GREATER LOWELL DIGITAL EQUITY PLAN

Executive Summary

NORTHERN MIDDLESEX COUNCIL OF GOVERNMENTS
SERVING THE REGION SINCE 1963

MAPC
METROPOLITAN AREA PLANNING COUNCIL

A component plan of
GREATER LOWELL STRONGER TOGETHER
2025-2030 COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY

MBI
MASSACHUSETTS BROADBAND INSTITUTE
at the MassTech Collaborative

Closing the digital divide is a key aspect of achieving equity. Access to the internet is a crucial tool, enabling access to education, healthcare, the economy, friends and family, civic participation, and much more. This 21st century reality—underscored by our post-COVID 19 remote and hybrid reality—means that municipalities throughout Greater Lowell increasingly believe in ensuring that all residents have affordable and reliable access to the internet, as well as the social infrastructure, technology support, and device access needed to engage online as a core civic responsibility. Vulnerable populations such as immigrants, non-English speakers, people with disabilities, communities of color, older adults, people who make lower-incomes, and others live in each of the region's municipalities. This is why the nine communities of Greater Lowell: **the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough, and Westford** came together to create a plan to confront disparities through the collaborative work of planning for digital inclusion.

WHAT IS DIGITAL EQUITY?

Before we dive into digital equity research and findings for the Greater Lowell region, we first need to establish what exactly we mean by the term "digital equity". The model used for the Greater Lowell Digital Equity Plan consists of three pillars:

Infrastructure for Reliable Internet Connections	Appropriate Devices and Access	Education and Digital Literacy
		

• A fast, affordable connection to the home, with enough bandwidth for all devices and family members.
• Fiber Optic Cables in the ground
• Consumer choice for all households and neighborhoods.
• Wi-Fi in public places.
	• Adequate and appropriate devices for each user and their needs including:
	  ○ Router
	  ○ Desktop Computer
	  ○ Laptop
	  ○ Tablet
	  ○ Specialty/adaptive devices catered to the needs of those living with disability.
		• Knowledge of how to use technology
		• Skills to troubleshoot and maintain software and devices/equipment.
		• Media literacy to evaluate the quality of information and privacy risks
		• Confidence to overcome fear and shame due to lack of digital skills/knowledge
		• Programs/resources that are accessible for those with disabilities or language barriers

FINDINGS AND RECOMMENDATIONS

The plan incorporates quantitative data from various sources including the US Census Bureau's American Community Survey (ACS), the FCC's Form 477, from internet speed test data providers like M-Lab and Ookla, and program data from the American Connectivity Program (ACP). Alongside these standard data sources, the plan also incorporates a region-wide digital equity survey, and qualitative data gathered via interviews, workshops, and focus groups with stakeholders, service providers, municipal officials, and people impacted by the digital divide. The methodology was informed by a planning approach that reflects best practices and the values of the Greater Lowell region.

This information was used to create six major strategies. Each strategy has a number of actions that can be found in Section 4, Recommendations. These strategies can be undertaken independently or together as a region.

STRATEGY 1: BUILD CAPACITY TO IMPLEMENT AND EVALUATE DIGITAL EQUITY PROGRESS

Digital equity is a relatively new domain for municipal governments and community-based organizations compared to issues like housing, recreation, or transportation. There is no "department" of digital equity, so to address the digital divide, communities and the region will need to build new capacity. Staff, budget, organizational structure, and other resources and capacities are needed to support broadband access, device access, and digital literacy, and to evaluate progress toward the implementation of the digital equity plan. In some cases, this may mean designating existing staff, departments, or organizations to include digital equity in their work and responsibilities, while in other instances new staff or structures will be needed to advance digital inclusion and measure impact. Crucially, building capacity includes building resources for addressing the digital divide, including pursuing state and federal grants.

STRATEGY 2: IMPROVE QUALITY, RELIABILITY, AND AFFORDABILITY OF BROADBAND SERVICES TO THE HOME, ESPECIALLY FOR PRIORITY POPULATIONS

At-home internet access is perhaps the most direct measure of the digital divide, and in Massachusetts, cost is the number one barrier. Municipalities can improve the quality, reliability, and affordability of at-home internet access through coordination with Internet Service Providers (ISP)s, and through investments and policies to improve access and competition at the regional, municipal and neighborhood scale. Because the digital divide does not impact all populations equally, municipalities should also pursue, facilitate or support interventions that improve broadband access at specific housing sites serving priority populations, such as older adults, people living with disabilities, low-income households, formerly incarcerated individuals, and individuals experiencing housing insecurity.

Recommendations to improve at-home internet access at the regional or community scale include actions focused on improving ISP low-cost plan sign-ups or expanding ISP coverage and competition; providing public or open infrastructure to increase consumer choice by building on existing

municipal fiber networks or exploring open access networks through large scale infrastructure investment or through policies including dig-once policies and zoning and permitting reform.

STRATEGY 3: ENHANCE DIGITAL ACCESS IN PUBLIC SPACES AND FACILITIES

Local governments are often best equipped to ensure digital access in public spaces, like public parks and buildings. Freely available Wi-fi networks, computers, and other devices or equipment like digital screens/kiosks and charging stations, can provide numerous benefits to all members of the public and can provide a digital access safety net to the most vulnerable.

These recommendations focus on improvements to public facilities, including parks and open spaces as well as buildings, where municipalities can invest in network infrastructure, equipment or devices to provide free wi-fi, shared computer workstations, or otherwise enhance digital access.

STRATEGY 4: SUPPORT PROGRAMS AND SERVICES THAT REACH PRIORITY POPULATIONS AND ADVANCE ALL PILLARS OF DIGITAL EQUITY

Some residents lack access to a high-speed broadband connection or to appropriate devices at home or otherwise lack the digital literacy and tech skills needed to use a computer and take full advantage of the internet in ways that support participation in modern life. These residents need support, and often for multiple "pillars" of digital equity. To successfully meet the need, support services should layer internet access, device access, and digital skills training, and do so in ways that are accessible to diverse populations with different cultures, language needs, and with different schedules, habits, and access to mobility.

This means that support is needed from national, state, and local organizations that focus on the core pillars of digital equity: helping residents sign up for low-cost internet plans, distributing devices, providing skills training and tech support. It also means that support is needed from trusted local organizations and individuals who can meet priority populations where they are, in ways that understand local context, cultures, and language needs. Where organizations are already doing digital equity work in Greater Lowell, these programs often need more support to expand to meet resident needs. Where organizations are already reaching priority populations, these programs often have an opportunity to layer in culturally competent support for digital equity alongside existing services.

STRATEGY 5: COLLABORATE REGIONALLY TO EXPAND IMPACT AND UPLIFT EXISTING WORK

As research and outreach conducted during the planning process revealed, a number of organizations and initiatives are already doing great digital equity work in Greater Lowell. Coordinating, sharing, and regionalizing existing programs and resources is a key strategy for maximizing the impact of existing work, and expanding its reach to meet the needs of various communities and populations. For example, some residents aren't aware of existing programs that could connect them to cheaper internet or a new device, and better outreach and promotion can help. Some libraries have tech support expertise that others lack and could share staff support,

program resources or expand service regionally to help. Similarly, programs and resources designed to support the general public, or English speakers could be catered to support a specific group, such as older adults, or translated to become accessible to Spanish speakers.

STRATEGY 6: PROVIDE INCLUSIVE MUNICIPAL DIGITAL SERVICES TO MAKE LOCAL GOVERNMENT MORE ACCESSIBLE AND USER FRIENDLY

In the 21st century, residents expect government services to be as reliable and easy to use as private sector services, and accessible in the same place where they have come to expect everything else in their lives: online. Municipal websites and other online tools provide greater access to local government—including greater access to information and opportunities for engagement and feedback, as well as access to government services themselves via program enrollment intake forms, permit applications, etc. Known collectively as "digital services" these online approaches to local government are crucial for advancing digital equity, as they make civic engagement easier for populations who may speak English as a second language, have disabilities, or face other historic barriers. At the same time, putting services online alone is not enough. Local governments should also continuously evaluate and improve digital services to ensure that they are working through processes known as "user centered design". And, as more and more services move online, municipalities should also ensure support for residents experiencing the digital divide. This means offering customer support for online interfaces and continuing to provide in-person and paper-based options alongside digital options.

GREATER LOWELL DIGITAL EQUITY PLAN

A Collaborative Approach to Digital Equity

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Introduction

Closing the digital divide is a key aspect of achieving equity. Access to the internet is a crucial tool, enabling access to education, healthcare, the economy, friends and family, civic participation, and much more. This 21st century reality—underscored by our post-COVID 19 remote and hybrid

reality—means that municipalities throughout Greater Lowell increasingly believe in ensuring that all residents have affordable and reliable access to the internet, as well as the social infrastructure, technology support, and device access needed to engage online as a core civic responsibility.

The digital divide impacts many groups in Greater Lowell's rural, suburban, and urban areas. Vulnerable populations such as immigrants, non-English speakers, people with disabilities, communities of color, older adults, people who make lower-incomes, and others live in each of the region's municipalities. This is why the nine communities of Greater Lowell: **the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough, and Westford** came together to create a plan to confront disparities through the collaborative work of planning for digital inclusion—with a focus on regional approaches and on partnerships with community-based organizations to prioritize serving the residents who are most persistently and disproportionately impacted by the digital divide.

WHAT IS DIGITAL EQUITY?

Before we dive into digital equity research and findings for the Greater Lowell region, we first need to establish what exactly we mean by the term "digital equity". The National Digital Inclusion Alliance defines the term as follows:

> "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)

For the purposes of this plan and the process that produced it, we have adopted a definition consistent with that of NDIA. Digital equity means that everyone has access to the online opportunities and resources that they need, regardless of socio-economic status or location.

DIGITAL EQUITY FRAMEWORK: THE THREE PILLARS

Beyond this basic definition, in discussing and analyzing digital equity in Greater Lowell, this plan also adopts the common framework of the "three pillars" of digital equity: broadband connection; device access; and digital literacy.

The table below provides an overview definition of each of these three pillars, along with common barriers and support opportunities. Each pillar is further illustrated with context from the Greater Lowell region.

DIGITAL EQUITY FRAMEWORK: THREE PILLARS			
	Broadband Connection	**Device Access**	**Digital Literacy**
Overview/ Definition	Having a reliable, and affordable internet connection, ideally to the home, fast enough to support the needs of all members of a family or household, simultaneously. Broadband subscription services are most commonly obtained via private internet service providers (ISPs), but in some cases may be offered by a public service provider or as a shared service or building amenity. Broadband is currently defined as 100mbps / 20mbps by the FCC, but advocates also emphasize the importance of symmetrical upload speeds.	Owning or otherwise having access to personal computing devices with sufficient hardware, software, and features/capabilities to support online needs while respecting user privacy. Different devices may be needed to support different use cases and individual users. Devices include home desktop or laptop computers, and can also include Chromebooks, tablets, mobile phones, etc., as well as auxiliary devices such as webcams, which may be needed for specific use cases, such as remote learning or telehealth. Device access also includes adaptive hardware equipment or other specialty devices that can support the needs of individuals living with disabilities or experiencing language barriers.	Having the knowledge and skills to operate and maintain devices and confidently navigate the internet and other digital environments to access needed resources and fully participate in modern online life. This means having the individual skills needed to use hardware, software, and an internet connection across a variety of use cases, as well as having access to educational resources or even technical support to troubleshoot when there are issues.
Common barriers	Broadband infrastructure is insufficient; there is a lack of market competition and consumer choice; high-speed plans have a high cost; and in-building wiring or hardware is inadequate or outdated.	Devices are older and outdated; devices are inadequate for user needs; households don't own devices; shared devices have limited access; devices aren't affordable; and there is a lack of specialty devices with features to accommodate those living with disabilities.	Users may be new to or unfamiliar with digital tools, contributing to fear, distrust, or lack confidence with devices or with navigating the internet; misinformation and scams can confuse residents and pose cybersecurity risks to users, furthering distrust; technology training or support programs and associated educational materials often aren't translated into relevant languages, limiting access for populations in need.
Greater Lowell in context	**7.8%** of households in the Greater Lowell region are without a home internet subscription in the Greater Lowell region. **30%** of Greater Lowell households have access to fiber internet connections. **35%** of residents surveyed reported that it was "Somewhat hard" or "Very hard" to pay their monthly internet bill.	**6.1%** of households in the Greater Lowell region only have access to a smartphone at home without another home computer. Another **4.8%** of households in the Greater Lowell region are without access to any home computer at all, including a smart phone. This means that at least **11%** of households in the region are without access to an adequate computing device at home.	**46%** of survey respondents from the Greater Lowell region said they were concerned about their ability to navigate the internet to do what they need. Over **75%** of survey respondents reported being somewhat or very concerned about internet safety.
Support opportunities	At the municipal level, these may include public broadband infrastructure or services; open access networks; and increased private ISP competition. At the household level, these may include affordable service or subsidy programs like ACP or Internet Essentials. At the personal level, these may include hotspot lending programs and public Wi-Fi.	For the home, these may include device refurbishment and distribution programs and device lending programs. For public spaces, these may include making shared devices available and setting up computer labs and workstations in public spaces. In addition, these may include providing specialty/adaptive devices.	These may include digital literacy training programs; self-service educational materials; accessible IT support; digital navigators; and culturally competent and multi-lingual digital literacy resources.

WHY IS DIGITAL EQUITY IMPORTANT TO GREATER LOWELL?

Digital equity is not an isolated issue but is instead interrelated to many of the core strengths, challenges and disparities present in Greater Lowell. Embracing technology-forward, in-person and digital learning is crucial to a region known for its high-performing school districts, vocational high schools, and for its institutions of higher education, UMass Lowell and Middlesex Community College. Digital access and skills are now a necessity for workforce development and access to opportunity in a region with large technology employers and in an economy where jobs are increasingly remote. Telehealth practices can ensure access to healthcare for an aging population and alongside remote work and remote learning can help address regional issues like traffic and limited public transit or high costs of childcare. In a survey conducted for the 2022 Greater Lowell Community Health Needs Assessment, reliable, high-speed Internet access is ranked 13th out of 37 total health resource priorities.[1] Broadband infrastructure can help support economic development, including by attracting new businesses and meeting the needs of existing STEM clusters, tech companies, and research institutions in Greater Lowell. Online services and hybrid public meetings can help address challenges associated with local government efficiency and civic engagement.

Given the importance of digital access, devices, and literacy to participation in all these aspects of broader society in Greater Lowell, it's crucial that communities embrace digital infrastructure and approaches. However, it is also critical to ensure that no one is left behind in a diverse region home to many populations who face challenges accessing online tools and resources on a daily basis.

HOW CAN MUNICIPALITIES AND ORGANIZATIONS USE THIS DIGITAL EQUITY PLAN?

This Digital Equity Plan is a strategic document motivated by a vision of a Greater Lowell region without a digital divide and ultimately focused on advancing that vision by providing practical recommendations. It has prioritized recommendations that emerged from assessing the community's existing digital equity assets, its needs, and the gap between them. Alongside recommendations, the plan also lists resources that can be used to support implementation.

The plan has been designed to specifically guide and support the following activities:

- **Identify priority projects and initiatives suitable for grant proposals:** The Infrastructure Investment and Jobs Act (IIJA) provisioned significant funds for digital equity and broadband infrastructure from the federal government via the Broadband Equity Access and Deployment (BEAD) program. This plan will provide Greater Lowell's communities with plans, programs, and projects that can form the basis of strong grant proposals to ensure the region is able to take advantage of these once-in-a-generation funding opportunities.

[1] 2021 Community Health Needs Assessment, Community Teamwork, Inc.

- **Target and secure future funding and capital investment:** This plan provides an inventory of existing available funding for near-term and long-term actions specifically focused on digital equity. Additionally, it identifies funding that addresses broader community and economic development actions where digital equity fits in.
- **Guide ongoing programs:** Achieving and maintaining digital equity requires continual effort. Municipalities and regional organizations, central to funding and coordination, can refer to this plan for ongoing guidance in addressing digital access challenges.
- **Advocate for policy change:** Municipalities have regulatory capacity in permitting and licensing internet services. This plan offers guidance and direction for how local regulatory authority can enhance digital access, empowering municipalities to implement local reforms and support state-level policy changes.
- **Coordinate and track progress regionally:** The plan recommends various approaches to regional coordination, including the formation of a regional task force composed of representatives of the nine municipalities. This committee can share resources, coordinate actions, and track progress ensuring greater efficiency and impact through regionalism.

Additionally, the plan includes a detailed memo for each of the nine municipalities of Greater Lowell. The memos include data that can be used for targeting programs and supporting grant applications. The memos also include a prioritized list of actions specific to that municipality's context. The actions each connect to larger goals and suggestions on resources available to complete the action. Finally, the actions list a lead actor, which in some cases may be municipal staff and in others elected or appointed officials.

The plan isn't just for Greater Lowell's municipalities. Outside organizations and individuals can consult the plan to understand the priorities of the region and how they can best "plug into" the actions. They can utilize the list of assets and resources in the plan to coordinate and enhance their own programs and services. Additionally, the vision and data within the plan can be used to support grant applications and program development while strategies and recommendations ensure that community-based organizations are "rowing in the same direction" as municipal and regional goals.

BACKGROUND: EXISTING DIGITAL EQUITY WORK IN THE GREATER LOWELL REGION

This is the first time the nine communities have come together for a collaborative approach to closing the digital divide, but this plan does not represent the first digital equity work that has taken place in the Greater Lowell region. Libraries and Councils on Aging have been leading the charge through direct technical assistance, classes, and device and Wi-fi access. Many public-school systems now distribute Chrome books, tablets, or laptop computers to all students, emphasizing technology and digital skills as a crucial part of education and job readiness. Local cable access corporations have been reimagining their missions beyond television, offering training and support for digital media. Community-based organizations serving specific populations such as youth, cultural groups,

newcomers/immigrants, people with disabilities, and others have also provided classes, devices, and technical assistance to ensure vulnerable populations have equal access to online life.

The region's communities have also previously expressed concerns about digital equity at the municipal level. For example, in their latest Master Plan, the Town of Pepperell worked with the Dukakis Center of Northeastern University on an Economic Development Self-Assessment Tool (EDSAT) Study. The study found that the Town could be better positioned to attract business investment and jobs by upgrading its digital infrastructure. The Town of Tyngsborough's Media Department is working to increase its use of social media and digital content providers such as YouTube. The Town of Westford is looking to develop a digital backbone for redundant fire systems to ensure continuity of operations during emergencies and to improve reception for hand-held police radios to keep up with digital upgrades. The City of Lowell has been exploring ways to improve broadband access and infrastructure for at least two decades, offering Wi-fi hotspots for public use and providing Wi-fi access at visitor attractions.[2]

The COVID-19 pandemic further highlighted and intensified the digital divide's disparate impact on certain populations. Some students were unable to access online learning due to poor bandwidth or lack of private space to use it, other individuals and families had digital literacy challenges blocking them from telehealth and scheduling vaccination appointments, some couldn't access remote work opportunities or online services, and others were excluded from online civic engagement due to technology barriers compounded by language or accessibility barriers.

In response to these concerns and others, the Greater Lowell region has stepped up, with school districts furthering their support for digital access for students and families and with libraries, senior centers and other organizations feeling even more pressure to provide computers, internet, and training. To meet this demand, University of Massachusetts, Lowell (UML) has received grant funding from the MBI Digital Equity Partnership program and has been providing digital literacy training and device access in partnership with community based organizations in Lowell, including the YWCA, the Abisi Adult Education Center, the African Community Center, Coalition for a Better Acre, and Pollard Memorial Library.

In this post-COVID context and in response to these concerns and others, the nine municipalities decided to take a collaborative approach to enhance existing services, break down barriers, and close the digital divide across the region.

[2] https://www.lowellma.gov/AgendaCenter/ViewFile/Item/19384?fileID=41600

CONNECTION TO FOUNDATIONAL COMMUNITY ISSUES

The Digital Divide impacts the region's ability to meet its Housing, Economic Development, Health, Education, and Civic Participation goals as detailed below.

Digital Equity + Housing

- High speed internet access is an increasingly vital aspect of adequate housing. Wiring and infrastructure can impact the internet options available to residents.
- High cost of housing / cost burden can force households to have to choose between basic necessities, 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 + Transportation

- Our increasingly remote and hybrid economy and society is changing travel and commuting patterns, impacting traffic and congestion, ridership, trip times and emissions. Logging on to access online learning, remote work, or telehealth, or online government services means not having to commute via personal automobile or public transit to school, the office, the doctor or town hall. Similarly, the growth of online shopping and delivery means fewer trips to retail centers and more delivery vehicles on the roads.
- The rise of digital applications for ride hailing, route planning, and accessing transit schedules and fares has impacted access to mobility in a variety of ways, with some young people delaying getting their drivers licenses, and with older adults or those with limited mobility needing to learn to navigate digital tools in order to access needed information and services.
- Digital equity resources and programs such as computer labs or digital skills classes that are not transit accessible may be difficult to access for those without a personal automobile, a group that includes low income and older individuals, two populations more likely to be experiencing the digital divide.

Digital Equity + Economic Development

- Research increasingly shows that digital inclusion is a prerequisite for economic inclusion and for closing generational wealth gaps.
- 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 digital skills.
- 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.
- Small businesses owners need digital skills to market and promote their business on social media, and to engage in online marketplaces, set up online bill payments, delivery, and e-commerce features to compete in a modern retail environment.
- 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, online mental health services, 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 + Arts + Culture

- From memes to blogs and social media, to audio visual tools and digital art, the internet has long been a medium for personal and collective cultural and artistic expression.
- We all experience a richer culture and more vibrant art scene when diverse voices are empowered to participate, especially voices from our own community. When not everyone can participate in cultural conversations online and express themselves in unique ways, we all miss out.
- The internet provides free access to culture and content from across the world but also provides a forum for content from a particular place to be shared with the world.
- In the context of place and community, ensuring that residents and organizations are empowered to share themselves online can help create a sense of identity, promote local businesses, artists, events and attractions, and build online communities and connections that spill over into the "real world".

Digital Equity + Education

- Remote learning allows students to attend school, complete assignments, and experience educational programs from home.
- As early on as 2008, the Federal Reserve found that 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 (Federal Reserve)[3]
- 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[4]
- Education exposes students to digital skills that can expand learning and introduce future career pathways.

Digital Equity + Government Services & Civic Participation

- Digital access and inclusion also enables civic participation, especially as online government services expand.
- Government permits and services are increasingly accessed online via program websites and online application forms.
- Many public meetings can now be accessed via online video conferencing, 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 online.

[3] https://www.federalreserve.gov/pubs/ifdp/2008/958/ifdp958.pdf

[4] https://quello.msu.edu/wp-content/uploads/2020/03/Broadband_Gap_Quello_Report_MSU.pdf

HOW WAS THIS PLAN CREATED?

The plan incorporates quantitative data from various sources including the US Census Bureau's American Community Survey (ACS), the FCC's Form 477, from internet speed test data providers like M-Lab and Ookla, and program data from the American Connectivity Program (ACP). Alongside these standard data sources, the plan also incorporates a region-wide digital equity survey. Finally, the team gathered qualitative data via interviews, workshops, and focus groups with stakeholders, service providers, municipal officials, and people impacted by the digital divide. These sources were synthesized into recommendations. The methodology was informed by a planning approach that reflects best practices and the values of the Greater Lowell region.

PLANNING APPROACH AND VALUES

MAPC's and NMCOG's planning approach for Greater Lowell region's Digital Equity Plan is grounded in the following core principles:

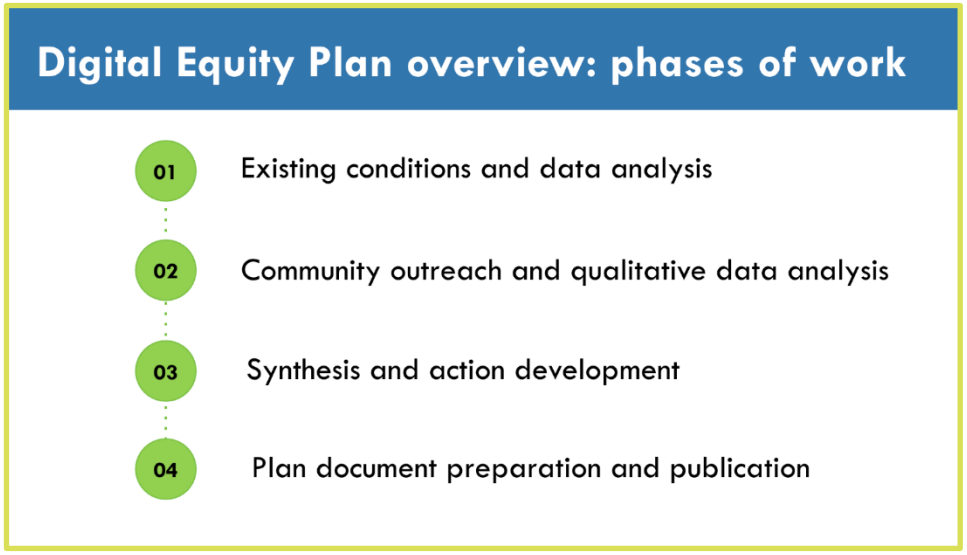
- **Data Informed and Community Led**: To understand residents' access to opportunities and services, the planning team takes insights from quantitative data, as well as the community voice through resident surveys and focus group discussions.
- **Targeted toward Action**: The focus of digital equity planning services is to set the foundation for future project implementation and program planning. The plan connects Greater Lowell'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, Collaborative, and Regional**: The planning process and recommendations are designed for Greater Lowell municipalities to collaborate with one another and with regional organizations through region-wide strategies.
- **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 Greater Lowell equally. Therefore, our planning process seeks to center the voices and needs of those most impacted.

PLANNING PROCESS AND TIMELINE

Existing Conditions Analysis (Fall 2023 – Winter 2023)

NMCOG and MAPC identified and analyzed the existing data sources for internet service availability, connection speed, device accessibility, and socio-economic census data. This included sources from **American Community Survey (ACS) 2019–2023**, **Federal Communications Commission (FCC)**

Form 477 Data, **M-Lab Speed Test Data**, and **Affordable Connectivity Program (ACP) Enrollment Data** via the Benton Institute's ACP Mapping tool.



Community Needs Assessment (Spring 2024 – Summer 2024)

NMCOG and MAPC analyzed community-level needs and aspirations through direct community engagement via key informant interviews with municipal staff, stakeholder interviews with organizations and agencies currently engaged in digital equity work, a tour of "strategy charrette" public meetings, focus groups with priority populations, and via a region-wide paper and digital survey. Staff also identified the most vulnerable population groups in the Lowell regions and highlighted their digital equity needs.

Action Plan Development (Fall 2024 – Spring 2025)

NMCOG and MAPC reviewed findings from existing conditions and community needs assessment to identify areas of intervention and improvement to match the plan goals. Staff also developed proposed strategies and actions to address identified needs at the regional and municipal scale and further refine actions with implementation guidance through best practice research and via discussions with proposed implementors.

Plan documentation, production and publication (continuous, Spring - Summer 2025)

NMCOG and MAPC documented the aforementioned work and synthesized the research, findings, and recommendations into a comprehensive document that outlines the barriers and needs of the Greater Lowell community along with recommended strategies, actions and implementation guidance. Lastly, municipality-specific memos were developed to guide decision making and collaboration.

Key Findings

CONTEXT, DATA, AND NEEDS ASSESSMENT

Through both the existing conditions analysis and the community needs assessment, this plan identifies thirteen key findings summarized below. However, there is incredibly rich data and qualitative input from stakeholders and the public fully described in Appendix 1 and Appendix 2. Users of this plan should reference those appendices when prioritizing and implementing actions. The summaries of key findings are below:

Digital Divide: A significant digital divide exists across the Greater Lowell region, affecting people based on income, age, disability, language proficiency, and newcomer status. This divide is particularly pronounced for non-white residents, non-English speakers, and immigrants. The disparity also varies by geography with over 12% of Lowell households having no broadband subscription at home compared to fewer than half a percent of households in Dunstable.

Essential Services: Internet access is crucial for education, employment, healthcare, banking, civic engagement, and more. Those without access at home may rely on public or guest Wi-Fi.

Affordability: The high cost of internet service, devices, and maintenance is the major barrier to access, particularly for low-income residents. The loss of the Affordable Connectivity Program (ACP) has worsened this issue, with over 13.7k households in the region having lost access to a $30/month

subsidy for internet, amounting to nearly $5M/year no longer going toward broadband for families earning less than 200% of the poverty level.

Income Disparities: There are significant income disparities across the region, with per-capita income ranging from $33,574 in Lowell to $67,346 in Dunstable. 31% of the population lives at or below 300% of the poverty line. More than 33% of households are cost-burdened, spending over 30% of their income on housing, further impacting their ability to afford internet service and devices.

Vulnerable Populations: The region includes vulnerable populations more susceptible to experiencing the digital divide, including low-income individuals, racial and ethnic minorities, immigrants and individuals with language barriers, aging individuals, incarcerated and formerly incarcerated individuals, veterans, and individuals with disabilities. While all municipalities have higher-need residents, particularly older adults, these populations are not evenly distributed across the region with the largest percentages and numbers of vulnerable populations concentrated in Lowell.

Internet Access and Income: Home internet access is highly correlated with income. A high percentage (34.1%) of households earning under $20,000 have no internet connection, compared to only 3.2% of households earning over $75,000.

Digital Literacy: While comprehensive data on digital literacy is lacking, stakeholder outreach suggests that certain population groups—including immigrants and older adults—disproportionately lack essential digital skills, such as basic computer skills, internet safety knowledge, and the ability to navigate online resources, including local government services that have moved online. There is a need to keep training updated with evolving technology.

Device Access: Many lower income, immigrant, and older residents lack a computer or rely on smartphones only, which are not always suitable for modern online needs. Stakeholders report a high demand for affordable devices, and while shared devices in public spaces can help, these lack privacy. 6% of households have no computer device, and 5.62% of households use only cellular devices to connect to the internet, representing nearly 12% of households in the region. Device access gaps are worse in urban areas of the NMCOG region, with nearly 20% of Lowell households and nearly 15% of Dracut households lacking a computer or having only a smartphone at home.

Language and Cultural Barriers: Language and cultural barriers amplify digital equity issues, as ISP customer support, digital skills classes, and device programs most often default to English, and digital equity programming and resources are most often offered in spaces that do not provide multilingual support and cultural competency for technical assistance and digital literacy classes.

Internet Safety: There are widespread concerns regarding internet safety, security, and online scams, undermining trust in and access to certain digital resources and services, like online bill payment. This is especially true among older adults and immigrants.

L**ack of ISP competition:** Across the Greater Lowell region, local government officials and residents alike are frustrated with the lack of competition among Internet Service providers. While nearly all addresses are served by at least one cable provider, only 30% of addresses in the region are served by fiber. Much of the region experiences duopoly conditions, with much of Lowell, Dracut, and

Pepperell experiencing near monopoly conditions and having only limed fiber coverage. This lack of consumer choice can have impacts on quality and affordability of service.

Connection Speed Disparities: There are significant differences in median download and upload speeds across the region, likely reflecting differences in broadband infrastructure technology (i.e. fiber vs. cable vs. fixed wireless) and customer plan selection. For example, speed test data in Dunstable show a median download speed of only 78 Mbps, a speed so slow it doesn't even meet the definition of broadband, while the data show a median download speed of 288 Mbps in Westford. Similarly, Dracut, which is not well served by fiber plans, has a median upload speed of just 12 Mbps, while Westford, which is well-served by fiber—a technology known for faster upload speeds—has an upload speed of 653 Mbps.

Lack of Coordination and Funding: Inconsistent funding for programs that provide digital equity support and a lack of coordination between municipal and community programs can hinder progress. Organizations providing digital literacy support face challenges due to limited staff capacity and training, as well as limited or outdated equipment.

ABOUT THE MUNICIPAL MEMOS

This plan also includes nine municipal memos, which dive into the specific data and qualitative input for each municipality. They are intended to provide additional context specific to each municipality, and they illustrate how each municipality can undertake actions that will advance local and regional digital equity goals. They are provided in Appendix 5 in addition to existing as stand-alone documents.

Recommendations

Six major strategies were identified to address the key findings. Each of these strategies has a number of specific actions that can be undertaken to implement the strategy, but these actions are not meant to be exhaustive. The strategies are designed to build upon one another as we work together as a region, but if the opportunity arises, they may also be undertaken individually.

Specific ways each municipality may advance the strategies follow the six strategies, including implementors, priority, and resources. Notably, agencies listed as “implementors” might not be a lead implementor for a given strategy. Rather, “implementors” should be considered as stakeholders to consult when implementing the strategy who may want to take a lead or support role as appropriate.

More information, including a comprehensive explanation of each action, is listed in Appendix 4, Implementation Guide. That appendix also includes a Funding Memo with a list of grant resources that may help fund the strategies.

Recommendations specific to each municipality are listed in the nine municipal memos provided in Appendix 5. These recommendations tie into the actions listed below: for example, a municipal memo might list a specific agency in that municipality that would benefit from an upgraded computer lab. That recommendation would tie into *Action 3.4: Expand access to and upgrade*

computer labs and shared devices at senior centers, libraries, schools, community centers, nonprofits, and other local and regional entities offering device access.

The "Resources" column in action matrices below provide an estimate for the level of investment for each recommendation as follows:

$: This action can be achieved with little additional investment.

$$: This action requires an attainable level of new investment.

$$$: This action requires a level of investment that may be hard to achieve.

STRATEGIES AND ACTIONS

STRATEGY 1: BUILD CAPACITY TO IMPLEMENT AND EVALUATE DIGITAL EQUITY PROGRESS

Digital equity is a relatively new domain for municipal governments and community-based organizations compared to issues like housing, recreation, or transportation. There is no "department" of digital equity, so to address the digital divide, communities and the region will need to build new capacity. Staff, budget, organizational structure, and other resources and capacities are needed to support broadband access, device access, and digital literacy, and to evaluate progress toward the implementation of the digital equity plan. In some cases, this may mean designating existing staff, departments, or organizations to include digital equity in their work and responsibilities, while in other instances new staff or structures will be needed to advance digital inclusion and measure impact. Crucially, building capacity includes building resources for addressing the digital divide, including pursuing state and federal grants.

#	Action	Implementor(s)	Priority	Resources
1.1	Form a regional digital equity task force	All municipalities	High	$
1.2	Bring on a regional digital navigator to support and coordinate existing programs and to staff the digital equity task force	Digital Equity Task Force	High	$$
1.3	Hire or appoint dedicated digital equity staff, including exploring opportunities for shared/regional staff and hiring staff at the municipal scale, especially in the highest need communities	Municipalities, Digital Equity Task Force	Middle	$$$ Staff time
1.4	Pursue state, federal, and foundation grants or fellowships to support digital equity efforts	All municipalities (specific grant development staff), Digital Equity Task Force	High	$

#	Action	Implementor(s)	Priority	Resources
1.5	Offer municipal and/or regional grants to support community-based organizations providing digital equity services	All municipalities, Digital Equity Task Force	Middle	$$
1.6	Undertake coordinated program evaluation, including conducting survey assessments to measure progress	Digital Equity Task Force	Low	$

STRATEGY 2: IMPROVE QUALITY, RELIABILITY, AND AFFORDABILITY OF BROADBAND SERVICES TO THE HOME, ESPECIALLY FOR PRIORITY POPULATIONS

At-home internet access is perhaps the most direct measure of the digital divide, and in Massachusetts, cost is the number one barrier. Municipalities can improve the quality, reliability, and affordability of at-home internet access through coordination with Internet Service Providers (ISP)s, and through investments and policies to improve access and competition at the regional, municipal and neighborhood scale. Because the digital divide does not impact all populations equally, municipalities should also pursue, facilitate or support interventions that improve broadband access at specific housing sites serving priority populations, such as older adults, people living with disabilities, low-income households, formerly incarcerated individuals, and individuals experiencing housing insecurity.

Recommendations to improve at-home internet access at the regional or community scale include actions focused on improving ISP low-cost plan sign-ups or expanding ISP coverage and competition; providing public; or open infrastructure to increase consumer choice by building on existing municipal fiber networks or exploring open access networks through large scale infrastructure investment or through policies including dig-once policies and zoning and permitting reform.

#	Action	Implementor(s)	Priority	Resources
2.1	Target broadband improvements at subsidized and affordable housing sites, including working with housing providers to support the provision of building scale "Apartment Wi-fi" and retrofitting housing sites with modern wiring to support fiber.	Housing Authorities, Community Development Corporations, and other housing providers; Municipal IT departments and housing staff	Middle	$$$
2.2	Commission a feasibility study to explore the provision of municipal internet service or public administration of an open access network.	Municipal executives, councils or selectboards	Middle	$$

#	Action	Implementor(s)	Priority	Resources
2.3	Research and adopt policies to support broadband infrastructure, access, and competition, such as "dig once" policies, streamlined permitting, and permitting by-right telecommunications uses in certain districts.	City council and town selectboards	Middle	$
2.4	Promote affordable broadband plans and low-income programs to get qualified households enrolled.	Municipalities, ISPs, Housing providers, CBOs	Middle	$
2.5	Inventory and map existing broadband infrastructure—including existing municipal or public fiber, private fiber, and cell signal coverage—and explore public and private investments to improve and expand service.	Planning departments, IT departments	High	$
2.6	Support or pilot mesh networks in densely populated, high-need neighborhoods.	Neighborhood associations, CDCs, Tech Educators	Low	$$$

STRATEGY 3: ENHANCE DIGITAL ACCESS IN PUBLIC SPACES AND FACILITIES

Local governments are often best equipped to ensure digital access in public spaces, like public parks and buildings. Freely available Wi-fi networks, computers, and other devices or equipment like digital screens/kiosks and charging stations, can provide numerous benefits to all members of the public and can provide a digital access safety net to the most vulnerable.

These recommendations focus on improvements to public facilities, including parks and open spaces as well as buildings, where municipalities can invest in network infrastructure, equipment or devices to provide free wi-fi, shared computer workstations, or otherwise enhance digital access.

#	Action	Implementor(s)	Priority	Resources
3.1	Inventory digital assets and needs in public facilities to identify and implement "quick win" improvements such as adding devices or expanding wi-fi networks	Planning departments	High	$$
3.2	Partner with the business community to explore and promote the provision of free Wi-fi on main streets and commercial corridors, as well as in "third spaces".	Local businesses, merchants' associations, Economic development offices	Low	$

#	Action	Implementor(s)	Priority	Resources
3.3	Deploy free Wi-Fi in parks, plazas and other public spaces such as at or near transit stops, and in the immediate vicinity of municipal buildings.	Parks and Rec departments, IT departments City of Lowell; National Park Service, DCR; LRTA, MBTA	Medium	$$$
3.4	Expand access to and upgrade computer labs and shared devices at senior centers, libraries, schools, community centers, nonprofits, and other local and regional entities offering device access.	COAs, Libraries, School Districts, Community Centers, Non-profit organizations	High	$$
3.5	Work with affordable housing providers and shelters to bring computer labs or shared devices to affordable housing and shelter sites.	Housing Authorities, Community Development Corporations, Shelters	High	$$

STRATEGY 4: SUPPORT PROGRAMS AND SERVICES THAT REACH PRIORITY POPULATIONS AND ADVANCE ALL PILLARS OF DIGITAL EQUITY

Some residents lack access to a high-speed broadband connection or to appropriate devices at home or otherwise lack the digital literacy and tech skills needed to use a computer and take full advantage of the internet in ways that support participation in modern life. These residents need support, and often for multiple "pillars" of digital equity. To successfully meet the need, support services should layer internet access, device access, and digital skills training, and do so in ways that are accessible to diverse populations with different cultures, language needs, and with different schedules, habits, and access to mobility.

This means that support is needed from national, state, and local organizations that focus on the core pillars of digital equity: helping residents sign up for low-cost internet plans, distributing devices, providing skills training and tech support. It also means that support is needed from trusted local organizations and individuals who can meet priority populations where they are, in ways that understand local context, cultures, and language needs. Where organizations are already doing digital equity work in Greater Lowell, these programs often need more support to expand to meet resident needs. Where organizations are already reaching priority populations, these programs often have an opportunity to layer in culturally competent support for digital equity alongside existing services.

#	Action	Implementor(s)	Priority	Resources
4.1	Create or expand programs that include device distribution, digital literacy training, affordable access, and/or tech support, with a focus on programs that holistically combine elements for one or more priority populations.	Municipal IT Departments, Diversity Equity and Inclusion Staff, COAs, Libraries, School Districts, Community Centers, CBOs	High	$$
4.2	Purchase and distribute additional devices, including adaptive devices, for in-demand programs to expand access and increase accessibility for those living with disabilities.	Diversity Equity and Inclusion Staff, COAs, Libraries, CBOs	High	$$
4.3	Provide tailored programs for older adults and veterans to increase comfort with technology, including basic tech skills, cybersecurity, and online safety training.	COAs, Veterans Services Departments, Healthcare Organizations, CBOs	High	$$
4.4	Incorporate tech training, device distribution and other digital equity services into existing programs for immigrants and refugees, including courses for English language learners.	CBOs, School Districts, Cultural Centers, English Language Instructors	High	$$
4.5	Reach households with lower incomes by partnering with housing providers to bring tech support and other digital equity programming to affordable housing sites, shelters and other residential locations.	Housing Providers, CBOs	High	$$
4.6	Partner with hospitals and healthcare organizations to support devices access, digital skills training and access to telehealth for patient populations.	Municipal Health Departments, Healthcare Organizations	Low	$$
4.7	Bring device access and skills training programs to incarcerated and formerly incarcerated individuals by partnering with detention facilities and re-entry programs.	Detention Facilities, Re-entry Programs	Low	$$
4.8	Provide programming and resources to support employers, job seekers, and the small business community with relevant workplace digital skills.	Chambers of Commerce, Small Businesses, Large Employers, MassHire	Medium	$ $
4.9	Explore opportunities for expanding device access through expansion of existing device lending programs at libraries and elsewhere	Libraries, School Districts, Community Centers	Medium	$$

STRATEGY 5: COLLABORATE REGIONALLY TO EXPAND IMPACT AND UPLIFT EXISTING WORK

As research and outreach conducted during the planning process revealed, a number of organizations and initiatives are already doing great digital equity work in Greater Lowell. Coordinating, sharing, and regionalizing existing programs and resources is a key strategy for maximizing the impact of existing work, and expanding its reach to meet the needs of various communities and populations. For example, some residents aren't aware of existing programs that could connect them to cheaper internet or a new device, and better outreach and promotion can help. Some libraries have tech support expertise that others lack and could share staff support, program resources or expand service regionally to help. Similarly, programs and resources designed to support the general public or English speakers could be catered to support a specific group, such as older adults, or translated to become accessible to Spanish speakers.

#	Action	Implementor(s)	Priority	Resources
5.1	Make existing digital equity educational program materials more accessible and adaptable by inventorying, sharing, and translating for language access and cultural relevance.	Digital Equity task force, regional digital navigator, CBOs	High	$
5.2	Connect similar organizations via peer learning cohorts and "train the trainer" sessions to share resources and approaches across municipalities.	Digital equity task force, regional digital navigator	High	$
5.3	Create a regional program to coordinate device donation, refurbishment, and distribution, partnering with non-profit and corporate entities.	IT departments, corporate partners, non-profit device refurbishment or distribution partners	Medium	$$$
5.4	Create a regional digital equity resources directory and shared events calendar, and market and promote to at-risk populations and the organizations that serve them.	Digital Equity task force, regional digital navigator, CBOs	High	$
5.5	Collaborate regionally on digital equity advocacy and ISP engagement to improve policy, expand coverage and increase affordability	Municipal leadership	Medium	$
5.6	Help Public Access Corporations navigate funding challenges by expanding technology access and training.	Public Access Corporations	Medium	$

STRATEGY 6: PROVIDE INCLUSIVE MUNICIPAL DIGITAL SERVICES TO MAKE LOCAL GOVERNMENT MORE ACCESSIBLE AND USER FRIENDLY

In the 21st century, residents expect government services to be as reliable and easy to use as private sector services, and accessible in the same place where they have come to expect everything else in their lives: online. Municipal websites and other online tools provide greater access to local government—including greater access to information and opportunities for engagement and feedback, as well as access to government services themselves via program enrollment intake forms, permit applications, etc. Known collectively as "digital services" these online approaches to local government are crucial for advancing digital equity, as they make civic engagement easier for populations who may speak English as a second language, have disabilities, or face other historic barriers. At the same time, putting services online alone is not enough. Local governments should also continuously evaluate and improve digital services to ensure that they are working through processes known as "user centered design". And, as more and more services move online, municipalities should also ensure support for residents experiencing the digital divide. This means offering customer support for online interfaces and continuing to provide in-person and paper-based options alongside digital options.

#	Action	Implementor(s)	Priority	Resources
6.1	Expand municipal services inclusively to reach constituents both in person and online.	All municipalities, IT Departments, Clerk's Offices	Medium	$$
6.2	Monitor and evaluate online services, including talking to "users" to understand who is visiting municipal websites and how residents are succeeding or not in using digital tools offered.	IT Departments, Constituent services staff	Medium	$
6.3	Create a digital outreach and online engagement guide to assist communities in using social media and digital tools equitably and effectively.	Communications Staff, outreach and engagement staff	Medium	$
6.4	Support and improve hybrid meetings, including providing guidance for staff and meeting facilitators and providing needed equipment at municipal facilities.	IT departments, Department staff, board and commission staff	Medium	$$
6.5	Inventory online services offered by municipal departments, reviewing each digital service or website for compliance with accessibility guidelines, language access, and for support options for individuals who face digital barriers.	Constituent services staff, IT departments	High	$

#	Action	Implementor(s)	Priority	Resources
6.6	Create and provide "how-to" guidance and support for residents attempting to use municipal online services, including tutorial videos, how-to instructions, and/or a "help desk" or "customer support" number where needed.	Constituent services staff, IT departments	High	$
6.7	Ensure language access by Increasing the use of translation technology to support online and in person services.	Municipalities, IT departments	High	$$

A REGIONAL APPROACH

Although each municipality, agency, or community-based organization can advance actions individually, an ideal approach would include a higher level of collaboration across boundaries. This would amplify the ability for the region to address the digital divide in a holistic way. Key actions that a coalition of municipalities and service providers could take together to make a substantive change in the digital equity landscape, making actions that single entities should undertake that much easier, include the following:

#	Action
1.1	Form a regional digital equity task force
1.2	Bring on a regional digital navigator to support and coordinate existing programs and to staff the digital equity task force
1.4	Pursue state, federal, and foundation grants or fellowships to support digital equity efforts
1.5	Offer municipal and/or regional grants to support community-based organizations providing digital equity services
1.6	Undertake coordinated program evaluation, including conducting survey assessments to measure progress
2.3	Commission a feasibility study to explore the provision of municipal internet service or public administration of an open access network.
2.6	Inventory and map existing broadband infrastructure—including existing municipal or public fiber, private fiber, and cell signal coverage—and explore how existing public infrastructure can be leveraged or expanded, while coordinating with private ISPs to advocate for expanded service coverage.

#	Action
3.1	Conduct an inventory and audit digital assets and needs in public facilities and then invest in "quick win" facilities improvements.
4.3	Ensure older adults have access to digital literacy and tech support, with a focus on basic tech skills and cybersecurity and online safety training. A senior/youth pairing program is a good system for digital literacy training and tech support.
5.1	Create a regional digital equity library through inventorying, sharing, and translating existing digital equity educational program materials for language access and cultural relevance, making them more accessible and adaptable.
5.3	Create a regional program to coordinate device donation, refurbishment, and distribution, partnering with non-profit and corporate entities.
5.4	Create a regional digital equity resources directory and shared events calendar, and market and promote to at-risk populations and the organizations that serve them.
6.3	Create a digital outreach and online engagement guide to assist communities in using social media and digital tools equitably and effectively. This may include adapting existing materials with local and regional information.

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STATEWIDE AND NATIONAL ORGANIZATIONS

- Internet Access Task Force
- Mass Broadband Institute (MBI)
- National Digital Inclusion Alliance (NDIA)

Appendix 1: Existing Conditions

Research work conducted as part of the digital equity planning process combined **quantitative data analysis**, **desk research on existing context and assets**, and **direct community engagement** with municipal officials, community leaders, and vulnerable populations to understand needs and create a holistic picture of the digital divide in Greater Lowell. This appendix contains the findings of that work.

RESEARCH APPROACH AND ENGAGEMENT METHODS

QUANTITATIVE DATA SOURCES:

The following data sources were gathered and utilized in existing conditions analysis for each municipality and for the region.

- **American Community Survey (ACS) 2019–2023**: Data on broadband subscriptions and device access (Table S2801), and general community demographics.
- **Federal Communications Commission (FCC) Form 477 Data**: Broadband service availability data, including information on ISPs offering broadband speed plans, and the kind of broadband technology employed for various plans at the census block level.
- **M-Lab Speed Test Data**: Internet speed test results from Measurement Lab, an open-source initiative that collects open data from Google's speed tests.

- **Affordable Connectivity Program (ACP) Enrollment Data**: Figures for the number of households enrolled in this federal subsidy program in February 2024, available at the zip code level and explored via the Benton Institute's ACP Mapping tool.

The results were metrics, tables, charts & graphs, and maps that together create a digital equity data snapshot of each of the nine communities and of the region. These figures and data profiles can be seen in the technical appendix and in the municipal memos and existing conditions handouts, below.

DESK RESEARCH AND ASSET INVENTORY:

In addition to standard digital equity and demographic data analysis, additional desk research was conducted for each community and for the region. This desk research included the following:

- Review of municipal websites and online services, library resources and programs, IT departments, municipal boards or commissions, councils on aging/senior center programming, community center programming, public school district digital resources, cable access corporation websites, as well as a review of nonprofit programs and other relevant businesses or institutions.
- Compilation and review of existing municipal documents containing references to digital equity or related issues, such as IT strategies, recommendations contained in economic development plans, cable franchise agreements, municipal memos, and meeting minutes or materials related to cable and technology committee meetings.
- Documentation of **existing public sector and community digital equity assets**, including digital literacy classes, tech support programming, cybersecurity initiatives, telehealth initiatives, computer labs, device lending programs, public wi-fi networks, etc.

The result was an inventory of assets for each community in the region. These inventories can be viewed in the municipal memos below.

GREATER LOWELL'S COMMUNITY CONTEXT AND VULNERABLE/IMPACTED POPULATIONS

The digital divide is not an issue that affects all segments of our society equally, and the same is true in Greater Lowell. We know that certain populations experience the impacts of lack of access to the internet, to devices, and to digital skills more acutely and more persistently than others. The Greater Lowell region is highly diverse geographically, economically, socially, and culturally. Each of the nine communities have populations of residents within the following groups covered in the federal Digital Equity Act, who are prioritized as more likely to experience the digital divide:

- Individuals living in eligible households (Income at or below 150% poverty)
- Individuals who are members of a racial or ethnic minority group
- Older adults
- Veterans
- Incarcerated or formerly incarcerated individuals
- Individuals living with disabilities

- Individuals who speak a language other than English
- Individuals living in rural areas

While the above population groups are present in all communities, they are not evenly distributed, making geography a key lens for understanding and analyzing the digital divide, in Greater Lowell.

Additional plans have noted that the digital divide has had an impact on health, especially among these populations. For example, "Reliable, High-Speed Internet Access" was ranked 13th out of 37 "Health Resource Priorities" (p 120) in the Greater Lowell Community Health Needs Assessment.[5] Access to reliable technology to utilize telehealth was identified as a significant barrier to service access identified during the Community Needs Health Assessment key informant interviews and focus groups (p 16, 37). People without access to technology was listed as a "Special Population" (p 124).

TABLE 1: VULNERABLE AND IMPACTED POPULATIONS

	150% Poverty Level		Nonwhite		65+		Veterans		Language Other Than English at Home		Population Living with Disabilities	
Municipality	**No.**	**Pct.**	**No.**	**Pct.**	**No.**	**Pct.**	**No.**	**Pct.**	**No.**	**Pct.**	**No.**	**Pct.**
Billerica	2,489	6.1%	8,355	19.8%	6,865	16.3%	2,317	5.5%	7,716	18.5%	3,994	9.8%
Chelmsford	2,657	7.4%	7,624	20.9%	6,551	18.0%	1,820	5.0%	5,350	14.7%	3,859	10.7%
Dracut	3,161	9.8%	7,120	21.8%	5,545	17.0%	1,957	6.0%	5,121	15.7%	4,451	13.8%
Dunstable	106	3.2%	428	12.7%	470	14.0%	175	5.2%	289	8.6%	277	8.2%
Lowell	27,653	25.1%	62,960	54.5%	16,178	14.0%	3,467	3.0%	56,390	48.8%	16,549	14.5%
Pepperell	884	7.7%	1,245	10.7%	1,973	17.0%	894	7.7%	1,114	9.6%	1,468	12.7%
Tewksbury	1,808	5.9%	4,065	13.0%	5,955	19.0%	2,006	6.4%	3,855	12.3%	3,347	10.9%
Tyngsborough	753	6.1%	2,254	18.2%	1,486	12.0%	545	4.4%	2,018	16.3%	1,310	10.6%
Westford	1,245	5.1%	6,979	28.3%	3,204	13.0%	1,503	6.1%	5,939	24.1%	1,550	6.3%

Source: U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023)

GEOGRAPHY/COMMUNITY

The City of Lowell serves as the economic hub of the region and also has by far the greatest number and percentage of residents in the above groups, including more non-white and low-income residents than the rest of the region combined. It is additionally home to the highest number of community organizations and institutions that engage in digital equity work. To its southwest and

[5] https://www.tuftsmedicine.org/sites/default/files/2023-11/2022-greater-lowell-community-health-needs-assessment-v6a.pdf

south are the next-largest municipalities, Chelmsford and Billerica, which are highly developed suburbs that have significant vulnerable populations. Notably, Billerica is home to the Middlesex Jail and House of Correction, which houses men awaiting trial and serving sentences of up to 2 ½ years, as well as women classified to the office's pre-release center.

To Lowell's north and east are Dracut and Tewksbury respectively, which also have significant vulnerable populations, but fewer existing resources to serve those residents than the city and larger suburbs. Finally, Westford, Tyngsborough, Dunstable, and Pepperell are smaller and more rural, ranging from Dunstable's 2020 population of 3,358 to Westford's 24,643.[6] Westford has a relatively high number of resources dedicated to digital equity work compared to the other three.

In addition, Dunstable and Westford have a significantly higher median income than the other municipalities, at 266% and 238% of Lowell's median income respectively. The other suburban municipalities range between 146% and 189% of Lowell's median income.[7] However, all nine municipalities have residents at 150% or below poverty, a group that often includes seniors and people living in subsidized affordable housing.

LOW-INCOME RESIDENTS

Affordability is the number one barrier to closing the digital divide in Massachusetts, meaning low-income residents are often hit hardest by the digital divide. Nearly all addresses in Massachusetts and in the greater Lowell region have infrastructural access to broadband speed internet plans offered by ISPs, meaning that those without a broadband subscription either don't want it or more likely can't afford it. Factors like income, poverty, and cost-burden are some of the most important population characteristics to consider in understanding and planning for digital equity in the Greater Lowell region.

The region's per-capita income is $49,866, ranging from $36,138 in Lowell to $73,464 in Westford.[8] Despite the relatively high average income, 388,619 residents in the region live at 300% of the poverty line or below.[9] 6.23% of households earn under $15,000 per year, and 22.19% earn less than $50,000 per year.[10] Just over 33% of households in the region are cost-burdened, spending more than 30% of their income on housing. Nearly 15% spend over 50% on housing.[11] This financial pressure means that basic necessities like groceries, rent, or transportation can compete with lower income residents' ability to afford internet service subscriptions or up-to-date computing devices.

The City of Lowell has the widest range of household incomes and the most block groups with the highest concentration of poverty.

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[6] U.S. Census Bureau, Decennial Census (2020), Table P1

[7] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table B19013

[8] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table B19301

[9] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table S1701

[10] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table B19001

[11] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Tables B25091 and B25070

FIGURE 1: HOUSEHOLDS WITH INCOME BELOW $20,000/YEAR BY BLOCK GROUP

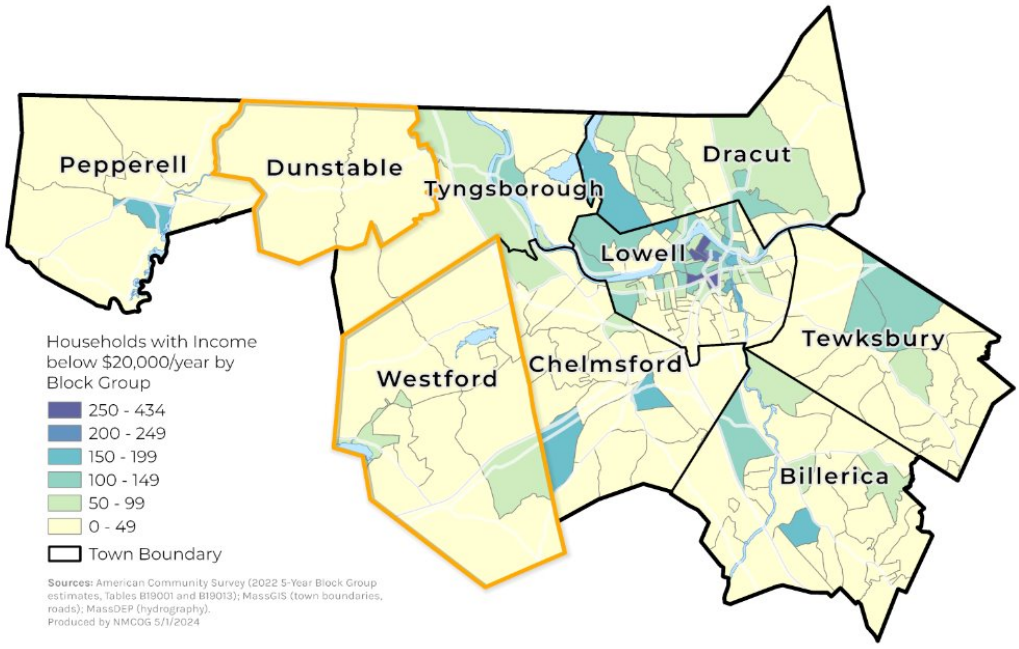


FIGURE 2: PERCENT OF HOUSEHOLDS WITHOUT AN INTERNET SUBSCRIPTION

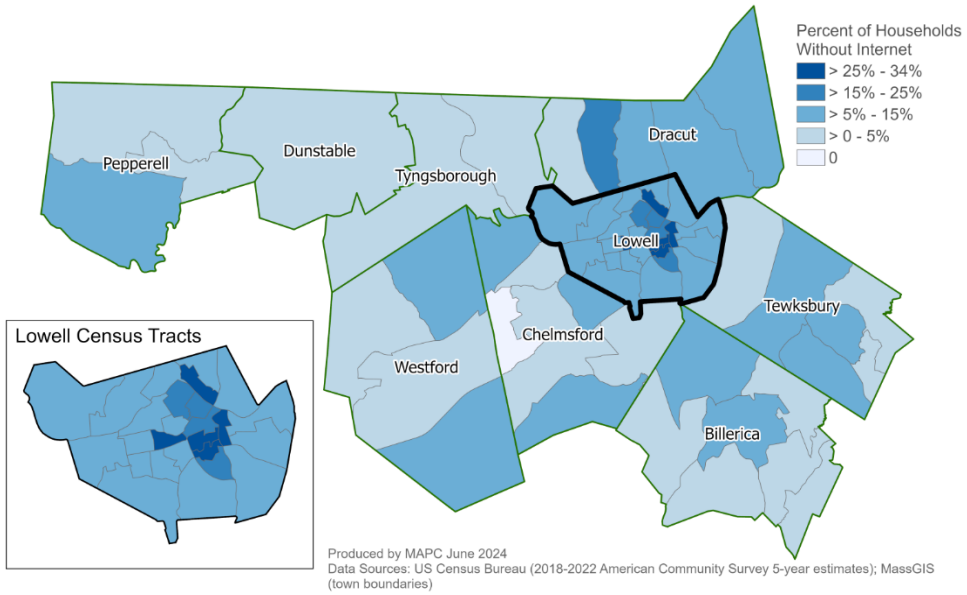


TABLE 2: HOUSEHOLDS BY INCOME LEVEL AND HOUSING COST BURDEN

Income Level	# HH	% HH
Households with Income under $20,000	10,229	9.0%
Households with Income $20,000 to $74,999	29,774	26.1%
Households with income $75,000 to $124,999	24,683	21.6%
Households with Income $125,000 to $199,999	26,148	22.9%
Households with Income $200,000 or more	23,209	20.4%
Cost Burden	**# HH**	**% HH**
Cost Burdened Households	38,535	33.8%
Cost Burdened Households paying 30-50% of Income	21,659	19.0%
Cost Burdened Households paying 50% or more of Income	16,876	14.8%

Source: U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Tables B25091 and B25070

NONWHITE RESIDENTS, NEWCOMER STATUS, AND LANGUAGE ACCESS

The digital divide disproportionately impacts non-white residents, non-English speaking residents, and immigrants. Those with limited English language proficiency may face barriers to accessing the internet and needed information. Newly arrived individuals may have had less access to technology in their country of origin and may have less trust in government programs, as well as more concerns about privacy.

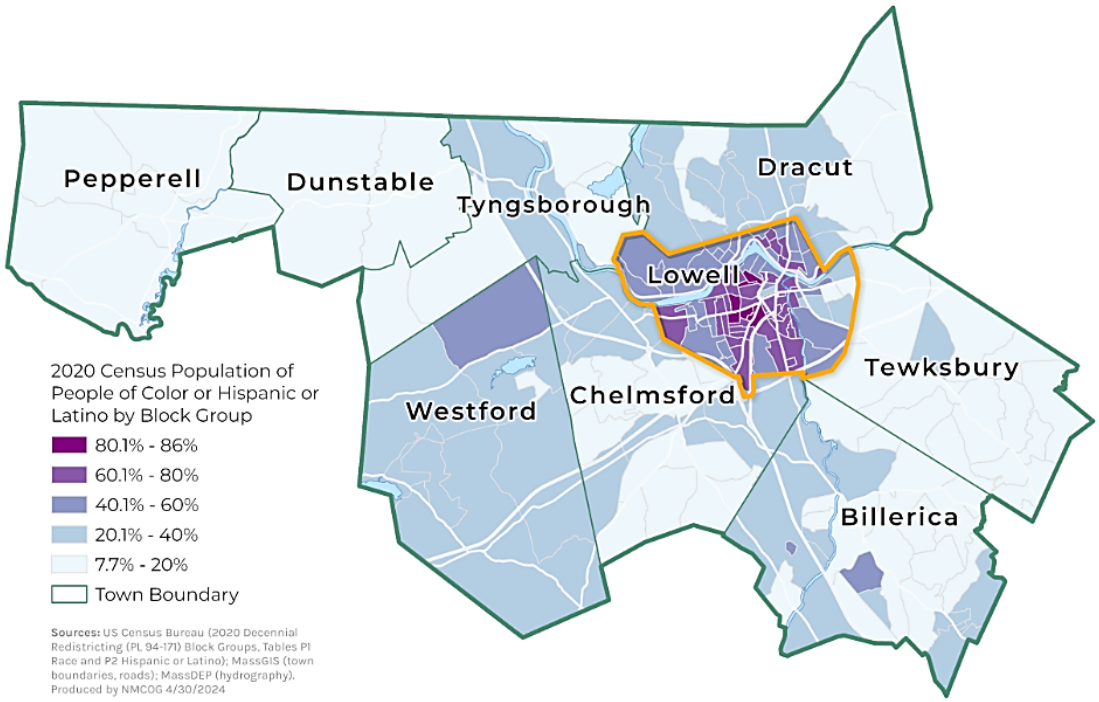
Sixty-six percent of Greater Lowell residents identify as non-Hispanic white, 13% of residents identify as Asian, and 6% of residents identify as Black or African American. Roughly eleven percent identify as two or more races, and 11% of the population identifies as Hispanic or Latino. 26.65% of Greater Lowell residents were born in a country other than the United States.[12] 26.21% of residents speak

[12] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table B25070

a language other than English at home, and of those, 10.15% report not speaking English well—meaning at least 10% of the Greater Lowell population have limited English language proficiency.[13]

The City of Lowell is the only majority non-white community and contains more non-white residents than the rest of the region combined. Lowell also has the highest population and concentration of individuals who are immigrants and who speak a language other than English at home.

FIGURE 3: 2020 CENSUS POPULATION OF PEOPLE OF COLOR OR HISPANIC OR LATINO BY BLOCK GROUP



OLDER RESIDENTS, VETERANS, AND RESIDENTS WITH DISABILITIES

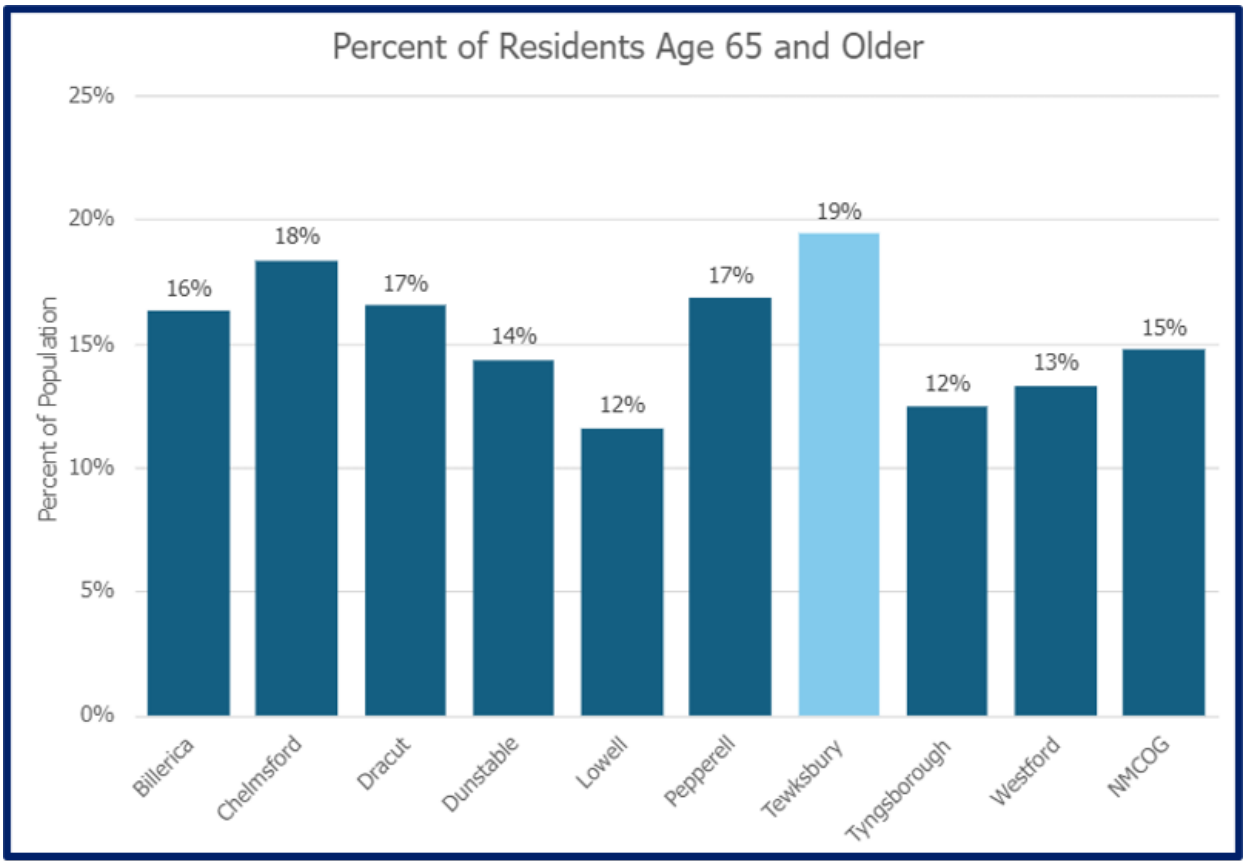
Older residents, veterans and those with disabilities also face significant barriers to digital equity, including physical limitations and inadequate access to supportive technologies and devices. A little more than fifteen percent of the Greater Lowell population is over 65 years old, with Lowell and Tyngsborough having the lowest percentages of seniors and Tewksbury and Chelmsford the highest.[14] Compared to the City of Lowell, the surrounding communities have a higher proportion of residents aged 65 and above. Below is the percentage breakdown by age group from the 2019-2023 ACS:

[13] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table C16001.

[14] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table B01001

TABLE 3: AGE COHORTS

Age Cohort	City of Lowell	Region Outside of Lowell
19 and Under	25.0%	22.9%
20-44	38.9%	29.7%
45-64	23.8%	29.9%
65 and Above	12.36%	17.5%



Despite this, because of its larger population, the City of Lowell is still home to by far the largest number of individuals over 65.

Veterans are more evenly distributed across the region, with percentages ranging from 3% in Lowell to 7.7% in Pepperell.

Twelve percent of the region's population reports living with a disability, including 5% with ambulatory disability, 4% with independent living difficulty, 5% with cognitive difficulty, 3% with hearing disability, 2% with visual disability, and another 2% with self-care difficulty.[15] At 14.5% of the

[15] U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023), Table S1810

population, residents of Lowell are the most likely in the region to be living with a disability, while residents of Westford are the least likely at only 6.6%.

INDIVIDUALS RESIDING IN RURAL AREAS

Individuals residing in rural areas have historically faced challenges with digital access, as historically ISPs have had less of a business incentive to serve rural places where lower population densities mean potential revenue from new customers may not justify infrastructure costs. Data also show that rural residents are less likely to own a device and tend to log in to the internet less frequently when compared to suburban and urban residents.[16] Within the Greater Lowell region, Dunstable, with a population density of just over 200 residents per square mile, is the only town classified as rural by the State Office of Rural Health[17]. That said, there is no single definition of rural, and in addition to Dunstable, Pepperell, Tyngsborough and to some extent Westford could all be thought of as rural as well. While none of these communities is so remote as to fully lack infrastructure or broadband coverage from ISPs, some, particularly Pepperell and Dunstable, do face limited ISP coverage and have reported issues with mobile "dead zones". Residents of these areas may face similar challenges to those traditionally faced in rural places, with high need and fewer resources to support digital access.

Municipality	Land Area (sq mi)	Population	Population Density (per sq mi)
Lowell	13.61	115,554	8490
Billerica	25.96	42,119	1622
Dracut	20.8	32,617	1568
Chelmsford	22.8	35,488	1556
Tewksbury	20.7	31,342	1514
Westford	31.33	24,643	787
Tyngsborough	18.05	12,380	686
Pepperell	22.99	11,604	505
Dunstable	16.74	3,358	201

Source: NMCOG website "Our Communities" page / 2020 US Decennial Census

INCARCERATED OR FORMERLY INCARCERATED INDIVIDUALS

Additionally, incarcerated individuals or those formerly incarcerated who have re-entered communities are especially vulnerable and face unique risk factors when it comes to the digital divide. These individuals have limited access to technology and the internet while in custody and

[16] https://www.benton.org/visions-digital-equity/challenges

[17] https://www.mass.gov/info-details/state-office-of-rural-health-rural-definition

may lack crucial tech familiarity and skills when they re-enter. Although available data does not document the exact number of incarcerated or formerly incarcerated individuals in the NMCOG region, the Middlesex Jail and House of Corrections in Billerica can house a population of up to 1500 and Lowell serves as a regional hub for re-entry programs and services, with organizations like THRIVE Communities and the Bridge Club of Greater Lowell providing reentry support and with housing and shelter programs like those at Road to Renewal House offering residential reentry programs with a capacity of 25 beds for adult men recently released from prison.

DIGITAL EQUITY DATA

Beyond demographics, data about internet subscriptions, computer ownership, internet service availability, internet performance, and enrollment in internet subsidy programs provides a more detailed look into the context of digital access and the shape of the digital divide in greater Lowell.

INTERNET SERVICE AVAILABILITY AND MARKET

A key factor in reliable, high-speed broadband access is physical infrastructure. This includes the ISPs that provide the infrastructure and subscription service connecting a personal computing device (computer, tablet, smartphone, or any number of connected devices like televisions, gaming consoles, smart home devices, etc.) and the broader Internet. Competition among ISPs brings prices down and service quality up, and municipal infrastructure and policy can make it easier or more difficult for ISPs to expand service to new areas.

All Internet Service Providers must self-report information about the service they provide to the FCC using Form 477. This form requires an ISP to report the fastest plan they offer within a given census block (for Cable, Fiber, or Fixed Wireless providers), or provide a coverage map (for Satellite and Cellular providers). Form 477 lists the number of “Broadband Serviceable Locations” (BSLs), served by each technology. The FCC defines a BSL as “a business or residential location in the United States at which mass-market fixed broadband Internet access service is, or can be, installed.” In Greater Lowell region, there are nearly 80,000 BSLs.

TABLE 4: INTERNET SERVICE

Community	Served	Underserved	Unserved	Total BSLs
Billerica	12,759	2	6	12,767
Chelmsford	10,926	0	12	10,938
Dracut	9,050	9	6	9,065
Dunstable	1,208	0	1	1,209
Lowell	20,076	6	9	20,091
Pepperell	4,040	0	6	4,046
Tewksbury	9,387	3	17	9,407
Tyngsborough	3,878	5	5	3,888
Westford	7,993	2	34	8,029
NMCOG Region	79,317	27	96	79,440

Source: FCC Baseline Broadband Availability Data by Massachusetts Municipality, MBI

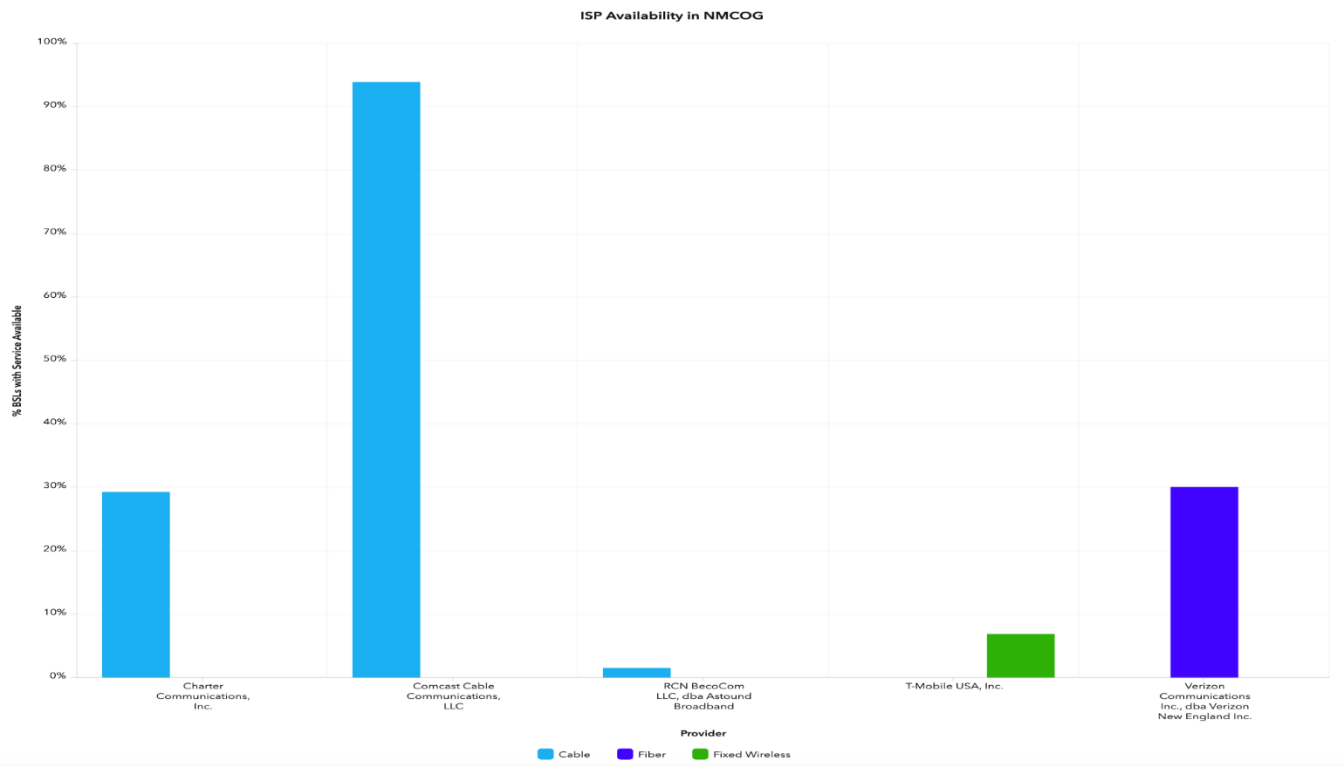
FCC Form 477 does not collect information about cost, how many people subscribe to the plan being listed, how many BSLs receive that level of connectivity, or what the other "lower" plans are; it only provides information about the fastest plan available for at least one location within a census block.

The Greater Lowell region is majorly served by Comcast, covering around 94% of serviceable addresses. Relative to other regions, Greater Lowell is well served by ISPs using cable technology. Fiber to home technology, considered to be the gold standard of wired residential connection, is more limited, with Verizon covering roughly 30% of the addresses in the region, but with disparities. The table below shows the technology and percentage of addresses served by ISPs in the Greater Lowell region.

TABLE 5: INTERNET SERVICE PROVIDER REGIONAL COVERAGE

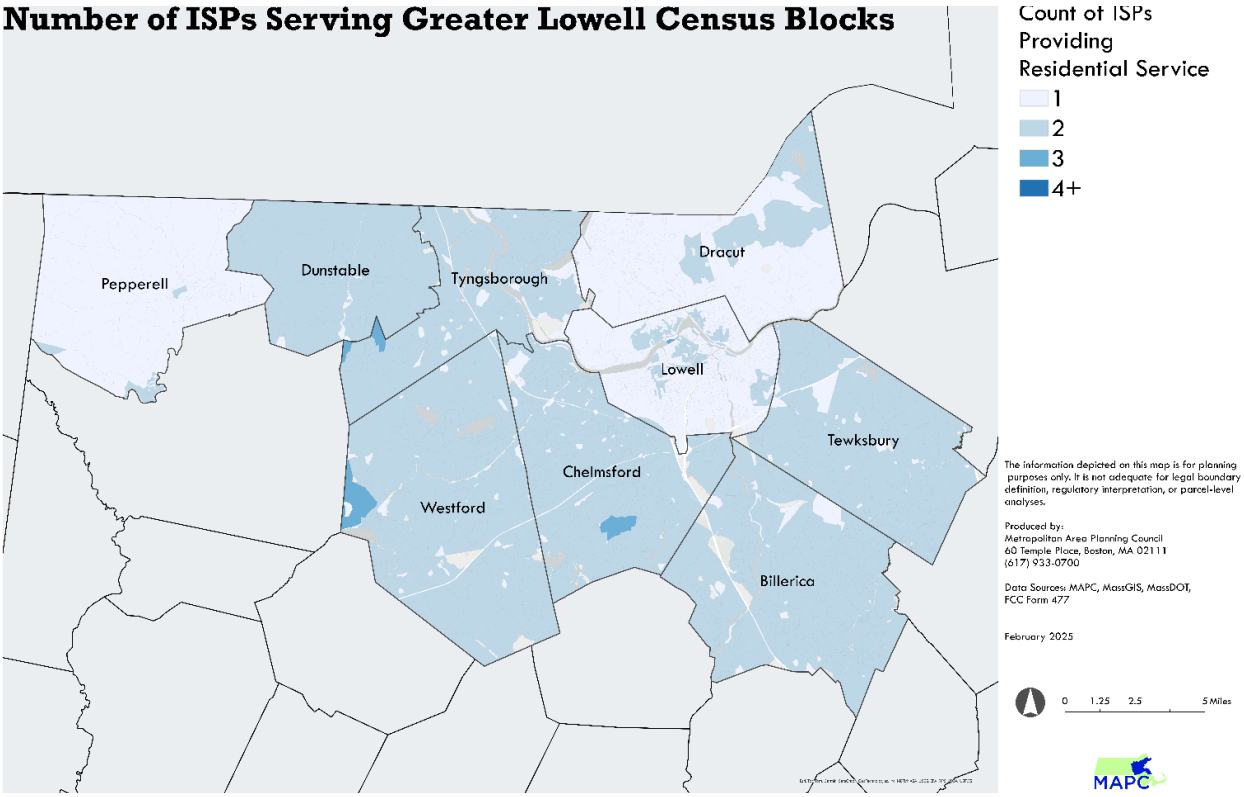
Provider	Technology	% of addresses served
Charter Communications, Inc	Cable	29.26%
Comcast Cable Communications, LLC	Cable	93.9%
RCN BecoCom LLC, dba Astound Broadband	Cable	1.51%
T-Mobile USA, Inc.	Fixed wireless	6.87%
Verizon Communications Inc., dba Verizon New England Inc.	Fiber	30.04%

Source: FCC Form 477 Data: https://mapping.massbroadband.org/map



Most of Pepperell, Dracut, and Lowell only have access to one service provider, reducing competition in those areas, while parts of Westford, Chelmsford, and Tyngsborough are served by three ISPs.

FIGURE 4: NUMBER OF ISPS SERVING GREATER LOWELL CENSUS BLOCKS



CONNECTION SPEED

About twelve percent of the region's residents surveyed by MBI reported that the function of their home internet services is "not good enough to meet my household's needs." Additional data from M-Lab speed tests reinforces this reality. The following chart lists median upload and download Internet speed by municipality, as shared by users conducting speed tests. Unlike the advertised speed of the fastest available plan reported by ISPs in Form 477, this data shows what users have actually experienced, at least while taking a speed test on their computer. The picture that emerges from this data is that internet service quality is not equal across the region. Dunstable and Dracut have median download/upload speeds of 78/77 and 98/12 Megabits per second (Mbps) respectively, missing the FCC's definition of broadband on (100/20 Mbps) on both metrics. These are dramatically slower than the highest download and upload speeds in the region both seen in Westford (288/653 Mbps). Upload speeds, an increasingly important performance metric for applications like dynamically streamed video, as on a conference call—lag download speeds in all communities except Westford, showing a lack of "symmetrical" service. In particular, beyond Dracut and Dunstable, Lowell, Pepperell, and Tewksbury do not meet a 100/100 Mbps performance benchmark often used by advocates.

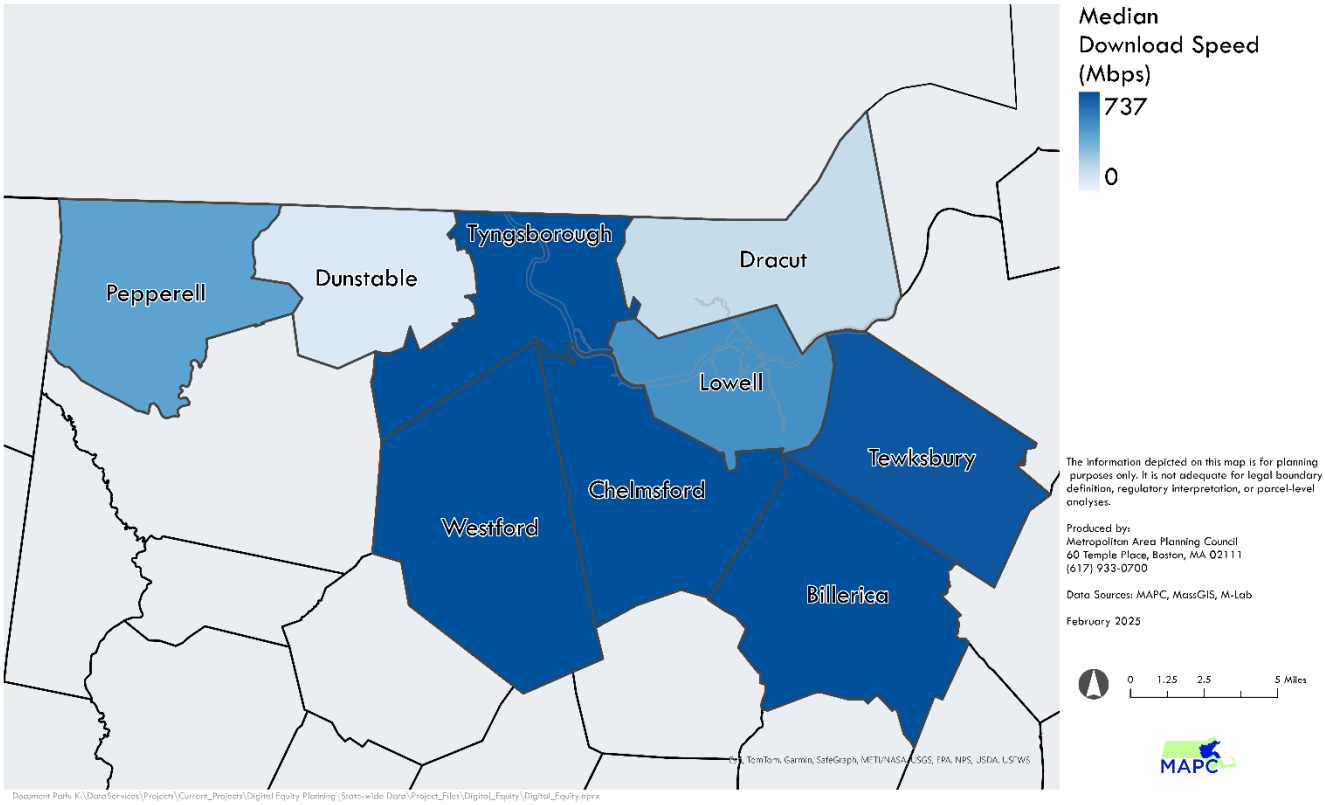
TABLE 6: MEDIAN UPLOAD AND DOWNLOAD INTERNET SPEED BY MUNICIPALITY

Community	Median download speed (Mbps)	Median upload speed (Mbps)
Billerica	279	137.5
Chelmsford	268	115
Dracut	98	12
Dunstable	78	77
Lowell	182	21
Pepperell	163	17
Tewksbury	239	40
Tyngsborough	270	236
Westford	288	653

Source: M-lab

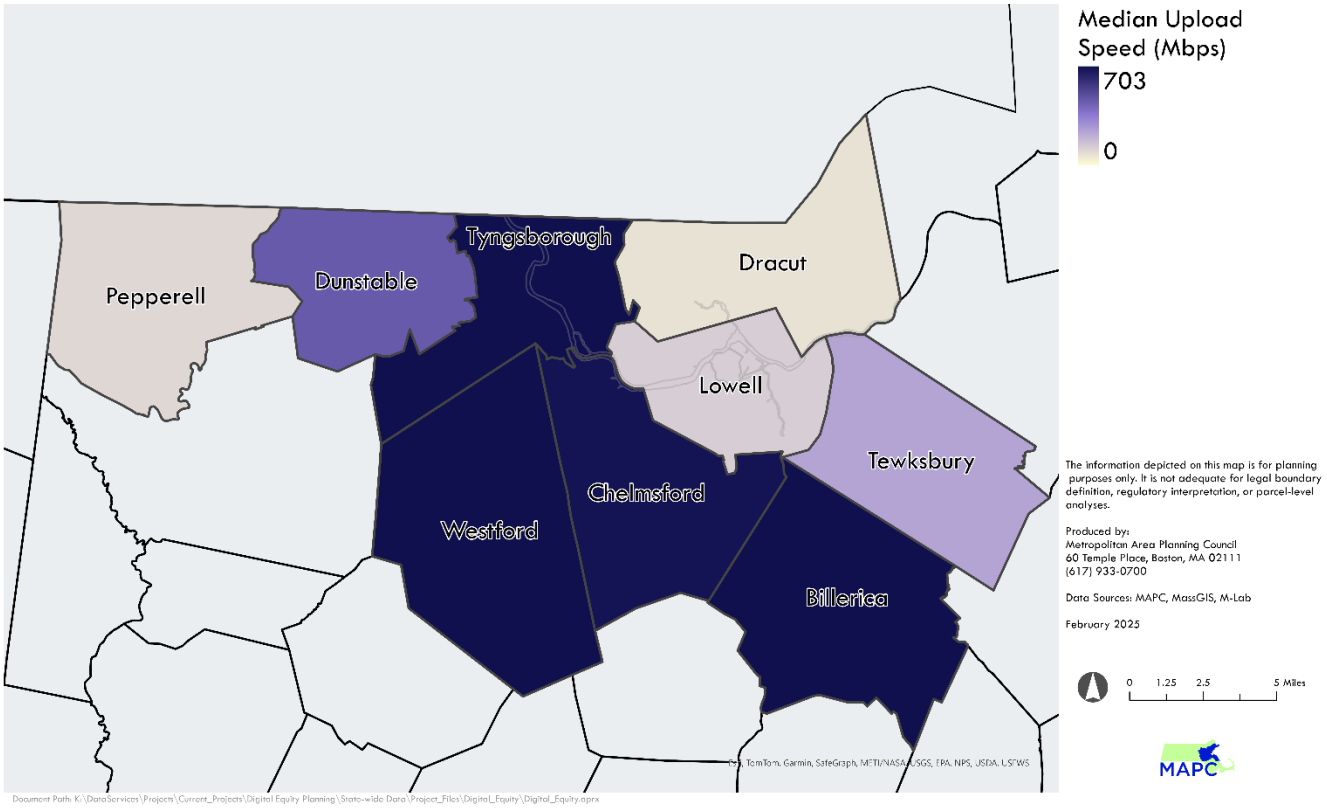
The map below shows median download speeds reported by devices using M-Lab internet speed tests by municipality. Lowell, Pepperell, and especially Dracut and Dunstable show lower speeds than the rest of the NMCOG region.

FIGURE 5: DOWNLOAD SPEEDS



The map below shows median upload speeds reported by devices using M-Lab internet speed tests by municipality. Dunstable, Tewksbury, and especially Lowell, Pepperell, and Dracut show lower upload speeds than the rest of the NMCOG region.

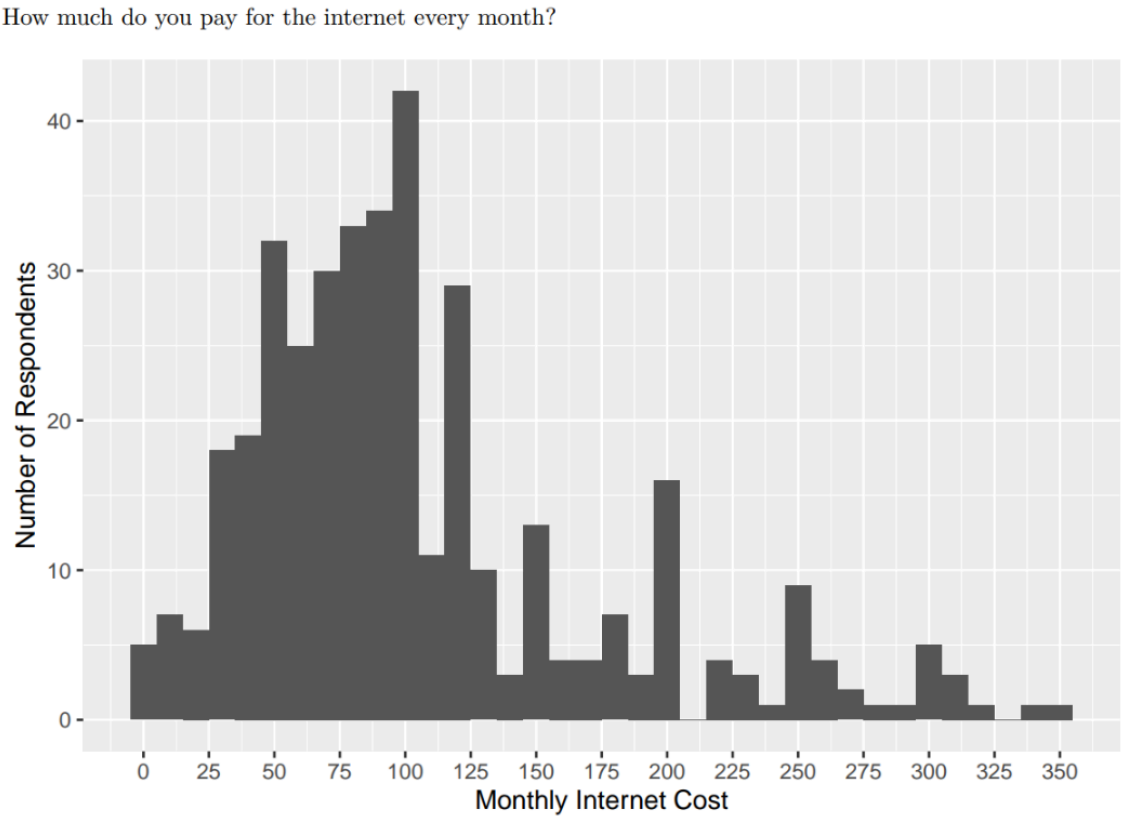
FIGURE 6: UPLOAD SPEEDS



COST OF SERVICE + AFFORDABLE CONNECTIVITY PROGRAM

According to the MBI survey, the modal reported monthly internet bill in Greater Lowell was more than $100/month. Additionally, about 26% of respondents selected that it was “somewhat hard” to pay their Internet bill, with an additional 9.1% selecting “very hard.”

FIGURE 7: HOW MUCH DO YOU PAY FOR THE INTERNET EVERY MONTH?



Another measure of cost burden is the Affordable Connectivity Program (ACP), a federal subsidy program that was made available to households living at or below 200% of the Federal Poverty Line ($60,000 for a family of four), which provided a $30 monthly subsidy towards any qualifying internet service plan. This program was enacted in 2021 as part of the Bipartisan Infrastructure Law and originally funded with $14.2 billion. In January 2024 the FCC announced plans to wind down the ACP program as Congress had not appropriated additional funding to sustain it. The FCC stopped accepting new sign-ups or renewals for the program in February 2024, and the program stopped full $30 subsidies in April 2024.

According to data gathered from the Benton Institute's ACP Tool, of an estimated 36,823 households that were eligible for the ACP program, 13,999 enrolled. The biggest share, 9,586 households, were in Lowell, followed by Dracut (1,019) and Billerica (854).

The ending of ACP meant that all enrolled households lost access to this subsidy by June 2024. This represents a loss of approximately $419,970 in subsidies every month, or $5,039,640 annually, exclusively for internet service for low-income households. The wind-down of ACP represents a truly urgent need for the region's most vulnerable residents, as well as an opportunity for the municipalities to step in to help address the digital divide at a local level, in the wake of federal inaction.

INTERNET CONNECTION BY INCOME

The ACS also provides data about internet connection by income. While the majority of the Greater Lowell population has an internet connection, households with no internet connection are concentrated in the lower income groups. The chart below also shows the disparity in access to internet connection, with only 3% of households earning more than $74,000 having no internet while 31% of households whose income is less than $20,000 do not have internet access at home.

FIGURE 8: AT-HOME INTERNET BY INCOME (NMCOG REGION, 2019-23)

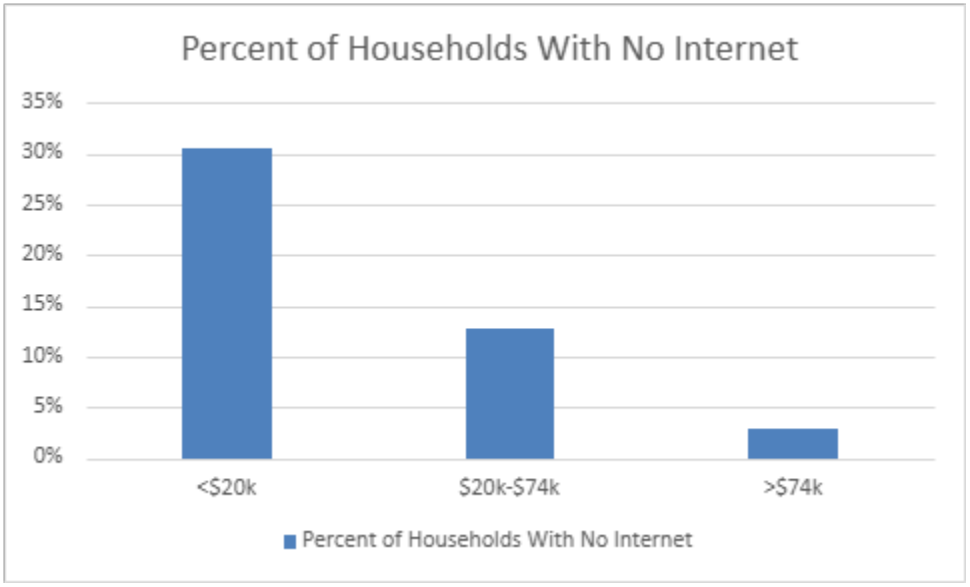


TABLE 7: AT HOME INTERNET BY INCOME (NMCOG REGION, 2019-23)

Household income	% with no internet connection	# HH with no internet connection
Under $20,000	31%	3,037
$20,000 - $74,000	13%	3,685
Over $74,000	3%	1,924

Source: U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023

Looking geographically, Lowell and Dracut have a higher proportion of households living below 300% of the federal poverty level (at about 50% and 30% of their populations). As previously shown in Figures 1 and 2, the below maps shows that Lowell and Dracut also have the highest percentages of households with income below $20,000 per year and the highest percentages of households without internet, further highlighting the connection between income levels and internet access.

FIGURE 2: PERCENT OF HOUSEHOLDS WITHOUT INTERNET

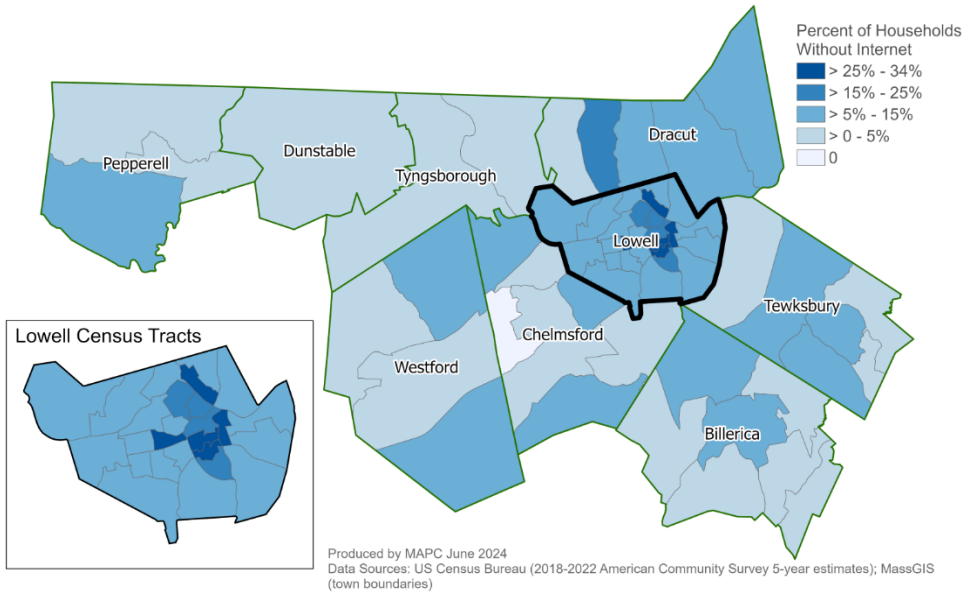
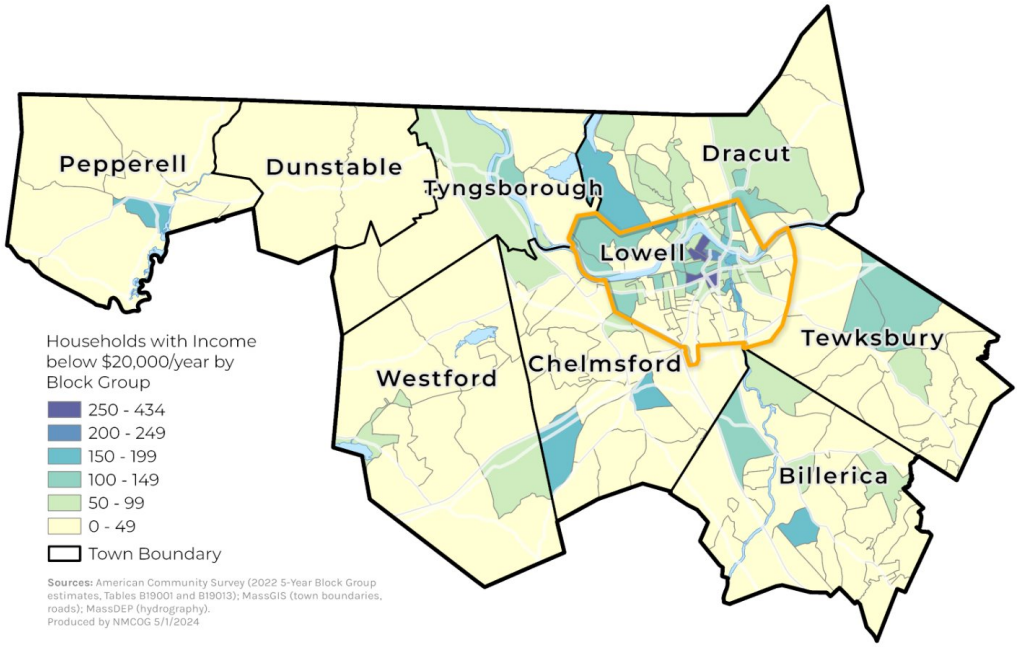


FIGURE 9: HOUSEHOLDS WITH INCOME BELOW $20,000 PER YEAR BY BLOCK GROUP



Affordable internet connection is critical to helping Greater Lowell residents most impacted by the digital divide.

DEVICE ACCESS

In addition to a lack of affordable home internet connection, the lack of appropriate devices creates barriers to digital inclusion. The ACS collects data on whether households own or use desktop or laptop computers, smartphones, tablet or other portable wireless computers, or other types of computers. As the below table shows, roughly 5% of households in the NMCOG region are estimated to not have any type of computer, not even a smartphone. An additional 6% only have a smartphone, but no other device such as a laptop or tablet.

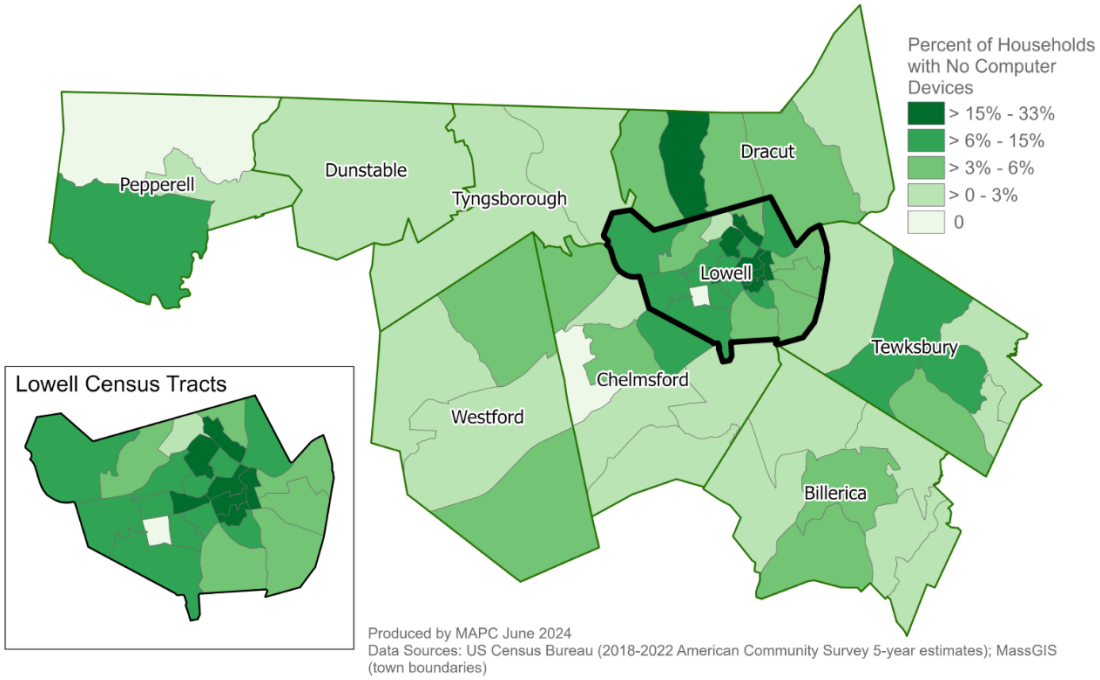
TABLE 8: DEVICES AND CONNECTION, GREATER LOWELL

Community	% Households with no internet connection	% Households with no computer	% population with only smartphones	Total households
Billerica	5.0	3.7	4.1	15,653
Chelmsford	4.1	2.1	2.4	13,496
Dracut	8.9	5.9	5.3	12,145
Dunstable	0.4	1.2	1.8	1,135
Lowell	12.1	7.6	10.7	42,383
Pepperell	5.8	1.1	5.3	4,313
Tewksbury	5.5	4.1	2.7	11,933
Tyngsborough	1.0	0.0	4.0	4,171
Westford	3.9	1.7	1.1	8,814
NMCOG region	7.7	4.8	6.1	114,043
Massachusetts	8.1	4.9	6.8	2,762,070

Source: U.S. Census Bureau, American Community Survey, Five-Year Tables (2019-2023

Lowell and Dracut, the communities with the lowest- and second-lowest median income in the NMCOG region, have the highest percentages of households with no computer devices, further highlighting the connection between income levels and digital connectivity.

FIGURE 9: PERCENT OF HOUSEHOLDS WITH NO COMPUTER DEVICES



DIGITAL EQUITY ASSETS

Many organizations and individuals are already doing digital equity work in the region, whether they name it explicitly or not. In addition to data analysis, the NMCOG and MAPC teams also collected an inventory of Digital Equity Assets from each city and town.

SUMMARY OF EXISTING ASSETS

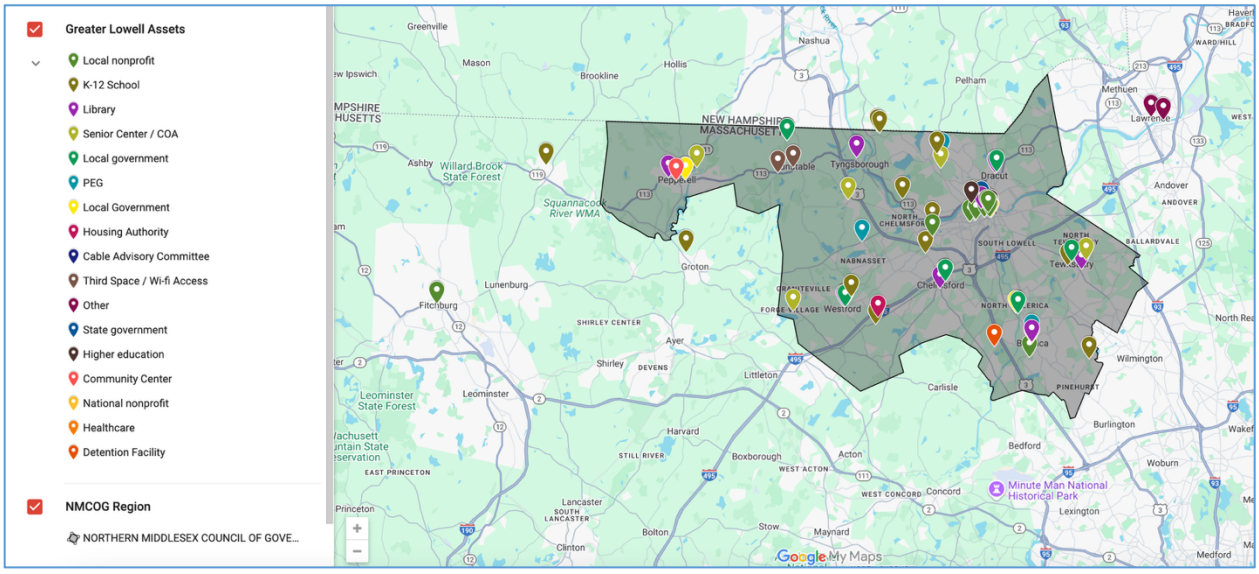
1. Libraries as Digital Equity Hubs:
    - Libraries provide essential services, including internet access, hotspot loans, device lending, and training. However, these resources are often limited by capacity and funding constraints.
2. Senior-Focused Digital Support:
    - Many communities, such as Billerica, Chelmsford, and Lowell, prioritize programs for seniors, offering device training, tech support, and targeted resources like computer labs and one-on-one sessions.
3. Device Access and Connectivity:
    - Hotspot lending programs are widespread but face high demand and waitlists. Schools often provide Chromebooks for students, but gaps in home internet access remain, especially for low-income families.

4. Collaborative Efforts:
    - Partnerships with community organizations, schools, and municipalities bolster digital equity. Programs like Tech Goes Home and initiatives for bilingual and culturally tailored support stand out in Lowell.
5. Training and Education:
    - Communities offer digital literacy classes at senior centers, libraries, and homeless shelters. Some programs, like those in Lowell, include incentives like free laptops or tablets upon completion.

ASSET INVENTORY + MAP

Below is a map of over 100 digital equity assets and resources researched, including libraries, public housing, and community health centers, data from the Massachusetts Broadband Institute's Digital Equity Asset Inventory, and resources from additional desk research and connections with non-profits and community organizations. These are listed in Table 9 starting on the next page.

FIGURE 10: ASSET INVENTORY MAP



View the interactive Greater Lowell Digital Equity Asset Map Online:
https://www.google.com/maps/d/viewer?mid=11eccDqwLVajhurqihD9ttBIsyBbPAmg&ll=42.596080217949 79%2C-71.43764063779297&z=11

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Abisi Adult Learning Center	Local nonprofit	- Provides education and training services for adults - Partnered with UMass Lowell to provide digital skills classes and devices
African Community Center Lowell	Local nonprofit	offers a range of workshops and classes, including a computer skills class offered in partnership with UMass Lowell, for immigrants and refugees, led by members of the African immigrant community.
Albert Harris Center	Senior Center / COA	- Various services and programs for older adults, including a "Help Desk" with "Gadget Man Dean" supporting cell phones and tablets, and in-person and online workshops like "Technology Talks", and "Scams Targeting Seniors".
Billerica Access TV	Community Media	provides municipal content over cable, partners with various community organizations and groups, and provides training and workshops on digital media, including video editing, and media literacy classes training for youth/children.
Billerica Boys and Girls Club	Local nonprofit	has a "STEAMcenter Makerspace" that offers drop-in classes on podcasting, movie making, and digital media.
Billerica Council on Aging	Senior Center / COA	provides occasional computer training classes and tech support sessions and a computer lab.
Billerica Public Library	Library	offers free Wi-fi, 21 computer workstations, and a hotspot lending program. They also have a library app, and a tech help program that offers one-on-one tech support for basic device and software set up and troubleshooting on an appointment or drop-in basis.
Billerica Public Schools	K-12 School	offers an online technology help desk with guidance on software, Chromebook devices, and cybersecurity.
Billerica Recreation Department	Local government	- offers digital literacy training courses - provides public Wi-Fi access at various locations, including the Peggi Hannon-Rizza Recreational Complex.
Boys and Girls Club of Greater Lowell	Local nonprofit	distributed laptops and other devices to kids in the past. They also allow members to access the Internet with assistance on-site. They have two computer labs: one for kids 12 and under, and the other for teenagers. They also offer Khan Academy to help kids learn and create apps and video games, which serves as a pathway toward other digital skills. They also assist youth in achieving Google certifications. Some of this programming is via partnerships with UMass Lowell.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Cambodian Mutual Assistance Association of Greater Lowell	Local nonprofit	offers training programs that include receiving a laptop device.
Cameron Senior Center	Senior Center / COA	offers free Wi-Fi, computer workstations and document printing
Chelmsford Housing Authority	Housing Authority	has proactive support staff to help residents, including with digital access.
Chelmsford Public Library	Library	- has a hotspot lending program, a traveling computer lab, and free Wi-Fi. - participates in the Access to Justice Public Library Initiative, a program to assist people with remote court hearings and provide them with lawyers they can meet with remotely. - offers digital skills training sessions
Chelmsford Public School System	K-12 School	- provide secure Wi-Fi, issue Chromebooks for at-home use, and their library provides hotspots. - offers online Technology Tutorials for parents and students. - partners with Massachusetts Educators Using Computers (MassCUE) and the Collaborative for Educational Services (CES) to offer professional training to Chelmsford School District staff on "Building Capacity Through Digital Equity"
Chelmsford Senior Center	Senior Center / COA	- Offers digital skills training sessions
City of Lowell	Local government	- provides access to virtual public meetings and offers a number of online services via its website, including 311, online payments, online permitting, and alert sign up. - In late 2018 the City of Lowell issued an RFP for a community wide fiber to the premises (FTTP) network over an open access network for residents businesses, government and community anchor institutions in Lowell, with the City offering facilitation of necessary processes, partnership on grant opportunities, access to existing City resources and other community assets, including right of way access and assistance with permitting, as well as access to existing city infrastructure and customers to potential vendors. This and other broadband efforts are summarized in a 2022 memo from Chief Information Officer Miran Fernandez.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
City of Lowell Management of Information Systems (MIS) department	Local government	- supports the use of technology within local government, including supporting city staff via a help desk, developing solutions for departments, and maintaining the city's websites, software, hardware, network, and security technology.
Coalition for a Better Acre	Local nonprofit	offers a digital literacy training program via a partnership with UMass Lowell.
Collegiate Charter School of Lowell	K-12 School	offers free Adult ESL Digital Literacy Classes to CCSL families.
Community Teamwork, Inc.	Local nonprofit	- Supports low-income residents, young people, and seniors with various programs, including education, employment & training, energy & utility support. - Conducted a survey for the Community Health Needs Assessment, identifying high speed internet as a resource priority for Greater Lowell.
Dracut Access TV	Community media	provides livestreaming of municipal and community events, multi-language podcasts and other media, and tech training and equipment
Dracut Council on Aging	Senior Center / COA	has weekly Drop-in Tech Support and their facility provides public wi-fi.
Dracut Public Schools	K-12 School	as a strategic technology plan and provides social media and Online Safety Guides for Parents and Students. The School Also has an app available on Apple and Android devices to provide students and families with alerts/notifications and an events calendar.
Dunkin'	Third Space / Wi-fi Access	Offers Wi-fi to customers
Dunstable Cable Committee	Cable Advisory Committee	- Oversees town's cable franchise agreement
Dunstable Commissioners of Trust Funds	Local government	- manages all trust funds given or bequeathed for the benefit of the Town of Dunstable or the inhabitants thereof, unless the donor making the gift or bequest shall otherwise provide - supports those in need

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Dunstable Technology Advisory Committee	Local government	- Oversees the town's information technology, including the town website - worked with many of the departments to purchase and install a server and computers as well as establish security, virus protection and a backup system. - helped departments acquire/update software and update operating systems, address system issues, recover files if needed, and provide assistance upon request
Greater Lowell Health Alliance	Local nonprofit	The Greater Lowell Health Alliance's Community Health Improvement Plan (CHIP) includes priorities and recommendations for increased healthcare service access and navigation through increased digital equity and digital tools training for high need populations such as elders and people who speak languages other than English. It also recommends a digital resources summit for healthcare stakeholder to share digital resources.
Greater Lowell Technical High School	K-12 School	- one of just 3 technical high schools in the NMCOG region - offers information technology courses to students. Night courses are also available to adult learners - makes its faculties available for rental by the community.
Groton Dunstable Regional School District	K-12 School	- has a 1:1 Device program providing students with iPads and Chromebooks, as well as Google student accounts to support digital learning in school.
ICNA Relief Lowell	National nonprofit	Provides support for immigrants and for families in need
International Institute of New England	Local nonprofit	Supports Refugees and other newcomers. Partnered with Tech Goes home to provide newcomers with laptops, digital literacy training and tech support.
J.V. Fletcher Library	Library	- has computer workstations available for public use and provides free loanable hotspots. - offers free Wi-fi - Undergoing renovation that will support additional capacity and programming
Kids in Tech Inc.	Local nonprofit	provides an "After-school Tech Club Program" where volunteers and professional educators teach STEM technology skills to children aged 8-14 from low-income families.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Latinx Community Center for Empowerment	Local nonprofit	offers computer lab devices and technical support. The International Institute of New England sets up Wi-Fi for refugee households. They partner with Tech Goes Home to provide computers and additional support.
Lawrence Library	Library	- Computer stations with access to MS Office suite software, printing - Staff assistance with updating resumes and applying for jobs online - Free Wi-Fi inside and outside the library building - Seven hotspots available for check out for 2 weeks at a time.
Literacy Volunteers of the Montachusett Area	Local nonprofit	- provider of literacy and ESOL tutoring services to adults
Lowell Association for the Blind	Local nonprofit	provides six computers with software to assist people who are blind. They provide training and assistance.
Lowell Community Health Center	Healthcare	has digital equity programs and direct funding for families. They provide cell phones for patients without them. The LCHC also launched a website to help patients request appointments as well as a new app that has MyChart.
Lowell Council on Aging/ Senior Center	Senior Center / COA	- Supports older adults with activities and services, and access to benefits, including AgeSpan, Comcast Internet Essentials - Hosted a digital equity charrette - The Lowell Department of Veterans' Services is located in the Senior Center and offers benefits and referrals to eligible U.S. military veterans and their spouses, widows or dependents.
Lowell Housing Authority	Housing Authority	- reworked their community rooms to include desks and older computers. They also created digital information boards to spread information during COVID in multiple languages.
Lowell Makes	Local nonprofit	a non-profit community maker space whose members teach classes, facilitate workshops, and share skills, including digital skills from software application development and web design to 3d modeling, to search engine optimization for businesses.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Lowell Public School District (LPSD)	K-12 School	- has adopted a Digital Learning and Technology Integration Plan, provides loaner laptops to students for use in school and at home, and also supports a "Bring Your Own Device" (BYOD) model as well. - provides a number of technology resources to teachers, students, guardians and families via the "Instructional Technology Corner" website, which provides resources detailing available technology purchased by the school district, an "accessibility toolbox" with language access technology tools, and a "Family Resources" page with tutorial videos for common hardware and software issues. The site even has resources providing guidance and exploring emergent technology, such as generative AI, and how it might be used in the classroom. - PSD Family Resource Center provides access to computers during business hours so that families can make use of LPSD web content and resources.
Lowell Technology and Utilities Committee	Cable Advisory Committee	Oversees the Lowell cable franchise agreement and advises the Lowell city council on technology
Lowell Transitional Living Center (LTLC)	Local nonprofit	offers gathering space, user-friendly technology instruction, and tools and equipment for individuals, students, seniors, businesses, and non-profit groups to learn digital media skills and create multimedia.
MassDevelopment	Other	- helps MA cities and towns revitalize, develop, and transform through lending, grant making and technical assistance
MassHire Greater Lowell Workforce Board Career Center	State government	Lowell Career Center offers digital skills assessment and various trainings and events for job seekers—such as workshops on strengthening a LinkedIn profile, tips for nailing an online interview, and guidance on incorporating ChatGPT in the job search. The Career Center also provides a resource center with computer access and staff support.
Middlesex Community College (MCC)	Higher education	- "MCC-guest" network provides free Wi-Fi on campus to anyone for up to 6 hours - Offers technology classes for credit and non-credit programs
Nashoba Valley Technical High School	K-12 School	- one of just 3 technical high schools in the NMCOG region - has space for learning and access to technology for students, which can also be made available to the community

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Nectar Community Investments	Other	a community development financial institution (CDFI) and a community development corporation (CDC) deploying resources where they don't usually go— to historically disinvested individuals and their communities.
North Middlesex Regional School District	K-12 School	- Access to Wi-fi at all school buildings and online remote access to some software applications - Students issued Chromebooks for in school use - In some situations, the school district may approve the provision of access to school computers and technology systems to members of the community.
Northern Middlesex Council of Governments	State government	- provides planning services and technical assistance for municipalities, including digital equity planning and implementation support services
Parker Memorial Library	Library	- has free Wi-fi, 17 desktops, hotspots, charging stations, and offers tech support. - offers support to patrons via its Reference staff and also has printers and copiers with scanning capabilities for the public to use. Printing has a small fee, while scanning is free.
Pepperell Cable Advisory Committee	Cable Advisory Committee	- appointed by the selectboard to support residents with mediation with Charter Communications, the only Internet Service Provider in town. - set goals to seek additional lost cost internet service options in town.
Pepperell Community Media Inc	Community media	- Offers various digital media equipment and training - Cable channel and online videos include occasional digital training workshops
Pepperell Town Hall	Local government	- Public Wi-Fi in the municipal building - Received a $250,000 grant in FY2022 for the creation of a new municipal fiber network - Various online digital services, including meeting agendas and minutes via the agenda center, online bill pay, access to various permit applications and other online forms via Pepperell's OpenGov portal, and online sign up for email/SMS notifications via NotifyMe. - Online engagement via various municipal social media accounts (Facebook, Instagram, YouTube, Twitter/X)
Peter Fitzpatrick Collaborative Community Center	Community Center	- Occasional digital training - Free Wi-Fi

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Rodenbush Community Center	Community Center	- offers classes to all ages, including occasionally offering limited classes on coding and technology. - hosts local organizations, such as the Rotary Club who volunteer and organize to help those in need
Shawsheen Valley Tech	K-12 School	offers educational technology and digital learning resources including access to software for students, and resources for parents, such as guidance on affordable internet plans.
Tewksbury Public Library	Library	- provides free Wi-fi and computer workstations as well as laptops that can be used at the library but not checked out. - offers or connects residents to online and in person technology education resources, including device and software basics, resources catered to seniors, and accessible tech resources. - provides a variety of additional services that complement core digital access resources, including remote printing, fax scanning, integrated library services, IT assistance, English language learning resources, community rooms available for booking, and training sessions when possible. - One staff person offers hybrid adult programming - The library also has a technology plan and a security plan.
Tewksbury Public Schools	K-12 School	- provides Chromebooks to all students grades 5-12 as part of their 1:1 device program. Students are permitted to take Chromebooks home and keep them over the summer months as well. - provides a Digital Resources and Support webpage with information, guides, and tutorial for students and guardians on Chromebooks, email, the Clever app, Google Classroom, G Suite, and videoconferencing software including Zoom and Meet.
Tewksbury Senior Center	Senior Center / COA	- offers various programs, including technology classes.
Tewksbury Telemedia Department	Community media	- provides local cable customer complaint support services.
The Farmhouse Cafe	Third Space / Wi-fi Access	Offers Wi-fi to customers
The Middlesex Valley Jail and House of Corrections	Detention Facility	offers a Computer Literacy and Typing class to its incarcerated population.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
The Pollard Memorial Library of Lowell	Library	- provides "Tech @ Home" remote digital skills learning resources and also offers a rotating schedule of in-person single-session computer workshops for beginners, including one-on-one sessions with IT help staff available during "tech night" at the main branch of the library and classes on a variety of topics covering basic digital skills offered at the Lowell Senior Center computer lab. - provides computer workstations, printing, and free Wi-Fi.
The Tyngsborough Center for Active Living (Tyngsborough Senior Center)	Senior Center / COA	offers activities, events, and workshops, including occasional sessions providing "Computer and Phone Help"
Thrive Communities Lowell	Local nonprofit	empowers communities to welcome and support our neighbors transitioning from incarceration.
Town of Billerica	Local government	- Website provides access to a number of digital services, including a 311 app, online bill pay, online notifications, and a login system for commenting on website content. - Follows online accessibility design guidelines and makes those guidelines available on its website accessibility webpage, which also provides links to assistive technology.
Town of Chelmsford	Local government	- Many public properties are connected to Chelmsford's fiber network offering fast speeds to municipal staff and providing the backbone for public Wi-Fi guest networks at certain sites. - Serves priority populations and engages the public through the services coordinator.
Town of Dracut	Local government	- website offers online systems for complaints, bills, and permitting.
Town of Dunstable	Local government	- Municipal staff receive training in cyber security. - website offers limited online services, including online permitting.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Town of Tewksbury	Local government	- The town of Tewksbury has a Computer Services Department that supports computer help for municipal staff. - The town has an existing municipal fiber network and in FY2024 received a $190k grant to upgrade that infrastructure from a 1gb to a 40gb network. - implemented a new website in 2022 which operates on the Civic Plus platform to improve accessibility. The website includes a number of online services, including online permit applications, online payments, a citizen request app, a comment/feedback form, etc.
Town of Tyngsborough	Local government	- All Town-owned buildings have public Wi-Fi. - The Town has an existing municipal fiber network and received a $150k grant in FY2024 to connect various municipal facilities to that infrastructure. - The town offers online public meetings and digital services, including alert sign up, online permit applications, and online bill pay, via its website.
Town of Westford	Local government	- Municipal buildings are equipped with technology for hybrid meetings and recordings - The town has existing municipal fiber optic infrastructure and received a grant in 2022 to expand it. - The town technology department provides cybersecurity assessment and training for all municipal staff. - The town website offers a number of online services, including online documents, online permit and license applications, online bill pay, online notification sign up, online comments and feedback, etc. - The town offers a Wellness Services Resource Guide that includes information on a number of programs catered to various populations and needs. - All public meetings were held on Zoom during the pandemic and the town continues to provide support for remote/hybrid meetings.
Tyngsborough High School (THS)	K-12 School	- Rather than supplying students with devices Tyngsborough High School has a Bring Your Own Device (BYOD) program that encourages students to utilize their own technology devices in the classroom and at home as empowered “digital citizens”. The program also provides the roughly 10% of students who lack access to a personal laptop device with a loaner Chromebook for the year.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Tyngsborough Media	Community media	oversees local cable access and provides technical support and training on digital media skills, including video production, editing, and audio/podcasting.
Tyngsborough Public Library	Library	- supplies free Internet inside and outside of the library as well as hotspots, Chromebooks, and cameras. - provides volunteer technical support
Tyngsborough Public Schools (TPS)	K-12 School	- Technology Department offers online technology support resources for teachers, students and parents, including a remote learning portal made available in multiple languages, including Spanish, Gujarati, and Khmer.
UMass Lowell	Higher education	- The UMass Lowell Center for Community Research & Engagement in partnership with the UMass Lowell Innovation Hub and faculty digital equity researcher Carol McDonough PhD. has been awarded a grant as part of the Mass Broadband Institute's Digital Equity Partnership program to coordinate UMass Lowell student digital navigators to provide culturally competent digital literacy and tech support to the community. - provides free guest wi-fi within its campuses and libraries
UTEC	Local nonprofit	- Provides programming, facilities, and support for at-risk young people - Hosted the MBI "Internet for All" listening tour to support the state digital equity plan and has advised on the Greater Lowell digital equity plan
Vinfen	Local nonprofit	nonprofit based in Cambridge that offers digital inclusion services focused on supporting individuals living with disability—piloted a "Tech Navigator serving the Lowell area" who provided one-on-one support for device purchasing and set up, digital skills learning, and broadband enrollment.
Westford Cable Access Television	Community media	- offers classes on various digital media topics, including video editing software.
Westford Committee on Disability	Local government	researches needs and coordinates support for people living with disability in Westford
Westford Housing Authority	Housing Authority	- Some Housing Authority buildings are equipped with free Wi-fi

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Westford School District	K-12 School	- provided hotspots during the pandemic to students in need - provides Chromebooks to all middle school and high school students for in school and at-home use. - provide various resources and guidance for parents, including a "remote learning" toolkit and resources on online safety and cyberbullying.
Worcester Talking Book Library	Library	- provides free services to Massachusetts residents of any age who are unable to read traditional print materials due to a visual or physical disability and to organizations serving these populations.
YWCA of Lowell	Local nonprofit	provides a computer tech lab classroom on-site. They offer training courses for digital literacy in partnership with UMass Lowell. These training courses are offered in both English and Spanish.
Lowell Telemedia	Community media	offers gathering space, user-friendly technology instruction, and tools and equipment for individuals, students, seniors, businesses, and non-profit groups to learn digital media skills and create multimedia.
Chelmsford TV	Community media	offers PEG tv services and provides training and education in video production, podcasting, and media, for students and others.
Dracut Cable Advisory Committee	Cable Advisory Committee	- The main duty of this committee is negotiating contracts for local access television in the cable contract, with no involvement in determining cable television prices
Tyngsborough Housing Authority	Housing Authority	- Provides affordable housing for low- and moderate-income households, including for older adults, people living with disabilities, and families.
Dracut Housing Authority	Housing Authority	- Provides affordable housing for low- and moderate-income households, including for older adults, people living with disabilities, and families.
Pepperell Housing Authority	Housing Authority	- Provides affordable housing for low- and moderate-income households, including for older adults, people living with disabilities, and families.

TABLE 9: ASSET INVENTORY

Digital Equity Asset Name	Asset Type	Relevant Resources or Services
Tyngsborough Commission on Disability	Local government	- The Commission on Disability is tasked with (1) researching local problems of people with disabilities; (2) advising and assisting municipal officials and employees in ensuring compliance with state and federal laws; (3) coordinating and carrying out programs designed to meet the problems of people with disabilities in coordination with programs of the Massachusetts Office on Disability; (4) reviewing and making recommendations about policies, procedures, services, activities, and facilities of departments, boards, and agencies of said city or town as they affect people with disabilities; (5) provide information, referrals, guidance and technical assistance to individuals, public agencies, businesses and organizations in all matters pertaining to disability; and (6) coordinate activities of other local groups organized for similar purposes. - In 2021 the Commission conducted a Web Accessibility Evaluation for the town website and has since been involved in web accessibility improvements.
Pepperell Economic Development Advisory Committee	Local government	Promotes tools for economic development and supports small businesses in Pepperell
Chelmsford Diversity, Equity, and Inclusion Committee	Local government	- advises and promotes diversity, racial equity, and inclusion in Chelmsford
Girls Inc.	Local nonprofit	- ThinkSMART program provides science, technology, and engineering skills learning to girls, starting in 7th grade.
Veterans Services Department	Local government	- Assists veterans in Westford in accessing benefits
AgeSpan	Local nonprofit	- Provides programs, solutions, and resources for aging adults - Services include helping older adults access technology devices, including phones and tables, and access affordable internet plans

View the full Greater Lowell Digital Equity Asset Inventory:
https://docs.google.com/spreadsheets/d/14cnmDcTX12JF_GowKE9zjTrZh9SkkEk2shavCpub1XM/edit?usp=sharing

Appendix 2: Community Needs Assessment

The Community Needs Assessment answers the question "What digital equity assets exist in the region, what impacts does the digital divide have on the region, and how can we leverage those assets to mitigate those impacts and reduce the digital divide?" It focused on answering these questions through collecting qualitative data from stakeholders through interviews, public meetings, via survey, and focus groups with special populations.

This information was utilized in two important ways: One was to identify common themes that would be combined with the existing conditions information to create and prioritize strategies, and the second was to identify specific assets and specific needs of specific stakeholders, such as a nonprofit that needs a computer lab upgrade or a library that needs a training program. This helps identify implementation partners and concrete actions.

METHODOLOGY

MBI INTERNET FOR ALL LISTENING SESSION + DIGITAL EQUITY SURVEY

On September 20th, 2023, roughly corresponding to the Greater Lowell Digital Equity Plan project kick off, the Mass Broadband Institute facilitated a listening session for the region, as part of the "Internet for All" Massachusetts State digital equity planning process. Held at the United Teen Equality Center (UTEC) on Warren Street in downtown Lowell and online via zoom, the session was attended by around 20 individuals and included a presentation and discussion of digital equity issues led by MBI and supported by MAPC and NMCOG staff.

NMCOG's Isabel Emmet (third from the right) participates in a breakout group discussion with MBI Director of Program Development Josh Eichen and residents and stakeholders from Lowell and the surrounding region as part of the "Internet for All" listening session at UTEC.

Following this session, as part of the team's direct outreach to residents, NMCOG distributed a digital equity survey developed by the Massachusetts Broadband Institute (MBI). The survey was open from Fall 2023 through Spring of 2024 and was made available both online and in paper form, with the latter being distributed at municipal offices, libraries, and senior centers throughout the Greater Lowell Region. This survey was made available in English, Chinese, Haitian Creole, Khmer, Portuguese, Russian, Spanish, Vietnamese, and Arabic. The purpose of the survey was to identify what Greater Lowell residents used the internet for, and which challenges residents faced regarding digital equity, be they costs of services and devices, lack of training, or concerns about internet safety. The team received the following response rates from each municipality, totaling 541 responses for the entire region:

TABLE 9: NUMBER OF RESPONSES TO SURVEY BY COMMUNITY

Municipality	Number of Responses
Billerica	63
Chelmsford	64
Dracut	41
Dunstable	5
Lowell	120
Pepperell	24
Tewksbury	48
Tyngsborough	26
Westford	150
Total	**541**

Outreach And Community Engagement:

Outreach and engagement included the following activities:

Municipal listening session and project meetings

Kicking off the planning process in November and December 2023, NMCOG and MAPC staff met with groups of municipal staff from each of NMCOG's nine member communities. The purpose of these meetings was to gain a sense of context and current conditions, including existing challenges and trends. Questions also solicited advice on effective municipal-specific outreach methods. NMCOG/MAPC staff utilized an interview guide but encouraged open response as part of the interviews. Six of these meetings were held virtually and the other three were held in person. Overall, staff met with the following municipal stakeholders:

- 6 City Planner Staff
- 7 Public Library Staff
- 6 Town Manager Staff
- 2 Council on Aging Staff
- 4 IT Department Staff

Notes taken during these meetings were categorized into information/description, existing resources, challenges, outreach methods, and proposed actions.

(For more information on this phase of outreach see "Findings from Municipal Outreach")

Additionally, throughout the planning process, the project team continued to gather information during monthly project meetings and "office hours" sessions, including reviewing and discussing in progress research notes and draft project deliverables.

Stakeholder Interviews

To better understand digital equity issues beyond the municipal offices, staff developed a stakeholder organization list in coordination with municipalities. In a first round in February/March 2024 and a second round in September/October 2024, NMCOG staff led outreach to stakeholders of interest throughout the Greater Lowell Region. These stakeholders were contacted via email and telephone and invited to both group and one-on-one interviews via Zoom or in person.

Staff met with stakeholders working in schools, libraries, housing, higher ed, workforce development, cultural organizations, youth support, disability support, veteran support, healthcare, telecommunication, community development, and economic development. Below is a list of the number of stakeholders NMCOG and MAPC met with in each of these categories:

- Cultural/Ethnicity-Based Organizations: 3
- Economic Development: 3
- Libraries: 6
- College Education: 1
- Community Empowerment: 7
- Disability Support Organizations: 2
- Healthcare: 1
- Telecommunications: 4
- Youth Support: 2
- Housing: 2
- Schools: 7
- Veterans: 1
- Workforce Development: 3
- Total stakeholders interviewed: 42

As with the municipal interviews, notes were taken and categorized into information/description, existing resources, challenges, outreach methods, and proposed actions.

"Strategy Charrette" Community Workshops

Between the two rounds of stakeholder interviews, NMCOG and MAPC held a "strategy charrette" tour: eight public workshops (one per municipality, with Dunstable's workshop combined with Westford's for logistical reasons) engaging municipal staff, community stakeholders, and residents on their digital access needs and experiences. To promote workshops, outreach flyers were shared by each municipality via direct email and through social media, with an option to RSVP ahead of time. Key stakeholders previously identified were also invited via email and/or telephone.

Workshops included a presentation of existing conditions data, followed by group discussion and/or breakout activities to brainstorm assets, challenges, and recommendations. In total, community workshop sessions engaged over 60 participants, with workshops in Lowell, Chelmsford, and Westford/Dunstable seeing the highest participation, and sparser participation in all other communities.

TABLE 10: NUMBER OF CHARETTE ATTENDEES BY COMMUNITY

Municipality	Number of Attendees
Billerica	4
Chelmsford	12
Dracut	3
Dunstable/Westford	7
Lowell	28
Pepperell	6
Tewksbury	1
Tyngsborough	1
Total	**62**

These charrettes presented an opportunity for stakeholders to not only consider digital equity at the regional level, but also zero in on their particular community.

Open House / Tabling Engagement

NMCOG staff offered to present or table at existing meetings in any of the nine municipalities during the stakeholder interview phases. Two events were identified: the *Chelmsford Woods Residences Planning Social*, and the *Creating Chelmsford's Future Strategic Plan Ice Cream Kickoff* at the Chelmsford Elks Lodge. Maps and handouts outlining digital equity challenges and strategies applicable to Chelmsford were distributed. Notes from 1:1 conversation with residents at both events were taken and categorized similarly to the other outreach activities.

Focus Groups with Priority Populations

Crucially, the engagement and research team sought to hear directly from populations most likely to experience the digital divide. NMCOG and MAPC coordinated a total of eight focus group meetings from September to November 2024 with the goal of validating in-progress findings and hearing directly from those with lived experience with the digital divide. Two focus groups were conducted electronically over Zoom and email, and the other six were held in-person. NMCOG staff, with assistance from eight key organizations or agencies, met with exactly 50 residents through focus groups representing the following populations:

TABLE 11: NUMBER OF PARTICIPANTS BY FOCUS GROUP

Focus Group	Number of Participants
Formerly Incarcerated Individuals (THRIVE Communities)	5
Housing Authority Residents (Chelmsford Woods Residences)	8
Individuals Living with Disabilities (Tyngsborough Commission on Disability)	3
Khmer Speakers (Cambodian Mutual Assistance Association)	8
Spanish Speakers (Latinx Community Center for Empowerment)	7
Recent Immigrants (International Institute of New England)	7

Seniors (Cameron Senior Center in Westford)	8
Small Business Owners (City of Lowell Economic Development Office)	4
Total	**50**

All partner organizations with 501(c)3 designation received a $500 honorarium to thank them for their assistance in recruitment. Organizations coordinating groups of people speaking a language other than English received additional compensation for their interpretation and translation services. Individual participants each received a $50 gift card to Market Basket as an incentive and thank you for time and contribution to the plan.

All meetings were recorded, and responses were anonymized and transcribed. Notes were then coded and categorized in line with themes developed in previous interviews, with special focus given to refining needs and strategies to address them.

OUTREACH MAJOR CROSS-CUTTING FINDINGS

Although cross-cutting key findings are organized into the three pillars of digital equity, multiple groups have cited the need for wider knowledge of existing resources and programs and the need for educational outreach. This cuts across all three pillars.

BROADBAND ACCESS

Access to broadband is a critical need for all residents across nearly all aspects modern life

Greater Lowell residents access the internet to meet their individual needs and access different opportunities including education, employment, healthcare, banking, civic engagement, social, entertainment, and e-commerce. In conversation with one municipality, municipal staff pointed out the all-round need for digital services- internet, devices, and literacy- to navigate crucial public health emergencies and national disasters. Access to the internet is important for many activities, from booking license renewal to getting a replacement for a Social Security Number.

> "Most support for utilities is built-in or automatic, but it is not for internet."
> - municipal stakeholder from Pepperell

The cultural-ethnic stakeholder groups shared that the internet is an important tool for small businesses to navigate. It is important for these businesses to have relevant sources to make informed decisions about security and bandwidth. In discussion with the City of Lowell, municipal staff raised the need to increase internet accessibility for residents to access government programs that are now going digital.

Greater Lowell residents need access to internet service that is affordable, good quality, and reliable

Access to good quality and reliable internet is essential for residents to effectively participate in economic and social life. In the discussion with library stakeholder group, librarians from all municipalities shared that they see the need for a robust internet service first-hand as many residents come into libraries to use the internet. Free loanable hotspots are always in demand as they provide a private internet connection for residents without at-home internet connection.

For instance, Dracut's library director shared that the hotspot lending program in Dracut public library is very popular, with 12 to 15 hotspots in circulation. Similarly, Tyngsborough's public library director also shared the need more accessible internet connection, as demonstrated by the high demand for library's supply of hotspots.

Residents rely on different methods to access internet for essential digital services

Many community stakeholders noted that high-need residents rely on different methods to connect to the internet when they don't have at-home internet service. Many residents use hotspots to access online services. Residents also connect to the internet through public or guest wi-fi networks provided by private businesses, community centers, schools, and public housing properties. The Workforce training group discussed that many residents access community resources to get access to the internet. For instance, families use the library, go to local businesses, and even restaurants to use the internet.

Most addresses lack ISP competition, limiting consumer choice

Many stakeholders highlighted the lack of competition in available service providers in the Greater Lowell region that limits the residents' ability to access at-home internet service.

"Competition is not there – FIOS, Spectrum not there. [There is] issue with competition in certain apartments." - Cultural-Ethnic stakeholder group

DEVICE ACCESS

High-need populations don't have convenient access to appropriate devices, and many rely on smartphones for their technology needs

There is a high demand for device access among residents, yet affordable devices often do not adequately meet their professional and personal needs. Many individuals rely on smartphones to fulfill their device access needs. In the discussion with community empowerment group, stakeholders shared that many residents have access to free smartphones through SafeLink. Additionally, the workforce training group highlighted that immigrants and asylum seekers have better familiarity with phones. Additionally, in discussion with the disability group, we heard that younger residents use cell phones and tablets regularly but do not know how to use laptops and computers once they are preparing to go to college. For older residents, device access through smartphones is not an accessible means of device use and needs something larger than phone screens.

> "Older people- they have familiarity with use but haven't identified other uses. To work on other projects, you need something larger than phone screens." - Workforce development stakeholder

Similarly, patients navigating the healthcare system are at a significant disadvantage if they lack a device to contact essential services or healthcare providers. In discussion with healthcare stakeholders, they pointed out that reaching residents can be particularly difficult for those who are unable to obtain a cell phone plan. Many residents share cell phones or use their child's device, complicating communication and support that healthcare providers can provide. Telehealth services become much more accessible when healthcare providers have the resources to direct patients to available devices.

> "Lot of patients share phones. Getting in touch with them is difficult." -Healthcare group stakeholder

> "There are certainly people we were able to reach because we could provide them with phones. Telehealth really is an essential piece." -Healthcare group stakeholder

Public or shared devices provide a needed safety net, but also have limitations

Access to shared or public devices through the community centers, public libraries, and other locations plays a crucial role in enabling residents to use the internet for filling forms, scheduling appointments, and using important online tools.

> "Budding entrepreneurs, new workforce, folks at the margins looking to upskill reskill and go to library community centers to get access to resources. Students have access to resources on the campus and dorms." - College education stakeholder

However, access to devices in these community spaces is closely linked to residents' ability to reach these locations, highlighting the need for accessible locations and transportation options. In discussion with stakeholders from Chelmsford, they raised that residents who experience transportation barriers also experience digital access barriers. It is difficult for these residents to access community spaces like the library to access the internet.

> "Those who have transportation issues have device issues as well. I have been talking with the library for individuals who have telehealth needs." -community empowerment stakeholder

Community stakeholders have expressed concerns about residents who rely on shared or family devices. This dependency often limits their user experience and raises safety issues, particularly regarding privacy and data security. Additionally, while libraries and similar centers offer Wi-Fi access, the lack of privacy can make it uncomfortable for residents to have sensitive conversations. In discussion with the workforce training group, stakeholders raised the importance of safe location points in the community where residents can go to access internet for various essential services from public benefits, education, healthcare and much more.

> "Even if they can go to library for Wi-Fi connection, it might not always be private enough for them to be comfortable having conversations." -Healthcare stakeholder

Individuals also have distinct personal device needs based on their circumstances. For instance, residents with mobility issues may require specific technologies, such as callbox systems, to enhance their access to services.

SKILLS TRAINING WITH DEVICE ACCESS

Digital literacy is an important consideration for this group as it is almost all populations that face inequitable access to the internet. These initiatives will be more effective when combined with accessible essential skills training.

Community stakeholders have highlighted that many residents may lack the confidence and digital skills needed to effectively use the devices available to them. Basic skills necessary for navigating technology include safety training in cybersecurity, using search engines, creating email accounts, and even simple tasks like turning a device on and off.

Small business owners, individual artists, and cultural organizations can benefit significantly from skills training and access to devices. Such resources could help them grow their businesses by opening doors to opportunities like grants and loans.

> "It hinders their [small business owners] ability to access grants/loans. Can't expand business. Can't access COVID money because they don't have good records. Couldn't demonstrate how COVID impacted them because they did not have records. Can do this through POS systems but many don't have or don't know how to use." -Economic Development stakeholder

In discussion with the Cultural-Ethnic group, stakeholders shared the need for device skills for older residents. While youth are more likely to access devices and training through the school system, opportunities for aging populations may be more limited. For seniors, organizations like AARP provide support in using the internet on smartphones and educate them on navigating online resources, including cybersecurity practices.

Furthermore, community stakeholders from workforce training programs have noted that while youth are comfortable using cell phones or tablets, they often lack familiarity with computers. This gap in skills can hinder their ability to meet further employment or educational goals, underscoring the need for targeted training in these essential devices.

DIGITAL LITERACY

There is a significant need for digital literacy support for those who have been marginalized from the digital world.

For example, incarcerated individuals who have often been insulated from technology for extended periods require targeted assistance. Similarly, youth who are entering the workforce as well as older residents also face challenges in navigating the digital landscape. Many stakeholders emphasized that digital skills training should be readily available and regularly updated to keep pace with the rapidly evolving technological environment.

The COVID-19 pandemic revealed the significant impact of the digital divide, as many individuals suddenly faced online barriers for education and employment. This shift highlighted the struggles of those who were unprepared to navigate a fully digital environment. In discussions within the community empowerment group, it became evident that the transition to online services has also revealed a knowledge capacity issue for residents.

> "If a student doesn't have the digital skills to access these services, the pandemic was a wakeup call. It was shocking. The first year, we couldn't serve many of the students because they didn't have access to internet and didn't have the knowledge. This is one of our primary goals for next 5 years." -workforce development stakeholder group

Additionally, in the economic development group stakeholders noted that during the pandemic, many start-up businesses moved their operations online. This resulted in substantial job losses, leading to an identified need for support in areas such as marketing, training, and education.

At least one community cited that municipal employees themselves suffered from the digital divide in terms of literacy and comfort. Even with municipal devices, certain employees may shy away from email or other digital communication.

Internet safety and privacy concerns

Among the most cited challenges among all populations was concern about internet safety and security. Many residents need resources and support to ensure their safety online. Stakeholders from workforce training, community empowerment, and disability group discussion highlighted the need for preventative skills-training. It is important to protect households against identity theft, hacking, viruses, and digital scams.

> "One of the issues that often gets looked over for our users is being safe on the internet. Both in terms of security of identity, antivirus, knowing what not to click on, what digital scams look like. Having an intro to digital safety and digital public health would be helpful."
> -Community empowerment stakeholder group

A related digital challenge is online misinformation, which was a top concern of many municipal stakeholders. Stakeholders saw a need for those impacted by the digital divide to also increase skills in media savviness but also sought ways to counter or overcome scams and other types of misinformation when distributing municipal news.

Stakeholders noted a flip side of misinformation, digital scams, and identity theft: fear of these stops some populations from responding to legitimate texts and calls. This may have equity impacts on healthcare, municipal service provision, and human service provision.

Digital literacy is a crucial component for climbing the economic ladder

Digital training plays a crucial role in facilitating access to employment, education, transportation, and Department of Transitional Assistance (DTA) services, thereby creating pathways for greater community engagement and support. In Greater Lowell, poor digital literacy and limited access to devices pose significant barriers to employment for residents. Digital literacy support can empower communities by providing essential support for resumes, job skills, and language learning. The workforce training group and the library stakeholders shared the importance of digital skills in fostering community empowerment. The community empowerment group has also partnered with MassHire to help address these challenges. Also, the workforce training group discussed the potential for collaboration with the University of Massachusetts

OUTREACH FINDINGS FROM SPECIFIC MUNICIPALITIES

BILLERICA

Billerica Sees a Critical Connection between Digital Equity and Municipal Engagement, Including Virtual and Hybrid Public Meetings

Municipal stakeholders report that much of the community relies on Facebook for news and outreach, but that makes it imperative to reduce misinformation and support digital media skills. They note people affected most by planning policy often have the least digital access and skills.

With that in mind, municipal stakeholders want to better understand the best practices for virtual outreach and engagement, including, in-person, and hybrid meetings.

Essential services now require digital skills

Many essential services that residents rely on are now online. For instance, the Billerica Food Pantry now has an online registration system, further highlighting how embedded digital equity needs have become with almost all other needs. Stakeholders suggested that more support for high-need residents is crucial and may require more coordination between the town, the school district and various community partners.

Billerica Access TV is an Important Community Resource, but has Funding Concerns

Like most public access telecommunication services, Billerica Access TV is concerned about funding shortfalls as their primary funding source, fees from cable subscribers are shrinking as cable customers increasingly "cut the cord" in favor of online streaming services. They stress that access TV is an educational and community resource, not just a TV station.

Billerica Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Billerica Public Library sees high demand for all digital devices, including computer workstations and hotspots. There is also a designated one-on-one tech support person who sees a high demand for appointments and drop-in help sessions. Though the Library provides eBooks and kindles for patrons to access stories in Spanish and Portuguese, there has been an increased demand for books and other resources in other languages. The library especially needs resources for programs such as hotspot lending.

Language Barriers Have Increased, Prompting a Need for Translation

Municipal stakeholders report that many immigrant households struggle with language barriers. The municipality works hard to share accurate information, but staff rely heavily on Google Translate to communicate with these groups. In addition, the Town website is not currently linguistically accessible, and without translations, digital access is very limited. The most prominent languages spoken in Billerica are Spanish, Portuguese, and Gujrati. Billerica staff are interested in learning more about local immigrant populations and what challenges they face, including challenges with digital access.

Digital Equity for Seniors is a Critical Concern

Though the Council on Aging offers devices and training courses, stakeholders reported that seniors are often reluctant to deal with technology in general, and that this can pose challenges as important services, resources, and aspects of daily living move online. Many seniors don't own a computer or have an email address and may need catered support to navigate digital services. One strategy suggested by a Billerica stakeholder was to develop a program of younger tech mentors for seniors.

Interest in Broadband Infrastructure and Wi-Fi Access in Public Spaces and Commercial Areas

Stakeholders raised the need for infrastructure-related strategies in Billerica, including investigating the possibility of underground conduit for fiber, and fiber or wireless installation by right.

Stakeholders were also interested in municipal or otherwise publicly available wireless networks in public spaces and in commercial areas.

Digital Equity is Also a Concern for at the Middlesex Jail and House of Correction

Billerica is unique in that it is the home for the Middlesex Jail and House of Correction. Stakeholders who work with incarcerated and formerly incarcerated individuals note that this population faces special digital barriers, despite needing digital skills and access for getting a state ID, seeking jobs, and telehealth. These stakeholders have advocated for better partnerships and dialogue with correctional facilities to ensure access to devices and skills training for incarcerated individuals.

CHELMSFORD

Municipal Stakeholders work to Meet People Where They Are

Chelmsford residents have a wide range of backgrounds, experiences, and access to devices. A key concern for municipal stakeholders is addressing this range of needs, especially for residents who are not the right age for the Senior Center or Chelmsford Public Schools—a "missing middle". Stakeholders at the charrette noted device access, broadband access, and digital literacy are all barriers for this group. Chelmsford had some of the highest turnout for our digital equity municipal workshop, showing that municipal leaders are engaged and willing to coordinate with each other to address these needs.

Transportation plays a role in digital access

Those with the greatest needs tend to lack both devices and transportation to places that might provide digital services and therefore have barriers to in-person visits and telehealth. There is a need to make sure digital equity resources are transit accessible.

Chelmsford Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Chelmsford Public Library offers numerous resources, including a large number of computer workstations, traveling computer lab, a hotspot lending program, and free public Wi-Fi. However, many residents lack reliable transportation to get to the library. The library also wants to provide additional support and resources to meet demand, for example for telehealth, but it lacks devices and staff training and capacity to facilitate expanded services.

Seniors Can Lack the Confidence to Participate in Digital Literacy Programs, Creating Barriers

The Chelmsford Senior Center is a regional hub: it served residents from 22 communities in 2024. They run technology skills and internet training and safety programs periodically. The biggest challenge they report is seniors lacking comfort, confidence, or interest in digital literacy training. One stakeholder noted many seniors have a lack of confidence in using the Internet and give up before they get started. Some are reluctant to learn due to fears of Internet scams and phishing emails. However, municipal leaders feel this group still needs to be reached.

Chelmsford Housing Authority is Working to Upgrade Properties and Provide Affordable Options

The Chelmsford Housing Authority has pursued grants to update their properties' digital infrastructure. Newer buildings contain modern wiring and access to network equipment via media

closets. However, several buildings lack modern network infrastructure and none of the CHA properties offer community amenities like computer labs. Low- and moderate-income tenants must purchase internet services from an ISP without subsidies, and for many, this creates a cost burden. The Housing Authority reports having a strong 24-hour supportive services staff and a resident services coordinator helps residents with many issues, including getting connected. More support is needed though, as digital training and IT help is expensive to implement for seniors, low-income residents, and residents living with disabilities.

The Town Sees Opportunities for Public Wi-fi Networks in Public Spaces and to Serve Affordable Housing Residents, but with Some Concerns to Address

Chelmsford has a large municipal fiber network serving many public facilities, ensuring fast broadband speeds for municipal staff. Using this network as a backbone, the town also provides free public Wi-fi via guest networks at some buildings and parks and has received requests to provide more public Wi-fi access at additional sites. The Chelmsford IT department is interested in exploring this approach, but expressed a need to evaluate sites on a case-by-case basis as feasibility may vary depending on proximity to existing infrastructure. The Housing Authority was also interested in Public Wi-fi to serve residents at residential buildings, but CHA leadership expressed some concerns about network management and liability should residents use the network for illicit or inappropriate content.

Chelmsford Public Schools are a Possible Conduit for Data Collection

Chelmsford Public Schools provides Chromebooks to middle school students. It tracked statistics on those who did not have home Internet and provided hotspots. Those students often used the library or coffee shops such as the Java Room in Chelmsford Center or the Dunkin in Drum Hill. Stakeholders voiced interest in take-home surveys to better track and understand if broadband access is improving among families.

There are Capacity Challenges Despite a Desire to Do More

Municipal stakeholders voiced a need for more funding and staff to address the digital divide. For example, the Community Services Coordinator has many needs and services to address and is just one person, so cannot devote many resources to digital equity. The Town recognizes the importance of training, device access, and maintenance programs, but funding is needed to implement them.

DRACUT

Poor Areas of Cell Phone Coverage

Dracut has several areas, especially in more rural areas, that lack adequate cell phone coverage. One stakeholder reported that this can negatively impact small businesses located in these areas, as they can have trouble operating their businesses due to a lack of adequate coverage. This can also impact the large number of households that have no digital device except for cell phones in their household.

Dracut Access TV is a Critical Service, but has Funding Concerns

Like most public access telecommunication services, Dracut Access TV is concerned about funding shortfalls as their primary funding source, fees from cable subscribers, is shrinking as cable customers increasingly “cut the cord.” In addition, there is a desire for stronger collaboration

between Dracut Access TV and the Town of Dracut to ensure a holistic approach to communicating local information.

Parker Library Serves as De-Facto Digital Equity Service Organization, but Needs *Resources*

The Parker Memorial Library spends a significant amount of staff time assisting Dracut and out-of-town residents with access to digital services. An especially common need is assistance in filling out online forms for services such as the RMV—an only increasing need as more permitting and licensing moves online. Without this support, many Dracut residents would be cut off from vital services. Despite this, staff must help residents overcome their fears, digital illiteracy, and lack of confidence. In addition, Dracut maintains a popular hotspot lending program with 12 to 15 hotspots in circulation.

Dracut Small Businesses Suffer from Digital Divide

Dracut's economy is driven by entrepreneurs, many of whom are recent immigrants or English language learners. They often lack knowledge about how to use the internet for business, face language barriers, and lack appropriate digital equipment. Often, a family's children serve as interpreters.

There are Locations Well-Suited for Neighborhood-Scale Public Wi-Fi

There are several business districts that have small businesses that could benefit from public wi-fi to assist businesses and their patrons. This includes the Navy Yard, the Broadway Corridor, and the Bridge Street Corridor.

Assistance Often Relies on Volunteers or Untrained Staff

Dracut has had at least one program – a Senior Center computer lab – end because of lack of volunteers. In other cases, staff might have difficulty due to lack of support, or organizations may struggle with lack of funding for staff time dedicated to digital equity issues.

Hybrid Municipal Meetings Pose a Possible Challenge—And an Opportunity

Like many communities with limited resources, the Town relies on volunteer boards and committees that may not have familiarity or comfort with providing remote participation options. This limits the ability for some people to participate in their government as more programs go digital.

DUNSTABLE

Despite its Small Size, Digital Literacy Education is a Need, Especially Among Seniors

Dunstable has a growing aging population. Stakeholders have noted a need for digital literacy education among this population and others who might face a digital divide. Some employees who are seniors have fallen victim to Internet phishing. Stakeholders have not encountered barriers to broadband or device access, but they have seen challenges such as exposure to the Internet or understanding what technology can do for them.

Small Staff Means Capacity Issues

Many municipal employees are part-time, making it challenging to coordinate around initiatives and community programming. There is also some reluctance on the part of staff to use email, such as the Department of Public Works. The regional school district also makes it harder to dedicate resources tailored to Dunstable's community.

Lowell Residents are Diverse and Need Specialized Support from Trusted Partners

Lowell residents from a variety of age groups and backgrounds want and need training to use devices and navigate the Internet with confidence. Organizations have their own programming and while technology support can become an ad hoc part of programs and service provision, staff may lack the resources to fully meet the demand for digital skills. Many participants learn best one-on-one from a trusted teacher who speaks and understands their language and culture and can adapt to their learning style and needs. This includes teachers specialized in non-English languages, working with those with disabilities, or having other cultural competencies. Training course structures should be adapted to serve users living with disabilities, career development skills, Internet safety, and topics that young people are interested in, such as video game design. It may also include technology guides that reach people where they are – through cartoons, multiple languages, or other culturally appropriate methods.

Language is a Barrier to Digital Equity, but Technology Also Presents Opportunities for Access and Learning

Many Lowell residents speak a language other than English, including Khmer, Spanish, Portuguese, and Mandarin. There is a lack of online resources available in these languages. In addition to expanding multilingual digital literacy resources, stakeholders suggest incorporating digital skills training into English Language Learning courses. Finally, language barriers impact more than access to training. For example, technical support from ISPs is primarily in English, and speakers of languages other than English report a lack of patience and understanding from ISP customer support staff. Nonprofit program staff report that assistance related to working with internet service providers is labor-intensive: for example, making sure the ISP follows through on its appointment to set up Internet. However, stakeholders also report that technology, such as Google Translate, assists with language gaps, and suggest additional training and devices could be set up for virtual interpretation.

Immigrant Communities Face Additional Barriers Beyond Language

In addition to the cultural barriers described above, stakeholders report that immigrant communities in Lowell often need additional training or outreach as they are used to other tools or norms such as using WeChat or WhatsApp, for communication. This may result in greater difficulty in outreach efforts to reach these populations online, as well as in unfamiliarity with digital tools such as email or SMS.

Unhoused Population Have Special Digital Needs that Create Barriers to Inclusion

Unhoused individuals lack storage and charging opportunities for devices. They are more frequently the targets of theft. Stakeholders report that these individuals use devices for a wide range of purposes—not only entertainment and news, but also telehealth, accessing services, and career searches. Stakeholders suggested targeted strategies related to storage and charging for these populations.

Key Neighborhoods Could Benefit from Wi-Fi or Mesh Networks

Stakeholders identified several key neighborhoods that might benefit from free public wi-fi or mesh networks. This includes downtown, which has a concentration of affordable housing and outdoor

public areas; the Acre Transformative Development Initiative area, which includes a combination of public housing, affordable homes, and immigrant-owned businesses; and Cambodia Town, which includes a mix of businesses and homes and has several possible institutional partners. In addition, charrette participants expressed a desire for public wi-fi in places like parks and plazas.

Device Maintenance is a Critical Concern for Communities with Low Incomes and Other Barriers

Multiple Lowell stakeholders reported that device access is a critical concern, not just at the initial phase of receiving a new tablet or laptop, but throughout the lifetime of that device. This includes assistance in procuring a device and navigating salespeople, keeping the device software up-to-date and secure, repairing or refurbishing the device if it is damaged, and understanding when a device's life cycle is complete, and a new device is required.

Lowell Could Consider a Holistic Infrastructure Policy

Stakeholders noted the need for a more holistic infrastructure policy. A policy in which roads cannot be opened for five years after paving is important but also makes installing new underground conduit difficult. In some areas such as the Hamilton Canal Innovation District and the Lord Overpass, the City already owns empty public conduit that could be leveraged for expansion of affordable broadband, but this network is incomplete and not well-advertised. Stakeholders suggested a policy of always installing communication conduit during construction or repair to reduce the future expense of installation of new services.

Pollard Memorial Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

Pollard Memorial Library staff help users with IT assistance on an as-needed basis. It is constantly working to keep up with technological updates and device maintenance. It is also a source of free Wi-Fi and publicly available computers. However, it would like to be able to expand on the classes it offers and provide more books and digital resources in languages other than English. It is seeking partners for these efforts.

Lowell Small Businesses Suffer from Digital Divide

Internet access is essential for operating and conducting business. Some small businesses in Lowell struggle with Internet access due to the lack of a proper wireless signal. In addition, many business owners lack the time to train themselves in marketing themselves online, particularly through social media. Other skills include training in financial management software, Google Analytics, project management tools, and online marketing and social media.

Lowell Housing Authority Working Toward Equity, but there are More Opportunities

Lowell Housing Authority is not able to provide affordable wi-fi or tenant broadband to its residents. Many of its properties are very old, and the status and ease of broadband installation is unknown. However, they have community rooms with older computers and digital information boards in multiple languages.

Limited ISP Competition is a Challenge and High-speed Data Plans are Expensive

The majority of addresses in Lowell are only served by Comcast when it comes to cable internet, which could lead to slower speeds and higher prices. The City reports that they have repeatedly

reached out to additional ISPs and are always ready to negotiate another franchise agreement but have not received interest. The Technology and Utilities Subcommittee of the City Council may be one avenue for exploring options to support residents and consumers.

PEPPERELL

Issues with Cell Phone Coverage

Pepperell stakeholders reported that a number of areas in town lack adequate cell phone coverage. This could impact households that have no computer except for cell phones in their household.

Difficulty Reaching Single-Parents, Self-Employed, Low Income, and Senior Populations with Assistance

Municipal stakeholders noted that internet service is not treated like all other utilities, which creates difficulty especially for low-income, single parent, self-employed and senior populations in need. The Town noted that, unlike households struggling with other essential utilities, it did not always know where the need was, which populations might lack access, and how to assist them when it comes to the internet. There was further concern that attitudes were such that cell phones and data and high-speed internet plans might still be classified or thought of as "luxury expenses" when broadband access is crucial for public health emergencies, national disasters, and day-to-day life.

Need for Language Support

The Town has some Spanish speakers, and occasionally Portuguese speakers. The library needs additional resources available in their languages, both digital and otherwise.

Lawrence Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

Pepperell's Lawrence Library spends a significant amount of staff time assisting Town residents with access to digital services. Some of the common needs we heard about include help with employment materials, such as resume writing and online job applications; support navigating logins and two-factor authentication; creating email addresses and other online accounts; accessing or printing digital plane tickets; or obtaining replacement government documents, like Social Security cards. The Library provides a place to work with public computers and has seven hotspots available to loan out. As many as five or six hotspots are loaned out at any given time, demonstrating a clear demand. A laptop loan program was previously available, but the library was unable to keep devices secure and had to discontinue the program as a result. Lawrence Library is very interested in implementing Internet training programs and increasing local awareness of its free public Wi-Fi.

Pepperell Small Businesses Suffer from Digital Divide

Pepperell's business community is reported to have a high proportion of home-based businesses. These small business owners and entrepreneurs often had to rely on marketing themselves online, especially during the pandemic, but not every at-home businessperson had the skills and know-how, creating a digital divide. Among local business owners, training and support for online marketing, and other relevant digital skills are important needs.

Safety Concerns

Many residents, especially seniors, are concerned about Internet safety and scams. Training in Internet safety is needed, but there is a lack of staffing and money. The Town can support awareness of cyber safety programming but often cannot act as the delivery mechanism.

Hybrid Municipal Meetings Pose a Possible Challenge and Opportunity

When it comes to municipal engagement, Pepperell can still perform all its services in person, but the Town is trying to move as much as possible to an online format. Municipal stakeholders report that this system is working, but residents wish it was more connected and integrated.

TEWKSBURY

Understanding Needs of Seniors at Age-Restricted Housing Developments

Tewksbury has a large number of age-restricted affordable housing developments. These were of special concern to municipal and community stakeholders, as it is unknown whether seniors living at these developments have affordable access to broadband, appropriate computing devices, or tech support and digital literacy training opportunities. Multiple stakeholders noted the need for senior-focused digital literacy programs and suggested the Tewksbury Senior Center as a possible venue.

Tewksbury Public Library Serves as a De Facto Digital Equity Organization, but Needs Resources

The Tewksbury Public Library has become a de facto source of IT services for many residents. The library offers access to the internet, computers and laptops, hybrid community groups, as well as occasional training sessions. However, digital equity work is taken on by library staff in addition to other duties, so capacity to provide these services is limited. The library is doing everything it can, but to expand, staff would either need to be reassigned or more staff would need to be hired. In addition, the library has voiced the need for more outreach, as many residents do not know about existing programs. Staff also noted that while the Wi-fi network is in demand, the network is not properly secure, limiting the types of activities recommended for patrons.

The Tewksbury Senior Center Offers Some Resources, but Lacks Reliable Funding

The Senior Center thinks carefully about the kinds of digital equity-related programming to prioritize and tries to strike a balance between what is needed and what is feasible, as well as fun and engaging, such as a hybrid tech class that ran for fifteen months. Unfortunately, the grant funding for that class has stopped. There is a desire to offer more classes, but programming cannot continue without sufficient funding. There is a volunteer who offers one on one tech assistance, but it is difficult to schedule time with him.

Further Improvements to Town of Tewksbury Website

One municipal stakeholder noted a concern that increasingly, residents receive outdated or incorrect information from web searches that provide direct links to out-of-date or draft documents. ADA and language access for all municipal digital services also remains a top concern for stakeholders, despite some improvements made in the recent switch to the Civic Plus platform. Even so, more can be done to ensure that online services and materials are made accessible, including keeping content up to date, providing guidance for residents new to online government services, and ensuring translation and accessibility.

Tewksbury Telemedia Department is a Critical Service, but has Funding Concerns

Like most public access telecommunication services, Tewksbury Telemedia Department is concerned about funding shortfalls as their primary funding source, fees from cable subscribers, is shrinking as cable customers increasingly "cut the cord" in favor of streaming services. In addition, they want to be able to address language needs but cannot afford closed captioning. Other needs include equipment and identifying a source of centralized digital equity assistance for the town—such as a Digital Equity task force.

Wi-Fi Access in Public Spaces, and at Housing Authority Sites

There is a discrepancy among Housing Authority sites in terms of Wi-Fi accessibility for residents. The library, town hall, and some businesses have public Wi-Fi, but it is not available Town-wide.

TYNGSBOROUGH

Seniors Have Unique Digital Literacy, Device, and Accessibility Needs

Seniors were of special concern to Tyngsborough stakeholders, with multiple stakeholders noting the need for senior-focused digital literacy programs, including for those who live in Housing Authority-owned senior housing. Device access among seniors was another concern for municipal stakeholders, who noted that seniors may also have accessibility barriers requiring special devices/equipment or other accommodation.

Tyngsborough Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Tyngsborough Public Library supplies free Internet in and around the building. They supply hotspots, for which there is always a waitlist, Chromebooks, cameras, and other digital equipment. This equipment is dependent on funding, and Library staff noted a need for more dependable funding for these programs. Volunteers provide technical support, but they cannot do so consistently. The library is very interested in developing a digital navigator program to be able to provide more consistent help, especially since staff are already stretched thin. Transportation is also an issue, as those who lack digital access are also more likely to lack mobility options. The library is interested in setting up a shuttle service that takes students, seniors and other users directly to the library.

Language is a Barrier to Digital Equity, but Digital Tools Present Language Opportunities as Well

The library and Town Hall encounter language barriers, particularly among Asian language speakers, Arabic speakers, and Portuguese speakers. One stakeholder noted that Google Translate is a critical tool to overcome barriers, but staff require training in using it empathetically. Another need identified was language access for the municipal website. The Town would like to be doing more but has only been able to find the resources for the "bare legal minimum."

Hybrid Municipal Meetings Pose a Possible Challenge and an Opportunity

Municipal staff have tried to implement digital meetings using laptops set up specifically for this task. However, volunteers, boards, and committees have voiced a need for education on how they work and how to interface with members of the public who may be unfamiliar with online video

conferencing. Despite challenges and even occasional pushback from some residents, there is a desire to continue utilizing remote meetings due to their accessibility to a broader range of people—including people living with disability or experiencing mobility challenges—promoting Americans with Disabilities Act (ADA) compliance. Residents have varied opinions about remote-only public meetings, but municipal stakeholders noted hybrid meetings are the hardest and most expensive to implement and require more resources, staff, and staff training.

WESTFORD

There is a New Need to Meet the Digital Needs of Diverse Language Groups

A recent survey noted that 85 languages are spoken in Westford schools. Older generations have moved with their families, and they still speak their native language and need language assistance. Mandarin, Spanish, Russian, and a wide range of languages spoken in India have all been identified locally. Within schools, they hope to identify the primary and secondary languages spoken and expand their materials for those languages.

J.V. Fletcher Library Provides De-Facto Digital Equity Services, but Faces Resource Challenges alongside Opportunities for Expansion

The J.V. Fletcher Library provides free loanable hotspots but wishes to provide more. The library is interested in providing more materials, both digital and paper, in languages other than English. The library also allows users to print government forms and other confidential documents. The library wants to do more but is facing staffing and funding challenges.

The library also has a big opportunity to do more to support digital equity with the significant expansion of its facility, which will add more computer workstations, improve the wiring and Wi-fi access on site, add meeting rooms with equipment to support hybrid meetings, and double the amount of program space for events and workshops.

Different Generations in Westford Face Different Barriers to Device Access and Digital Literacy

Lower socio-economic groups don't have easy access to devices besides cell phones, which often don't meet every need. Older adults on a fixed income have to come to the Council on Aging to print documents or transfer files. Stakeholders report that older adults face confidence, interest, and comfort barriers in learning digital skills. Some service-proving stakeholders we spoke to reported providing ad hoc digital navigator services for seniors and veterans, for example often helping them complete online forms. Municipal stakeholders have expressed a need to better understand the resources needed to assist this senior community, with improved access to technology education and training and more resources at senior housing sites. Basic tutorials and online safety and security were top issues, with stakeholders suggesting a need for printed instructional materials, and support with password management and other security software to enhance safety and accessibility for seniors. Younger adults show great interest in learning digital skills, but they lack the equipment.

Hybrid Municipal Meetings Are an Opportunity for Access, but Can be a Challenge to implement

During the COVID-19 pandemic, all public meetings were virtual on Zoom. This was helpful for people with disabilities, those who lacked mobility options, as well as to those with childcare or other logistical needs that could pose barriers to in-person attendance. Virtual meetings, however, also required a baseline access to and knowledge of videoconferencing hardware and software, posing challenges for those who lack digital devices or skills. To balance the benefits of accessibility of both in person and virtual meetings, hybrid meetings are ideal but can mean twice the work for municipal staff and therefore hard to implement without more support. Luckily most municipal buildings now have access to Zoom and recording equipment, but some facilities still need these upgrades.

Westford Wants to Provide Low-Cost Municipal Internet, but there are Regulatory Obstacles

One municipal stakeholder explored providing municipally owned internet to affordable housing developments, but encountered regulatory barriers, including the need to establish a Municipal Light Plant to provide this service. Another difficulty was that affordable housing is not concentrated in one area, but rather spread throughout town, creating difficulty efficiently creating the necessary infrastructure. Better conduit access to encourage private providers was also raised as a possibility to provide more affordable options.

Municipal and Community Leaders are Eager to Do More Across the Region

Westford businesses and residents may be interested in supporting more digital equity-related activity and participation in regional partnerships. The Town has a number of digital-related businesses that help sponsor digital equity efforts that could be coordinated across the region. Nashoba Tech also offers a possible location for digital "night classes." However, there is no exiting regional digital equity structure to plug into.

OUTREACH FINDINGS FROM AGENCIES AND ORGANIZATIONS

LIBRARIES, COUNCILS ON AGING, AND OTHER GENERAL HUMAN SERVICE PROVIDERS

Libraries, Councils on Aging, and General Human Service Nonprofits play important roles but have no dedicated Digital Equity funding.

The region's Councils on Aging, Libraries, and general human service nonprofits provide a first line of digital equity service for most residents. This critical role is often overlooked but, if missing, could lead to much deeper digital divide concerns. That said, some stakeholders have voiced a concern about overreliance on library staff with limited resources. They have also noted that libraries are not private enough for many digital needs: For example, telehealth.

Libraries, Councils on Aging, and General Human Service Nonprofits are concerned about staff capacity and training to play increasingly technical support roles.

Many stakeholders shared that staff capacity issue is a significant barrier to providing essential supportive services for digital training. The library stakeholder interview group expressed concerns about being overwhelmed by demand and the need for increased staffing. Similarly, the Community

Empowerment stakeholder interview group shared their worries about inadequate staff capacity to effectively support their initiatives.

Although these stakeholders have nevertheless worked hard to embrace this role, they face challenges big and small. A critical one is a lack of training. Providers often utilize their own knowledge, meaning that staff who use one ecosystem of products--Apple phones, for example--can't help those clients who don't use that ecosystem—Android users, for example.

To boost the staff capacity to deliver and manage digital literacy programs, stakeholders elevated the need for additional funding for programs, resources, and staff time. In the library group discussion, stakeholders shared the need for more staff who have the technical knowledge capacity to assist residents who come to the library for tech help. The economic development stakeholder group shared examples where they have programs targeted at technology support for small businesses, but they don't have adequate staff to operationalize it. Also, many stakeholders noted that residents benefit more from personalized skills training, which is best delivered in smaller groups. The Cultural-Ethnic stakeholder group also echoed the value of having staff who can provide IT assistance in culturally relevant ways. However, funding is necessary for digital literacy training and support.

Device loan programs are difficult and expensive to operate for libraries.

All libraries with device loan programs, especially hot spots, noted that these are very popular, but also difficult to operate. One library noted it had to end its program because devices were returned damaged, late, or not at all. Another library noted a cost of $7,000 to $8,000 annually to maintain the program.

Senior Centers have a specialized need for technical support, but public-facing computers and wi-fi networks carry special security challenges. Senior centers in Chelmsford and Lowell report that technology support is a critical need – not only one-to-one technical support for seniors with technology challenges, but also for their own computers and technology. Limited municipal IT departments may have difficulty safely and securely maintaining public-facing computers and wi-fi networks.

Inconsistent digital equity funding makes program planning difficult.

Many stakeholders stressed that digital equity funding in general should be consistent and predictable whenever possible. This helps with advance planning, reducing administrative burden to continue grant writing, and changing funders, reporting requirements, and expectations. In addition, a healthcare stakeholder noted that funding for telehealth reimbursement for low-income clients is a critical need.

There is a need for instructors even when funding is available.

Some stakeholders noted that finding temporary instructors for specific programs was difficult, even when a program is funded. This includes experts in general skills (for example, how to use a smartphone) or specific, specialized skills (for example, QuickBooks).

MUNICIPALITIES

Municipalities face multiple communication challenges reaching target populations.

For example, stakeholders noted confusion over municipal online documents when draft and final documents are posted, difficulty sharing municipal news and updates and emergency alerts as media becomes fragmented (and those suffering from the digital divide begin to miss that news), and a patchwork of software creating compatibility issues. These municipal-specific communication challenges were in addition to language and accessibility gaps noted in previous sections.

There are opportunities to improve coordination between town/city halls, libraries, schools, and other municipal departments.

Although multiple municipal stakeholders stated an interest in closing the digital divide by overcoming these challenges and through other steps, they mentioned a lack of coordination between town programs such as libraries and school districts being a barrier to achieving these goals. Stakeholders shared that it is also a challenge for municipalities to coordinate with one another and for municipalities to coordinate with other agencies and organizations. One critical goal for the plan is to enhance coordination among entities.

There is a need for communication systems and training for municipal offices.

Stakeholders in many municipalities note that training for fully accessible public meetings via hybrid Zoom is not available. There were also concerns about staff capacity to effectively and equitably communicate. In addition to translation and accessibility concerns about websites and about public meetings, they have stated that overall communication lacks staff. This also includes the ability for all communities to effectively run hybrid meetings. Some noted that there's no consistency in which public meetings are hybrid, meaning some public meetings are more accessible than others. In limited cases, new technology may be needed as well. For example, stakeholders noted that Westford Town Hall meeting rooms aren't all equipped with cameras for Zoom meetings.

PUBLIC ACCESS COMMUNICATION ORGANIZATIONS

Public Access Communication Organizations face uncertain funding.

Public Access Television stations are a digital equity tool that is at risk of vanishing due to uncertain funding. There are two related issues: As fewer people subscribe to cable a critical revenue stream is vanishing. At the same time, this eliminates people's access to local news, increasing the need for local public access television even more. Stakeholders noted that people in the region with more resources have more ways to access local news. This means the reduction of funding for these sources reinforces patterns of people with resources influencing local policies the most.

Relationships are especially important for Public Access Communication Organizations.

In some cases, a strained relationship between government and public access may be a concern. One stakeholder noted a bad relationship between their cable access and municipal office as a concern, while others noted their reliance on public access to provide open access to their public meetings and concern that they have no alternative if their public access organization folded. There are some very specific needs as well: a stakeholder from one municipality noted their public access station cannot afford closed captioning for all programing.

HOUSING AUTHORITIES

Several organizations reported a need for reduced-cost or free project-wide wi-fi.

This includes Chelmsford Housing Authority, which is not able to provide wi-fi to all residents, and residents often have weak connections, and Lowell Housing Authority. In some cases, municipalities were concerned about how to manage open wi-fi networks securely and prohibit illegal or undesirable internet uses through public networks.

STATE AND FEDERAL AGENCIES

State and Federal Agencies' online requirements create digital divides.

Libraries and other service providers commonly cited a concern that much of their digital assistance to residents was for state and federal agencies, even for routine tasks such as making appointments at the Registry of Motor Vehicles or utilizing state or federal forms.

CROSS-AGENCY NEEDS

Several groups need upgraded computers.

Stakeholders noted that Chelmsford Senior Center's computers need to be upgraded. Latinx Center for Community Empowerment specifically needs new computers for its lab for the Spanish-speaking population.

FINDINGS FROM COMMUNITY MEMBER FOCUS GROUPS

HOUSING AUTHORITY RESIDENTS

Participants mentioned overall affordability, both for Internet subscriptions and for devices, as major challenges. They also expressed frustration regarding the lack of assistance from Comcast and other Internet service providers when establishing an in-home Internet connection. When asked about digital resources they'd consider using, participants expressed a lot of interest in a refurbishment program for device repair and reuse, a technology and Internet security training program, and a regional digital equity curriculum offered at libraries.

SPANISH SPEAKERS

Most participants use the internet for just about everything. One participant thought at first that they didn't need the internet, but now that they have it, they cannot imagine going without it. One participant's parents use the Wi-Fi they pay for via a hotspot. Participants are glad that T-Mobile and Verizon are available in addition to Comcast to expand plan options and prices. A couple of participants have had Internet problems, one of which was a problem with a neighbor who had the same account number and was receiving the service instead of them, while another explained that Internet access via an antenna could be unreliable. Many participants are interested in upgrading their homes and devices digitally, but a few lack the training and knowledge to do so. One participant lives with family members who are very experienced with the Internet and new

technology. Participants varied in having their devices in Spanish and English. One participant has their devices all in English in order to learn the language better. Participants faced challenges of high cost of services, primarily international calls, a lack of resources to print necessary documents, and the inability to use preferred Internet services. Though these participants did not personally go to restaurants or the library to address their digital needs, they acknowledged that many others do. The participants themselves find their offices and the schools most helpful. They expressed a lot of support for the following proposed resources: webpages and digital resources available in Spanish, digital literacy training incorporated into English Language Learning courses, and a Spanish-speaking tech consultant who has expertise in device usage and skills who can provide one-on-one assistance. Participants expressed a preference for learning in small groups, as well as flexible scheduling for training sessions as they are not always available in the evenings. All expressed concerns about Internet safety, particularly with regard to falling for scams, Internet safety for children, and tracking personal data. They all believed that governments should make Internet safety a higher priority for all users.

KHMER SPEAKERS

Many participants rely on the CMAA for reliable Internet service and tech support. Their Internet service is very slow at home despite its high cost. The library, hospital, and restaurants are also reliable sources of Internet service. All participants experienced the challenges of expensive Internet services, communicating with Comcast when in need of assistance, a lack of cell phone skills and resources to print necessary documents, and an inability to use a preferred Internet service. When asked about proposed resources, participants expressed support for digital literacy trainings incorporated into English Language Learning courses, webpages and digital resources available in Khmer, and having a Khmer-speaking tech consultant who has expertise in device usage and skills available to provide one-on-one assistance. All expressed concern about Internet safety, especially when it comes to banking information.

INDIVIDUALS LIVING WITH DISABILITIES

Participants emphasized the need and benefits of having closed captioning as a more readily available resource. Making assistive technology more widely available is crucial. Assistive technology can include devices with fewer buttons, different style mouse pads, different sized screens, and options to zoom in to see text onscreen. Dragon software helps with speech and text. One-on-one training sessions would be the most helpful.

SENIORS

Participants mostly had reliable Internet service, but all agreed that Verizon and Comcast are too expensive primarily because services are primarily part of larger packages, and not all features are wanted or needed. There are a couple of sections of Westford, such as Pine Street and a part of Nab and Polly Road, that are the last to get fixed after a storm or power outage. Participants primarily use the Internet for healthcare needs, maintaining family and social connections, civic engagement,

obtaining public benefits, banking, shopping, repair instructions, safety alerts, and accessing YouTube. Participants expressed interest in being able to access Town Meetings remotely, which is not yet legal in Massachusetts. Their biggest barrier to using the Internet is coming across dead zones for phone service. When it came to helpful digital devices, participants mentioned iWatches, hearing aids with Bluetooth connectivity, and software that blocks ads. One participant wanted to be able to access their car's computer without going to a mechanic. Another used Alexa to practice singing. Internet safety was a huge concern for participants, with some experiencing situations in which a scammer claimed that sensitive data was stolen. Another safety concern was online bullying among teenagers. Participants expressed support for many proposed resources, including a reuse and refurbishment program for digital devices, a separate digital training program each for Mac and Window computer skills, a digital training program that pairs seniors and students together to provide one-on-one digital literacy training, and a written guide to technology basics/tips, in the form of a brochure, cartoon strip, or a video. Participants stated that companies going paperless is exclusionary to those who are not comfortable shopping online.

RECENT IMMIGRANTS

Of the seven participants, three relied exclusively on cell phones due to the high cost of Internet plans in addition to rent. One participant bought different phone plans with various numbers of minutes and amounts of data. Another participant relied on friends and family to assist them with all digital needs. Participants expressed the desire to use the Internet to learn English and to search for and find a job. Many want to obtain additional devices besides cell phones, such as tablets, computers, and iPads. Participants have dealt with many challenges with regard to digital access, including the high cost of services, use and maintenance of devices, an inability to use their preferred Internet service, and slow Internet speeds. Only half of participants expressed concerns about Internet safety. A couple of participants have received assistance with digital needs at the International Institute of New England and the doctor's office. Few used churches, the library, or schools. Participants expressed support for language-related resources such as webpages and digital resources in languages such as French, Arabic, Spanish, and Swahili, and digital literacy training incorporated into English Language Learning courses. They also unanimously supported a Tech Goes Home Program. Another resource they expressed interest in were classes in English and Spanish where one can learn how to use technology and programs such as Instagram and YouTube.

FORMERLY INCARCERATED INDIVIDUALS

Participants expressed a lot of concerns over pop-up ads and viruses. The consensus among them was that iPhones are more dangerous than Androids due to iPhones being able to track users more easily. They expressed concerns about hackers and scammers. One participant had a scammer call their grandmother asking for bail money because they were back in jail. In reality, they hadn't even been arrested at that point. Running a scam is a bigger money maker today than selling drugs. They rely on their families, friends, and Thrive Communities to provide them with support for Internet

and device access. Most businesses provide free Wi-Fi. Many participants enjoy using PS5s for entertainment.

SMALL BUSINESS OWNERS

Participants all emphasized the importance of Internet access to the daily operation of their businesses. One participant expressed frustration with the lack of a proper wireless signal. Another participant emphasized the need for Internet access in order to use design software and communicate with clients and vendors. All participants agreed that it can be expensive and challenging to keep up with digital upgrades and keep their businesses running smoothly. They expressed a need for resources such as funds, training, easier digital access, new point-of-sale systems, new website looks, and any new tools to improve overall workflow. Digital training topics of interest included social media, online marketing, digital literacy, technical skills, website development, financial management software, Google Analytics, and PubNet. The biggest challenge is figuring out how to balance the time needed to learn all these skills while also running a business day-to-day.

Appendix 3: Implementation Guide

This implementation guide is provided to give enough information for a "first step" on any of the actions in the Recommendations section of a plan. A municipality or other stakeholder should be able to use this guide to understand the steps needed to complete the action, how the action would address digital equity gaps in the region, possible funding sources, and knowledge resources.

The "Resources" column in each action provides an estimate for the level of investment for each recommendation as follows:

$: This action can be achieved with little additional investment.

$$: This action requires an attainable level of new investment.

$$$: This action requires a level of investment that may be hard to achieve.

STRATEGY 1: BUILD CAPACITY TO IMPLEMENT AND EVALUATE DIGITAL EQUITY PROGRESS

Digital equity is a relatively new domain for municipal governments and community-based organizations compared to issues like housing, recreation, or transportation. There is no "department" of digital equity, so to address the digital divide, communities and the region will need to build new capacity. Staff, budget, organizational structure, and other resources and capacities are

needed to support broadband access, device access, and digital literacy, and to evaluate progress toward the implementation of the digital equity plan. In some cases, this may mean designating existing staff, departments, or organizations to include digital equity in their work and responsibilities, while in other instances new staff or structures will be needed to advance digital inclusion and measure impact. Either way, building capacity requires access to resources for addressing the digital divide, necessitating the pursuit of various funding sources to kickstart digital equity work—and sustain it.

FORM A REGIONAL DIGITAL EQUITY TASK FORCE

#	Implementor(s)	Priority	Time Scale	Resources
1.1	Municipal Leadership	High	Short Term	$

In order to implement the plan, track progress toward advancing digital equity, and coordinate regionally, there needs to be a designated regional structure run by a group of trusted individuals. A digital equity task force or steering committee with representation from all municipalities and from key community stakeholders can play just that role. The task force could have "formal" membership with staff and stakeholders appointed by municipal executives or could be more informal in nature.

Other roles of a task force could include sharing best practices across nonprofits and municipalities; developing region-wide collaborative programs; evaluate progress on the measures of success within this plan; provide an outlet for communities with more resources to share and collaborate with others; and play an advocacy or liaison role to facilitate more coordination between local and state agencies.

Examples, case studies, or further reading to support implementation

- After adopting a digital equity plan in early 2025, the City of Gloucester convened a Digital Equity Task Force, facilitated by Sawyer Free Library Director Jenny Benedict and made up of city staff and community-based organizations.
- The National Digital Inclusion Alliance offers guidance and templates for communities getting started with forming a digital inclusion coalition:
    - NDIA Digital Inclusion Coalition Guidebook: https://www.digitalinclusion.org/resource/digital-inclusion-coalition-guidebook/
    - NDIA, Digital Inclusion Coalition Leadership Brief: https://www.digitalinclusion.org/resource/coalition-leadership-brief/

BRING ON A REGIONAL DIGITAL NAVIGATOR TO SUPPORT AND COORDINATE EXISTING PROGRAMS AND TO STAFF THE DIGITAL EQUITY TASK FORCE

#	Implementor(s)	Priority	Time Scale	Resources
1.2	Digital Equity Task Force, Municipal Leadership	High	Short Term	$$

Hiring a regional digital navigator is critical for bridging gaps between residents and digital services across municipalities. This role would support the task force by coordinating digital literacy training, helping residents sign up for affordable internet plans, distributing devices, and providing direct support in navigating online resources. The navigator would also build connections with community-based organizations, schools, and libraries, etc., ensuring that programs reach priority populations.

Examples, case studies, or further reading to support implementation

- The National Digital inclusion Alliance (NDIA) has various resources on digital navigators:
  - NDIA: What is a Digital Navigator: https://www.digitalinclusion.org/digitalnavigatormodel/
  - NDIA Digital Navigator Baseline Job Description: https://www.digitalinclusion.org/resource/dn-job-description/
  - NDIA 2025 Digital Navigator Toolkit: https://www.digitalinclusion.org/resource/2025-dn-toolkit/

HIRE OR APPOINT DEDICATED DIGITAL EQUITY STAFF

#	Implementor(s)	Priority	Time Scale	Resources
1.3	Digital Equity Task Force, Municipal Leadership, Digital Equity Service Providers	Medium	Long Term	$$$

Staff dedicated to digital equity—whether shared regionally or municipal-specific—will strengthen implementation capacity. Digital equity staff will be needed to oversee and carry out program work and coordinate with the regional navigator and with the task force to monitor progress as the plan is implemented. In some cases, more technical staff may be needed to support work focused on devices, equipment and infrastructure, while cultural and language competency may be most relevant for other important aspects of digital equity work, such as reaching households experiencing the digital divide.

In higher-need communities where challenges like language barriers, affordability, and digital literacy gaps are more acute, new municipal staff positions may be needed; in other communities, digital equity work may be able to be addressed regionally, contracted with service organizations, or incorporated into existing staff responsibilities. Part time staff or contractors, digital equity fellows or interns can complement full time staff, allowing even resource constrained municipalities to add capacity for digital equity implementation. No matter the specific arrangement, staff capacity is necessary to ensure digital equity becomes an ongoing, sustained part of municipal service delivery.

Examples, case studies, or further reading to support implementation

- Boston first hired full time dedicated digital equity staff, a broadband and digital equity advocate, in 2016, one of the first municipalities to do so: https://www.digitalinclusion.org/blog/bostons-broadband-and-digital-equity-advocate/

- As of 2025 Boston has a dedicated digital equity team with a digital navigator and digital equity manager overseen by a chief digital equity officer and director of broadband, alongside a network support IT team: https://www.boston.gov/departments/broadband-and-cable/broadband-and-digital-equity
- Since the covid-19 pandemic, many local governments now have full time dedicated digital equity staff, including the city of Somerville.

PURSUE STATE, FEDERAL, AND FOUNDATION GRANTS OR FELLOWSHIPS TO SUPPORT DIGITAL EQUITY EFFORTS

#	Implementor(s)	Priority	Time Scale	Resources
1.4	Digital Equity Task Force, Municipal Grant Writers	High	Short Term	$

Actively seeking external funding through state, federal, and philanthropic sources will provide resources for municipalities to implement and facilitate digital equity initiatives at a scale more responsive to the need. While building digital equity into core budgets, operations and work should be a long-term goal for local government; grants can support the initial startup costs and provide a "runway" for building this capacity.

Thanks to federal programs like the Digital Equity Act (DEA) and Broadband Equity, Access, and Deployment (BEAD) Program—both part of the federal Infrastructure, Investment, and Jobs Act of 2021 (IIJA)—billions of dollars have been dedicated to digital equity at the federal level and Massachusetts itself has received over $147M dollars to advance broadband infrastructure improvements, device access programs, digital literacy skills and training. NMCOG municipalities and the region as a whole can apply for funding opportunities directly from the federal government from agencies like NTIA and the FTC and/or offered at the state level, often via the Massachusetts Broadband Institute (MBI). Many non-profits or other entities, like ISPs, also offer applications or partnership opportunities to provide program support at the local level, including entities participating in MBI's Digital Equity Partnership Program. Philanthropic entities like Connect Humanity, the Ford Foundation, and the Mozilla Foundation also offer grants to communities and non-profits to advance digital equity. Finally, applying to host a digital equity fellowship program like Lead for America's American Connection Corps can be another way to build capacity.

Examples, case studies, or further reading to support implementation

- NTIA BEAD Program: https://broadbandusa.ntia.gov/funding-programs/broadband-equity-access-and-deployment-bead-program
- LFA ACC Fellowship Program: https://www.americanconnectioncorps.org/
- MBI Digital Equity Partnership Program: https://broadband.masstech.org/partnershipsconne
- Connect Humanity - "Funding to bridge the digital divide: U.S. philanthropic giving to digital equity causes": https://connecthumanity.fund/research-philanthropic-giving-to-digital-equity/

OFFER MUNICIPAL AND/OR REGIONAL GRANTS, PARTNERSHIPS, OR CONTRACT OPPORTUNITIES TO SUPPORT COMMUNITY-BASED ORGANIZATIONS PROVIDING DIGITAL EQUITY SERVICES

#	Implementor(s)	Priority	Time Scale	Resources
1.5	Municipalities, Digital Equity Task Force, Philanthropic Funders	High	Short Term	$$$

Local government is just one part of the "ecosystem" of actors needed to advance digital equity. Municipalities and the NMCOG region can amplify the impact of digital equity work by providing targeted grants to community-based organizations (CBOs) that are already trusted by and embedded in priority populations. These organizations often have strong relationships with residents and can deliver tailored training, device support, and outreach in culturally and linguistically appropriate ways. This can be achieved by building digital equity programming into existing locally administered grant programs like CDBG, by partnering with non-profits to apply for grant programs together, or by dedicating other local funds to procure services or solicit proposals.

Examples, case studies, or further reading to support implementation

- Boston's Digital Equity Fund encouraged community based organizations to apply for support from the city to advance digital equity priorities, including Digital Navigation, Telehealth Programming, and Device Refurbishment: https://www.boston.gov/innovation-and-technology/2023-digital-equity-fund
- CDBG funds can be used to support community-based organizations and broadband infrastructure. HUD – Exchange - CDBG broadband infrastructure facts: https://www.hudexchange.info/resource/4891/cdbg-broadband-infrastructure-faqs

UNDERTAKE COORDINATED PROGRAM EVALUATION, INCLUDING CONDUCTING SURVEY ASSESSMENTS TO MEASURE PROGRESS

#	Implementor(s)	Priority	Time Scale	Resources
1.6	Digital Equity Task Force, Municipal Staff, Community Based Organizations (CBOs)	Low	Long Term	$

You can't improve what you can't measure. Implementing a coordinated program evaluation framework, including regular surveys and assessments, will help track progress and inform decision-making on digital equity initiatives. This might include evaluating individual programs run by public and private stakeholders such as libraries, Council's on Aging, and community-based organizations, or even following up with individual program participants or households to understand tech needs, progress, and impact. Beyond a focus on individual programs, digital equity evaluation should also involve community- and region-wide resident surveys, distributed in coordination with CBOs and school districts, as well as review of key digital equity metrics as federal data on broadband subscriptions and devices is updated.

Additionally, frameworks like the National Digital Inclusion Alliance's Digital Inclusion Trailblazers program set a national standard for local governments to track and evaluate digital equity work and capacity. Completing such a scorecard annually can be a great way to measure municipal and regional progress alongside specific program evaluation. Progress should be tracked with metrics, benchmarks, and qualitative measures of success both locally and regionally, and, ideally, communicated to the public, including online via a public dashboard or regular report.

Examples, case studies, or further reading to support implementation

- NDIA Trailblazers Program: https://www.digitalinclusion.org/digital-inclusion-trailblazers/
- NDIA Household Tech Checkup Tool: https://www.digitalinclusion.org/resource/tech-checkup-tool/
- City of Boston 2024 Digital Equity Survey: https://data.boston.gov/dataset/2024-digital-equity-survey
- NDIA Digital Equity Primary Data Sources: https://www.digitalinclusion.org/research-data/

STRATEGY 2: IMPROVE QUALITY, RELIABILITY, AND AFFORDABILITY OF BROADBAND SERVICES TO THE HOME, ESPECIALLY FOR PRIORITY POPULATIONS

At-home internet access is perhaps the most direct measure of the digital divide, and in Massachusetts, cost is the number one barrier. Municipalities can improve the quality, reliability, and affordability of at-home internet access through coordination with Internet Service Providers (ISP)s, and through investments and policies to improve access and competition at the regional, municipal and neighborhood scale. Because the digital divide does not impact all populations equally, municipalities should also pursue, facilitate or support interventions that improve broadband access at specific housing sites serving priority populations, such as older adults, people living with disabilities, low-income households, formerly incarcerated individuals, and individuals experiencing housing insecurity.

Recommendations to improve at-home internet access at the regional or community scale include actions focused on improving ISP low-cost plan sign-ups or expanding ISP coverage and competition, providing public or open infrastructure to increase consumer choice by building on existing municipal fiber networks or exploring open access networks through large scale infrastructure investment or through policies including dig-once policies and zoning and permitting reform.

TARGET BROADBAND IMPROVEMENTS AT SUBSIDIZED AND AFFORDABLE HOUSING SITES

#	Implementor(s)	Priority	Time Scale	Resources
2.1	Public Housing Authorities (PHAs), Community Development Corporations (CDCs), and other housing providers; Municipal IT Departments, Planning/Housing Staff	Medium	Long Term	$$$

Affordable housing sites house some of the region's most digitally vulnerable residents, including low-income families, older adults, and individuals with disabilities. These homes are often older, lacking modern wiring, and often higher density multi-dwelling units (MDUs) where multiple households can be served at the more efficient scale of the building or site. Retrofitting these sites with modern broadband wiring—such as fiber conduit or fiber service itself—enables greater quality and consumer choice, supporting equitable access for all residents. Additionally, implementing building-wide "Apartment Wi-fi" can provide affordable or even free internet as an amenity, reducing individual costs and simplifying connectivity for residents who may struggle with signing up for or maintaining private internet subscriptions. Municipalities can work with housing authorities, community development corporations, and private property owners to plan upgrades, identify funding sources (like BEAD or state programs) and secure grants (such as MAPC's Apartment Wi-Fi and Residential Retrofit programs), and coordinate implementation.

Examples, case studies, or further reading to support implementation

- MBI Residential Retrofit Program: https://broadband.masstech.org/retrofit
- MAPC Apartment Wi-fi Program: https://www.mapc.org/our-work/expertise/digital-equity/apartment-wi-fi/
- Education Superhighway Free Apartment Wi-Fi: https://www.educationsuperhighway.org/free-apartment-wifi/

COMMISSION A FEASIBILITY STUDY TO EXPLORE THE PROVISION OF MUNICIPAL INTERNET SERVICE OR PUBLIC ADMINISTRATION OF AN OPEN ACCESS NETWORK IN GREATER LOWELL.

#	Implementor(s)	Priority	Time Scale	Resources
2.2	Municipal Leadership, Municipal IT Departments	Medium	Long Term	$$

Municipal internet service could actually be a wide variety of models. The municipality can own, operate, or manage infrastructure and/or service. This could be through a full municipal to-the-home network, institutional network (I-Net), or an open access model. Regardless of the model, municipal internet service or administration of an open access network can increase affordability, improve reliability, and expand competition in communities with limited ISP choices. A feasibility study is the first step to evaluate technical, financial, and legal considerations for such an initiative, including an analysis of local needs, potential subscribers, cost structures, and governance options.

The study can also examine models like a Municipal Light Plant (MLP) or Enterprise Fund, as well as exploring opportunities for regional intermunicipal agreements. Municipalities can then use the findings to make informed decisions about investing in broadband as critical infrastructure to support economic development and digital equity efforts, from relatively modest or incremental efforts focused on expanding the reach of existing municipal infrastructure to additional community anchor institutions or in partnership with institutional partners like hospitals and universities, to more ambitious efforts to expand coverage and consumer choice in neighborhoods and communities.

Examples, case studies, or further reading to support implementation

- Chelsea Digital Access Plan: https://cms5.revize.com/revize/chelseama/Document_Center/Departments/Housing%20&%20Community%20Development/Chelsea%20Digital%20Access%20Plan%20-%20April%202023.pdf
- Everett Digital Access Plan: https://connecthumanity.fund/wp-content/uploads/2023/10/EVERETT-MA-DIGITAL-ACCESS-PLAN-FINAL-DRAFT-04.27.23.pdf
- Municipal Broadband in Cambridge: Feasibility and Business Model Options: https://www.cambridgema.gov/news/2023/03/cityunveilsreportonmunicipalbroadbandfeasibility
- Quincy Broadband Master Plan Summary Presentation: https://cms7files1.revize.com/quincyma2024/QUINCY,%20MA%20-%20BROADBAND%20MASTER%20PLAN%20SUMMARY%20PRESENTATION%20-%2012%2014%202020.pdf
- Concord Broadband: https://concordma.gov/467/Concord-Broadband
- Institute for Local Self Reliance, Community Networks, Start a Community Network: https://communitynetworks.org/content/start-community-network

RESEARCH AND ADOPT POLICIES TO SUPPORT BROADBAND INFRASTRUCTURE, ACCESS, AND COMPETITION, SUCH AS "DIG ONCE" POLICIES, STREAMLINED PERMITTING, AND PERMITTING BY-RIGHT TELECOMMUNICATIONS USES IN CERTAIN DISTRICTS.

#	Implementor(s)	Priority	Time Scale	Resources
2.3	Lowell City Council, Town Select boards, Cable and Technology Advisory Committees	Medium	Short Term	$

Policy levers at the local level can play a role in reducing the cost and complexity of broadband deployment or strengthening capacity for digital equity generally. Municipalities can review their zoning ordinances or bylaws, planning review processes, and permitting processes and other municipal codes and policies to identify opportunities to:

1. Streamline broadband access projects, and/or
2. Require infrastructure improvements.

Various best practices and examples exist for local policy supportive of broadband access. "Dig once" policies, for example, require that broadband conduit be installed when streets are opened for other work, saving money and time on future installations. Streamlined permitting processes for accessing utility poles or the right of way, or allowing certain kinds of telecommunications uses and facilities by-right in commercial, mixed-use districts, or other districts can make it easier for ISPs to deploy and expand service. Similarly, communities can consider requiring that new developments include modern fiber conduit as part of the site plan review process. Even simple definitions, like

defining broadband as a utility, or resolutions or proclamations committing to improving broadband access can help signal commitment to grant funders and to the private ISP market.

Examples, case studies, or further reading to support implementation

- Wireless Broadband Zoning Review Project: https://broadband.masstech.org/sites/default/files/2022-06/wireless-zoning-bylaw-report.pdf
- National League of Cities "The Power of Dig Once Policies": https://www.nlc.org/article/2023/05/18/building-resilient-communities-the-power-of-dig-once-policies/

PROMOTE AFFORDABLE BROADBAND PLANS AND LOW-INCOME PROGRAMS TO GET QUALIFIED HOUSEHOLDS ENROLLED.

#	Implementor(s)	Priority	Time Scale	Resources
2.4	Municipal Staff, Internet Service Providers (ISPs), Housing Providers, School Districts, CBOs	High	Short Term	$

Even where affordable plans exist, many eligible residents remain unconnected due to lack of awareness or difficulty navigating enrollment processes. Municipalities can close this gap by launching outreach campaigns through trusted community partners, schools, libraries, and housing authorities to promote federal programs like Lifeline or partnering with ISPs to better promote affordable plan options like Comcast/Xfinity's "Internet Essentials" plan. These efforts can include multilingual materials, public information sessions, and one-on-one assistance from digital navigators or community outreach staff. By prioritizing residents who have recently lost ACP subsidies or are otherwise unserved, municipalities can help ensure that no household is left behind due to cost barriers.

Examples, case studies, or further reading to support implementation

- Lifeline Support for Affordable Communications: https://www.fcc.gov/lifeline-consumers
- Comcast/Xfinity Internet Essentials: https://www.xfinity.com/learn/internet-service/internet-essentials
- NDIA Honor Roll of Low-Cost Plans: https://www.digitalinclusion.org/honor-roll-of-low-cost-plans/

INVENTORY AND MAP EXISTING BROADBAND INFRASTRUCTURE—INCLUDING EXISTING MUNICIPAL OR PUBLIC FIBER, PRIVATE FIBER, AND CELL SIGNAL COVERAGE—AND EXPLORE PUBLIC AND PRIVATE INVESTMENTS TO IMPROVE AND EXPAND SERVICE.

#	Implementor(s)	Priority	Time Scale	Resources
2.5	Municipal Planning Departments, Municipal IT Departments, ISPs	Medium	Long Term	$$

A clear, shared understanding of existing broadband infrastructure is foundational to planning effective improvements. Mapping municipal fiber, private provider coverage, and cell tower signals helps identify service gaps, underserved areas, and opportunities for new investment. Municipalities can use this data to negotiate with ISPs to fill gaps, prioritize upgrades, and explore creative uses of public infrastructure (like using existing conduits or utility poles). This process also strengthens the case for grants and investments and empowers municipalities to coordinate regionally on broadband infrastructure improvements.

Examples, case studies, or further reading to support implementation

- The City of Flagstaff, AZ publishes GIS data on existing and planned public fiber lines and conduit: https://gis.flagstaffaz.gov/portal/apps/webappviewer/index.html?id=624ea30cc172443eaeebab0245f69aae
- MBI Massachusetts Broadband Map: https://mapping.massbroadband.org/

SUPPORT OR PILOT MESH NETWORKS IN DENSELY POPULATED, HIGH-NEED NEIGHBORHOODS.

#	Implementor(s)	Priority	Time Scale	Resources
2.6	CBOs, CDCs, Tech Educators, Tech Schools	Low	Short Term	$$

Mesh networks offer a flexible and community-centered approach to internet access, especially in dense, low-income areas where traditional infrastructure might be limited or expensive. These networks use interconnected nodes (installed on rooftops, light poles, or other community infrastructure) to share bandwidth across homes and public spaces, creating a reliable web of connectivity. Municipalities can pilot mesh networks in neighborhoods with high concentrations of affordable housing, a mix of residential and commercial uses, or where residents have historically faced internet adoption barriers. Partnering with community organizations, technology providers, or nonprofit ISPs, municipalities can explore grant opportunities to fund equipment and training. A pilot project also provides a learning opportunity to assess feasibility, address privacy and security concerns, and build community trust in innovative solutions to digital inequity.

Examples, case studies, or further reading to support implementation

- Shareable, How to set up a mesh network in your neighborhood: https://www.shareable.net/how-to-set-up-an-open-mesh-network-in-your-neighborhood/
- HighSpeedInternet.com How to Set Up a Mesh Network: https://www.highspeedinternet.com/resources/how-to-set-up-mesh-network
- Salem Point Neighborhood / North Shore CDC Mesh Network: https://www.eccf.org/blog/2022/11/10/digital-equity-it-all-comes-together-in-the-point/

STRATEGY 3: ENHANCE DIGITAL ACCESS IN PUBLIC SPACES AND FACILITIES

Local governments are often best equipped to ensure digital access in public spaces, like public parks and buildings. Freely available Wi-fi networks, computers, and other devices or equipment like digital screens/kiosks and charging stations, can provide numerous benefits to all members of the public and can provide a digital access safety net to the most vulnerable.

These recommendations focus on improvements to public facilities, including parks and open spaces as well as buildings, where municipalities can invest in network infrastructure, equipment or devices to provide free wi-fi, shared computer workstations, or otherwise enhance digital access.

INVENTORY DIGITAL ASSETS AND NEEDS IN PUBLIC FACILITIES TO IDENTIFY AND IMPLEMENT "QUICK WIN" IMPROVEMENTS SUCH AS ADDING DEVICES OR EXPANDING WI-FI NETWORKS.

#	Implementor(s)	Priority	Time Scale	Resources
3.1	Municipal Facilities Managers, School Facilities Managers, Municipal IT Departments, School District Technology Departments, Municipal Parks Departments, Municipal Public Works Departments, Municipal Planning Departments	High	Short Term	$$

Identifying existing assets and gaps in equipment, connectivity, and accessibility is a foundational step to enhancing digital access in public space. With an inventory of existing digital assets in public facilities—including parks, plazas, libraries, senior centers, community centers, school buildings, town halls, and other municipal buildings—municipal staff can audit needs and opportunities, revealing outdated computers, slow Wi-Fi, or insufficient device access as well as assets that could be more fully leveraged, such as existing staff Wi-fi networks with enough bandwidth to provide access to the public via guest login access. With this baseline, municipalities can identify and implement "quick win" improvements like:

1. Expanding Wi-Fi networks with additional access points,
2. Adding guest networks to municipal buildings,
3. Purchasing additional modern computing devices,
4. Adding shared workstations or kiosks in libraries and community centers,
5. Installing new equipment and infrastructure like charging stations in libraries, community centers, or outdoor parks and plazas,
6. Supporting storage options for unhoused or unsheltered people to protect digital devices from loss, theft, or damage while working on providing permanent housing,
7. Working with state and federal agencies such as the RMV to provide registration kiosks at state agencies to fill application forms or schedule appointments,

8. Creating telehealth/telelearning pods for private online sessions in libraries or community centers, or
9. Even making non-technical improvements like adding tables and seating to an area with an existing Wi-fi guest network.

By focusing on these small-scale but high-impact interventions, communities can make meaningful, incremental progress that provides a safety net for those experiencing the digital divide, and enhances access for everyone, while modernizing and improving municipal digital capacity and infrastructure. Additional support can be provided to navigate any safety, security, or logistical concerns.

Examples, case studies, or further reading to support implementation

- NDIA's asset mapping guidance can serve as a starting point for inventorying digital equity resources in public spaces and facilities: https://www.digitalinclusion.org/asset-mapping/
- Smartsheet - IT Equipment Inventory Template (google sheet): https://docs.google.com/spreadsheets/d/1I0krlyjpVxL878qcyjWHn0Vli21BX7c836XbMxOu6lQ/edit?gid=2079177336#gid=2079177336
- City of Philadelphia publishes a map and dataset with an inventory of city-owned sites where free Wi-fi is available to the public: https://opendataphilly.org/datasets/free-wifi/

PARTNER WITH THE BUSINESS COMMUNITY TO EXPLORE AND PROMOTE THE PROVISION OF FREE WI-FI ON MAIN STREETS AND IN COMMERCIAL CORRIDORS AND OTHER "THIRD SPACES"

#	Implementor(s)	Priority	Time Scale	Resources
3.2	Local Businesses, Merchants Associations, Chambers of Commerce, Municipal Economic Development Offices	Low	Long Term	$

Partnering with local businesses to provide free Wi-Fi in downtowns, main streets, and commercial corridors strengthens digital access while promoting local economic development. Such partnerships can leverage existing infrastructure—like lampposts or storefronts—to extend Wi-Fi coverage to outdoor seating areas, sidewalks, or plazas. This helps residents and visitors stay connected and encourages people to spend more time in commercial areas, support small businesses as well. Municipalities can facilitate these partnerships by convening business associations, offering small grants or technical assistance, or even just by developing guidance or helping to promote existing free Wi-fi available at local business locations.

Examples, case studies, or further reading to support implementation

- MIT News, Kendall Square Wi-fi: https://news.mit.edu/2016/free-kendall-square-wi-fi-1128
- City of Pittsfield Free Downtown Wi-fi: https://www.cityofpittsfield.org/press_detail_T32_R918.php

DEPLOY FREE WI-FI IN PARKS, PLAZAS AND OTHER PUBLIC SPACES SUCH AS AT OR NEAR TRANSIT STATION STOPS AND IN THE IMMEDIATE VICINITY OF MUNICIPAL FACILITIES.

#	Implementor(s)	Priority	Time Scale	Resources
3.3	Municipal Parks Departments, Municipal IT Departments, Transit Operators, Municipal Public Works Departments, Municipal Facilities Managers, School Facilities Managers, MA Department of Conservation and Recreation (DCR), National Park Service (NPS), "Friends of" Parks Groups	Medium	Long Term	$$

Free wi-fi access can transform parks, plazas and other public spaces into digital access hubs, allowing residents and visitors alike to connect to the internet in a location that doesn't require a purchase or membership. Wi-fi networks in parks and plazas can benefit municipalities as well, supporting additional uses and programming like technology-forward events or outdoor classroom spaces, while also encouraging park users to linger, bringing vibrancy and safety to public areas.

To identify possible sites, municipalities should consider both technical feasibility and community need. Sites with existing network infrastructure will be most feasible, requiring only additional access points and other network equipment to extend an existing network or to convert a wired signal into a wireless signal. For example, adding free public Wi-fi access to the grounds or immediate vicinity of a municipal building, like a school that adjoins a park, may take little more than installing outdoor access points to extend a Wi-fi network already available indoors. Other sites without existing network access will require adding infrastructure, a proposition that can be more or less labor and cost intensive depending on how far the site is from a network backbone. In considering community need, municipalities should prioritize sites that are well used and visited, especially where people gather and linger, and especially in low-income neighborhoods or other locations easily accessed by populations that may lack reliable broadband access at home.

Depending on technical capacity and experience, free Wi-fi networks can be managed by municipal IT departments themselves similarly to existing guest networks at municipal buildings or can be installed and managed by a Managed Service Provider (MSP) that can monitor and manage network traffic and ensure network performance, privacy, and security for users and for the municipality.

Examples, case studies, or further reading to support implementation

- Public Wi-fi Supercluster Blueprint: https://pages.nist.gov/GCTC/uploads/blueprints/20170823-GCTC-PWSC-Public-WIFI-Blueprint-FINAL-v2.pdf
- BKLYNConnect Playbook: A Guide for Piloting Public Wi-fi In Your Neighborhood: https://static.bklynlibrary.org/prod/public/documents/general/BKLYNConnect_Playbook.pdf

- State Tech Magazine - 4 Considerations for Building Public Wi-fi Networks: https://statetechmagazine.com/article/2020/03/4-considerations-building-public-wi-fi-networks
- Boston Wicked Free Wi-fi: https://www.boston.gov/departments/innovation-and-technology/wicked-free-wi-fi
- Cambridge Public Internet: https://www.cambridgema.gov/departments/informationtechnology/cpi
- South Hadley Public Wifi: https://www.southhadley.org/1369/Public-Wifi
- NMCOG LRTA Bus Stop Inventory: https://storymaps.arcgis.com/stories/46205cdc704e46c0bf8673e5b64ffab4

EXPAND ACCESS TO AND UPGRADE COMPUTER LABS AND SHARED DEVICES AT SENIOR CENTERS, LIBRARIES, SCHOOLS, COMMUNITY CENTERS, NONPROFITS, AND OTHER LOCAL AND REGIONAL ENTITIES OFFERING DEVICE ACCESS.

#	Implementor(s)	Priority	Time Scale	Resources
3.4	COAs, Libraries, School Districts, Community Centers, CBOs	High	Short Term	$

Many existing computer labs or shared device programs throughout the region have experienced challenges meeting community need, whether because of outdated computers, inadequate devices to accommodate a diversity of users, or long wait lists due to high demand. Some locations that serve as gathering spaces and locations for educational and service support, such as senior centers or community centers, lack computer labs altogether. On the other hand, some existing computer labs may be underutilized, due to lack of awareness or limited public access. This means municipalities have an opportunity to expand successful programs and meet high need populations where they are by purchasing additional computers, laptops, and adaptive devices or by offering grants or other supports to partners to upgrade and expand computer labs and lending programs. Computer labs should also be marketed and made more widely available for public use where feasible, for instance by expanding hours of operation or allowing community groups to rent or reserve computer lab space (at, for example, schools or municipal training centers) for digital workshops or skills trainings.

Examples, case studies, or further reading to support implementation

- Greater Lowell Tech facilities rental form: https://www.gltech.org/community-services/facility-rental

WORK WITH AFFORDABLE HOUSING PROVIDERS AND SHELTERS TO BRING COMPUTER LABS OR SHARED DEVICES TO AFFORDABLE HOUSING AND SHELTER SITES.

#	Implementor(s)	Priority	Time Scale	Resources
3.5	PHAs, CDCs, Shelters, Housing Providers	High	Short Term	$

Installing computer labs or workstations in common areas or otherwise providing shared devices at affordable housing locations and shelters can ensure baseline device access to some of the region's highest priority residents, supporting job searches, educational activities, access to social services, telehealth appointments, etc.—especially for those who may lack internet or devices at home. Municipalities can work with housing authorities, CDCs and other housing providers to secure funding, procure equipment, and install devices.

Examples, case studies, or further reading to support implementation

- Cambridge Housing Authority Public Computing Centers NTIA Case Study (2013): https://www2.ntia.gov/files/cambridge_housing_authority_case_study_report_round_2.pdf
- The Somerville Housing Authority Installed a modern computer lab in the Mystic Activity Center, a community center adjacent to the Mystic Apartments affordable housing site: https://sha-web.org/mysticActivityCenter.aspx
- City Bar Justice Center - How Access to Internet and Technology Resources Can Support Homeless Families' Transition out of Homeless Shelters: https://www.citybarjusticecenter.org/wp-content/uploads/2020/05/Homeless-Need-Internet-Access-to-Find-a-Home-2020-Report.pdf

STRATEGY 4: SUPPORT PROGRAMS AND SERVICES THAT REACH PRIORITY POPULATIONS AND ADVANCE ALL PILLARS OF DIGITAL EQUITY

Some residents lack access to a high-speed broadband connection or to appropriate devices at home or otherwise lack the digital literacy and tech skills needed to use a computer and take full advantage of the internet in ways that support participation in modern life. These residents need support, and often for multiple "pillars" of digital equity. To successfully meet the need, support services should layer internet access, device access, and digital skills training, and do so in ways that are accessible to diverse populations with different cultures, language needs, and with different schedules, habits, and access to mobility.

This means that support is needed from national, state, and local organizations that focus on the core pillars of digital equity: helping residents sign up for low-cost internet plans, distributing devices, providing skills training and tech support. It also means that support is needed from trusted local organizations and individuals who can meet priority populations where they are, in ways that understand local context, cultures, and language needs. Where organizations are already doing digital equity work in Greater Lowell, these programs often need more support to expand to meet resident needs. Where organizations are already reaching priority populations, these programs often have an opportunity to layer in culturally competent support for digital equity alongside existing services.

CREATE OR EXPAND PROGRAMS THAT INCLUDE DEVICE DISTRIBUTION, DIGITAL LITERACY TRAINING, AFFORDABLE ACCESS, AND/OR TECH SUPPORT, WITH A FOCUS ON PROGRAMS THAT HOLISTICALLY COMBINE ELEMENTS FOR ONE OR MORE PRIORITY POPULATIONS.

#	Implementor(s)	Priority	Time Scale	Resources
4.1	Municipal IT Departments, Diversity Equity and Inclusion Staff, COAs, Libraries, School Districts, Community Centers, CBOs	High	Short Term	$$

Throughout stakeholder interviews and best practice guides, a holistic approach to digital equity showed the biggest impacts. This was shown through a pilot program funded by the Digital Equity Partnership Program and implemented by UMass Lowell. The program paired training in classroom settings, additional 1:1 support, and a "tech goes home" model that provided appropriate devices to train the entire family. Priority populations include:

- Older Adults and Veterans
- Those Living with Disabilities
- Newcomers and English Language Learners
- Lower-Income Populations
- Formerly Incarcerated People
- Youth in Priority Households

Stakeholders noted that the most success was found when classes assembled a cohort or group to take a series of courses together with additional 1:1 training and consulting for the household. Stakeholders noted that the Digital Equity Partnership Program-funded classes led to excellent outcomes and expressed the hope for it to be expanded. Topics of interest to the target population were especially important, with the topic of interest of each population explored in the qualitative data in Appendix 2.

In addition, as much as possible, programs should include cultural, language, or ability sensitivity, ideally led by a member of the target population. When possible, they should take place in areas priority populations already live, work, or visit. This type of program could be paired with any of the other recommended actions in this Strategy and take advantage of the regional collaborations in Strategy 5.

Examples, case studies, or further reading to support implementation

- UMass Lowell has been funded by the MBI Digital Equity Partnership Program to provide digital navigation, device access, and digital literacy support in partnership with local organizations, such as the Coalition for a Better Acre or African Community Center, already engaging priority populations: https://www.uml.edu/news/stories/2024/digital-equity-grant.aspx
- Tech Goes Home offers holistic support for device distribution, at home internet access via hotspots, and digital literacy. They also partner with local organizations to bring their curriculum and support model to those in need: https://www.techgoeshome.org/

- The MBI Digital Equity Partnership Program funds a number of organizations providing digital literacy, device access, and education + outreach: https://broadband.masstech.org/education-outreach-and-adoption-program

SUPPORT DIGITAL ACCESS FOR THOSE LIVING WITH DISABILITIES, INCLUDING BY PROVIDING ADAPTIVE DEVICES AND CATERED TRAINING/SUPPORT.

#	Implementor(s)	Priority	Time Scale	Resources
4.2	Diversity Equity and Inclusion Staff, COAs, Libraries, CBOs	High	Short Term	$$

Access to devices remains a key barrier for those living with disabilities who may require adaptive technologies such as screen readers, larger monitors, or specialized software. Municipalities and regional partners can work together to identify high-demand device access programs—like those that may already exist at libraries, senior centers, community centers, and nonprofits—and ensure they are equipped with up-to-date devices that meet diverse needs.

For example, stakeholders noted there's a gap between young people still attending school and elders with access to senior-centered programs for people with disabilities that require specialized digital devices and training on how to use them. Residents living with disabilities, who fall outside the targets of technology programs for youth and older residents, need support in accessing appropriate devices with support to use them efficiently.

Other considerations for these types of programs are described in Action 4.1.

Examples, case studies, or further reading to support implementation

- Assistive Technology Industry Association - Resources: https://www.atia.org/home/at-resources/what-is-at/
- The Massachusetts Association for the Blind and Visually Impaired (MABVI)'s offers Access Technology Training to help blind or visually impaired people learn to use technology: https://www.mabvi.org/services/assistive-technology/
- The Arc of Massachusetts Technology Forward also provides tools and resources on technology for work, health, learning, communication and much more: https://thearcofmass.org/technology-forward/

PROVIDE TAILORED PROGRAMS FOR OLDER ADULTS AND VETERANS TO INCREASE COMFORT WITH TECHNOLOGY, INCLUDING BASIC TECH SKILLS, CYBERSECURITY, AND ONLINE SAFETY TRAINING.

#	Implementor(s)	Priority	Time Scale	Resources
4.3	COAs, Veterans Services Departments, Healthcare Organizations, CBOs	High	Short Term	$$

Older adults and veterans are among the most impacted by the digital divide, often lacking foundational tech skills or confidence in navigating online platforms. Although the needs assessment noted that multiple priority populations need additional support related to basic skills,

cybersecurity, and online safety, older adults in particular were most often noted as lacking confidence or comfort in learning digital literacy skills. Municipalities can partner with Councils on Aging, veterans' organizations, and local nonprofits to deliver accessible, targeted training that covers essential topics like using smartphones and tablets, managing email, accessing online services, and practicing online safety to protect against scams and fraud.

This could include providing one-on-one training and support, small group classes, and printed materials in plain language, and could even include helping CoAs partner with high schools to offer internships or volunteer opportunities for young people who can provide individualized tech support to ensure that all older adults and veterans can fully access online resources. These programs may also find success in recruiting older adults with greater comfort to introduce these topics to other older adults who may not feel as confident. These populations may need specialized devices such as simplified smartphones and training on how to learn them as well.

Other considerations for these types of programs are described in Action 4.1.

Examples, case studies, or further reading to support implementation

- MA Healthy Aging Collaborative - Digital Equity Resources: https://mahealthyagingcollaborative.org/resources/resource-library/digital-equity-resources/
- AgeSpan Digital Access Program: https://agespan.org/wp-content/uploads/2024/03/FINAL_Digital_Access.pdf
- Teeniors: https://www.teeniors.com/
- Net Literacy Indiana - Senior Connects: https://www.netliteracy.org/senior-connects/

INCORPORATE TECH TRAINING, DEVICE DISTRIBUTION AND OTHER DIGITAL EQUITY SERVICES INTO EXISTING PROGRAMS FOR IMMIGRANTS AND REFUGEES, INCLUDING COURSES FOR ENGLISH LANGUAGE LEARNERS.

#	Implementor(s)	Priority	Time Scale	Resources
4.4	CBOs, School Districts, Cultural Centers, English Language Instructors	High	Short Term	$$

Immigrants, refugees and other newcomers to the Greater Lowell region often face unique challenges in using technology and accessing digital services, including language and cultural barriers and unfamiliarity with devices and norms. These barriers can be further exacerbated when it comes to online government services, due to distrust of government and concerns about privacy. At the same time, these populations are often already participating in various programs and classes and are often eager to learn. By integrating tech training, device distribution, and other digital equity support services into programs that already serve these populations—such as English language learner (ELL) classes and cultural centers—municipalities can leverage trusted relationships and existing outreach to improve digital inclusion.

When possible, these programs can utilize the lessons learned by the work funded by the Digital Equity Partnership Program, incorporating a "tech goes home" model to train the entire family--

youth and adults--and make sure proper devices are included. This should include regularly scheduled trainings hosted by a network of organizations with flexible schedules.

Other considerations for these types of programs are described in Action 4.1.

Examples, case studies, or further reading to support implementation

- "Language Barriers and Digital Equity", Benton Institute: https://www.benton.org/blog/language-barriers-and-digital-equity
- The Collegiate Charter School of Lowell offers free Adult ESL Digital Literacy Classes to CCSL families: https://www.collegiatelowell.org/64399_3
- Microsoft offers digital literacy education modules available in multiple languages: https://www.microsoft.com/en-us/digital-literacy

REACH HOUSEHOLDS WITH LOWER INCOMES BY PARTNERING WITH HOUSING PROVIDERS TO BRING TECH SUPPORT AND OTHER DIGITAL EQUITY PROGRAMMING TO AFFORDABLE HOUSING SITES, SHELTERS AND OTHER RESIDENTIAL LOCATIONS.

#	Implementor(s)	Priority	Time Scale	Resources
4.5	Housing Providers, CBOs	High	Short Term	$$

Households with lower incomes, including households with no income, are a key priority population that face the digital divide. Bringing digital equity programming to housing sites, including public housing, affordable housing, and shelters and supportive housing can reach many members of this priority population. Although not all households in this priority population live in this type of housing, providing programs at these housing types ensures that those residents have convenient access to the technical support they need without the barriers of transportation or scheduling.

Municipalities can collaborate with housing providers to bring on-site tech support, device distribution, and digital literacy training directly to where people live. This approach might include bringing existing programs at libraries or senior centers to housing sites or might involve bringing in nonprofits that specialize in digital literacy training like Tech Goes Home. This approach can also include training existing resident services staff to offer tech support and skills workshops as part of existing resident programs.

Other considerations for these types of programs are described in Action 4.1.

Examples, case studies, or further reading to support implementation

- The City of Somerville's Digital Bridge Initiative Partnered with the Somerville Housing Authority to provide digital navigation support for residents of affordable housing: https://www.somervillema.gov/dbi
- The NYC Neighborhood Tech Help program bringing library tech support staff into neighborhoods with a focus on serving section 8 residents: https://www.nyc.gov/assets/hpd/techhelp/index.html

PARTNER WITH HOSPITALS AND HEALTHCARE ORGANIZATIONS TO SUPPORT DEVICES ACCESS, DIGITAL SKILLS TRAINING AND ACCESS TO TELEHEALTH FOR PATIENT POPULATIONS.

#	Implementor(s)	Priority	Time Scale	Resources
4.6	Municipal Health Departments, Healthcare Organizations	Low	Short Term	$$

The healthcare system increasingly relies on digital tools for appointment scheduling, patient portals, and telehealth visits—yet many patients, especially those with lower incomes or language barriers, lack the devices and skills to fully participate. Municipalities can partner with local hospitals, community health centers, and healthcare nonprofits to offer device distribution, training on using telehealth platforms, and one-on-one tech support for patients. Similarly, libraries and other public facilities install telehealth pods or similar private spaces where a member of the public could safely and securely access virtual healthcare appointments and information. Hospitals often have access to funding sources and grants that municipalities and other community organizations do not, and integrating these efforts with existing community health worker or patient navigator programs can build trust and reach those who need it most.

Examples, case studies, or further reading to support implementation

- MBI Partnered with the Essex County Community Foundation to support "Telehealth Navigators" at the Lynn Community Health Center and at North Shore Community Health: https://broadband.masstech.org/news/massachusetts-fqhc-telehealth-consortium-announces-grant-essex-county-community-foundation
- The Greater Lowell Health Alliance's Community Health Needs Assessment calls for greater support for telehealth via device access and digital skills support for high-need patient populations: https://www.greaterlowellhealthalliance.org/health-priorities/needs-assessment/

BRING DEVICE ACCESS AND SKILLS TRAINING PROGRAMS TO INCARCERATED AND FORMERLY INCARCERATED INDIVIDUALS BY PARTNERING WITH DETENTION FACILITIES AND RE-ENTRY PROGRAMS.

#	Implementor(s)	Priority	Time Scale	Resources
4.7	Detention Facilities, Re-entry Programs	Low	Long Term	$

Individuals who are incarcerated or recently released often face significant digital skill gaps, leaving them at a disadvantage in job searches, education, and accessing services. Municipalities can partner with detention facilities, re-entry programs, and community-based organizations to provide device access and digital literacy training tailored to the needs of this population. Training might include using email, navigating job search platforms, understanding digital privacy, and learning how to apply for services online, or even include advanced technology skills training, like computer programming, to support this population in accessing employment opportunities.

Other considerations for these types of programs are described in Action 4.1.

Examples, case studies, or further reading to support implementation

- Benton Institute - Open Letter on Digital Equity for Incarcerated People: https://www.benton.org/blog/open-letter-state-broadband-leaders-digital-equity-incarcerated-people
- Ameelio - https://www.ameelio.org/
- The Last Mile MCI Shirley MA - https://www.mass.gov/news/massachusetts-department-of-correction-and-the-last-mile-celebrate-first-graduates-from-coding-program-at-mci-shirley
- Orijin - https://orijin.works/about/
- MA DOC Inmate Training and Education Policy - https://www.mass.gov/doc/doc-441-inmate-training-and-education/download

PROVIDE PROGRAMMING AND RESOURCES TO SUPPORT EMPLOYERS, JOB SEEKERS, AND THE SMALL BUSINESS COMMUNITY WITH RELEVANT WORKPLACE DIGITAL SKILLS.

#	Implementor(s)	Priority	Time Scale	Resources
4.8	Chambers of Commerce, Small Businesses, Large Employers, MassHire	Medium	Short Term	$$

The digital skills required in the modern workplace are evolving rapidly, leaving many job seekers and small businesses struggling to keep up, a reality for the NMCOG region we heard reflected in planning outreach and research. Municipalities can collaborate with local workforce boards, chambers of commerce, and educational institutions to offer training programs and/or device access programs that teach digital skills such as using productivity software and provide appropriate devices for modern jobs. These programs may help youth and adults suffering from the digital divide learn about and enter new career paths. Grants, regional programs, and partnerships or sponsorships with local corporations, technology companies, or other employers can help fund these initiatives.

Small businesses owned by members of priority populations face additional barriers due to time demands of operating a business, yet have unique technology needs such as social media marketing, e-commerce and accounting platforms, and procurement and installation of safe infrastructure and wi-fi. For programs supporting small businesses owned by members of priority populations, implementors should consider allowing flexible and self-paced training and specialized outreach including door knocking. Programs for these businesses may also include small-dollar grant programs for websites, social media management, or other digital services or direct grants or reduced-cost technical support for best online practices.

Supporting small businesses and job seekers in building these skills not only strengthens the local economy but also ensures that all residents have equitable access to employment opportunities in a digitally connected world.

Examples, case studies, or further reading to support implementation

- MassHire Digital Literacy Program: https://masshiredowntownboston.org/digital-literacy-program/
- Grants from the Workforce Innovation and Opportunity Act (WIOA) may provide potential funding opportunities to support employers and job seekers with digital skills.
- Technical assistance services from organizations that support underserved small businesses in Massachusetts are also available to provide multilingual, on-the-ground support.
    - MassDevelopment offers technical assistance that can be tailored to the digital needs of small businesses, including services in community visioning, marketing, and branding.
    - The Massachusetts Growth Capital Corporation (MGCC) provides grants through its Small Business Technical Assistance (SBTA) program, as well as other mini grants, to support small business owners with professional, technical, and operational services.
    - The Local Enterprise Assistance Fund provides solutions-oriented advisory services to underserved business owners in Massachusetts.
- Verizon's "Small Business Digital Ready" program offers online courses focused on digital skills training relevant to small businesses: https://www.verizon.com/about/responsibility/digital-inclusion/small-business-training
- The Google Grow platform offers online digital skills training for employees and for small businesses:
    - Grow your career - https://grow.google/grow-your-career/
    - Grow your business - https://grow.google/grow-your-business/

EXPLORE OPPORTUNITIES FOR EXPANDING DEVICE ACCESS THROUGH EXPANSION OF EXISTING DEVICE LENDING PROGRAMS AT LIBRARIES AND ELSEWHERE

#	Implementor(s)	Priority	Time Scale	Resources
4.9	Libraries, School Districts, Community Centers	Medium	Short Term	$$

Access to devices remains a key barrier for many residents—particularly low-income households that may not be able to afford devices, and those living with disabilities who may require adaptive technologies such as screen readers, larger monitors, or specialized software. Municipalities and regional partners can work together to identify high-demand device access programs—like those that may already exist at libraries, senior centers, community centers, schools, and nonprofits—and ensure they are equipped with up-to-date devices that meet diverse needs. Similarly, they can work with community organizations that successfully reach target populations to coordinate device access programming.

This activity might involve securing devices through donations, grants, or procurement, as well as researching and document best practices for device loaning (including hotspots, laptops, and other devices). Municipalities should consider a regional loaning model that would be able to efficiently marshal resources with economies of scale.

Examples, case studies, or further reading to support implementation

- Assistive Technology Industry Association - Resources: https://www.atia.org/home/at-resources/what-is-at/
- MACIR Device Donation: https://www.macir.org/donate-technology/
- Computers for People: https://www.computers4people.org/apply
- Somerville organized a tech donation drive in the fall of 2024: https://www.somervillema.gov/events/2024/10/05/somervilles-fall-tech-donation-drive

STRATEGY 5: COLLABORATE REGIONALLY TO EXPAND IMPACT AND UPLIFT EXISTING WORK

As research and outreach conducted during the planning process revealed, a number of organizations and initiatives are already doing great digital equity work in Greater Lowell. Coordinating, sharing, and regionalizing existing programs and resources is a key strategy for maximizing the impact of existing work, and expanding its reach to meet the needs of various communities and populations. For example, some residents aren't aware of existing programs that could connect them to cheaper internet or a new device, and better outreach and promotion can help. Some libraries have tech support expertise that others lack and could share staff support, program resources or expand service regionally to help. Similarly, programs and resources designed to support the general public could be catered to support a specific group, such as older adults, or translated to become accessible to Spanish speakers.

MAKE EXISTING DIGITAL EQUITY EDUCATIONAL PROGRAM MATERIALS MORE ACCESSIBLE AND ADAPTABLE BY INVENTORYING, SHARING, AND TRANSLATING FOR LANGUAGE ACCESS AND CULTURAL RELEVANCE.

#	Implementor(s)	Priority	Time Scale	Resources
5.1	Digital Equity Task Force, Regional Digital Navigator, Municipal Staff, Language Access Staff, CBOs	High	Short Term	$

Many organizations across the region have developed valuable educational materials—such as training guides, how-to instructions, and curriculum modules—that could benefit a broader audience if shared across the region's various program staff or made more accessible and relevant to diverse communities. Conducting an inventory of these existing resources helps identify what's already available, where gaps exist, and which materials could be adapted to serve non-English speakers or culturally specific audiences.

Sharing these resources across municipalities and community-based organizations and translating them into the region's most commonly spoken languages (such as Khmer, Spanish, and Portuguese), ensures that all residents can benefit from digital literacy programming. This collaborative approach amplifies the impact of existing investments, reduces duplication of effort, and builds a more inclusive digital learning ecosystem for priority populations.

Examples, case studies, or further reading to support implementation

- NDIA's asset mapping guidance can serve as a starting point for inventorying programs and program materials: https://www.digitalinclusion.org/asset-mapping/
- King County, WA - Digital Literacy Resources: https://www.seakingwdc.org/digital-equity-asset-map

CONNECT SIMILAR ORGANIZATIONS VIA PEER LEARNING COHORTS AND "TRAIN THE TRAINER" SESSIONS TO SHARE RESOURCES AND APPROACHES ACROSS MUNICIPALITIES.

#	Implementor(s)	Priority	Time Scale	Resources
5.2	Digital Equity Task force, Regional Digital Navigator, Municipal Staff, CBOs	Medium	Short Term	$

Frontline staff in libraries, senior centers, housing authorities, community-based organizations, and in certain municipal offices or departments (like IT, communications or constituent engagement) are often the first points of contact for residents seeking help with technology. These staff develop approaches and expertise for addressing digital equity for their specific stakeholders within the context of their field. However, our research showed that similar organizations or departments aren't frequently talking to each other across municipalities. To accelerate shared learning and avoid having to "reinvent the wheel", municipalities can facilitate peer digital equity learning cohorts or "communities of practice" with staff of similar organizations or departments communicating on an ongoing basis to ask questions about common challenges and share digital equity resources and approaches specific to their domain. This can be achieved through the digital equity task force by designating sector- or topic-specific subcommittees and/or by bringing digital equity challenges to existing peer learning networks and professional associations where staff already connect with peers. By coordinating regionally, staff can share success stories and teach each other how to replicate what's working via formal or informal "train the trainer" sessions. Ultimately all communities will benefit from a supportive digital equity learning network and knowledge base of shared challenges and solutions for program staff.

This model could facilitate regular direct training for the library, Council on Aging, and Community Based Organization staff on changing technology so they can help their constituents when asked for help. This should also include training on assisting people with disabilities that create a digital divide, including neurodivergent people.

Examples, case studies, or further reading to support implementation

- The Alliance for Digital Equity in Western MA facilitates digital equity "networks" with email lists and facilitated monthly zoom meetings for digital navigators, digital skills programs, libraries, and older adults: https://alliancefordigitalequity.org/network-building/
- MA Library Association shares resources with librarians, including a guide on digital technology and privacy https://guides.masslibsystem.org/digital-privacy-and-technology
- Mass Municipal Association has Member Groups that bring together municipal staff with similar roles for peer learning and resource sharing, including Member Groups for municipal

executive leadership and for municipal communications staff: https://www.mma.org/members/massachusetts-municipal-communicators/

- The MA Office of Municipal and School Technology (OSMT) supports local government efforts to use technology, including providing grants and publishing resources on topics like cybersecurity, GIS, and tech vendor procurement and fostering collaboration among municipal IT teams through events and online resource hubs, as well as email lists to establish community and encourage shared learning among IT Directors at a regional scale: https://www.mass.gov/info-details/partnership-and-engagement
- MA Councils on Aging have an "infohub" login for members: https://members.mcoaonline.org/MIC/login
- National Association of Housing and Redevelopment Officials MA Chapter: https://massnahro.org/
- MA American Planning Association (APA) has resources for planners and committees organized by topic area: https://www.apa-ma.org/membership/committees/

CREATE A REGIONAL PROGRAM TO COORDINATE DEVICE DONATION, REFURBISHMENT, AND DISTRIBUTION, PARTNERING WITH NON-PROFIT AND CORPORATE ENTITIES.

#	Implementor(s)	Priority	Time Scale	Resources
5.3	IT Departments, Corporate Partners, Non-profit Device Refurbishment or Distribution Partners	Medium	Long Term	$$

Adequate access to, and ideally ownership of, a modern computing device is one of the most immediate barriers to digital equity for low-income households, seniors, people living with disabilities, and other vulnerable populations. At the same time, the NMCOG region is home to many corporations, businesses, organizations, and even households that cycle through devices on a regular basis, creating an opportunity for donation, refurbishment, and redistribution.

While device donation and distribution can be coordinated at a local level, these are also activities that can achieve greater impact and efficiency on a regional scale. A regional program that coordinates device donation, refurbishment, and distribution could more efficiently meet resident needs while reducing e-waste and building partnerships across sectors. Municipalities can work together with nonprofits, schools, and corporate partners to collect surplus devices, refurbish them to a standard that ensures usability, and distribute them equitably to at-risk populations.

Establishing a centralized clearinghouse or logistics partner—such as an organization experienced in electronics recycling or refurbishment—can streamline donations and ensure that the right devices reach the right communities.

Examples, case studies, or further reading to support implementation

- MACIR Device Donation: https://www.macir.org/donate-technology/

- Computers for People: https://www.computers4people.org/apply
- Somerville organized a tech donation drive in the fall of 2024: https://www.somervillema.gov/events/2024/10/05/somervilles-fall-tech-donation-drive

CREATE A REGIONAL DIGITAL EQUITY RESOURCES DIRECTORY AND SHARED EVENTS CALENDAR, AND MARKET AND PROMOTE TO AT-RISK POPULATIONS AND THE ORGANIZATIONS THAT SERVE THEM.

#	Implementor(s)	Priority	Time Scale	Resources
5.4	Digital Equity Task force, Regional Digital Navigator, Municipal Staff, CBOs	High	Short Term	$

Residents often face confusion about where to find help with digital literacy training, affordable internet, device support, and other services. Even service providers and case managers themselves can lack familiarity with digital equity programs and resources available. A centralized regional digital equity resources directory and events calendar, hosted on a simple website or user-friendly platform, could compile information on digital equity services offered by libraries, senior centers, nonprofits, municipalities, and other local and regional partners. This resource should include multilingual materials, contact information, program eligibility details, and schedules of free or low-cost digital literacy classes and events. By marketing and promoting this directory to both at-risk populations and the organizations that serve them, municipalities can ensure that residents are connected to the right resources at the right time, while also fostering greater coordination and peer-to-peer learning and resource sharing among service providers themselves—ultimately fostering a sense of shared responsibility and reducing duplication of effort while amplifying the impact of existing initiatives. This directory can and should build on the digital equity asset inventory started by NMCOG and MAPC as part of the Greater Lowell digital equity planning process.

A centralized library of digital equity materials will benefit all organizations and could be directly accessed by the public. While curriculum modules can be utilized by CBOs seeking to develop digital literacy training programs, written “how-to” instructions in simple language, training videos, and similar materials could be used by a broad population base. Curriculum modules could be tailored for specific populations that meet special interests, such as

- Elders: Connecting with family, overcoming fears, health value of reducing isolation;
- Youth: Video games, video editing, and other areas that may capture youth interest; and
- People with disabilities: proper closed captioning and collaboration with CBOs that support people with disabilities.

Examples, case studies, or further reading to support implementation

- MBI Digital Equity Asset Inventory: https://broadband.masstech.org/massachusetts-digital-equity-asset-inventory

- NDIA Digital Inclusion Resources Library: https://www.digitalinclusion.org/resources/
- National Collaborative for Digital Equity, Digital Equity Resources Database: https://www.digitalequity.us/resource-database-search/
- MA Healthy Aging Collaborative - Digital Equity Resources: https://mahealthyagingcollaborative.org/resources/resource-library/digital-equity-resources/
- State of Hawaii Digital Equity Ecosystem Map and Resources Directory: https://broadband.hawaii.gov/deemap/

COLLABORATE REGIONALLY ON DIGITAL EQUITY ADVOCACY AND ISP ENGAGEMENT TO IMPROVE POLICY, EXPAND COVERAGE AND INCREASE AFFORDABILITY

#	Implementor(s)	Priority	Time Scale	Resources
5.5	Municipal Leadership, MA State Reps and Senators, Cable Advisory Committees, Municipal Legal Counsels, ISP Government Relations	Medium	Long Term	$

Many of the forces and actors shaping digital equity in communities, such as ISP markets and broadband policy, transcend municipal boundaries, making regional collaboration essential for effective advocacy and engagement with key entities like ISPs, state and federal policy makers, and funders. By presenting a united regional front, communities can leverage greater bargaining power to hold ISPs accountable, coordinating with each other, with NMCOG, and with community organizations to engage ISPs in discussions about coverage gaps, affordability concerns, and service quality issues, and to identify areas of possible collaboration—including the priorities and strategies set in this plan. Similarly, municipalities should work together alongside other municipal associations like MMA and think tanks like MassINC. to engage the state legislature to weigh in on needed reforms, and to engage the offices of MA US Senators as well as MA's 3rd and 6th US Congressional Districts. A collaborative advocacy approach will amplify the voices not only of each municipal government, but ultimately of at-risk populations.

Examples, case studies, or further reading to support implementation

- NDIA DEA Advocacy Toolkit: https://www.digitalinclusion.org/resource/digital-equity-act-advocacy-tools/
- MBI - Trump Admin Halts $14M in Funding to Increase Internet Access in MA: https://broadband.masstech.org/news/trump-administration-halts-141-million-funding-increase-internet-access-massachusetts
- MassAccess has a page with active legislation supported by Community Media organizations: https://www.massaccess.org/about/

HELP PUBLIC ACCESS CORPORATIONS NAVIGATE FUNDING CHALLENGES BY EXPANDING PROGRAMMING FOR TECHNOLOGY ACCESS AND TRAINING.

#	Implementor(s)	Priority	Time Scale	Resources
4.5	Public Access Corporations, Municipal Communications Departments	Medium	Short Term	$

Public Access Corporations (PAC)s, also referred to as Community Media organizations, have traditionally been funded by cable franchise fees assessed as a percentage of cable tv subscriptions in a community. They are now facing a funding crisis as more and more households opt to end their cable TV subscriptions in favor of streaming. While this presents an urgent challenge, digital equity also presents an opportunity for Greater Lowell's public access corporations to grow their services and expand their business model. Many community media corporations already offer technology and software training and education focused on media literacy and video production. Some additionally offer access to equipment and computer workstations and software.

Expanding this existing capacity to provide broader digital skills training and device access through equipment lending or computer lab facilities can help public access corporations access new revenue streams, like municipal contracts, grants, or tiered public membership fees. Lowell's LTV likely leads the pack in this evolution, but all municipalities can help their Public Access Corporations expand more directly into digital equity services by bringing them into the conversation with other non-profits and including them in grants and contract opportunities. Municipalities can partner with PACs to develop programming that supports technology access, device usage, and media literacy. For example, PACs can host workshops on using devices, navigating online media sites like YouTube, accessing online government services, engaging in online government feedback or participating in social media more broadly, and practicing safe browsing. Municipalities can also help coordinate and advocate for policy to address the community media funding crisis by requiring internet streaming providers to pay for their use of the public right of way in the same way that cable providers are required to. By strengthening the role and business model of PACs, municipalities can leverage these trusted community anchors to reach priority populations and bridge digital divides.

Examples, case studies, or further reading to support implementation

- Mass Access a non-profit advocate for its community media members, offers resources and training for modernizing community media: https://www.massaccess.org/resources/
- Mass Access is also advocating for MA House Bill H91, which would require streaming video providers to pay for the use of the public right of way to fund community media in the way cable providers currently do. The house bill is sponsored by Rep. Margaret Scarsdale whose district includes the NMCOG communities of Dunstable and Pepperell
    - Mass Access - Active Legislation: https://www.massaccess.org/get-involved/activelegislation/
    - H91: https://malegislature.gov/Bills/194/H91/BillHistory

- Cambridge Community Television has embraced digital equity as part of their service offering and partnered with MBI to host digital navigators: https://www.eff.org/deeplinks/2024/05/cctv-cambridge-addressing-digital-equity-massachusetts
- BevCam, the PAC for Beverly, offers its members access to equipment, computer workstations with various software, and audio/video studios: https://bevcam.org/membership/

STRATEGY 6: PROVIDE INCLUSIVE MUNICIPAL DIGITAL SERVICES TO MAKE LOCAL GOVERNMENT MORE ACCESSIBLE AND USER FRIENDLY

In the 21st century, residents expect government services to be as reliable and easy to use as private sector services, and accessible in the same place where they have come to expect everything else in their lives: online. Municipal websites and other online tools provide greater access to local government—including greater access to information and opportunities for engagement and feedback, as well as access to government services themselves via program enrollment intake forms, permit applications, etc. Known collectively as "digital services" these online approaches to local government are crucial for advancing digital equity, as they make civic engagement easier for populations who may speak English as a second language, have disabilities, or face other historic barriers. At the same time, putting services online alone is not enough. Local governments should also continuously evaluate and improve digital services to ensure that they are working through processes known as "user centered design". And, as more and more services move online, municipalities should also ensure support for residents experiencing the digital divide. This means offering customer support for online interfaces and continuing to provide in-person and paper-based options alongside digital options.

EXPAND MUNICIPAL SERVICES INCLUSIVELY TO REACH CONSTITUENTS BOTH IN PERSON AND ONLINE.

#	Implementor(s)	Priority	Time Scale	Resources
6.1	Municipalities, Municipal IT Departments, Clerk's Offices	High	Long Term	$$

Expanding services to be available both in-person and online provides more options to meet residents where they are. For example, offering online permitting, bill payments, meetings, and information access can save time for busy residents unable to take time off work or allow participation for parents unable to afford childcare. At the same time, maintaining in-person options at town halls, libraries, and community centers supports those with limited digital skills or device access. This dual approach acknowledges that not all residents are comfortable or able to use digital

platforms yet and that municipal services should meet people where they are—whether online, over the phone, or face-to-face.

Examples, case studies, or further reading to support implementation

- USDS Digital Services Playbook: https://playbook.usds.gov/
- Commonwealth Digital Roadmap: https://www.nascio.org/wp-content/uploads/2024/08/MA_DigitalServicesGovernmenttoCitizen.pdf

MONITOR, TEST, AND EVALUATE ONLINE SERVICES, INCLUDING TALKING TO "USERS" TO UNDERSTAND WHO IS VISITING MUNICIPAL WEBSITES AND HOW RESIDENTS ARE SUCCEEDING OR NOT IN USING DIGITAL TOOLS OFFERED.

#	Implementor(s)	Priority	Time Scale	Resources
6.2	Municipal IT Departments, Constituent Services Staff	Medium	Short Term	$

Conducting usability testing and speaking directly with residents who use (or attempt to use) online services can reveal hidden barriers—such as language, accessibility issues, or complex navigation. Focus groups, interviews, and surveys can be combined with website analytics to understand more about who is being served and who may not be. This insight can inform improvements that make services easier to use and more accessible to all, especially for those less familiar with digital platforms or facing digital literacy barriers.

Examples, case studies, or further reading to support implementation

- 18F Methods: https://preserved.org.uk/guides.18f.gov/methods/index.html
- Digital.gov Website Usability: https://digital.gov/topics/usability
- Digital.gov - Website Analytics: https://digital.gov/topics/analytics

CREATE A DIGITAL OUTREACH AND ONLINE ENGAGEMENT GUIDE TO ASSIST COMMUNITIES IN USING SOCIAL MEDIA AND DIGITAL TOOLS EQUITABLY AND EFFECTIVELY.

#	Implementor(s)	Priority	Time Scale	Resources
6.3	Municipal Communications Staff, Outreach and Engagement Staff	Low	Short Term	$

Many municipalities struggle to reach all segments of their population through digital channels and not every community has a dedicated social media manager. A regional digital outreach and engagement guide can help staff navigate the complex landscape of social media, email newsletters, and other online tools to effectively communicate with diverse communities. The guide should build on existing resources that may exist within municipalities and include best practices for accessible language, countering misinformation, reaching populations with limited digital skills, and engaging residents who may distrust government sources. Municipalities can tailor this guide to local contexts while collaborating regionally to share lessons learned and ensure consistent, equitable outreach across the Greater Lowell region.

Examples, case studies, or further reading to support implementation

- Mass Municipal Association - Best Practices for Using Social Media in Municipal Government (March 2023): https://www.mma.org/resource/best-practices-for-using-social-media-in-municipal-government/
- Improving Accessibility of Social Media in Government: https://digital.gov/resources/improving-the-accessibility-of-social-media-in-government/
- Municipal Research Services Center (MRSC) - Community Engagement Resources; https://mrsc.org/explore-topics/engagement/resources/community-engagement-resources
- Next Century Cities / Benton Foundation - Five Lessons for Tech-Powered Engagement - https://www.benton.org/publications/five-lessons-tech-powered-civic-engagement
- Digital.gov US Public Participation Playbook: https://digital.gov/guides/public-participation#content-start
- Bloomberg Harvard City Leadership Initiative - City Leader Guide on Civic Engagement: https://www.cityleadership.harvard.edu/wp-content/uploads/migrate/BHCLI_CivicEngagement_0000CG.pdf

SUPPORT AND IMPROVE HYBRID MEETINGS AND ENGAGEMENT, INCLUDING PROVIDING GUIDANCE FOR STAFF AND MEETING FACILITATORS AND PROVIDING NEEDED EQUIPMENT AT MUNICIPAL FACILITIES.

#	Implementor(s)	Priority	Time Scale	Resources
6.4	IT departments, Municipal Staff, Board and Commission Staff	Medium	Short Term	$$

Hybrid meetings—where participants can join both in person and remotely—can increase civic engagement and transparency by making it easier for residents with transportation, childcare, or scheduling barriers to participate. To ensure these meetings are effective, municipalities need to invest in reliable equipment (cameras, microphones, and displays) and provide clear guidance for staff and facilitators on managing both in-person and virtual interactions. This includes training on how to use meeting technology, manage chat functions, and troubleshoot connectivity issues. A regional guide or training program could help standardize best practices and ensure that all communities have the resources they need to host inclusive, high-quality hybrid meetings.

Examples, case studies, or further reading to support implementation

- MAPC Hybrid Engagement Hub: https://www.mapc.org/resource-library/hybrid-engagement/
- MassDOT - Guidelines for successful virtual public meetings: https://www.mass.gov/guides/guidelines-for-successful-virtual-public-meetings

INVENTORY ONLINE SERVICES OFFERED BY MUNICIPAL DEPARTMENTS, REVIEWING EACH DIGITAL SERVICE OR WEBSITE FOR COMPLIANCE WITH ACCESSIBILITY GUIDELINES, LANGUAGE ACCESS, AND FOR SUPPORT OPTIONS FOR INDIVIDUALS WHO FACE DIGITAL BARRIERS.

#	Implementor(s)	Priority	Time Scale	Resources
6.5	Constituent services staff, IT Departments	High	Short Term	$

Municipal websites and digital services are gateways for residents to access government resources, but they must be inclusive and accessible. Conducting a thorough inventory of existing online services across departments—checking for compliance with WCAG accessibility standards, language translation options, and available help channels—ensures that no one is left out. This process can identify areas where improvements are needed, such as adding screen reader compatibility, simplifying language, or providing contact information for technical support.

Examples, case studies, or further reading to support implementation

- Dept of Civic Things, How to Create an Inventory of Your Government Services: https://deptofcivicthings.com/how-to-create-an-inventory-of-your-government-services/
- 18F Methods - Website content audit: https://preserved.org.uk/guides.18f.gov/methods/decide/content-audit/index.html
- City of Portland, OR Inventory of Services: https://www.portland.gov/services
- ADA.gov - Fact Sheet: New Rule on the Accessibility of Web Content and Mobile Apps Provided by State and Local Governments: https://www.ada.gov/resources/2024-03-08-web-rule/
- Digital.gov - Accessibility: https://digital.gov/topics/accessibility
- plainlanguage.gov - checklist for plain language on the web: https://www.plainlanguage.gov/resources/checklists/web-checklist/
- GSA Section508.gov - Create Accessible Digital Products: https://www.section508.gov/create/

CREATE AND PROVIDE "HOW-TO" GUIDANCE AND SUPPORT FOR RESIDENTS USING MUNICIPAL ONLINE SERVICES, INCLUDING TUTORIAL VIDEOS, WRITTEN INSTRUCTIONS, AND/OR A "HELP DESK" OR "CUSTOMER SUPPORT" NUMBER WHERE NEEDED.

#	Implementor(s)	Priority	Time Scale	Resources
6.6	Constituent services staff, IT Departments	High	Short Term	$

Even the most user-friendly online services can be intimidating or confusing for some residents. Creating step-by-step guides—through videos, written instructions, or infographics—can demystify digital tools and empower residents to complete tasks independently. Offering a help desk or customer support line (staffed by trained personnel or a regional digital navigator) ensures that those who need extra assistance can get it, reducing frustration and building trust in municipal

systems. These resources should be available in multiple languages and formats to reflect the diversity of the region and address the needs of seniors, newcomers, and residents with disabilities.

Examples, case studies, or further reading to support implementation

- Iowa Digital Experience - Best Practices for Creating FAQ pages - https://dxtraining.iowa.gov/content-types/how-do-i-create-frequently-asked-questions/best-practices-creating-faq-pages
- City of Boston Video Guidelines - https://www.boston.gov/departments/digital-team/city-boston-video-guidelines
- Atlassian - How to Create Engaging Training Videos: https://www.atlassian.com/blog/loom/training-videos
- City of Boston How to Pay a Parking Ticket (example): https://www.boston.gov/departments/parking-clerk/how-pay-parking-ticket
- City of Boston - New User-Friendly Updates to Our How To Pages: https://www.boston.gov/news/new-user-friendly-update-our-how-pages-released

ENSURE LANGUAGE ACCESS BY INCREASING THE USE OF TRANSLATION TECHNOLOGY TO SUPPORT ONLINE AND IN PERSON SERVICES.

#	Implementor(s)	Priority	Time Scale	Resources
6.7	Municipal Language Access Staff, IT Departments	High	Short Term	$

Language barriers can prevent residents from accessing essential municipal services and fully participating in civic life. Municipalities can bridge this divide by expanding the use of translation technology—such as real-time interpretation software, multilingual website plug-ins, and printed materials in commonly spoken languages—to support both online and in-person services. This ensures that residents who speak languages other than English can navigate municipal websites, attend meetings, and receive assistance effectively. By partnering with community-based organizations, municipal staff can also ensure that translations are culturally appropriate and address local nuances. Incorporating translation services builds trust and promotes equity, ensuring that all residents can engage with their local government.

Examples, case studies, or further reading to support implementation

- MAPC Language Access Guide: https://www.mapc.org/resource-library/language-access-guide/#:~:text=MAPC%20defines%20Language%20Access%20within,consistently%20adapt%20to%20people's%20needs.
- City of Boston - Language Access: https://www.boston.gov/departments/language-and-communications-access/language-access-information-and-services

FUNDING MEMO

FUNDING OPPORTUNITIES

Funding opportunity	Description	Types of Programs that May be Supported
NTIA Digital Equity Act (DEA) Funding	Through this federal act, part of the Infrastructure Investment and Jobs Act (IIJA) of 2021, Congress allocated $2.75B for digital equity projects across the country, with the Massachusetts Broadband Institute receiving over $1M in DEA Planning funding for the preparation of the statewide "Internet for All" digital equity plan and another $14M in DEA Capacity grant funding to give individuals and communities the tools, skills, and opportunities to expand the adoption and use of high-speed internet. As of May 16, 2025, the Trump administration has terminated NTIA's contract with the State of Massachusetts, and, as of writing, NTIA's DEA program website is down. This puts the future of certain programs like MBI's Launchpad Program in jeopardy. Although this is not currently a funding opportunity, municipalities and CBOs should follow developments closely as Massachusetts has joined a coalition of 21 State suing the Trump Administration seeking to reinstate DEA grant contracts.	Digital literacy and skills training, workforce development, device refurbishment and distribution, public space workstations, accessibility improvements to government digital services, digital equity marketing and outreach. See also the American Library Association's "FAQ: Cancellation of the Digital Equity Act Grant Programs"
Broadband Equity, Access, and Deployment (BEAD)	$42.45B federal program allocated by Congress under the IIJA of 2021 to ensure high-speed internet meeting the FCC's definition of broadband (100mbps / 20mbps) is available to all unserved and underserved locations across the US. Massachusetts received ~$147M in BEAD funding with MBI overseeing grant administration for the Commonwealth.	Broadband Infrastructure, including last mile connections to unserved and underserved addresses and Community Anchor Institutions.

FUNDING OPPORTUNITIES

Funding opportunity	Description	Types of Programs that May be Supported
MBI Digital Equity Implementation Grant	A one-time grant up to $100,000 for municipalities that have developed a Digital Equity Plan or Charrette report. This implementation grant will enable the municipality to put one or more recommendations from the plan/report to action.	Any projects connected to approved digital equity plan recommendations.
MBI Digital Equity Partnerships program	This program funds organizations to improve digital equity in 6 focus areas: digital literacy, free in-unit Wi-Fi for affordable housing, public infrastructure, connectivity for those facing economic hardship, device distribution, and outreach to boost digital adoption. UMass Lowell has been awarded the partnership grant and has been providing digital navigation, tech literacy, and device distribution support in Lowell alongside community-based organizations. Municipalities and community-based originations can connect with MBI partnership organizations to explore whether programs, services, or funding is available.	Digital literacy, free in-unit Wi-Fi for affordable housing, public infrastructure, connectivity for those facing economic hardship, device distribution, and outreach to boost digital adoption.
Efficiency and Regionalization (E&R) Grant program	Supports governmental entities in implementing regionalization and efficiency initiatives to enhance long-term sustainability. This program can be used for digital inclusion for planning and implementation activities, including small capital purchases, technical assistance, and project management costs as well as internal efficiency initiatives to improve municipal service delivery.	Small capital purchases, technical assistance, and project management costs as well as internal efficiency initiatives to improve municipal service delivery.

FUNDING OPPORTUNITIES

Funding opportunity	Description	Types of Programs that May be Supported
English Language Acquisition State Grant	Enhance instruction for English learners with digital resources.	Digital literacy and skills training through public schools or in partnership with public schools
EPA Government-to-Government Grant	Provides funding that supports sovereign partnerships, enabling recipient governments—particularly tribal nations—to design and implement programs aligned with their self-determined priorities, while strengthening intergovernmental relationships and respecting tribal self-governance.	Studying Digital Equity needs and impacts
NMCOG Technical Assistance Program (TAP)	The NMCOG TAP supports cities and towns in the NMCOG region by providing planning and technical assistance for projects that advance regional goals such as housing, economic development, climate resilience, and equity.	Technical assistance for digital equity planning or implementation.
Community Development Block Grants (CDBG)	CDBG provides opportunities for digital equity initiatives including conducting a broadband needs assessment, installing critical infrastructure—including wiring, fiber optic cables, and permanently affixed equipment—and providing digital literacy classes to ensure underserved residents can access and effectively use essential online services.	Infrastructure for community or neighborhood networks; digital equity programming
Massachusetts Growth Capital Corporation (MGCC)	Provides grants through its Small Business Technical Assistance (SBTA) program, as well as other mini grants, to support small business owners with professional, technical, and operational services.	Education materials that can be shared with Veterans needing assistance

FUNDING OPPORTUNITIES

Funding opportunity	Description	Types of Programs that May be Supported
Local Enterprise Assistance Fund	Provides solutions-oriented advisory services to underserved business owners in Massachusetts	Digital literacy training materials and courses
Massachusetts Community Health and healthy Aging Funds	Resources - MA Health Funds The Funds focus on addressing health and racial inequities and are guided by the following principles: • The Social Determinants of Health account for significant variation in health outcomes • Policies, systems, and social/physical environments are historically based in structural and institutional racism and other forms of oppression. • Structural and institutional racism and other forms of oppression need to be understood and disrupted to eliminate inequities in population health outcomes and the social determinants of health.	Digital equity projects connected to health, aging, and racial equity.
Massachusetts Municipal Fiber Grant Program	The MA Municipal Fiber Grant program is a competitive grant program that supports the closing of critical gaps that exist in municipal networks. Fiber procured must be owned by the municipality and can assist in many digital equity and infrastructure goals. The program has been offered in multiple fiscal years and may be offered again in the future.	Municipal Fiber infrastructure.

FUNDING OPPORTUNITIES

Funding opportunity	Description	Types of Programs that May be Supported
Community Compact IT Grant	Competitive grant program focused on driving innovation and transformation at the local level via investments in technology. Grants of up to $200,000 support the implementation of innovative IT projects by funding related one-time capital needs such as technology infrastructure or software. Incidental or one-time costs related to the capital purchase such as planning, design, installation, implementation and initial training are also eligible.	Innovative IT projects with capital needs such as broadband infrastructure or software.
T-Mobile Hometown Grant	Provides up to $50,000 for a community project idea, with a focus on projects that foster local connections, like technology upgrades, outdoor spaces, the arts, and community centers. Projects must be shovel-ready and municipal governments or community non-profits from towns with populations under 50,000 are eligible to apply.	Technology upgrades, equipment, devices, or training programs that foster local connections.

MISC. ADDITIONAL RESOURCES

Workforce Innovation and Opportunity Act (WIOA)	Digital literacy- use of technology to improve teaching, learning, professional development, skill development and abilities, career guidance, supportive services, job search workshop, referral to jobs or training, workers' rights and complaint system information.	Digital literacy- skills training, one-on-one classes
Technology Forward Task Force	The Arc of Massachusetts partners with the Massachusetts Department of Development Services (DDS), Massachusetts Association of Developmental Disabilities Providers (ADDP) to run a Technology Forward Task Force which is a useful resource to guide strategies and services for Assistive Technology through equipment, education and training.	Accessible devices and resources for community members living with disabilities
MABVI	The Massachusetts Association for the Blind and Visually Impaired (MABVI)'s Access Technology help blind and visually impaired people learn to use technology	Accessible devices and resources for community members living with disabilities
Senior Planet- Older Adults Technology Services by AARP	Technology support and courses for older adults	Digital literacy courses and educational resources tailored for older adult residents
Mass Attorney General: Computer and Online Privacy Mass Attorney General: Cyber Crimes	Educational materials to protect personal information and mitigate safety and privacy concerns.	Technology education and resources
Mass Vets Advisor	A resource directory of benefits available for Veterans	Education materials that can be shared with Veterans needing assistance with

Tech Goes Home (TGH)	Tech Goes Home has aided in education, jobs, managing finances, and connecting seniors to loved ones. The nonprofit seeks to expand its networks throughout Central Massachusetts as they have received a $4.5 million grant in 2023.	Digital literacy and device access
Computers 4 People	Provides free or low-cost computers to income-qualifying adults, free refurbished laptops to college-bound students in financial need	Device lending programs Digital Navigators
National Digital Inclusion Alliance (NDIA): Digital Navigator Resources	NDIA provides support resources for Digital Navigators	
PLA Digital Literacy Workshop Incentives, supported by AT&T	Online Digital Learn courses and training packages in English and Spanish.	Digital literacy training materials and courses
MassDevelopment	Offers technical assistance that can be tailored to the digital needs of small businesses, including services in community visioning, marketing, and branding	Digital skills and capacity support for small businesses

Appendix 4: Technical Definitions

NETWORK TECHNOLOGY

The technology used to transmit data to and from the internet impacts how fast that data moves. 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 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 is 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. With widespread availability of cable internet service at nearly every address in Greater Lowell, satellite internet is typically not considered an attractive option outside of specific remote/rural locations not well served by other options.

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. 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 generally lower, because most home uses for the internet involve receiving 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.

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.

Internet speed tests are one source of data available to determine the real-world experience of home internet users in Greater Lowell. However, speed test data is not without its 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.

Appendix 5: Municipal Memos

DIGITAL EQUITY IN BILLERICA

The Town of Billerica (pop. 41,700) is the second largest community in the NMCOG region and has various populations with a higher likelihood of being impacted by the digital divide. Over 4,100 residents (**10% of the population) lives under the 200% poverty level** and 7,483 adults (**nearly 18% of residents) are 65 or older**.[18] Over 9500 residents (23%) are nonwhite, and over 6200 residents (nearly 15%) were born in a country other than the US. A significant population in Billerica speaks languages other than English, with 19% of residents aged 5 or older speaking a language other than English at home. In addition, the Middlesex Jail and House of Correction is in Billerica, with a population of up to 1150 incarcerated people awaiting trial and serving sentences of up to 2-and-a-half years. These incarcerated individuals face unique digital barriers both within the facility

[18] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

and upon release. Billerica has many assets that can help address the digital divide and increased coordination will ensure that the community is fully supported.

EXISTING ASSETS IN BILLERICA

Billerica has many digital equity assets including the Billerica Public Library, the Billerica School District, Billerica Access TV, the Council on Aging, and the Recreation Department. Billerica is also home to Shawsheen Valley Technical High School, one of just three technical schools in the NMCOG region.

- Billerica Public Library offers free Wi-fi, 21 computer workstations, and a hotspot lending program. They also have a library app, and a tech help program that offers one-on-one tech support for basic device and software set up and troubleshooting on an appointment or drop-in basis.
- Billerica Access TV provides municipal content over cable, partners with various community organizations and groups, and provides training and workshops on digital media, including video editing, and media literacy classes training for youth/children.
- The Council on Aging provides occasional computer training classes and tech support sessions and a computer lab.
- The Billerica Boys and Girls Club has a "STEAMcenter Makerspace" that offers drop-in classes on podcasting, movie making, and digital media.
- The Recreation Department offers digital literacy training courses.
- The town provides public Wi-Fi access at various locations, including the Peggi Hannon-Rizza Recreational Complex.
- The Town website provides access to a number of digital services, including a 311 app, online bill pay, online notifications, and a login system for commenting on website content.
- The town follows online accessibility design guidelines and makes those guidelines available on its website accessibility webpage, which also provides links to assistive technology.
- Billerica Public Schools offers an online technology help desk with guidance on software, Chromebook devices, and cybersecurity.
- The Middlesex Valley Jail and House of Corrections offers a Computer Literacy and Typing class to its incarcerated population.
- Shawsheen Valley Tech offers educational technology and digital learning resources including access to software for students, and resources for parents, such as guidance on affordable internet plans.

BILLERICA AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable

Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

	Households with no internet connection		Households with no computer		Households with only smartphones		Median download speed (Mbps)	Median upload speed (Mbps)	ACP Enrollment (Households)
Community	Number	Percent	Number	Percent	Number	Percent			
Billerica	783	5.0%	579	3.7%	642	4.1%	279	138	854
Chelmsford	553	4.1%	283	2.1%	324	2.4%	268	115	468
Dracut	1,081	8.9%	717	5.9%	219	5.3%	98	12	1,019
Dunstable	5	0.4%	14	1.2%	20	1.8%	78	77	33
Lowell	5,128	12.1%	3,221	7.6%	4,535	10.7%	182	21	9,586
Pepperell	250	5.8%	47	1.1%	229	5.3%	163	17	493
Tewksbury	656	5.5%	489	4.1%	322	2.7%	239	40	641
Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
Westford	344	3.9%	150	1.7%	97	1.1%	288	653	295
MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Billerica has relatively high levels of need compared to the rest of the NMCOG region municipalities, including **783 households (5%) with no internet connection**, and an estimated **1221 households (7.8%) with no computer or only a smartphone** – third highest in the region after only Lowell and Dracut. **Billerica also saw the third highest number of households (854) enrolled in the ACP in February 2024.** These households have since lost access to that federal subsidy and may now have trouble affording their monthly internet subscription. Over 90% of Billerica is served by two ISPs, Comcast/Xfinity and Verizon Fios—the latter of which provides a fiber option. This leaves around 8% of addresses with only Comcast/Xfinity available, representing a monopoly condition with potential implications for consumer choice and quality of service. Billerica's median download and upload speeds are 279 and 138 mbps, respectively, both exceeding thresholds for broadband speed and both relatively fast for the region.

WHAT WE HEARD FROM STAKEHOLDERS

Billerica Sees a Critical Connection between Digital Equity and Municipal Engagement, Including Virtual and Hybrid Public Meetings

Municipal stakeholders report that much of the community relies on Facebook for news and outreach, but that makes it imperative to reduce misinformation and support digital media skills. They note people affected most by planning policy often have the least digital access and skills. With that in mind, municipal stakeholders want to better understand the best practices for virtual outreach and engagement, including, in-person, and hybrid meetings.

Essential services now require digital skills

Many essential services that residents rely on are now online. For instance, the Billerica Food Pantry now has an online registration system, further highlighting how embedded digital equity needs have become with almost all other needs. Stakeholders suggested that more support for high-need residents is crucial and may require more coordination between the town, the school district and various community partners.

Billerica Access TV is an Important Community Resource, but has Funding Concerns

Like most public access telecommunication services, Billerica Access TV is concerned about funding shortfalls as their primary funding source, fees from cable subscribers are shrinking as cable customers increasingly "cut the cord" in favor of online streaming services. They stress that access TV is an educational and community resource, not just a TV station.

Billerica Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Billerica Public Library sees high demand for all digital devices, including computer workstations and hotspots. There is also a designated one-on-one tech support person who sees a high demand for appointments and drop-in help sessions. Though the Library provides eBooks and kindles for patrons to access stories in Spanish and Portuguese, there has been an increased demand for books and other resources in other languages. The library especially needs resources for programs such as hotspot lending.

Language Barriers Have Increased, Prompting a Need for Translation

Municipal stakeholders report that many immigrant households struggle with language barriers. The municipality works hard to share accurate information, but staff rely heavily on Google Translate to communicate with these groups. In addition, the Town website is not currently linguistically accessible, and without translations, digital access is very limited. The most prominent languages spoken in Billerica are Spanish, Portuguese, and Gujrati. Billerica staff are interested in learning more about local immigrant populations and what challenges they face, including challenges with digital access.

Digital Equity for Seniors is a Critical Concern

Though the Council on Aging offers devices and training courses, stakeholders reported that seniors are often reluctant to deal with technology in general, and that this can pose challenges as important services, resources, and aspects of daily living move online. Many seniors don't own a computer or have an email address and may need catered support to navigate digital services. One strategy suggested by a Billerica stakeholder was to develop a program of younger tech mentors for seniors.

Interest in Broadband Infrastructure and Wi-Fi Access in Public Spaces and Commercial Areas

Stakeholders raised the need for infrastructure-related strategies in Billerica, including investigating the possibility of underground conduit for fiber, and fiber or wireless installation by right. Stakeholders were also interested in municipal or otherwise publicly available wireless networks in public spaces and in commercial areas.

Digital Equity is Also a Concern for at the Middlesex Jail and House of Correction

Billerica is unique in that it is the home for the Middlesex Jail and House of Correction. Stakeholders who work with incarcerated and formerly incarcerated individuals note that this population faces special digital barriers, despite needing digital skills and access for getting a state ID, seeking jobs, and telehealth. These stakeholders have advocated for better partnerships and dialogue with correctional facilities to ensure access to devices and skills training for incarcerated individuals.

RECOMMENDED PRIORITY ACTIONS

- Improve coordination between the town, the school district, and other partners such as Shawsheen Technical High School, the Council on Aging, the Billerica Boys and Girls Club, Billerica Access TV, and other civic and religious organizations to address digital equity by forming a digital equity task force.
- Build on the success of the library's technology resources by expanding the hotspot lending program and replicating the one-on-one "tech help desk" model at other locations and organizations, including the Senior Center.
- Partner with the school district to learn from and expand their family technology help desk model to new populations.
- Encourage the Council on Aging to provide additional technology support and training, including by partnering with the schools to provide an internship or volunteering opportunities for young people to support older adults with technology needs.
- Improve access to existing digital equity resources by ensuring the availability of program information and training materials in languages other than English. This could start with the Library's existing resources but should also include partnership—to share materials or share translation services—with other nearby communities prioritizing language access, such as Lowell and Tewksbury.
- Work with Billerica Housing Authority and EOHLC to identify Housing Authority and 40B developments in need of better broadband infrastructure, and pursue broadband improvements such apartment Wi-Fi and retrofit, as well as device access and educational programming that could meet elderly, disabled, and low-income residents where they are via grants.
- Leverage the proximity of BHA owned River Street properties to the Billerica Public Library and to the COA to provide access to tech support and digital literacy programming for Elderly/Disabled residents.
- Ensure that BHA is treated as an eligible community anchor institution and that BHA-owned and other affordable housing sites are connected to (public) fiber infrastructure, or retrofit with modern wiring to support ISP competition, pursuing BEAD or other grants as needed.
- Inventory public facilities and digital assets, identifying opportunities for "quick win" improvements via guest networks, and device and equipment purchases. This might include

device charging stations at town hall or adding outdoor access points to expand the reach of the public Wi-fi network at the library to cover the nearby town common.

- Explore opportunities to deploy Wi-fi in public spaces, including at Vietnam Veterans Park. Similarly, leverage the proximity of Kohlrausch Park and BHA-owned Talbot School Apartments to pursue the provision of public Wi-fi to both the park and to residents.
- Evaluate whether the Planning Board can treat broadband access in the same way that it treats other utilities such as electricity or water/sewage when conducting site plan review of larger housing projects with affordability requirements.
- Inventory and map existing municipal and private fiber infrastructure and network coverage, including cell signal coverage, to identify gaps and opportunities, including opportunities to connect additional community anchor institutions to municipal fiber infrastructure.
- Research and pursue grants and policies to support broadband infrastructure, such as the MA Municipal Fiber Grant or a "Dig Once" policy that could also apply to Billerica public works to require fiber conduit whenever streets are dug up.
- Find efficiencies by coordinating with other municipalities in the region, with similar population groups and levels of need such as Tewksbury, Dracut, and Lowell, to pursue digital navigation support and regional digital literacy training programs made available in multiple languages.
- Audit and improve municipal online services such via improvements to the website and online meetings approaches. This should include conducting "user testing", focus groups, or other engagement with priority populations who may have trouble accessing online municipal services and opportunities for civic participation.
- Build on and expand BATV's existing partnerships, classes, and workshops to provide technology training to priority populations.
- Work with the Middlesex Sheriff's Office and Jail and House of Corrections Programming Staff to explore additional digital skills training and device access at the facility. Consider partnerships with organizations that specialize in technology access for incarcerated populations like Ameelio or Orijin and consider replicating programs like the Last Mile, which has a digital skills training program at MCI Shirley MA and at the RIDOC Maximum Security Facility in Warwick, RI. For a listing of all technology education programs offered at MA Department of Corrections Facilities as of 2024 see p. 24 of the MADOC Program Description Booklet.

DIGITAL EQUITY IN CHELMSFORD

The Town of Chelmsford (pop. 36,220) has higher proportions of population likely to be impacted by the digital divide than many other communities in the NMCOG region, including **3,042 people living under the 200% poverty level** and **over 18% of the population 65 or older (6,652)**.[1] Chelmsford is a diverse community with a wide range of income levels and needs, and municipal stakeholders have voiced their support in addressing the needs of all residents.

EXISTING ASSETS IN CHELMSFORD

Chelmsford has a wide variety of entities providing digital equity support. These include the community services coordinator, Chelmsford Public Schools, Chelmsford Public Library, the Senior Center, and the Chelmsford Housing Authority.

- Chelmsford Public Library has a hotspot lending program, a traveling computer lab, and free Wi-Fi.
- The Library participates in the Access to Justice Public Library Initiative, a program to assist people with remote court hearings and provide them with lawyers they can meet with remotely.

- Many public properties are connected to Chelmsford's fiber network offering fast speeds to municipal staff and providing the backbone for public Wi-Fi guest networks at certain sites.
- Chelmsford schools provide secure Wi-Fi, issue Chromebooks for at-home use, and their library provides hotspots.
- Chelmsford schools offer online Technology Tutorials for parents and students.
- Chelmsford schools is partnering with Massachusetts Educators Using Computers (MassCUE) and the Collaborative for Educational Services (CES) to offer professional training to Chelmsford School District staff on "Building Capacity Through Digital Equity"
- There are digital training sessions at the library, Senior Center, and at Chelmsford's homeless shelters.
- Chelmsford Housing Authority has proactive support staff to help residents, including with digital access.
- The Town is proactive in community services and engagement through the services coordinator.

CHELMSFORD AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

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Pepperell	250	5.8%	47	1.1%	229	5.3%	163	17	493
Tewksbury	656	5.5%	489	4.1%	322	2.7%	239	40	641
Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
Westford	344	3.9%	150	1.7%	97	1.1%	288	653	295
MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

By proportion, Chelmsford has low percentages of households without internet connections or computers compared to the region and to the state of MA. However, due to Chelmsford's large

population, these small percentages are nevertheless significant numbers: **553 households without an internet connection and 607 with no computer or only a smartphone.** 468 households were enrolled in the Affordable Connectivity Program in February 2024, meaning these households have lost access to a subsidy helping them pay their internet bill and are at risk of losing access or downgrading a plan that doesn't meet their needs. Although it is not affordable to all residents, broadband speeds are relatively high and most of Chelmsford is served by two Internet service providers (ISPs), usually with a fiber option, and one section is served by three ISPs.

WHAT WE HEARD FROM STAKEHOLDERS

Municipal Stakeholders work to Meet People Where They Are

Chelmsford residents have a wide range of backgrounds, experiences, and access to devices. A key concern for municipal stakeholders is addressing this range of needs, especially for residents who are not the right age for the Senior Center or Chelmsford Public Schools—a "missing middle". Stakeholders at the charrette noted device access, broadband access, and digital literacy are all barriers for this group. Chelmsford had some of the highest turnout for our digital equity municipal workshop, showing that municipal leaders are engaged and willing to coordinate with each other to address these needs.

Transportation plays a role in digital access

Those with the greatest needs tend to lack both devices and transportation to places that might provide digital services and therefore have barriers to in-person visits and telehealth. There is a need to make sure digital equity resources are transit accessible.

Chelmsford Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Chelmsford Public Library offers numerous resources, including a large number of computer workstations, traveling computer lab, a hotspot lending program, and free public Wi-Fi. However, many residents lack reliable transportation to get to the library. The library also wants to provide additional support and resources to meet demand, for example for telehealth, but it lacks devices and staff training and capacity to facilitate expanded services.

Seniors Can Lack the Confidence to Participate in Digital Literacy Programs, Creating Barriers

The Chelmsford Senior Center is a regional hub: it served residents from 22 communities in 2024. They run technology skills and internet training and safety programs periodically. The biggest challenge they report is seniors lacking comfort, confidence, or interest in digital literacy training. One stakeholder noted many seniors have a lack of confidence in using the Internet and give up before they get started. Some are reluctant to learn due to fears of Internet scams and phishing emails. However, municipal leaders feel this group still needs to be reached.

Chelmsford Housing Authority is Working to Upgrade Properties and Provide Affordable Options

The Chelmsford Housing Authority has pursued grants to update their properties' digital infrastructure. Newer buildings contain modern wiring and access to network equipment via media closets. However, several buildings lack modern network infrastructure and none of the CHA properties offer community amenities like computer labs. Low- and moderate-income tenants must purchase internet services from an ISP without subsidies, and for many, this creates a cost burden. The Housing Authority reports having a strong 24-hour supportive services staff and a resident services coordinator helps residents with many issues, including getting connected. More support is needed though, as digital training and IT help is expensive to implement for seniors, low-income residents, and residents living with disabilities.

The Town Sees Opportunities for Public Wi-fi Networks in Public Spaces and to Serve Affordable Housing Residents, but with Some Concerns to Address

Chelmsford has a large municipal fiber network serving many public facilities, ensuring fast broadband speeds for municipal staff. Using this network as a backbone, the town also provides free public Wi-fi via guest networks at some buildings and parks and has received requests to provide more public Wi-fi access at additional sites. The Chelmsford IT department is interested in exploring this approach but expressed a need to evaluate sites on a case-by-case basis as feasibility may vary depending on proximity to existing infrastructure. The Housing Authority was also interested in Public Wi-fi to serve residents at residential buildings, but CHA leadership expressed some concerns about network management and liability should residents use the network for illicit or inappropriate content.

Chelmsford Public Schools are a Possible Conduit for Data Collection

Chelmsford Public Schools provides Chromebooks to middle school students. It tracked statistics on those who did not have home Internet and provided hotspots. Those students often used the library or coffee shops such as the Java Room in Chelmsford Center or the Dunkin in Drum Hill. Stakeholders voiced interest in take-home surveys to better track and understand if broadband access is improving among families.

There are Capacity Challenges Despite a Desire to Do More

Municipal stakeholders voiced a need for more funding and staff to address the digital divide. For example, the Community Services Coordinator has many needs and services to address and is just one person, so cannot devote many resources to digital equity. The Town recognizes the importance of training, device access, and maintenance programs, but funding is needed to implement them.

RECOMMENDED PRIORITY ACTIONS

- Document existing resources into a digital equity resources directory and coordinate on a shared community events calendar to highlight workshops or trainings relevant to digital equity.

- Bring on a dedicated digital navigator at the local or regional scale to help coordinate programs and services to help ensure residents have access to the internet and the support they need to use it.
- Explore the possibility of designating volunteer roles for students to pair with seniors at the Senior Center with a focus on supporting the use of digital technology for common needs such as email communication.
- Purchase devices and plan for designated staffing to create a digital learning lab and IT help desk at the Senior Center.
- Invest in existing programming that has shown promise, such as the Adam's library's digital equity services. This might include additional equipment/devices and/or staff time to provide additional or expanded services, such as telehealth support.
- Support Chelmsford Housing Authority in exploring infrastructure improvements to connect low- and moderate-income residents of CHA properties to greater broadband connection and digital access. This might include participation in the Mass Broadband Institute's Apartment Retrofit program to rewire building and provide additional ISP service, supporting housing sites with public Wi-Fi-networks, installing a computer lab, or providing access to greater tech support.
- Partner with the city of Lowell, and with relevant community-based organizations in Lowell to coordinate digital equity efforts and ensure Chelmsford residents have access to additional resources that may be available.

DIGITAL EQUITY IN DRACUT

The Town of Dracut (pop. 32,617) has higher numbers and proportions of the town population likely to be impacted by the digital divide than most communities in the NMCOG region, including the **second-highest proportion of population under 200% poverty level (13%),** after Lowell and a **large number of people 65 or older (5,787).**[19] 21% of residents identify as nonwhite, 16% of residents over the age of 5 speak a language other than English at home, and over 10% of residents were born in a country other than the US. The population in these categories tends to be concentrated in West Dracut. However, despite the high level of need, Dracut does not necessarily have the resources that larger communities may have to provide digital equity assistance, making regional partnership—particularly with neighboring Lowell, and nearby suburbs like Tewksbury and Billerica—crucial.

EXISTING ASSETS IN DRACUT

Dracut has a small but dedicated number of entities providing digital equity support. This includes the Dracut Senior Center, Parker Memorial Library, and Dracut Access TV.

[19] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

- Dracut's website offers online systems for complaints, bills, and permitting.
- The Parker Memorial Library has free Wi-fi 17 desktops, hotspots, charging stations, and tech support.
- The Parker Memorial Library also offers support to patrons via its Reference staff and also has printers and copiers with scanning capabilities for the public to use. Printing has a small fee, while scanning is free.
- Dracut Senior Center has weekly Drop-in Tech Support, and their facility provides public wi-fi.
- Dracut Access TV provides livestreaming of municipal and community events, multi-language podcasts and other media, and tech training and equipment
- Dracut Public Schools has a strategic technology plan and provides Social Media and Online Safety Guides for Parents and Students. The School Also has an app available on Apple and Android devices to provide students and families with alerts/notifications and an events calendar.

DRACUT AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program available to households living at or below 200% of the Federal Poverty Line which provided a subsidy for internet and ended in April 2024. This represents a number of individuals or families that may now have trouble affording internet service.

	Households with no internet connection		Households with no computer		Households with only smartphones		Median download speed (Mbps)	Median upload speed (Mbps)	ACP Enrollment (Households)
Community	Number	Percent	Number	Percent	Number	Percent			
Billerica	783	5.0%	579	3.7%	642	4.1%	279	138	854
Chelmsford	553	4.1%	283	2.1%	324	2.4%	268	115	468
Dracut	1,081	8.9%	717	5.9%	219	5.3%	98	12	1,019
Dunstable	5	0.4%	14	1.2%	20	1.8%	78	77	33
Lowell	5,128	12.1%	3,221	7.6%	4,535	10.7%	182	21	9,586
Pepperell	250	5.8%	47	1.1%	229	5.3%	163	17	493
Tewksbury	656	5.5%	489	4.1%	322	2.7%	239	40	641
Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
Westford	344	3.9%	150	1.7%	97	1.1%	288	653	295
MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Dracut has the **second-highest percentage of households with no internet connection and with no computer in the region**. An estimated 717 households have no computer or smartphone, and an additional 643 have only a smartphone. Notably, Dracut is **one of only two communities in the NMCOG region that has a significant lack of competition** for internet service providers. While Comcast/Xfinity provides cable broadband plans to every address, Verizon only serves 4.4% of town, leading to monopoly conditions and limiting consumer choice in ways that could impact quality of service and support, as well as price. Dracut has the lowest median speeds in the region according to speed test data, including the lowest upload speeds, which may reflect that lack of a fiber option to over 95% of addresses.

WHAT WE HEARD FROM STAKEHOLDERS

Poor Cell Phone Coverage Areas

Dracut has a number of areas, especially in more rural areas, that lack adequate cell phone coverage. This can negatively impact small businesses that rely on cell service and is especially notable given the large number of households in Dracut that have no digital device except for a smartphone in their household.

Dracut Access TV is a Critical Service, but has Funding Concerns

Like most public access telecommunication services, Dracut Access TV is concerned about funding shortfalls as their primary funding source, fees from cable subscribers, is shrinking as cable customers increasingly "cut the cord" in favor of online streaming services. Stakeholders shared a desire for stronger collaboration between Dracut Access TV and the Town of Dracut.

Parker Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Parker Memorial Library spends a significant amount of staff time assisting Dracut and out-of-town residents with access to digital services. An especially common need is assistance in filling out online forms for services such as the RMV—an only increasing need as more permitting and licensing moves online, from building permits to dog licenses. Without this support, many Dracut residents would be cut off from vital services. In addition, Dracut maintains a popular hotspot lending program with 12 to 15 hotspots in circulation.

Dracut Small Businesses Suffer from Digital Divide

Dracut's local economy is driven by entrepreneurs, many of whom are recent immigrants or English language learners. They often lack knowledge about how to use the internet for online marketing or business profiles, face language barriers, and lack appropriate digital equipment, which potentially puts their businesses at a competitive disadvantage.

Public Wi-Fi could Support Commercial Districts

There are several business districts that have small businesses that could benefit from public wi-fi to assist businesses and their patrons. This includes the Navy Yard, the Broadway Corridor, and the Bridge Street Corridor.

Senior Center Support Often Relies on Volunteers or Untrained Staff

Dracut has had at least one program – a Senior Center computer lab – end because of lack of volunteers. In other cases, staff might have difficulty due to lack of support, or organizations may struggle with lack of funding for staff time dedicated to digital equity issues.

Hybrid Municipal Meetings Pose a Possible Challenge—And an Opportunity

Like many communities with limited resources, the Town relies on volunteer boards and committees that may not have familiarity or comfort with providing remote participation options. This limits the ability for some people to participate in their government.

Consumers Have Limited Choice for ISP options and High-speed Plans are Expensive

The overwhelming majority of addresses in Dracut are only served by Comcast when it comes to cable internet, a near monopoly condition that could lead to slower speeds and higher prices, with cost coming up as a salient issue in focus groups.

RECOMMENDED PRIORITY ACTIONS

- Coordinate and promote existing services from the Greater Lowell region. Given Dracut's high level of need, but low level of capacity and existing programs Dracut should prioritize partnering with Lowell to ensure the provision of digital equity support for residents. This might include resource sharing or coordinating to bring digital literacy programming from Lowell to organizations like the Parker Memorial Library and Dracut Senior Center. This coordination could further be supported by working with nearby municipalities to bring on a regional digital navigator.
- Pursue (regional) digital navigation support. Dracut has organizations and facilities like the Parker Library, Senior Center, and Dracut TV that may be well positioned to provide digital literacy training or tech support. A digital navigator could provide that support to a number of venues and organizations, while also sharing resources from across the town and region.
- Conduct targeted engagement with low-income, elderly, and disabled households to better understand digital access needs and connect residents with support. This should include partnering with the existing ISP, Comcast/Xfinity, to better market its "Internet Essentials" low-cost plan and ensure that any qualified households are able to sign up.
- Expand devices, equipment and services offered at the Library, including purchasing additional hotspots for the hotspot lending program, and adding specialty/adaptive devices for in-library use, purchasing more laptops for lending, and creating more private spaces, such as reservable telehealth or remote work/learning pods.
- Map areas with poor cell service and target device distribution programs to households relying only on Smartphones.
- Advocate for additional ISP coverage in Dracut, including by reaching out to Verizon to court additional coverage and fiber infrastructure, and including in coordination with nearby communities experiencing similar ISP coverage challenges, like Lowell.
- Work with the Dracut Housing Authority to explore better supporting broadband access at affordable housing sites, including by pursuing the MBI residential retrofit program, which could bring additional ISP competition and fiber infrastructure to affordable housing sites.
- Work with the Dracut Housing Authority to explore providing public Wi-fi networks at high density affordable housing sites, such as 971 Mammoth Road.
- Leverage the proximity of 971 Mammoth Road to the Dracut Council on Aging to provide better Wi-Fi network services to both properties by expanding the existing network at the COA. Similarly, work with the COA to provide digital literacy and device access support at the Senior Center and or to add computer workstations or a digital learning lab that could be available to meet nearby housing residents where they are.

- Encourage the Senior Center to expand on its existing tech support nights with additional programming and support, including exploring working with Dracut schools to offer internship or volunteering opportunities for high schoolers to provide tech training or troubleshooting for older adults.
- Partner with the Greater Lowell Chamber of Commerce to provide digital skills training catered to the needs of small businesses.
- Partner with corporations and community organizations to coordinate device donation and refurbishment locally and regionally.
- Partner with the business community to explore the feasibility of adding public Wi-fi networks to commercial areas, such as Lakeview Ave, Bridge Street, and Route 113 commercial corridors.
- Explore how the town might offer Wi-fi access in parks and public spaces where residents gather, including Veterans Park, and leveraging proximity to municipal buildings and facilities that already have access to high-speed broadband and Wi-fi networks, such as Monahan Park's proximity to the fire station.

DIGITAL EQUITY IN DUNSTABLE

The Town of Dunstable's (pop. 3,375) is a rural community with **15% of the population (486 individuals) aged 65 or older,** being the largest population facing the digital divide.[20] Dunstable is best positioned to participate in regional-level digital equity programming to help connect seniors and others facing the digital divide with resources.

EXISTING ASSETS IN DUNSTABLE

Dunstable has a small municipal staff, a small library with a relatively new director, and a senior services department with a part-time director. Dunstable is part of a regional school district, the Groton Dunstable Regional School District.

- Municipal staff receive training in cyber security.
- Municipal staff at the Council on Aging / Senior Services Department, as well as the Veterans Services Department assist seniors and veterans with digital needs such as phone set-up regularly.
- The Town website offers limited online services, including online permitting.

[20] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

- Dunstable has a Cable Committee and a Technology Advisory Committee.
- A local trust fund commission supports those in need.
- The Groton Dunstable Regional School District has an online safety hub to support parents and caregivers in ensuring student online safety through guidance, videos, and an app called Questodio.
- The Groton Dunstable Regional School District has a 1:1 Device program providing students with iPads and Chromebooks, as well as Google student accounts to support digital learning in school.
- Relatively few businesses are present in Dunstable, limiting resident access to "third places" with public Wi-fi. The Farmhouse Cafe in the town center and the Dunkin' on Pleasant St. are two options for those in need of a place to access the internet.

DUNSTABLE AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

	Households with no internet connection		Households with no computer		Households with only smartphones		Median download speed (Mbps)	Median upload speed (Mbps)	ACP Enrollment (Households)
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Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
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MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Due to Dunstable's small population size, margins of error are relatively large for ACS data. However, available data suggest that Dunstable has the lowest number and percent of households with no internet subscriptions, and among the lowest with no computer at home, well as with just a smartphone of all communities in the Greater Lowell region. **ACP enrollment data demonstrates a larger population in need with 33 households having signed up for—and then lost—assistance with their monthly internet bill** and another 60 households in Dunstable that qualified

for the ACP program but did not sign up. Despite the low number of unserved households or households without devices, Dunstable's median download speed was the **lowest in the region, at 78 Mbps.** Given that nearly all addresses in Dunstable are served by two ISPs and have a fiber option from Verizon, this is a surprising finding and one that suggests many households in Dunstable may be enrolled in low bandwidth plans. This may mean that some residents—such as those who are lower income or older—may not have equal access to broadband speeds needed for all modern applications, such as streaming video.

WHAT WE HEARD FROM STAKEHOLDERS

Despite its Small Size, Digital Literacy Education is a Need, Especially Among Seniors

Dunstable has a growing aging population. Stakeholders have noted a need for digital literacy education among this population and others who might face a digital divide. Some employees who are seniors have fallen victim to Internet phishing. Stakeholders have not encountered barriers to broadband or device access, but they have seen challenges such as exposure to the Internet or understanding what technology can do for them.

Small Staff Means Capacity Issues

Many municipal employees are part-time, making it challenging to coordinate around initiatives and community programming. There is also some reluctance on the part of staff to use email, such as the Department of Public Works. The regional school district also makes it harder to dedicate resources tailored to Dunstable's community.

RECOMMENDED PRIORITY ACTIONS

- Digital literacy rather than broadband connection and device access is key in Dunstable. The town should consider offering programming where possible, such as at the library or council on aging, especially to priority populations like Seniors and Veterans.
- To address Dunstable's capacity constraints, the town should explore partnerships or shared service agreements to support digital skills training, especially for seniors. The Dunstable Council on Aging, Veterans Services Department, and Library in particular should explore partnering with Library or Senior Centers in nearby Pepperell or Tyngsborough or partnering with the Groton Dunstable Regional School District to bring digital skills training to their constituents.
- The number of households without devices or internet is extremely small, likely under 40. Given this, Dunstable has a unique opportunity to take a human-scale, neighbor-to-neighbor approach, identifying and directly meeting with these households to have conversations and understand context and needs more directly.
- Explore opportunities to partner with GDRS to connect high-need households with devices and hotspots, including for use at home, especially given that the number of families in need with school aged children may only be a handful.

- Explore opportunities to partner with GDRSD to offer digital literacy and tech support resources to the broader community, especially to aging adults, both online and via in-person events utilizing school equipment and faculties.
- Work with the GDRSD to ensure access to free public Wi-fi in the town field and gazebo by offering a guest network on Swallow Union Elementary School's Wi-fi network and installing outdoor access points as needed to support sufficient signal strength.
- Re-engage the Technology Advisory Committee to take on digital equity issues, including coordinating with regional partners to ensure that residents of Dunstable have access to resources supporting broadband connection, appropriate computing devices, and technology support and digital literacy.
- Conduct research and/or community engagement to learn more about why Dunstable's download speeds are so much slower than surrounding communities, including investigating whether residents are on low bandwidth internet subscriptions than they should be due to issues with affordability and/or digital literacy.

DIGITAL EQUITY IN LOWELL

The City of Lowell (pop. 114,799) has the highest proportions and by far the greatest absolute numbers of population likely to be impacted by the digital divide in the NMCOG region, including the **31.1% of the population (35,702 individuals) under 200% poverty level** and a **large number of people 65 or older (14,188).** [21] Lowell is a diverse city and unique among the NMCOG communities in that a majority of residents are non-white, nearly 20% of residents are Hispanic or Latino, and nearly 30% of the population was born in a country other than the US. Lowell also has a diversity of languages spoken, with 42% of residents over the age of 5 speaking a language other than English at home. As the largest and most socioeconomically diverse community in the NMCOG Region, Lowell has the greatest digital equity needs, but it also has the most mature ecosystem of nonprofits, institutions and local entities doing digital equity-related work, some of which extend to the region as a whole.

[21] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

EXISTING ASSETS IN LOWELL

Lowell has many nonprofits and programs that address digital equity issues. Most of these are not focused primarily on digital equity but rather are targeted toward specific populations. Many nonprofit and government programs face a lack of resources, including staff time, equipment, training, and funding. Those organizations that are focused on digital equity often focus on youth, such as Kids in Tech, but many other organizations provide digital services such as training, devices, or technical support.

- The UMass Lowell Center for Community Research & Engagement in partnership with the UMass Lowell Innovation Hub and faculty digital equity researcher Carol McDonough PhD. has been awarded a grant as part of the Mass Broadband Institute's Digital Equity Partnership program to coordinate UMass Lowell student digital navigators to provide culturally competent digital literacy and tech support to the community.
- Kids in Tech provides an "After-school Tech Club Program" where volunteers and professional educators teach STEM technology skills to children aged 8-14 from low income families.
- The YWCA Lowell provides a computer tech lab classroom on-site. They offer training courses for digital literacy in partnership with UMass Lowell. These training courses are offered in both English and Spanish.
- The Coalition for a Better Acre offers a digital literacy training program via a partnership with UMass Lowell.
- The African Community Center of Lowell offers a range of workshops and classes, including a computer skills class offered in partnership with UMass Lowell, for immigrants and refugees, led by members of the African immigrant community.
- The Boys and Girls Club of Greater Lowell distributed laptops and other devices to kids in the past. They also allow members to access the Internet with assistance on-site. They have two computer labs: one for kids 12 and under, and the other for teenagers. They also offer Khan Academy to help kids learn and create apps and video games, which serves as a pathway toward other digital skills. They also assist youth in achieving Google certifications. Some of this programming is via partnerships with UMass Lowell.
- Cambodian Mutual Assistance Association (CMAA) offers training programs that include receiving a laptop device.
- Latinx Community Center for Empowerment offers computer lab devices and technical support.
- The International Institute of New England sets up Wi-Fi for refugee households. They partner with Tech Goes Home to provide computers and additional support.
- Restaurants and multi-service businesses focused on residents who don't speak English as a primary language offer free, secure Wi-Fi and phone assistance.

- The Lowell Association for the Blind provides six computers with software to assist people who are blind. They provide training and assistance.
- The Lowell Community Health Center has digital equity programs and direct funding for families. They provide cell phones for patients without them. The LCHC also launched a website to help patients request appointments as well as a new app that has MyChart.
- The Lowell Housing Authority reworked their community rooms to include desks and older computers. They also created digital information boards to spread information during COVID in multiple languages.
- Pollard Memorial Library provides "Tech @ Home" remote digital skills learning resources and also offers a rotating schedule of in-person single-session computer workshops for beginners, including one-on-one sessions with IT help staff available during "tech night" at the main branch of the library and classes on a variety of topics covering basic digital skills offered at the Lowell Senior Center computer lab.
- The Pollard Memorial Library also provides computer workstations, printing, and free Wi-Fi.
- UMass Lowell provides free wi-fi within its campuses and libraries, and Middlesex Community College also offers free access to its guest Wi-Fi network for sessions limited to 12 hours.
- Lowell Makes is a non-profit community maker space whose members teach classes, facilitate workshops, and share skills, including digital skills from software application development and web design to 3d modeling, to search engine optimization for businesses.
- Lowell TeleMedia Center (LTC) offers gathering space, user-friendly technology instruction, and tools and equipment for individuals, students, seniors, businesses, and non-profit groups to learn digital media skills and create multimedia.
- Lowell Public School District (LPSD) has adopted a Digital Learning and Technology Integration Plan, provides loaner laptops to students for use in school and at home, and also supports a "Bring Your Own Device" (BYOD) model as well.
- LPSD provides a number of technology resources to teachers, students, guardians and families via the "Instructional Technology Corner" website, which provides resources detailing available technology purchased by the school district, an "accessibility toolbox" with language access technology tools, and a "Family Resources" page with tutorial videos for common hardware and software issues. The site even has resources providing guidance and exploring emergent technology, such as generative AI, and how it might be used in the classroom.
- The LPSD Family Resource Center provides access to computers during business hours so that families can make use of LPSD web content and resources.
- The Colligate Charter School of Lowell offers free Adult ESL Digital Literacy Classes to CCSL families.

- In 2023, Vinfen—a nonprofit based in Cambridge that offers digital inclusion services focused on supporting individuals living with disability—piloted a "Tech Navigator serving the Lowell area" who provided one-on-one support for device purchasing and set up, digital skills learning, and broadband enrollment.
- The MassHire Greater Lowell Workforce Board's Lowell Career Center offers digital skills assessment and various trainings and events for job seekers—such as workshops on strengthening a LinkedIn profile, tips for nailing an online interview, and guidance on incorporating ChatGPT in the job search. The Career Center also provides a resource center with computer access and staff support.
- The Greater Lowell Health Alliance's Community Health Improvement Plan (CHIP) includes priorities and recommendations for increased healthcare service access and navigation through increased digital equity and digital tools training for high need populations such as elders and people who speak languages other than English. It also recommends a digital resources summit for healthcare stakeholder to share digital resources.
- The City of Lowell provides access to virtual public meetings and offers a number of online services via its website, including 311, online payments, online permitting, and alert sign up.
- The City's Management of Information Systems (MIS) department supports the use of technology within local government, including supporting city staff via a help desk, developing solutions for departments, and maintaining the city's websites, software, hardware, network, and security technology.
- The Lowell City Council has a Tech and Utilities Subcommittee that advises the city council on matters pertaining to technology and utilities, including reviewing the City's Cable Franchise Agreement with Comcast and overseeing issues related to resident access to affordable internet service.
- In late 2018 the City of Lowell issued an RFP for a community wide fiber to the premises (FTTP) network over an open access network for residents businesses, government and community anchor institutions in Lowell, with the City offering facilitation of necessary processes, partnership on grant opportunities, access to existing City resources and other community assets, including right of way access and assistance with permitting, as well as access to existing city infrastructure and customers to potential vendors. This and other broadband efforts are summarized in a 2022 memo from Chief Information Officer Miran Fernandez.

LOWELL AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal

Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

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Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Lowell is the community with by far the greatest need. Lowell has the largest number and percent of households without Internet connection or devices in the NMCOG region: 12% (5,128) of households have no Internet service, nearly 8% (3,229 households) have no computer, and an additional 11% (4,537 households) have only a smartphone, meaning over 18% of Lowell's households (7766) don't have access to adequate computing devices. **Unlike most of the NMCOG region, most of the City of Lowell is served only by a single ISP, Comcast/Xfinity, limiting competition.** Verizon Fios also serves 13.5% of Lowell addresses giving some residents a choice of two ISPs and a fiber option, but the limited choice for internet plans may contribute to lower speeds, poorer customer support, and higher costs for customers. Lowell's median download speed was 182 mbps—above broadband speed thresholds, but relatively slow for the region—and the median upload speed—a measure that is typically slower with cable internet than with fiber—was 21 mbps, also among the slowest in the region. These relatively slow bandwidths are even more concerning when considering that families in Lowell are more likely to experience overcrowding, meaning more people—and more devices—likely relying on the same network. Lowell had **over 9,500 households enrolled in the ACP** in February 2024 who then lost access to the $30/month subsidy. The loss of the program therefore means the loss of over $3.4M/year in funds to subsidize the cost of internet subscriptions for families in need in Lowell.

WHAT WE HEARD FROM STAKEHOLDERS

Lowell Residents are Diverse and Need Specialized Support from Trusted Partners

Lowell residents from a variety of age groups and backgrounds want and need training to use devices and navigate the Internet with confidence. Organizations have their own programming and while technology support can become an ad hoc part of programs and service provision, staff may lack the resources to fully meet the demand for digital skills. Many participants learn best one-on-

one from a trusted teacher who speaks and understands their language and culture and can adapt to their learning style and needs. This includes teachers specialized in non-English languages, working with those with disabilities, or having other cultural competencies. Training course structures should be adapted to serve users living with disabilities, career development skills, Internet safety, and topics that young people are interested in, such as video game design. It may also include technology guides that reach people where they are – through cartoons, multiple languages, or other culturally appropriate methods.

Language is a Barrier to Digital Equity, but Technology Also Presents Opportunities for Access and Learning

Many Lowell residents speak a language other than English, including Khmer, Spanish, Portuguese, and Mandarin. There is a lack of online resources available in these languages. In addition to expanding multilingual digital literacy resources, stakeholders suggest incorporating digital skills training into English Language Learning courses. Finally, language barriers impact more than access to training. For example, technical support from ISPs is primarily in English, and speakers of languages other than English report a lack of patience and understanding from ISP customer support staff. Nonprofit program staff report that assistance related to working with internet service providers is labor-intensive: for example, making sure the ISP follows through on its appointment to set up Internet. However, stakeholders also report that technology, such as Google Translate, assists with language gaps, and suggest additional training and devices could be set up for virtual interpretation.

Immigrant Communities Face Additional Barriers Beyond Language

In addition to the cultural barriers described above, stakeholders report that immigrant communities in Lowell often need additional training or outreach as they are used to other tools or norms such as using WeChat or WhatsApp, for communication. This may result in greater difficulty in outreach efforts to reach these populations online, as well as in unfamiliarity with digital tools such as email or SMS.

Unhoused Population Have Special Digital Needs that Create Barriers to Inclusion

Unhoused individuals lack storage and charging opportunities for devices. They are more frequently the targets of theft. Stakeholders report that these individuals use devices for a wide range of purposes—not only entertainment and news, but also telehealth, accessing services, and career searches. Stakeholders suggested targeted strategies related to storage and charging for these populations.

Key Neighborhoods Could Benefit from Wi-Fi or Mesh Networks

Stakeholders identified several key neighborhoods that might benefit from free public wi-fi or mesh networks. This includes downtown, which has a concentration of affordable housing and outdoor public areas; the Acre Transformative Development Initiative area, which includes a combination of public housing, affordable homes, and immigrant-owned businesses; and Cambodia Town, which

includes a mix of businesses and homes and has several possible institutional partners. In addition, charrette participants expressed a desire for public wi-fi in places like parks and plazas.

Device Maintenance is a Critical Concern for Communities with Low Incomes and Other Barriers

Multiple Lowell stakeholders reported that device access is a critical concern, not just at the initial phase of receiving a new tablet or laptop, but throughout the lifetime of that device. This includes assistance in procuring a device and navigating salespeople, keeping the device software up-to-date and secure, repairing or refurbishing the device if it is damaged, and understanding when a device's life cycle is complete, and a new device is required.

Lowell Could Consider a Holistic Infrastructure Policy

Stakeholders noted the need for a more holistic infrastructure policy. A policy in which roads cannot be opened for five years after paving is important but also makes installing new underground conduit difficult. In some areas such as the Hamilton Canal Innovation District and Thorndike Street, the City already owns empty public conduit that could be leveraged for expansion of affordable broadband, but this network is incomplete and not well-advertised. Stakeholders suggested a policy of always installing communication conduit during construction or repair to reduce the future expense of installation of new services.

Pollard Memorial Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

Pollard Memorial Library staff help users with IT assistance on an as-needed basis. It is constantly working to keep up with technological updates and device maintenance. It is also a source of free Wi-Fi and publicly available computers. However, it would like to be able to expand on the classes it offers and provide more books and digital resources in languages other than English. It is seeking partners for these efforts.

Lowell Small Businesses Suffer from Digital Divide

Internet access is essential for operating and conducting business. Some small businesses in Lowell struggle with Internet access due to the lack of a proper wireless signal. In addition, many business owners lack the time to train themselves in marketing themselves online, particularly through social media. Other skills include training in financial management software, Google Analytics, project management tools, and online marketing and social media.

Lowell Housing Authority Working Toward Equity, but there are More Opportunities

Lowell Housing Authority is not able to provide affordable wi-fi or tenant broadband to its residents. Many of its properties are very old, and the status and ease of broadband installation is unknown. However, they have community rooms with older computers and digital information boards in multiple languages.

Limited ISP Competition is a Challenge and High-speed Data Plans are Expensive

The majority of addresses in Lowell are only served by Comcast when it comes to cable internet, which could lead to slower speeds and higher prices. The City reports that they have repeatedly reached out to additional ISPs and are always ready to negotiate another franchise agreement but have not received interest. The Technology and Utilities Subcommittee of the City Council may be one avenue for exploring options to support residents and consumers.

RECOMMENDED PRIORITY ACTIONS

- Employ train the trainer models that recruit residents from diverse language and cultural backgrounds to serve as digital navigators who can provide culturally competent and accessible tech support and digital skills training.
- Adapt digital skills training courses and materials in culturally specific ways to serve particular population segments and cohorts. Potential examples may include users living with disabilities in need of adaptive devices; job seekers looking for career development skills; patients accessing healthcare services; and older residents, immigrants, and families interested in support with internet safety.
- Create a directory of all digital literacy, device access, and tech support resources available in Lowell. Partner with non-profit organizations to support culturally appropriate shared marketing and outreach to promote these existing programs and resources to the Lowell community and regionally.
- Create a map of free Wi-fi network coverage areas, such as guest networks provided by small businesses and educational institutions.
- Inventory the most used public spaces and explore the provision of public free Wi-fi at key locations. This could include partnering with private entities.
- Inventory Lowell's over 500 transit station stops, most of which are part of the LRTA bus network, to identify stations that could be served by charging stations and/or Wi-fi coverage. Prioritize high ridership stops and transit hubs such as Gallagher Terminal.
- Work with organizations providing immigrant support and resettlement services to ensure newcomers to Lowell have access to device distribution and digital literacy programs, building on existing programs such as IINE's partnership with Tech Goes Home, English as a Second Language provider programs, and UMass Lowell's existing Digital Literacy Program.
- Partner with Lowell Community Health Center and Greater Lowell Health Alliance to engage the healthcare community around the issue of telehealth to better understand patient device access and digital skills needs related to telehealth. This effort could also include partnering with hospitals and health centers to support and/or promote device access and digital literacy programs.

- Engage shelters and transitional housing providers, such as Lowell Transitional Living Center, House of Hope, Alternative House, etc. to better understand the digital access needs of the housing insecure population, including inventorying existing device access, charging station, device storage, and internet/Wi-fi access for shelter residents at each shelter facility. Explore opportunities to provide equipment or other upgrades to facilities to increase access to this high-need priority population.
- Partner with UMass Lowell to explore the deployment of a Mesh Network in the Acre and in other high need neighborhoods such as Cambodia Town and Downtown. Such an effort could involve partnering with community organizations and CDCs such as Coalition for a Better Acre. This effort could be modeled on North Shore CDC's implementation of a mesh network in Salem's Point neighborhood.
- Partner with Lowell Housing Authority to identify housing sites that could be a fit for broadband improvements, including re-wiring buildings to support fiber and/or additional ISP competition, or the provision of campus style free Wi-fi provided to residents as an amenity.
- Similarly work with LHA, CDCs and other affordable housing providers to identify on site community spaces that could be a fit for the installation of shared computer workstations or computer labs that could serve low-income populations where they live.
- Support the Pollard Memorial Library in expanding its existing tech support and digital equity resources through additional dedicated staff, fellows, or volunteers, and/or funding for additional equipment and program support.
- Work with the Lowell School District to explore the use of school facilities and resources by community groups and programs supporting digital equity. This could include the use of school computer labs to host digital skills training and tech support classes.
- Review an inventory of Lowell's municipal buildings and facilities noting existing digital access assets, such as publicly available Wi-fi, computers, or other tech support services, as well as opportunities to enhance digital access through "quick win" improvements.
- Explore the provision of public Wi-fi network access, including after hours, in the immediate vicinity of municipal buildings, including schools, prioritizing areas where municipal buildings are located near well used parks or commercial corridors and/or low-income neighborhoods.
- Work with the Greater Lowell Chamber of Commerce and local business associations to cater digital skills trainings and tech support resources to the needs of small businesses.
- Consider appointing an internal steering committee to coordinate the implementation of digital equity initiatives, including the implementation of the digital equity plan.

- Leverage the Cable Franchise agreement to ensure Comcast is meeting its current responsibilities and explore opportunities for future agreements to support digital equity programming and efforts.
- Map existing municipal network infrastructure, taking stock of existing municipal fiber and opportunities to connect additional community anchor institutions, including affordable housing sites.
- Use the upcoming opportunity for zoning policy reform to research and adopt zoning and planning policies that can support broadband infrastructure. These might include defining broadband as a public utility or essential service in the zoning ordinance, streamlining permitting for or affording by-right installation of fiber conduit and other broadband infrastructure like access cabinets in the right of way; allowing certain wireless and backhaul "telecom facilities"—like small cell or 5g equipment antennae, cabinets, or other equipment—by right in certain zones or overlay districts in the use table, or allow them if certain criteria are met; require the inclusion of fiber conduit in all new developments over a certain size as part of site plan review; establish a dig once policy requiring the installation of fiber conduit when the roads are opened up, etc.
- Conduct an audit of public facilities and service as well as community organizations that serve Individuals living with disabilities to understand the need for specialty or adaptive devices or equipment across the city of Lowell and purchase and deploy such devices.
- Explore more proactive management of public or open access broadband infrastructure, including implementing a Dig Once policy.
- Lead a feasibility study to explore options for expanding public or open broadband infrastructure, analyzing and exploring various models and approaches including expanding municipal networks and institutional networks.
- Revisit the City's 2018 RFP for an open access fiber to the premise network and explore alternative approaches to improving broadband infrastructure and competition.

DIGITAL EQUITY IN PEPPERELL

The Town of Pepperell (pop. 11,656) has higher proportions of population likely to be impacted by the digital divide than many other communities in the NMCOG region, including a **high proportion of population under 200% poverty level (12%),** such as those living in the Pepperell Housing Authority's 70 units, and a **large number of people 65 or older (1,969)**[22] such as users of the Albert Harris Center. Other portions of the population that have been identified as needing assistance are single-parent households and self-employed workers. Pepperell can support the awareness and promotion of existing internet access resources at public facilities and could support Internet training and safety programs. However, on its own, Pepperell may not have the level of services and resources to support the needs of all its residents, making regional partnership—with the North Middlesex Regional School District, and with other Northern Middlesex Council of Governments communities in the greater Lowell region—crucial.

EXISTING ASSETS IN PEPPERELL

Pepperell's primary digital equity-related assets are the Lawrence Library and the Albert Harris Center (Council on Aging). The Fitzpatrick Collaborative, which provides community center programs

[22] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

and events at the historic Peter Fitzpatric School building also provides computer-related educational programs.

Asset	Digital Equity Resources or Services
Lawrence Library	• Computer stations with access to MS Office suite software, printing • Staff assistance with updating resumes and applying for jobs online • Free Wi-Fi inside and outside the library building • Seven hotspots available for check out for 2 weeks at a time.
Albert Harris Center / Council on Aging	• Various services and programs for older adults, including a "Help Desk" with "Gadget Man Dean" supporting cell phones and tablets, and in-person and online workshops like "Technology Talks", and "Scams Targeting Seniors".
North Middlesex Regional School District	• Access to Wi-fi at all school buildings and online remote access to some software applications • Students issued Chromebooks for in school use • In some situations, the school district may approve the provision of access to school computers and technology systems to members of the community.
Peter Fitzpatrick Collaborative	• Occasional digital training • Free Wi-Fi
Pepperell Community Media, Inc.	• Offers various digital media equipment and training • Cable channel and online videos include occasional digital training workshops
Cable Advisory Committee	• appointed by the selectboard to support residents with mediation with Charter Communications, the only Internet Service Provider in town. • set goals to seek additional lost cost internet service options in town.
Town of Pepperell	• Public Wi-Fi in the municipal building • Received a $250,000 grant in FY2022 for the creation of a new municipal fiber network • Various online digital services, including meeting agendas and minutes via the agenda center, online bill pay, access to various permit applications and other online forms via Pepperell's OpenGov portal, and online sign up for email/SMS notifications via NotifyMe. • Online engagement via various municipal social media accounts (Facebook, Instagram, YouTube, Twitter/X)

PEPPERELL AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

	Households with no internet connection		Households with no computer		Households with only smartphones		Median download speed (Mbps)	Median upload speed (Mbps)	ACP Enrollment (Households)
Community	Number	Percent	Number	Percent	Number	Percent			
Billerica	783	5.0%	579	3.7%	642	4.1%	279	138	854
Chelmsford	553	4.1%	283	2.1%	324	2.4%	268	115	468
Dracut	1,081	8.9%	717	5.9%	219	5.3%	98	12	1,019
Dunstable	5	0.4%	14	1.2%	20	1.8%	78	77	33
Lowell	5,128	12.1%	3,221	7.6%	4,535	10.7%	182	21	9,586
Pepperell	250	5.8%	47	1.1%	229	5.3%	163	17	493
Tewksbury	656	5.5%	489	4.1%	322	2.7%	239	40	641
Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
Westford	344	3.9%	150	1.7%	97	1.1%	288	653	295
MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Pepperell is a smaller, rural community with the **third-highest percentage of households with no internet connection at 5.8% and the second-highest percentage of households with only smartphones in the region at 5.3%**. An estimated 250 households have no internet, and 276 have no computer (not including smartphones). In addition, **Pepperell's median upload speed is second lowest in the region**, which impacts video calls, work-from-home, and many other common internet tasks. This may be in part because almost no addresses in Pepperell have access to fiber Internet, a technology that typically supports faster upload speeds. Much of Pepperell is served cable broadband by only one Internet Service Provider (ISP), Spectrum / Charter Communications. This near-monopoly condition limits consumer choice and could lead to slower speeds and higher prices.

WHAT WE HEARD FROM STAKEHOLDERS

Issues with Cell Phone Coverage

Pepperell stakeholders reported that a number of areas in town lack adequate cell phone coverage. This could impact households that have no computer except for cell phones in their household.

Difficulty Reaching Single-Parents, Self-Employed, Low Income, and Senior Populations with Assistance

Municipal stakeholders noted that internet service is not treated like all other utilities, which creates difficulty especially for low-income, single parent, self-employed and senior populations in need. The Town noted that, unlike households struggling with other essential utilities, it did not always know where the need was, which populations might lack access, and how to assist them when it comes to the internet. There was further concern that attitudes were such that cell phones and data and high-speed internet plans might still be classified or thought of as "luxury expenses" when broadband access is crucial for public health emergencies, national disasters, and day-to-day life.

Need for Language Support

The Town has some Spanish speakers, and occasionally Portuguese speakers. The library needs additional resources available in their languages, both digital and otherwise.

Lawrence Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

Pepperell's Lawrence Library spends a significant amount of staff time assisting Town residents with access to digital services. Some of the common needs we heard about include help with employment materials, such as resume writing and online job applications; support navigating logins and two-factor authentication; creating email addresses and other online accounts; accessing or printing digital plane tickets; or obtaining replacement government documents, like Social Security cards. The Library provides a place to work with public computers and has seven hotspots available to loan out. As many as five or six hotspots are loaned out at any given time, demonstrating a clear demand. A laptop loan program was previously available, but the library was unable to keep devices secure and had to discontinue the program as a result. Lawrence Library is very interested in implementing Internet training programs and increasing local awareness of its free public Wi-Fi.

Pepperell Small Businesses Suffer from Digital Divide

Pepperell's business community is reported to have a high proportion of home-based businesses. These small business owners and entrepreneurs often had to rely on marketing themselves online, especially during the pandemic, but not every at-home businessperson had the skills and know-how, creating a digital divide. Among local business owners, training and support for online marketing, and other relevant digital skills are important needs.

Safety Concerns

Many residents, especially seniors, are concerned about Internet safety and scams. Training in Internet safety is needed, but there is a lack of staffing and money. The Town can support awareness of cyber safety programming but often cannot act as the delivery mechanism.

Hybrid Municipal Meetings Pose a Possible Challenge and Opportunity

When it comes to municipal engagement, Pepperell can still perform all its services in person, but the Town is trying to move as much as possible to an online format. Municipal stakeholders report that this system is working, but residents wish it was more connected and integrated.

RECOMMENDED PRIORITY ACTIONS

- Expand the existing cable advisory committee into a "digital equity advisory committee" charged with improving digital access and coordinating the implementation of the regional digital equity plan, including by participating in a regional digital equity task force.
- Similarly work locally (with the Cable Advisory Committee) and partner regionally with other municipalities to advocate for expanded ISP service and to better promote affordable broadband plans offered by existing ISPs and ensure that qualifying households are able to sign up.
- Create a resources directory of existing public computers, public Wi-fi networks, and technology training programs, made available in English, Spanish, and Portuguese.
- Add additional Hotspots to the Lawrence Library's Hotspot Lending program and explore the purchase of adaptive devices to support those with accessible technology needs.
- Partner with North Middlesex Regional School District to expand community access to technology, and technology education, including access to technology resources on school facilities and exploring allowing high-need families access to Chromebooks for at-home use.
- Partner with nearby municipalities to provide expanded digital programming, including programming targeting small and at-home businesses.
- Partner with nearby municipalities to support a regional technology help desk and digital navigator services. In particular, consider a partnership with Dunstable, as it shares Pepperell's rural context.
- Inventory public facilities, including what buildings are connected to the town's municipal fiber network, and opportunities for expanding connection to the municipal network and other quick win technology improvements that can provide digital access.
- Purchase workstations, adaptive/accessible devices and/or add a computer learning lab to the Albert Harris Center
- Help the Albert Harris Center partner with the school district to create an internship or volunteer opportunity for students to provide tech support to older adults.

- Consider the deployment of public wi-fi networks in parks and public spaces where people gather, such as at McNabb Field or along Main Street in East Pepperell by the Nashua River Rail Trail.

- Partner with Pepperell Housing Authority to provide digital access resources, such as public Wi-Fi networks or computer labs, or other programming or resources to residents on site at Housing Authority properties, including Elderly/Disabled residents on Foster St., and Low-Income Families on Cottage and Groton Streets.
- Help Pepperell Housing Authority apply for the MBI Residential Retrofit program to bring fiber internet to Housing Authority residential sites.
- Map cell phone signal dead zones and pursue advocacy and infrastructure to address them, coordinating efforts to engage mobile carriers with Dunstable and nearby neighbors.
- Pursue proposals or incentives to bring additional telecommunications internet service providers to Pepperell to provide low-cost cable and internet services, including low-cost services for seniors, low-income residents and residents with disabilities.

DIGITAL EQUITY IN TEWKSBURY

The Town of Tewksbury (pop. 31,168) has high proportions of population likely to be impacted by the digital divide, including a **high proportion of population under 200% poverty level (13%)** and a **large number of people 65 or older (6,261)**.[23] About 11% of residents identify as non-white, over 10% of residents were born in a country other than the US, and over 13% of residents speak a language other than English at home. Additionally, over 1500 veterans call Tewksbury home. Tewksbury's main challenge is expanding community-level coordination of digital equity-related programming to support these priority populations.

EXISTING ASSETS IN TEWKSBURY

Tewksbury's primary assets in digital equity support are the Tewksbury Public Library and Tewksbury Telemedia Department.

- The Tewksbury Public Library provides free Wi-fi and computer workstations as well as laptops that can be used at the library but not checked out.

[23] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

- The library also offers or connects residents to online and in person technology education resources, including device and software basics, resources catered to seniors, and accessible tech resources.
- The library provides a variety of additional services that complement core digital access resources, including remote printing, fax scanning, integrated library services, IT assistance, English language learning resources, community rooms available for booking, and training sessions when possible. One staff person offers hybrid adult programming, which is extremely popular. The library also has a technology plan and a security plan.
- Tewksbury Public Schools provides Chromebooks to all students grades 5-12 as part of their 1:1 device program. Students are permitted to take Chromebooks home and keep them over the summer months as well.
- Tewksbury Public Schools provides a Digital Resources and Support webpage with information, guides, and tutorial for students and guardians on Chromebooks, email, the Clever app, Google Classroom, G Suite, and videoconferencing software including Zoom and Meet.
- Tewksbury Telemedia Department provides local cable customer complaint support services.
- The town of Tewksbury has a Computer Services Department that supports computer help for municipal staff.
- The town has an existing municipal fiber network and in FY2024 received a $190k grant to upgrade that infrastructure from a 1gb to a 40gb network.
- The Senior Center offers various programs, including technology classes.
- The town implemented a new website in 2022 which operates on the Civic Plus platform to improve accessibility. The website includes a number of online services, including online permit applications, online payments, a citizen request app, a comment/feedback form, etc.

TEWKSBURY AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

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Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

5.5% of households have no Internet connection. An estimated 489 households have no computer at all and another 322 have only a smartphone, together representing 6.8% of households in town that lack adequate access to digital devices. These numbers are close to the median among NMCOG communities but represent a significant need that may be difficult for the town to meet without dedicated digital equity resources. Over 90% of Tewksbury addresses are served by two ISPs, Comcast and Verizon, with fiber available to most households through Verizon Fios. Tewksbury had 641 households enrolled in the ACP in February 2024 who have since lost access to that federal subsidy and may now have trouble affording monthly internet subscription costs.

WHAT WE HEARD FROM STAKEHOLDERS

Understanding Needs of Seniors at Age-Restricted Housing Developments

Tewksbury has a large number of age-restricted affordable housing developments. These were of special concern to municipal and community stakeholders, as it is unknown whether seniors living at these developments have affordable access to broadband, appropriate computing devices, or tech support and digital literacy training opportunities. Multiple stakeholders noted the need for senior-focused digital literacy programs and suggested the Tewksbury Senior Center as a possible venue.

Tewksbury Public Library Serves as a De Facto Digital Equity Organization, but Needs Resources

The Tewksbury Public Library has become a de facto source of IT services for many residents. The library offers access to the internet, computers and laptops, hybrid community groups, as well as occasional training sessions. However, digital equity work is taken on by library staff in addition to other duties, so capacity to provide these services is limited. The library is doing everything it can, but to expand, staff would either need to be reassigned or more staff would need to be hired. In addition, the library has voiced the need for more outreach, as many residents do not know

about existing programs. Staff also noted that while the Wi-fi network is in demand, the network is not properly secure, limiting the types of activities recommended for patrons.

The Tewksbury Senior Center Offers Some Resources, but Lacks Reliable Funding

The Senior Center thinks carefully about the kinds of digital equity-related programming to prioritize and tries to strike a balance between what is needed and what is feasible, as well as fun and engaging, such as a hybrid tech class that ran for fifteen months. Unfortunately, the grant funding for that class has stopped. There is a desire to offer more classes, but programming cannot continue without sufficient funding. There is a volunteer who offers one on one tech assistance, but it is difficult to schedule time with him.

Further Improvements to Town of Tewksbury Website

One municipal stakeholder noted a concern that increasingly, residents receive outdated or incorrect information from web searches that provide direct links to out-of-date or draft documents. ADA and language access for all municipal digital services also remains a top concern for stakeholders, despite some improvements made in the recent switch to the Civic Plus platform. Even so, more can be done to ensure that online services and materials are made accessible, including keeping content up to date, providing guidance for residents new to online government services, and ensuring translation and accessibility.

Tewksbury Telemedia Department is a Critical Service, but has Funding Concerns

Like most public access telecommunication services, Tewksbury Telemedia Department is concerned about funding shortfalls as their primary funding source, fees from cable subscribers, is shrinking as cable customers increasingly "cut the cord" in favor of streaming services. In addition, they want to be able to address language needs but cannot afford closed captioning. Other needs include equipment and identifying a source of centralized digital equity assistance for the town—such as a Digital Equity task force.

Wi-Fi Access in Public Spaces, and at Housing Authority Sites

There is a discrepancy among Housing Authority sites in terms of Wi-Fi accessibility for residents. The library, town hall, and some businesses have public Wi-Fi, but it is not available Town-wide.

RECOMMENDED PRIORITY ACTIONS

- Conduct outreach, such as a survey or focus groups, targeting Seniors living at age-restricted affordable housing in order to better understand that population's digital access needs, including understanding access to broadband (what ISP plans do they subscribe to? How much are they paying?), ownership of computing devices, and the need for digital skills training or tech support.
- Partner with Tewksbury Housing Authority and Elder Services of Merrimack Valley to explore upgrading age-restricted affordable housing with retrofitted wiring to support additional ISP

competition and/or to support additional building services and amenities to support digital equity such as building-scale free apartment Wi-Fi and/or a computer lab for residents.

- Similarly, work with the housing authority and other affordable housing providers to explore opportunities for computer labs or workstations, device lending, or digital literacy programming that could meet high need populations where they are.
- Expand the success of the Library's IT support model by investing in programming through additional staff capacity. Utilize a train-the-trainer approach to bring the library's existing program resources and support model to other organizations and locations, including the Senior Center.
- Translate existing digital literacy program materials from the library for greater language access, and or explore partnerships with libraries in nearby communities to share resources, included translated digital literacy program and education materials.
- Explore opportunities for public space Wi-Fi in the vicinity of municipal buildings and facilities. Tewksbury's Town Hall, Town Hall Annex, Fire Station, and Police Station are all on Main Street in close proximity to the Town Common and to other well-used public spaces. Setting up new guest networks or expanding the reach of existing Wi-fi via outdoor access points could be a simple way to expand public access to the internet.
- Use the municipal fiber network grant to upgrade from 1gb to 40gb as an opportunity to document fiber infrastructure and explore opportunities to partner with and connect more community anchor institutions, such as additional municipal facilities and affordable housing sites.
- Conduct outreach and/or research to identify where English Language Learners from Tewksbury are receiving educational support. Partner with these English Language programs to explore offering device access and digital literacy training alongside language classes.
- Conduct an audit of digital services made available by the town and ensure that all websites are compliant with the town's website accessibility guidelines, are available in needed languages, and, where possible, include explanatory guidance and how-to resources for residents who may be new to digital services. Update the current website accessibility statement to improve on the template provided by Civic Plus, making it specific to Tewksbury and adding contact information.
- Conduct usability/user testing with priority populations to understand how residents are using the town website and available online service, including understanding potential "pain points". Then cater website improvements and digital literacy training to the results of user testing.

DIGITAL EQUITY IN TYNGSBOROUGH

The Town of Tyngsborough (pop. 12,424) includes several populations likely to be impacted by the digital divide. **It has a high proportion of population under 200% poverty level (12%)** and **a large number of people 65 or older (1,700).**[24] The Department of Veteran Services reports over 1,000 veterans residing in town. Over 18% of Tyngsborough residents are non-white, and nearly 9% were born in a country other than the US, and over180 residents speak English less than "well". Tyngsborough is very interested in expanding its resources, many of which not only community members in Tyngsborough rely on but also are used regionally.

EXISTING DIGITAL EQUITY ASSETS IN TYNGSBOROUGH

Tyngsborough is a small, rural town with digital equity assets concentrated in the Tyngsborough Public Library, Tyngsborough Public Schools, and Tyngsborough Media.

- All Town-owned buildings have public Wi-Fi.
- The Town has an existing municipal fiber network and received a $150k grant in FY2024 to connect various municipal facilities to that infrastructure.
- The town offers online public meetings and digital services, including alert sign up, online permit applications, and online bill pay, via its website.

[24] Source: 2019-2023 American Community Survey, Tables S1701 and B01001.

- Tyngsborough Public Library currently supplies free Internet inside and outside of the library as well as hotspots, Chromebook, and cameras.
- The Library also provides volunteer technical support.
- Tyngsborough Public Schools (TPS) Technology Department offers online technology support resources for teachers, students and parents, including a remote learning portal made available in multiple languages, including Spanish, Gujarati, and Khmer.
- Rather than supplying students with devices Tyngsborough High School has a Bring Your Own Device (BYOD) program that encourages students to utilize their own technology devices in the classroom and at home as empowered "digital citizens". The program also provides the roughly 10% of students who lack access to a personal laptop device with a loaner Chromebook for the year.
- Greater Lowell Technical High School, located in Tyngsborough is one of just 3 technical high schools in the region, and offers information technology courses to students. Night courses are also available to adult learners, and GLTHS makes its faculties available for rental by the community.
- Tyngsborough Media oversees local cable access and provides technical support and training on digital media skills, including video production, editing, and audio/podcasting.
- The Tyngsborough Center for Active Living (Senior Center) offers activities, events, and workshops, including occasional sessions providing "Computer and Phone Help"

TYNGSBOROUGH AND ACCESS TO DEVICES AND BROADBAND

The following table compares the nine NMCOG communities and Massachusetts on common digital equity metrics. It includes the number of households that were previously enrolled in the Affordable Connectivity Program (ACP), a federal subsidy program providing $30/month for internet subscription service, which was available to households living at or below 200% of the Federal Poverty Line from 2021 through April 2024. This figure represents the number of individuals or families that lost access to the ACP subsidy and may now have trouble affording home internet.

Community	Households with no internet connection		Households with no computer		Households with only smartphones		Median download speed (Mbps)	Median upload speed (Mbps)	ACP Enrollment (Households)
	Number	Percent	Number	Percent	Number	Percent			
Billerica	783	5.0%	579	3.7%	642	4.1%	279	138	854
Chelmsford	553	4.1%	283	2.1%	324	2.4%	268	115	468
Dracut	1,081	8.9%	717	5.9%	219	5.3%	98	12	1,019
Dunstable	5	0.4%	14	1.2%	20	1.8%	78	77	33
Lowell	5,128	12.1%	3,221	7.6%	4,535	10.7%	182	21	9,586
Pepperell	250	5.8%	47	1.1%	229	5.3%	163	17	493
Tewksbury	656	5.5%	489	4.1%	322	2.7%	239	40	641
Tyngsborough	42	1.0%	0	0.0%	167	4.0%	270	236	341
Westford	344	3.9%	150	1.7%	97	1.1%	288	653	295
MA Average	223,728	8.1%	135,341	4.9%	187,821	6.8%	N/A	N/A	N/A

Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

ACP Data suggest that Tyngsborough has among the lowest number and percent of households without an internet connection of all communities in the NMCOG region. Remarkably, the data show no households without a computing device of any kind. However, a larger number of households (167) report having only a smart phone. Due to its small size, Tyngsborough's margin of errors for households with no internet connection, no computer, and only smartphones are relatively large, so the actual need could be greater than what is represented here. **ACP enrollment data show that at least 341 households sought help paying for the internet,** receiving**—and** then **losing—the federal subsidy when the ACP program ended in 2024**. Even more households (859) were eligible to receive the subsidy. Tyngsborough's median download and upload speeds are on the higher end of those reported in the region. Tyngsborough is served by two internet service providers, Comcast/Xfinity and Verizon: **Although most (85%) of Tyngsborough addresses are serviced by two ISPs, about 15% of addresses in the western portion of Town, are not served by Verizon and do not have access to fiber.**

While no households report not having a computer at home in the ACS data, 8.7% of Tyngsborough High School students surveyed report not participating in the Bring Your Own Device Program, and 18.7% of students surveyed reported only using technology for class two or fewer times per week25. This suggests that some students may not have access to the devices they need at home and may not have the digital skills needed to fully participate in modern learning.

[25] Source: Tyngsborough High School 2022 BYOD survey results: https://ths.tyngsboroughps.org/en-us/byod-8f778ba5/byod-survey-results-557506fb

WHAT WE HEARD FROM STAKEHOLDERS

Seniors Have Unique Digital Literacy, Device, and Accessibility Needs

Seniors were of special concern to Tyngsborough stakeholders, with multiple stakeholders noting the need for senior-focused digital literacy programs, including for those who live in Housing Authority-owned senior housing. Device access among seniors was another concern for municipal stakeholders, who noted that seniors may also have accessibility barriers requiring special devices/equipment or other accommodation.

Tyngsborough Public Library Serves as De-Facto Digital Equity Service Organization, but Needs Resources

The Tyngsborough Public Library supplies free Internet in and around the building. They supply hotspots, for which there is always a waitlist, Chromebooks, cameras, and other digital equipment. This equipment is dependent on funding, and Library staff noted a need for more dependable funding for these programs. Volunteers provide technical support, but they cannot do so consistently. The library is very interested in developing a digital navigator program to be able to provide more consistent help, especially since staff are already stretched thin. Transportation is also an issue, as those who lack digital access are also more likely to lack mobility options. The library is interested in setting up a shuttle service that takes students, seniors and other users directly to the library.

Language is a Barrier to Digital Equity, but Digital Tools Present Language Opportunities as Well

The library and Town Hall encounter language barriers, particularly among Asian language speakers, Arabic speakers, and Portuguese speakers. One stakeholder noted that Google Translate is a critical tool to overcome barriers, but staff require training in using it empathetically. Another need identified was language access for the municipal website. The Town would like to be doing more, but has only been able to find the resources for the "bare legal minimum."

Hybrid Municipal Meetings Pose a Possible Challenge and an Opportunity

Municipal staff have tried to implement digital meetings using laptops set up specifically for this task. However, volunteers, boards, and committees have voiced a need for education on how they work and how to interface with members of the public who may be unfamiliar with online video conferencing. Despite challenges and even occasional pushback from some residents, there is a desire to continue utilizing remote meetings due to their accessibility to a broader range of people—including people living with disability or experiencing mobility challenges—promoting Americans with Disabilities Act (ADA) compliance. Residents have varied opinions about remote-only public meetings, but municipal stakeholders noted hybrid meetings are the hardest and most expensive to implement and require more resources, staff, and staff training.

RECOMMENDED PRIORITY ACTIONS

- Prioritize high need populations, including older adults, veterans, those living with disability and low-income households by incorporating digital equity support into existing programs and resources, such as the Senior Center, Veterans Services Department, and Tyngsborough Housing Authority.
- Work with the School District to understand the needs of the 8.7% of students not participating in the High School's Bring Your Own Device Program, and explore offering supportive resources, such as access to free or low-cost devices for use at home and at school.
- Learn from School District's online resource hub for technology to provide better FAQ's and how-to guidance and tutorials for residents seeking to access public services online, including virtual public meetings.
- Seek grants or other resources to expand the library's current device access and lending capabilities by adding computer workstations, and additional Chromebooks and hotspots for lending.
- Coordinate digital equity efforts regionally, including with nearby Dunstable, which faces similar challenges to Tyngsborough's largely rural context, and with Lowell, which has more resources and capacity to provide support, by creating a regional digital equity resource directory or pursuing a regional digital navigator to assist residents.
- Inventory the town's existing fiber network, including facilities that are connected and not connected to municipal fiber. Identify opportunities to add additional facilities and community anchor institutions.
- Explore opportunities to deploy public Wi-Fi in parks and other public spaces, such as Ironwood Park, Areas in the Town Center, and Bicentennial Field.
- Work with the Tyngsborough Housing Authority to pursue improved broadband access and wrap around digital equity support at Brimley Terrace and Red Pine Terrace—including by pursuing programs like the MAPC/MBI Apartment Wi-fi program to provide free Wi-Fi on the property and to residents' homes.

DIGITAL EQUITY IN WESTFORD

The Town of Westford (pop. 24,584), although the highest-income town in the region, nonetheless has significant populations likely impacted by the digital divide. These include **a large population of immigrants and speakers of a language other than English**, with Westford having the second highest percentage of foreign-born residents in the NMCOG region (21%), as well as the second lowest percent of English-speaking residents (74.6%), second highest percentage of households that speak a language other than English (25.4%) and second highest percentage of people speaking Asian languages (13%) after only Lowell. Westford also has **a large number of people 65 or older (3,505), another critical population that is likely to be impacted by the digital divide**.[26] Westford used ARPA funds to provide Wi-Fi to seniors living on the west side of Town. Adults living with disabilities make up approximately 16% of the population, also comprising a notable priority group with unique digital equity needs. Municipal stakeholders have voiced great interest in expanding assets and programming locally and forming regional partnerships.

EXISTING ASSETS IN WESTFORD

Westford has a small but dedicated number of entities providing digital equity support. These include the school district, the Council on Aging, J.V. Fletcher Library, and the Cameron Senior

[26] Source: 2019-2023 American Community Survey, Table B01001.

Center. Nashoba Valley Technical High School, one of just three technical high schools in the region, is another unique asset.

- Westford Schools provided hotspots during the pandemic to students in need and currently provide Chromebooks to all middle school and high school students for in school and at-home use.
- Westford Schools provide various resources and guidance for parents, including a "remote learning" toolkit and resources on online safety and cyberbullying.
- J.V. Fletcher Library has computer workstations available for public use and provides free loanable hotspots.
- The Cameron Senior Center and the Library offer computer workstations and document printing.
- Municipal buildings are equipped with technology for hybrid meetings and recordings.
- Free Wi-Fi in Westford Housing Authority buildings, Library, and Council on Aging.
- Local organizations—including the Rotary Club, the Masons, Church groups and others--
- Proactively identify people with needs, which can include digital needs so that members can provide mutual aid;
- Nashoba Tech has space for learning and access to technology for students and that can be made available to the community.
- The Rodebush Community Center offers classes to all ages, including classes on coding and technology.
- The Committee on Disability researches needs and coordinates support for people living with disability.
- Westford Cable Access Television offers classes on various digital media topics, including video editing software.
- The Communications Advisory Committee advises and represents the selectboard and advocates for Westford residents in matters pertaining to Information and Communications technology, including cable, broadband, and phone service.
- The town has existing municipal fiber optic infrastructure and received a grant in 2022 to expand it.
- The town technology department provides cybersecurity assessment and training for all municipal staff.
- The town offers a number of online services, including online documents, online permit and license applications, online bill pay, online notification sign up, online comments and feedback, etc.

- The town offers a Wellness Services Resource Guide that includes information on a number of programs catered to various populations and needs.
- All public meetings were held on Zoom during the pandemic and the town continues to provide remote/hybrid meetings.

WESTFORD AND ACCESS TO DEVICES AND BROADBAND

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Source: American Community Survey 5-year data, 2019-2023, Table S2801; M-Lab Speed Test Data; Benton Institute ACP Tool

Westford has some of the lowest rates of households without broadband access or no computers in the region, and the highest upload and download speeds. It is also served by both Comcast and Verizon, with fiber reaching over 85% of broadband serviceable locations (BSLs). However, there are pockets of digital inequity. For example, ACP enrollment data shows that **295 households signed up for—and then lost—assistance with internet payments through the Affordable Connectivity Program (ACP).**

WHAT WE HEARD FROM STAKEHOLDERS

There is a New Need to Meet the Digital Needs of Diverse Language Groups

A recent survey noted that 85 languages are spoken in Westford schools. Older generations have moved with their families, and they still speak their native language and need language assistance. Mandarin, Spanish, Russian, and a wide range of languages spoken in India have all been identified

locally. Within schools, they hope to identify the primary and secondary languages spoken and expand their materials for those languages.

J.V. Fletcher Library Provides De-Facto Digital Equity Services, but Faces Resource Challenges alongside Opportunities for Expansion

The J.V. Fletcher Library provides free loanable hotspots but wishes to provide more. The library is interested in providing more materials, both digital and paper, in languages other than English. The library also allows users to print government forms and other confidential documents. The library wants to do more but is facing staffing and funding challenges.

The library also has a big opportunity to do more to support digital equity with the significant expansion of its facility, which will add more computer workstations, improve the wiring and Wi-fi access on site, add meeting rooms with equipment to support hybrid meetings, and double the amount of program space for events and workshops.

Different Generations in Westford Face Different Barriers to Device Access and Digital Literacy

Lower socio-economic groups don't have easy access to devices besides cell phones, which often don't meet every need. Older adults on a fixed income have to come to the Council on Aging to print documents or transfer files. Stakeholders report that older adults face confidence, interest, and comfort barriers in learning digital skills. Some service-proving stakeholders we spoke to reported providing ad hoc digital navigator services for seniors and veterans, for example often helping them complete online forms. Municipal stakeholders have expressed a need to better understand the resources needed to assist this senior community, with improved access to technology education and training and more resources at senior housing sites. Basic tutorials and online safety and security were top issues, with stakeholders suggesting a need for printed instructional materials, and support with password management and other security software to enhance safety and accessibility for seniors. Younger adults show great interest in learning digital skills, but they lack the equipment.

Hybrid Municipal Meetings Are an Opportunity for Access, but Can be a Challenge to implement

During the COVID-19 pandemic, all public meetings were virtual on Zoom. This was helpful for people with disabilities, those who lacked mobility options, as well as to those with childcare or other logistical needs that could pose barriers to in-person attendance. Virtual meetings, however, also required a baseline access to and knowledge of videoconferencing hardware and software, posing challenges for those who lack digital devices or skills. To balance the benefits of accessibility of both in person and virtual meetings, hybrid meetings are ideal but can mean twice the work for municipal staff and therefore hard to implement without more support. Luckily most municipal buildings now have access to Zoom and recording equipment, but some facilities still need these upgrades.

Westford Wants to Provide Low-Cost Municipal Internet, but there are Regulatory Obstacles

One municipal stakeholder explored providing municipally owned internet to affordable housing developments, but encountered regulatory barriers, including the need to establish a Municipal Light Plant to provide this service. Another difficulty was that affordable housing is not concentrated in one area, but rather spread throughout town, creating difficulty efficiently creating the necessary infrastructure. Better conduit access to encourage private providers was also raised as a possibility to provide more affordable options.

Municipal and Community Leaders are Eager to Do More Across the Region

Westford businesses and residents may be interested in supporting more digital equity-related activity and participation in regional partnerships. The Town has a number of digital-related businesses that help sponsor digital equity efforts that could be coordinated across the region. Nashoba Tech also offers a possible location for digital "night classes." However, there is no exiting regional digital equity structure to plug into.

RECOMMENDED PRIORITY ACTIONS

- Work with the JV Fletcher Library to provide digital literacy programming, and technology particularly for seniors and immigrants, and plan for increased programming in the library's expanded facility.
- Reach out to the Adams Memorial Library in Chelmsford to explore how Westford might implement some of the successful digital access programs and resources made available there, including the travelling computer lab, and Access to Justice Public Library initiative.
- Improve the existing Wellness Services and Resources Guide to make information more searchable/discoverable, not just a PDF, and document existing digital equity resources in a new section on Technology Support.
- Work with the Commission on Disability to evaluate access to digital equity resources catered to individuals living with disability, including access to supportive equipment and hardware devices at the library and at municipal facilities, as well as reviewing online websites and digital services for accessible design.
- Expand the purpose of the Communications Advisory Committee and/or consider forming a Digital Equity Committee to research and coordinate support for digital equity initiatives, including the implementation of this plan and participation in regional digital equity coordination.
- Document, evaluate, and share the town's existing initiative to provide public Wi-Fi networks at Housing Authority sites so that this approach can be replicated elsewhere in town and throughout the region.

- Expand the Technology Department's existing Cybersecurity Program, currently focused on municipal staff, to include resources made available for residents, particularly for older adults most at risk of online scams.
- Provide language access resources to support Westford's large and growing population of non-English speakers.
- Explore regional partnership and coordination, particularly with nearby Chelmsford, which has similar context to Westford, and with Lowell, where more regional services are clustered for those in need.
- Reach out to Technology Corporations with a presence in Westford, like NVidia and NetScout to solicit sponsorship of digital equity initiatives and/or to explore partnerships for device distribution or digital literacy programs.
- Add outdoor access points to municipal buildings and schools to allow public Wi-fi access and explore the feasibility of deploying public Wi-fi networks in parks and public spaces where people gather, such as the Town Common.
- Explore partnering with commercial businesses on the rt. 110 corridor and with LRTA to provide free Wi-fi at bus stop locations.
- Explore student internships, fellowships, or plan for permanent staffing at the local or regional scale to support IT help and digital navigation for high need populations.
- Reach out to Concord Broadband to understand that community's use of a municipal light plant to provide public internet.


PLAN OVERVIEW
PHASES OF WORK
Community Outreach and Qualitative Research
Fall 2023-Winter 2024
Existing Conditions Assessment and Data Analysis
Spring 2024
Spring 2024
Summer-Fall 2024
Digital Equity Plan Document Preparation and Publication