

Digital Equity Report: Columbus Corridor

*Produced by the Metropolitan Area Planning Council (MAPC) on behalf on Urban Edge CDC
September, 2022*

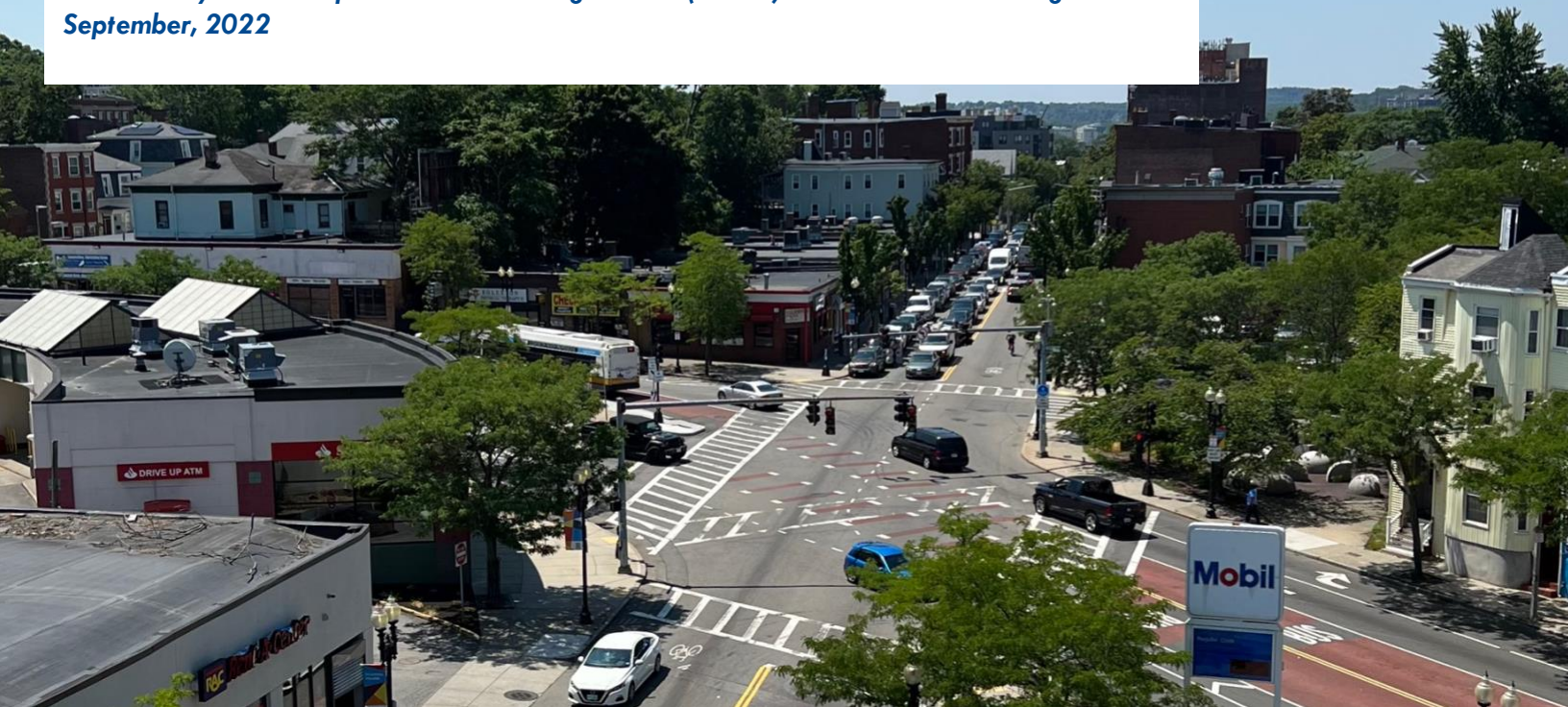


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Introduction

Founded in 1974, Urban Edge has a rich history of creating affordable homes in the Roxbury, Jamaica Plain and Dorchester neighborhoods. In addition to selling and leasing high quality housing for low- and middle-income Bostonians, Urban Edge has developed community programs to support residents' social and economic needs. This effort includes programs that support first time home ownership, foreclosure prevention, financial planning, student loan payments, pre-K preparation, and recently, digital literacy training. As digital tools become increasingly crucial for civic participation, employment, and education, Urban Edge aims to support digital equity and access for its members and their neighbors.

The National Digital Inclusion Alliance defines digital equity as “a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital Equity is necessary for civic and cultural participation, employment, lifelong learning, health, and access to essential services”. Digital equity is often broken down into three component parts: affordable internet access; affordable digital devices such as computers and tablets; and digital literacy, the ability to use one's digital device effectively and navigate the internet safely and securely.

Urban Edge engaged the Metropolitan Area Planning Council (MAPC), greater Boston's regional planning agency to support their efforts. MAPC supports the 101 municipalities that make up greater Boston, as well as local nonprofits, in economic development, land use, arts and culture, and other planning activities. More recently, spurred by the challenges many communities faced with technology systems and online access during the COVID-19 pandemic, MAPC included digital equity planning in their support services for communities. This report outlines the steps Urban Edge and MAPC took to diagnose the issue in and around Columbus Corridor and develop solutions for residents and community leaders.

Urban Edge staff were closely involved in the planning work, providing their expertise in all matters and making connections when necessary. Many of the community development organizations supporting Roxbury and Jamaica Plain residents contributed to this project as well. The staff of like-minded housing developers Jamaica Plain Neighborhood Development Corporation, WinnCompanies, and The Community Builders made significant contributions to this work, as did community-based organizations such as Jewish Vocational Services, Dimock Health Center, Union Capital Boston, Tree of Life, and Egleston Square Main Streets, and Three Squares Main Streets. Technologists from Roxbury Community College, the Timothy Smith Network, InSource Services Inc, Tech Goes Home, Boston Neighborhood Network, and the Egleston Library shared their perspectives. Special mention goes to municipal leaders in the Boston Office of Broadband and Cable and Boston Housing Authority for their leadership and ongoing support. Lastly, many thanks go to the more than 250 local residents who responded to the digital access survey, made possible by the efforts of Urban Edge's community engagement team. The community contribution helped us to better understand day to day challenges residents face in their digital needs and set the stage for further community engagement on digital equity work in the region.

Executive Summary

During the summer of 2021, Urban Edge engaged the Metropolitan Area Planning Council to support its efforts to address the digital divide in their community. MAPC began by investigating [existing conditions](#) through research and a survey of local residents of the Columbus Avenue corridor in the Roxbury and Jamaica Plain neighborhoods of Boston. MAPC also spoke with [community-based organizations](#) working nearby to learn about the challenges and opportunities that those organizations and their constituents face relating to online access and digital skills, seeking to understand ways to provide services and programming that will encourage adoption and digital literacy in the neighborhood. MAPC investigated [broadband infrastructure in the area](#), including private and municipal fiber optic cable locations and Internet Service Providers (ISP) offerings. MAPC also collected data related to Urban Edge and other CDC properties in the area, as real estate plays an important role in the ability to deploy broadband networks. The result is a framework proposing a range of interventions such as collaborative digital literacy programming, building construction best practices, and federal broadband subsidy registration. [These strategies](#) will set the stage for building a community broadband network that provides an affordable route to getting online, engages with the community, and creates workforce and training opportunities.

Columbus Avenue Corridor

American Community Survey (ACS) data indicates that 27% to 39% of Columbus Avenue corridor residents (located roughly between Jackson Square and Egleston Square) do not have internet in their home, and a third to half of Internet subscribers do not receive broadband speeds (currently defined by the FCC as 25 megabits per second download, 3 Mb/s upload). MAPC and Urban Edge surveyed 260 local residents and the results were consistent with the ACS data: 29% of survey respondents reported their homes did not have an Internet subscription, and 61% reported issues with the quality of their Internet service. It is worth noting that 54% of seniors reported not having an internet subscription in their homes.

Though the need for increased digital access is significant, there is much to be encouraged by. There are multiple community-based organizations offering workforce training opportunities, business support, healthcare, and youth and senior services. These organizations are often in conversation with one another, and all expressed willingness to collaborate to solve digital equity challenges. These organizations recognize that the digital divide impedes their ability to provide services to residents in addition to the challenges those residents face themselves. These groups, coupled with the many affordable housing developers in the area who also offer supportive services, provide a strong safety net for Roxbury and Jamaica Plain community members.

The affordable housing developers also possess another useful asset for broadband delivery, namely real estate. Urban Edge and its partners own and/or manage approximately 1500 units of affordable housing in the area. Buildings, rooftops, courtyards, maintenance rooms, and conduit can all be leveraged for installation of broadband equipment. Urban Edge ownership can expedite installation and create opportunities that may not exist for municipal or other community solutions. Creating digital access solutions for residents of Urban Edge properties, and extending the same to their neighbors, will significantly decrease the number of unconnected individuals in the neighborhood. Urban Edge's approach will also empower those residents to

meet this challenge themselves, encouraging their contribution to the solution through digital skills training, career training opportunities and opportunities to advocate for and lead digital equity work.

Seizing the moment

The timing of Urban Edge's efforts is also important to note. The COVID pandemic highlighted the need for individuals to be connected to the internet and have the skills to navigate the web and computer applications for work, education, and civic and community participation. Leadership at Urban Edge saw this need and chose to respond, putting the housing developer at the forefront of this work. The federal government has also stepped up their efforts and have made resources available to communities working to improve broadband infrastructure. Alongside this new funding for States, Congress highlighted data that shows that some of the greatest need for improved, affordable broadband service is concentrated in low-income urban areas. The Commonwealth of Massachusetts and City of Boston are currently working out details of their digital equity funds and other grant programs, and when those plans are released later this year, Urban Edge and its partners will be well prepared to take advantage of them.

MAPC proposes an operational framework describing actions to be taken to improve digital equity for residents of the Columbus Avenue Corridor. This framework will allow Urban Edge to understand the roles and actions its staff, partners, and residents may take to achieving digital equity. The operational framework outlines actions Urban Edge and its partners can take to align work around the three components of digital equity, plus workforce development and community engagement:

- Identify the unconnected and create an affordable pathway for those individuals to be connected to the Internet, if they so wish.
- Promote, and where necessary, create digital literacy training opportunities, or incorporate components of digital literacy into existing programs leveraging touch points already in existence within community organizations.
- Promote opportunities for residents to purchase affordable devices and find technical support when needed.
- Create, promote, and support opportunities for community residents to engage and lead digital access and equity work in their community.

Immediate actions (Affordable Connectivity Program registration, promoting existing resources, increasing capacity to lead digital equity work) set the stage for more significant projects, such as the design and implementation of digital literacy programs and the construction of a community-wide affordable broadband network, currently in the design phase. With each step, resident engagement will ensure the project and programs respond to community needs. Taken as a whole, the set of actions will increase the number of local residents who have the skills, resources, and opportunities to take advantage of the benefits of online access and digital technologies.

Existing Conditions

Background

MAPC began the Columbus Ave Digital Access Planning Process with an existing conditions assessment to establish a baseline understanding of the current use and challenges associated with internet access in the community. MAPC began this process by establishing a study area for the Columbus Ave corridor based on Urban Edge's existing service area. Once the study area was identified, MAPC explored publicly available data from a variety of sources to articulate levels of internet adoption, user speed, and other indicators that will inform a suite of recommendations for technology and operations that Urban Edge and their partners can enact.

Key Findings

The existing conditions analysis for the Columbus Ave corridor between Egleston Square and Jackson Square in Roxbury and Jamaica Plain exposed the extent of the digital divide in the area. A review of publicly available data from the US Census Bureau's American Community Survey¹ indicates that nearly 40% of households within the core Columbus Ave corridor do not have access to the internet at home.

Further, an analysis of recently published data from Microsoft that captures the download speed of Microsoft products² indicated that between a third and half of all households that have an internet connection do not have what is considered to be a "broadband" connection – or a speed of at least 25 Mb/s download and 3 Mb/s upload³. Another publicly available speed test resource, mLab, indicated that only about 45% of users who conducted a speed test in the study area since 2017 received "broadband" speed quality.

When taken together with the Census data, this analysis shows that only about 35% of households in the Columbus Ave corridor have an internet connection **and** are receiving what is currently considered to be high-speed internet.

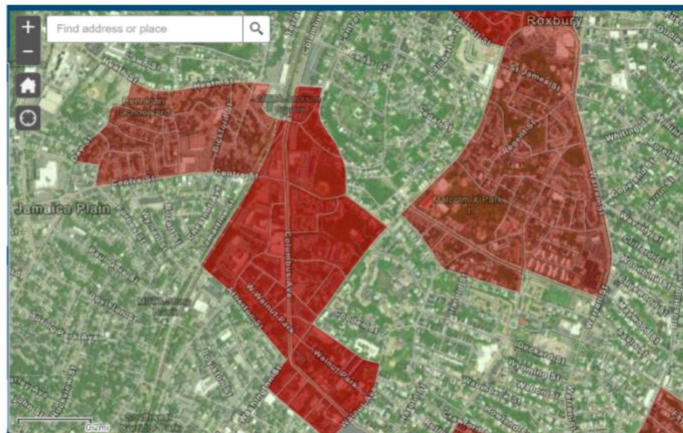
While there are many contributing factors to why households may not have access to an internet connection or are receiving poor internet quality (discussed in the accompanying Digital Access chapter), it is clear that the Columbus Ave corridor is a hotspot for digital access issues within the city of Boston and the region.

In fact, the Census Tract that captures Columbus Ave itself shows up as a clear area of need on the recently published NTIA Broadband Availability map, which takes into account multiple digital access indicators⁴.

NTIA Map

In June the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) released a map that displays key indicators of broadband needs across the country.

Columbus Ave Corridor stood out



Source

The neighborhood has high proportions of BIPOC, Non-Native English speakers, and older adults over 70. The digital disparities that exist in the community compared to other neighborhoods in Boston represent more significant social inequities within the city and region that these populations face in accessing digital technologies.

Detailed Findings

The Existing Conditions Assessment component of the Columbus Ave Corridor Digital Access and Equity Plan (the Plan) was designed to establish a baseline understanding of the current levels of internet service adoption and use among the residents and businesses within the project study area. The existing conditions research also included an inventory of Internet Service Providers (ISP's) that offer service to residents and businesses along the corridor and their associated infrastructure.

MAPC established the study area for the Plan as the four 2010 Census tracts that encompass the majority of Urban Edge's housing (2020 Census tract boundaries and associated ACS data were not available when the study kicked off.) Census Tract 813 is the tract that covers the "core" of the Columbus Ave corridor, but the analysis presented in this chapter covers all four tracts. The "core" Columbus Ave corridor is defined as stretching from Egleston Square to Jackson Square, where Urban Edge owns or manages more than a thousand units of housing.

Census Tracts of Study Area

(813) "Columbus Ave Corridor"

primary UE corridor, comprising the majority (56%) of all UE housing and 34% of all UE residents, Urban Edge HQ, the Jackson Square T Station and Dimock

(1203.01) "Egleston Square"

includes bulk of Egleston Square (in Jamaica Plain) and represents 7% of all UE housing units

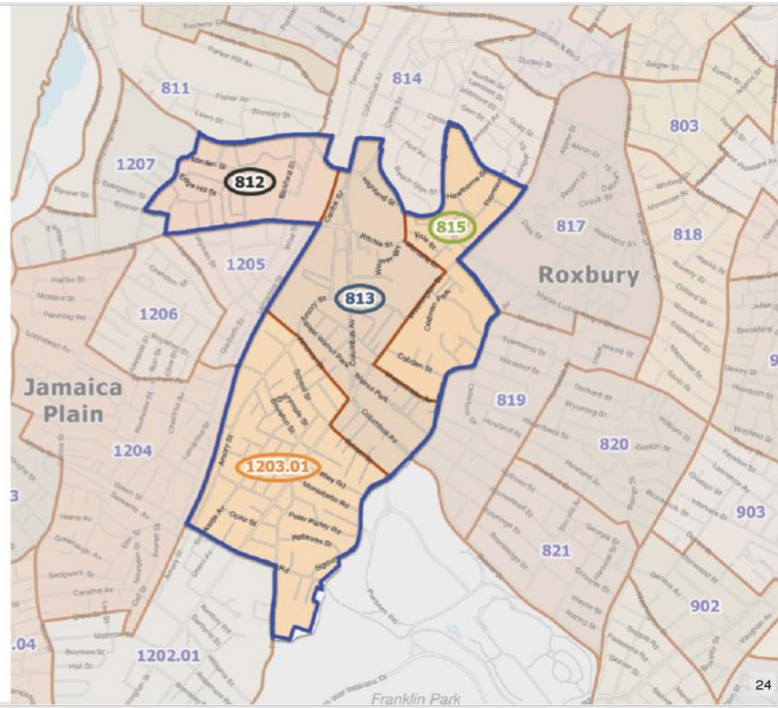
(812) "Jackson/Hyde"

includes Hyde Square and the Mildred Hailey development

(815) "Roxbury"

includes a few mostly clustered UE properties in Roxbury

2/3 of Urban Edge's portfolio is clustered primarily in four census tracts. The remaining third of UE's portfolio is located in Mattapan and Dorchester



The Existing Conditions Assessment consisted of a review of the recently completed Urban Edge strategic plan, analysis of US Census data related to internet use, analysis of Microsoft and mLab speed test data, and a spatial review of public and commercial infrastructure using data made available from telecommunications infrastructure data provider GeoTel.

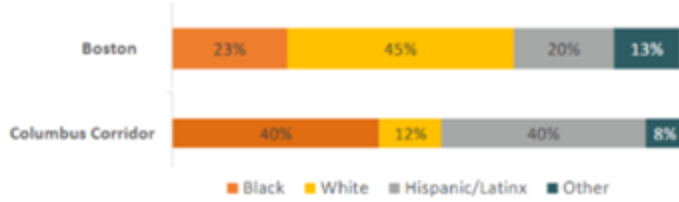
The analysis of mLab and Microsoft Speed Test data was done at the zip code level due to data limitations. MAPC used zip codes 02119 (Roxbury) and 02130 (Jamaica Plain) for this analysis. Zip Code 02119 contains most of the core Columbus Ave Corridor.

Demographic Review

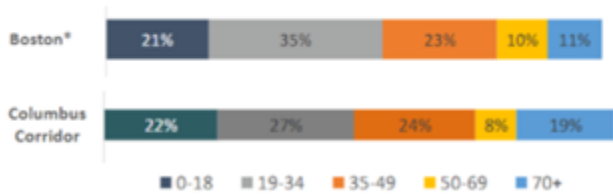
The study area, as defined in the section above, is a vibrant and diverse area, with a high concentration of affordable housing developments owned by Urban Edge, The Community Builders, and Jamaica Plain Neighborhood Development Corporation. Demographically, the study area has a higher proportion of Black and Hispanic/Latinx residents than the city as a whole, and a higher proportion of seniors over the age of 70.

Lack of internet access tends to correlate with areas of low income, communities of color and immigrant households. These neighborhoods often suffer from a lack of private and public investment and this continues to be true in relation to Internet infrastructure (often referred to as digital redlining).

Racial Composition



Age Composition

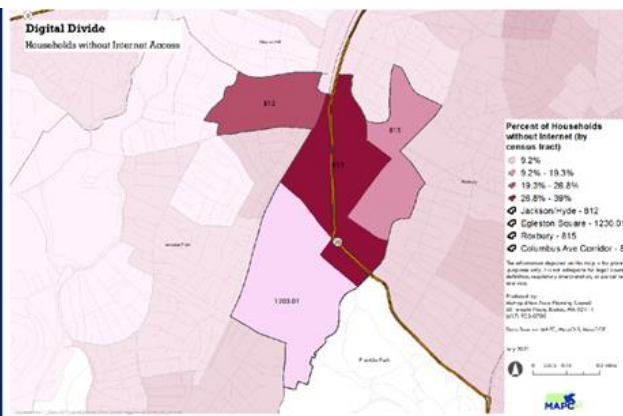


Internet Connectivity

Residents of Census Tract 813 (the tract that covers the core of Columbus Ave corridor) consistently experience greater barriers to digital access as compared to the other census tracts in the study area, as well as the city of Boston as a whole. Nearly 40% of households in Census Tract 813 lack an internet subscription. This census tract also has the highest percentage of seniors (aged 65+) at nearly 20% of all residents.

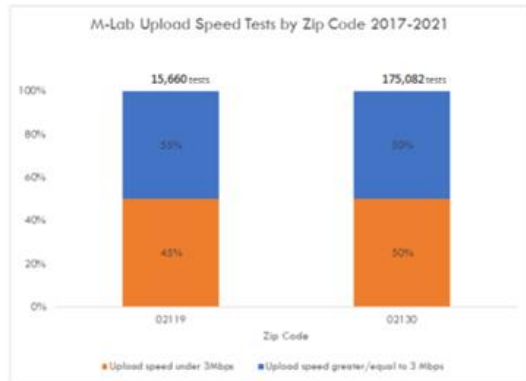
Households Without Internet

According to this Census data 39% of “Columbus Ave Corridor” households do not have access to the internet.



Further, those households that do have an internet connection frequently do not receive speeds that qualify as “broadband” under the FCC’s current definition of 25 Megabits per second (Mb/s) download speed, and 3 Mb/s upload speed. Data made available from Microsoft indicates that

at least one in five subscribers in zip code 02119 and more than half of those in zip code 02130 do not meet broadband speeds.



M-Lab Speed Data

M-Lab is another source for speed data. When you Google "speed test" this is the data from tests run there. It's only one way of measuring speed and has limitations.

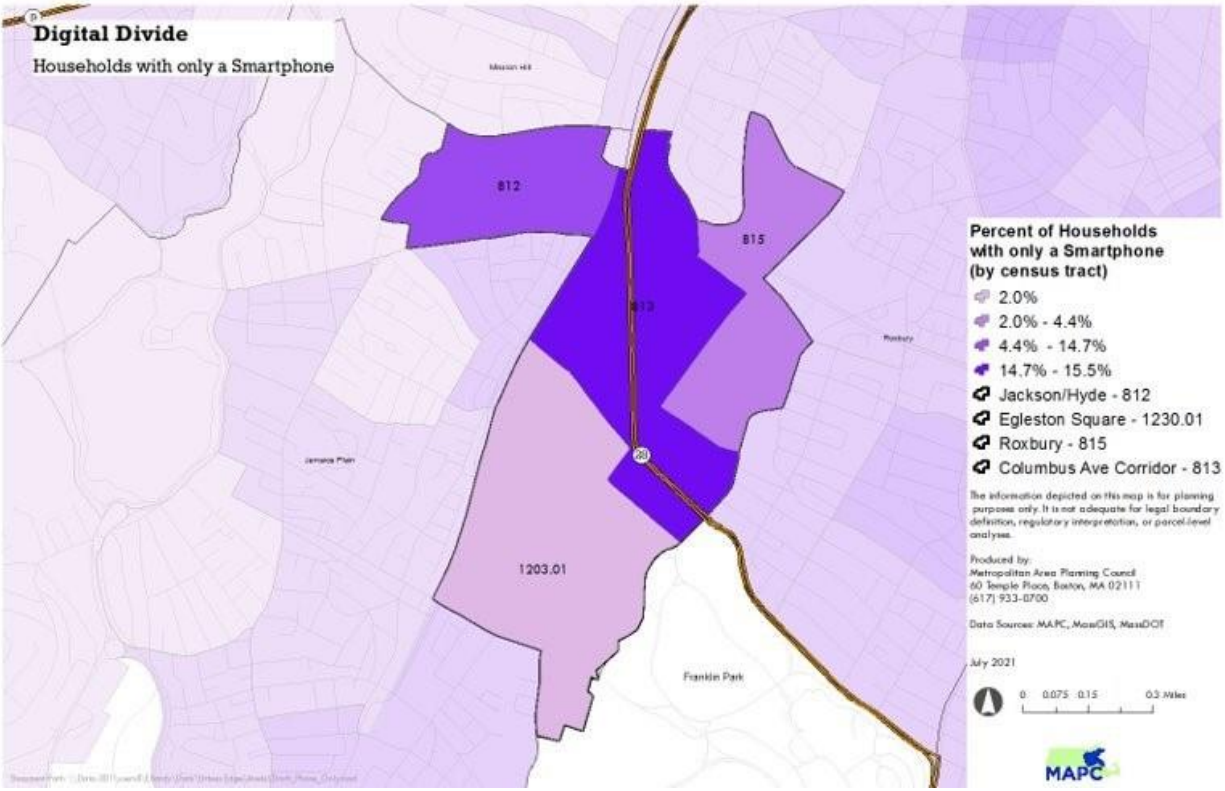
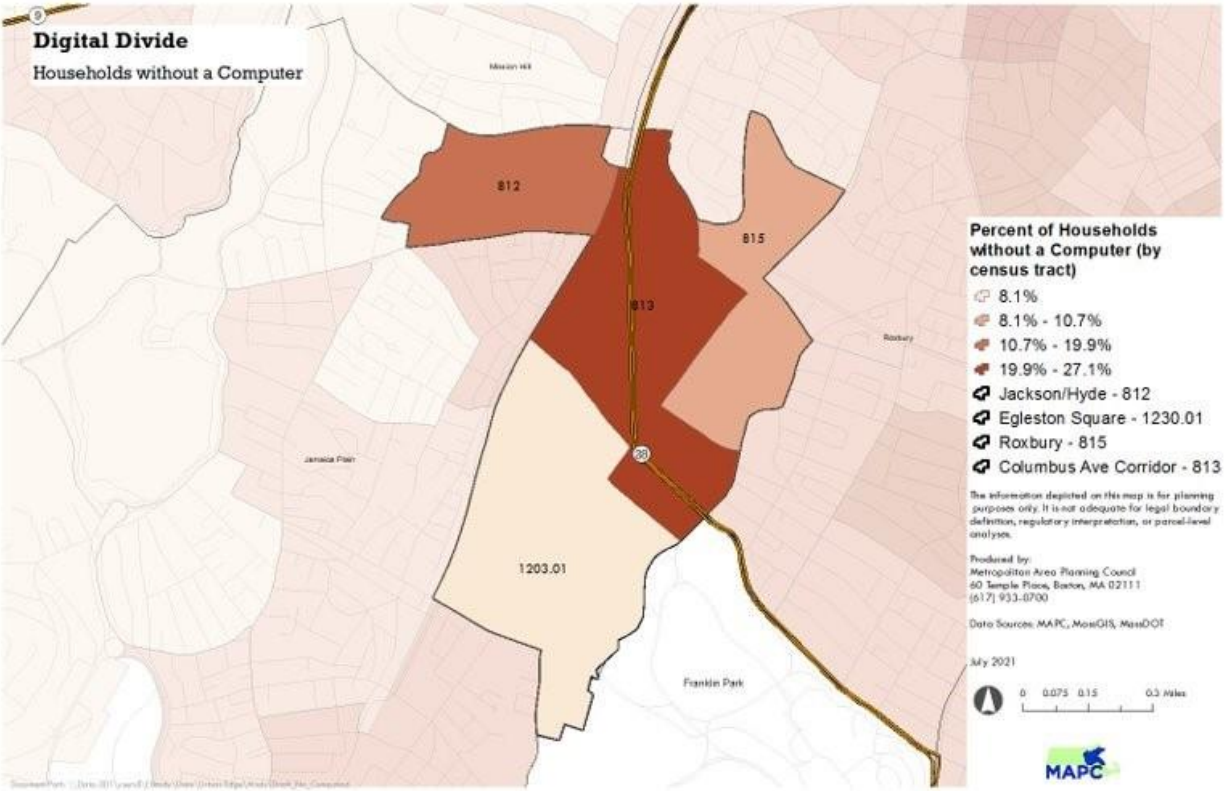
For upload measured since 2017 in 02119, 45% of the time the speed was under the "broadband" definition.

The speed and reliability of broadband service changes with the number of household members using the Internet at the same time, the types of devices used to connect to the internet, and what activity the Internet is being used for. Examining the U.S. Census Bureau's household demographic data highlights the gaps in residential broadband service within the region. Within the Urban Edge study area, approximately 31 percent of households are three- to four-member households, and 12 percent of households have 5 or more members. Although a 25-50 Mb/s download speed may support the activity of a 1- to 2-person household, high-demand activity for a larger household would require upwards of 200 Mb/s (AllConnect).

Device Access

Device access, alongside connection and literacy, is one of three determining factors of digital access. Within the Urban Edge study area, the Jackson/Hyde census tract includes between 11 and 20 percent of households that do not have access to a computer, with the Columbus Avenue corridor tract's percentage ranging from 20 to 27 percent.

Findings from a Pew Research Center survey of 1,502 U.S. adults point to increased smartphone dependency in recent years, with approximately 15 percent of adults identified as "smartphone-only" Internet users. These users have a smartphone, but do not have a home broadband connection (Perrin, 2021). Within the Columbus Avenue corridor census tract, the percentage of households with a only a smartphone averages between 14 and 15 percent. Smartphone only users may be limited in their ability to apply for jobs, fill out applications and access websites not optimized for mobile devices.



Digital Access Survey

Background

To understand the digital access needs of the study area, MAPC conducted a Digital Access Survey in partnership with local organizations and residents. This survey sought to identify the key functional needs of the internet in daily life, current ability to use the internet for those key functions, and barriers or challenges impacting the ability to use the internet. The assessment was structured within the framework of internet availability, device access and digital literacy and was designed to reflect the differing needs of different demographic populations within the community.

Key Findings

In sum, 265 surveys were completed by community residents between October and December of 2021. The respondents to the survey were largely representative of the communities demographic and age groups. The survey was conducted both digitally and in person.

Target Survey Goal	Surveys	200	265	Total Surveys Conducted
Area Population Race/Ethnicity	Black / African American	40%	35%	Black / African American
Area Population Race/Ethnicity	Hispanic or Latinx	40%	56%	Hispanic or Latinx
Area Population Age	Seniors	19%	12%	Seniors

Survey respondent demographics.

The findings of the Columbus Ave Digital Access Survey supported and provided further nuance to the existing conditions assessment completed earlier in the process. The key findings as related to the three sections of the survey are as follows:

Internet Availability and Service:

- 27% of respondents do not have an internet subscription for their household.
- 61% of respondents have had to cancel or change their internet subscription because it was too expensive.
- Larger households (more than 5 people) more frequently experience dropped or choppy video calls.

Literacy:

- 15% of respondents without an internet subscription indicated it was because they did not know how to subscribe.
- 82% of respondents indicated they were comfortable using a laptop, Chromebook, or other computer.
- 57% of respondents indicated they were comfortable resolving issues related to an internet connection.

Devices:

- 38% of respondents indicated they **disagreed** with the statement “People in my household always have access to a computer if needed.”
- 45% of respondents have had to buy a new computer in the last three years.

Detailed Findings

Methodology

The Columbus Ave Digital Access Survey is structured around three sections: Connection, Devices and Literacy. The survey opened in October and closed in December of 2021. Urban Edge residents received a text blast with a link to the survey, paper surveys were dropped off at sites of partner organizations as well as an alternative option to the online survey, and a group of youth knocked on doors in the area with both online and paper surveys while supervised by Urban Edge staff.

Demographics of survey respondents:

MAPC sought to execute 200 surveys in order to gather a substantial sample of the community population. With the great support of the Urban Edge Community Engagement team, MAPC was able to collect 265 surveys. In addition to being available in English the digital access survey was translated into Spanish. Additional demographic summary of the respondents as follows:

- 193 responses were recorded in English
- 73 responses were recorded in Spanish
- 56% of respondents identified as Hispanic or Latino
- 35% of respondents identified as Black or African-American

- 3% of respondents identified as White or Caucasian
- 3% of respondents identified as Multiracial or Biracial
- 2% of respondents identified as a race or ethnicity not listed
- 1% of respondents identified as Native American or Alaskan Native

- 12% of respondents lived in a household with three or more adults
- 77% of respondents lived in a household with at least one child
- 38% are households with 2 – 3 children
- 6% are households with 4 or more children
- 52% of respondents have an annual household income of \$25,000 / year or less.

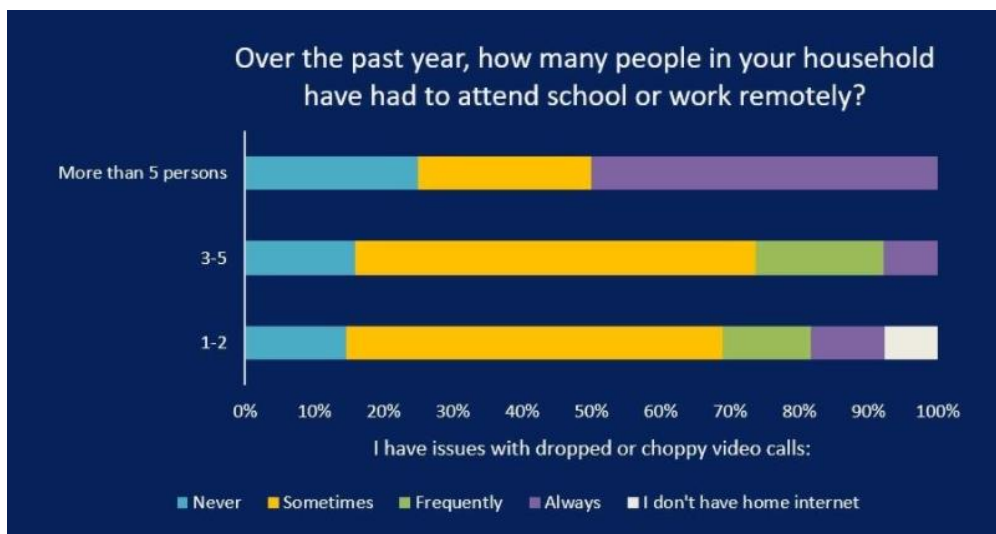
Detailed Findings, Internet Availability and Service:

In alignment with the existing conditions analysis, MAPC found that a high percentage (27%) of survey respondents lacked a home internet connection. The number of disconnected homes along Columbus Ave is significantly higher than the national average of 7%. Further, MAPC found that 54% of seniors that responded did not have an in-home internet subscription.

Affordability was identified as the driving force behind the lack of internet subscriptions. 63% of respondents without a subscription indicated that cost was the prohibiting factor. 61% of all respondents indicated that they have had to cancel or change their internet subscription because it was too expensive.

In addition to issues of affordability, many respondents indicated that reliability of service was an issue. About 35% of survey respondents indicated that they have had to leave their home to use the internet at another location because their home service was unreliable. This also aligns with the findings from the Existing Conditions analysis which found that only about 50% of internet subscribers are receiving broadband speeds along the Columbus Ave corridor.

The issue of unreliable internet is especially pronounced for those households with 5 or more people. Survey respondents in larger households indicated that they more frequently had issues with dropped or choppy video calls than smaller households.



Household size and Internet quality relationship

While there are multiple service providers available in the Columbus Ave corridor, the majority of survey respondents (77%) were Comcast subscribers. Comments from survey respondents indicated that many residents may not be aware of service offerings from competitive providers, which could potentially offer more affordable or better service.

Further, many residents along the Columbus Ave corridor may be eligible for subsidies from the federal government through the Emergency Broadband Benefit program (now called the Affordable Connectivity Program) which offers a \$30/month subsidy to income eligible residents. As of November 2021, only 1,043 households in the 02119 zip code had taken advantage of this program.

Community Stakeholders

Background

In conjunction with the Digital Access Survey MAPC engaged with community partners to identify how their clients or constituents are impacted by digital access barriers, and what role they play, or envision playing, in addressing these issues.

Key Findings

Urban Edge and the residents of the Columbus Ave corridor are fortunate to have a large number of well-established and effective community organizations and affordable housing developers in their neighborhood. Three organizations in particular (Urban Edge, the Jamaica Plain Neighborhood Development Corporation, and The Community Builders) own and/or manage a significant number of affordable housing units within the study area. Coupled with local organizations such as Jewish Vocational Services, Tree of Life, the Dimock Center, and two Main Streets organizations, there is a strong network of active community partners focused on the wellbeing of the community and neighborhood.

In conversations with these entities, MAPC learned about their current digital equity work and hopes for the future. Besides Tech Goes Home, which is working very hard in many different communities specifically on digital literacy and equity, there is no organization with a dedicated program or staff focused on digital access or equity. Instead, each organization is addressing the need where it is presented among their constituent groups. For example, JVS and Urban Edge have partnered with Tech Goes Home to offer digital literacy training, and other groups provide one on one support aligned with their constituents' goals. The efforts of municipal leaders have been laudable as well and appear to be increasing, recommending a coordinated approach by both public and private entities.

Almost all staff spoke of the need for coordinating their efforts with other groups, and that to solve the digital equity issues residents face, each dimension (digital access, devices and literacy) must be addressed.

Detailed Findings

Methodology

MAPC spoke with stakeholders identified by Urban Edge and through other research, either individually or in groups, in some cases more than once. When holding group meetings, attendants were thematically linked—municipal staff, real estate teams, or workforce development organizations, for example. Meeting agendas and topics areas were arranged by current work, future work (planned or aspirational), and challenges associated with digital equity for their constituents and how it relates to their own work. Meeting notes were reviewed and consolidated into themes—digital equity needs, insights, assets, capacity, and further questions.

Digital Access

As shown in MAPC's existing conditions study and community needs assessment, approximately 27% of households in the study area are experiencing some type of challenge with being online. Most often the issue is one of affordability, but service quality was also mentioned by residents. Municipal organizations are the main group working to provide free online access with schools and libraries lending Wi-Fi hotspots and computers to those in need. These solutions were ramped up during the pandemic, but are generally stop-gap, temporary solutions, as DOE property will be returned, and library equipment lent out for a limited period. Boston's Wicked Free Wi-Fi outdoor network exists in some areas and efforts to bring this inside of Housing Authority common areas are underway. There have been efforts by stakeholders to publicize the federal EBB/ACP broadband subsidy program and ISP discount plans such as Comcast's Internet Essentials, yet both programs are significantly under enrolled.

Devices

As mentioned previously, schools and libraries are providing equipment to users in need on a temporary basis. Jewish Vocational Services and Urban Edge have partnered with Tech Goes Home, running digital literacy trainings that provide Chromebooks to graduates of the program. There are also computer labs open to the public at the Boston Public Library, Roxbury Community College, and in some apartment complex common rooms. During the pandemic, many of these rooms were closed to the public.

Digital Literacy

Digital literacy is an equally important dimension of digital equity, and for the approximately 18% of surveyed residents expressing a lack of confidence in how to use their computers and/or tablets, additional access to the Internet and devices will be less effective. Stakeholders mentioned that the lack of digital literacy compounds the challenge of providing services to constituents and was a motivating factor for the digital literacy and Digital Navigator programs JVS initiated, in order to prepare job seekers for the digital skills that would be necessary for

success in their other programs. To support their senior population, Urban Edge is launching a Tech Goes Home class, incorporating roles for younger community members to support the elders. In other organizations, the work is less formal, with Tree of Life staff supporting residents to use their devices to register for services, healthcare needs, or other online tasks, and Main Streets' leaders working to support businesses to take advantage of digital tools.

Organizational Takeaways

Each organization mentioned how digital skills of their constituents and staff impact their ability to provide the services they offer. They detailed the challenge of communicating with their constituents when there is no broadband in the home, or email account, or computer to use to fill out various forms and applications. The issue is compounded by literacy itself and language barriers. A holistic approach seems to hold promise, either within an organization or within the community. JVS described how they have adapted their intake process to address an applicant's ability to be successful in their workforce development programs, including an assessment of their digital skills. By creating one intake form, as opposed to a separate one for each program, JVS can identify the skills that may be needed for an applicant to be successful in a specific program. For example, though an applicant may wish to take part in a medical record training program, an intake form can indicate if they will have the necessary skills and equipment in the home to complete the online training program. Taken a step further, if JVS does not have the support service necessary in house, they would be able to make referrals to other local groups working on that skillset specifically.

The need for devices is more difficult to address, as this often comes down to affordability. As mentioned previously, efforts to support device usage in our study area were limited to Tech Goes Home and the local libraries and schools. Refurbishment programs by nonprofits such as MACIR, an IT training organization in Revere, are intriguing methods to addressing this issue, as in addition to providing low-cost devices to the community, staff at these organizations are also learning skills which can help them find work as IT Support Desk technicians, an entry level position within the technology sector. The EBB/ACP program also provides a \$100 rebate for subscribers of the internet subsidy for the purchase of a device.

To address the issue of online access, the easiest method for each organization would be the promotion of subsidized broadband programs. Each of the ISPs serving the area offer a discounted service plan to qualifying households, and all ISPs must integrate the EBB/ACP subsidy into each of their service plans as well. Promoting the EBB/ACP subsidy to qualified households can be a first step, and each organization might train staff to support residents in applying for the rebate. With the EBB and other discounted programs, households should be able to gain basic Internet access for \$20/month or less. For households with greater need (multiple Internet users at the same time), prices may increase for sufficient service.

Coordinated efforts that consider each dimension of digital equity will be the most likely to succeed in providing residents with the benefits of digital access and literacy, and the stakeholders interviewed all expressed a desire for collaboration and mutual support. Coalition building and relationships with municipal leaders will also help the neighborhood prepare to take

advantage of state or federal funding. The figure below lists applicable assets and efforts of the interviewed stakeholders.

Asset Map				
	Infrastructure	Digital Literacy	Workforce Dev	Device access
Urban Edge	●	●		
Jewish Vocational Services		●	●	
City of Boston	●	●	●	●
Tree of Life		●		●
JP Neighborhood Development Corp	●		●	
The Community Builders	●			
WinnCompanies	●			
InSource	●			
Roxbury Community College	●		●	●
Timothy Smith	●	●	●	●
Three Squares Main Streets	●	●	●	
Egleston Square Main Streets	●	●	●	
The Dimock Center	●			●
Tech Goes Home		●	●	●
Boston Neighborhood Network	●	●		●

Technical Assessment

Background

The cost of building necessary infrastructure is a major contributing factor to a lack of broadband competition. Smaller, neighborhood networks have found ways to alleviate that cost through opportunities that make use of existing social networks, anchor institutions, and strategic partnerships. MAPC’s scope of work allowed us to investigate each of these components to understand how a neighborhood network might be deployed, and with this technical assessment MAPC incorporates the physical assets that might also play a role. The number of allied housing developers and community-based organizations in the Columbus Avenue corridor afford many possibilities for building a neighborhood network. MAPC reviewed the physical assets of the corridor, with close attention to the properties under management of these groups, and was able to identify opportunities to deploy low-cost broadband options for residents.

Multi-dwelling units with proper internal infrastructure can offer cost savings for residents and building owners for residential broadband service. With a coordinated approach, owners of multiple buildings can create similar economies of scale, purchasing enterprise-scale connection to

the Internet and use wired and wireless technology to distribute it within their properties. With gateway sites chosen for their location, elevation, and/or existing broadband infrastructure, and secondary sites chosen for similarly impactful reasons (including density of households), MAPC believes a neighborhood network could serve an estimated 600+ Urban Edge households in the Columbus Avenue Corridor study area as well as other residents living nearby. Coordination among housing developers, CBO's, local institutions, municipal actors and residents could allow Urban Edge to coordinate assets and resources both physical and social to launch a pilot broadband network, demonstrating local solutions for Boston and other regions.

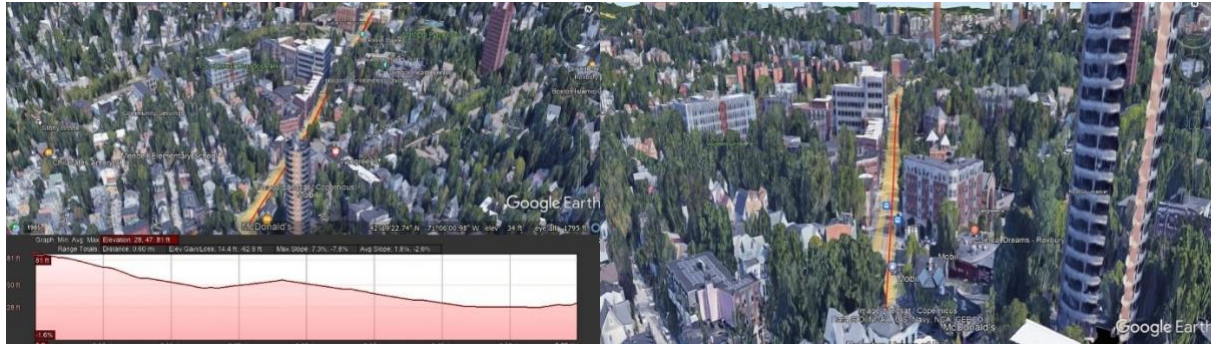
Urban Edge CEO Emilio Dorcelly suggested the study of a neighborhood network, having been familiar with similar projects while working in New York City and as a colleague of The Community Builders, who had recently announced an effort to provide free Wi-Fi service to its residents in the Olneyville neighborhood in Providence, RI (an area with some similarities to Roxbury and Jamaica Plain). Armed with the knowledge of the strong relationships existing in the Columbus Avenue corridor, Urban Edge asked MAPC to investigate how a network might be built.

After initial research and discussion regarding broadband network design and construction, MAPC began by studying maps of the area to identify important assets in the corridor including subsidized housing, businesses, existing broadband infrastructure and other landmarks. MAPC reviewed the area spatially as well, determining building heights and land elevations. Urban Edge provided a tour of the area, pointing out their properties as well as those of other partners and stakeholders, sharing the physical layout of the neighborhood but also identifying social networks that enable their and others' work. Conversations with stakeholders began during the fall of 2021 and are continuing, helping MAPC and Urban Edge to learn other helpful information such as municipal and private broadband assets in the area. Conversations continue with partners, including InSource, Urban Edge's IT consultant, as MAPC seeks to understand the more specific opportunities and challenges in the buildings that they own or manage. The City of Boston and Boston Housing Authority have been very encouraging and have offered ideas for ways they might support a network buildout.

Key Findings

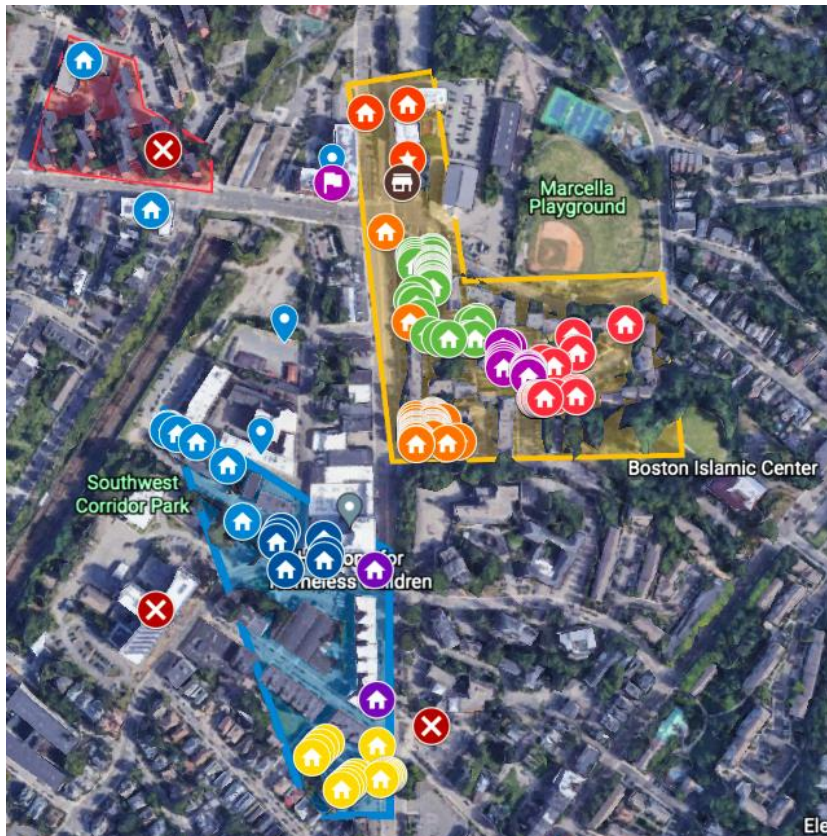
Topography

The Columbus Ave corridor sits in a basin, with Egleston Square at the top of a gradual hill, descending to the south along Columbus Avenue to Jackson Square.

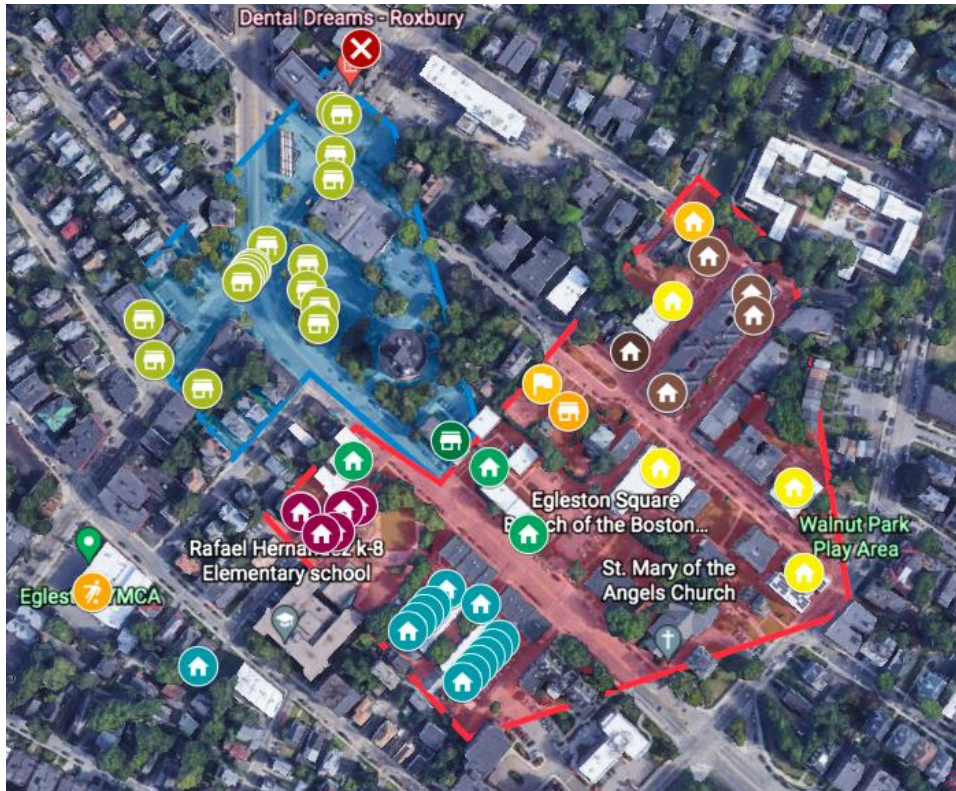


Building Clusters

Urban Edge manages many properties scattered throughout Roxbury, Dorchester and Jamaica Plain, but we focused our investigation on the dense concentration of housing units along Columbus Avenue. In that area MAPC identified five building clusters, where deploying wired and wireless broadband equipment at gateway sites and secondary sites would allow a broadband network to reach the greatest number of Urban Edge households. These sites are owned by Urban Edge as well project partners, which will require their collaboration but also enable broadband access for their constituents as well.



Building Clusters 1 (Mildred Hailey), 2, and 3. Blue icons are UE properties, pink icons are TCB properties, and red icons are gateway buildings. (402 Urban Edge Units plus Mildred Hailey)



Clusters 4 and 5 (372 Urban Edge units)

Gateway Sites

Individual buildings in the Columbus Avenue corridor are identified as Gateway sites for a variety of reasons. These buildings may have municipal or private fiber connections which may be used to provide backhaul to the Internet. They may also be very tall or have internal cabling allowing for easy installation of cable runs either vertically, from the basement to the roof, or horizontally, allowing for easier deployment of indoor access. Other buildings may be identified due to their location in relation to other buildings, or for the needs of residents that live in or near to the site. A consideration during future planning of Gateway sites will be line of sight from their rooftops to as many Urban Edge or other affordable housing locations as possible. Gateway sites currently under consideration can be found in the Appendix.

Secondary sites

Secondary sites may receive their internet backhaul wirelessly from the Gateway sites, creating a more efficient network and/or redundancy and resilience. Secondary sites may be campus-like in their physical make up, creating opportunities for inter- or intra- building wiring. Secondary sites

may also be local gathering areas, community institutions, or locations that would benefit from free access to the Internet. A partial list of secondary sites can be found in the Appendix.

Municipal Assets

Partnerships are often the key to successful digital access work. The City of Boston has been ramping up its work on this issue, collaborating with ISP's to provide access elsewhere in the city. Conversations with the City regarding Urban Edge's work continue, and with advocacy and coalition building Urban Edge might move the City to take a leadership role in the provision of affordable Internet access. Presenting the Columbus Avenue corridor as a pilot program could be a viable path for the government to explore, especially as they have infrastructure in the area which under the right circumstances might be activated to support services to Urban Edge residents and neighbors. The City of Boston noted locations in the corridor where municipal broadband assets exist: the fire station (District 9 Chief, Engine 42 and Rescue 2), Boston Neighborhood Network, Egleston Crossing (3037 Washington), Doris Bunte Apartments, Mildred Hailey Apartments, and 125 Amory St. MAPC contacts at the Boston Department of Broadband and Cable and Boston Housing Authority are currently having internal discussions on how they might support the project with their construction, broadband and legal teams. They flagged that most likely any service that is enabled by City assets will be required to be free to users.

Types of access

A building's architecture and construction materials influence how best to design an interior broadband network. It is difficult to propagate a wireless signal within concrete and steel buildings, whereas wood construction may allow the signal to pass at a much higher throughput. Depending on construction material, in older buildings, installing wiring can be tricky. Some newly renovated buildings (Walker Park, Holtzer Park) were constructed with in-building ethernet data cable running to each apartment, solving one of the more challenging infrastructure pieces in multi-unit buildings. As CDCs prepare for renovation and new construction, internal ethernet wiring should be considered, if not mandated. During Wi-Fi network design, engineers can set up a radio beacon and walk the area using software that measures signal strength and gain an understanding of the quality of a proposed Wi-Fi signal for users. This information, coupled with blueprints of the building aids network designers in deciding on the most effective placement of an access point. This work can also determine if a publicly installed Wi-Fi signal might function within a person's home, or if a wired network is a better solution.

Some MDU's may have a cable (coaxial) network within the building, or even copper telephone wire, a remnant of the era when cable television was ubiquitous and Internet data was transferred on the same lines. Recent technology may allow these wires to transfer data at speeds up to 100 Mb/s. This speed may be sufficient for some households presently.

The most "future-proof" medium for data transfer is fiber optic cable, which can send data at speeds up to multiple terabits per second, although generally the highest commercial offering is 10Gb/s. Though it is becoming more common for use as inside wiring of commercial buildings, fiber is the preferred medium for long range transmission, across telephone poles or buried in trenches. New construction should consider the cost of installing fiber and other broadband infrastructure that will have a long useful life. It is important to keep in mind that as 5G and other

wireless technologies advance, they will always need to be connected to a wire at some point and the closer the wires are to the home/office, the faster and more resilient the networks will be. Fiber deployment at a municipal scale will be important to the growth of cities, and their residents.

Planning for the future

When examining opportunities and assets for broadband deployment, it is important to consider a timeline of work. As previously mentioned, recently constructed or renovated buildings (Holtzer Park, Walker Park) have had data cabling installed throughout the building and so are best prepared for taking advantage of new network or ISP offerings. CDCs should prioritize communication systems in the planning of future development/redevelopment sites. Where new buildings or even campuses (as in the case of Mildred Hailey) are being planned, thought should be given to not only the networks inside the buildings, but routes for conduit between buildings and to the street where a local network can connect to commercial offerings and the larger Internet. Pre-configuring buildings and land in this way will speed deployment of networks in future phases of work or when the building comes online. Common areas with Wi-Fi access are another amenity developers should consider while in the design stage of building.

Detailed Findings

Installation costs/equipment

To build a neighborhood network, there will be capital costs for equipment, materials, and labor for installation. Depending on the scope of the project and which parts of the infrastructure must be built (installing fiber in public rights of ways can be expensive and time consuming), start-up costs can range dramatically. As a reference, the Olneyville project, which was designed with 11 wireless access points intended to serve 1500 households, initial costs were estimated at \$225,000.

The ongoing costs of supporting a network must also be looked at very closely. Purchasing Internet backhaul can be a straightforward process, if fiber optic networks are near to the premises, and 1 Gb/s circuit may cost approximately \$1500 per month. Wireless fiber companies, newer to the market, can provide similar speeds at similar cost, but may be able to install their equipment faster. Networking equipment may also come with ongoing cost, as many of the top performing brands require a subscription cost for their monitoring and operation software, as well as warranties. Most networking equipment has an expected life of 2-5 years.

Another ongoing charge for a large-scale network is paying a contractor for actively monitoring and repairing the network. Commercial providers have a Service Level Agreements, dictating the terms of their response times, allowed downtime, and other parameters of the service. Software will alert the network administrators to faults in the network, which can either be resolved remotely or by onsite technicians. Some community networks are training local residents to act as network administrators, creating cost savings, skills, and employment opportunities.

Opportunities for cost savings

There are many avenues for cost savings that are aligned with Urban Edge and its partners' values and goals. Once again, determining the scope and goals of the digital access work will determine which of these approaches is best.

- The Urban Edge real estate team has been forward thinking in considering infrastructure investments in new construction projects, incorporating data cabling in those plans when possible. Discussions in collaboration with other partners in the Mildred Hailey redevelopment should pay close attention to opportunities there, including street grid infrastructure planning.
- The Affordable Connectivity Program, a federal subsidy program that offers a \$30 monthly subsidy and discount voucher for equipment, is an opportunity to provide affordable broadband for qualifying residents, many of whom live in the area. CBOs and municipalities have stood up programs to help residents sign up for the subsidy, a possible next step would be to coordinate applying that subsidy for all users on a network.
- Ubiquiti Networks is an exception to the subscription-based network devices, a network equipment manufacturer that is used by many ad hoc community networks and provides its monitoring service free of charge.
- As previously noted, many community networks have individuals who serve as network technicians, user support, or marketing teams, providing local service through community hiring. Local stakeholders who might be support this approach (funding and capacity notwithstanding) are Roxbury Community College, YouthBuild, Jewish Vocational Services, or the local Main Streets organizations.
- Community development corporations in the area own a mix of building stock, from single family homes to large apartment buildings. Some of them are laid out around a central square and may have older networks that may be repurposed. Contiguous buildings, such as the Academy Homes, create opportunities in distributing signal for both wired and wireless networks.

Other considerations

Building a new network is expensive, one of the reasons why there is limited (if any) ISP competition in most areas. Wireless systems may be the most likely to compete with the incumbents and are demonstrating promise but lacking in consumer awareness and area of service.

Liability in providing Internet access must also be considered before initiating any deployment. Acting as an ISP, in addition to the administration, customer support, and technical components, requires meeting state and federal guidelines of customer privacy and other consumer protections, and therefore would not be a role for Urban Edge to play. Managing public Wi-Fi networks is not the same as running an ISP, and the liability can be spread out among partners. Urban Edge will advocate for the safety and security of its users to any contractor it would hire, and they would be responsible for building secure networks that do not endanger users' data through use of the network. The network vendor would be responsible for managing those risks as well as any risks stemming from the physical installation of the equipment. The ISP providing connection to the Internet would then assume liability of users' activity on the Internet. Urban Edge

and its partners would play a role here too, in educating users on how to protect themselves and their data while online.

As Urban Edge and its partners consider the path forward, understanding the goals of the project will greatly influence the correct strategy to choose. If the goal is to get every resident online, then promoting the Internet subsidy programs and supporting neighbors to sign up could be a very effective use of staff resources and capacity. Coupled with local IT support to help configure and support networks in the homes, affordable, quality service may be within reach. To more significantly alter the landscape, providing an alternative to incumbent networks may push private providers to offer more affordable options or better networks. From a resiliency and economic lens, retrofitting buildings with data cabling will ensure future generations of affordable housing tenants will have more service options and faster networks. If creating opportunities for work and other forms of engagement for community members are paramount, organically growing a neighborhood network may be the right path and has been shown to be an empowering program of community organizing for local groups. Any of these choices, made in coordination with other digital access efforts can significantly alter the landscape of digital equity for Urban Edge residents and their neighbors.

Operational Framework

Introduction

In previous chapters, MAPC described existing conditions, identified local partners and their constituents as well as other stakeholders in the work, shared the results of a survey regarding digital access and literacy taken by approximately 250 local residents, and catalogued existing infrastructure and technical solutions for creating a neighborhood network. Based on evaluation and discussed with project partners, MAPC proposes the operational framework that follows, detailing short-, medium- and long-term actions Urban Edge may take to support its residents and their neighbors to take full advantage of the resources and opportunities available online.

An operational framework will serve as a roadmap of sorts, describing actions to be taken towards creating digital equity for residents of the Columbus Avenue Corridor. The National Digital Inclusion Alliance defines digital equity as “a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital Equity is necessary for civic and cultural participation, employment, lifelong learning, health, and access to essential services”.

Using this framework will allow Urban Edge to understand the roles and actions its staff, partners, and residents may take to achieving digital equity. Capacity may force adjustments to the strategy and roles of Urban Edge and its partners, but outcomes planned for each set of actions shall guide the work.

The operational framework is built with the following goals in mind, to be used as measurable targets for program investment:

- 90% of Columbus Avenue Corridor residents are connected to affordable, secure, high quality broadband service.
 - *According to our survey results, approximately 73% of Columbus corridor residents are connected to broadband services currently. 54% of seniors are not connected, and 61% of respondents have had to change or cancel their service previously because it was too expensive.*
- 90% of Columbus Avenue Corridor residents can identify support resources in finding and registering for affordable broadband services.
 - *Currently 52% of survey respondents are Internet Essential customers, census data shows approximately 10% of households who qualify for subsidized service are using the discount in the 02119 zip code.*
- 90% of Columbus Avenue Corridor residents report confidence using or accessing support to use laptops, tablets or Chromebooks to pay bills, communicate, access resources and maintain their security and privacy online, a proxy MAPC has used to demonstrate digital literacy.
 - *82% report confidence in using devices, 57% feel comfortable resolving issues related to Internet access*
- 90% of Columbus Avenue Corridor residents believe Urban Edge and project partners support their digital access issues and needs

To accomplish these goals, MAPC believes that Urban Edge and its partners must do the following:

- Identify the unconnected and create an affordable pathway for those individuals to be connected to the Internet, if they so wish.
 - *Our research indicates that lower income residents and seniors are most likely to be affected by digital divide issues and should be prioritized.*
- Promote, and if necessary, create digital literacy training opportunities.
 - *Stakeholders expressed an interest in incorporating components of digital literacy into existing programs such as tax assistance, food support, home ownership and childcare programs, leveraging touch points already in existence within community organizations.*
- Promote opportunities for residents to purchase affordable devices and find technical support when needed.
- Create, promote, and support opportunities for community residents to engage and lead digital access and equity work in their community.
 - *Trainings are available to develop Digital Navigators or Digital Stewards, two models of community-based technology programs.*

OPERATIONAL FRAMEWORK

To reach the goals set forth in the beginning of this document, MAPC proposes a mix of short term activities that build capacity and interest in order to support the longer term, transformational actions Urban Edge may take in building a community broadband network. Short-term actions

should be understood as immediate, medium-term would be in the next 6-12 months and long term would be within 1-2 years.

Increase awareness of existing resources:

1. ACP and Internet Essentials registration

Time Frame: Short Term

Partners: Tree of Life, The Dimock Center, CDC partners

The federal program known as the Affordable Connectivity Act, passed by Congress in late 2021, provides a \$30 monthly subsidy for qualifying households to apply to broadband service, and a one-time \$100 discount on a device (the device discount must also be used through the same provider). This subsidy can also be applied if renters receive their broadband service through the property owner. Comcast recently announced the \$30 Internet Essentials Plus program, which provides 100 Mb/s download speed (though the upload speed is 5 Mb/s, which can be problematic for large households). When the ACP subsidy is applied, this becomes a free service to the household. Signing households up for this program is intended to be a stop gap measure until a longer-term, more reliable, and affordable internet connectivity option is created.

There is only one subsidy per household, and it must meet certain qualifying criteria:

A household is eligible for the Affordable Connectivity Program if the household income is at or below 200% of the [Federal Poverty Guidelines](#), or if a member of the household meets at least one of the criteria below:

- *Participates in certain assistance programs, such as SNAP, Medicaid, Federal Public Housing Assistance, SSI, WIC, or [Lifeline](#);*
- *Participates in Tribal specific programs, such as Bureau of Indian Affairs General Assistance, Tribal TANF, or Food Distribution Program on Indian Reservations;*
- *Participates in the National School Lunch Program or the School Breakfast Program, including through the USDA Community Eligibility Provision;*
- *Received a Federal Pell Grant during the current award year; or*
- *Meets the eligibility criteria for a participating provider's existing low-income internet program.*

Urban Edge and partners might create a coordinated campaign to sign up residents for ACP-subsidized service through a new program of the community outreach teams, or by integrating the information into intake or other introductory or information gathering appointments and meetings. Supporting users to navigate the sign-up process would be an integral component of a program that promotes this benefit. MAPC is currently supporting a nonprofit organization in Revere to pilot ACP outreach and registration in their community and will share results and lessons learned from this pilot when complete.

2. Share locations and hours of public computer labs and digital device loan programs
Time Frame: Short Term
Partners: Tree of Life, The Dimock Center, Main Streets, JVS, CDC partners

Many CDC's have community spaces including computer labs, as does the Egleston Library (in addition to its hotspot and lending program). Roxbury Community College also has a computer lab, created by the Timothy Smith Network, that has open hours for community members. Other partners also have digital resources available or are in the process of creating those spaces. Hopefully, with the return of in-person activities, these spaces and the resources within should be promoted to the community through community outreach, social media, maps, and other promotional tools, including any new communication resources launched as part of this work.

Increase local capacity:

1. Hire staff member responsible for Digital Access and Equity for Columbus Ave residents
Time Frame: Short Term
Partners: Funders, CBOs, CDC partners

Over the last year in our work with community-based organizations and municipalities, MAPC has identified a clear gap in capacity in our region for addressing digital equity issues. Urban Edge or one of its partners would benefit from assigning this work to a new hire, so they might concentrate on developing and running digital literacy programs, building capacity and empowerment at a resident level, and managing the planning, deployment and management of digital services, including coordination of a community led group such as the Digital Stewards program. Additionally, this staff position would be responsible for advocacy work on behalf of the community and should consider leading efforts to create a digital equity coalition to support equitable funding and actions by City, State and Federal programs. A summer Fellowship at Urban Edge, where a local resident or nearby higher education student might be supported by Urban Edge staff to initiate the actions outlined in this document would be one way to jump start the work within the office and in the Corridor. Urban Edge is encouraged to explore funding mechanisms that would allow this staff person to be shared among partner CDCs and CBOs.

2. Further develop digital literacy and career training programs
Time Frame: Medium Term
Partners: Tree of Life, Tech Goes Home, JVS, CDC partners

When the first cohort of the Urban Edge/Tech Goes Home digital literacy training program comes to an end, in addition to any TGH post program surveys, Urban Edge program administrators and participants should conduct additional evaluation to determine where the program was successful and where it can be improved, within a community context. Armed with this information, Urban Edge staff should bring together local community-based organizations to understand how to expand the program, making use of the assets that different groups can bring to a collaborative program. Collaboration will allow staff to identify a larger group of potential

participants, activate spaces, and strengthen proposals for funding further digital literacy programming.

Each of the local stakeholder organizations might identify a subset of their constituents, be it seniors, youth, those looking to begin or change careers, local businesses and others. Local stakeholders can then develop outreach and program materials that target these users. Tech Goes Home is well qualified to develop new trainers, Timothy Smith has established career training programs for youth and young adults, JVS and RCC offer continuing education or training programs for adults, and the Main Streets organizations have the knowledge to share with local businesses. The Dimock Center, or another trusted entity could be tasked with supporting seniors.

3. Develop a local Digital Stewardship program

Time Frame: Medium Term

Partners: RCC, YouthBuild, Timothy Smith, CDC partners

Digital Stewardship takes a broader definition of digital literacy, empowering community members to understand the technology needs of their communities and gives them the tools to create solutions. Digital Stewards have built community networks, staffed computer labs, created marketing tools for businesses and provided IT support for communities. Digital Steward programs have been developed in schools, community-based organizations, and local community groups. Each one of these instances defines the activities of a Digital Steward a bit differently, and a Columbus Corridor version might do the same, starting with some of the actions outlined in this document. For example, Columbus Corridor Digital Stewards might lead the build out of a neighborhood Wi-Fi network and install smart sensors and the routers that pass that data. Helium routers, for example, earn money for hosts as they also handle data for “Internet of Things” devices, such as the monitoring devices on the new bus routes recently installed on Columbus Ave. Training materials and support are accessible through [Community Tech NY](#) and other groups, providing guidance for Digital Steward groups to organize themselves and their communities to create their own, tailor-made solutions to digital equity issues.

MAPC has engaged with Roxbury Community College to understand if Digital Stewardship might be a good program for undergraduates in Information Systems Technology and Broadcast Media departments to practice their learning in an applied way, within their community. The community college and its active student body might be an opportunity to build capacity within the neighborhood organizations and has been a presence in the community for many years.

Increase affordable broadband access:

- i. Identify, operationalize and circulate best practices for data cabling in new construction and renovation planning
Time Frame: Short Term
Partners: CDC partners

As Urban Edge continues to purchase and renovate or build new projects, it will be worthwhile to understand the process and cost for planning and installing fiber optic cable networks as part of the buildout. A first step would be to identify which buildings in the portfolio are in the pipeline for renovation or construction. Then, reviewing the process that was done in Holtzer or Walker Park, or by embarking on a new project, document the steps in that process. With this information, Urban Edge can operationalize this piece of the construction process, understand costs, and circulate the approach amongst its staff and the staff of other CDCs. This should be done campus wide and within the streetscape as well with partners in the Mildred Hailey renovation. Specific actions for the Mildred Hailey Apartments renovation, in coordination with participating CDCs and city agencies might include installing fiber in streets while constructing new street grid; installing in building wiring; and investigating costs for multiyear broadband service from ISPs and/or managed service providers.

- ii. Hire Managed Network Service Provider to design community-wide network deployment
Time Frame: Short Term
Partners: Network Service Vendor, MAPC CDC partners

Urban Edge should engage with a managed network vendor to understand the design, costs and operation of building a network. MAPC will support Urban Edge to identify, evaluate and choose a network vendor, and manage the vendor's process in designing a community network, building off the previous work and lessons learned as described in this document. MAPC will support the vendor to create a design that will include bringing broadband service to all of the Urban Edge properties in the Columbus Ave corridor and incorporate properties and assets of current project partners. The vendor will also be tasked with incorporating a public Wi-Fi option made possible by the support of the City of Boston and the Boston Housing Authority,

- iii. Upgrade connection at Holtzer and Walker Park
Time Frame: Medium Term
Partners: CDC partners, ISP's

As Urban Edge works to understand costs and process for building a larger neighborhood network, less expensive pilot activities can be pursued to understand costs, management, and usage rates. Due to their recent renovation, Holtzer Park and Walker Park properties feature in-building wiring that brings Internet access into each apartment. Currently, Urban Edge purchases

a small amount of bandwidth that allows residents access to their email and other light browsing. Urban Edge could increase the bandwidth of the Internet access that is provided to each apartment and learn how residents might make use of the service. Urban Edge could pilot this in one of two ways. Urban Edge could purchase an enterprise level service package from an ISP (1 Gb/s service is approximately \$1000/month) and provide that service free or at discounted rates to residents. Another option, if applicable, would be to work with current ISPs in the area to qualify all households in a building for the ACP subsidy, reducing each apartment's Internet service cost by \$30.

By piloting this building-wide approach, Urban Edge would understand the resources, financial commitment, and staff capacity required to provide digital access to its residents. Just as important, Urban Edge could understand residents' comfort level with alternative methods of broadband service, learn which residents would be willing to use such a service and at what price (the "take rate"), and through surveys and other community engagement, how the residents are using and benefitting from the service. Customer subscriptions to ISP bundled services (cable, phone, and internet as one package) have historically been a challenge to stand-alone broadband networks. As viewing habits change from cable to streaming services, we are beginning to see more users "cut the cord" of their cable TV services. This pilot could help Urban Edge to understand their residents' comfort level making that shift.

iv. Create outdoor and common area Wi-Fi access using City-supplied assets

Time Frame: Medium Term

Partners: City of Boston, Boston Housing Authority, CDC partners, YouthBuild, RCC

In partnership with the City of Boston and the Boston Housing Authority, MAPC suggests Urban Edge continue to take a leadership role in the digital equity space by creating an outdoor Wi-Fi network focused on providing free Internet access where it may be needed most. In addition to providing a free Internet service for residents, a public Wi-Fi network can encourage local communication using a splash page for users, serve as a training mechanism for Digital Stewards, provide alternative communication resource in the event of emergency, and test the feasibility of expanding a neighborhood network that serves residents in their homes. MAPC believes a Digital Steward program or other version of community engagement and oversight will be prerequisite for the success of a network deployment of this type.

v. Expand community broadband network into participating homes

Time Frame: Long Term

Partners: CDC partners

The challenges in creating an alternative network that can provide the speed, reliability, and service to replace residents' current home service are significant. The sum of the network building actions presented so far aim to provide a variety of opportunities to support Columbus Avenue residents with either low-cost service in their homes (ACP or Internet Essentials registration support) or "backup" Internet easily accessible and promoted as a resource (Outdoor and community

space public Wi-Fi). The design and administration of these services as well as the other related programs will serve to inform, engage, and empower local organizations and community residents to take further action on digital access and equity.

After cultivating this engagement Urban Edge and its partners will have the experience, skills, knowledge and community engagement to work towards creating an alternative broadband network. The community outreach of the digital literacy and other programs and the wireless bridges between buildings set up for the public Wi-Fi installations, coupled with the in-building wiring and uptake information gleaned from those pilots, plus learning the costs associated with providing that service will provide much of the information necessary for planning a successful community network. Additionally, this work will help Urban Edge and its partners understand the specific needs of the community, such as the speeds required to support local households and their digital activities, which many existing networks may not be providing, according to our research. Armed with the design and implementation costs gleaned from the managed service vendor's community network design, Urban Edge will have all the relevant information prepared for the launch of a neighborhood network.

Costs:

MAPC has suggested a range of actions to be considered, including generally low-cost programs to promote existing resources, mid-cost programs to increase local capacity, and larger infrastructure investments to build affordable broadband access.

It will be generally inexpensive to use existing channels and capacity to promote existing Tech Goes Home programs, library device loan programs, and public computer labs. To create new programs, whether they be digital literacy training or simply supporting ACP registration, will include the cost of planning, staff time, equipment, and overhead. For any programming to be successful, the cost of labor will be of greatest concern. However, building capacity within staff and constituents creates long-term benefits and allows subsequent investment in programming or other work to be more effective.

Costs for broadband networks must be split between capital (CAPEX) and operating costs (OPEX). CAPEX costs will include installation labor and equipment. CAPEX labor will include planning, installation, and often maintenance and monitoring for an agreed upon period of time. Equipment costs will vary depending on the size and scope of the network, and the manufacturer of equipment. Most managed network service vendors design networks using industry standard hardware. The more expensive equipment generally requires a subscription to its software service, which often leads to higher performance and better management tools. Equipment lifespans are generally 3-5 years. Historically, capital funding (CAPEX) has been the easier of the two types of costs to attract funding resources, especially if that funding comes from government sources. The Olnyville network in Providence, RI built by One Neighborhood Builders, a network that might closely resemble a network in the Columbus Ave corridor, raised \$225,000 to launch their network, installing 12 access points along with other equipment, and installing two fiber "laterals" connecting their buildings to the Internet.

Operational costs (OPEX) are often more challenging, as they must weather the storms of changing priorities, available resources, and generally create sustainability for the project. Operational cost will include the “Internet backhaul”, or the connection to the Internet brokered by an Internet Service Provider. Municipalities bulk purchase this backhaul or build their own networks, and occasionally share connection to the Internet as a community resource, such as free municipal downtown Wi-Fi networks. OPEX will also include the continued monitoring and maintenance done by the network vendor, though that role has occasionally been played by community members, creating economic opportunity and community engagement. One Neighborhood Builders believed their ongoing annual cost to be approximately \$25k per year at the outset of planning.

With community networks of the type being proposed, community outreach is essential, to increase adoption of the service and help community members identify and trust the Wi-Fi network as a community resource. Once again, Digital Steward programs accomplish this by having local residents become the installers, managers and customer service agents for the network.

Resource Opportunities:

It would appear Urban Edge embarked on working towards digital access and equity for its residents at a prescient time. The pandemic clearly demonstrated to many the importance of high speed, secure broadband networks, and the federal government seems to have responded to the need. Over the next few years, many millions of dollars will be spent to improve broadband networks, and a good portion of those funds are meant to go to unserved and underserved communities in Massachusetts, including urban areas, which have often been overlooked in previous broadband spending opportunities. Urban Edge and its partners are more prepared than most to advocate for their constituents and launch digital equity activities.

MAPC expects that in calendar year 2022, **The Massachusetts Broadband Institute (MBI) will administer \$50 million in funding provided by the federal government as part of the ARPA Coronavirus State Fiscal Recovery Funds.** “Shovel-ready” projects will be looked upon favorably in order to get these funds into action. Eligible projects will have the following purposes:

- i. closing the digital divide by facilitating equitable broadband service adoption in underserved and unserved communities.
- ii. expanding digital literacy for residents experiencing economic hardship including, but not limited to, persons eligible for the temporary assistance for needy families program, the federal supplemental nutrition assistance program, the federal communications commission’s emergency broadband benefit program, the federal communications commission’s lifeline program, and those whose household includes a child who is eligible for free or reduced price lunch; provided, however, that priority shall be given to programming for existing regional partners, public housing authorities and public libraries; and
- iii. empowering communities to use digital tools through the provision of devices, connectivity and training to low-income populations.

MBI is actively looking for proposals for these resources. Urban Edge and its partners should move quickly to determine which set of actions they might like to undertake in the immediate future that could be supported by these funds. MAPC can support the group to craft a proposal and share it with the proper staff members in the MBI office.

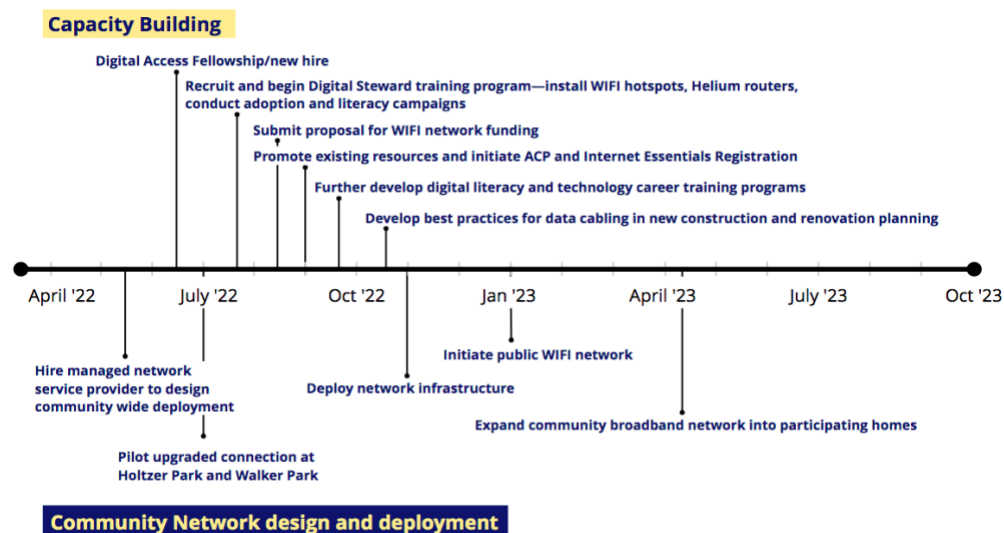
Also part of the federal ARPA Capital Projects Fund, \$175M was provided for broadband projects in Massachusetts. The State must organize itself and submit a Grant Plan and Program Plan(s) in September, which will allow for grants to be deployed in 2023. There are three eligible categories of projects for these funds:

- i. Broadband infrastructure projects
- ii. Digital connectivity technology projects
- iii. Multipurpose community facility projects (must jointly and directly enable work, education, and health monitoring)

A third set of funding is set to come from the federal government to the state of Massachusetts via the Infrastructure Investments and Jobs Act (IIJA). These funds will be administered through several programs by the National Telecommunications Information Administration (NTIA), and one of these programs will be the Broadband Equity, Access Deployment (BEAD) program. BEAD will include up to \$100M to MA for broadband infrastructure. In addition to BEAD, the FCC is working to create new, improved maps of Internet use and availability, which will help to determine which communities will be prioritized. The IIJA also includes the Digital Equity Act, with \$2.75B for 3 programs; funding to develop and implement the State Digital Equity Plan; support for digital inclusion activities; and building capacity related to the adoption of broadband

As we have discussed earlier, the Affordable Connectivity Program, born out of the Emergency Broadband Benefit that was created during the pandemic, is also a government subsidy. The ACP program reduced the benefit to \$30 from \$50, but the program was given a more permanent status.

Proposed Timeline of Work:



Appendix 1: Gateway and Secondary sites

See attached spreadsheet for [Urban Edge Property List – Network Planning](#)

Network Gateways

- 125 Amory
 - Owned by The Community Builders (TCB) and Boston Housing Authority (BHA), 125 Amory is one of the larger buildings in the area, and is prime real estate for telecom providers, as evidenced by the multitude of equipment on its roof. 125 Amory is connected to municipal fiber.
- Doris Bunte Apartments
 - Formerly Walnut Park, renamed in 2018 to honor the legacy of Doris Bunte’s advocacy on behalf of Boston’s low-income community, the BHA building is the tallest in the immediate area, a 20-story building that is set to begin renovations soon. Doris Bunte is also connected to the municipal fiber plant.
- Council Tower
 - An elderly and assisted living facility at 2875 Washington owned by The Council of Elders, this is the only other tall (17 story) building in the area. Though slightly more distant from the Columbus Avenue corridor, should Doris Bunte be unavailable to host equipment, Council Tower could be another option.
- 225 Centre
 - One of the taller buildings on Columbus Ave, this TCB building could be a useful link as the network travels down Columbus Ave
- 1785 Columbus
 - A project of Horizons for the Homeless and Boston Watermark, this new building is well situated on Columbus Avenue, and will house an education center, YouthBuild, and office space for Horizons for the Homeless.
- 3037 Washington
 - Centrally located overlooking Egleston Square, Urban Edge’s building is also next door to Boston News Network, connected to municipal fiber routes and hosts a Wicked Free Wi-Fi access point.
- Mildred Hailey
 - Though on a more distant timeline, facilitating affordable broadband through the redevelopment of the Mildred Hailey complex should be high on the list of digital equity work. The height of the buildings will offer line of site to other areas of the neighborhood, but that may be secondary to providing discounted service to Mildred Hailey residents, which can be enabled by choice made during construction of the buildings and streetscape at this site.

Secondary Sites

- 75, 25 Amory
- Holtzer Park
- Amory Residences
- Academy Homes
- Commercial businesses –Egleston Center
- Dimock Center
- Westminster House

Appendix 2: Community Network Examples

Communities in the US and around the world have worked to fill the gaps in broadband service left by the private ISP's. Those networks have taken on many different forms, but at the core of each is a group of individuals committed to improving access to information for the community. Urban Edge and its partners fit very well into this cohort, and it is only a matter of how they choose to accomplish the work.

Detroit Community Technology Project

DCTP formed officially in 2014 to encompass broader community technology education and organizing work and to share best practices, having previously built community power through the training of Digital Stewards, community leaders trained in broadband installation, network management and promotion. In its 8 years of existence, the DCTP has built 11 neighborhood networks, the majority in collaboration with community organizations providing outdoor Wi-Fi networks, occasionally partnering with ISPs to buy bulk fiber connectivity and serving users in their homes. As DCTP works to bring more individuals online, they expand their work to educate users about broader systems of data collection and surveillance technologies, so they may protect themselves online and off.

TCB in Providence

At the onset of COVID The Neighborhood Builders, owners of approximately 95 units of affordable housing in the Olneyville neighborhood of Providence, RI decided to take on the challenge it saw for many of its tenants, the ability to afford quality Internet connection. TND hired Harbor Networks to design a neighborhood network that would provide free Wi-Fi access to the 4000 residents of the area. TND's network was supported by OSHEAN, a nonprofit Internet and cloud services provider, which helped to keep costs down for backhaul and local connection to local broadband infrastructure. TND

began a capital campaign, ultimately raising more than \$200,000 and began installing 11 access points in 2021.

Red Hook Wi-Fi in Brooklyn

The Red Hook Initiative (RHI), a youth and community development nonprofit supporting residents of public housing in Red Hook, Brooklyn, began experimenting with wireless networks in order to share the resources offered by the community-based organization. When Hurricane Sandy flooded the neighborhood, cutting off access to electricity and phone/Internet services, the nascent network enabled residents to connect to the Internet and organize relief efforts in the aftermath of the emergency. RHI then initiated a Digital Stewards program, training local young adults to install, maintain and promote the network, eventually leading to a technology career training program of the same name. The Red Hook Digital Stewards installed Wi-Fi hotspots throughout the neighborhood, outdoors, in businesses and in community gathering places. Through RHI's advocacy, Mayor DiBlasio initiated Wi-Fi access in 5 public housing developments, Queensbridge Houses being the first to deploy. The Red Hook Houses are next to have Wi-Fi access installed, but that process has moved haltingly due to a variety of reasons. The story of Red Hook Wi-Fi demonstrates the challenges and opportunities that arise in community led programs working in collaboration with government offices.