either. It worked for maybe half a month, and then it stopped working. So, the only company that is supposed to work in Chelsea is Comcast. I think that there need to be more providers.

AFFORDABILITY

About half of participants at the community workshop did not have internet at home at all because it is too expensive. A pattern that came up was that households had to choose whether to pay for internet or for cable subscriptions.

Many people talked about the high cost of plans. Multiple people reported paying $100/month or more for their service and noted that it would be a struggle to pay that when they got older or retired. Some who had discount plans said that the speed was too slow.

Notably, affordability only came up one time in stakeholder interviews, potentially indicating that there is a large gap to be filled in community and City services in this area.

DIGITAL LITERACY

Throughout the charrette, participants expressed the need for computer skills (see "basic needs" above) and enthusiasm for computer classes and opportunities for learning. Some people talked about needing to rely on their children to teach them, while others wanted skills to help teach their children (see "supporting parents and children" above).

It was evident that there was a strong need for basic skills classes, and there was appetite for learning more.

APPENDIX 2: EXISTING CONDITIONS

DEMOGRAPHICS OF CHELSEA

The estimated population of Chelsea is **38,319** (US Census Bureau, ACS 2023 5-year estimate). The actual population may be **50,000 or more,** due to undercounting of non-citizens, temporary residents, and other marginalized groups.

Table 1: Chelsea's Population

	Chelsea	**Inner Core region**
Non-white population	80%	*47%*
Hispanic	*66%*	*17%*
Black	*6%*	*13%*
Asian	*3%*	*12%*
Two or more races	*6%*	*5%*
Non-Hispanic white population	20%	*53%*
Foreign-born population	*47%*	29%
Speak a language other than English at home and speak English less than "well"	19%	*7%*
Identifies as having one or more disability	12.7%	11%
Population living in poverty	21%	23%

Table 2: Chelsea household characteristics

	Chelsea	**Inner Core region**
Renter-occupied households	70.83%	*54%*
Cost burdened households	48.93%	39%
Cost burdened 30% - 50% income	*21.7%*	*20%*
Cost burdened >50% income	*27.22%*	*19%*
Median household income	$72,220	*$92,900 (Suffolk County, MA)**
Households making less than $50,000/year	38%	*31.2% (Suffolk County, MA)**

** Data not aggregated to the ICC sub- region level; Suffolk County data used instead (ACS 2019-2023)*

Table 3: Digital equity data, households

	Chelsea	**Inner Core region**
Households with no internet connection	19%	*7.65%*
Connect to internet via smartphone only	13.5%	*6.75%*

INTERNET INFRASTRUCTURE AND SERVICE

Internet service providers must report the service they sell to the Federal Communications Commission (FCC) using Form 477. These data are public and give us one way of understanding what internet service is available in a municipality. FCC Form 477 data only show the fastest speed plan that a provider offers in each census tract; they do not show the cost of that plan, or how many people subscribe to it. It also only shows "wireline" service (cable, fiber, and fixed wireless), while cellular and satellite service is instead reported via coverage maps.

Provider	Technology	Max. Speed	# of BSLs served	% of BSLs served
Comcast	Cable	1,200/35 Mb/s	5,378	100%
Starry, Inc.	Fixed wireless	200/100 Mb/s	1,813*	33.71%*
T-Mobile	Fixed wireless	100/20 Mb/s	662**	12.31%**

* Starry also reports providing a 100/50 and a 500/250 Mb/s plan to a total of 21 BSLs in Chelsea, around 0.4% of BSLs.

** T-Mobile also provides a 25/3 Mb/s plan to 1,300 BSLs (24.17%). This falls short of the FCC-defined minimum broadband speed of 100/20 Mb/s and has been excluded from this analysis.

Ed. note: According to FCC and Mass. Broadband Institute data, RCN (dba Astound Broadband) provides cable service to 16.6% of BSLs in Chelsea. However, RCN does not hold a Cable Franchise Agreement with the City of Chelsea, which would be required to provide service using the public right of way. Additionally, multiple sources familiar with the Broadband market in Chelsea confirmed that RCN does not provide service in the municipality and spot checks on the RCN website for addresses showing as "covered" in FCC and MBI data do not appear to be served.

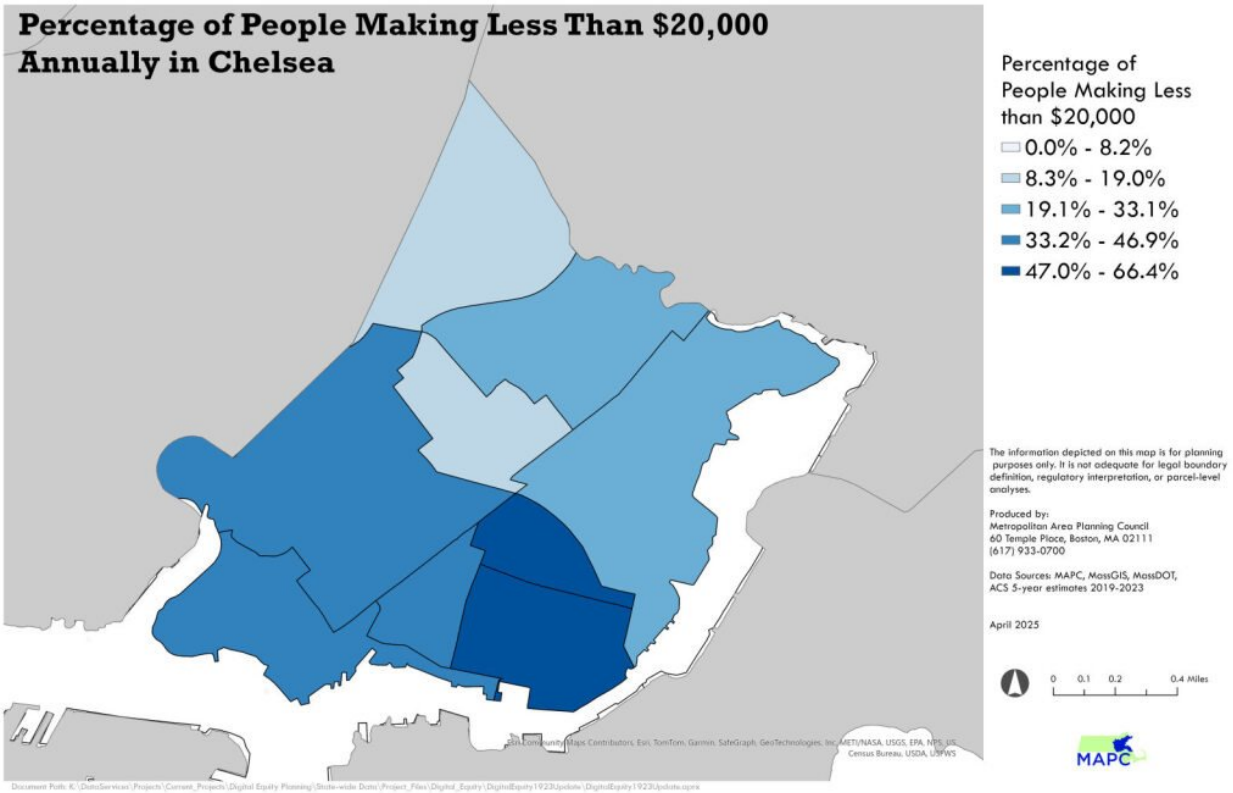
Data on connection speed and service quality is limited, with the majority of data either coming from M-Lab (an open-source project which provides the speed test tool built into Google search results for the phrase "speed test") and Ookla (the company that owns speedtest.net). We primarily rely on open-source M-Lab speed test data to assess network performance in Chelsea. While these data have their limitations and may over-represent people who are performing speed tests to diagnose connectivity issues, it is the best data available on connection quality.

Test	**Time period**	**# of tests**	**Average speed**	**Median speed**
Download speed	2023-2024	4,528	145.6 Mb/s down	115 Mb/s down
Upload speed	2023-2024	4,438	37.74 Mb/s up	24 MB/s up

According to the American Community Survey, about 15% of households in Chelsea have no internet service at home. Whether or not a household has a broadband subscription is highly correlated with income:

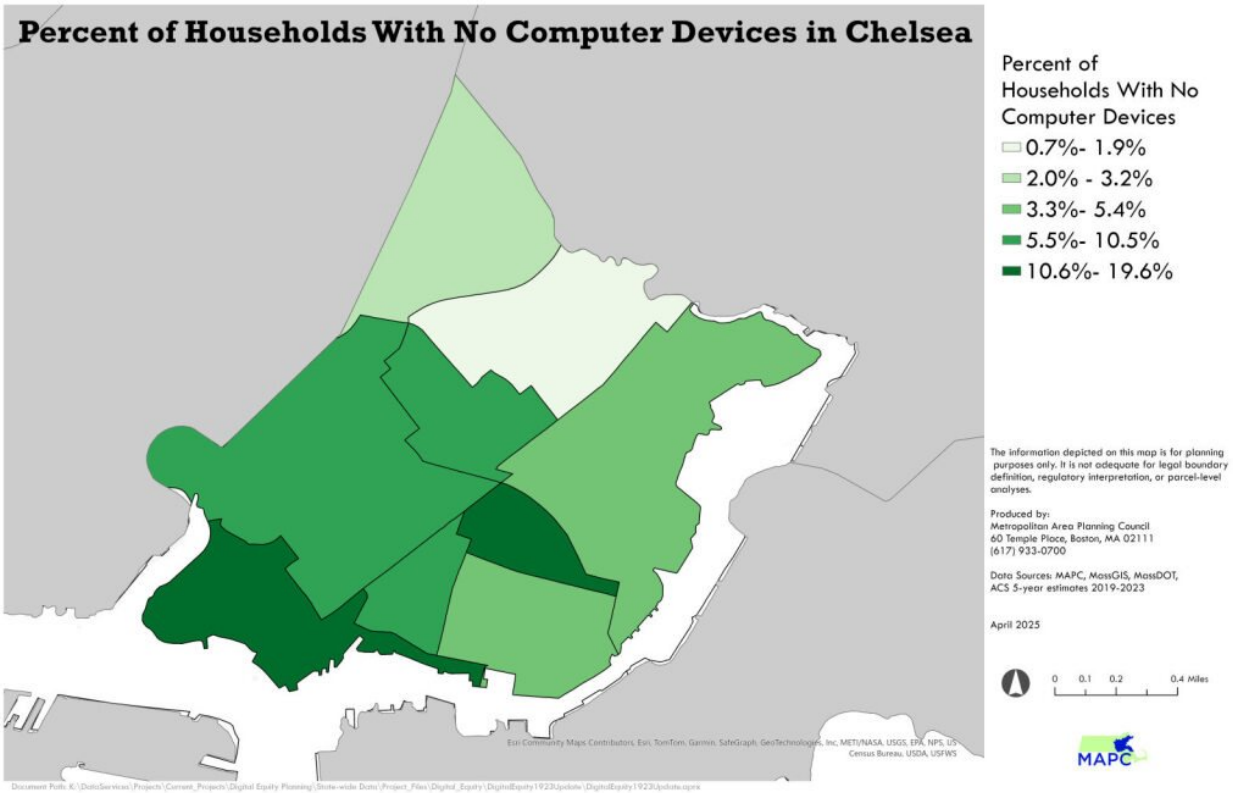
Income Range	**% HH with no internet**
< $20,000	35.7%
$20k - $74k	14.1%
> $75,000	6.1%

Note: While more granular data (especially data pertaining to different percentages of Area Median Income) would be instructive, that level of detail is not available from the American Community Survey.



DEVICE ACCESS

- Over 1,000 households in Chelsea (8%) do not have a computing device of any kind at home.
- Of the 92% of households that do have a computing device, 2,679 households (20%) have only a smartphone with no other type of computing device.


Percent of Households With No Computer Devices in Chelsea
Percent of Households With No Computer Devices
0.7%- 1.9%
2.0% - 3.2%
3.3%- 5.4%
5.5%- 10.5%
10.6%- 19.6%
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111
(617) 933-0700
Data Sources: MAPC, MassGIS, MassDOT, ACS 5-year estimates 2019-2023
April 2025
0 0.1 0.2 0.4 Miles
MAPC

APPENDIX 3: PLANNING PROCESS

The plan balances quantitative and qualitative data. Quantitative data are numerical data from the U.S. Census Bureau, a bilingual community charrette, and other sources. Qualitative data are stories, observations, and information provided by people impacted by the digital divide and by the people already doing digital equity work throughout the region. The methodology was informed by a planning approach that reflects best practices and the values of Chelsea.

PLANNING APPROACH AND VALUES

MAPC's planning approach for the Chelsea Digital Equity Plan is grounded in the following core principles:

- **Data Informed and Community Led**: To understand residents' access to opportunities and services, the planning team takes insights from quantitative data, as well as the community voice through resident surveys and focus group discussions.
- **Targeted toward Action**: The focus of digital equity planning services is to set the foundation for future project implementation and program planning. The plan connects Chelsea's digital needs to ongoing programs and future funding resources. It is tailored to fit the capacity of municipal staff and other local implementers. The action plan develops an implementation strategy to address the digital divide with concrete projects, resources, and other interventions.
- **Public, Multidisciplinary, and Collaborative**: The planning process and recommendations are designed for different Chelsea stakeholders to collaborate with one another.

Opportunity and Asset-Oriented: Digital equity is a pre-requisite to further accessing essential services like healthcare, education, job opportunities, transportation, and social services. The assessment includes conversations with stakeholders in those areas around assets, needs, and opportunities.

Centering Socially Disadvantaged Populations: The digital divide does not impact everyone in Chelsea equally. Therefore, our planning process seeks to center the voices and needs of those most impacted.

PLANNING PROCESS AND BACKGROUND

Background

- **2021**: Chelsea, Everett, and Revere partnered with MAPC to create a regional digital equity plan.
- **2022**: MAPC published the *Chelsea, Everett, and Revere Digital Equity Plan*.
- **2022**: EntryPoint Networks and Biarri publish the *Chelsea Digital Access Plan*, with support from MAPC.
- **Ongoing**: Chelsea and MAPC collaborated with the Chelsea Housing Authority on Apartment Wi-Fi initiatives.

Charrette Planning Process (2024–2025)

1. Pre-Workshop Assessment
MAPC reviewed past plans, analyzed local data, conducted interviews, and identified priorities with city staff.

2. Workshop Preparation
Two workshops were designed — one for city leaders and one for impacted residents — with translated materials and targeted outreach.

December 12, 2024: First workshop held in Spanish with Chelsea Residents, supported by La Colaborativa digital navigators.

April 8, 2025: Second workshop held with municipal leadership.

3. Synthesis and Action Plan
Community feedback and data were used to develop recommendations and an action plan, shared via a final report and public updates.

Key Contributors

Led by MAPC's digital equity team, with support from Chelsea municipal departments, housing authority, community organizations, and MBI.

COMMUNITY ENGAGEMENT PROCESS

- MAPC facilitated a concentrated engagement process that included stakeholder and municipal interviews in addition to two "charrettes": one community workshop facilitated in Spanish, and one convening of municipal employees. The charrette model allows for a smaller budget and accelerated planning process while still making space for community input.
- Twelve Chelsea residents attended the community workshop, providing almost 50 comments sharing their experiences and ideas.
- La Colaborativa, a community-based organization serving Greater Boston's Latinx community, played a key role in the community workshop. Catherine Torres and Nelson Montesinos, both Digital Navigators with La Colaborativa funded through the Digital JEDI Consortium, did outreach for the event at their digital literacy classes and facilitated the small group discussions. They also provided insights and reflections in a debrief discussion after the event.
- MAPC staff conducted five stakeholder interviews, with Chelsea Community Connections, the City of Chelsea's Small Business Development Specialist, Mass Association for Computer and Internet Resources (MACIR), MassHire Metro North, and Mystic Valley Elder Services.

APPENDIX 4: DIGITAL EQUITY ASSETS IN CHELSEA

Beyond infrastructure, broadband connections, device access, and digital literacy, it is also important to consider digital equity "assets" that support residents' access to the internet directly or indirectly. These assets can be formal, digital equity-specific assets like computer training programs, hotspot or laptop lending programs, or public spaces with free Wi-Fi. There are also many informal digital equity assets, which might include a librarian who provides help setting up an email account, a housing authority staff member who assists a resident in filling out online benefit forms, or a financial literacy and tax assistance workshop at a senior center or community development corporation office.

Asset mapping information below is on Chelsea's existing programs, organizations, plans, or involved individuals drawn from MAPC's research and statewide asset mapping activities coordinated as part of the State Digital Equity Plan (SDEP). The exercise was led by MBI, in collaboration with regional planning agencies (RPAs) to document local assets like community anchor institutions, school districts, libraries, and other entities in their regions. This process that MBI led also included public input to map community assets within the state.

INSTITUTIONAL PROGRAMS & RESOURCES

Many resources are provided directly by the City of Chelsea or other institutional organizations (public schools, libraries, etc.):

- The Chelsea Public Library provides free Wi-fi, computer workstations and a computer room, mobile printing, and access to digital collections and other content to download and stream.
- The Library also participates in the Access to Justice Program, a partnership with the Massachusetts Trial Court offering virtual court hearings and work space in the reference and computer room.
- Chelsea Housing Authority, with the support of MAPC and the Massachusetts Broadband institute, offer free in-unit Wi-Fi for residents at the Prattville family housing site. CHA has also enrolled other properties in MBI's Residential Retrofit program, which will provide higher-quality access to CHA residents.
- The School District Technology website provides online resources for accessing the internet at home and online safety and security.
- MassHire Metro North Workforce Board has established the Digital JEDI consortium (comprised of offering digital equity support resources to the North Shore, including to members of the Chelsea community). The initiative partners with La Colaborativa and other community organizations serving Chelsea.

COMMUNITY-BASED RESOURCES

Chelsea is home to a robust network of community-based organizations, some of which provide specific Digital Equity services:

- La Colaborativa employs digital navigators and offers computer skills classes.
- The "Mass Mesh" open mesh network project has a node in Chelsea at Webster and Summit.

POLICIES AND PLANS

Policies and plans help guide institutional priorities intended to advance Digital Equity and can serve as tools for advocates and community-based organizations to keep track of goals being set by the municipality.

- MAPC published a regional Digital Equity Plan for Chelsea, Everett, and Revere in 2022. A separate Digital Access Plan was also produced by EntryPoint Networks and Biarri in 2022, which detailed the technical steps the City of Chelsea would need to take to develop a municipal broadband network.
    - These plans identify broadband access as an essential service and make recommendations for improving access and closing the digital divide.
- The City has adopted a "Dig Once" policy to encourage the installation of conduit that the city can manage to advance fiber infrastructure. The policy has already been used to install conduit in major utility reconstruction programs in the city.

OTHER DIGITAL EQUITY ASSETS

The Massachusetts Broadband Institute led a crowdsourced, Digital Equity asset inventorying effort as part of the Statewide Digital Equity Planning project in 2024. The collected results of that inventory are available on MBI's website, and can be filtered by municipality, region, type, and other aspects.

The assets inventoried for Chelsea appear below:

Organization Name	**Summary Notes**
Beth Israel Deaconess Medical Center Division of Digital Psychiatry	Offers Digital Navigation service for clients served, including individualized digital literacy support, device distribution and low-cost broadband enrollment support.
Chelsea CDC	The Neighborhood Developers' CONNECT initiative provides outreach support for partners in Chelsea, Everett, and Revere, helping to promote DN services. When Intermediate/Advanced Digital Literacy Courses are live, CONNECT will promote them in coordination with Chelsea, Everett, and Revere partners. CONNECT will also assist in the implementation of Intermediate/Advanced Digital Literacy Courses by providing multiple spaces where RCS and WEE can run said courses.
Chelsea Housing Authority	MAPC, the Chelsea Housing Authority, and the City of Chelsea are working together to provide free in-unit Wi-Fi for the 128 units located at Prattville Apartments. Prattville consists of family housing.
English for New Bostonians	English for New Bostonians (ENB) serves immigrant communities in Greater Boston through 20 community-based sites located in neighborhoods across the City of Boston and workplace English programs conducted in partnership with employers located in Chelsea, Somerville, Burlington, Dedham, and Framingham. ENB envisions a city and a Commonwealth in which adult immigrants have an open door to economic pathways, resources and community life by learning English. This vision goes hand in hand with advancing digital equity as immigrants are not able to fully participate in the workforce or engage in civic life without digital inclusion and digital education. In recognition of this, nearly all ENB-supported ESOL classes include a focus on digital literacy and tech skills, and many classes are conducted virtually or hybrid. ENB's coaching model is student-led. Students meet one-on-one with a coach to articulate their needs and goals and develop an Education and Career Goals Plan. This Plan guides the work each student does with her/his coach, as well as beyond their ENB experience. As an example of ENB response to student English and digital literacy needs in a changing environment, when Boston shut down in March 2020, ENB's Program Manager held calls with each of ENB's 20 grantees about transition to online learning. She and our Training/Technical Assistance Coordinator assisted ESOL staff to adapt strategies and help students keep their families safe while learning English and tech skills and adjusting to employment realities. ENB staff surveyed all programs to determine tech needs and coordinated supply of Chromebooks, Zoom accounts, and hotspots for students and teachers. Overall, 41 of 42 classes across 20 programs were up and running shortly after shutdown. That year, we also conducted student and teacher surveys to compile the report Immigrants Unmute: Voices from Boston's Adult ESOL Pandemic Response (Fall 2020). MBI Outreach & Engagement Awardee
Mass General Brigham	As of Jan. 2023, MGB has "acquired over 2,000 cellular-enabled tablets to start a loaner program for patients in primary care practices" and "provided outreach to over 16,000 patients for Patient Gateway enrollment".

MetroNorth Workforce Investment Board	Grantee under MBI's DE Partnerships Program for Education, Outreach, and Adoption; Digital Literacy; and Device Access.
Mystic Valley Elder Services	MVES's Technology Access Program is dedicated to enhancing literacy, access and equity for older adults and individuals with disabilities across 11 communities. Key features of the program include in home training for a series of four home visits to support the participant in meeting their goal, device procurement, resource distribution, tech support over the phone, and community engagement through tech troubleshoot cafes and in-person classes.
Opportunity Community	TND and Nuestra tenants can join our FREE online classes! Every family that needs a computer receives a FREE Chromebook to participate in our online and in-person classes. Topics include basic computer skills, student mentoring, English Language Learning, basic business skills, home finance information, housing information, career planning, and even digital art and cooking. Tech Goes Home program includes: 15 hours of classes; Free Google Chromebook; Apply for free internet access for one year. Students attend this class with a parent, older sibling, or guardian to facilitate learning.
Revere Community School	Revere Community School (RCS) under the City of Revere Talent and Culture Department was established in 2013 with a mission to unite lifelong learners with community with resources; empower its adult learners and encourage workforce development. The Community School is the City of Revere adult education program and serves a diverse student population from Revere and surrounding communities, working with adults and youths from more than 30 different countries. This year the Community School celebrated 10 years of successful community education. When the pandemic started, our program became the lifeline for many low-income and non-English speaking families and seniors. We provided information, food, PPEs, digital devices, internet and many other resources. Every year, over 1000 learners including parent, teachers, and other professionals enroll in RCS courses such as English for Speakers of other language (ESOL); HiSET, Citizenship; Computer training (basic and workforce); Spanish language, financial literacy/ job training workshops and a laptop lending library with access our support services to skills, attend college, gain employment and citizenship. Offers Tech Goes Home digital literacy training program.
Roca, Inc.	Roca works with 16-to-24-year-old young men from 20 communities in Massachusetts who have experienced extensive trauma and are the primary victims or drivers of urban violence. Roca's Central American Youth Initiative seeks to ensure the most urgent form of social justice for a group of young people that is perhaps the most forgotten and excluded within our borders. Partnering with police, schools, and cities to provide a continuum of prevention and intervention services, Roca has developed and nurtured a community in Greater Boston that is actively helping these young people heal. Roca is one of the only organizations in the country working with a forgotten group of young women, most of whom are mothers, who are traumatized victims of abuse and neglect. The nationally recognized, four-year behavioral health intervention model teaches young women across Massachusetts and Hartford, CT, the skills they need in order to choose to live and set their children up for success. ROCA also offers Tech Goes Home digital literacy training program.

Source: https://broadband.masstech.org/massachusetts-digital-equity-asset-inventory

APPENDIX 5: MAKING THE CASE FOR DIGITAL EQUITY

Digital equity is not an isolated issue but is instead interrelated to many of the core challenges faced by Chelsea. Given the importance of digital access, devices, and literacy to society participation, Chelsea is home to many populations who face challenges in getting their digital needs met daily.

Most notably, low-income households have trouble being able to afford a fast, reliable internet connection for their home, even if they use the internet regularly and recognize the need for it. This is also true of residents who speak a language other than English, who also face a lack of training and resources available in their native languages.

While residents in some neighborhoods have higher incomes and do not have as many issues with affordability, they have pockets of people with lower incomes that often live in subsidized or naturally occurring affordable housing. Senior residents often lack digital skills and an accessible means of learning them. All these groups are concerned about scams and internet safety.

Importantly, the Digital Divide impacts the region's ability to meet its housing, economic development, Health, Education, and Civic Participation goals as detailed in the **sidebar/table/page/figure.**

DIGITAL EQUITY + HOUSING

- High speed internet access is an increasingly vital aspect of adequate housing
- A building's wiring and infrastructure can impact the internet options available to residents
- High cost of housing and the high prevalence of cost burden, particularly in lower income households with little or no discretionary income, can force households to have to choose between basic necessitates, sometimes sacrificing internet access
- Applications for affordable housing and other housing related services (such as rent payment portals) are increasingly online
- Low-income residents of affordable housing experience lower levels of internet access and adoption
- Housing authority-managed sites and other multi-dwelling unit buildings (MDUs) can provide opportunities for shared broadband amenities or services

DIGITAL EQUITY + ECONOMIC DEVELOPMENT

- Research increasingly shows that digital inclusion is a prerequisite for economic inclusion and for closing generational wealth gaps [1]
- Digital access is necessary for a variety of important economic activities that increasingly take place online, from working remotely, to searching for a job, upskilling through online training, to e-commerce and online entrepreneurship
- Digital skills are required for 92% of job opportunities, and jobs that require more digital skills pay more than jobs that require fewer [2]
- A community's broadband coverage and adoption is associated with the number of jobs and economic output, and individuals with broadband subscriptions report higher income than those without[i].
- Small businesses owners need digital skills to market and promote their businesses online

- Tech companies and other employers require top-tier broadband speeds to locate in a community

DIGITAL EQUITY + HEALTH

- Digital equity is a "super" social determinant of health, meaning it influences others, such as healthcare, education, and employment.
- The COVID-19 pandemic spotlighted the internet's impact on these domains, when medical appointments, school, and certain jobs moved online during lockdown and made digital access vital to meeting many daily needs associated with health outcomes
- With the rise of telehealth appointments, online patient portals, and secure messaging services for communicating with medical staff, access to healthcare is increasingly predicated on digital access
- Staying connected online via social media, email, messaging apps and other online communication with friends and family can prevent social isolation and reduce depressive symptoms in older adults.

DIGITAL EQUITY + EDUCATION

- Remote learning allows students to attend school, complete assignments, and experience educational programs from home
- Teenagers with computers at home are 6-8% more likely to graduate high school than those without, when controlling for individual, parental, and family differences [4]
- Middle and high school students without home internet access or who depend on a cell phone for internet access tend to have lower GPAs, lower homework completion rates, and lower standardized test (like SAT) scores, and are less likely to plan to attend college or pursue STEM-related careers (https://quello.msu.edu/wp-content/uploads/2020/03/Broadband_Gap_Quello_Report_MSU.pdf)
- Education exposes students to digital skills that can expand learning and introduce future career pathways

DIGITAL EQUITY + CIVIC PARTICIPATION

- **Digital access and inclusion also enable civic participation**, especially as online government services expand [5]
- Government **permits and services** are increasingly accessed online via program websites and online application forms
- Many **public meetings** can now be accessed via online videoconferencing, allowing more flexible remote participation, but also presenting challenges for those without digital access
- **Public announcements** and community alerts are shared online on websites and via online applications
- **Community organizing** and other forms of **social participation** in civic life increasingly take place on social media

APPENDIX 6: NETWORK TECHNOLOGY

The technology used to transmit data to and from the internet impacts how fast those data move. Companies which provide internet service using either Cable or Fiber Optic infrastructure must hold a Cable Franchise Agreement with the municipal government in which they operate, because this kind of infrastructure must use the public right of way. These agreements originally governed the operation of Cable Television providers; they still do, but because the transmission technology used for television and internet is largely the same, the same agreements apply. Because Fixed Wireless and Satellite providers do not rely on physical infrastructure to connect a home to the internet, they don't require these same municipal agreements.

FIBER INTERNET

Fiber optic cables are currently considered the "gold standard" of internet infrastructure. While any internet technology has a maximum transmission speed, the theoretical maximum transmission speed of fiber is so high that it is at present functionally unlimited (some experts theorize that a single strand of fiber optic cable could transmit as much as 44 terabits per second, or 44 million megabits).

CABLE INTERNET

The most widespread ISP technology used in the United States is cable—the same coaxial copper cable infrastructure that brings cable television into homes. Because these cables have been in use for so long, they're extremely widespread. However, they do have a much lower transmission capacity than fiber, topping out at about 10 gigabits per second under ideal laboratory conditions. In practice, it is uncommon to see cable internet speeds above 1 gigabit per second.

FIXED WIRELESS INTERNET

Unlike cable or fiber, fixed wireless internet uses point-to-point terrestrial microwave (radio) signals to move data around. An apartment building might have a fixed wireless antenna on the roof, which sends and receives data from a central hub which is connected to the internet at an existing fiber optic node. The data are then transmitted through the building using ethernet cables connected to wireless routers or other devices. This technology has the benefit of not requiring the ISP to invest in costly buried infrastructure but can be more expensive to operate and less reliable.

SATELLITE AND MOBILE (CELLULAR) INTERNET

While all internet connection technologies must at some point be physically connected to the broader internet, satellite and mobile internet transmit wirelessly over a much longer distance, and as such are not regulated at the municipal level. Data about coverage using these technologies is not available at a municipal level.

Satellite connections have the advantage of being usable in more remote locations, out of range of cable/fiber infrastructure and far from cellular towers. However, most satellite ISP service is both expensive and quite slow, while newer "low earth orbit" technologies which do provide faster speeds are extremely dependent on horizon sightlines, meaning that they are impacted by topography, tree cover, and the built environment. In an urban environment, with widespread availability of cable internet service, satellite internet is not an attractive option.

Cellular internet, while nearly ubiquitous in smartphones, has disadvantages for home internet connections. Because of the high demands on the cellular network, most plans have data caps (limits on the amount of data that can be transmitted each month) and higher subscription costs. A dedicated hotspot can provide flexible internet access if traditional connections are not available, and individuals may forego home internet for financial reasons in favor of relying on the mobile hotspot already built into their smartphone. The same is often true for people without a stable home address, which would preclude them from subscribing to a traditional home internet service provider.

DIGITAL SUBSCRIBER LINK (DSL) INTERNET

DSL internet is an outdated technology that relies on copper telephone wire infrastructure, in much the same way that cable internet relies on cable television infrastructure. It differs from "dial-up" internet in that it offers faster speeds and can be used simultaneously with a telephone call, but it does use the same physical infrastructure. While DSL was once considered "high speed" internet, the maximum transmission speeds possible using this infrastructure are well below the capacity of even cable internet.

HOW IS SPEED MEASURED AND REPORTED?

BITS VS. BYTES

Internet speed is generally measured using multiples of bits: kilobits per second, megabits per second, and gigabits per second. A bit is a single character of binary code: a 0 or a 1. This differs from how file size is measured, which is generally in multiples of bytes. A byte is 8 bits, which is the maximum amount of data needed to transmit a single character of text. A text document containing 1,000 characters of text would have a file size of about 1 kilobyte and would take 8 seconds to transmit over a 1 kilobit per second connection.

Broadband speed is measured using two numbers: an upload speed and a download speed. These numbers typically represent a maximum or "best effort" rate, not the rate that is actually provided at all times. A connection listed as 100/30 means that the download speed (the speed of receiving data from the internet) is 100 megabits per second, and the upload speed (the speed of sending data to the internet) is 30 megabits per second. Upload speeds are often lower, because most home uses for the internet involve receiving much more data than sending. However, the increased usage of video conferencing means that upload speed requirements for the average user are higher now than they have been historically. There's no technical reason uploads need to be slower than downloads, this is just one way that ISPs manage data transfers to preserve higher download speeds. Fiber internet service, which has a significantly higher technical bandwidth capacity than cable service, is more often sold at symmetrical speeds such as 100mbps/100mbps because there is less need to manage limited bandwidth.

REGULATION, REPORTING, AND SPEED TESTS

The FCC updated their definitions of what speed constitutes "Broadband" internet in 2023. Speeds at or above 100/20 are considered "served" with broadband, while anything between 25/3 and 100/20 is considered "underserved." Speeds below 25/3 are considered "unserved."

While FCC Form 477 (the source of the maximum advertised speeds listed per ISP) lists the maximum advertised speed available at a given address, these numbers do not tell the full story. First and foremost, a speed listed in a Form 477 filing indicates only that the ISP is willing to sell a subscription at that speed; it does not indicate how many people (if any) purchase that service, nor does it indicate the price at which it is provided. For most home use, a 100/30 connection is sufficient, while 300mbps download speeds may be desired for heavier uses such as remote work/school when multiple connections are active simultaneously. Some applications, such as online gaming or audio/video production may require an even higher connection speed (as much as 1gbps) and begin to have implications for network latency (sometimes called "ping," the time it takes for a packet of data to be transmitted, measured in milliseconds, as opposed to the quantity of data which can be transmitted at once time).

Internet speed tests are one source of data available to determine the real-world experience of home internet users. However, speed test data are not without their limitations. A person is most likely to take a speed test when something is

not working the way they expect it to, which may bias the data towards slower speeds. These speeds are also impacted by a large number of factors beyond the ISP service, including device condition, age, and quality, wireless router placement, condition and quality of in-building wiring, etc. For people who do take a speed test, the test results are a fairly accurate representation of their experience using their internet connection; they do not tell us *why* their experience is what it is, or how much of that experience is caused by their internet service provider.

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[i] Curtis ME, Clingan SE, Guo H, Zhu Y, Mooney LJ, Hser YI. Disparities in digital access among American rural and urban households and implications for telemedicine-based services. J Rural Health. 2022 Jun;38(3):512-518. doi: 10.1111/jrh.12614. Epub 2021 Aug 6. PMID: 34355427; PMCID: PMC9827725.