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Municipal Digital Equity Plan

Prepared for the City of Lawrence, MA

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Columbia Telecommunications Corporation

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1 Executive summary

The City of Lawrence commissioned CTC Technology & Energy (CTC) to engage in a study to document gaps in digital equity—a condition in which all residents have access to adequate broadband service and devices and possess the skills to use these resources—and develop strategies to bridge these gaps. This report presents findings of significant digital equity gaps in Lawrence, offers recommendations for how the City and other entities can address these gaps, and discusses how other municipalities have recently implemented state-funded programs and services.

This study was funded by the Massachusetts Broadband Institute (MBI) at the MassTech Collaborative under its Municipal Digital Equity Planning Program. Funding came from State and Local Fiscal Recovery Funds provided under the American Rescue Plan Act (ARPA). This report may also be considered by MBI as it develops strategies for addressing digital equity gaps under the Massachusetts State Digital Equity Plan.[1]

Residents of Lawrence face digital access gaps at some of the highest rates of Massachusetts municipalities, particularly with respect to household internet subscriptions, number of households without a computer, and exclusive reliance on mobile data plans.

In response to these issues in Lawrence and other nearby municipalities, the Essex County Community Foundation (ECCF)—a community foundation that manages charitable assets and supports nonprofits in the county that includes Lawrence—has since 2021 been leading its "Advancing Digital Equity (ADE)" initiative in the region, and has assembled a coalition of 250 members (including 49 in Lawrence) to carry out a variety of activities. Through the ADE coalition, ECCF has committed to making a $3 million investment to support nonprofit organizations that develop or expand programs that advance access to devices, internet, and digital literacy education. Between 2021 and 2024, the ADE initiative has supported more than 13,000 Essex County residents through its investment in local entities.

In Lawrence, this included supporting numerous nonprofits and other entities with investments in equipment and digital literacy programs and internet access. Through the end of 2024, these efforts in Lawrence have resulted in the distribution of 3,351 devices, the digital literacy training of 171 people, and the connection of more than 3,000 households to the internet—notably including a free Wi-Fi program offered by Lawrence Community Works, an organization that, among other efforts, provides affordable housing in the City. Further details on these efforts are provided in an interactive map on ECCF's website.[2]

[1] The Digital Equity Act is a $2.75 billion federal program that, in part, funds state planning processes to establish a vision for digital equity that will guide overarching strategies and goals. The first draft of MBI's "Massachusetts State Digital Equity Plan" (SDEP) can be viewed here: Massachusetts' State Digital Equity Plan Approved by National Telecommunications and Information Administration | Mass.gov

[2] "Advancing Digital Equity Interactive Map," ECCF, https://www.eccf.org/interactive-map/.

As the next step in this initiative, ECCF in February announced that it had awarded $150,000 to three nonprofits in Lawrence (see Section 10.4), as a portion of $627,000 it awarded to 13 nonprofits in the region. The awards in Lawrence were as follows:

1. **Mass Association for Computer and Internet Resources (MACIR),** in collaboration with the Lawrence Public Library, was awarded $50,000 for their ELEVATE (Equity, Literacy, Empowerment for Valued Access to Technology & Education) program. See Section 6.4 for more details on ELEVATE.
2. **Greater Lawrence Community Action Council (GLCAC)** was awarded $50,000 for its digital literacy and workforce training classes.
3. **Vinfen,** which provides services to individuals with intellectual and developmental disabilities, was awarded $50,000 to support its digital equity programming interventions. Vinfen has been a leader in offering digital navigation services to its patients since 2023 with support from MBI's Partnerships Program (see Section 10.2.5 for more detail on Vinfen's digital equity programming).

Additionally, MBI has helped through its Partnerships Program, which funded the implementation of Tech Goes Home's digital literacy and device distribution programming at community-based organizations in Lawrence, and funded Vinfen's digital navigator program (see Section 10.2). Additionally, MBI funded this report and a subsequent grant award of up to $100,000 that will be available to the City.

But the needs in Lawrence remain significant.

1.1 Project overview

This report presents findings (see Section 2) and recommendations (see Section 3) informed by the following tasks CTC performed over a six-month period, including:

- Analyzing the availability of broadband service, level of competition, and broadband pricing in Lawrence (see Section 5).
- Determining levels of enrollment in the now-defunct Affordable Connectivity Program (ACP), which offered a $30 monthly subsidy toward broadband bills until earlier this year and estimating of the gap in utilization by eligible households so as to inform future efforts to enroll residents in available low-cost plans (see Section 7).
- Conducting interviews with stakeholders from seven entities over the course of several meetings and follow-up communications to further illuminate gaps in affordability, skills, and devices; existence of local programs; and the ability of stakeholders to start or expand those programs to fill the identified gaps. See Section 6 for a report on the stakeholder meetings and Appendix B for the stakeholder questionnaire.
- Promoting MBI's statewide residential digital equity survey (see Appendix A) and reporting on Lawrence-specific findings on topics including broadband utilization, affordability, skills, device access, and related topics (see Section 9).

- Co-facilitating a public meeting called “Lawrence Digital Empowerment: bridging the gap with technology,” with the City of Lawrence, the Lawrence Public Library, and the Senior Center to engage residents and understand their digital needs (see Section 8).
- Developing recommendations on strategies and activities designed to address gaps using potentially available funding, potentially augmented by local funds (see Section 3).
- Tracking how other towns and cities have used funds from MBI’s Implementation Grant Program to execute programs in digital literacy, device distribution, education, outreach and adoption, and public space improvements and Wi-Fi availability in apartments (see Section 4).
- Outlining models for how, in the absence of the ACP, the city can consider helping residents in connecting to broadband service with low-cost and any future subsidy programs. This includes opportunities for single-payer broadband arrangements with internet service providers, and promotion of low-cost broadband programs offered by local providers (see Section 7).

2 Key findings

2.1 Lawrence lags state and nationwide averages of home internet subscription rates, and low-income households experience larger gaps

According to American Community Survey (ACS) data, only 67.3 percent of households in Lawrence subscribe to residential internet services via wireline technology (cable, fiber, or DSL), which is below the state figure of 80.4 percent and the national figure of 73.3 percent. This number is far below Lawrence's neighbor North Andover, which has a wireline subscription rate of 89.9 percent.

In a public meeting with Lawrence residents, approximately half of attendees did not have a home internet subscription, typically relying on their smartphone data to access the internet as needed (see Section 8 for information on this event).

2.2 Low-income households in Lawrence experience the largest subscription gaps

Among households without wired broadband services, 86.5 percent earn less than $75,000 annually.

When looking at those that do not subscribe to wireline internet by specific income tranches, only 7.2 percent of households with annual incomes above $75,000 do not subscribe. However, the rate of households without an internet subscription noticeably grows by nearly ten percentage points (to 16.9 percent) among households that earn between $20,000 and $75,000 per year, and by nearly 31 percentage points (to 47.8 percent) among households that earn below $20,000 per year. These figures point to further need for programs to connect households with programs that provide discounts or subsidies for broadband subscriptions.

2.3 Lawrence households face significant device gaps compared to state and national averages

ACS data show that approximately 9.4 percent of Lawrence households do not own a personal device to access the internet, which is noticeably higher than the state and national averages of 5.7 percent and 6.0 percent, respectively. When looking at the rate of ownership by type of device, the gaps are even more significant. Only 61.4 percent of Lawrence households own a desktop or laptop computer, which is far less than the state (82.8 percent) and national (79.3 percent) averages. Further, 52.9 percent of Lawrence households own a tablet device, which lags state (66.1 percent) and national (63.4 percent) averages.

2.4 Lawrence residents disproportionately rely on smartphones as their primary device to access the internet

According to ACS data, 12 percent of Lawrence households rely exclusively on their smartphone for home internet access. This figure is significantly higher than the statewide figure of 8.8 percent. This reliance was even deeper among approximately 50 participants in the public Digital Empowerment Event hosted by CTC and the City, where all residents in attendance stated they had a smartphone, but only ten residents said they had another device at home other than their phone to access the internet.

This has also been echoed by stakeholders engaged with for this report, which detail Lawrence residents' reliance on their smartphones as a primary device.

These data highlight a significant need for home broadband subscriptions and devices for Lawrence residents.

2.5 Approximately 46.1 percent of households that were potentially eligible for the FCC's Affordable Connectivity Program (ACP) were enrolled by the program's end

The ISPs in Lawrence all participated in the ACP, either directly or through an affiliate. The federal ACP program paid a $30 monthly subsidy for broadband service for eligible low-income residents. As of January 31, 2024, FCC data suggest that 11,231 households in Lawrence were receiving the ACP subsidy—or 46.1 percent of the estimated 24,377 households eligible for the program.[3] This enrollment rate had steadily increased by 14.8 percentage points in the last year of the ACP—enrollment rates for eligible households were at 31.3 percent in January 2023 and had progressed to 40.0 percent in June 2023. This increase may reflect positive results of efforts by local entities to boost awareness and participation when the program was still active.

2.6 Lawrence has ubiquitous wireline broadband coverage from Comcast cable service, and significant fiber coverage from Verizon Fios

The National Broadband Map reports that Comcast offers cable broadband at served broadband speeds to nearly every address in City (99.9 percent of all locations). While the NTIA has defined "served broadband speeds" as 100/20 Mbps, Comcast offers customers in Lawrence a minimum of 300/20 Mbps, and every address can receive a maximum speed of 1200/40 Mbps. Additionally, Verizon offers its Fios fiber services to 10,493 (or 88.9 percent of all) locations in Lawrence.

Although Comcast serves nearly all addresses in the City, many residents that attended the Digital Empowerment public event expressed their frustration with the provider and high cost of service.

2.7 Broadband competition is present in the City

Approximately 88.9 percent of Lawrence addresses having access to more than one wireline service. Comcast's cable service and Verizon's Fios service overlap significantly, and with these two wireline broadband options in Lawrence, there are 10,488 (out of 11,800) residential locations that have access to more than one wireline service.

2.8 Only 17.4 percent of Lawrence households have access to fixed wireless services, and only 11.1 percent of households can reportedly receive speeds at or over 100/20 Mbps

Verizon Wireless, and to a lesser extent T-Mobile, offer fixed wireless home services (leveraging the networks previously used only for mobile service) to approximately 17.4 percent of addresses in

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

Lawrence. These services provide a relatively affordable option to some existing wireline services, but with the significant caveat that performance of these networks is dependent on individual subscribers' distance from wireless facilities, and the data speeds may be cut (or "throttled") by these providers during times of congestion. FCC data show that approximately one in six Lawrence locations have access to licensed fixed wireless services, with 591 locations being able to receive up to 25/3 Mbps, 155 locations receiving up to 50/4 Mbps, and 1,304 locations able to receive 100/20 Mbps or higher. These licensed fixed wireless services also require a bundled mobile plan and phone as an additional cost.

3 Recommendations

CTC recommends the City and its stakeholders explore the following strategies and pursue available funding sources to help close digital equity gaps in Lawrence. Most recommendations involve work that established, proven, and trusted community partners could perform.

Table 1 and the following subsections summarize the major recommendations of this report.

Table 1: Summary of recommendations

Recommendation	Access and affordability	Devices	Skills	Privacy/ security	Potential cost
Consider setting up a modest City grant fund to fill small gaps and reduce reliance on uncertain or finite state or federal funding streams	X	X	X	X	Start with $25,000
Provide additional financial support to Lawrence Public Library and MACIR for its ELEVATE program, which includes digital navigator services	X	X	X		$80,000
Consider funding the purchase of 50 Chromebooks, 20 laptops, and three Smartboard for Lawrence Community Works	X	X	X		$35,000 ($400 per Chromebook, $600 per laptop, $1,000 per Smartboard)
Consider funding the cost of a new Digital Skills for Life instructor at Lawrence Community Works	X		X		$50,000 for instructor (part-time stipend)
Explore funding the device purchasing and cost of ten laptops, and software purchasing and installation at Lazarus House	X	X			$15,000

Recommendation	Access and affordability	Devices	Skills	Privacy/ security	Potential cost
Fund the purchase of 20 laptop computers and improve internet connectivity at the Council on Aging's computer lab to host digital literacy classes		X			$12,000 for laptops Obtain quote for Wi-Fi upgrade
Consider funding establishing 12 kiosks at City Hall and two at the Police Department so residents can submit applications, forms, and payments online	X	X			$25,200 ($1,800 per kiosk)
Consider installing Wi-Fi services and four laptop computers at five Lawrence Housing Authority community rooms	X		X		$12,000 for laptops Obtain quote for Wi-Fi upgrade
Explore cybersecurity programming/partnership opportunities				X	Varies
Explore partnership opportunities with Tech Goes Home		X	X		Potentially no cost if TGH has adequate grant funding. The paid model is approximately $1,500 per learner
Explore funding for one digital navigator and four laptops at the Lawrence Redevelopment Authority's workspace hub	X	X	X		$80,000 for digital navigator; $2400 for laptops

3.1 Consider setting up a modest City grant fund to fill small gaps and reduce reliance on uncertain or finite state or federal funding streams

The City of Lawrence would benefit from using local resources to create a small grant fund to address specific gaps in digital equity and inclusion. The City could consider creating a modest grant fund of perhaps $25,000, with awards of approximately $2,500 to $5,000 to local nonprofits and community organizations to support existing programs and provide seed funding for new ones. The City should reevaluate the total grant fund amount each year and consider incremental increases as additional funds become available.

A simple grant application, organized and managed by the City, could allow local organizations serving Lawrence to provide specific proposals for training, enrollment support for affordability programs, or device subsidy and assistance programs. The City could develop metrics and reporting on timelines, financial accountability, and program results that will demonstrate the effectiveness of the use of these awarded funds and how they help meet digital equity goals and objectives created by MBI.

As an example of how this has been implemented at large scale, the City of Boston has been operating its Digital Equity Fund since 2017. Boston's Digital Equity Fund awards grants to local organizations for various digital equity-related programming, including digital literacy and education for individuals to learn how to use the internet and develop digital tools for personal or employment-based needs, device and internet access and affordability, and digital navigation assistance to support individuals in accessing telehealth, government services, and other programs that exist online.[4] In its first year of operation the Digital Equity Fund had $35,000 to offer local organizations.

Lawrence, together with ECCF, operated its own small grant program utilizing disaster-relief money to offer grants to small businesses affected by the Columbia Gas explosion. The City could use its experience from that grant fund as a model for future digital equity-specific grants to local nonprofits and businesses that would like to start or expand their own programs in digital literacy and education, device distribution, digital navigation services, or increased internet accessibility and affordability.

3.2 Provide additional financial support to Lawrence Public Library and MACIR for its ELEVATE program

The Lawrence Public Library has been working closely with the Massachusetts Association for Computer and Internet Resources (MACIR)[5] to develop the program ELEVATE (Enhancing Literacy

[4] "Digital Equity Fund," City of Boston, https://www.boston.gov/innovation-and-technology/2023-digital-equity-fund#about-the-fund.

[5] MACIR is a nonprofit organization committed to expanding opportunities for underserved communities through technology access, enhancing literacy, and workforce development. As part of this mission, MACIR plays a leading role in the JEDI (Justice, Empowerment, Diversity, and Inclusion) consortium, a regional initiative focused on creating pathways to digital opportunity throughout North Shore and Metro North communities. Through JEDI, MACIR collaborates with community organizations, government agencies, and technology providers to develop sustainable programs that equip residents with the skills and resources needed to thrive in the digital age.

and Empowerment for Valued Access to Technology and Education), which is aimed at bridging the digital divide in Lawrence. ELEVATE has a detailed action plan with four steps to address Lawrence's ongoing digital needs (see Section 6.4 for more detail on these steps):

1. **Infrastructure and hardware upgrades**, including the purchase of new desktop computers, equipment for library kiosks, and internet access points.
2. **Digital services and accessibility enhancements**, which would allow for the ELEVATE program to be expanded and offered at other local entities like the Senior Center.
3. **Community engagement and capacity building,** which would include the hiring and training of digital navigators or training library staff on digital navigation, and the purchasing of Chromebooks for individuals without a device or partnering with existing Device Distribution organizations such as Tech Goes Home, Tek Collaborative and Computers for People depending on available funding.
4. **Team and communication enhancements,** including the integration of Zoom, Teams, Trello and other team-based software for appointments, meeting, and scheduling.

Through key funding opportunities by local and state government, private investment, and regional philanthropies, the library and MACIR hope that the ELEVATE program will be able to achieve the following goals:

- Improve access to up-to-date technology and services
- Increase community participation in digital literacy programs
- Efficient handling of digital service requests through a centralized system
- Strengthened workforce development through Digital Navigator training and certifications
- Enhanced access professional certification opportunities for community members
- New partnerships with regional educational institutions to encourage continued education
- A scalable digital equity model applicable across Essex County.

One core aspect of the ELEVATE program is the development of its digital navigation efforts. Once trained, these navigators will provide their services at entities across the City seeking this support. Through stakeholder engagement for this report, three entities that have expressed interest in receiving such support include the Housing Authority, Council on Aging, and the Lawrence Public Schools.

- **Council on Aging:** A representative at the COA stated that seniors frequently ask about discounted internet service options, but staff are not aware of what services may be currently available. The same representative stated that staff notice most seniors have cell phones and have access to computers but are not confident using devices. Having a Digital Navigator available to come to the Senior Center once a week or less frequently, to offer informational and enrollment assistance in low-cost broadband programs and other assistance could be extremely helpful for its senior population.

- **Lawrence Housing Authority:** A representative at the housing authority stated that many residents lack basic technology and internet skills, and many do not have internet subscriptions due to the cost. The housing authority would be interested in having a digital navigator that is on-site on a regular basis to provide enrollment assistance in low-cost broadband programs and offer support with other online applications and technical support for residents.
- **Lawrence Public Schools:** As new students enter the Lawrence school system each year, the school district could benefit from having a digital navigator available at back-to-school and other school- or district-wide events to assist students and their families with various online applications, enrollments (including enrollment in low-cost broadband internet programs), and online school registration.

The library and MACIR were recently awarded $50,000 from Essex County Community Foundation to begin this work, but more funding would allow for an expansion of the program. An additional $80,000 would allow for the library and MACIR to cover the cost for its digital navigation efforts including stipends for navigators, devices for distribution to program participants, and Comcast Internet Essentials subscriptions for residents in need.

3.3 Consider funding the purchase of 50 Chromebooks, 20 laptops, and three Smartboard for Lawrence Community Works

Lawrence Community Works is a community-based non-profit that offers various life-impacting programs to the community, including workforce development, asset building, affordable housing, and youth programming.

Many students at Lawrence Community Works do not have computers at home. This is supported by data in the American Community Survey that states that 38.6 percent of (or 11,699) households in Lawrence do not have a laptop or desktop, which is significantly higher than the state (17.2 percent) and the nation (20.7 percent). This ultimately leaves residents to rely on smartphones or tablets and making it difficult to fully engage in the digital economy or successfully learn and work from home.

To combat this device access and affordability gap, LCW would like to purchase 50 Chromebooks to provide to students without a device, so they can practice their digital skills and also be able to connect with their loved ones. Additionally, LCW Movement City, our youth enrichment program, could also benefit from a donation of laptops that we could give to our seniors who are going to college, but cannot afford a computer.

At the moment, LCW uses low-tech devices, like projectors to teach its classes. It would greatly improve its class efficiency to purchase and install an interactive Smartboard, particularly for its digital literacy courses.

The City should consider funding these devices at LCW at a total sum of $35,000 ($20,000 for 50 Chromebooks at $400 each, $12,000 for 20 laptops at $600 each, and $1,000 for one Smartboard).

3.4 Consider funding the cost of a new Digital Skills for Life instructor at Lawrence Community Works

Lawrence Community Works offers a number of classes including workforce training, medical customer service program, Latinos in finance, and Digital Skills for Life (which replaced digital literacy classes from Tech Goes Home in 2024) in its Workforce Development Department. In addition to the specific curriculums of these courses, students learn how to write a resume, how to write a cover letter, and how to search for and apply for a job.

The Digital Skills for Life program is an evening course that is taught in Spanish and introduces basic concepts of digital skills and literacy including how to use a computer and how to use and search on the internet. These classes are incredibly popular, particularly among residents between the age of 40 and 60 years old. LCW would like to start offering a higher-level digital literacy class, which individuals who complete the current Digital Skills for Life curriculum can take to continue their digital skills and literacy education. These advanced classes would be offered in English for students who want to learn about how to use various computer applications, including Microsoft Suite (Word, Excel, PowerPoint).

LCW would like to offer part-time stipend positions to support the teaching of these classes. This position would require six hours of work per week for at least two weeks, for a minimum of twelve hours of work in total. Ideally, the organization hopes this part-time position can be filled by college or high school students. LCW has stated that $50,000 in funding would cover the cost for a part-time staff to assist in the teaching of these courses.

3.5 Explore funding the device purchasing and cost of desktop and software installation at Lazarus House

Lazarus House is a nonprofit located in Lawrence that aims to restore dignity and self-respect to low-income, under-resourced, and homeless individuals by providing food, shelter, clothing, advocacy, and community resources. In December 2024, Lazarus House applied for a $50,000 digital equity grant from Essex County Community Foundation to support its staff and guests but was not awarded any money.

If received, this money would have gone toward the purchase of two laptops to manage and track the success of its food pantry and soup kitchen programs, one laptop for its Community Resources Room for guests to use for telehealth and other appointment needs, two laptops for its Emergency Shelter program to replace aging equipment and to provide device access to guests that participate in life skills classes, and for the purchase and installation of device software and licenses. Please see Section 6.7 for more detail on Lazarus House's grant application.

The City should explore funding these initiatives. Lazarus House has produced a budget and implementation plan that, if funded, could start right away.

3.6 Explore funding the purchase of 20 laptop computers and upgrading connectivity at the Council on Aging's computer lab to host digital literacy classes

Lawrence Council on Aging's Senior Center previously operated a computer lab with 20 computers, but those devices are aged and no longer usable, and the internet service at the Center is notably slow. A representative at the Council on Aging stated that the computer lab had value when it was

available and has created a gap in access to the internet since its end. The Senior Center would like to offer improved connectivity and computer access to individuals again, but do not have the financial resources available to do this work. at this time.

Digital literacy and skills classes were previously offered to Senior Center patrons at the computer lab, which many people attended to learn basic skills like how to use email and zoom. The Council on Aging would like to reopen this space with new devices so that residents, many of which do not own a computer or have internet at home, can access the internet and perform online tasks, as necessary.

The City should consider supporting the Council on Aging with the purchasing of 20 new laptop computers to outfit this space, which would cost approximately $12,000 at $600 each.

Additionally, the Senior Center reported needing improved connectivity. CTC did not investigate the root cause of the slow service-which could involve the router or Wi-Fi access point—but if the underlying cable service is slow, there are likely faster options available from Comcast or Verizon.

3.7 Consider funding establishing 12 kiosks at City Hall and two at the Police Department so residents can submit applications, forms, and payments online

The City of Lawrence would like to build 12 information kiosks at City Hall, and two kiosks at the Police Department. The kiosks at City Hall would be located at the City Clerk office, the Tax Collector office, Inspectional Services Department, and the Water and Sewer Department.

The City IT Director stated that Lawrence is in the process of implementing paper-free payment and application structures, which is creating a barrier for many who do not have access to a computer or internet at home. These kiosks would provide a streamlined and simplified way for residents to access information and pay bills and would be most useful for those without access to home internet or a laptop or tablet at home.

A representative at the IT and Police Departments stated that 12 kiosks at City Hall and two at police headquarters, which would include a touch screen monitor, minicomputer, mouse, and keyboard at each station, would satisfy the City's growing need to provide a centralized space for residents to submit online governmental applications, forms, and payments.

As detailed by the City IT Director, these kiosks would be built "in-house" and cost approximately $1,800 per unit.

3.8 Consider installing Wi-Fi services and laptop computers at five Lawrence Housing Authority community rooms

The Housing Authority has explored MBI's Apartment Wi-Fi Program, which offers to cover the cost of installation and one year of operating expenses of Wi-Fi networks in public or affordable housing developments (see Section 10.2.2 for more information) but says it is unable to cover costs and maintenance after that first year.

However, more limited approaches are available. If funding allows and the Housing Authority supports such an effort, it could provide computer and internet access in certain community rooms. The Housing Authority operates 17 developments across the City—five of which have community

rooms. Currently these rooms do not have internet access. A representative at the housing authority stated that providing connectivity and computers in these rooms would be useful for residents, as many public housing tenants do not have a home internet subscription. The cost of 20 laptop computers (four per community room) would be approximately $12,000. The cost of providing adequate Wi-Fi would require a custom quote from available providers.

3.9 Explore cybersecurity programming/partnership opportunities

Concerns about online safety and privacy in Lawrence are significant, with 95 percent of Lawrence respondents to the MBI survey stating they are either somewhat concerned or very concerned about their online safety. Even further, 90 percent of Lawrence respondents said their main concern online is having personal data stolen or used without their consent and 75 percent of respondents said that they were concerned about them or a loved one getting scammed or tricked. These data reflect the concerns on this topic that residents voiced at the Digital Empowerment Event (see Section 8 for more details).

MBI's State Digital Equity Plan (SDEP) states that a future action to address online safety will include the development of a statewide cybersecurity curriculum. Additional actions will include training existing digital navigators so they support, protect, and inform clients about their online safety, and embedding cybersecurity awareness into youth digital literacy programming.

Lawrence stakeholders can leverage the resources of MassTech Collaborative's MassCyberSecurity online safety initiatives. As part of this, there is also a timely opportunity to apply for a state grant to enhance cybersecurity awareness for anyone using City or other government networks.[6]

3.10 Explore partnership opportunities with Tech Goes Home and other interested local nonprofits to ensure digital skills and device needs are being met

Nine percent of (or 2,847) Lawrence households do not own any type of device for accessing the internet, which is noticeably higher than both the state (5.7 percent) and national (6.0 percent) averages. Additionally, 38.6 percent of (or 11,699) households in Lawrence do not have a laptop or desktop, which is significantly higher than the state (17.2 percent) and the nation (20.7 percent), leaving these residents to rely on smartphones or tablets and making it difficult to fully engage in the digital economy or successfully learn and work from home. Additionally, digital literacy and skills gaps of residents are a concern among local entities.

There are organizations across the state that operate partnership-based programs that integrate digital literacy education and device distribution into adaptable curriculums for interested entities to offer to their communities. One example of this is Tech Goes Home (TGH),[7] a nonprofit organization that partners with community organizations to provide curated technology-based support through digital literacy, education, and device distribution. Upon successful completion of

[6] "About the Municipal Cybersecurity Awareness Grant Program," Mass.gov, https://www.mass.gov/info-details/about-the-municipal-cybersecurity-awareness-grant-program#how-to-apply-.
[7] "Tech Goes Home adds 25 new community partners", *Jamaica Plain Gazette*, https://jamaicaplaingazette.com/2024/02/05/tech-goes-home-adds-25-new-community-partners/.

a TGH course through the community partner, students are provided with a device for personal use. The cost per pupil (including the device) is $1,500.

One local TGH partner is Lawrence Community Works—a nonprofit organization that owns an affordable housing development and operates a number of programs and services in financial empowerment, workforce development, art, and network organizing for individuals of all ages. Through its partnership with TGH, Lawrence Community Works offers a class called "Digital Skills 4 Life," which is a four-week class in Spanish that teaches computer basics including how to access devices and the internet, to navigating email and virtual platforms.[8] A Chromebook is provided to each student at the end of the program.

Through a partnership with TGH, one or multiple staff could be trained in TGH digital equity programming and device provision efforts and offer classes through various entities, which may include the Council on Aging or Housing Authority, who would like to offer internet skills and device basics classes and device provision opportunities.

3.11 Consider Installing Digital Information Screens at Strategic Community Locations

The City of Lawrence proposes the installation of digital information screens at key community locations and high-traffic public areas. These screens would share critical community information including announcements about health clinics, emergency alerts, educational opportunities, public safety information, and local workshops.

This effort is connected to digital equity by providing timely, accessible information to all residents-including those who may not have reliable internet access or digital devices at home. By making essential updates and resources visible in public spaces, the City can ensure that everyone, regardless of their digital access or literacy, stays informed about vital community services and events.

To implement this initiative, the City will require funding for the purchase, installation, and maintenance of digital screens, as well as for the development of multilingual, accessible content.

3.12 Consider funding digital equity initiatives at the Lawrence Redevelopment Authority (LRA) collaborative workspace hub

The Lawrence Redevelopment Authority (LRA) is committed to integrating digital equity into its economic development initiatives. The LRA aims to address the digital divide while fostering economic growth in Lawrence. The LRA has secured a space exceeding 6,000 square feet at 255 Essex Street which is poised to become a collaborative workspace hub supporting local entrepreneurs and small businesses. This hub intends to foster a thriving community of innovators and creators. Simultaneously, adult education classes are offered at the 255 Essex Street location, with plans underway to open a computer lab and offer digital skills and literacy programming there.

[8] "Digital Skills for Life," Lawrence Community Works, https://www.lawrencecommunityworks.org/what-we-offer/workforce-development/digital-literacy/.

To advance its goals, the LRA has identified several potential initiatives related to digital equity. These include implementing Collaborative Workspace Digital Infrastructure, which would involve providing technology to support local entrepreneurs and small businesses and implement digital accessibility upgrades. The LRA also seeks to develop and deliver a digital skills training program. The LRA also envisions a digital navigator collaboration with the Economic and Business Development Department which could involve establishing a Digital Navigator within the workspace hub. This navigator would assist businesses and entrepreneurs with navigating online business resources, troubleshooting technical issues, providing guidance on cybersecurity, and offering technical assistance, guidance on digital resources, and personalized training. If funded, the LRA intends to partner closely with the City of Lawrence's Economic and Business Development department to implement these initiatives.

The LRA seeks funding for a digital navigator to provide personalized assistance to business owners and community members, helping them develop essential digital skills, navigate online resources, and access critical services such as affordable internet programs and business tools. Additionally, it seeks funding for four laptops to be available at the work hub. The LRA has committed to matching this request by providing an additional two laptops if four are funded, resulting in a total of six devices available at the hub.

4 Examples of MBI implementation grant projects include housing authority Wi-Fi buildouts, device provision programs, and curriculum development

MBI launched its direct grant program, the Municipal Digital Equity Implementation Program (MDEIP)—for municipalities to access implementation funds to initiate local programs. This is a $6 million grant fund that provides participating municipalities with up to $100,000 to make local digital equity investments and execute projects that will increase access, adoption, and usage of the internet.[9] This funding can go toward six areas of digital equity:

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

Municipalities interested in applying for this digital equity implementation opportunity must complete a two-step application process after submitting a digital equity study to MBI. [10] Applications will be reviewed by MBI on a rolling basis, and the final deadline for submissions is July 31, 2025.

Any municipality that has participated in the Municipal Digital Equity Planning Program or has a pre-existing local digital equity plan or related document can apply for this implementation funding. If desired, the City of Lawrence can start its application for these funds immediately, using this report and ongoing conversations with local organizations as a guide.

The total award amount in the first round of MBI's implementation grant was $1,270,258, which was split between 18 municipalities and will be put toward the five initiative areas (digital literacy; devices; education, outreach, and adoption; public space improvements; and apartment Wi-Fi).

Examples of funded projects include the following, from CTC's experience serving these municipalities:

Watertown: The City of Watertown has put its funding toward one initiative for the Watertown Housing Authority. With its implementation funds, the City will support up to two years of operating expenses to match against either the apartment Wi-Fi or wiring retrofit programs (see Section 10.2.1 for more information) in Watertown Housing Authority units.

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

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[9] "Municipal Digital Equity Implementation Program", MBI, https://broadband.masstech.org/digital-equity-implementation.
[10] "Municipal Digital Equity Implementation Program," MBI, https://broadband.masstech.org/digital-equity-implementation.

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

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

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

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

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

Other municipalities are using their round one grant funds to support various local entities and municipal projects. See Table 2 for a full list of all participating municipalities' initiatives and program plans.

Table 2: List of all round one Implementation Grant awardees and the entities or programs receiving these funds

Initiative area	Municipality	Entities/programs receiving funds
Digital literacy programs	Charlton	Library
	Somerville	Somerville Housing Authority
	Montague	Council on Aging
	Adams	Library and Council on Aging
	Lanesborough	Library and Council on Aging
	Worcester	Library
	Peabody	Citizens Inn Shelters
	Easthampton	(E-Media, LFA)
	Fairhaven	Library and Council on Aging
	Lynn	Lynn Community TV and Pathways
	New Bedford	Council on Aging and Thinkabit Lab
Device purchasing and distribution programs	Charlton	Library
	Florida	Florida Public Schools
	Cheshire	Library and Council on Aging
	Adams	Library and Council on Aging
	Lanesborough	Library and Council on Aging
	Worcester	Library
	Greenfield	Library
	Easthampton	E-Media
	Fairhaven	Community Connections and Fairhaven TV
	Lynn	New American Association of Massachusetts
	New Bedford	Council on Aging and Thinkabit Lab
Education, outreach, and adoption programs	Somerville	Somerville Housing Authority
	Pittsfield	Wayfinding and Digital Equity Ambassador
	Greenfield	Accessibility of public resources
	Peabody	Citizens Inn
	Lynn	Lynn Community TV
Public space improvement programs	Pittsfield	Public Park
	Cheshire	Transfer station hotspot
	North Adams	Library
	Adams	Library and outdoor center
	Lanesborough	Library and Council on Aging
	Lynn	Lynn Community TV
Apartment Wi-Fi programs	Greenfield	Greenfield Housing Authority
	Watertown	Watertown Housing Authority
	Peabody	Citizens Inn Shelters

5 Broadband availability conditions and participation in the ACP in Lawrence

This section provides an analysis of current broadband conditions in the City of Lawrence related to infrastructure availability, level of competition, uptake of services (and of available subsidies) by residents, and device ownership. Data is based on publicly available information from the U.S. Census Bureau, the American Community Survey (ACS), and the Federal Communications Commission (FCC).

5.1 Lawrence has ubiquitous wired broadband coverage from Comcast, and significant fiber coverage from Verizon Fios

CTC reviewed FCC data, researched websites of broadband providers operating in Lawrence to collect market data on residential broadband pricing, availability, and level of competition.

Comcast provides high-speed cable internet service to nearly every residential address (99.4 percent) in City. Even more, fiber services from Verizon Fios reaches approximately 15,131 (or 89.6 percent of) locations in City. Fixed wireless services (distinct from mobile services) are available from T-Mobile, Verizon Wireless, and AT&T to many households (4,668 locations, 463 locations, and 1,442 locations respectively).

Verizon DSL service was an option in Lawrence as the only other wireline option for internet service, offered over its legacy copper network, and it is possible that some Lawrence residents still use this service. However, a representative at Verizon stated that the company is no longer offering its DSL service to new customers. Verizon is still reporting its coverage for existing DSL customers to the FCC as required; however, the FCC is not making this data publicly available at this time.

Table 3 provides an analysis of FCC data for Lawrence. FCC data are based on reports of service availability from service providers and show a total of 16,895 “broadband serviceable locations” (BSL), which generally means addresses (which may contain one or more units or apartments in Lawrence).[11] Table 4 provides an analysis of the competitive landscape in Lawrence. Served speed is defined as a minimum of 100/20 Mbps. Underserved is defined as reported speeds of between 25/3 Mbps and 100/20 Mbps.

Table 3: Broadband service in Lawrence from FCC data

Tech	ISP	Number of locations	Number of locations (percent)
		Residential Service: 11,800	**Residential service: 100%**

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

Cable	Comcast (Xfinity)	**11,794** 11,522 locations with Speeds at least 1200/35 272 locations with speeds at least 2000/200	**99.9 percent** 97.6 percent with Speeds up to 1200/35 2.3 percent with speeds at least 2000/200
Licensed Fixed Wireless	T-Mobile, or Verizon "5G Home Internet"	**2,050** 1,304 at or above 100/20 Mbps* 155 at 50/5 Mbps 591 at 25/3 Mbps** 0 at 10/1 Mbps	**17.4 percent** 11.1 percent with speeds up to 100/20 Mbps* 1.3 percent at 50/5 Mbps 5 percent at 25/3 Mbps** 0 percent at 10/1 Mbps
DSL/Copper	-	N/A	N/A
Fiber	Verizon (Fios)	**10,493 locations**	**88.9 percent**

Table 4: State of high-speed broadband competition in Lawrence per FCC data

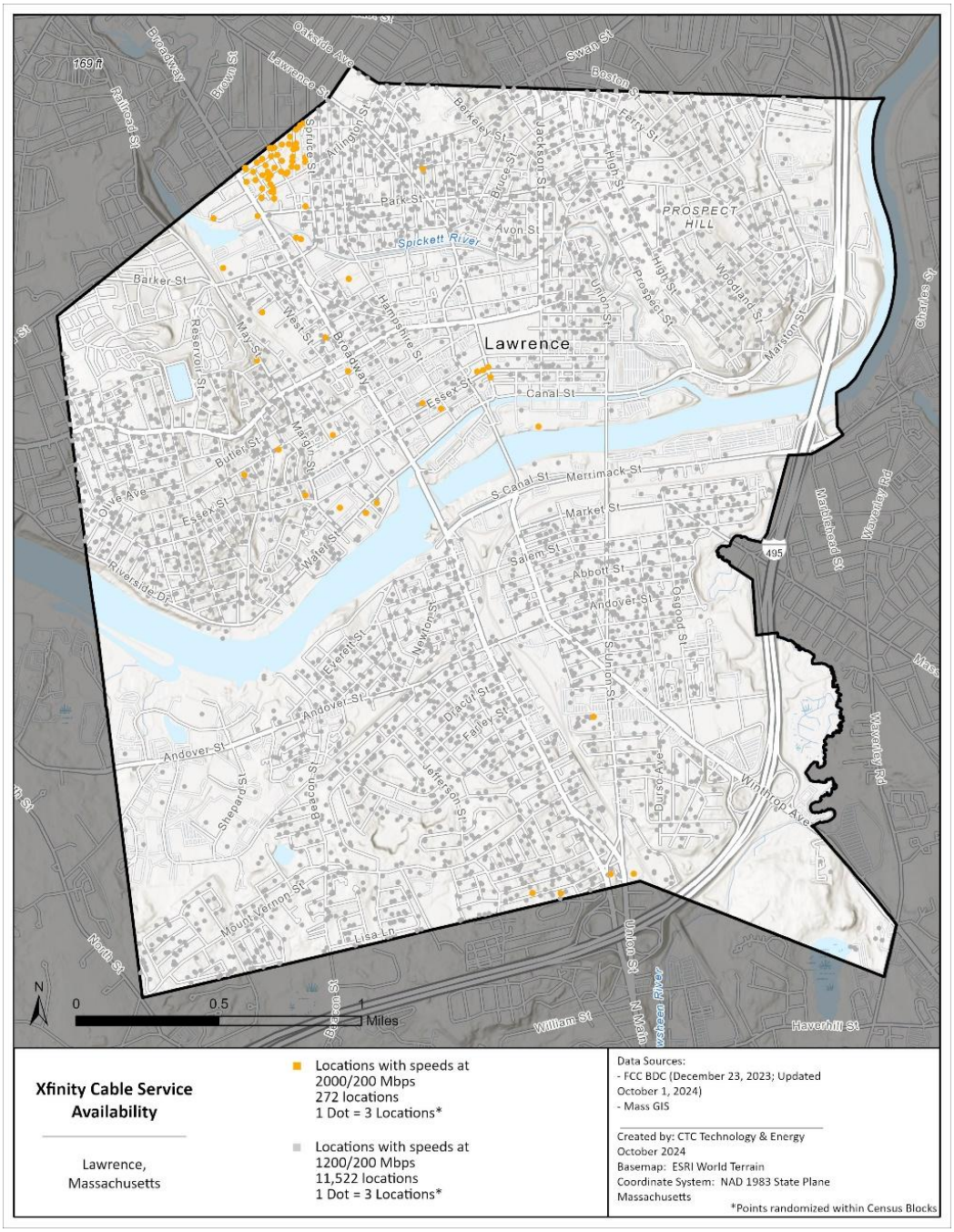
Availability of wireline broadband service		**Residential Service Locations**	**Residential Service Locations (percent)**
Addresses where 100/ Mbps download, 20 Mbps upload (100/20) or higher is available	Competition from two or more wireline providers	10,488	88.9 percent
	Fiber available in competition areas	10,488	88.9 percent
	Only one wireline provider	1,312	11.1 percent
Served only by licensed fixed wireless		0	0 percent
Underserved addresses—no options at 100/20 Mbps but can get at least 25/3 (wireline or licensed fixed wireless)		0	0 percent
No 25/3 or greater (wireline or licensed fixed wireless)		10	.08 percent
Total locations		**11,800**	

5.1.1 Cable service

Figure 1 shows Comcast's service availability in Lawrence, showing ubiquitous coverage. There are only 6 residential locations without Comcast service, as reported by the FCC. All locations and units are served by

up to 1200/35 Mbps service. As detailed in Table 1 above, 272 addresses are served at a higher speed of 2000/200 Mbps, showing the small number of locations where network upgrades are being made.

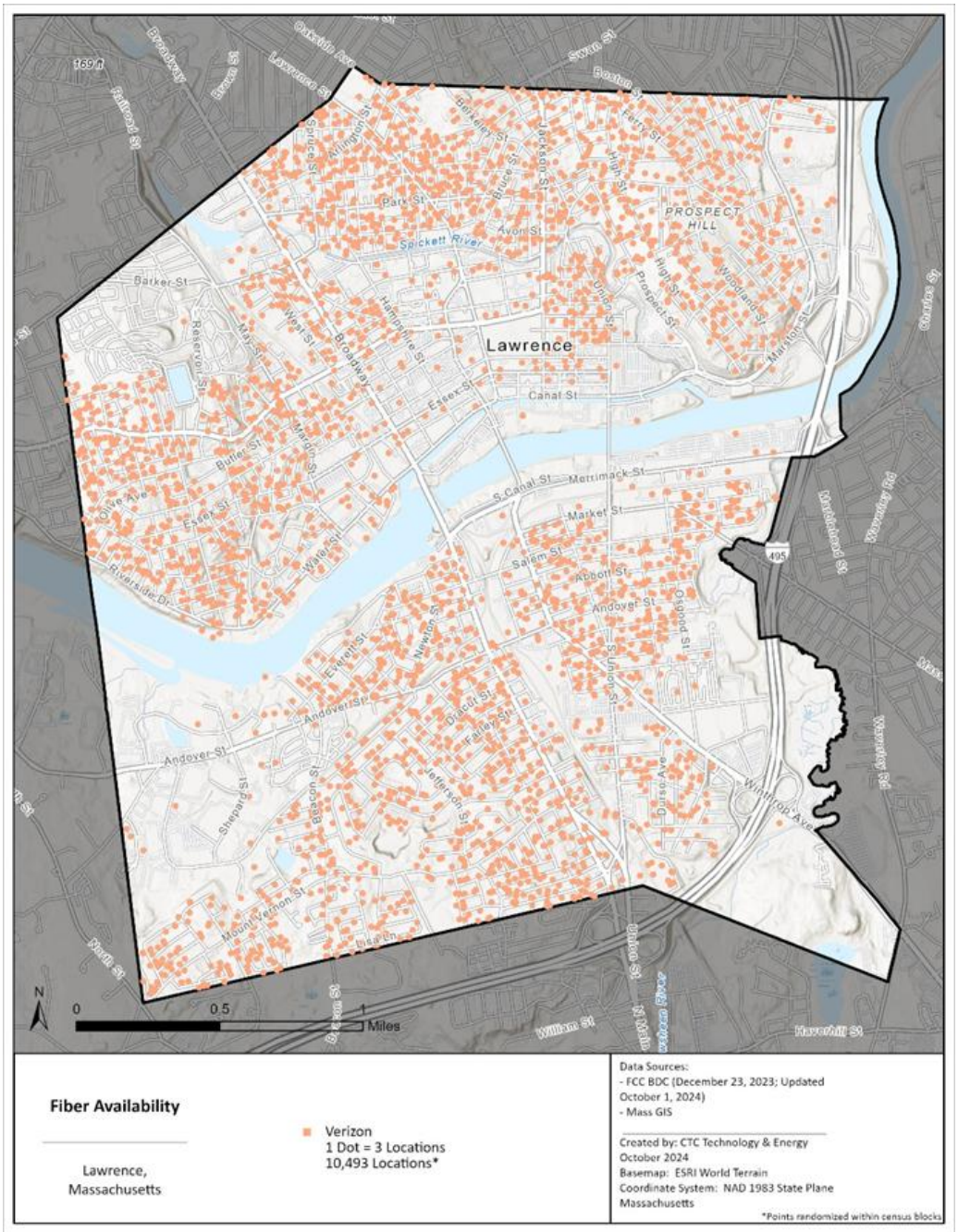
Figure 1: Cable coverage in Lawrence



5.1.2 Fiber service

The City of Lawrence has significant residential fiber coverage, with 88.9 percent of residential locations receiving services from Verizon Fios, as shown in Figure 2.

Figure 2: Fiber coverage by provider in Lawrence



5.1.3 Fixed wireless service

Residents have the option to subscribe to "5G Home Internet" services from Verizon and T-Mobile. These are known as "licensed fixed wireless" or LFW services because they use licensed spectrum under the exclusive control of the respective companies. The FCC notes that mobile wireless providers have been making these offerings an increasingly attractive alternative to services such as

Comcast, given the more competitive pricing.[12] Yet these remain a complement of, and not a full replacement to, services such as Comcast. Providers can throttle or reduce capacity in favor of mobile voice and data traffic during times of congestion. And the delivered speeds can vary greatly depending on distance from the wireless equipment or interferences in the line of sight in the environment.

In these figures, the dots represent five locations and are positioned randomly within census blocks. (The dots do not represent specific addresses.)

Figure 3 shows reported fixed wireless coverage levels by available speed. FCC data shows that approximately 2,050 (or 17.4 percent of all) locations in Lawrence are served by fixed wireless, with one third of locations served by slow speed tranches—up to 25/3 Mbps and 50/5 Mbps. FCC data report that 1,304 (or 11.1 percent of all) locations can receive served speeds of 100/20 Mbps or above. However, even this reported coverage may overstate what is actually available.

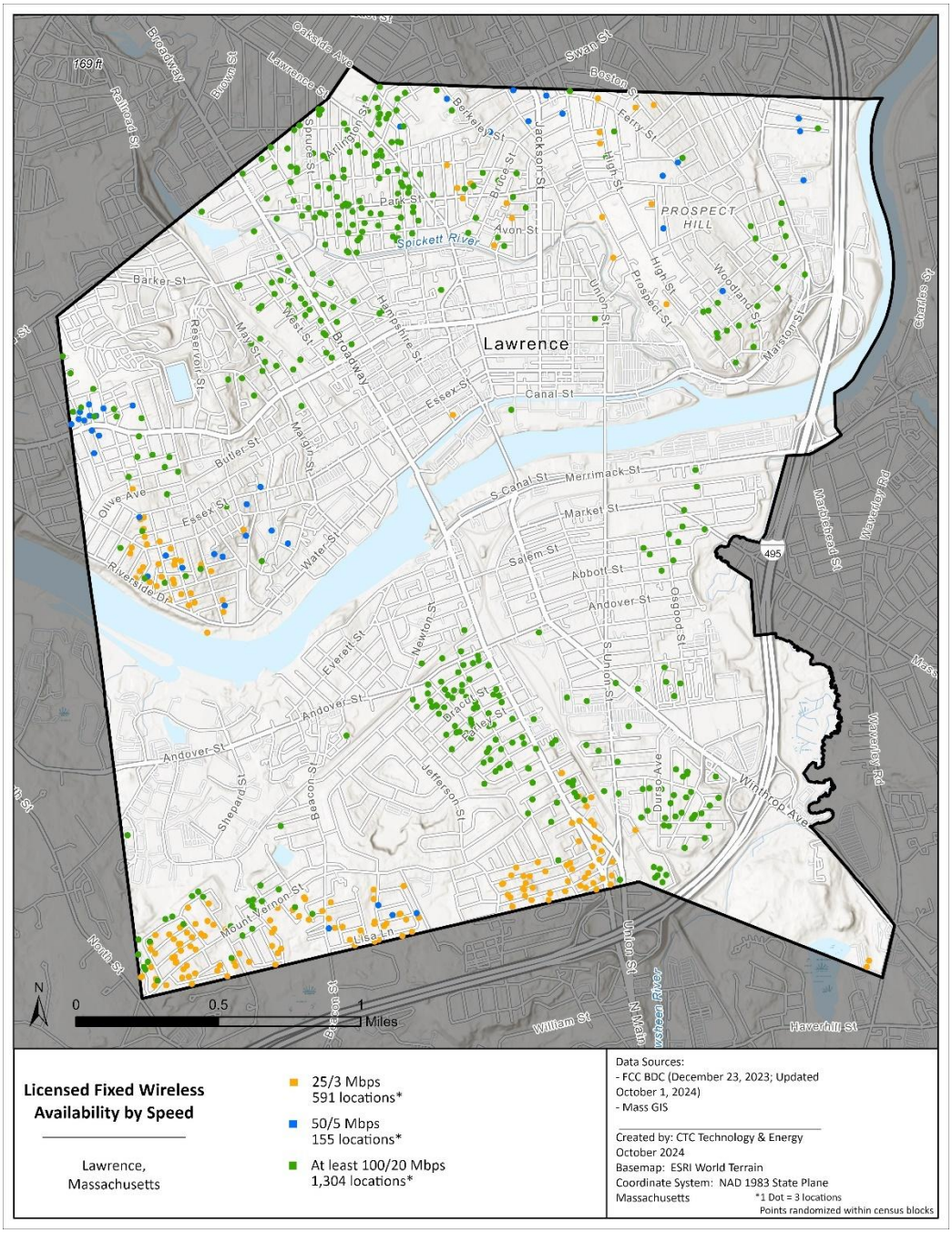
Figure 4 shows that approximately 838 locations in Lawrence can receive residential service from T-Mobile and 1,225 locations can receive residential service by Verizon, as reported in the FCC data.

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

In these figures, the dots represent five locations and are positioned randomly within census blocks. (The dots do not represent specific addresses.)

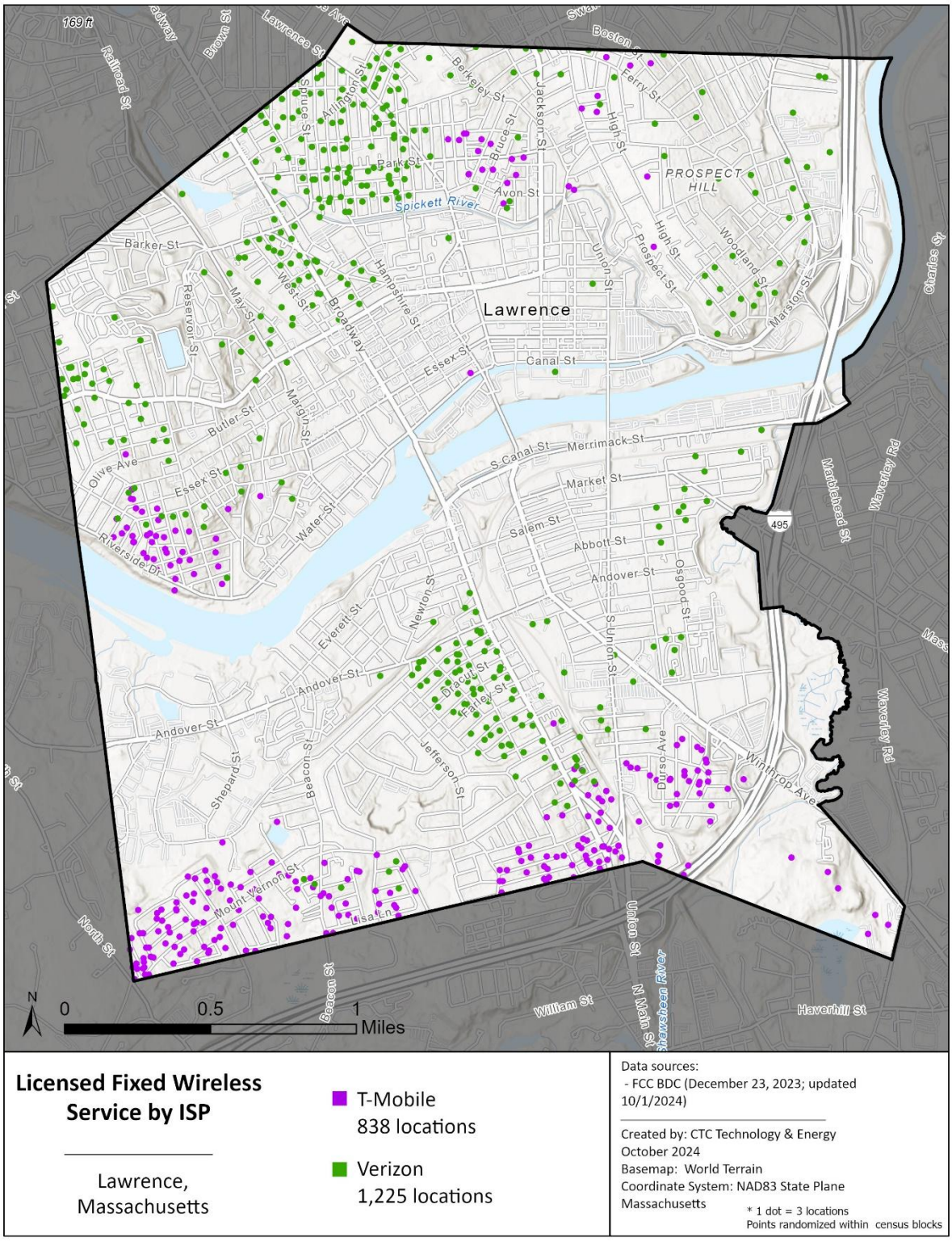
[12] "2020 Broadband Deployment Report," FCC, https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf.

Figure 3: Fixed wireless coverage by speed in Lawrence[13]



[13] As reported to the FCC using the federal Broadband Data Collection rules, gaps in speed ranges reflect no reported locations at speeds between the ranges.

Figure 4: Fixed wireless coverage by provider in Lawrence



5.2 Approximately 9.2 percent of Lawrence households rely on mobile services alone

As noted later in Section 5.5.1, roughly 2,199 (or 9.2 percent of) Lawrence households reported in the ACS survey that they are solely using a cellular internet service for broadband connectivity at home, which is higher than the state at 8.8 percent, and below the national rate of 11.2 percent. This points to the likelihood that some consumers find current costs of home internet unaffordable in the City, making some choose to rely on cellphone data plans or external hotspots to access the internet.

The FCC has repeatedly noted that mobile service is an inadequate substitute for fixed broadband services;[14] however, an estimated 11.2 percent of U.S. adults continue to rely on their smartphones and mobile data plans as the only source of home broadband connectivity[15] – a trend that is more common among young adults and low-income households[16].

5.3 When the ACP was available, 39 percent of eligible households enrolled in the program

The Affordable Connectivity Program (ACP), which once provided a $30 monthly subsidy toward some home internet subscriptions, presented an opportunity for many low-income residents to purchase broadband more affordably. Although this program has now ended, its rate of enrollment in the City provides an indication of the need for (and enrollment support in) other low-cost internet options for Lawrence residents.

FCC data reported by zip code showed that 11,231 households in Lawrence were receiving the ACP subsidy, which is 46.1 percent of the estimated 24,377 eligible households in the City.[17] Although less than half of eligible households were enrolled in the ACP at the end of the program, the percentage of those enrolled increased by nearly 15 percentage points over its final year. This may reflect the positive results of local efforts designed to increase enrollment. This data is shown in Table 5.

Residents may need continued help enrolling in low-cost programs offered by the City's broadband providers, as described in the next subsection. While outreach may help a number of residents enroll in local providers low-cost programs, there will also be some that are uninterested or unwilling. While outreach may help many residents enroll in local providers' low-cost programs, some will remain uninterested or unwilling. This may be the case if a household cannot afford internet even if

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[14] E.g., 2020 Broadband Deployment Report, para 11.
[15] "American Community Survey," US Census, https://data.census.gov/table/ACSST5Y2022.S2801?q=internet&g=010XX00US_040XX00US25_060XX00US2500562430,2500946365.
[16] Andrew Perrin, "Mobile Technology and Home Broadband 2021."
[17] Estimates of total number of eligible households are calculated by The Benton Institute for Broadband & Society through its ACP tool, using 2021 American Community Survey reported data on household income, food stamp recipiency, Medicaid recipiency, supplemental security income, and public assistance income. "The Affordable Connectivity Program Enrollment Performance Tool," Benton Institute for Broadband & Society, https://www.benton.org/acp_tool.

it receives a low-cost subscription to service, feels no need to use the internet, receives satisfactory service from a cellular provider, or receives free internet access through a communal source.

Table 5: ACP enrollment in Lawrence[18]

Date	Eligible households enrolled	Enrolled Households	Eligible Households	Unenrolled eligible households
January 2023	**31.3%**	7,634	24,377	16,743
June 2023	**40.0%**	9,756	24,377	14,621
January 2024	**46.1%**	11,231	24,377	13,146

5.4 Lawrence residents can obtain service offerings, some that were free with the ACP benefit, but initial prices may rise after promotional periods end

All broadband providers in Lawrence participated in the now-expired ACP. Although the ACP is now gone, Comcast and Verizon still offer their own low-cost programs to eligible low-income households. People who were previously enrolled in ACP may need assistance navigating and pursuing these low-cost internet service options, which are included in the following subsections.

For those who do not qualify for a discounted plan, the minimum cost of a monthly wireline broadband subscription is $59.99 after the promotional prices. For example, residents can obtain initial pricing from Comcast of $30 per month but these prices rise sharply following the promotional period. For existing wireless options, Lawrence residents can pay a minimum of $50 a month for residents seeking home internet services and can be as low as $30 a month for existing T-Mobile 5G Wireless customers.

5.4.1 Comcast cable service offerings and prices

Table 6 shows Comcast's service offerings in Lawrence. Options that had been free to those enrolled with ACP and/or are designed for eligible low-income residents are shaded green.

Table 6: Comcast (Xfinity) advertised service plans in Lawrence (low-income programs in green)

Package	Internet speed	Monthly cost	Terms
Internet Essentials	50/10 Mbps	$9.95	Available to eligible low-income customers following an application process and subject to certain conditions. Internet Essentials also includes added benefits; customers can purchase a refurbished computer for $149.99.

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

Package	Internet speed	Monthly cost	Terms
Internet Essentials Plus	100/20 Mbps	$29.95	Available to eligible low-income customers following an application process and subject to certain conditions. Internet Essentials also includes added benefits; customers can purchase a refurbished computer for $149.99.
Connect More	300/20 Mbps	$40 for the first 24 months, then $90/mo.	Pricing guaranteed for 12 months. No term contract. Can apply $10/mo. automatic payments and paperless billing discount with a stored bank account. Optional modem or gateway lease for $25/mo. Professional installation fee of $100.
Fast	500/20 Mbps	$55 for the first 12 months, then $105/mo.	Pricing guaranteed for 12 months. No term contract. Can apply $10/mo. automatic payments and paperless billing discount with a stored bank account. Optional modem or gateway lease for $15/mo. Professional installation fee of $100.
Gigabit	1000/20 Mbps	$70 for the first 12 months, then $115 /mo.	Pricing guaranteed for 12 months. No term contract. Can apply $10/mo. automatic payments and paperless billing discount with a stored bank account. Optional modem or gateway lease for $15/mo. Professional installation fee of $100.
Gigabit Extra	1200/40 Mbps	$85 for the first 12 months, then $120 plus $15/mo. router rental fee	Pricing guaranteed for 12 months. No term contract. Includes $10/mo. automatic payments and paperless billing discount with a stored bank account. Discount is $5/mo. when using a stored credit card. Professional installation fee of $100.
Gigabit X2	2,000/200 Mbps	$115 for the first 36 months, then $120 /mo.	Pricing guaranteed for 36 months. No term contract. Can apply $10/mo. automatic payments and paperless billing discount with a stored bank account. Optional modem or gateway lease for $15/mo. Professional installation fee of $100.

5.4.2 Fiber service offerings and prices

Table 7 outlines Verizon's Fios fiber plans, which are generally less expensive than those offered by Comcast for similar download speeds. Additionally, Fios offers symmetrical download/upload speeds regardless of plan.

Verizon offers a reduced cost program for any new or existing Verizon customer on any fixed wireless or fiber residential internet plan. Eligibility for Verizon Forward is limited to those that participate in Lifeline (income is 135% or less than the Federal Poverty Guidelines or uses SNAP or Medicaid),

participates in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), or who received a Federal Pell Grant within a year prior to application.[19]

Table 7: Verizon Fios advertised service plans

Package	Internet speed	Monthly cost	Notes
5G Home Internet (Verizon Forward Program)[20]	Can be applied to any Fios package	$30 discount to regular price of subscriptions	Eligibility includes Federal Pell Grant recipient within the last year, qualify for Lifeline (through participation in SNAP, Medicaid, or have income be 135% below FPL), and WIC. Wireless router included; available to existing customers. Can use Lifeline discount if applicable.
Fios 300	300/300 Mbps	$59.99	Pricing guaranteed for 24 months. No term contract. Router included. Possible $99 set up fee, location dependent. $10 off monthly bill with auto pay & paper-free billing.
Fios 500	500/500 Mbps	$74.99	Pricing guaranteed for 36 months. No term contract. Router included. Possible $99 set up fee, location dependent. $10 off monthly bill with auto pay & paper-free billing.
Fios 1 Gig	940/880 Mbps	$89.99	Pricing guaranteed for 48 months. No term contract. Router and whole-home Wi-Fi included. $10 off monthly bill with auto pay & paper-free billing. Order online to waive $99 set up charge.

5.4.3 Fixed wireless service offerings and plans

Table 8 shows pricing for T-Mobile's 5G Home Internet service plan at $50/month for 5G Home Internet-only service. T-Mobile will provide 5G Home Internet at $30/month if it is bundled with a cellular plan that costs between $60 and $100 per month for a single line.[21] T-Mobile prices its 5G Home Internet plans regardless of provided speeds; as noted above, Table 3 shows how these speeds vary widely.

T-Mobile did not participate in ACP directly for either its 5G Home Internet or mobile data plans.[22] Only T-Mobile affiliates – Metro by T-Mobile and Assurance Wireless – participated in ACP and

[19] "Verizon Forward", Verizon, https://www.verizon.com/discounts/verizon-forward/.
[20] "Verizon Forward," Verizon, https://www.verizon.com/discounts/verizon-forward/.
[21] See T-Mobile Home Internet webpage, https://www.t-mobile.com/home-internet/plans?INTNAV=tNav%3APlans%3AHomeInternetPlan (accessed November 19, 2023).
[22] See T-Mobile Newsroom, February 8, 2023 Press Release, "Taking part in ACP- through both Assurance Wireless and Metro by T-Mobile – is just one way that T-Mobile demonstrates its commitment to bringing wireless access to everyone." https://www.t-mobile.com/news/community/t-mobile-expands-acp; See also, T-Mobile website, "T-Mobile is proud to participate in the new federal Affordable Connectivity Program, which offers internet service payment assistance to eligible households. We're making the program available through Metro by T-Mobile and Assurance Wireless." https://www.t-mobile.com/brand/affordable-connectivity-program?INTNAV=fNav%3AAdditionalSupport%3AAffordableConnectivityProgram.

offered discounts on mobile data plans. Lawrence residents that qualified for ACP were required to sign up with prepaid provider Metro by T-Mobile for 5G Home Internet and could apply the ACP discount to the bundled 5G prepaid mobile plan. Metro by T-Mobile offers a 5G Home Internet plan and a mobile prepaid voice and data plan for $50 a month.[23]

Table 8: T-Mobile fixed wireless advertised service plans in Lawrence

Package	Internet speed	Monthly Cost	
Home Internet Unlimited	72-245 Mbps Download/ 15-31 Mbps Upload	$55/mo., or $30/mo. when bundled with cell plan.	Pricing does not include a $5/mo. autopay discount. Includes unlimited data and gateway router at no charge. One-time $35 device connection charge at sign up.
Home Internet Plus	72-245 Mbps Download/ 15-31 Mbps Upload	$75/mo., or $50/mo. when bundled with cell plan.	Pricing does not include a $5/mo. autopay discount. Includes unlimited data and gateway router at no charge. One-time $35 device connection charge at sign up. *Includes Wi-Fi mesh access point and 24/7 interactive video support for connected devices.

Table 9 shows Verizon Wireless' 5G Home Internet service plans. Verizon does not require users to subscribe to Verizon Wireless mobile plans to get these home internet options, but significant discounts are only available if the fixed wireless service is bundled with a Verizon mobile plan and handset. These plans include a Verizon Forward program which can provide discounted service by up to $30 per month to any Verizon Wireless package.

Table 9: Verizon Wireless fixed broadband service plans (low-income program in green)

Package	Internet speed	Monthly Cost	
5G Home Internet (Verizon Forward Program)[24]	Can be applied to any 5G package	$30 discount to regular price of subscriptions	Eligibility includes Federal Pell Grant recipient within the last year, qualify for Lifeline (through participation in SNAP, Medicaid, or have income be 125% below FPL), and WIC. Wireless router included; available to existing customers. Can use Lifeline discount if applicable.
5G Home Internet	50/5 to 85/10 Mbps	Discounted price $35/mo.; regular price $60/mo.	$10 discount available with Autopay and paperless billing. $15 discount when bundled with postpaid Verizon cellular plan and 5G phone. Pricing guaranteed for 24 months. Wireless Router included. Pricing for wireless plan and phone not included here.

[23] Metro by T-Mobile 5G Home Internet, https://www.metrobyt-mobile.com/plans/home-internet (accessed November 19, 2023). Customers that are not participating in autopay will pay $25/month. Customers must also purchase a modem for a one-time fee of $49.99.
[24] "Verizon Forward," Verizon, https://www.verizon.com/discounts/verizon-forward/.

5G Home Internet Plus	85/10 to 250/20 Mbps	Discounted price $45/mo.; regular price $80/mo.	$10 discount available with Autopay and paperless billing. $25 discount when bundled with postpaid Verizon cellular plan and 5G phone. Pricing guaranteed for 36 mos. Wireless Router included. Pricing for wireless plan and phone not included here.

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

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

The ACS is conducted yearly and nationwide by the U.S. Census Bureau. However, it is important to note a five-year sampling period (2016 – 2021)[25] that may not accurately illustrate most recent trends.

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

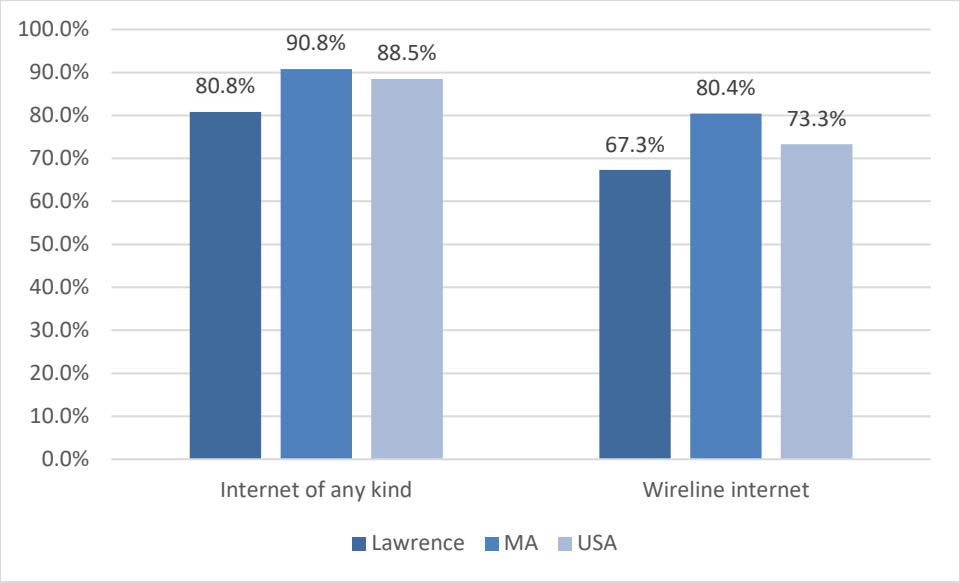
- 32.7 percent of households lack a wireline internet subscription.
- 86.5 percent of households that lack a wireline internet subscription also earn less than $75,000 annually.
- 38.6 percent of households do not own a desktop or laptop computer device.

5.5.1 Lawrence lags state and national adoption rates for both wireless and wireline internet subscriptions, and low-income residents face significant gaps

According to ACS data, 80.8 percent of Lawrence households subscribe to residential internet services. Most of these subscriptions, 67.3 percent, are via wireline technology (cable or fiber). The City lags the state and nation in subscriptions to internet of any kind and in wireline services, as shown in Figure 5.

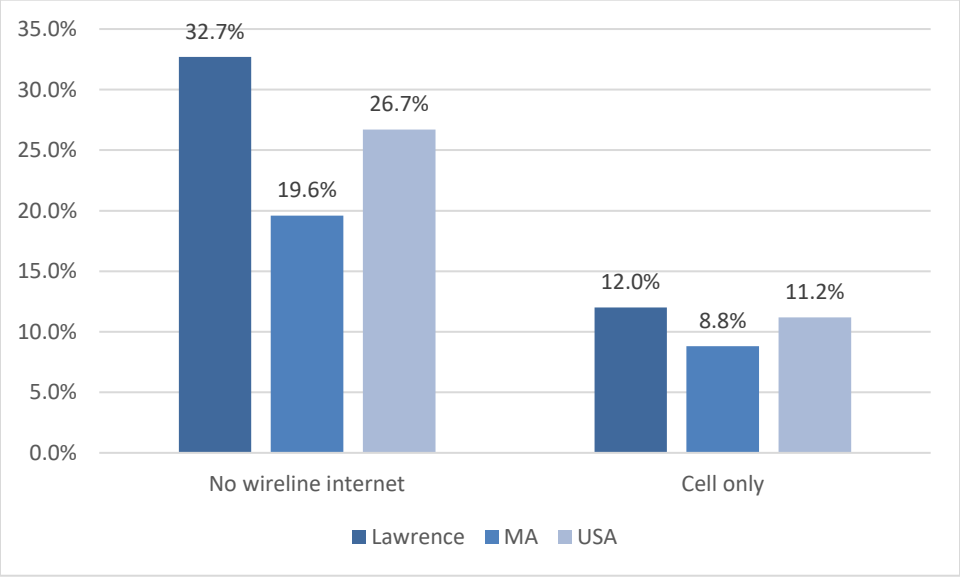
[25] The U.S. Census Bureau does not release data for communities the size of Lawrence for sampling periods less than five years in order to keep margins of error to a minimum.

Figure 5: Internet subscription rates in Lawrence compared to the state and nation



An estimated 9,920 (or 32.7 percent of) households lack residential wireline internet service, which is higher than the state and national rates of 19.6 percent and 26.7 percent respectively (Figure 6). Of those households without wireline service, roughly 3,646 (or 12 percent) are solely using a cellular internet service from their homes, which is also higher than state and national rates. Lower income households may use their cellular connection and smartphone in lieu of a more robust connection. However, reliance on cellular service will not enable all members of a household to participate in the digital economy, because of data caps and the potential for the service to be throttled in times of mobile network congestion.

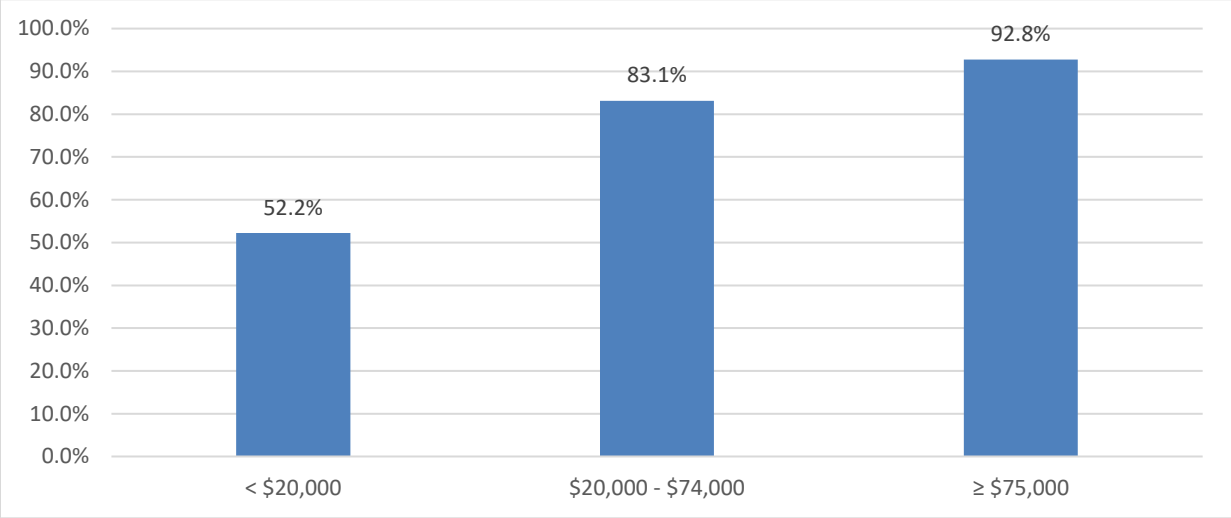
Figure 6: No access to wireline internet and mobile-only subscriptions compared to the state and nation



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

In Lawrence, most of the households lacking an internet subscription are lower-income households. Whereas 92.8 percent of households making more than $75,000 subscribe to wireline internet services, only 83.1 percent of households making between $20,000 and $75,000, and 52.2 percent of those earning less than $20,000 do so.[26] After accounting for the total number of households across all three income brackets, an estimated 86.5 percent of (or 5,042 out of 5,830) households without an internet subscription earn less than $75,000 per year. Figure 7 shows subscription rates by income bracket.

Figure 7: Wireline internet subscription rates by income level



5.5.3 Lawrence lags both state and national rates in device ownership rates across all types of devices

ACS data show that 90.6 percent of households in Lawrence own one or more computing devices, a figure that lags both the state and nation. Additionally, only 61.4 percent of Lawrence residents own a desktop or laptop computer, which is significantly less than state and national figures of 82.8 percent and 79.3 percent, respectively. Lawrence residents also own tablets at a lower rate than the state and nation yet are on par with both the state and national figures for smartphone ownership. Access to affordable devices that meet a household's needs is a critical element of the effort to expand broadband access to any community. Looking across different types of devices, including desktop, laptop, smartphone, and tablet ownership, residents seem more likely to access the internet using their smartphones, which limits the user's ability to access (Figure 8).

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

Figure 8: Device ownership rates in Lawrence compared to the state and nation

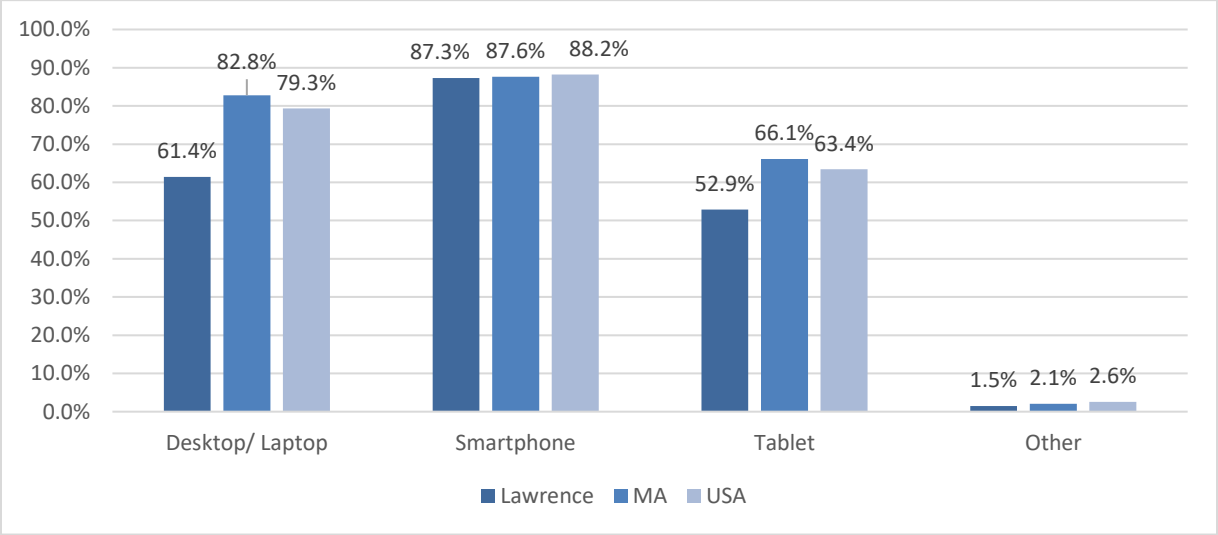
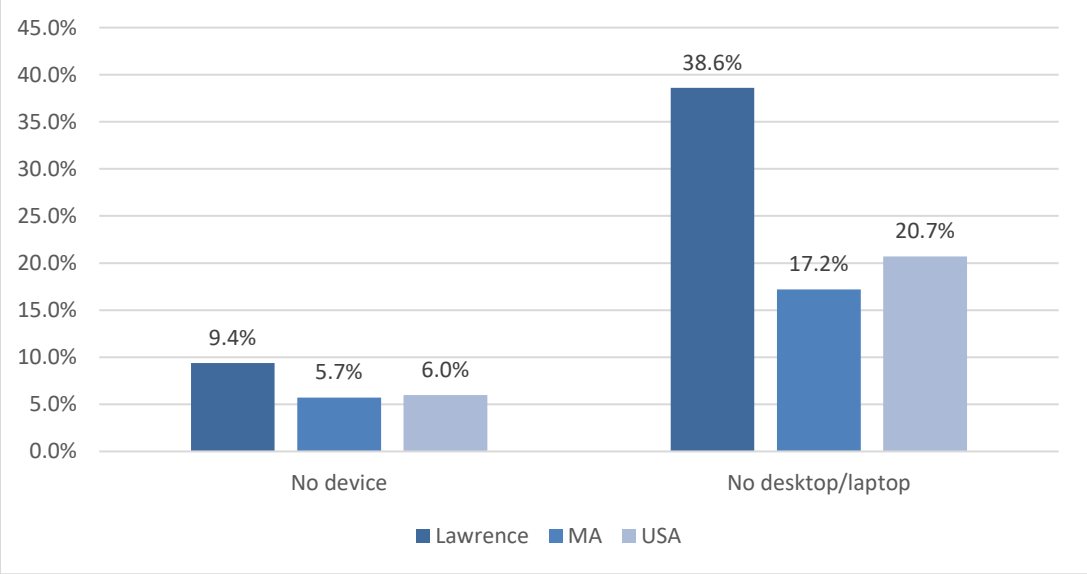


Figure 9 shows that 9.4 percent of (or 2,847) Lawrence households lack a device, which is noticeably higher than both the state and national averages. Additionally, 38.6 percent of (or 11,699) households in Lawrence do not have a laptop or desktop, which is significantly higher than the state (17.2 percent) and the nation (20.7 percent), leaving these residents to rely on smartphones or tablets and making it difficult to fully engage in the digital economy or successfully learn and work from home.

Figure 9: Lack of devices in Lawrence compared to state and national averages



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

households will require digital literacy training and access to technical support to maximize the benefits of these services.

6 Stakeholders

6.1 Lawrence Housing Authority

The Lawrence Housing Authority was established in 1942 and is the tenth largest housing authority in the Commonwealth. The authority operates 17 developments across the City, four of which are dedicated for families. There are a total of 1,500 units across all developments, and the housing authority also manages 1,000 Section 8 vouchers. Approximately 98 percent of Lawrence Housing Authority residents are Spanish first language individuals. All buildings have access to both Comcast and Verizon fiber services; however, there are a number of residents that do not have internet subscriptions in their units due to its monthly cost.

There are five community rooms across all developments, three of which are located in buildings dedicated for senior and disabled residents. These community rooms are not currently equipped with internet access or computers. A representative at the housing authority stated that these facilities would be useful to residents for various needs including employment search, resume building, emailing, and other basic tasks – and that the housing authority would consider establishing these facilities if funding were available and there was clarity on how the operating costs would be managed and the rooms maintained. Such facilities could also potentially be used as a site for skills training classes if digital navigators were available.

Infrastructure improvements are on the way for some of these sites. The following Lawrence Housing Authority developments are participating in MBI's Residential Retrofit Program to improve in-building wiring: Hancock (65 Hancock St.), Beacon Courts (71 Duckett Ave.), and Stadium (179 Osgood St.). These represent a total of 659 units.

6.2 Council on Aging & Senior Center

The Senior Center at Lawrence Council on Aging offers a number of programs, activities, and services that focus on the health, nutrition, education, and enrichment of Lawrence seniors. Services include exercise classes, health services, social and recreational programs, transportation support, case management and referrals, and educational classes.[27] The Senior Center had a computer lab with 12 computers, but those devices are aged and no longer usable. A representative at the Council on Aging stated that the computer lab had value when it was available. The Senior Center would like to offer computer access to individuals again, but do not have the financial resources available to purchase new devices at this time.

The Senior Center reports that internet access is slow at the center and should be upgraded to support the additional laptops. The first step toward addressing this issue is for City IT staff to determine the cause of the slow service and to determine the best path to improving the service.

During the pandemic, Senior Center staff taught individuals how to operate zoom on iPads for community engagement, which may have included communication with family, and Bingo or virtual

[27] "Lawrence Council on Aging Programs, Services, and Activities," City of Lawrence, https://www.cityoflawrence.com/DocumentCenter/View/476/Programs-and-Services-PDF?bidId=.

games held by the Senior Center. These classes expanded to teach Lawrence seniors how to operate a smart phone, including how to text, how to use WhatsApp, and email. There were approximately 40 to 50 individuals that attended these classes virtually. A representative at the Senior Center stated that there is an opportunity to bring these classes (or similar digital literacy and skills classes) back.

6.3 Lawrence Community Works

Lawrence CommunityWorks, Inc. (LCW) is a community development corporation founded in 1986 that weaves together community planning, organizing, and asset-building efforts with high-quality affordable housing and commercial development to create vibrant neighborhoods and empowered residents. By facilitating conversations and action on community priorities, LCW engages partners and a network of youth and adult residents in opportunities to move themselves and the city of Lawrence forward.

A critical way in which Lawrence CommunityWorks provides support to the residents of the city is through its Workforce Development activities. Within this Workforce Development department, LCW offers various workforce trainings, including Digital Skills for Life, and a basic digital skills class. The program is taught in Spanish and teaches students basic essentials of operating a computer, including: the different parts of a computer, how to create, save, and send documents, as well as how to create and send emails. The curriculum also includes how to safely navigate the web and social media, protect their on-line privacy, and combat identity theft. Classes are held in person at LCW in their computer lab, which has 18 desktop computers. The computer lab and other classrooms are in desperate need of additional equipment such as Smartboards, to enhance these educational classes. However, LCW does not have the resources currently to make this purchase.

LCW is also interested in developing a higher-level digital skills class– one that would be taught in English, during the day, where students would learn Microsoft Office Suite computer applications: Word, Excel, PowerPoint, and Outlook. These transferable skills could help those students to find employment or better jobs.

6.4 Lawrence Public Library

Lawrence Public Library has an incredible amount of programs for its patrons, including three computer labs with 17 desktop computers for children, teens, and adults; three kiosks equipped with seating, microphones and televisions for meetings, telehealth appointments, and podcasting; one printer; phone system for internal and external communication; headphones for loan; technical services through its Media Center; and information services including online databases and free online class curriculums.

The Lawrence Public Library has been working closely with the Massachusetts Association for Computer and Internet Resources (MACIR)[28] to develop the program ELEVATE (Enhancing Literacy

[28] MACIR is a nonprofit organization recognized as the 2024 Top Innovator in Digital Equity by the Massachusetts Broadband Institute and is committed to expanding opportunities for underserved communities through technology access, enhancing literacy, and workforce development. As part of this mission, MACIR plays a leading role in the JEDI (Justice, Empowerment, Diversity, and Inclusion) consortium,

and Empowerment for Valued Access to Technology and Education), which is aimed to bridge the digital divide in Lawrence by addressing technology gaps and digital skills among residents. ELEVATE has a detailed action plan with four steps to address Lawrence's ongoing digital needs:

1. **Infrastructure and hardware upgrades:** First, the library would like to increase its stock of computers, as a number of devices are outdated and do not support the necessary Windows 11 software. Second, the library would like to further equip its existing kiosks with computers, keyboards, and mice to enhance its usability, particularly for those without a personal computer. Third, the library would like to purchase a projector screen to support classes at the library. Finally, the library would like to add additional Wi-Fi access points to expand internet coverage throughout the library.
2. **Digital services and accessibility enhancements:** The library plans to become the primary hub for digital equity services and will be recognized as the "Central Command Center." There will be other "satellite offices" including the Senior Center and other local community-based entities that will support ELEVATE's digital equity programming. MACIR will oversee the hardware and software procurement, installation, configuration, curriculum development, and digital navigator training, which will be contingent on available funding resources.
3. **Community engagement and capacity building:** ELEVATE programming will include training of digital navigators to offer tech support and digital equity education; develop digital equity curriculums with certifications; launching of outreach programs in collaboration with other local organizations; partner with device distribution organizations to refurbish and distribute laptops and Chromebooks; and secure private funding to establish community digital equity labs citywide.
4. **Team and communication enhancements:** MACIR and the library plan to implement online appointment scheduling, integrate Zoom, Microsoft Teams, and Slack for meetings, appointments, and team collaboration, use Trello for tracking ongoing program usage and success, and utilize Microsoft Power BI as a data analytics tool to highlight program impacts.

Through key funding opportunities by local and state government, private investment, and regional philanthropies, the library and MACIR hope that the ELEVATE program will be able to achieve the following goals:

- Improved access to up-to-date technology and services.
- Increased community participation in digital literacy programs.
- Efficient handling of digital service requests through a centralized system.
- Strengthened workforce development through Digital Navigator training and certifications.

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a regional initiative focused on creating pathways to digital opportunity throughout North Shore and Metro North communities. Through JEDI, MACIR collaborates with community organizations, government agencies, and technology providers to develop sustainable programs that equip residents with the skills and resources needed to thrive in the digital age.

- Community members gain access to professional certification opportunities.
- College credit transfer options encourage further education through partnerships with regional institutions.
- A scalable digital equity model applicable across Essex County.

The library and MACIR were recently awarded $50,000 from ECCF to start this work, which is designated for staffing support, equipment and technology, and IT consulting. Additional funds would allow for further IT support and consulting, the purchase of devices for distribution to program participants, stipends for navigators, and Comcast Internet Essentials subscriptions for residents in need.

6.5 Schools

All students have access to a Chromebook.

Representing Lawrence Public School system, Carlos Matos expressed that affordability of the internet is a major challenge for Lawrence households. Even more significantly, the barriers that new immigrants experience with digital skills, device access, and language comprehension on the internet is an ongoing issue among households, which directly impact the children in those households.

Currently, Lawrence Public Schools do not have a dedicated staff member supporting students and their families on digital equity-related topics, including information sharing and enrollment support in low-cost internet programs. However, there are a number of LPS households without a home internet subscription due to the high cost of service. There are low-cost broadband subscription programs available in Lawrence, but enrollment in those programs can be confusing. Mr. Matos suggested that providing that enrollment support at the beginning of the year, or at parent events, could help boost household internet access among Lawrence residents.

Mr. Matos is interested in expanding public Wi-Fi and increasing supply of and access to hotspots for student household use. First, public, and free internet is helpful for individuals (some of which are students) to access the internet outside of the home, which may have many people living in one unit causing limited privacy to complete work or school assignments. It would be beneficial to incentivize existing providers in Lawrence to partner with the City to offer internet in community spaces. Comcast does have a program, in which it partners with local entities like community centers to install strong internet that is free to the public. These spaces are often also equipped with computers. Second, Lawrence Public Schools should increase its hotspot supply so that families with school-aged children that do not have a home internet connection can receive one during the school year at no cost.

Lawrence also offers adult education classes at the City's Adult Learning Center at 255 Essex Street. These classes are currently paper-based and the center does not have offer digital literacy courses. However, the center is in the process of opening a computer lab, and there is interest in expanding classes to include digital skills and literacy programming. Topics of interest among Lawrence

residents include implementation of internet safeguards on home devices, how to bank online, online fraud and scam awareness, and digital services for sending resources to family abroad.

6.6 IT Director

Carlos Castillo, the IT Director for the City of Lawrence, explained that the City is moving toward a paperless application and payment system for City programs, tax, and utilities payments. This is a part of a wider initiative to help digitize government programs moving forward.

To do this, the City would like to purchase 12 kiosks to assist constituents with their online application processes. These kiosks will help individuals who may require support with navigating digital platforms for various services and will significantly enhance the accessibility and efficiency of the online application process for Lawrence constituents. Three kiosks would be located at the City Clerk's office, the tax collection office, ISD, and at the Water Department in City Hall.

Each kiosk would be equipped with a touch screen monitor, minicomputer, mouse, and keyboard. The total cost of one kiosk would be $1,800.

6.7 Lazarus House

Lazarus House is a nonprofit located in Lawrence, which aims to restore dignity and self-respect to low-income, under-resourced, and homeless individuals by providing food, shelter, clothing, advocacy, and community resources. Approximately 95 percent of individuals served are residents of Lawrence. Approximately 97 percent of Lazarus's served population live below the 30th percentile of Median Family Income, and nearly 20 percent are at or below the poverty level. Guests are predominantly Latino, single mothers with children, and seniors living on fixed incomes.

- **Food Security:** Lazarus House serves over 125 meals per day at its soup kitchen and distributes supplementary groceries weekly to more than 1,800 families at its food pantry.
- **Clothing:** Lazarus House offers highly affordable clothing, housewares, and furniture at our thrift store. Those facing dire need receive vouchers for free items.
- **Shelter:** The organization offers emergency shelter and transitional housing programs, which provide life skills classes that include budgeting, job, and housing searches. Currently staff use their own laptops to assist with these classes. Additional computers would allow our Guests to be able to learn the computer skills needed in today's society as well as be able to participate our classes more fully. The organization is also increasing its Transitional Housing Program and will need new computers for both staff and Guests.
- **Advocacy and case management:** Services include medical and behavioral health care, housing referrals and vocational training plus showers, clothes, infant care items, personal care items and most recently – a barbershop. Staff help them to fill out job and medical applications as well as any other online access they might need.

In December 2024, Lazarus House applied for a $50,000 Digital Equity Grant from Essex Community Foundation but was not awarded this money. The grant would have been used to upgrade its desktops and laptops at its Soup Kitchen, Food Pantry, Community Resources Program, Emergency Shelter Program, and Transitional Housing Program for both guests and staff.

Lazarus House would have used the full sum of this money to purchase ten laptops for the following programs:

- Lazarus House was seeking two laptops for its food pantry and soup kitchen programs for staff to complete food orders, provide guest services, and manage volunteers and internal communications. Two laptops dedicated for soup kitchen and food pantry use would allow for these programs to function more efficiently and allow staff to provide better services to guests. Devices would have also allowed the organization to track the number of individuals served weekly to inform resource and food purchasing and understand the shifting needs of its guests.
- The organization was seeking one new laptop for its Community Resources Room, which would have been available to both guests and partners (partners may include doctors and medical providers that assist guests with health care applications, and companies that attend Lazarus House job fairs).
- Lazarus House's Emergency Shelter program was seeking two laptops, one to replace its aging staff laptop, and one additional computer for guest use in its life skills programs at Capernaum Place Transitional Housing and Ishah House.
    - Capernaum Place Transitional Housing staff use their own laptops to teach life skills classes. Additional computers are needed for guests to use in these classes, as many do not own a personal device. Class curriculums include personal and family budgeting, computer skills, employment and housing research and applications, and having access to a device is imperative to providing individuals with adequate care and resources to do learn these skills.
    - Ishah House, which is currently being renovated into five units of transitional housing equipped with internet, is seeking two desktop computers for staff and one laptop for public use in its conference room. Similar to Capernaum Place Transitional Housing, life skills classes will take place at this location, which will require one device for guest use, and one device to share among administrative staff.
- Finally, Lazarus House was seeking funding to update and cover the cost of its device software, which include Adobe Pro and Zoom licenses.

6.8 Lawrence Police Department

The Lawrence Police Department is headquartered on Lowell Street in the City's downtown. A representative from the department stated that one of the most recognizable aspects of the City's digital divide is public access to devices, other than smartphones.

The Police Department currently does not allow for fees and fines to be paid online—instead, individuals must pay tickets by cheque or cash. This can be a challenge, as a number of residents do not have a bank account, making payment a challenge at times.

The Police Department would like to install two kiosks, similar to those detailed in Section 6.6 above. These kiosks would offer a central location at the police department where individuals could pay for tickets and gain access to computers with a list of services and information for the public.

Additionally, the department is in need of updated digital fingerprint software for its intake processing.

The Police headquarter is moving, and the new location will open in March 2026.

7 The demise of the ACP was a challenge to low-income households nationally and in Lawrence, but there are options for filling this gap

Many households across the country relied on the Affordable Connectivity Program (ACP) to secure and maintain an internet connection at home, and the program's end has been a significant loss for many. A recent Benton Institute for Broadband & Society survey conducted immediately after the ACP ended in April 2024 found that 13 percent of households would disconnect their service without the ACP subsidy, and 36 percent of respondents would downgrade to a cheaper or slower plan.[29] Additionally, nearly half of respondents saw a home internet connection as an uncertainty, implying that they view their internet subscription as a service that may be canceled at any time based on the household's limited budget and varied costs each month. With over 23.2 million households enrolled in the program nationwide, and over 367,000 enrolled in Massachusetts, there are a significant number of households that are now feeling the tremendous impact of the program's end.

At the end of the ACP, Lawrence had 11,231 households enrolled, and as many as 13,146 potentially eligible households remained unenrolled. Some unenrolled yet eligible households may have not wished to subscribe, but accelerating enrollment efforts in low-cost programs offered by Lawrence's broadband providers would help close the enrollment and affordability gap and reinforce all digital equity programmatic efforts throughout this report.

Table 10: ACP enrollment in Lawrence over one year[30]

Date	Eligible households enrolled	Enrolled Households	Eligible Households	Unenrolled eligible households
January 2023	**31.3%**	7,634	24,377	16,743
June 2023	**40.0%**	9,756	24,377	14,621
January 2024	**46.1%**	11,231	24,377	13,146

7.1 There are ways that Lawrence can support residents post-ACP, primarily through enrollment assistance in low-cost internet programs or by pursuing more ambitious subsidy efforts

A variety of low-cost services do exist through existing ISPs in Lawrence, which should be promoted through various channels throughout City as described in more detail below. Additionally, there are examples of more ambitious models of subsidy-based programs that have been demonstrated regionally or nationally that can be adopted locally.

[29] "Leaving Money on the Table: The ACP's Expiration Means Billions in Lost Savings," Benton Institute for Broadband & Society, https://www.benton.org/publications/acp-expiration-means-billions-lost-savings.
[30] "ACP Enrollment and Claims Tracker," USAC, data as of June, 2024, https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/.

7.1.1 ISPs in Lawrence offer several low-cost broadband programs

Verizon, Comcast, and T-Mobile offer low-cost programs in Lawrence. Low-cost programs can provide significant relief to the 478 households that were previously receiving the ACP, and to the additional 757 households that were eligible for the ACP at the time of the program's end. Lawrence can utilize existing resources from local entities and organizations or consider creating a City digital navigator position (as referenced in Section 3.3) to support residents in the process for enrolling in these low-cost programs. A navigator would potentially help residents learn how to access competitive and lower-cost internet solutions by informing consumers about switching from expensive service plans that place a strain on monthly budgets to a more cost-effective plan.

Low-cost programs offered by ISPs in Lawrence are:

- **Verizon Forward,** which provides up to a $30 monthly discount toward any internet subscription for those who are eligible, resulting in service for as low as $20 per month.[31] Eligibility includes:
    - Federal Pell Grant recipient within the last year,
    - Qualify for WIC, or
    - Qualify for the FCC's Lifeline discount of $9.25 per month toward wireline or wireless service (through participation in SNAP, Medicaid, or other programs; or if income is 135 percent or less than the Federal Poverty Guidelines).[32]
- **Comcast Internet Essentials**, a cable internet plan that provides 75/10 Mbps service for the discounted price of $14.95 per month for eligible households.[33] Eligibility includes:
    - Participation in assistance programs like the National School Lunch Program, public housing assistance, Medicaid, SNAP, TANF, SSI, Low Income Home Energy Assistance Program, WIC, Federal Pell Grant, Veterans pension, and Tribal assistance, or were enrolled in the Affordable Connectivity Program
    - Have not had Xfinity Internet within the last 90 days
    - Have no outstanding debt on any Comcast account that is less than one year old
- **Comcast Internet Essentials Plus,** a cable internet plan that provides up to 100/20 Mbps service for the discounted price of $29.95 per month for eligible households. Eligibility requirements for Internet Essentials Plus are the same as for Internet Essentials, listed above.

[31] "Verizon Forward," Verizon, https://www.verizon.com/discounts/verizon-forward/?cmp=KNC_H_P_COE_GAW_FiOS_99_99_BP-9122&abr=CMOGBRPLUS&c=A005126&gad_source=1&gclid=EAIaIQobChMIhoXk08DKiAMVpwGtBh1igA4lEAAYASABEgK8nfD_BwE&gclsrc=aw.ds.
[32] "Lifeline," FCC, https://www.fcc.gov/lifeline-consumers.
[33] "Internet Essentials," Comcast Xfinity, https://www.xfinity.com/learn/internet-service/internet-essentials.

7.1.2 Single-payer agreements with ISPs have proven to be successful in closing the digital divide in communities across the country

Single-payer internet arrangements—in which a jurisdictional entity partners with an internet provider to pay for a defined population's monthly internet bill through a bulk purchase agreement—are common approaches nationally and are readily embraced by many ISPs. Lawrence could consider a single-payer agreement with a local internet provider, so that a segment of the City's population that is struggling to pay for home internet services each month is able to receive subsidized or free service. Lawrence could begin this process by issuing a request for proposals (RFP) from providers in the City to get an understanding of who would be interested in partnering with the City. Successful examples of this include:

- **Cambridge Public Schools:** The City of Cambridge recognized that the cost of internet was a barrier to a home broadband subscription for many families with young children. To combat this, Cambridge Public Schools (CPS) partnered with Comcast to offer free internet service to eligible CPS households.[34]

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

- **Chicago Connected:** The National Digital Inclusion Alliance notes that through a single-payer program called Chicago Connected, more than 40,000 Chicago Public School students and their families have received broadband subscriptions since 2021.[35] Chicago Connected has become nationally recognized as a successful model for other entities nationwide.[36]

- **San Francisco/Monkeybrains**: The City operates the "Fiber to Housing program," which provides free internet to low-income San Francisco residents, through the Department of Technology and in partnership with the local internet provider Monkeybrains. Fiber to Housing began in 2018 and leverages existing municipal fiber resources and private sector partnerships to operate the program.[37]

- **Cruzio Equal Access Program:** Cruzio started its Equal Access program in California at the beginning of the pandemic, and the company has raised nearly $1 million for projects to cover both infrastructure and discounted services. The Equal Access project provides connectivity to students and their families who may not be able to afford internet service. Completed projects are located in the City of Santa Cruz, Live Oak, and Pajaro Valley (all

[34] "Internet Essentials Program," Cambridge Public Schools, https://www.cpsd.us/internet_essentials_program.
[35] "Chicago Connected," Chicago Public Schools, https://www.cps.edu/strategic-initiatives/chicago-connected/.
[36] "What Are Single Payer Agreements?" NDIA, What Are Single Payer Agreements? - National Digital Inclusion Alliance
[37] "Monkeybrains and Fiber to Housing," Monkeybrains, https://www.monkeybrains.net/MB_fiber_to_housing.pdf.

located in Santa Cruz County).[38] These projects were completed through a partnership between Cruzio, the County Office of Education, and Community Foundation Santa Cruz County, as well as the Housing Authority of the County and the Central Coast Broadband Consortium.

[38] "Previous Projects," Equal Access Santa Cruz, https://equalaccesssantacruz.com/previous-projects/.

8 Lawrence Digital Empowerment Event

CTC facilitated a two-hour public stakeholder event at the Lawrence Senior Center on February 25, 2025, called "Lawrence Digital Empowerment: bridging the gap with technology." Organized by library and senior center staff, the event solicited public perspectives and feedback on broadband gaps. More than 50 people attended.

By a show of hands:

- Nearly everyone in attendance indicated they owned a smartphone
- Most indicated they used this as their primary device to access the internet.
- About one-third indicated they have a computer (not just a smartphone) at home.
- About half indicated that they do not have an internet subscription at home.

Individuals without internet at home were asked to explain their reasons for not having a subscription. Responses included that it was too expensive, that they had been unhappy with the speed of service and number of drops per week, or that it felt unnecessary because they did not own a computer or tablet.

  - One participant stated she subscribed to Comcast at an introductory rate of $30 per month and was surprised when the price rose to $80 at the end of that period.
  - Another stated that the limited number of ISPs in the City made them feel that providers can overcharge for their service.

- Although all individuals at the event were comfortable with, and capable of, using smartphones and certain apps including WhatsApp and iMessage to communicate, many expressed feeling less comfortable using other applications that may provide other services.
- Attendees stated that the most common way they receive tech support is through family and friends.
- When asked if they would be interested in learning new tech skills in a class setting, many were interested.
- Nearly all expressed significant concerns about online fraud and scams.
  - One participant stated that she has noticed that young people fall for scams just as frequently as elderly residents in Lawrence. She noted that a number of young adults have received text messages from a fake employer that offer a new job opportunity. The scammers attempt to obtain bank account information or social security numbers.

- Another attendee explained that individuals in Lawrence are falling victim to scammers who send texts posing as family members or friends, requesting cash in the form of gift cards and PINs on the back of the cards.

The evening ended on a hopeful note, with Janelle Abreu of the Lawrence Public Library expressing her hope that those that attended this event, and that the rest of Lawrence, continue to expand their digital skills and seek available resources so that Lawrence's digital divide will continue to shrink.

9 MBI Residential Survey results

This report is based on data collected from Lawrence City residents who responded to a survey instrument created by the Massachusetts Broadband Institute (MBI) and posted online.

The results presented in this section are based on analysis of information provided in the survey by 67 residents of Lawrence. Unless otherwise indicated, the counts and percentages reported are based on valid responses from those who provided an answer and do not reflect individuals who said "don't know" or otherwise did not supply an answer because the question did not apply to them. Key results are noted where appropriate, but keep in mind that the results are based on a relatively small number of respondents. The survey sample was self-selected and is not necessarily representative of the larger population.

This report focuses on data collected that is unambiguous with regard to meaning or accuracy, relevant to the topic of digital equity, and provides insights that are potentially actionable. As such, not all information from this survey was included. For example, the datapoint that only 21 percent of surveyed residents use mobile data plans was discarded because it seems to reflect respondent confusion due to how the question was phrased. (Nationwide, 85 percent or more adults own smartphones, and typically these are used with data plans.)

The full survey instrument is posted in Appendix A. The full dataset was provided to Lawrence City.

9.1 Residential internet service

Respondents were asked about internet connection types and providers. This information provides valuable insight into residents' need for various internet and related communications services.

9.1.1 Internet access

Sixty-two of 67 Lawrence respondents (93 percent) reported having either a home internet or mobile subscription, as shown in Figure 10. However, only 45 percent said they have wireline internet service in the home, leaving 55 percent not subscribing to wireline or any internet service (see Figure 11).

Figure 10: Have internet service in the home

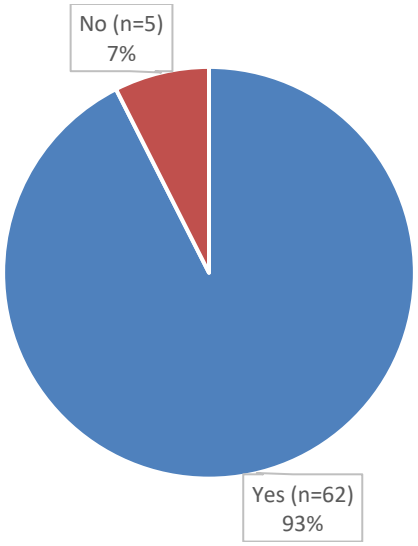
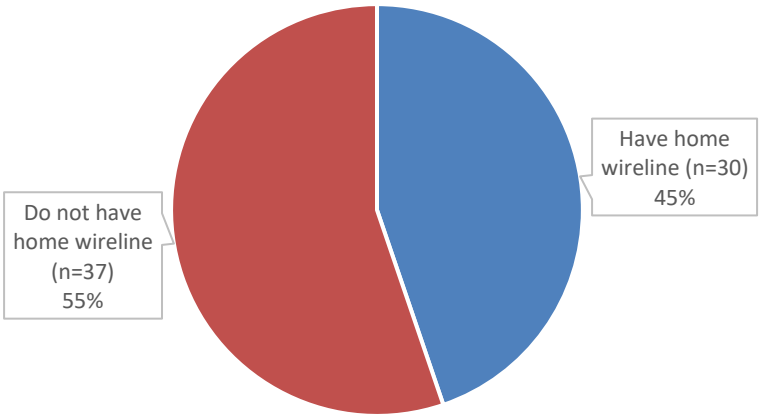


Figure 11: Have home wireline connection



9.1.2 Questions for those with home internet service

Respondents subscribing to home internet service were asked a series of questions about their service, including provider used and price paid.

9.1.2.1 Home internet service provider

Twenty-nine of 62 (47 percent) households with home internet service have Comcast/Xfinity, and 23 (37 percent) have Verizon Communications. Six (10 percent) have T-Mobile, and four (six percent) have internet service through other providers. (CTC combined answers in cases where the survey instrument listed the same provider twice, but under different brand or company names.)

9.1.2.2 How well home internet service works

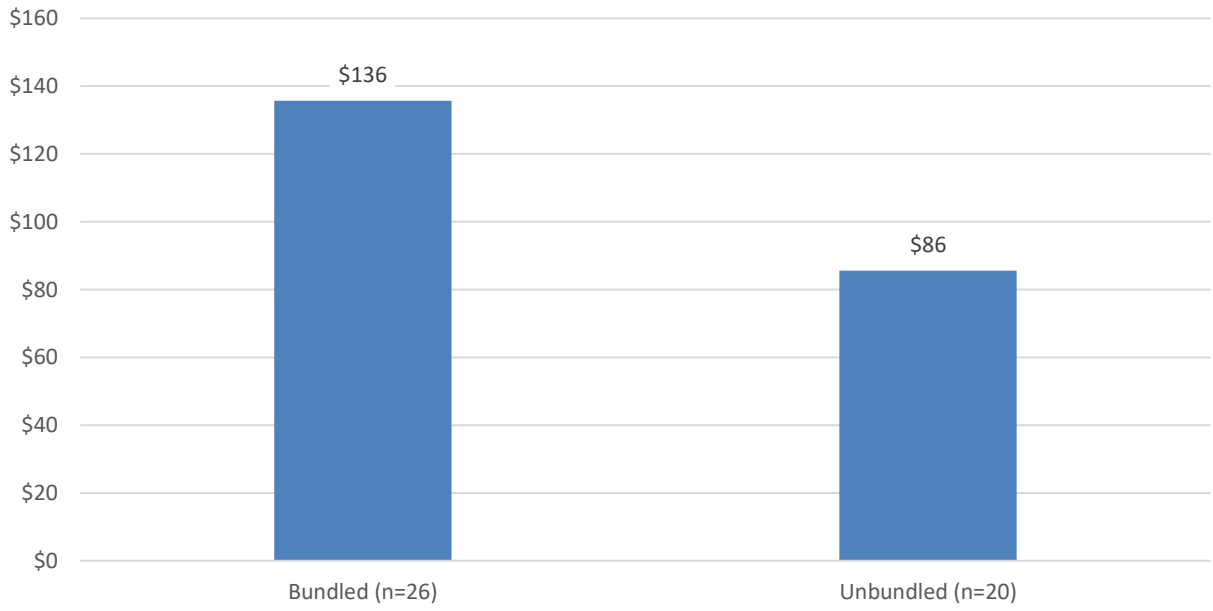
Most internet subscribers (75 percent) said their service is good enough to meet their household's needs, but 23 percent said it is not good enough and two percent said they do not know.

9.1.2.3 Internet service cost

Respondents were asked to give the cost of their home internet service, as well as indicate whether or not they bundle internet with TV and/or phone service. Overall, one-half of subscribers bundle their internet service.

Respondents pay an average of $136 per month for bundled internet service and an average of $86 per month for unbundled internet service, based on a relatively small number of people who responded (see Figure 12).

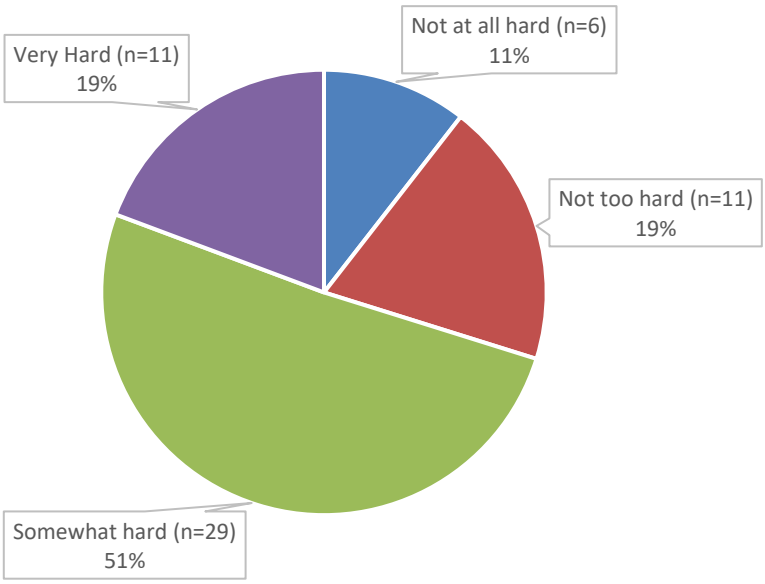
Figure 12: Average monthly price for internet service



Respondents were also asked how hard it is to pay their internet bill. Twenty-nine of 57 subscribers who answered (51%) said it is somewhat hard to pay their internet bill, as illustrated in Figure 13. Another 11 subscribers (19 percent) said it is very hard to pay. Although based on a relatively small

number of respondents, this data contributes to our finding that affordability is a significant concern for many residents of Lawrence.

Figure 13: How hard is it to pay internet bill



9.1.3 Questions for those without any home internet service—subscription or smartphone

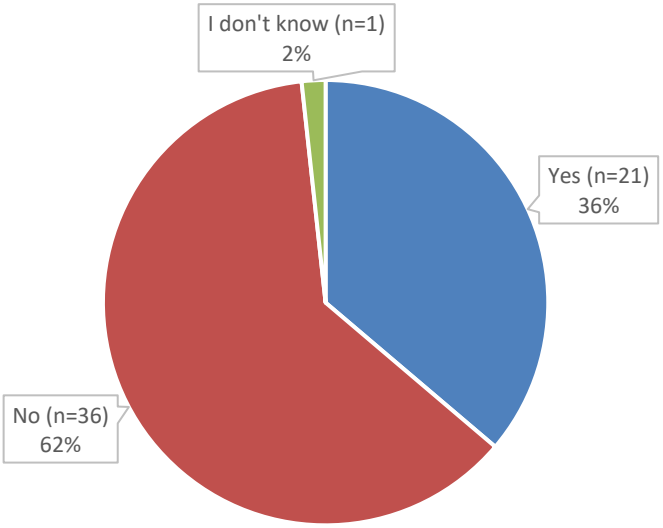
Respondents without internet services were asked to indicate the various reasons for this. The survey asked this question only of the very small number of people who lack any kind service (neither a home subscription nor a smartphone), not the larger number who, while they might have a smartphone, don't have home internet subscriptions specifically. As such, this report will use American Community Survey data on this point.

Given that only five people who responded lack either a home subscription or mobile subscription, the sample is too small to analyze in-depth. Four of the five individuals cited the high expense as a barrier to having internet service, and one said they do not want to use the internet. Four of the five respondents without mobile or home internet service access the internet elsewhere outside the home; one individual does not access the internet at any of the locations listed on the questionnaire.

9.1.4 Internet subsidy programs

All respondents were asked if they had heard of the Affordable Connectivity Program (ACP), which is available to eligible low-income households. As shown in Figure 14, only 21 of 58 respondents who answered (36 percent of respondents) are aware of this program. This datapoint supports our recommendation that enrollment support efforts be expanded in Lawrence.

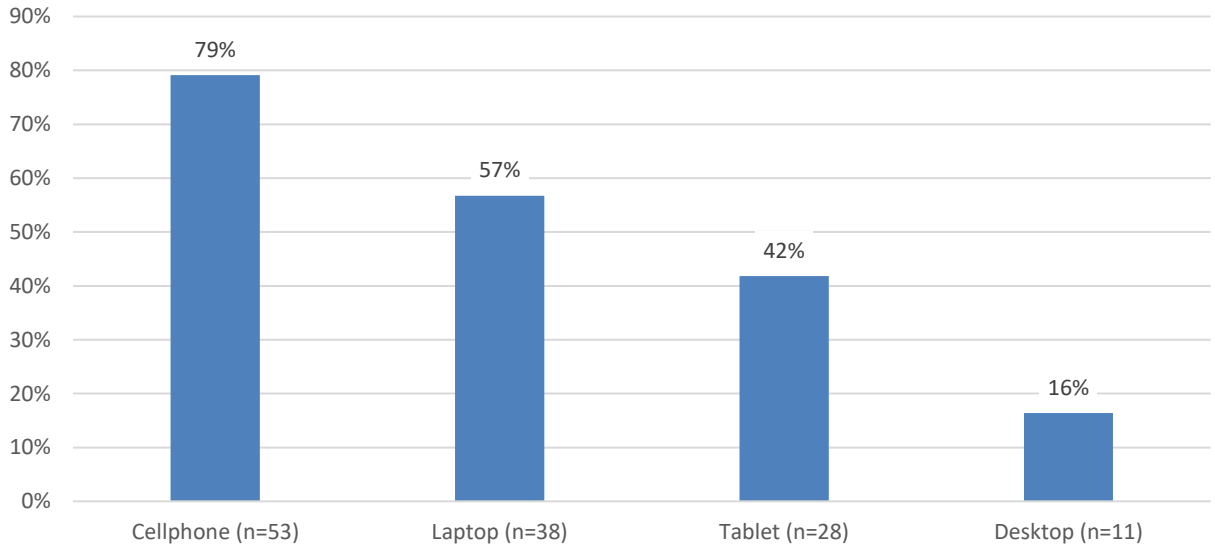
Figure 14: Aware of the Affordable Connectivity Program



9.1.5 Computing devices used in household

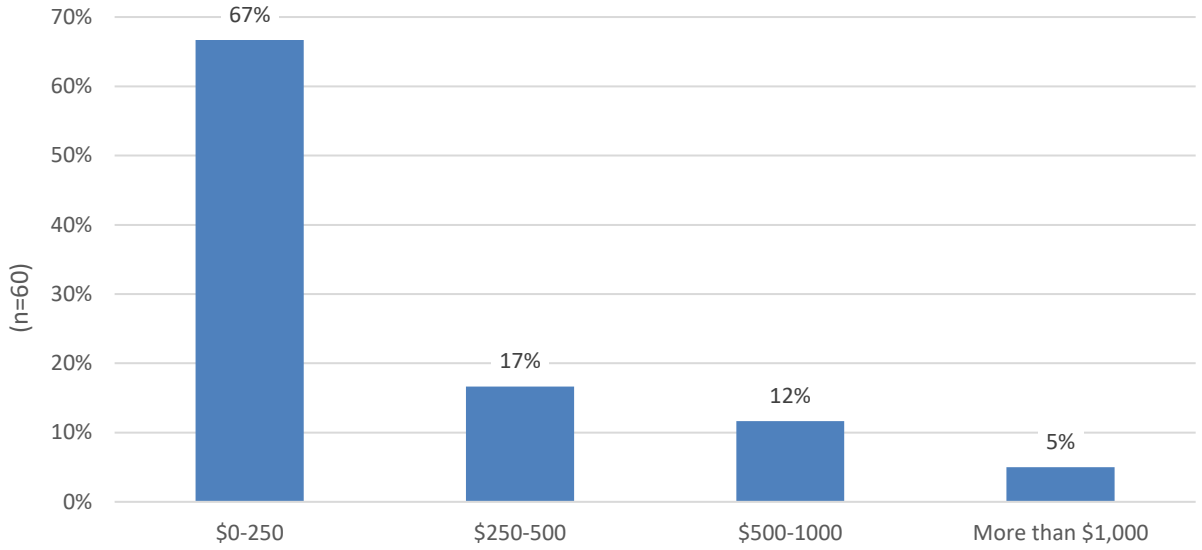
Respondents were asked a series of questions about access to computing devices and types of devices used. Most respondents (85 percent) said everyone in their household has access to the computing devices they need to meet their everyday needs for internet use, although 53 respondents (79 percent) said they use a cellphone most of the time to connect to the internet (see Figure 15).

Figure 15: Devices used most of the time to connect to the internet



Respondents were asked how much they would be able to pay for a laptop or desktop computer. As shown in Figure 16, just one-third of the 60 respondents would be able to pay $250 or more for a computer. Two-thirds of respondents could pay only $250 or less. Again, this informs our recommendation that device access programs for low-income residents of Lawrence be expanded.

Figure 16: Amount able to pay for laptop or desktop computer

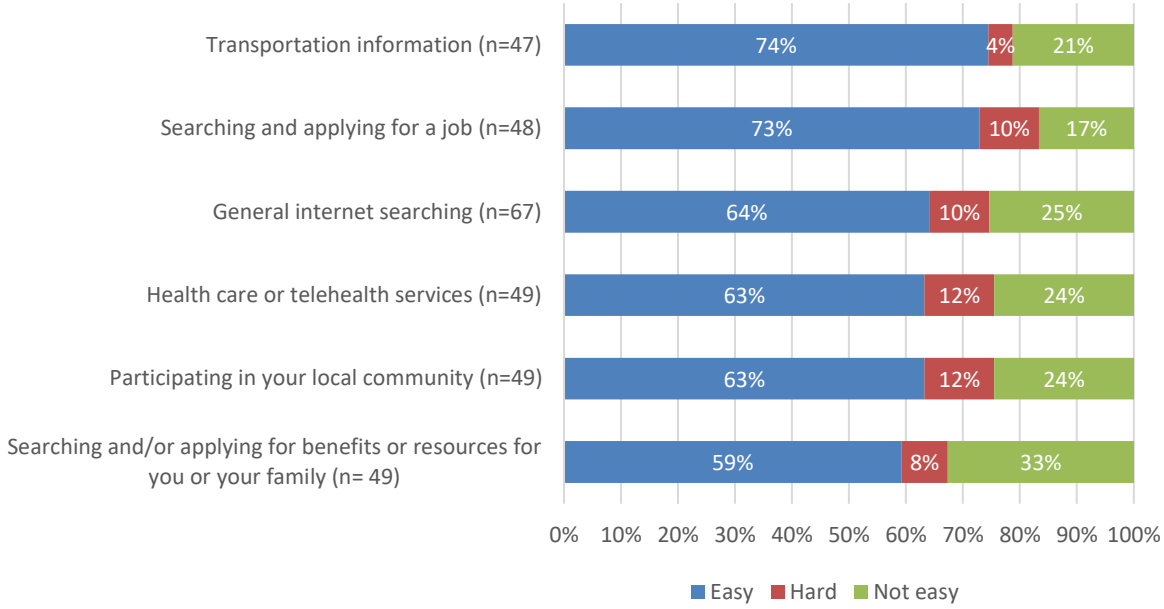


9.2 Digital skills

Respondents were asked a series of questions on how skilled they are using the internet in general and for specific activities. This information provides valuable insight into where there may be gaps in abilities and opportunities to educate residents. Almost all (88 percent) respondents said they are able to regularly use the internet for online activities. However, some respondents said using the internet is hard/not easy for various tasks, as shown in Figure 17.

All 67 respondents were able to evaluate the ease of using the internet for general searching, with most (64 percent) saying it is easy. Among those who responded, most said using the internet for transportation information (74 percent) and searching and applying for a job (73 percent) is easy.

Figure 17: Difficulty in using the internet for various tasks



Fifty-six respondents were able to indicate the type of digital skills support they would be most interested in. Among this segment of respondents, 18 (32 percent) said they would be most interested in a do-it-yourself training module (see Figure 18).

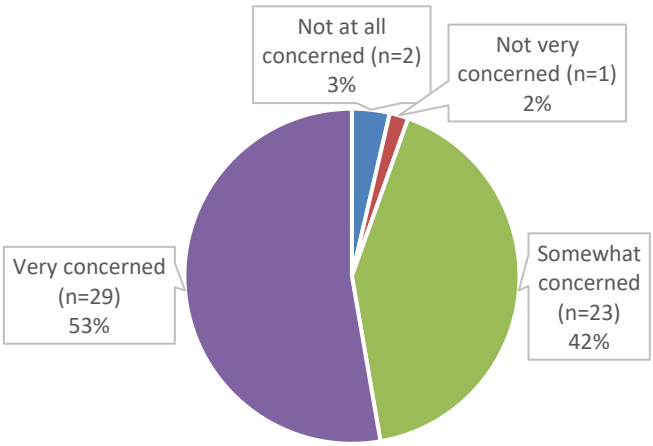
Figure 18: Digital skills support most interested in

The question did not provide respondents with the opportunity to say they were not interested in taking any kind of class. In other jurisdictions, CTC has found that significant numbers of people, even those lacking skills, are not interested in attending classes. As such, these results should not be taken to mean that Lawrence needs to expand skills-training programs at the levels indicated here.

9.3 Internet safety

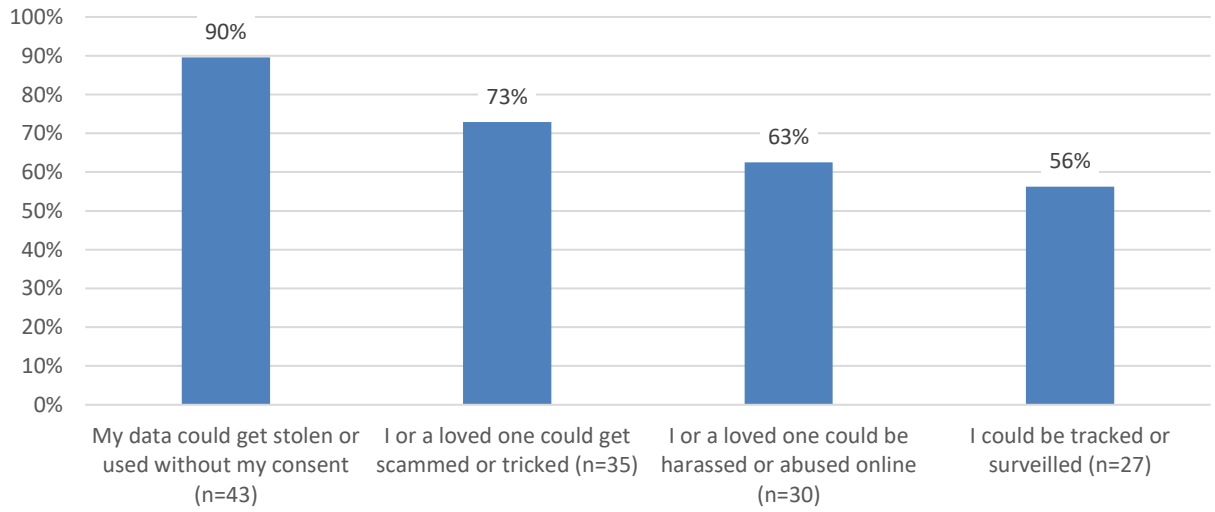
Most Lawrence residents in the survey have significant concerns about online safety and privacy. Respondents were asked a series of questions pertaining to individual awareness of, and the use of, measures to secure online privacy and internet safety. Fifty-two of 55 individuals who responded are somewhat concerned (42 percent) or very concerned (53 percent) about online safety (see Figure 19).

Figure 19: Concern about online safety



Respondents are most concerned about their data being stolen or used without their consent, cited by 43 of 48 respondents who answered the question (90 percent; see Figure 20). Nearly three-fourths of respondents are most concerned that they or a loved one could get scammed or tricked, and 63 percent are most concerned about being harassed or abused online. Another 56 percent are most concerned they could be tracked or surveilled. Respondents could select more than one area of concern.

Figure 20: Most concerned about in regard to internet safety



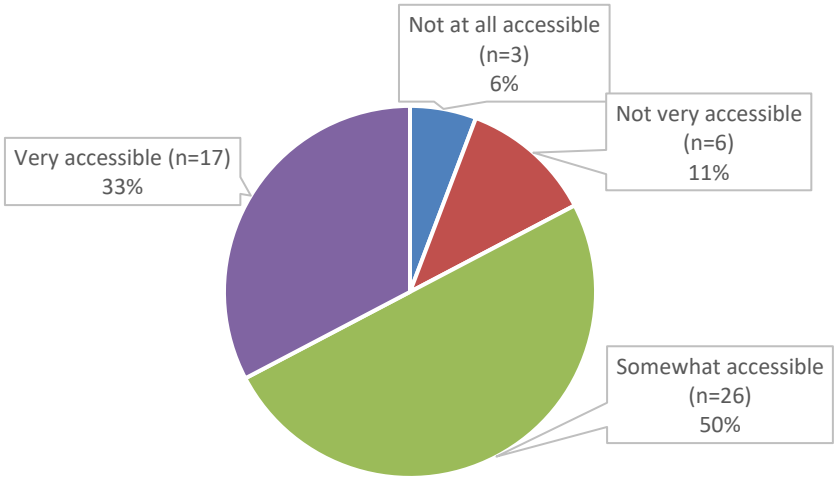
Fifteen of 33 individuals who responded (45 percent) said they have the tools and resources they

need to stay safe online, and another 15 respondents said they do not know of any tools or resources to stay safe online. Three respondents said they know of tools or resources but they do not work.

9.4 Online accessibility and inclusiveness

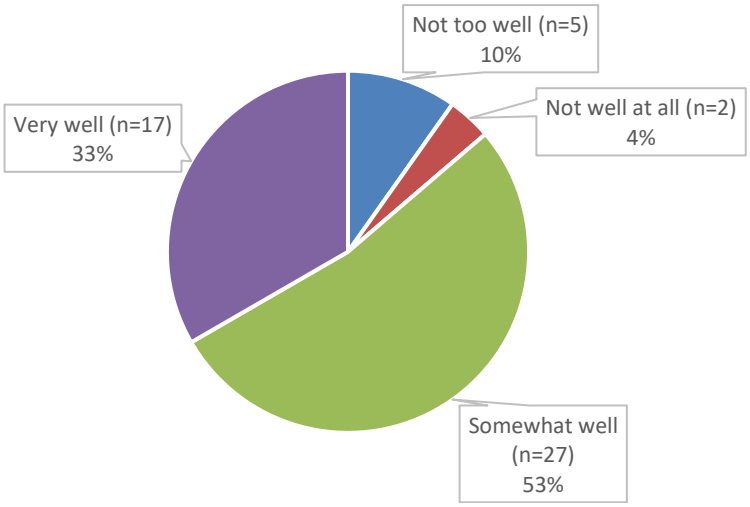
Respondents were asked questions related to online accessibility and inclusivity of public resources and services. Twenty-six of 52 respondents said online government services are somewhat accessible, and 17 respondents said they are very accessible (see Figure 21).

Figure 21: Accessibility of online government services



Twenty-seven of 51 respondents said online government services have worked somewhat well, and 17 respondents said they have worked very well (see Figure 22).

Figure 22: How well online government services have worked

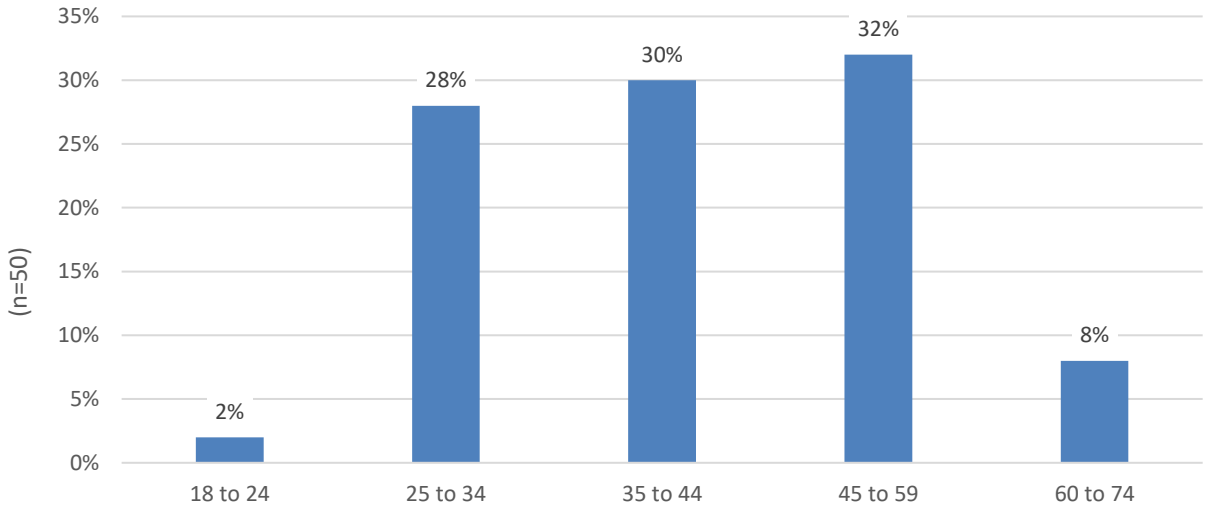


9.5 Respondent information

Basic demographic information was gathered from survey respondents and is summarized in this section. As shown in Figure 23, 45 of 50 respondents (90 percent) are ages 25 to 59. Nine in 10

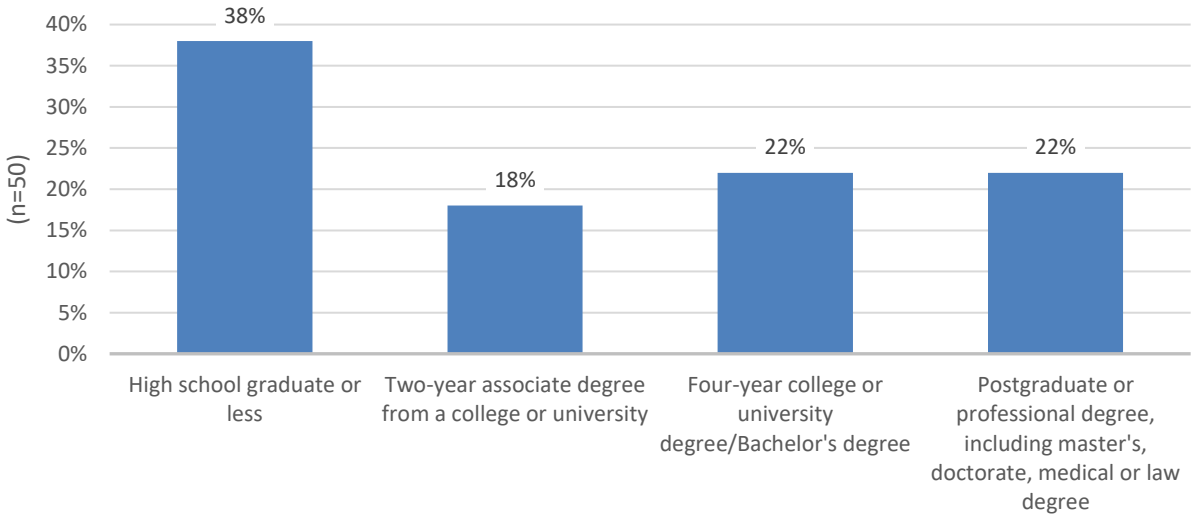
respondents identify as a woman, and one in 10 as a man. Six in 10 households have children in them, and 56 percent have four or more household members. Just 14 percent of those who responded live alone.

Figure 23: Age of respondents



The respondents' highest level of education attained is summarized in Figure 24. Nineteen of 50 respondents (38 percent) have a high school education or less, and 22 respondents have at least a four-year college degree (44 percent).

Figure 24: Education of respondents

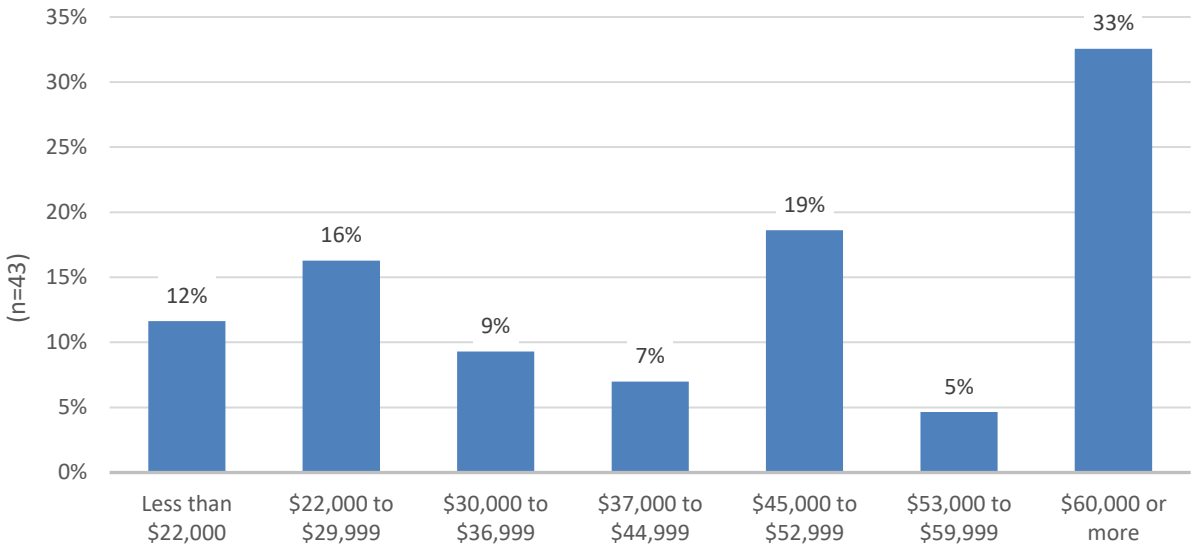


Respondents were asked to indicate what categories best describe their race and ethnicity. Among those who responded to the race and ethnicity questions, six individuals are White, non-Hispanic, and 42 individuals belong to a racial or ethnic minority group. Forty-one respondents said they are of

Hispanic, Latino, or Spanish origin. Four respondents belong to a North American Indigenous, Native, or Tribal Group. Respondents could belong to more than one race/ethnicity group.

As illustrated in Figure 25, two-thirds of respondents have an annual household income of less than $60,000, and one-third earn $60,000 or more per year. However, this is based on just 43 individuals who provided a response.

Figure 25: Annual household income



Respondents were asked if they belonged to certain other demographic groups. Eight respondents said they identify as a person with a disability, and six respondents identify as a member of the LGBTQIA community. Additionally, four respondents reside in affordable housing. No respondents serve on active duty in the US Armed Forces.

Respondents learned about the survey through a variety of sources, including through an organization's website, email list, flyer, or other outreach (15 individuals), a community meeting, community anchor institution, or other local institution (13 individuals), a friend, colleague, or acquaintance (nine individuals), and from a government website, email list, flyer, or other outreach (seven individuals). Individuals could select more than one source.

10 Digital equity funding landscape

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

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

MBI launched its direct grant program, the Municipal Digital Equity Implementation Program (MDEIP)—for municipalities to access funds to implement programs proposed through this and similar reports.[39] The City of Lawrence can start its application for these funds immediately, using this report and ongoing conversations with local organizations as a guide.

The one-time grant of up to $100,000 is intended to help municipalities make local digital equity investments and execute projects that will increase access, adoption, and usage of the internet.[40] Applications are reviewed by MBI on a rolling basis (see Section 4 for examples of implementation projects in other municipalities).

CTC is ready to assist the City in the process of applying for an implementation grant at no cost to the City; MBI has already pre-approved covering the cost of this assistance.

10.2 MBI's Digital Equity Partnerships Program supports nine organizations across the state, which can potentially assist the City of Lawrence

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

In 2023, MBI announced it was awarding funds through the Broadband Innovation Fund to nine partners to facilitate the implementation of programs that address six key areas of digital equity:

1. digital literacy,
2. Wi-Fi access,
3. public space modernization,
4. connectivity for economic hardship,
5. device distribution and refurbishment, and
6. education, outreach, and adoption.

The nine grant awardees are AgeSpan, Baystate Health, City of Boston, Tech Goes Home, Massachusetts League of Community Health Centers, Metropolitan Area Planning Council, Metro

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

North Workforce Investment Board, UMass Lowell, and Vinfen. Each partner has a defined scope of services, and their programs will be in operation through June 30, 2026. To varying degrees, the City of Lawrence or its residents can benefit from some of the programs, as noted in the following subsections.

10.2.1 Tech Goes Home

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

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

Through MBI's Partnership Program, 16 local entities in Brockton, Chelsea, Everett, Lawrence, Lowell, Lynn, Malden, New Bedford, Pittsfield, Quincy, Revere, Springfield, and Worcester have partnered with Tech Goes Home to advance digital education and device gaps by providing digital tools, skills, and connectivity necessary to thrive.[41]

Local entities that are interested in offering digital literacy education and device distribution programs can still partner with Tech Goes Home directly. To get started on this process, interested local entities can complete this partnership inquiry form.[42]

10.2.2 Metropolitan Area Planning Council

MBI has partnered with the Metropolitan Area Planning Council (MAPC), to award $5.6 million for the Apartment Wi-Fi program.

This program allows MAPC to provide procurement support, capital expense funding, and funding for the first year of operating expenses to provide free Wi-Fi internet access to residents living in roughly 2,400 public and affordable housing units in Massachusetts. The effort targets residents most likely to face barriers to connectivity—those experiencing housing insecurity who have access to broadband but cannot afford it.[43]

If Lawrence's housing authority wishes to consider applying for this program it can expressing interest at this link.

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[41] "Massachusetts Awards $14 Million to Address Digital Divide," MBI, https://broadband.masstech.org/news/massachusetts-awards-14-million-address-digital-divide.
[42] "Partnerships," Tech Goes Home, https://www.techgoeshome.org/becoming-a-tgh-site.
[43] "Smart Growth and Regional Collaboration: Apartment Wi-Fi," MAPC, https://www.mapc.org/our-work/expertise/digital-equity/apartment-wi-fi/.

10.2.3 Mass League of Community Health Centers

The Mass League is a recipient of MBI's Digital Equity Partnership grant, using its funding to help hire and staff a digital navigator at 12 community health centers across the Commonwealth. The navigators assist the health center patients with low-cost internet enrollment. Each health center also chose what digital health tools they would focus on, which could be telehealth, remote patient monitoring, or enrollment in patient portals with the goal that if patients are digitally engaged in their care, they will have healthier outcomes.

Mass League has an established digital navigation program under the FQHC (federally-qualified health center) Telehealth Consortium (FQHC Telehealth Consortium – Bridging the Health Equity Divide), which was founded during the pandemic as a partnership between C3 ACO and the Mass League. Community Health Centers serve the most underserved and diverse populations in healthcare, so the services are provided by and at the health centers for their patients in need. Unfortunately, the Greater Lawrence Community Health Center does not participate in this program.

10.2.4 AgeSpan

AgeSpan is a statewide organization supporting more than 230 age- and dementia-friendly communities, including Lawrence. (Age-and dementia friendly communities are municipalities that have infrastructure, programs, and policies geared to assist older people or people with dementia. Lawrence is included on the state's list of 230 such municipalities.[44])

AgeSpan supports MBI as part of the Statewide Digital Equity Plan Working Group and collaborates with various partners to promote inclusion of older adults in state and local digital equity planning and programs, working to connect aging services (councils on aging, affordable senior housing, aging service access points) to other partners doing this work including colleges, libraries, and housing partners.[45]

Areas of focus for this program include providing tablets, offering training to help blind and visually impaired individuals, offering educational programs to protect against online fraud online, and helping boost enrollment in low-cost broadband programs. The eight counties involved in this program include Bristol County.[46]

James Fuccione, the Senior Director of the Massachusetts Healthy Aging Collaborative (a co-lead to the AgeSpan Digital Equity Partnerships grant), stated that he and his team can assist Lawrence's Council on Aging if it is interested in establishing new digital access programming. One model is a Digital Access Program that offers a free tablet device, training on how to operate the device, and free data plans for individuals without broadband access in their home for up to a year. More details on this program, which is offered on the North Shore, can be found at this link.

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

10.2.5 Vinfen

In April 2023, Vinfen, on behalf of a group of Boston hospitals and other entities comprising the Human Services Alliance for Digital Equity,[47] received $4.3 million to increase digital inclusion among low-income people with physical disabilities, intellectual and developmental disabilities, and serious mental health conditions. The alliance deploys 15 technology navigators to help people obtain digital devices, develop digital skills, and enroll in low-cost broadband programs. The technology navigators collaborate with people served in their homes and in service settings. Individuals are primarily served through a closed referral system. Still, the alliance can offer materials and resources to interested municipalities seeking information for digital inclusion in telehealth for individuals with disabilities. In addition, the City of Lawrence can contact the MBI Partnerships Program lead at Vinfen, Jessie Wolfe, for more information on how Lawrence residents with physical, intellectual, or developmental disabilities can begin receiving telehealth services from participating organizations of the Alliance.

10.2.6 Metro North Workforce Investment Board

The Metro North Workforce Investment Board was formed to set and oversee workforce policy in the Metro North region of Massachusetts. The goal of the board is to ensure federal and state funds are efficiently and appropriately applied to workforce development programs and initiatives that serve the needs of the region and its residents.[48] In 2023, the Board received an award of $4.1 million to expand its digital equity initiatives by hiring and training 32 digital navigators and provide employment and career counseling, provide 1,500 refurbished laptops, 300 hotspots, and provide internet access and IT support to recipients.[49] These digital navigators are stationed at 16 local and regional partner organizations and serve 39 Cities and Towns in and around Metro North.

10.2.7 UMass Lowell

A $4 million grant was awarded to UMass Lowell to lead a digital equity initiative serving Leominster, Fitchburg, Lowell, Haverhill, and Lawrence, and communities in Merrimack Valley, Northern Worcester County, and the North Shore. Partnering with 13 other higher education community entities, UMass Lowell provides technical skills, support and training for student digital navigators, and project management resources. Through this grant, UMass Lowell will also be improving multiple public facilities with broadband service, creating a multi-tiered digital literacy and navigation initiative that establishes a regional help desk at UMass Lowell and advances new digital literacy programs, distributing 1,200 new or refurbished devices, and expanding low-cost broadband outreach and adoption programs at six community-based organizations.[50]

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[47]Organizations that comprise the Alliance are: Advocates, Behavioral Health Network, Beth Israel Deaconess Medical Center, Boston Center for Independent Living, Clinical Support Options, Open Sky, Riverside Community Care, and Vinfen.

[48] "Home," Metro North Workforce Investment Board, https://masshiremetronorth.org/.

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

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

10.2.8 City of Boston

The City of Boston was awarded $5 million in grant funding directed to the Boston Housing Authority to support residents seeking affordable and dependable internet connectivity, and to other community organizations that support telehealth programs in Boston and establish workforce development programs through refurbishing distributed devices. A portion of this grant will also go toward the expansion of the City's publicly accessible Wicked Free Wi-Fi network, and to expand the City's Digital Equity Fund.[51]

10.3 Four other funding opportunities are potentially available to the City of Lawrence

10.3.1 MBI's Residential Retrofit Program

The Residential Retrofit program deploys fiber at approximately 22,000 public and affordable housing properties to replace deficient wiring and infrastructure through grants to qualified ISPs who will install, own, and maintain equipment.[52] This program is operated by MBI using Capital Projects Fund money.

Similar to MAPC's Apartment Wi-Fi program application, Lawrence's housing authority can apply for this program online by expressing interest at this link.

10.3.2 Municipal Fiber Grant

The Massachusetts Division of Local Services is offering municipalities with the opportunity to apply for the Municipal Fiber Grant program, which offers assistance for the construction of municipally-owned fiber networks. Through this grant, the state hopes for municipalities to achieve certain goals of improving operations or improving disaster recovery and resiliency. Examples of this may include prevention of cyber security risks in local government, providing room for growth in internet bandwidth as municipalities grow, and supporting various infrastructure that rely on dependable technology for municipal needs including public safety, radio, and emergency operations centers.[53]

All fiber built must be owned by the municipality, and awards are up to $250,000 per individual municipality, or $500,000 for multi-jurisdictional municipalities. In 2024 Lawrence received $250,000 through this program for expansion of the city's existing fiber optic infrastructure.[54]

10.3.3 The Federal Communications Commission's E-Rate program can bring discounted services to schools and libraries in the area

The Federal Communications Commission's E-Rate program was created in 1996 to enhance access to advanced telecommunications and information services for all public and nonprofit elementary and secondary school classrooms and libraries.[55] E-Rate is one of four programs

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[51] "$5 Million in New Grant Funding to Expand Digital Equity," MBI, https://broadband.masstech.org/news/5-million-new-grant-funding-expand-digital-equity.
[52] "Residential Retrofit Program," MBI, https://broadband.masstech.org/retrofit.
[53] "About the Municipal Fiber Grant Program," Mass.gov, https://www.mass.gov/info-details/about-the-municipal-fiber-grant-program.
[54] "Municipal Fiber Grant Program FAQ," Mass.gov, https://www.mass.gov/info-details/municipal-fiber-grant-program-faq#what-kind-of-projects-are-eligible?-.
[55] Universal Service Administrative Co., E-Rate, https://www.usac.org/e-rate/.

comprising the Universal Service Fund (USF) and is funded by fees paid by telecommunications companies to fulfill the Congressional goals of universal service.

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

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

Funds are awarded as discounts ranging from 20 to 90 percent of the eligible costs and discount levels are based on the poverty level of the schools. Rural schools and libraries may also receive a higher discount. Recipients must pay a portion of the service costs. Often, schools and libraries will form consortia to centralize and manage the E-Rate application, reporting, and budgeting processes with a central point of contact.[56]

Eligible schools and libraries in Massachusetts received $10.1 million in E-rate disbursements in 2023.[57] The Massachusetts Board of Library Commissioners[58] tracks E-Rate participation by libraries and library networks and provides information and resources about the program. The Department of Elementary and Secondary Education's Office of Digital Learning provides similar outreach and education for schools.[59] While Massachusetts does not manage a state-wide consortium, several of the state's library networks and school districts participate in E-Rate.

As of December 2024, the E-Rate application window has not opened for Fiscal Year 2025. Interested entities should monitor USAC's E-Rate webpage for the upcoming application window announcement.

10.4 Essex County Community Foundation awarded grant funding to 13 nonprofits to support digital equity programming, three of which are located in Lawrence

The Essex County Community Foundation (ECCF) is a community foundation that inspires philanthropy and works to manage charitable assets, strengthen and support nonprofits, and engage in strategic community leadership initiatives for the communities of Essex County, including

[56] Universal Service Administrative Co., E-Rate, Consortia, https://www.usac.org/e-rate/applicant-process/before-you-begin/consortia/.
[57] Universal Service Administrative Co., E-Rate FRN Status Tool FY2016+, https://opendata.usac.org/E-Rate/E-Rate-FRN-Status-Tool-FY2016-/8xzh-ytkh.
[58] E-rate in Massachusetts Libraries, https://mblc.state.ma.us/programs-and-support/e-rate/index.php.
[59] Technology Planning and Sustainability, E-Rate, https://www.doe.mass.edu/odl/planning-funding/E-rate/.

Lawrence. ECCF has been a leader in advancing digital equity programs in the area and continues to develop new grant programs for entities to close the digital divide across the County.

On February 11, 2025, ECCF announced that it had awarded $627,000 to 13 nonprofits for programs that are aimed to close the digital divide in their communities. Funded programs include computer and digital literacy courses, financial literacy education, digital navigation programming, wireless hotspot program expansions, and workforce training.

Three organizations in Lawrence received grants under this program.

1. **Mass Association for Computer and Internet Resources (MACIR),** in collaboration with the Lawrence Public Library, was awarded $50,000 for their ELEVATE (Equity, Literacy, Empowerment for Valued Access to Technology & Education) program. See Section 6.4 for more details on ELEVATE.
2. **Greater Lawrence Community Action Council (GLCAC)** has been awarded $50,000 for its digital literacy and workforce training classes. GLCAC is a nonprofit that focuses primarily on providing education, social services, childcare, healthcare, housing, youth employment, and other related services to Lawrence residents.[60] GLCAC will use this money to enroll up to 80 adult learners in beginner and intermediate computer training classes, in partnership with Lawrence Community Works and MassHire.[61]
3. **Vinfen** has been awarded $50,000 to support its well-established digital equity programming interventions. Vinfen is a statewide nonprofit that aims to build the capacity of individuals with behavioral health challenges, brain injuries, intellectual and developmental disabilities, and mental health conditions through a variety of programs and services. Vinfen has been a leader in offering digital navigation services to its patients since 2023 with support from MBI's Partnerships Program (see Section 10.2.5 for more detail on Vinfen's digital equity programming).

This grant is a part of ECCF's Advancing Digital Equity program, the foundation's $3 million multi-year commitment to empowering individuals by supporting programs that advance access, education, and device ownership across Essex County. ECCF expects to offer another grant round under this program at some point in the next year, but details and dates had not yet been announced by the time this report was finalized. Awardees are required to do quarterly check-in meetings and interim reports on the progress and reach of their programs. This will allow for effective tracking of program successes.

[60] "About Us," GLCAC, https://www.glcac.org/about-us/.
[61] "GLCAC Receives ECCF Grant for Computer Classes," GLCAC, https://www.glcac.org/news/glcac-receives-eccf-grant-for-computer-classes/.

Appendix A: MBI survey

MBI
MASSACHUSETTS BROADBAND INSTITUTE
at the MassTech Collaborative

Massachusetts Statewide Digital Equity Survey

The Massachusetts Broadband Institute (MBI) wants to hear from you about your experiences with getting and using internet service! This survey is completely anonymous and should be completed by one individual per household. **Your feedback is vital to understand barriers to internet access, affordability, and adoption to help close the digital divide.** Thank you for your time and participation.

Section 1: Please answer the following questions.

1. What is your zip code? _____
2. Which Massachusetts municipality do you live in? _____

Do you have internet service in your home?

- ☐ **YES** – Please proceed to Section 2 below
- ☐ **NO** – Please skip to Section 3 (flip this page over)

Section 2: Please answer the following questions only if you CAN connect to the internet from home.

3. Who is your internet service provider? _____
4. What kind of internet service do you have at home? Please check all that apply.
   - ☐ A data plan for a smartphone, hotspot, or tablet
   - ☐ Dial-up internet
   - ☐ Home wireline connection (cable, fiber, DSL, etc.)
   - ☐ Satellite internet
5. How well does your home internet service work?
   - ☐ Good enough to meet my household's needs
   - ☐ I don't know
   - ☐ Not good enough to meet my household's needs
6. Is your home internet service bundled with other services such as telephone or TV?
   - ☐ Yes
   - ☐ No
7. How much do you pay for the internet every month? $_____
8. How hard is it for you to pay your internet bill?
   - ☐ Very hard
   - ☐ Not too hard
   - ☐ Somewhat hard
   - ☐ Not at all hard
9. Have you heard about the Affordable Connectivity Program (ACP) that provides discounted internet service for low-income households?
   - ☐ Yes
   - ☐ I don't know
   - ☐ No

   For more information and to find out if you qualify for ACP, call the Federal Communication Commission's ACP Support Center: 877-384-2575.

When complete, skip to section 4 below.

Section 3: Please answer the following questions only if you CANNOT connect to the internet at home.

10. If you do not have internet service in your home, what is the reason?
    - ☐ Service is not available in my area
    - ☐ Service is too expensive
    - ☐ I am concerned about online privacy or safety
    - ☐ I don't feel confident navigating the internet or using online tools
    - ☐ I can't afford or access a device to use the internet
    - ☐ I don't want / don't use the internet.
    - ☐ Other (please specify): _____

11. If you do not have internet at home, where do you go to use the internet? Please check all that apply.
    - ☐ A workplace
    - ☐ A friend or family member's home
    - ☐ School, college, or university
    - ☐ A library or community center
    - ☐ A business such as a restaurant, cafe, or bookstore (e.g., McDonald's, Taco Bell, Starbucks, etc.)
    - ☐ A public space such as a park or government building
    - ☐ On public transit
    - ☐ I do not regularly access internet in these or any other spaces
    - ☐ Other (please specify): _____

When complete, proceed to section 4 below.

Section 4: All respondents should answer these questions.

12. Does everyone in your household have access to the computer devices they need to meet their everyday needs for internet use? (Computers, smartphones, tablets, or other internet enabled devices)?
    - ☐ Yes
    - ☐ No

13. Which of the following devices do you use most of the time to connect to the internet? (Check all that apply)
    - ☐ Cellphone
    - ☐ Desktop computer
    - ☐ Laptop computer
    - ☐ Tablet (or similar device)
    - ☐ Other (please specify): _____

14. How much would you be able to pay for a laptop or desktop computer?
    - ☐ $0-50
    - ☐ $50-100
    - ☐ $100-150
    - ☐ $150-250
    - ☐ $250-500
    - ☐ More than $1,000

15. Are you able to regularly use the internet for online activities?
    - ☐ Yes
    - ☐ No

16. Please rank the level of difficulty for what you use the internet for. (Easy, Not easy, Hard)

	Easy	*Not easy*	*Hard*
Searching and applying for a job	☐	☐	☐
Health care or telehealth services	☐	☐	☐
Participating in your local community	☐	☐	☐
General internet searching	☐	☐	☐
Transportation information	☐	☐	☐
Searching and/or applying for benefits or resources for you or your family	☐	☐	☐

17. If you do not have regular access to the internet, what would most like to use it for if you could?
    - ☐ Searching and applying for a job
    - ☐ Health care or telehealth services
    - ☐ Participating in your local community
    - ☐ General internet searching
    - ☐ Transportation information
    - ☐ Searching and/or applying for benefits or resources for you and your family
    - ☐ Something else
    - ☐ I don't want to use the internet regularly

18. What kind of digital skills support would you be most interested in?
    - ☐ In person classes
    - ☐ Online classes
    - ☐ In person support from a friend or instructor
    - ☐ A do-it-yourself training module

19. How concerned are you, if at all, about internet safety?
    - ☐ Very concerned
    - ☐ Somewhat concerned
    - ☐ Not very concerned
    - ☐ Not at all concerned

20. What are you most concerned about? (Select all that apply)
    - ☐ That my data could get stolen or used without my consent
    - ☐ That I or a loved one could get scammed or tricked
    - ☐ That I could be tracked or surveilled
    - ☐ That I or a loved one could be harassed or abused online

21. Are you aware of tools or resources you can use to stay safe online?
    - ☐ Yes, I have tools and resources I use stay safe online
    - ☐ No, I don't know of any tools or resources to stay safe online
    - ☐ I know of tools or resources to stay safe online, but they don't work for me
    - ☐ Other (please specify) : _____

22. How accessible are online government services like benefits portals, RMV services, or paying for permits or tickets to you?
    - ☐ Very accessible
    - ☐ Somewhat accessible
    - ☐ Not very accessible
    - ☐ Not at all accessible

23. When you have used online government services like benefits portals, RMV services, or paying for permits or tickets, how well did they work for you?
    - ☐ Very well
    - ☐ Somewhat well
    - ☐ Not too well
    - ☐ Not well at all

When complete, proceed to section 5 below.

3

Section 5: All respondents should answer these questions. *We collect demographic information so that we can make sure we are representing all neighborhoods, towns, cities and groups across the Commonwealth.*

24. What is your age?
- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 59
- ☐ 60 to 74
- ☐ 75 and older
- ☐ Prefer not to answer

25. What is your gender identity?
- ☐ Woman
- ☐ Man
- ☐ Non-binary
- ☐ Gender fluid
- ☐ Other
- ☐ Prefer not to answer

26. How many people, including yourself, currently live in your household? *(Note: A household is defined as all the people who currently occupy the housing unit where you live).*
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8 or more
- ☐ Prefer not to answer

27. How many children under age 18, currently live in your household? *(Note: A household is defined as all the people who currently occupy the housing unit where you live).*
- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more
- ☐ Prefer not to answer

28. What is the highest level of school you have completed or the highest degree you have received?
- ☐ Less than high school, or high school incomplete (Up to grades 9-11 or Grade 12 with NO diploma)
- ☐ High school graduate (Grade 12 with diploma or GED certificate)
- ☐ Two-year associate degree from a college or university
- ☐ Four-year college or university degree/Bachelor's degree (e.g., BS, BA, AB)
- ☐ Postgraduate or professional degree, including master's, doctorate, medical or law degree (e.g., MA, MS, PhD, MD, JD)
- ☐ Prefer not to answer

29. Are you of Hispanic, Latino, or Spanish origin, such as Mexican, Puerto Rican, or Cuban?
- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

30. Which of the following best describes your race? (Select all that apply)
- ☐ White or Caucasian
- ☐ Black or African-American
- ☐ Asian or Asian-American
- ☐ Native American/American Indian/Alaska Native
- ☐ Pacific Islander/Native Hawaiian
- ☐ Some other race (please specify) _____
- ☐ Prefer not to answer

31. Do you belong to a North American Indigenous, Native, or Tribal group?
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

32. What is your total annual household income from all sources, and before taxes?
    - ☐ Less than $22,000
    - ☐ $22,000 to $29,999
    - ☐ $30,000 to $36,999
    - ☐ $37,000 to $44,999
    - ☐ $45,000 to $52,999
    - ☐ $53,000 to $59,999
    - ☐ $60,000 or more
    - ☐ Prefer not to answer

33. Do you identify as a person with a disability? *(Note: Disability is defined as physical, emotional, or mental health conditions that result in limitations of activities or restrictions to full participation at school, at work, at home, or in the community).*
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

34. If you identify as a person with a disability, do you have difficulty in any of the following areas? Please check all that apply.
    - ☐ Seeing even if wearing glasses
    - ☐ Hearing even if using a hearing aid
    - ☐ Walking or climbing steps
    - ☐ Remembering or concentrating
    - ☐ Self-care
    - ☐ Communicating, for example understanding or being understood
    - ☐ Prefer not to answer
    - ☐ I do not identify as a person with a disability

35. Do you identify as a member of the LGBTQIA+ community?
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

36. Did you serve on active duty in the U.S. Armed Forces?
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

37. Do you live in affordable housing? *(Note: Affordable housing is defined as housing subsidized by a housing authority, paid for through a voucher, or in a building run by a private developer.)*
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

38. Where did you hear about this survey? Please check all that apply.
    - ☐ From a government website, email list, flyer, or other outreach
    - ☐ From a friend, colleague, or acquaintance
    - ☐ From a community meeting, community anchor such as a library or school, or other local institution
    - ☐ From an organization's website, email list, flyer, or other outreach
    - ☐ Other (Please specify) _____

Thank you for taking the survey!

Your response will help shape Massachusetts's policies and future funding allocations to close the digital divide for all its residents. If you would like to learn more, please visit **https://broadband.masstech.org/.**

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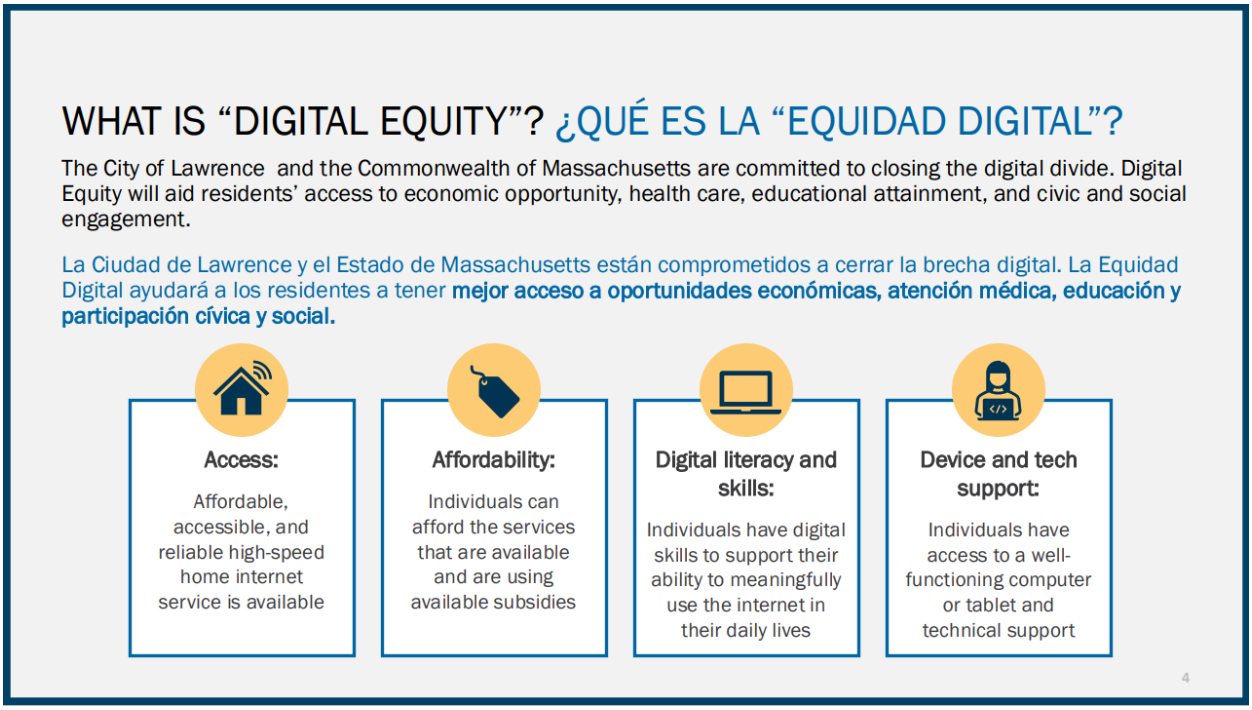
Appendix B: Lawrence Digital Empowerment Event Flyer


Mayor
Brian A, DePeña
EMPODERAMIENTO DIGITAL EN LAWRENCE: ACERCÁNDONOS A UNA TECNOLOGIA MÁS ASEQUIBLE PARA TODOS
Este evento destacará cómo la subvención de $100,000 de MBI ayudará a expandir el Internet, aumentar el Wi-Fi público, ofrecer capacitación gratuita en habilidades digitales y brindar soporte técnico en toda la ciudad. Su aporte permitirá a que el estado garantice que Lawrence tenga un servicio de Internet asequible y de alta calidad
JOIN US
Fecha: Martes, 25 de febrero de 2025
Hora: 5:00 PM
Ubicación: 155 Haverhill St, Lawrence, MA 01840,
LAWRENCE PUBLIC LIBRARY
ctc technology & energy
engineering & business consulting
the Center
Seniors, Families, Community
MBI
MASSACHUSETTS BROADBAND INSTITUTE
at the MassTech Collaborative
Llámenos para más información
(978)-620-3600
Visite nuestra Página web
https://www.cityoflawrence.com/

Appendix C: Lawrence Digital Empowerment Event slide deck



BACKGROUND

About this report:

- CTC is working with the City of Lawrence to determine:
  1. What digital equity gaps exist for City residents
  2. What digital equity programs currently exist in Lawrence
  3. What programs are needed in Lawrence to close the City's digital divide
- We are seeking your input about your experiences accessing the internet, the cost of internet in Lawrence, access to digital literacy and skills classes, and device availability and access to tech support.
- This project is fully funded by Massachusetts Broadband Institute (MBI), and a $100,000 grant is available to carry out this report's recommendations.

2

CONTEXTO

- **CTC está trabajando con la Ciudad de Lawrence para identificar:**
- Las dificultades que enfrentan los residentes para acceder a la tecnología y el internet.
- Los programas que ya existen en Lawrence para mejorar el acceso digital.
- Los programas que aún hacen falta para cerrar la brecha digital en la ciudad.
- Queremos conocer tu experiencia con el acceso a internet, el costo del servicio en Lawrence, la disponibilidad de clases de alfabetización digital, y el acceso a equipos y soporte técnico.
- Este proyecto está **100% financiado por el Massachusetts Broadband Institute (MBI)**, y hay una subvención de **$100,000 disponible** para implementar las recomendaciones de este informe.

3

RESIDENTIAL SURVEY

The goal of the survey is to identify the digital equity needs of Lawrence residents.

Questions in the residential survey cover the following topics:

1. Do you have internet at home?
2. How much is your home internet?
3. What types of devices do you own?
4. If you do not have internet at home, why?
5. How confident are you in using the internet for different tasks?

Every response is anonymous!

Survey link: https://mbicx.qualtrics.com/jfe/form/SV_bxTIMGFVF8KjigC

Scan this QR code to access the residential survey on your phone:

ENCUESTA

El objetivo de la encuesta es identificar las necesidades de equidad digital de los residentes de Lawrence.

Preguntas en la encuesta para residentes incluyen:

- ¿Tienes internet en tu casa?
- ¿Cuánto pagas por el internet en tu hogar?
- ¿Qué tipo de dispositivos tienes?
- Si no tienes internet en casa, ¿por qué?
- ¿Qué tan cómodo/a te sientes usando el internet para distintas tareas?

¡Todas las respuestas son anónimas!

Survy link: https://mbicx.qualtrics.com/jfe/form/SV_bxTIMGFVF8KjigC

Scan this QR code to access the residential survey on your phone:

DISCUSSION QUESTIONS

Devices and Subscriptions:

1. Other than your smartphone service, do you have an internet subscription at home?
2. Other than a phone, do you use a laptop, desktop, or tablet at home?
3. Do you use the internet or computers elsewhere in Lawrence? If so, where?

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PREGUNTAS DE DISCUSIÓN

¿Qué tipo de apoyo digital se necesita en Lawrence?

- **¿Cuáles crees que son los mayores desafíos que enfrenta la gente en Lawrence para acceder al internet o usar dispositivos?**
- **¿Existen programas y recursos adecuados en la ciudad para abordar estos desafíos?**
- **¿Hay algún programa de equidad digital que te gustaría que estuviera disponible en Lawrence?**
- **¿Qué más se debería hacer para solucionar estos problemas?**

9

DISCUSSION QUESTIONS

What digital support is needed in Lawrence?

1. What do you see are the biggest challenges that people experience accessing the internet or using devices in Lawrence?
2. Are there adequate programs and resources to address these challenges in the City?
3. Are there any digital equity programs you would like to see be available in Lawrence?
4. What should be done to further address these problems?

6