

Going for Growth Promoting Digital Equity in Massachusetts Gateway Cities

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I. Introduction

The coronavirus pandemic exposes the extent to which those with modest means are increasingly separated from access to opportunity. While these inequities were well documented before the current crisis, our efforts to address them were often halfhearted. The anemic response to the digital divide is a particularly striking example because today's information and communications technologies (ICTs)—innovations pioneered by Massachusetts residents and companies—offer enormous potential to span historic divides and foster a more inclusive society. Yet, as these technologies matured over the past two decades, by and large, the opposite has occurred.

The problem is especially pronounced in Massachusetts Gateway Cities, inclusive regional hubs that should serve as escalators to economic opportunity. Tens of thousands of Gateway City residents lack computers and reliable internet access. The majority of Gateway City residents who do have internet service have no choice in provider, which means they pay high fees for a relatively poor product. There are also profound skills gaps. Thousands of Gateway City residents have not received education and digital literacy training to make full use of these technologies at home and in the workplace.

From increasing access to wealth-building financial services to providing support to immigrant entrepreneurs, our *Going for Growth* policy brief series has sought to call attention to high-impact strategies to generate inclusive economic development for Gateway Cities and their residents. It is hard to think of an area of focus with the

Key Takeaways

- Entering the pandemic, nearly one-quarter of Gateway City households did not have a subscription internet service at home; another 10 percent depended on unstable connections to the internet such as a mobile phone. A similar proportion (28 percent) of Gateway City households did not have a computer at home.
- Data collected by the MassINC Polling Group through surveys conducted in June and September 2020 indicate Gateway Cities have reduced the number of school-age children without internet access and computing devices by about 40 and 66 percent, respectively. However, approximately 23,000 families still lack reliable internet service and 14,000 are without a sufficient number of computing devices.
- Through digital inclusion planning, Gateway Cities can sustainably increase access to technology and build digital literacy. By channeling resources toward these efforts in a targeted fashion, the state can accelerate this work and garner a range of benefits.

potential to generate more gain over the short-, medium-, and long-term than a blueprint to achieve digital equity.

One month before the pandemic hit, the Brookings Institution's Metropolitan Policy Program released a major report documenting how the fate of cities is now tied to the ability of their residents to make use of ICTs.² Internet access, computing devices, and digital literacy are critical to succeeding in school as well as enabling self-directed learning and discovery. They provide access to information and services to improve our health. They offer social connectivity and strengthen relationships with others near and far. And they have become essential tools for career advancement, small business growth, and civic participation.

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With data drawn from the Census Bureau, school departments, libraries, and local crowdsourcing, communities can map the contours of the digital divide neighborhood by neighborhood and marshal a coordinated campaign to close it. Gateway Cities lag behind in this work. COVID-19 necessitates immediate action: schools must engage students in remote learning; health care providers need to deliver more behavioral health services to patients struggling to cope with the stress of the experience; the workforce system must reach thousands of workers who have lost jobs and require employment services; economic development agencies must help small businesses find new ways to serve customers.

This policy brief describes the dimensions of the digital divide in Gateway Cities, unpacks the arguments for a concerted effort to increase digital inclusion, reviews strategies and resources that communities can pursue, and presents a state-level policy agenda to help Gateway Cities meet immediate needs while laying the foundation for more durable solutions. The ideas presented in the pages that follow are informed by digital divide literature and interviews with leaders from organizations at the intersection of this work in technology, education, health care, and workforce development. Like previous MassINC policy briefs, this paper offers fodder for policy dialogue. However, we also hope that at this unique moment, it will also spur and support immediate action, both in Gateway Cities and similarly situated communities, where residents have not been able to access the full benefits of 21st century technology.

II. Sizing up the Digital Divide in Massachusetts Gateway Cities

When the term “digital divide” first came into regular use in the mid-1990s, it described households lacking physical access to an internet connection. However, it quickly became apparent that we faced a larger, more complex problem. By the early 2000s, sociologists were arguing that the inability to afford internet service and adequate computing devices, coupled with lack of opportunities to build digital skills, would lead to wider levels of inequality throughout society. This prediction could not have been more accurate. The analysis below sizes up the digital divide in Gateway Cities, providing order-of-magnitude estimates for planners and policymakers.³

Internet Service

Physical access to broadband internet service is now widely available in urban areas. However, it is generally delivered by large internet service providers (ISPs) with regional monopolies. Limited competition elevates prices and reduces service quality, particularly in low-income areas. This pattern is so pervasive that some use the term “digital redlining” to refer to lack of investment and competition in underserved markets. According to data collected by the Federal Communications Commission (FCC), residents effectively have just one option for a wired broadband provider in 16 out of the 26 Gateway Cities.⁴

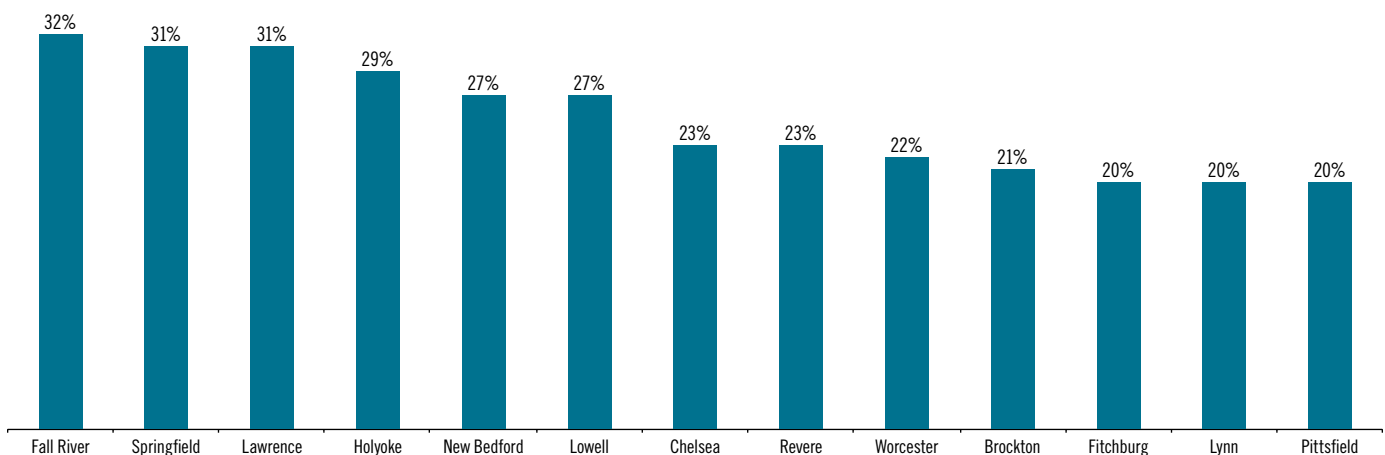
On average, access to a broadband internet service is approximately \$70 per month in Gateway Cities with setup fees around \$100. This initial fee to establish service is often a significant barrier, particularly when residents do not know how long they will be able to remain in their homes. Past MassINC research has documented the frequent moves many Gateway City families make as a result of financial instability.⁵

While ISPs do offer inexpensive programs for low-income households, these plans often come with slower speeds and data limitations that reduce their utility. Available information suggests only a fraction of eligible households participate, and many communities complain that providers refuse to provide enrollment figures and join efforts to increase awareness.⁶

In response to the pandemic, some ISPs have temporarily waived fees for these programs and increased speeds. But many cities still struggle to get families reliable internet. In Worcester, for example, the school district was unable to bulk purchase the low-cost plan for students through the local ISP.⁷

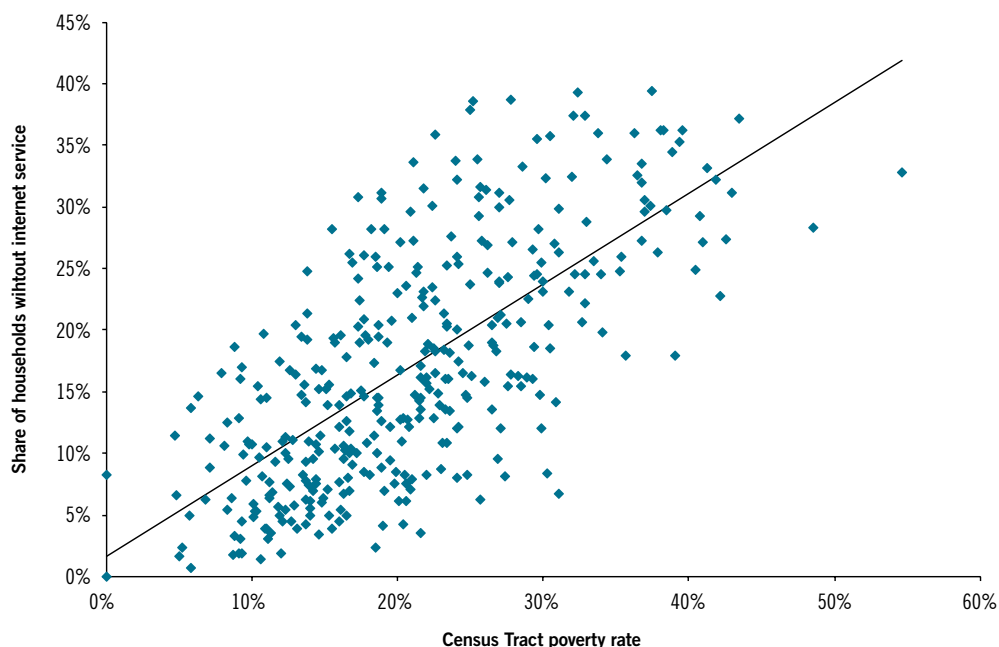
Recently the Census Bureau added questions to the American Community Survey that provide a detailed picture of internet access down to the neighborhood level. The data show 15 percent of Massachusetts house-

Figure 1: Share of households without internet service, selected Gateway Cities



Source: American Community Survey, 2014-2018 sample

Figure 2: Relationship between poverty and internet access, Gateway City Census Tracts



Source: American Community Survey, 2014-2018 sample

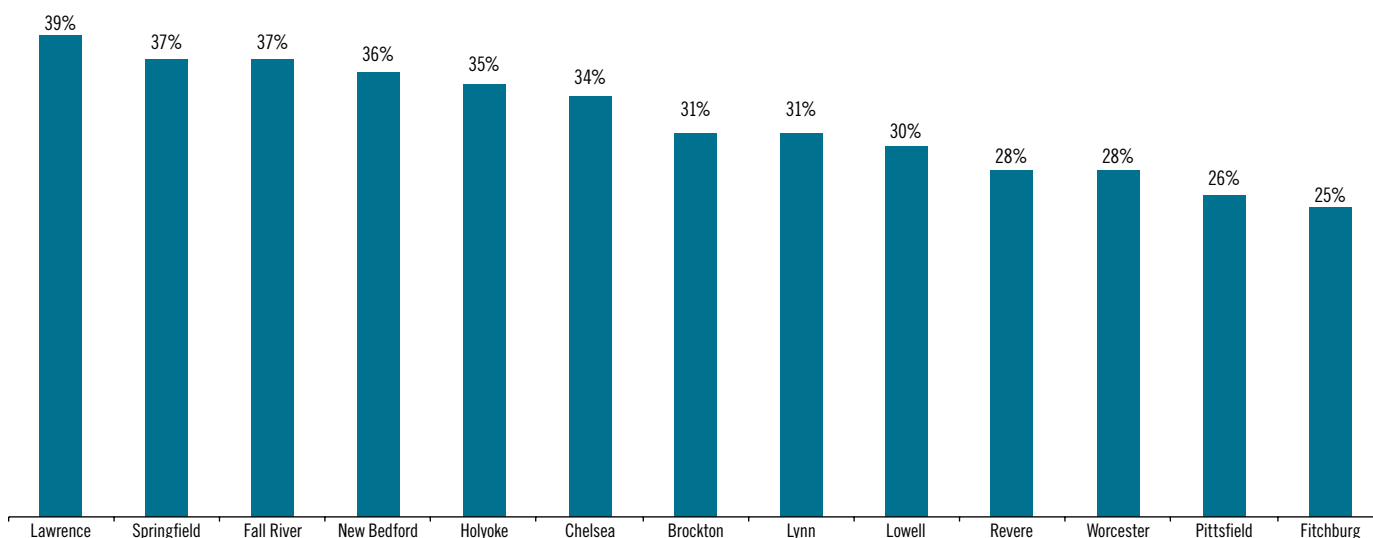
holds did not have an internet subscription in 2018. In Gateway Cities, the figure was far higher: nearly one in four homes had no internet service (22 percent); another 10 percent depended on unstable connections, such as a mobile phone or a neighbor's unprotected wireless network.

According to these Census figures, Fall River has the third-highest share of disconnected households in the state (32 percent), trailing the small Franklin County towns of Monroe and Wendell. Springfield (31 percent), Lawrence (31 percent), Holyoke (29 percent), and New Bedford (27 percent) fall in the top 10 Massachusetts communities with the lowest rates of household internet access. If the 26 Gateway Cities were a county, the share of households (22 percent) without internet access would surpass Berkshire (18.6 percent) and Franklin (18.8 percent), the state's most rural counties (**Figure 1**).

Often Gateway City households without internet are clustered in a handful of neighborhoods. Lawrence, Lowell, New Bedford, and Pittsfield each have Census

tracts where more than 40 percent of households are without internet. Fall River has five Census tracts where between 40 and 55 percent of residents have no connection. Across the Gateway Cities, there are approximately 100 neighborhoods where more than one-quarter of residents have no service. As **Figure 2** depicts, lack of internet access and neighborhood poverty rates are highly correlated.

Survey data collected by the MassINC Polling Group (MPG) in June 2020 found 13 percent of Gateway City families with school-age children did not have reliable internet access. A second MPG survey conducted in October 2020 found a similar level of Gateway City families with children remained without good internet service. Together, these two surveys suggest early pandemic response efforts by ISPs and school districts cut the number of families without connections by about 40 percent; further reductions, however, have been difficult to achieve.⁸ Using Census data, we estimate 23,000 Gateway City households with children still lack reliable internet service at home.

Figure 3: Share of households without computers, selected Gateway Cities

Source: American Community Survey, 2014-2018 sample

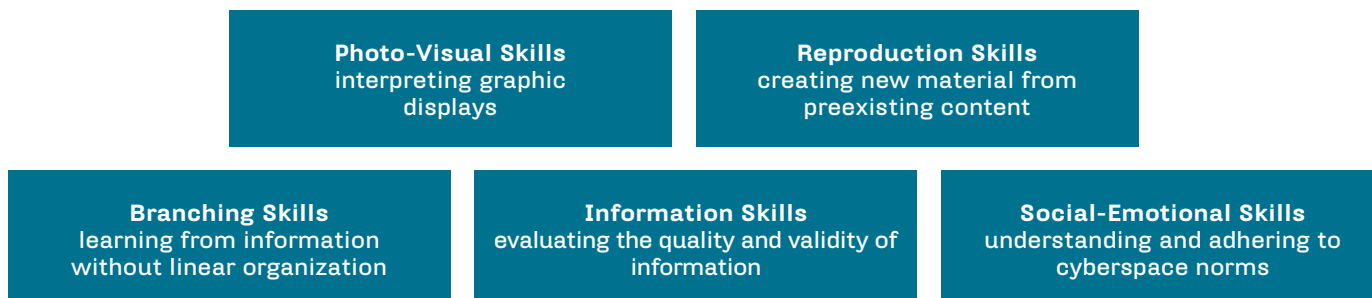
Computing Devices

Today, nearly all households with means in Massachusetts have tablets and computers. In contrast, a sizeable share of low-income households is “smartphone dependent.” These devices are still very expensive, so low-income households frequently purchase secondhand, which leaves them with slower, less stable technology, cracked screens, and limited battery life. To make matters worse, signal disruptions, monthly data limitations, and inability to pay bills lead to regular spells without internet service. Studies show that even in the best of circumstances smartphones lack the functionality necessary for academic work, job search, and some forms of telehealth.⁹

Smartphone dependence helps explain why higher-income individuals are more likely to use the internet to gain information and perform transactions, while disadvantaged users frequently confine their online activities to more limited social and entertainment uses. Evidence demonstrates simply having access to a computer rather than a smartphone shifts internet utilization toward “capital-enhancing” activities.¹⁰

Census data show 18 percent of households in Massachusetts did not have a laptop or desktop computer in 2018. In Gateway Cities, the share was much larger, with 28 percent of households lacking such devices. In Lawrence, nearly 40 percent of households did not have computers. The same was true for more than one-third of households in Springfield, Fall River, New Bedford, Holyoke, and Chelsea (**Figure 3**).

The June 2020 MPG survey found 16 percent of Gateway City families with school-age children did not have enough computing devices to meet the household’s needs. As with internet service, the initial pandemic response last spring addressed about 40 percent of this problem. The most recent October MPG survey found that 9 percent of Gateway City families did not have a sufficient number of devices. While this suggests two-thirds of the need has now been met, nearly 17,000 households with children still require additional computing devices by our estimate.¹¹

Figure 4: Five Core Digital Literacy Skills

Source: Eshet-Alkali and Amichai-Hamburger (2004)

Digital Literacy

From interpreting graphical displays and evaluating the validity of information to adapting to the norms of online behavior, digital literacy requires a range of both cognitive and social-emotional skills (**Figure 4**).¹² We often hone these skills through self-learning, which means young children without access to technology fall behind in acquiring them.¹³ People who build digital skills in one domain (e.g., social uses) often transfer and enhance those skills in other domains (e.g., political uses). This “compound growth” confers even greater advantage to those who develop digital literacy skills early.¹⁴

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Several questions on the MPG survey provide an indication of digital literacy skills among Gateway City residents. For example, nearly one-quarter of Gateway City parents responding to the survey reported difficulty using the computer systems required for remote learning, which was 6 percentage-points higher than non-Gateway City parents.

Perhaps most tellingly is the significant number of parents who do not use email. A full 13 percent of Gateway City respondents reported not using email communication compared to 7 percent of non-Gateway City respondents. Taking email usage as a proxy for basic digital literacy provides a basis for order of magnitude estimates. Approximately 14,000 Gateway City households with school-age children have at least one adult who may need digital literacy training and assistance.

The figures cited above reveal significant need. If gains made through pandemic response efforts are not sustained, the digital divide will almost certainly widen. Alternatively, Gateway Cities could marshal resources and leverage existing capacity to mount robust campaigns that lead to sustainable increases in digital equity.

III. The Multifaceted Benefits of Closing the Digital Divide

As the internet emerged, many speculated on the potential information and communication technologies (ICTs) held to reduce inequality in society *if* we could close the digital divide. A growing body of evidence demonstrates that ICTs can increase well-being and access to opportunity for low-income households across a number of domains, including health care, workforce development, civic participation, education, and economic development. Below we describe these benefits with a Gateway Cities lens, drawing from peer-reviewed research as well as anecdotal evidence emerging from the pandemic's many natural experiments.

1. Health care

With improvements in technology and increasing pressure to increase access to quality care and reduce health care costs, medical leaders have been working for years to expand the use of telehealth.¹⁵ However, up until the pandemic, telehealth remained a relatively rare delivery mode for Massachusetts. In 2017, just four out of 1,000 commercially insured patient visits in the state occurred via telehealth, a rate well below the national average.¹⁶ Executive orders issued in the early days of the pandemic made it possible for providers to receive reimbursement for care provided remotely. Overnight, Massachusetts became a leading telehealth state.¹⁷

There is good reason to believe the increase in telehealth will provide especially large benefits to low-income patients and people of color *and* reduce health care costs. This is because those with limited means face barriers to accessing in-person care, including lack of providers in their communities (particularly culturally competent providers), larger transportation cost burdens and lack of transportation options, larger childcare cost burdens, and difficulty taking time off work (especially for those without paid leave).¹⁸

The barriers low-income patients face accessing care also lead to more cancelled appointments, which impose a substantial cost burden on under-resourced community hospitals and community health centers.¹⁹ As care transitioned to telehealth during the pandemic, the Lowell

Community Health Center (see box p. x) and other providers in Gateway Cities immediately saw the costs associated with missed appointments fall dramatically.

A growing body of evidence suggests increased access to telehealth allows for stronger delivery of case management services, which is particularly beneficial for patients seeking behavioral health care and treatment for chronic conditions.²⁰ These ailments are especially prevalent in low-income communities, where poverty creates toxic stress and increases exposure to poor environmental conditions, both at home and in the workplace, leading to chronic illness.

Increased access to behavioral health services associated with the move to telehealth during the pandemic has been particularly beneficial for patients with opioid use disorder. Emergency regulations allowed physicians to prescribe and monitor medication-assisted treatment (MAT) using telehealth. Providers in Massachusetts report that this change has made it more likely that those with opioid addiction will seek MAT and adhere to treatment protocols. While it is too early to conclude that this increase in uptake will yield strong treatment outcomes, long-term pre-pandemic studies indicate receiving MAT treatment via telemedicine yields the same benefits as receiving care in person.²¹

While telehealth has already led to significant gains for low-income patients, there is good reason to believe that much larger benefits are possible if we can increase digital literacy in Gateway Cities. Patients with access to their providers and medical records through online portals are more engaged in their care and have better treatment outcomes.²² Knowledgeably consuming general health information online benefits diet and exercise, increases access to appropriate treatment, and improves clinical outcomes.²³ To be sure, socioeconomic inequality may make it difficult for all people to experience these benefits equally for various reasons unrelated to the digital divide. However, new research does indicate that digital skills training on its own can effectively lead to improved health outcomes for low-income patients.²⁴

The Lowell Community Health Center Turns to Telehealth

Located in the heart of downtown, the Lowell Community Health Center (LCH) provides access to quality treatment and care to thousands of immigrants and low-income residents. Before the COVID-19 pandemic hit, LCH did not use telehealth; while on its list of priorities, telehealth services were not previously reimbursable. The health center's staff also believed the barriers posed by the digital divide would be extremely difficult to overcome. In early March, the pandemic forced the center to abandon all in-person care with the exception of obstetrics and pediatrics for high-risk newborns (and other exceptions on a case-by-case basis). In a mere four weeks, LCH went from taking zero telehealth patients to serving over 800 daily.

Almost immediately the strengths of telehealth became apparent. No-show rates for appointments fell dramatically, especially for behavioral health visits. This increased the productivity of clinicians. As providers grew accustomed to telehealth, they also found that in many cases it helped them develop more intimate relationships with patients. The virtual consults opened a window into home environments, and patients shared information that they may have been uncomfortable communicating previously during in person visits.

LCH did encounter some telehealth challenges. For care deliver over the phone, the use of translators to overcome language barriers was made more difficult by the necessity of three-way calls. And video conferencing was not always possible, either because patients did not have adequate internet service or they feared a video call would push them over their plan's data limits, saddling them with an expensive bill.

According to the Pew Research Center, more than a third of Americans without internet service have difficulty creating professional resumes, contacting an employer via email, or filling out an online job application as a result.

2. Workforce Development

When it comes to finding and holding a good job, technology is a double-edged sword for residents with limited means: with computers and the internet becoming ubiquitous in the workplace, the digital divide produces acute labor market challenges for those without the requisite skills. At the same time, digital technology presents viable solutions to help workers efficiently retool their skills to keep up with the accelerating pace of change.

Analysis from the Brookings Institution shows the demand for basic digital literacy skills is increasing rapidly, even among low-skill occupations like home health aides.²⁵ In middle-skill jobs that offer family-sustaining wages, the Urban Institute finds the vast majority of positions now require the ability to operate a computer, access the internet, and use spreadsheets and word processing software.²⁶ Even when jobs do not call for digital skills on a daily basis, these abilities are needed to locate and apply for most jobs.²⁷ According to the Pew Research Center, more than a third of Americans without internet service have difficulty creating professional resumes, contacting an employer via email, or filling out an online job application as a result.²⁸

A pre-pandemic MassINC study found 40 percent of adults living in Gateway Cities lacked skills (a post-secondary degree or credential) and struggled in the labor market, meaning they were either unemployed, not looking for employment, or they held very-low-wage jobs.²⁹ Insufficient digital skills for both job searches and to meet occupational demands were likely a major contributor to the employment challenges many of these Gateway City residents face.

Targeted intervention to increase digital literacy and connectivity can make a major difference, as demonstrated by Tech Goes Home (TGH), a Boston-based nonprofit that provides digital skills training and helps low-income residents gain access to affordable devices and internet access. In 2019, the program served more than 3,500 adults at an average cost of \$750 per household (including new computer, one year of internet service, and all training). Approximately 20 percent of participants report finding a better job, continuing on

to employment training, or starting their own business after completing the program. Nearly 30 percent of adults served by TGH were unemployed entering the program, and 40 percent of these participants reported finding work as a result of the skills they built through TGH (see box p 16).

Technology that enables remote learning could help address this problem; however, the digital divide is a barrier to accessing these services. The workforce development system has been slow to offer online learning largely because clients lack access to devices and internet service. Despite these barriers, the pandemic experience shows providers can find ways to reach their clients online and build digital literacy skills through remote instruction. YouthWorks, a state-funded employment program for teens and young adults, found operating virtually this past summer allowed it to increase access to a richer set of learning opportunities (see box p. 10). Jewish Vocational Services retained approximately 85 percent of students in courses forced to transition to remote learning. Through the prolonged disruption to traditional classroom instruction, these programs have discovered real benefits from online learning, both in terms of recruiting adult students and increasing returns to scale (see box p. 9).

Achieving greater scale is critical given the mismatch between workforce development needs and the available resources. Quality instructional materials for students to draw from are increasing freely available. For example, Goodwill Industries has developed over 2,000 lessons covering over 200 topics of direct relevance that anyone looking to improve workplace skills, digital and otherwise, can access without paying any fees. However, there are limits to how much scale the workforce system can achieve without additional resources. While online learning platforms provide for more efficient and scalable instruction, experience shows this technology does not work well absent relationships among both teachers and peers. Adult learners need people working within trusted organizations to establish learning communities that can offer support, direction, and motivation.³⁰

Jewish Vocational Services' Move to Online Learning

Jewish Vocational Services (JVS) is one of the region's largest providers of workforce development and adult education services. In any given week, JVS serves approximately 4,000 clients. While the organization's strategic plan called for slowly developing and testing online learning platforms, the pandemic forced the organization to move the vast majority of its work online in a matter of weeks.

Fortunately, JVS had a head start with a \$2 million dollar grant from the Dell Foundation to develop blended in-person and online instructional models. It was able to quickly offer 60 classes online.

To facilitate the move to online learning, the organization contracted with an IT service provider, which offers help desk support, reducing the burden for instructors.

Remote learning has increased participation by reducing travel and childcare barriers. It has also strengthened recruitment, particularly among unemployed individuals who may have previously had to connect with JVS through the stigmatic experience of visiting a career center in person.

Current clients mostly had relationships with teachers and fellow students that predated the pandemic. Helping nurture these supportive ties could be challenging in the future. And clients' lack of adequate computing devices and internet service is still a significant barrier. While the need is less than anticipated, the organization has not been able to overcome these obstacles with about 15 percent of its clients.

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YouthWorks Provides a Virtual Summer Job

YouthWorks is a state-funded employment program for teens and young adults managed by Commonwealth Corporation. Participants receive paid short-term work placements at public, private, and nonprofit worksites. Most youth participate during the summer when they are out of school. This summer 3,800 youth received virtual summer jobs.

Administrators encountered significant digital divide challenges shifting to an online model. For example, program leaders had to negotiate with schools so students could keep their Chromebooks for the summer. This was not always possible. Many students participated as best they could using just a smartphone.

Despite these obstacles, there were clear benefits from the online model. A few times each week the youth gathered online for one-hour “lunch and learn” sessions in which three adults shared information about their professions and career pathways. Over the course of the summer, the students heard from over 200 professionals, many of whom were working outside of Massachusetts. In the past, students had in-person career exploration activities, but they only heard from a small number of professionals.

YouthWorks participants also received training and earn industry-recognized credentials, for such professions as web-design and Certified Nursing Assistant. Providing these courses virtually allowed YouthWorks to offer all students a greater variety of offerings.

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3. Civic Participation

In 2019, MassINC issued a lengthy report that cataloged systemic challenges that lead to lower rates of civic participation and underrepresentation of communities of color in civic leadership, particularly in diverse Gateway Cities.³¹ One of the most prominent concerns—the decline of local newspapers—has been exacerbated by the coronavirus pandemic. Many Gateway Cities are now effectively news deserts. This leaves residents without vital information, which will further suppress civic engagement. While there are no easy answers to these challenges, closing the digital divide is a crucial first step.

Research shows that access to broadband increases the likelihood that citizens will vote, donate to political campaigns, and contact their representatives.³² At a neighborhood level, information and communication technology can increase social capital, the web of relationship and trust among residents that make for healthy communities.³³ Research also suggests social networking sites are increasingly providing access to information and organizing tools for political action that increases civic participation, both online and off.³⁴ Perhaps most important, studies find the ability to engage through technology reduces some of the barriers those with limited means face, which leads to lower socioeconomic disparities in civic participation online, after controlling for the digital divide.³⁵

ICTs also present opportunities and challenges when it comes to trust and confidence in government. From renewing vehicle registrations to responding to a jury duty summons, government services have largely migrated online in order to provide customer convenience and reduce costs. By offering these services more conveniently and efficiently, as well as by increasing transparency through public websites, governments can counter the decades-long decline in public trust.³⁶ However, those who do not have access to these websites often have less information and receive inferior service delivery, which lowers their confidence in government. This is particularly problematic in underserved communities of color, where trust in government is often significantly lower.³⁷

4. Education

Numerous studies detail the disadvantages students face when they do not have access to internet service and devices to complete their homework, explore their interests and discover new worlds online, or connect and engage with teachers and peers.³⁸ It is critical to extend this discussion by digging deeper into the benefits erasing the digital divide could have for both parent engagement and comprehensive student support.

Recent MassINC research shows that “local accountability” for school performance is woefully underdeveloped.³⁹ Studies have long demonstrated that engaging parents and involving them in school governance increase student success.⁴⁰ This is not easy work to undertake, especially in cities that lack capacity in community-based organizations to cultivate trust, build relationships among neighbors, and nurture civic leadership. However, experience in the pandemic suggests connecting with parents online dramatically reduces barriers to participation.

At an education committee hearing last May, Gateway City school leaders touted the much improved two-way communication they had established with parents through Zoom as one of the silver linings of the pandemic.⁴¹ And whereas last fall’s Gateway City school committee debates often drew only a handful of voters, this summer hundreds of parents in Gateway City school districts joined town halls to discuss school reopening strategies.

This communication is especially critical as schools work to address the trauma students and families will experience as the toll of the pandemic increases. Work by the Trauma and Learning Policy Initiative (TLPI), which has more than a decade of experiences helping schools adopt “trauma-sensitive” designs, shows that family engagement is central to the development and execution of strategies to provide both instruction and support that is responsive to the social-emotional needs of students and families.⁴²

As schools move to engage parents through the use of technology, it is also important that they recognize the historic legacy of not providing power and voice to parents. Two-way communication over these platforms can be challenging. If leaders do not provide members of the school community sufficient opportunity to be heard, it will set precedents that could make it more difficult to engage parents over this medium in the future.⁴³

Much like telehealth, evolving ICT has long been seen as an opening to improve case management for comprehensive student support. A 2015 MassINC-UMass Donahue Institute report described efforts to nurture social-emotional development by using resources sprinkled throughout the community to meet the needs of the whole child.⁴⁴ The Boston College Center for Optimized Student Support at Boston College has delved deeply into this work. Closing the digital divide clearly presents new opportunities to employ technologies that will help families access appropriate forms of support in the community, monitor their efficacy, and generate valuable data to reveal gaps between supply and demand for these services.

Springfield Public Schools Make Technology Access a Top Priority

Home to over 26,000 students across 60 schools, the Springfield Public School District has been working for a number of years to increase access to computers and digital learning. Prior to COVID-19, grades 3–12 had achieved a 1:1 ratio, providing each student with a laptop to use for schoolwork, which those who needed could bring home. In kindergarten through second grade, typically two students shared the same laptop, trading off on alternating days. When schools moved to remote learning in the spring, the district distributed over 18,000 Windows touch-screen laptops.

Efforts to increase access to technology in Springfield provide numerous lessons for other Gateway City districts. In School Year 2018–2019, Springfield had a 1 percent loss rate for laptops. The district budgets for devices to last five years. The devices issued to students turn over every four years. Five-year-old devices are used as backups when students need temporary replacements. An IT staff of eight services the computers. The district also purchases a warranty on each device, largely to cover battery replacements.

5. Economic Development

From improved health to more education and skills, the benefits of a carefully honed digital divide strategy will generate meaningful long-term economic growth for Gateway Cities. But there are also more direct and immediate economic development considerations.

LISC-Boston's Beyond Six Feet Apart Accelerator and other efforts to help small businesses weather the pandemic found digital literacy presents a major challenge (see box p. 12). Limited use of digital information systems made it difficult for many businesses to provide documentation to apply for recovery loans and other public assistance. Information about resources and changing regulatory requirements was slower to reach these businesses because they were not receiving notices disseminated electronically. And many businesses are having difficulty reaching existing customers or tapping into new markets online.

Efforts to improve broadband in Gateway Cities could have broader implications if this crisis serves as an inflection point for the influence of ICTs on urban form. Theorists have long argued that these transformational technologies will lead to greater decentralization of both workers and businesses, particularly in congested regions.⁴⁵ While this has not occurred up until now, major companies have announced plans to permanently allow employees to work remotely. This may provide an opportunity for Gateway Cities. Evidence suggests that many remote workers have a preference for walkable neighborhoods with amenities and options for networking and social interaction.⁴⁶ Telecommuting from dense urban locations also has major environmental advantages.⁴⁷

If Gateway Cities can cultivate a residential market for remote workers who previously resided closer to the region's core by offering reliable and affordable high-speed internet service, it will create more local demand for Gateway City businesses to serve, a new pool of talented workers for Gateway City employers to tap, and more local startups launched by former remote workers striking out on their own.

LISC Boston's Helps Small Businesses Survive COVID-19 by Building Digital Skills

LISC Boston recently launched the Beyond Six Feet Apart Accelerator (BSFAA) to help small minority-owned businesses in the region grow. This new program quickly pivoted to helping these businesses respond safely and strategically to COVID-19. LISC partnered with the IXL Center, a global business consulting company, to pair MBA students with the small business owners. Supported by IXL consultants, they worked together for five weeks, exploring low-cost, digital solutions to avoid unnecessary contact, reach customers, and capture new demand. Businesses and their consulting teams met weekly over Zoom in sector-specific groups, networking and developing sector-specific strategies. Since June, BSFAA has assisted nearly 50 small businesses in two waves.

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IV. Tailoring a Local Strategy to Close the Digital Divide

Cities working to tackle the digital divide approach the problem from two directions—broadband access and digital literacy—and then mount a tactical response from both sides following a digital equity plan. Below we flesh out this strategy, providing examples of leading cities, technical assistance providers, and local institutions that Gateway Cities can tap into as they tailor their local response (**Figure 5**).

1. Increasing Broadband Access

Across the country, a small but growing number of municipalities have built their own fiber optic networks. This requires significant borrowing that may or not be serviced entirely by future fee revenue. Communities are often able to justify this risk by the prospect of providing residents with much improved service, connecting underserved low-income households, and accomplishing a variety of other municipal goals.

Massachusetts communities with some form of municipally owned broadband network include Braintree, Chicopee, Concord, Leverett, Norwood, and Westfield. These networks are all operated by existing municipal electric utility companies. More than two decades ago, Braintree Light and Electric built a fiber optic network to provide residents with more speed and reliability.⁴⁸ In Concord, the municipal electric company laid fiber in the 2000s hoping to improve internet service, while also enabling smart grid technologies to increase energy efficiency.⁴⁹

Gateway Cities with municipal electric companies have also been able to develop municipal broadband despite serving a lower-income market where it is more difficult to generate strong revenues (particularly when the goals include reducing the cost burden and expanding access). Westfield Gas and Electric has benefited from significant subsidy. In exchange for extending fiber to 20 surrounding rural communities, it has received \$20 million from the state's Last Mile Infrastructure Grant program and \$10 million in federal funding. Chicopee Electric Light is

managing risk by dividing the city into 140 “fiberhoods.” When a sufficient number of residents in an area sign up to make deployment financially viable, it will extend service to the neighborhood.

Several other Gateway Cities including Lowell, Springfield, and Quincy have examined municipal broadband. The Worcester Regional Chamber of Commerce conducted a detailed analysis of the city's fiber infrastructure in 2015 with an eye toward economic development opportunities.⁵⁰ In the wake of the challenges students experienced with remote learning last spring, the Greater Worcester Regional Research Bureau looked closely at residential internet service in a report this past summer.⁵¹

Municipal electric companies, which offer capacity to spearhead complex technical projects and assume debt, have played a critical role in the deployment of publicly owned broadband networks locally or at regional scale. However, the pandemic has fueled efforts by groups that are working to provide communities with other models to make municipal broadband a reality. Leading examples of organizations offering technical assistance that Gateway Cities can engage include the Institute for Local Self-Reliance and Next Century Cities.

Communities working creatively to increase access to affordable internet service are often able to find intermediate solutions that do not involve the cost and risk associated with building a complete network. For example, cities can selectively use schools, libraries, parks, light poles, and other public assets to broadcast wireless signals to underserved neighborhoods. In a handful of cities, this is occurring without assistance from local government. Neighbors are acting independently, fashioning “mesh networks” with antennas that relay signals wirelessly from rooftop to rooftop, giving residents free access to high-speed internet service.⁵² While these projects are unlikely to provide scalable or sustainable models, they illustrate how communities can increase broadband access with ingenuity and resolve.

2. Building Digital Literacy

Cities can help build digital literacy through a web of community partners, including early learning centers, public schools, libraries, senior centers, public housing authorities, and community-based nonprofits. Many of these institutions have years of experience teaching digital literacy, albeit often in a low-key manner that we have not fully appreciated. Others are just beginning to understand the important role they can play.

As a sector, early education is discovering the various ways it can help families overcome the digital divide. Studies by Rand and New America demonstrate how early learning centers can take a “two-generation” approach, introducing technology to children in their classrooms while also helping families get connections and technology in the home, directing parents to developmentally appropriate software and websites, and helping them establish patterns for utilizing technology in a safe and healthy manner. Early education and care providers can also familiarize parents with email and other services that facilitate two-way communication with educators and help them monitor their child’s progress.⁵³

Public schools districts can integrate digital literacy into their efforts to build kindergarten readiness by working collaboratively with private early education providers to improve and align instruction. Similarly, they can also develop a similar two-generation approach to building digital literacy of both students and parents who have not been served by the early care systems. Public schools districts increasingly provide one-to-one devices to students. This a substantial investment that will yield much larger return if schools allows students to bring the devices home *and* encourage family members to make use of them. Bringing parents into schools at the beginning of the year to familiarize them with the device and the classroom technology is also an excellent way to establish strong parent-teacher relationships.

For residents who are not connected to the schools, public libraries play a particularly important role building digital literacy. Neighborhood libraries have long been

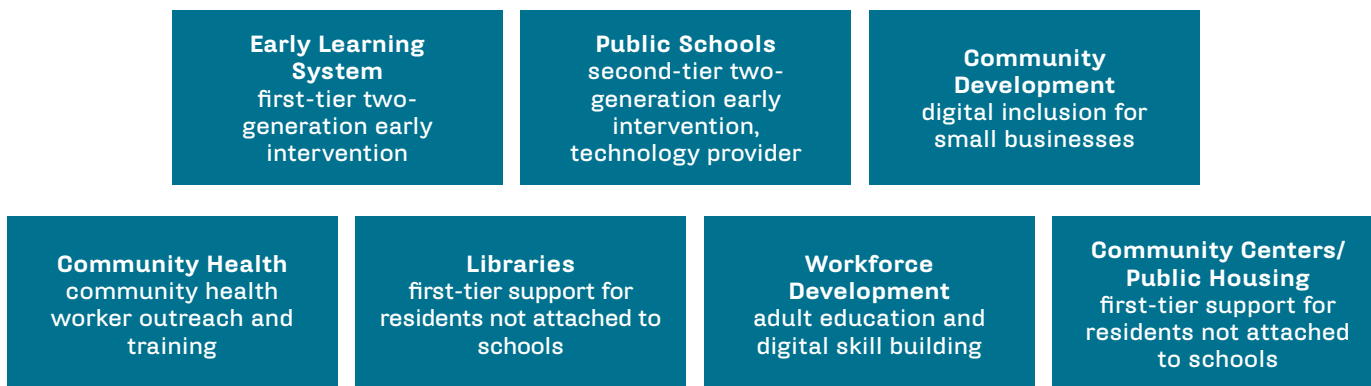
an important resource for low-income residents, and they have evolved to serve families in a digital world, even if resources have not kept pace accordingly (see box p. 15). In addition to providing free Wi-Fi and lending laptops, e-readers, and wireless hotspots, librarians are often available to answer basic questions and help patrons make use of technology. Most library science programs now include an explicit focus on preparing librarians to support the development of digital literacy.⁵⁴

Public institutions like libraries can effectively market their services because they are highly visible and can easily advertise programs to residents using banners and billboards. They also benefit from stable staffing, which allows them to both establish relationships and steadily improve service delivery. Senior centers, recreation centers, and public housing developments with staffed computer rooms function similarly. These institutions often have trusted actors who reflect the community they serve, which allows them to recognize and meet the needs of their patrons.

These human relationships are especially crucial to capitalizing on technology’s potential to improve health outcomes. Community health centers and accountable care organizations are increasingly deploying community health workers (CHW) to establish trusting relationships with patients. CHWs can help patients utilize technology and interpret and respond to the information they receive electronically.⁵⁵ The investments health care organizations are making to provide this outreach capacity can both complement and benefit from coordinated efforts to tackle all dimensions of the digital divide in Gateway Cities.

Much like the outreach approach CHW take for sensitive health conversations, efforts to help small businesses adopt unfamiliar technologies begin with relationship building. Digital inclusions efforts should leverage community development corporations, main street organizations, and other established nonprofits that are anchored in the community and able to facilitate access to quality training and technical assistance.

Figure 5: Local Digital Literacy Landscape



Source: Authors' analysis

The Underfunded and Underrepresented Urban Library

As demand to help residents overcome the digital divide has put more pressure on urban libraries to deliver vital services, state funding for them has fallen significantly. Adjusting for inflation, library aid is down 16 percent since FY 2009, and over 30 percent since FY 2001. The highest-need communities have not been protected from these deep funding cuts. The library aid distribution formula is far less progressive than the Chapter 70 formula for education aid (Gateway Cities receive 60 percent of education aid and just 30 percent of library aid).

The unique needs of urban libraries are also systematically underrepresented in Massachusetts. None of the nine Massachusetts Library Commissioners hail from Gateway Cities. Gateway City librarians are also noticeably absent from the Massachusetts Library Association board of officers and committee chairs. The underrepresentation of urban libraries serving a disproportionately large share of Massachusetts residents is likely a reflection of understaffing in these systems. With many competing demands on their time, Gateway City librarians likely find it difficult to contribute in leadership roles outside of their community. Perhaps a silver lining of the pandemic will be greater utilization of technology to convene statewide bodies virtually, lessening the time commitment required for Gateway City leaders to participate.

3. Digital Equity Planning

To strategically organize efforts to expand access to technology and increase digital literacy, many cities are preparing detailed digital equity plans. Through collaborative planning efforts, they bring stakeholders together to examine all aspects of digital inclusion, including access, adoption, and application of technologies in various domains. Digital planning processes use town hall forums, focus groups, and resident surveys to collect information to benchmark needs, develop informed strategies, and monitor progress. These efforts are coordinated by an established office within city government or, in some cases, by an appointed taskforce. In many communities, they have led to a permanent staff position, such as a digital equity officer, responsible for overseeing implementation of the plan.⁵⁶

While this field is relatively new, there are resources communities can turn to for support of digital equity planning initiatives. The Institute of Museum and Library Services' Building Digital Communities: A Framework for Action is a valuable tool that many cities have utilized.⁵⁷ Communities can also request funding and technical assistance for digital inclusion planning and strategy from the National Telecommunications and Information Administration's (NTIA) BroadBandUSA program.

Because information from private internet service providers is limited, generating reliable baseline data about access and utilization is key to the success of a digital equity planning process. Austin worked with the University of Texas at Austin to develop a resident survey that provides an excellent template for communities looking to benchmark digital access and digital literacy across multiple dimensions.⁵⁸ Portland generated similar information by conducting focus groups targeting specific populations including Spanish, Chinese, and Vietnamese speakers, and people with disabilities. In order to uncover information about speeds, rates, and service quality, Louisville, built a crowdsourcing platform SpeedUpLouisville.

Tech Goes Home's Train-the-Trainer Model Increases Access to Technology

The Boston-based nonprofit Tech Goes Home (TGH) is a national leader in digital inclusion. The program provides low-income participants with 15 hours of free digital skills instruction. Upon completion of the course, they receive six months of free internet access and the option to purchase a new Chromebook for \$50. From job search to communicating with a child's classroom teachers, courses are tailored to the needs and aspirations of the participants.

With a staff of seven, TGH serves 5,500 learners per year with a train-the-trainer model. Over 300 partner organizations participate. Boston Public Schools, for instance, offer teachers a stipend to work with parents in the evenings. Often the parent and child attend the course together. Teachers enjoy the opportunity to engage with families in this manner at the beginning of the school year, and it helps ensure that their students will have the technology required to complete their assignments and the parents will have the ability to communicate over email throughout the year.

With modest funding, the state can help ensure that digital inclusion initiatives are properly resourced and as impactful as possible.

V. Providing State Support to Advance Digital Equity

Given the untapped power of digital inclusion efforts as both anti-poverty and economic development strategy, the state has a keen interest in supporting efforts to close the digital divide both in Gateway Cities and other communities where a significant number of residents are not accessing the full benefits of 21st century information and communication technology. With modest funding, the state can help ensure that digital inclusion initiatives are properly resourced and as impactful as possible. Below we offer some more specific ideas for targeting state resources that follow from our research:

1. **Digital equity planning.** This is the foremost need and one that Gateway Cities will have difficulty fully meeting on their own, considering the many competing demands on local resources, both private and philanthropic, at this time. Funding to develop these plans will be particularly critical to securing appropriate consulting services to evaluate complex questions surrounding municipal broadband and other business models to increase access to reliable and affordable internet service. Digital equity plans will also help cities leverage existing assets and direct resources toward areas that will have the greatest impact in building digital literacy. The production of digital equity plans will put Gateway Cities in a more competitive position for federal and philanthropic funds and help them achieve specified goals by engaging ISPs more effectively.
2. **Partnerships between private early education providers and public school districts.** Positioning early education providers to provide two-generation intervention to build digital skills within the family unit is a strategy with extremely high potential. A small state grant program could draw attention to this work and accelerate efforts in the field.

With assistance from past state and federal grants, Gateway City public school districts have already spent a considerable amount of time building partnerships with private early education providers to align standards, curriculum, and assessments so that students gain early literacy skills and enter the public school system prepared for kindergarten. Communi-

ties can leverage these established efforts as they work to increase the capacity of early education and care providers to deliver digital inclusion services.

3. **School council pilots.** Previous MassINC research has noted the underdeveloped role school councils play as governing bodies responsible for providing local accountability for improved student outcomes. As we move into the Student Opportunity Act era, it is critical to build the capacity of these bodies to perform this function. Technology should make it easier for members of these bodies to meet openly, engage, and share information with their wider school community. The state could help ensure that we take advantage of this unique moment by supporting schools that want to pursue innovative new ways of leveraging technology in school governance.
4. **Fellows for urban libraries.** Gateway City librarians are on the frontlines of efforts to build digital literacy. However, these libraries have steadily seen their resources erode, and this problem will only intensify as the downturn exerts pressure on state and local budgets. With limited staffing, few Gateway City librarians have time to engage in special initiatives, such as digital inclusion planning and policy development. As a result, we lack the knowledge of those with exceptional experience and a unique set of assets to contribute to the coordinated effort.

Through programs like MassDevelopment's Transformative Development Initiative (TDI) we have seen the significant contribution young professionals participating in fellowships have brought to collaborative economic development projects. The state could take a similar approach to bring talented graduates from the region's library science programs to aid efforts to develop and implement community-wide digital inclusion strategies.

5. **Youth workers.** The Great Recession took an especially heavy toll on youth employment with lasting effects on the economy. Massachusetts can help increase employment opportunities for youth while providing communities with an important resource to scale digital equity efforts by expanding support for the YouthWorks program. Youth who participate in the program could receive training to provide digital literacy instruction through organizations such as Tech Goes Home. With subsidy through YouthWorks, they could then serve as part-time workers, delivering instruction at libraries, community centers, community health centers, community development corporations, and other local nonprofits. This model would create more opportunities for youth to have rewarding professional experiences in a variety of settings, while helping to meet acute digital literacy needs in their communities.
6. **Small business technical assistance.** Massachusetts has steadily increased support for organizations that provide small business assistance. However, the limited funding available is vastly exceeded by the need, which has increased dramatically as these organizations work to respond to businesses seeking pandemic-related assistance. Digital capacity building is both a short- and long-term tactic, given the number of small businesses that could benefit from these services. Nonprofit community development organizations are building strong partnerships to help meet the needs of small businesses in their service areas. State grants will be critical to scaling and sustaining these efforts throughout the recovery.

Endnotes

- ¹ Benjamin Forman has served as MassINC's research director since 2010. Zayna Basma is a dual-degree graduate student at Brandeis University studying business administration and social policy. Kelley Gourley is doctoral student in the anthropology department at Boston University. Both Basma and Gourley contributed to this research project as summer graduate fellows at MassINC.
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