

WIRED:

CONNECTING EQUITY TO A UNIVERSAL BROADBAND STRATEGY

A JOINT REPORT FROM:



BY RAKEEN MABUD AND MARYBETH SEITZ-BROWN

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About the Authors

Rakeen Mabud is the Program Director for the Roosevelt Institute’s 21st Century Economy and Economic Inclusion projects. In this capacity, she manages the Institute’s work on the social safety net, job creation, contingent work, and intersectionality and economics. Prior to joining Roosevelt, she served as a political appointee in the Obama administration, where she worked on domestic economic policy issues at the Treasury Department. Her doctoral research examined how housing wealth affects political preferences. Rakeen holds a Ph.D. in Government from Harvard University and received her B.A. in Economics and Political Science from Wellesley College.

Marybeth Seitz-Brown is a Senior Program Associate for the Roosevelt Institute’s 21st Century Economy and Economic Inclusion projects, to which she provides research, writing, and program support. She served as a research assistant for Roosevelt’s latest book *Hidden Rules of Race: Barriers to an Inclusive Economy* and was a coauthor of the Roosevelt report “Reality Check: Raising Revenue for Structural Reform and Large-Scale Public Investment.” She earned a BA in Linguistics *cum laude* from Columbia University.

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| EXECUTIVE SUMMARY

High-speed internet has become essential to full participation in today's economy and is increasingly considered the "fourth utility," joining the more commonly recognized vital goods: water, electricity, and heat. From applying for jobs to doing homework, access to fast, reliable internet is crucial to making the most of opportunities in today's world. Despite the critical need for reliable broadband, a shocking number of our neighbors—a staggering 55 million Americans—do not have high-speed internet at home.

In this case study, we argue that barriers to broadband access, one aspect of the digital divide for low income communities of color, stem from a myriad of factors including deregulation of the telecommunications industry and a history of segregation of and disinvestment in neighborhoods of color. Specifically:

- The deregulation of the telecommunications sector in the 1990s allowed sweeping consolidation of the industry and created a broadband market with significantly less competition between firms, steeper prices, and slower speeds compared to other industrialized nations.
- Regulators do not hold internet service providers (ISPs) accountable to universal build out requirements, which the government enacted in exchange for granting monopolies in the market. This monopolized and deregulated environment has allowed ISPs to upgrade digital infrastructure in the most profitable, high-income areas first. The persistence of *de facto* racial segregation of neighborhoods means such investments (and lack thereof) result in digital redlining of a disproportionate number of neighborhoods of color and rural areas of all races.

Based on these facts—that broadband access is necessary to participate in today's economy, that broadband markets are increasingly monopolized because of deregulation, and that deregulation enables digital redlining—we argue that the public sector has a role to play in bridging the chasms of digital equity between those who have broadband access and those who do not.

Municipalities across the country have sought to expand broadband access for their residents by tackling this mixture of challenges. For many cities, this starts with an effort to increase service quality and reduce prices for all citizens by combating the monopolized market through increased private competition, public utility provision of broadband, or direct public provision.

As a strategy for reducing income inequality in New York City, Mayor Bill de Blasio set out to provide universal internet access in every borough. This case study explores how the administration began to combat the digital divide through the Queensbridge demonstration project, wherein the City created a free, high-speed wireless corridor in the largest public housing community on the continent.

Key takeaways from this project include:

- **Universal programs must include a targeted lens:** Low-income communities of color face much higher obstacles to accessing high-speed internet than residents of the Upper East Side. To create digital equity, local government solutions must create a “targeted universalist” vision for broadband that includes both public disruption of the currently monopolized internet market (lowering prices and improving competition for all) and targeted provision of services to those most in need of affordable, up-to-date, and competitive services by using City resources to provide free or very low-cost services for low-income communities of color. Cities can begin working toward that end vision by first tackling one of the two prongs of the problem. By focusing its demonstration project on those who are the most marginalized within the current market, New York City took an equity approach and should continue to expand this strategy to create universal access.
- **Leverage public ownership:** The administration used publicly owned infrastructure to create accountability and equity in build-out and services; doing so also allowed them to lower prices, increase wireless speeds, and create more competition with monopoly ISPs in public housing developments. The City did not have an electrical utility like cities that are direct internet service providers, so it contracted with a private wireless ISP to design, build, and maintain publicly owned, free wireless broadband internet. Its long-term vision of public, free universal internet access will also rely on city-owned infrastructure.
- **Experimentation is vital:** Given the size and technical difficulties of implementing universal broadband, demonstration projects help identify challenges and opportunities in broadband deployment before scaling to an entire city. Cities should try something out, learn from the experience, and commit to an equitable process from pilot to completion. Not all cities enter the problem of broadband inequity from the same starting point or with the same resources and institutions; this case study serves as one example that other cities can learn from as they work to tackle digital inequity.

Our tools to ensure digital equity are decades behind the technology for high-speed internet. The first step in closing the yawning gap between where the most marginalized populations are now and where the digital landscape is evolving is to ensure universal broadband access, which must include a targeted racial equity lens. Policymakers can approach that end goal in one of two ways: by first lowering prices for all constituents through public disruption of the monopolized broadband market (for example by creating a public utility for broadband), or by targeting resources to those who are most in need with free internet access. To truly create digital equity that tackles both monopoly power and structural, spatial racism, ultimately both strategies are needed.

| INTRODUCTION

Scott Joyner lives in Brownsville, Brooklyn, a neighborhood with a large number of public housing units and high poverty and crime rates. Like many low-income people, Family Dollar Manager Joyner relied on his iPhone's LTE data plan for most of his daily online tasks. But iPhones can't do everything and Joyner lacked broadband internet at home, so about four times a week, he would make the one-hour round trip commute to the Brooklyn Public Library for internet access. He would sometimes bring his elementary school aged son Rhys, who needed computer access to complete school assignments.

A few years ago, a bakery looking to hire Joyner requested that he send them his resume that same evening. Joyner only had an outdated version on his phone and because the public library was closed, he couldn't get to a computer to make changes to it until the next day. He didn't get the job (Teicher 2016).

For far too many low-income people, mobile telephones serve as the primary access point to the internet, but that alone is not enough. Today, institutions ranging from grade schools to employers presume home internet access. Schools demand that students download and upload homework assignments online. Employers increasingly require that job applications be filled out exclusively online, even for relatively low skill jobs like gas station attendants. Yet for many low-income residents of cities and rural communities, the only place they can get online is at the library or at a McDonald's.

It's clear that today, high-speed internet is the "fourth utility" after water, electricity, and heat. The service undergirds so much of our economic, civic, educational, and social life—and one's ability to participate in each—that the internet is no longer an optional good but rather the foundation on which many other essential activities of life are possible.

As broadband access becomes increasingly crucial, we should highlight city-led efforts to develop more equitable deployment of this infrastructure and understand how we can scale up their work. Cities, where most policy innovations begin, have been experimenting with different ways to create meaningful access to broadband at home for low-income people, including in the nation's largest city: New York. In this case study, we will explore the New York City Housing Authority's residential "wireless corridors" project.

We begin this case study by defining digital equity beyond the current discourse about the digital divide. We highlight some of the inequities that exist in New York City before turning to a historical analysis of the root of these inequities. We connect the history of structural racial exclusion to the rise of a deregulated and increasingly concentrated broadband industry. We then highlight the potential opportunities and challenges of piloting digital equity projects on the local level through a targeted approach, and we examine the state and federal policy environment and how this context can impede or facilitate local broadband innovation. We close this piece with a vision for how broadband can be a tool to promote inclusion going forward and takeaways for local governments who wish to embark on similar initiatives.

WHAT IS DIGITAL EQUITY?

Digital equity means that all residents and neighborhoods have the information technology capacity needed for civic and cultural participation, employment, lifelong learning, and access to essential services (City of Seattle Information Technology), and the ability to use this capacity to further develop their communities. At its core, digital equity is about having internet access and the literacy and tools necessary to use it—not only to take care of individual needs but also to innovate solutions to community problems and participate in the shaping of our society that is so fundamentally impacted by technological change. Most low-income communities, whether urban or rural, are living in digitally inequitable conditions.

The National Digital Inclusion Alliance offers helpful definitions for understanding this landscape.

DIGITAL EQUITY

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, and access to essential services.

DIGITAL INCLUSION

The activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs).

This includes 5 elements:

- 1) Affordable, robust broadband internet service;
- 2) Internet-enabled devices that meet the needs of the user;
- 3) Access to digital literacy training;
- 4) Quality technical support; and
- 5) Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration. Digital Inclusion must evolve as technology advances. Digital Inclusion requires intentional strategies and investments to reduce and eliminate historical, institutional, and structural barriers to access and use technology (NDIA).

The “digital divide” is typically understood as individual or group-based differences in access to Information Communication Technologies (“ICTs”), based on population (e.g. race, age, disability, class) and/or geography (e.g. urban neighborhood or rural area). However, cheap and easy access to smartphones has caused some to wrongly suggest that the closing of the digital divide is inevitable and universal access to broadband is unnecessary. Accessing the internet on a cell phone is helpful but does not enable full participation in our economy and society. Completing homework assignments, submitting job applications, starting a business, writing a book, and conducting freelance work are just some of the vital activities that require real residential broadband access. Mobile access is simply insufficient to participate in today’s job market. Census Bureau data show Black and Latino households have access to lower speed wireless connections than the majority of white households—if they have internet access at all (Thom and File 2014). Nor does a smartphone alone necessarily equip a community to come together and use ICTs to drive neighborhood level solutions.

Completing homework assignments, submitting job applications, starting a business, writing a book, and conducting freelance work are just some of the vital activities that require real residential broadband access. Mobile access is simply insufficient to participate in today’s job market.

Digital equity today requires us to think about the innovation that digital access enables, as well as the rise of “Big Data” and the need for control over our own data. Increasingly, the way we interact with the internet can be used to define us. Technology is getting better at understanding our activities, interests, and preferences—the things that make us individuals. Any number of entities can use that information to sell us products, conduct surveillance, or steal our identity. Big Data is also developed and being interpreted in ways that shape decisions and interventions. As such, any definition of digital equity must take into account the importance of data transparency, ownership, control, and interpretation, to avoid a world where data is used inappropriately and where the wealthy have more control over their data than those who are poor.

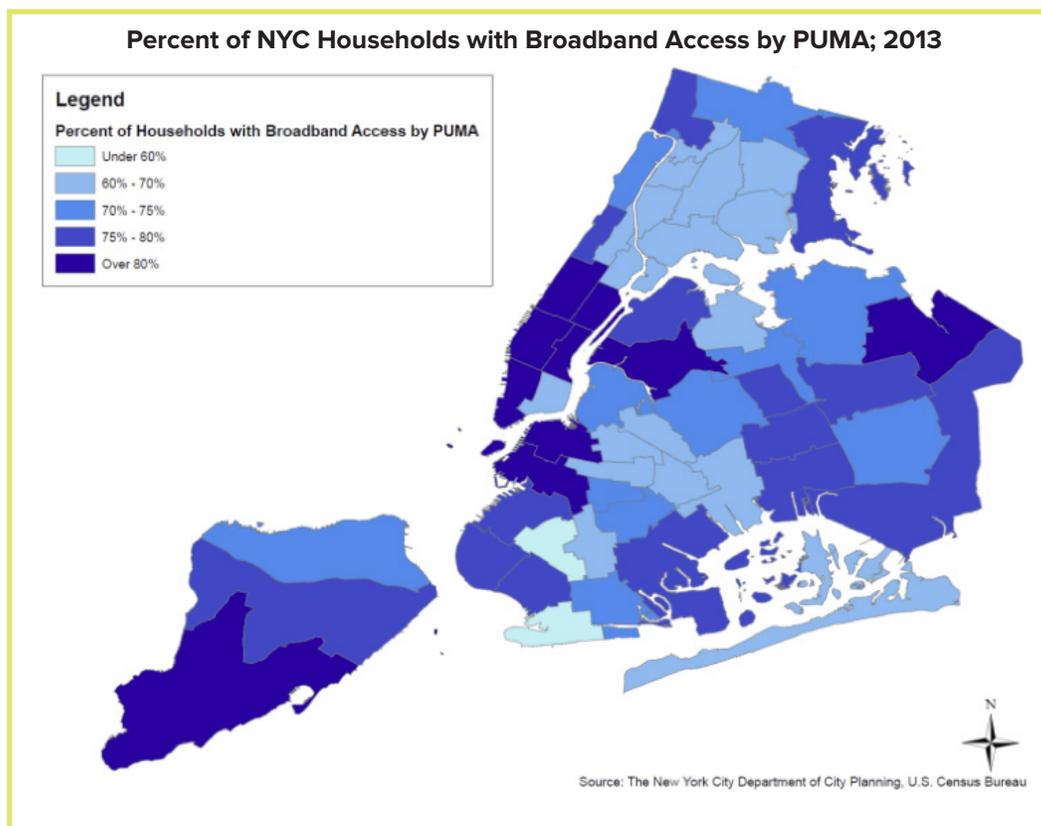
Deepening inequality as a result of Big Data is worrisome, especially because discrimination in Big Data is already occurring. The rise of these data has enabled programmers to embed stereotypes into technology, such as facial recognition software that misidentifies people of color and algorithms that racialize search results for people or businesses. These data have also enabled employers to exercise greater direct control over their employees, such as with algorithms that change workers’ schedules at a moment’s notice (Caliskan et al. 2017; Devlin 2017; Sweeney 2013; Zukin et al. 2015; Covert 2014).

Our tools to ensure digital equity are decades behind. The first step in closing the yawning gap between where the most marginalized populations are now and where the digital landscape is evolving is to ensure universal broadband access, with an eye on the horizon of Big Data. Connecting communities to the web is the pathway, not the end goal, for true equity and empowerment.

BROADBAND EQUITY IN NEW YORK

In this case study, we focus on increasing access to broadband as a key aspect of closing the digital divide. Like many municipalities across the United States, New York has vast digital disparities by race and income. According to the Pew Research Center, 54 percent of African Americans nationwide had residential broadband access in 2015, an 8 percent decline from 2013; meanwhile 72 percent of white Americans had home broadband service in 2015. Of adults making \$20,000-50,000 a year, 63 percent had residential broadband while 80 percent of adults making \$50,000-\$75,000 annually had access. Suburban families are more likely than either urban or rural families to have home internet access (Horrigan and Duggan 2015).

In New York, just like all across the country, access to broadband is vital to participating in the economy and in one's community. But 21 percent of New York City residents (more than 650,000 people) lack access to the internet in their homes, and 16.1 percent do not own a computer, according to the NYC Center for Economic Opportunity (2014). The NYC Comptroller's Office released numbers in 2014 showing that lack of home broadband access is more prevalent for those without a high school degree (40 percent), the elderly (45 percent), those who live in the Bronx (34 percent), and Black and Latino communities (27 and 25 percent, respectively). Access to broadband is clearly correlated with both income and race, as demonstrated by the map below.



Neighborhoods with fewer households online are more likely to be poor and/or majority people of color.

*Map courtesy of the Office of the New York City Comptroller
Source: The New York City Department of City Planning, U.S. Census Bureau*

The Open Tech Institute tracks prices of high speed residential broadband packages in major cities in data that reveals two features of internet inequity in New York City: high prices and low speeds. Compared to Kansas City and Chattanooga, where residents can access a 1-gigabit connection for less than \$70 a month, New Yorkers pay more than four times that amount for half the speed (Open Technology Institute 2014).

The negative effects of the highly concentrated and fully privatized structure of the U.S. telecommunications industry are even starker compared to the costs and speed of internet to other developed countries. America is ranked 31st in the world in terms of average internet download speeds, falling behind countries like Estonia, Romania, and Uruguay. New Yorkers and Angelenos spend \$300 per month for alleged 500 megabit per second speeds (half a gigabit) (Aziz 2014). In South Korea, internet users can get 1 gigabit per second connections for just \$30 a month (Russo et al. 2014). In other words, South Korea offers twice the speed of that in New York at a tenth of the cost.

What is broadband?

“Broadband” is not a single technology, but rather a term that describes a range of technologies that provide high-speed access to the internet (Bock et al. 2015). When private residential access to the internet first became available, people got online through telephone lines: “dial-up” technology and then “Digital Subscriber Lines” (“DSL”). Broadband enables a lot more data to be transmitted a lot more quickly than dial-up. Broadband technologies can be wire-based or wireless, but even technologies we call “wireless” depend on a physical backbone of wire line to operate and bring within close proximity of residences. The fastest commercially available technology is fiber-optic cable—as opposed to the copper cable of telephone companies—but in order to have fiber-optic service, one needs to live in proximity to where the network already exists; currently, its availability is mostly limited to dense urban areas with high incomes.

A HISTORY OF EXCLUSION AND MONOPOLY IN BROADBAND DEPLOYMENT

Inequities in broadband are not inevitable: Digital disparities exist because of historical choices that have segregated communities of color and limited the kinds of services they can access. The monopolized nature of the telecommunications industry exacerbates these inequalities. While improved competition in the broadband market would begin to address the quality and cost of internet service, improved competition policy alone will not completely fix racial exclusions in the market and in society. It is important to both restructure the highly concentrated telecommunications industry by increasing competition *and* address issues of digital inequity through public provision and direct infrastructure investment. In this case study, we suggest that public intervention is the best way of achieving these twin goals.

Broadband’s History of Structural Racism

Neighborhoods of color in urban areas are disproportionately unable to access high-speed broadband—either because their buildings lack options or because the options available are low quality or prohibitively expensive. Residential segregation by race has existed for more than a century, and grew with suburbanization, through both *de jure* and *de facto* means. Redlining—the practice of denying wealth building and other services¹ to neighborhoods of color—has resulted in concentrated zones of people of color with lower relative income and wealth.² Importantly, neighborhoods are also the unit by which ISPs make upgrades and investments in internet services. ISPs choose to upgrade the highest-profit neighborhoods first (Callahan 2017), which in turn leaves neighborhoods of color with lower quality service or none at all.

Exclusionary deployment of telecommunications upgrades began with the rollout of telephone services, and it continues in modern day broadband investments. In the 1990s, regional telephone companies began wiring advanced telecommunications networks for video dial tone, which enabled the transmission of video, audio, and data over telephone lines. After examining deployment plans of some regional telephone companies, a coalition of civil rights groups found “a clear and systematic pattern of not serving lower income areas, which turn out to be much more heavily minority areas” (Kahl 1997). In part, regional telephone companies did this by skipping over inner cities and moving to wealthier suburban counties (e.g. Denver, Chicago) and ignoring adjacent predominantly minority counties (e.g. Washington, DC) (Kahl 1997). Similarly, the National Digital Inclusion Alliance found that over the last decade, AT&T skipped notable portions of its promised universal upgrade to fiber in the greater Cleveland area—communities with significant poverty rates (largely African-American census tracts) were left out of investments while suburban communities around Cleveland received them (Callahan 2017).

¹ Residential segregation continues to have effects today through practices such as predatory lending, which targets risky lending to neighborhoods of color. Those predatory practices are harmful for many reasons, and they restrict the types of services that communities of color have access to. For example, the Free Press report “Digital Denied” argues that private ISPs’ practice of conducting credit checks on potential customers before granting them broadband service is a key structural barrier to broadband adoption (Turner 2016). Credit scores, touted as an objective measure of trustworthiness, are themselves racialized and do not account for the fact that communities of color are targeted with financial products that damage credit (Ludwig 2015).

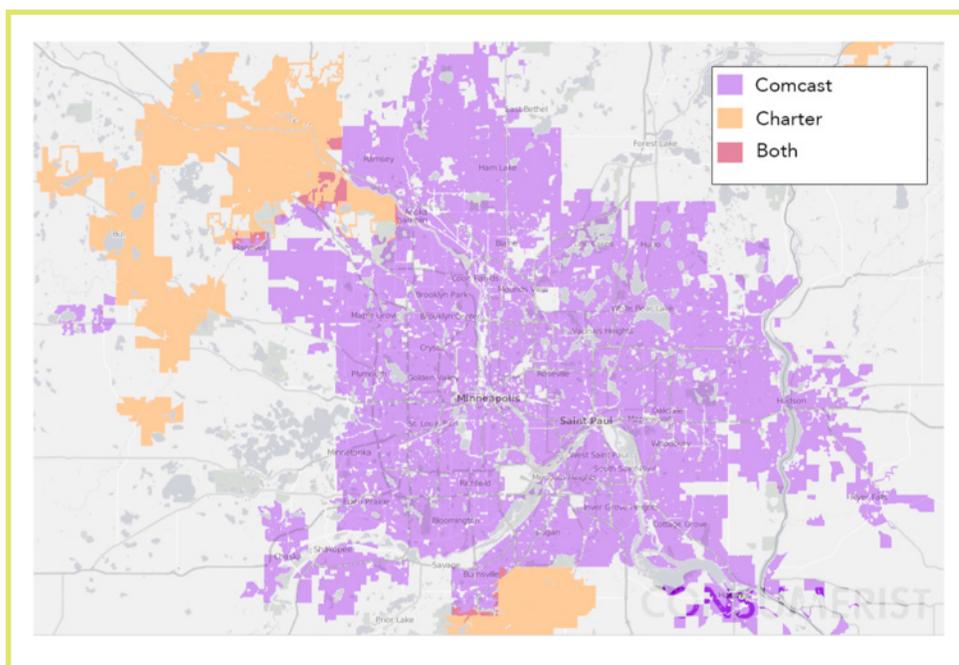
² The concept of residential *redlining originates* in the Home Owners’ Loan Corporation established in 1933, which mapped cities divided by neighborhoods and color-coded them according to race. “Redlined” neighborhoods were deemed the least desirable because they were majority Black, and the federal government did not guarantee mortgages for homes inside those redlined communities. This left these neighborhoods with access to either disproportionately expensive or nonexistent mortgage loans (Bouie 2015).

This layering of segregation, redlining, and lack of investments is part of what we refer to as *structural racism* and explains why many communities of color have been excluded from resources and opportunities, both personal and communal. Telecommunications investments are a part of this structural history. What reinforces skyrocketing prices, racial exclusion, and inferior service is weak monopoly and competition policy that allows inequitable practices to continue to flourish.

Private Power’s Capture of the Broadband Market

The telecommunications market is one of the least competitive industries in the U.S. economy (Cooper 2017). The concentrated nature of this market creates opportunities for firms to engage in behavior that worsens digital inequity for communities of color for two primary reasons. First, monopolies by definition can charge higher prices for mediocre goods and services, which hurts all consumers but poses a bigger obstacle to households of color who have lower relative income and wealth and thus fewer options to choose from in the face of poor customer service. Second, ISPs are more likely to invest in the most profitable areas first, which tend to be white, affluent areas.

In the early 1990s, there were hundreds of small-scale regional cable companies throughout the country that provided internet and TV services. Between 1993 and 2013, over 40 regional companies became just three telecommunications giants: Comcast, Cox, and Spectrum (Cox 2015). This merger-marathon was facilitated in large part by the Telecommunications Act of 1996, which deregulated the industry and gave incumbents the right to compete across modes, which left cable companies in the best position to deliver broadband service. Ironically, the aim of the act was to make the telecommunications market more competitive (U.S. Congress House of Representatives 1996), but because of lax antitrust policy, incumbents chose to monopolize the market rather than compete to deliver quality service.



Competition—or lack thereof—between ISPs in the Twin Cities.

Source: Consumerist (2014)

ISPs in a monopolized market do not need to compete on prices in order to acquire customers—because they have a captive audience, they are free to charge higher prices than they would in a more competitive marketplace. Monopolies price out many people of color from services because these households tend to have lower relative wealth and income due to a complex web of rules that deny them economic prosperity. Only a little over half of African-American households have home broadband, and those households cite unaffordable monthly packages as their top barrier to service (Horrigan and Duggan 2015).

ISPs in a monopoly market have fewer incentives to lower prices through innovation because they are less dependent on prices to maintain their consumer base. Increased competition generally leads to more innovation, which brings down the costs of providing service and improves the service itself (Wu 2012). When the cost of providing service is lower, firms can make a profit in markets that were not historically deemed profitable: Consumers who were previously priced out can afford those lower costs. In the inverse condition—the world we are in today—highly concentrated markets allow large firms to be complacent with those conditions, profiting through extremely high prices instead of expanding to new regions with improved services. This lack of innovation is ossifying a market that leaves behind low-income communities of color.

Moreover, ISPs in a monopolized environment seek the highest possible profits and build digital infrastructure in the most profitable, high-income areas first, often white and affluent neighborhoods that have received consistent infrastructure upgrades over time (Callahan 2017). In contrast, historical disinvestment in neighborhoods of color makes upgrading their infrastructure upgrades more expensive. This does not mean it is impossible to service those communities: Cooperative and municipal ISPs have found that it is possible to break even or make modest profits when building this broadband infrastructure (Chambers 2016). The question is not whether profit can be extracted, then, but *how much* profit can be extracted. Mega ISPs acting in a monopolized environment will choose to service regions that will provide the highest short-term profits, leaving communities of color behind—potentially with no or low-quality services.

The Need for, and Limits of, Increased Competition

While increasing competition in the broadband industry is deeply important to addressing digital inequity, it does not fully address the issues we have laid out in this section. Google’s expansion of Google Fiber has created some price competition between it and the big telecommunications firms, but it has not been sufficient to result in digital equity for low-income communities of color. First, the price competition it has introduced has simply not been substantial enough to meaningfully improve affordability; just 10 percent of low-income residents purchased Google Fiber in Kansas City, Missouri (compared to 42 percent in adjacent higher income communities), citing cost as a barrier to acquiring the service (Barr 2014). Second, equity requires not only fair pricing but also adequate access to services, which remain patchwork at best in many regions despite these new entrants.

Unlike other public utilities and goods, we are far from having universal access—especially for low-income communities of color. Because of the history of structural racism—through residential redlining, historical disinvestment, and countless other policy choices made to take power away from communities of color—increased competition in the broadband market can only do so much. The highly concentrated private market in telecommunications increases barriers to access for communities of color and low-income communities, but even in competitive markets, private firms will not be able to close the digital divide on their own. It is only the public sector, which can engage in infrastructure investments explicitly with a digital equity frame, that can both tackle the concentrated nature of telecommunications and begin to dismantle the structural discrimination that is so deeply baked into the way our economy and society is organized.

THE ROLE OF CITIES IN BROADBAND INNOVATION

Left with a federal telecommunications policy environment unwilling to tackle the power of large telecommunications firms and with insufficient incentives for greater competition or public infrastructure, municipalities are increasingly active in developing and implementing innovative strategies to reap the social benefits that more inclusionary broadband can bring.

By playing a greater role in broadband provision, municipal governments have the potential to rearrange incentives in the broadband market and counter many of the race and income-biased outcomes that occur in the current system.

When a large public player enters the market, a series of outcomes result:

- The city advocates for citizen interests rather than private profit motives;
- The city can negotiate lower prices because it is buying in bulk;
- Private players want to compete for this business, which drives prices down further than if individuals were to shop for plans;
- Public delivery provides access to markets that were not profitable enough without public intervention; and
- Public ownership allows for more possibilities for communities to come together and use broadband to solve problems and innovate collectively—from digital literacy to data collection and analysis to job training.

There are different models cities can and do take for approaching broadband equity and accomplishing the outcomes stated above. Many municipalities start by tackling the monopolized market to bring down prices and improve quality of service for all residents. Strategies can include introducing new private actors to increase competition, but municipal governments have also expanded their electrical utilities to provide broadband infrastructure and services at much lower rates and higher speeds for the local market. Defining broadband access as a critical public service akin to electricity or water (and one that benefits from the natural monopoly inherent to high cost infrastructure), these government agencies choose to either provide the service directly or regulate ISPs to limit opportunities for price gouging or additional abuse of market power.

A notable example of this strategy is Chattanooga, Tennessee, which provides \$70/month service for the fastest broadband speeds in the country at 1 gigabit per second. This policy induced more competition in the market, with private ISPs lowering their prices to compete, resulting in lower costs and higher quality options. While very effective at disrupting the monopolized broadband market, this approach did not close the digital divide; due to state laws preventing the city from subsidizing internet packages below the cost of delivery, the lowest-cost option the municipal service provides for low-income families is still \$27/month (Koebler 2016). For families living near or below the poverty line, disproportionately people of color, this is an expense many cannot justify. The results show in rates of adoption: Only 20 percent of Chattanooga's poorest neighborhoods have households online (Koebler 2016).

A second approach is represented in this case study and in cities participating in the Connect Home initiative.³ Instead of beginning the process by disrupting the broadband market writ large, these cities (including New York) chose to take an equity approach, prioritizing access and build-out for those who have the least access and ability to pay, for whom broadband access could meaningfully improve economic opportunity and mobility. As we will illustrate in the following section, this strategy is compelling in a city like New York, which suffers from staggering levels of inequality. Lowering prices for all would still leave behind hundreds of thousands of residents. As we describe in the next section, the city government chose a demonstration project that crystallized this equity approach: prioritizing use of resources on the lowest-income communities of color in public housing communities and providing free service to remove as many barriers as possible to adoption.

These two approaches—one beginning by lowering prices for everyone, and the other beginning with those who are most excluded from the market and ensuring they have free access—are both high-impact and effective strategies. The ultimate vision for broadband equity must both disrupt monopoly ISPs that unfairly overcharge everyone *and* target access for those who will not be able to afford even a more competitive set of options. In other words, policymakers must move away from a “one-size-fits-all” approach to one of “targeted universalism,” which considers how specific communities are uniquely marginalized.⁴ In the case of New York, the Mayor’s office created a strategy with a long-term vision of a “network of networks” that would be both universal and targeted. Instead of a public utility for broadband, the team hoped to eventually utilize the City’s many wireless hubs—currently operating throughout the subway system, via its LinkNYC kiosks, through public housing communities, and more—to build out a system that knits its free wireless networks together. This network of networks would allow anyone in New York City to log into the public network and roam freely throughout the city, effectively creating universal free access.

Beginning the process to create that kind of long-term vision is far from easy; giant ISPs will devote significant lobbying and political resources to protecting their monopoly power and blocking municipal innovation in broadband equity. In 2004, Philadelphia launched an experiment with a city-owned and publicly operated broadband network, managed by a non-profit, to serve low-income and disconnected Philadelphians. The project was deemed a failure, but it opened the possibility of municipal broadband for other cities (Abraham 2015). The initiative failed in part because once Verizon realized that an accessible broadband public utility would pose competition to its significant concentration in the region, the telecom giant heavily lobbied the Pennsylvania state legislature to enact harsher restrictions on municipal broadband projects (Breitbart 2007). Even when advocates for the public wireless project successfully slowed Verizon’s lobbying efforts, the city council did not commit the adequate funds necessary to deliver the service at a high quality. The City then hired a low-quality vendor, Earthlink, which botched the construction of the project and ultimately withdrew from its operation (Abraham 2015). Philadelphia’s pioneering experimentation should teach us not that failure is inevitable but rather that local experimentation can pave the way for bolder and better projects in the future.

³ Connect Home is an initiative of the U.S. Department of Housing and Urban Development that seeks to close the digital divide in public housing through support for broadband access initiatives.

⁴ Targeted universalism is a concept coined by John A. Powell that argues against a false choice between universal versus targeted policies. Instead, it advocates for acknowledging how different social groups are situated differently relative to institutions and resources in order to design universal policies that rectify unequal distribution (Powell et al. 2009).

As Blair Levin (the former Executive Director of the National Broadband Plan⁵) has made clear, even in this current climate, “infrastructure deployment is largely dependent on the efforts and policies of cities” (Levin 2017). One of the largest municipal experiments in developing inclusionary broadband has been in New York City, the largest and one of the most diverse cities in the U.S. With 8.5 million residents spread over 330 square miles, 38 percent foreign born with Latino, Black, and Asian populations making up two-thirds of the city, New York had tremendous equity interests in thinking about broadband access.

CASE STUDY: THE QUEENSBRIDGE BROADBAND PROJECT

After the Mayor was sworn in, the de Blasio administration began a dramatic expansion of broadband access in New York City. The administration identified high prices and low-quality internet as a challenge facing large swaths of the population, and committed to extending high-speed internet to all 3 million households by 2025 (Scola 2014).

The Mayor’s particular attention to communities of color, who make up the majority of city residents, meant that broadband access could directly improve issues of racial inequity across the city (Wiley 2014, Wiley 2016). This informed the administration’s decision to tackle the digital divide in New York with an equity-led approach. The City’s starting point was a demonstration project to bring free, fast broadband to a population highly in need—residents of New York public housing.



The ultimate vision for broadband equity must both disrupt monopoly ISPs that unfairly overcharge everyone and target access for those who will not be able to afford even a more competitive set of options.

⁵ The National Broadband Plan is an FCC initiative from 2010 to ensure robust broadband competition, efficient allocation of spectrum and other government assets, reforms of universal service mechanisms to better deploy broadband to high-cost and low-income areas, and reform laws to maximize the benefits of broadband in public services like health and education (FCC 2010).

CAST OF CHARACTERS

OFFICE OF THE COUNSEL TO THE MAYOR:

Members included Counsel to the Mayor, Deputy Counsel to the Mayor, Senior Advisor for Broadband, and Policy Associate.

BROADBAND INTERAGENCY WORKING GROUP (IAWG)

DEPARTMENT OF INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS (DOITT):

The agency lead for broadband. The DOITT Broadband Planning Unit had already embarked on similar projects, like deploying the LinkNYC WiFi kiosks around the city and bringing WiFi to the city's subway system and parks. It holds both infrastructure expertise (identifying and developing city assets that can be turned into telecommunications ports) and significant bargaining power, negotiating all third-party contracts for the City's telecommunications needs.

To meet the capacity needed for universal broadband, DOITT hired a Deputy Commissioner for Telecommunications to focus on telecommunications deployment strategy.

ECONOMIC DEVELOPMENT CORPORATION (EDC):

The EDC works on economic development through the private sector and an incubation framework; they had overseen a number of wireless corridors previously and wanted to improve access. One EDC staff person was dedicated to technology (before and during this project).

MAYOR'S OFFICE OF TECHNOLOGY AND INNOVATION (MOTI):

The Chief Technology Officer was a new addition to meet capacity needed for Government technology and to support broadband initiatives.

NEW YORK CITY HOUSING AUTHORITY (NYCHA):

NYCHA is the landlord for the City's public housing projects.

NEW YORK CITY LAW DEPARTMENT:

The Law Department had expertise on federal, state, and local laws and regulations pertaining to broadband providers and their obligations.

BROADBAND TASKFORCE:

Announced in April of 2015, the Taskforce was comprised of racially diverse and multi-sectorial representatives. Participants included representatives from community based wireless network initiatives like the Red Hook Initiative, representatives from broadband adoption training non-profits, representatives with real estate expertise, and venture capitalists with technological expertise. This task force served as an external advisory body to the City.

Toward Universal Access

Before the de Blasio administration could embark on the Queensbridge demonstration project, the City had to first consider the pathway toward universal access: infrastructure. The Counsel's Office, which led the project's Interagency Working Group (IAWG), agreed that the City needed to own the physical infrastructure. Where many cities adopt a public utility model, and in fact employ an electrical utility to deliver broadband, New York does not own the electrical utility. The IAWG established a strategy to expand WiFi access by employing the infrastructure it does own—subway platforms, lamp posts, buildings, phone booths, and more. The vision was a “network-of-networks” model, starting with a growing number of internet hotspots, or “wireless corridors,” by wiring city-owned facilities with WiFi. The long-term goal is that these hotspots will be so ubiquitous that they will in fact create a seamless and low-cost (or free) experience for WiFi users. Broadband technology is developing to a point where wireless service can even penetrate buildings from a distance, providing an opportunity to reach residents through such a system. It is vital that the City continue to innovate and invest in this vision in order to tackle both structural racism and monopoly power in the broadband market.

The vision was a “network-of-networks” model, starting with a growing number of internet hotspots, or “wireless corridors,” by wiring city-owned facilities with WiFi. The long-term goal is that these hotspots will be so ubiquitous that they will in fact create a seamless and low-cost (or free) experience for WiFi users.

Within political and funding constraints, the IAWG sought incremental progress. The agency lead for broadband, DOITT's Broadband Planning Unit, had already succeeded in similar projects like deploying LinkNYC WiFi kiosks around the city and bringing WiFi to the city's subway system and parks. IAWG was also able to help the Business Improvement District in Sunset Park, Brooklyn get Department of Transportation approval on pole permits for a free, street-level wireless corridor. DOITT identified resources it could use to deploy broadband service to seven community computer centers serving public housing residents that lacked broadband and to add another mobile digital van equipped with computers and internet connection so more residents could get more time on the internet for free.

When situated within the long-term network of networks vision, these short-term solutions are cast in a new light: Creating small, hyper-local, city-owned, and controlled nodes of broadband service in neighborhoods is in fact helping to stitch together the city-wide network over time. Given that goal, the City made an important strategic decision to ensure that the rollout of that universal service took an equity approach, beginning with NYCHA residents most failed by the current profit-driven models in the private sector.

Principles for the Working Group's development of strategies:

Municipal ownership:

The City as a government did not have an electrical utility, as cities with municipal broadband had, thus making a public utility model difficult. But the team believed that the city could create a public ownership model of infrastructure build-out and services.

Community engagement:

The Red Hook Initiative demonstrated that the goal of projects like these is not the broadband technology itself but rather the community building and opportunity that broadband facilitates. That meant that the community needed to be a part of the project.

Support for adoption:

The aphorism “if you build it, they will come” does not actually apply in a broadband context. Ensuring full adoption of the services the City aimed to provide meant considering devices and applications the community previously had access to and felt familiar with, particularly for the elderly. The project needed to consider a range of strategies for supporting adoption, especially for youth and the elderly, who require different models of adoption.

Provide minority and women-owned business enterprise and local hiring opportunities:

Equity means local, women- and minority-owned businesses would and could participate in and benefit from the project. It also meant utilizing local hiring strategies to ensure that all aspects of the project served the Mayor's goals of ending income inequality.

Leveraging private and non-profit partnerships:

Leveraging relationships and partnerships would help the group bring added capacity to the project.

The Queensbridge Demonstration Project

As a major step toward closing the digital divide and achieving universal access in New York City, the de Blasio administration embarked on a demonstration project providing free, fast broadband access to residents of the Queensbridge housing development, the largest public housing complex in North America.

While residents could purchase broadband in the existing market, the cost was unaffordable for most. By employing its own infrastructure and negotiating with an alternative vendor, the City could provide broadband at a cheaper price. However, simply providing low-cost options would not advance the goals of digital inclusion and equity. Even very cheap plans would force too many residents to make a choice between accessing broadband and other essential needs, such as paying for food or paying off bills. Given the socioeconomic status of the community, residential broadband expansion had to be both free and fast.

To that end, the New York City program built on the work of the Red Hook Initiative, a community-led effort in the Red Hook public housing community to establish free WiFi for disaster relief efforts in the wake of Hurricane Sandy. Inspired by the initiative's innovation and the social capital expanded from it, the Mayor's office considered RHI's broadband deployment a model for the rest of the city's low-income neighborhoods.

Even very cheap plans would force too many residents to make a choice between accessing broadband and other essential needs, such as paying for food or paying off bills. Given the socioeconomic status of the community, residential broadband expansion had to be both free and fast.

With the goal of wiring at least one public housing development in each borough, the administration began with the Queensbridge demonstration project to experiment with the wireless corridor model and learn about the challenges the city might face in providing broadband more broadly. The IAWG selected the Queensbridge Houses, whose two Long Island City buildings contain 3,142 units and house more than 7,000 residents. By rolling out its pilot program at such a sizeable property, the administration could learn how to make broadband services work at a much larger scale—the Mayor's office planned for the NYCHA's wireless corridors to eventually reach every borough and 16,000 households.

The Queensbridge property was already equipped with some of the basic physical infrastructure required for broadband, despite having been built in 1939. NYCHA had installed an intercom system a few decades after the 1940s, which the City had overbuilt with additional wiring and left in place. This existing infrastructure allowed the City to save time and money because each Queensbridge unit was already connected through this existing system (Breitbart 2017).

In addition to the physical infrastructure, a solid community infrastructure was also in place for the City to build on. There was a strong local voice in the Queensbridge Tenant Association, as well as a cornerstone non-profit that worked with tenants and the City. These relationships helped facilitate community buy-in for the project (Breitbart 2017).

Securing Funding

One of the biggest challenges with municipal innovation in general, and in municipal broadband specifically, is securing sufficient funding sources. Political will, bolstered by the Mayor's prioritization of broadband access and assignment of senior staff to manage the project, was critical. The City committed significant funding through two revenue sources: revenue from the LinkNYC franchise's guaranteed income and the City's 10-year capital budget. Because the Mayor made universal broadband a platform commitment and had approved a plan that included NYCHA wireless deployment, the administration secured \$70 million over ten years through the capital budget process (Saunders 2017).

DOITT was the natural agency lead for executing the Queensbridge project, as it provides information technology and telecommunications services to all city agencies and negotiates and manages the City's franchise agreements with telecommunications providers. NYCHA's work serving the target population paired well with DOITT's technical expertise in telecommunications contracting and accountability.

Navigating Procurement

The City faced two potential obstacles in seeking a vendor who could build and maintain a well-managed WiFi system⁶ on behalf of the City, with the preexisting infrastructure laid throughout NYCHA properties. First, procurement is generally a lengthy and bureaucratic process. The standard procurement process includes issuing a Request for Proposals and proceeding along a 9 to 18 month process to hire a contractor to do the work. Because Queensbridge qualified as a demonstration project—a small-scale project meant to inform a larger undertaking by the City with a novel approach—procuring a contractor took only a few months (Breitbart 2017).

Second, the City sought a vendor who would perpetuate the values embedded in the project—high-quality service paired with local engagement and employment. The City's top priorities for selecting a vendor included excellent customer support, a clear plan to incorporate residents into the process (both to hear their needs and to employ them), and integration of technology at a high standard (Saunders 2017). SpotOn, an ISP who had worked with public housing developments in San Antonio, was willing to provide employment to residents during the installation process (Simpson 2017). SpotOn had also provided service to high-end residential properties in the city. The administration believed that public housing residents deserved the same quality service as those with high incomes, so it selected an ISP that had experience delivering that quality. In April 2016, the City finalized a three-year contract with SpotOn with the option to renew for one year.

Building Trust with Tenants

In implementing the project, SpotOn and the administration took steps to engage directly with tenant needs. The company had a number of conversations with the head of the Tenant's Association (TA), as well as meetings with the TA board, which provided opportunities for tenants to express their interest in employment with SpotOn. NYCHA worked with SpotOn to ensure the company hired 12 residents to help with tenant interfacing, one of whom also worked on the technical side of the project (Vergara 2017). Since the design of the Queensbridge houses required SpotOn to enter individual units for WiFi installation, tenant employees were critically helpful in building trust with Queensbridge residents (Sherwin 2017).

⁶ Managed WiFi systems consist of a single network throughout a property where residents log into a unified network rather than individual routers.

Queensbridge TA President April Simpson worked to educate tenants about the process and address their concerns. One tenant concern was that the broadband infrastructure was being implemented before the community's roofs were fixed; that concern was alleviated when the City announced shortly thereafter that the NYCHA roofs would be fixed before installing broadband (Office of the Mayor 2017). Second, many residents were wary of allowing unfamiliar people into their homes to install hardware they weren't familiar with, especially since they didn't know whether the project involved surveillance.

Simpson and Queensbridge tenants employed by SpotOn were able to assuage these concerns and reassure tenants that the project was meant to serve their needs and that their activities would not be monitored. Simpson notes that the fact that SpotOn told residents what they were about to do before they embarked on any stages of the project also built trust with tenants, and that that honesty went a long way. ("After a certain point, you heard people say 'I can't wait until they get to my block!'") Having a SpotOn office in the development also allowed tenants to ask questions in-person and put any fears to rest by seeing representatives from the company onsite (Simpson 2017). Lastly, the TA leveraged partnerships with two non-profits to provide trainings on how to use the technology: the Jacob Riis Neighborhood Settlement, a community center for western Queens, and Urban Upbound, which provides resources to public housing residents to improve their economic mobility.

SpotOn and the Mayor's office grappled deeply with the question of data privacy and ownership (Sherwin 2017). The administration felt strongly that the City should not be able to collect any data on how residents were using the service; however, the administration did want to collect data on usage rates in order to ensure the population was getting high-quality service. The City wrote data use policies into the SpotOn contract to ensure residents' data privacy, while holding the vendor accountable for high-quality service.

To date, about two-thirds of apartments wired by the demonstration project have signed up for service, and the City hopes to sign up 100%. The City expects to have all Queensbridge apartments wired by the end of September 2017 and plans to launch additional support programs in the coming months to reach 100% adoption (Breitbart 2017).

| LESSONS LEARNED

As the largest city in the country to undertake the challenge of providing free municipal broadband in public housing, the Queensbridge demonstration project offers several lessons for practitioners in this area.

Because every city is different with regard to the political will, financing power, and legal authority for municipal broadband, we do not suggest that every local government must follow this exact approach to creating universal, equitable broadband access. However, the Queensbridge experience highlights many of the challenges and opportunities that all municipalities will face when embarking on a project like this, both during the implementation process and while creating broader change in the marketplace.

1

Political will and financing are deeply important and allow for institutionalization

Access to the highest levels of government was not only critically important in the convening of power, but was also particularly important in the processing of acquiring the funding necessary to pursue the Queensbridge demonstration project. The fact that the Counsel to the Mayor was also a senior cabinet member helped to ensure that other cabinet members perceived universal broadband as a mayoral priority. This was especially helpful in securing funding for the project. Moreover, working with an interagency task force and with agency support was key. The Office of Management and Budget (OMB) approved the use of guaranteed income from the LinkNYC franchise—taken from the City’s General Fund—to pay for the project, and later approved a capital budget line that was crucial to ensuring available funding for additional municipal broadband infrastructure projects for poor communities.

2

Bringing together various parts of government is hard, but can result in real innovation

In the absence of a utility, creating universal access to a 21st century public good like broadband requires reconfiguring the way government agencies normally function and interact. Not only did the Mayor’s office need to increase staff capacity in City Hall and just below, the administration also had to organize various agencies and stakeholders that each owned a small piece of broadband service delivery. Both within and across agencies, staff that hadn’t worked together before were challenged to create new systems for doing so. Of particular note is the new working relationship between the NYCHA and the DOITT, whose paths had not significantly crossed before.

City governments who wish to embark on municipal broadband efforts will likely find a similar need to flex new muscles of collaboration: A mix of expertise with the target population and with the technology and infrastructure required rarely exist in one office, so institutions will need to dedicate point people across and within agencies to actively communicate, brainstorm, and trouble shoot, ideally with a central managing team that owns the project.

3

Cities can and should be market disrupters to improve digital equity

By playing a greater role in broadband provision, municipal governments can correct for market failures that target low-income neighborhoods of color in particular.

The New York City government—through its contractor, SpotOn—was able to provide free broadband at 25 megabits per second. Before public intervention, the only broadband options available to Queensbridge residents were prohibitively expensive (around \$60/month). Leveraging public power paid huge dividends to low-income New Yorkers; the City is now able to purchase services in bulk at much lower costs than individual residents would be able to find on the market on their own, and local government can (in this case fully) subsidize those costs for residents. In effect, the City has also stepped into the market to offer this service with improved access, and thus also has the potential to force more competition in the private market. If competitors in the neighborhood want to attract customers away from the public package, they could lower their own prices or provide better customer service.

Creating a role for local government to participate in the market—either by purchasing service on behalf of city residents from a third-party ISP or by creating a municipal utility—is essential to ensuring digital equity.

THE IMPORTANCE OF STATE AND FEDERAL POLICY

There is a clear and present need for strategies to connect the disconnected, those who are too often rural low-income whites and people of color in *de facto* segregated neighborhoods excluded from ICTs. Inherent in the policy history that explains this disconnection are the tensions of a deregulated and private sector strategy, coupled with a rapidly shifting technological landscape. For the foreseeable future, federal policy will be focused on reversing Former President Barack Obama’s efforts to reform the regulatory framework of telecommunications, at the same time that the federal government is auctioning off spectrum⁷ that might be utilized effectively for public options (Boorstin 2017). In fact, the Obama administration adopted reforms that enabled the Federal Communications Commission (FCC) to treat broadband as a “telecommunications” service under Title II of the Communications Act of 1934, instead of an “information” service to support public utility-like regulation of broadband. The former President also made broadband access a major part of the American Reinvestment and Recovery Act (“Stimulus” Act) to invest in economic growth.

Local government has the most direct effect on communities’ daily lives, but state and federal law can support—or hinder—free public broadband projects like Queensbridge. At the state level, state preemption laws put significant obstacles in the way of cities that want to develop municipal broadband programs. At the federal level, three major policy advancements that the federal government could make to support local broadband include investing in infrastructure, modernizing regulation by the FCC, and maintaining adequate funding to public housing in cities.

⁷“Spectrum” refers to the radio frequency spectrum that a collection of federal agencies is tasked with regulating to promote efficient use and social benefit. The agencies hope to double the amount of spectrum available for commercial mobile and wireless use within ten years.

State Preemption Laws

State preemption refers to laws at the state level that limit the expansion of municipal broadband internet services. As of 2017, more than 20 states in the U.S. forbid localities from embarking on free public broadband initiatives like the one we describe in this report. Removing barriers to local innovation is key if other cities are to build off the success of New York's program.

The mounting trend of state-imposed restrictions on municipal broadband deployment can be attributed to several factors. Firstly, as with any monopolistic firm, incumbent internet service providers are able to devote large amounts of resources to lobbying efforts and have successfully captured the sources of policy data and analysis that are provided to state legislators. Secondly, municipal broadband has come to be viewed through an increasingly partisan lens at the federal level since its endorsement by President Obama, despite having historically been regarded as a bipartisan issue. Lastly, there is a disconnect between municipal and state approaches to broadband where state legislators instinctively see any public involvement in service provision as inherently inefficient, whereas municipalities see their broadband initiatives as a way of increasing private sector competition and lowering costs.

During Tom Wheeler's tenure as Chairman, the FCC sought to roll back such restrictions enacted by state legislatures, arguing that Congress had authorized the FCC to promote telecommunications competition under the Telecommunications Act of 1996, thereby preempting state laws. However, in August 2016, the Court of Appeals for the Sixth Circuit barred the FCC from pursuing this course of action. The court held that for the FCC to preempt the allocation of decision-making power between the states and municipalities, explicit authorization from Congress is required, and such form of authorization was not present in the Telecommunications Act. The FCC has decided not to appeal this decision on the grounds that prolonging legal proceedings would not be the best use of the Commission's resources. FCC's retreat effectively closed off the most direct avenue to challenge state preemption laws at the federal level.

Federal Policy

Infrastructure Investment: In the 21st century, infrastructure is so much more than roads and bridges. Broadband is not only digital infrastructure, it also requires physical infrastructure. If Congress were to pass an infrastructure bill, it should include funds that are earmarked towards laying the literal groundwork needed to implement local broadband, and it is crucial that those funds be publicly administered to ensure equity. Specifically, Congress should provide infrastructure funding that is directed towards public housing developments, so that they can install interior wiring and conduct necessary internal upgrades needed to install broadband throughout a property. One important change in any effective federal infrastructure bill would allow that money to be used by municipalities (Next Century Cities 2017).

Modernizing FCC Regulations: The Federal Communications Commission (FCC), an independent government agency overseen by Congress, is a regulatory body that is the United States' primary authority for communications law, regulation, and technological innovation. The FCC is charged with promoting competition in the telecommunications market and managing spectrum policy.

Although independent, the FCC is not immune from politics. Five commissioners, appointed by the President and confirmed by the Senate, head the agency. The commissioners sit for five-year terms, and no more than three commissioners can be of the same party at any given time.

As of 2017, the FCC Chairman is Ajit Pai, a former Verizon lawyer and a “die-hard free market Republican who truly believes that largely unregulated competition is the path forward” (Coldewey 2017). Since his elevation to Chairman, Pai has quickly moved to overturn hallmark competition and consumer protection measures, like the 2015 Open Internet rules, that ensure net neutrality, and the Broadband Consumer Privacy rules, which were put in place by his predecessor, Tom Wheeler, and empower consumers to decide how data are used and shared by ISPs (FCC2016).

The FCC has also created the Broadband Deployment Advisory Committee (BDAC) to advise it on how to accelerate the deployment of broadband, by reducing and/or removing regulatory barriers to infrastructure investment. The telecommunications industry is seeking unfettered access to public rights-of-way in cities across the country to acquire the small cell technology needed for 5G deployment. Local authority is necessary to address equitable deployment of broadband. Therefore, the FCC should ensure that local governments maintain a role in safeguarding equitable deployment and that telecommunications firms are accountable to serving all residents.

There are two primary areas in which FCC policy has implications for municipal broadband. The first is the Lifeline program, and the second are the policies around licensed and unlicensed spectrum.

Lifeline: The Lifeline program is a subsidy program run by the FCC intended to make communications technology more affordable for low-income consumers. The program was originally intended to make telephone service affordable, but in March 2016, the FCC passed rules to expand the program to broadband. Though the rules have not yet taken effect (as of March 2017), consumers will be offered discounted packages from participating providers. The packages will include stand-alone broadband, bundled voice-broadband packages, and stand-alone voice service (FCC). Eligible customers must meet income requirements such as being at or below 135 percent of the federal poverty guidelines. Households who are eligible for certain safety net programs, such as food stamps, Medicaid, and Section 8 vouchers, are also automatically eligible for the Lifeline subsidy (FCC 2017).

Although the Lifeline program did not intersect with the development of the NYCHA wireless corridors, the Lifeline subsidy is an important program in furthering digital equity. The FCC should work to develop ways for networks’ local efforts to aggregate lifeline subsidies as a method of supporting the sustainability of public and non-profit broadband networks. Because many cities do not have the financial and political resources necessary to build public broadband systems, the Lifeline program is fundamental in ensuring low-income families don’t fall further behind. Moreover, allowing public housing residents to be eligible for Lifeline modernization could make municipal projects more or less viable—even if these municipal programs do not go so far as to provide free broadband access to residents (Breitbart 2017).

Spectrum Policy: Spectrum regulation in the public interest is important to ensuring private players do not slow down wireless speeds for municipal broadband projects like Queensbridge. After the spectrum used by the federal government, there are two primary types of spectrum available—licensed spectrum and unlicensed spectrum. Licensed spectrum allows for the exclusive⁸ use of a particular frequency. This exclusive use is often geographically limited, such that the license holder can only have the rights to exclusive use within set bounds (FCC “Accessing Spectrum”). Most non-federal licensed spectrum is allocated for commercial use, and there is a small amount used for public emergency services.

⁸Licensed spectrum is occasionally used in a non-exclusive way.

Unlicensed spectrum is open-use spectrum that does not require a license to operate on. WiFi—including that provided through the NYCHA wireless corridors—operates on unlicensed spectrum, as do microwave ovens, remote controls, and other everyday household objects. As such, it is subject to interference and is extremely crowded with users.

Although the FCC regulates only a small amount of spectrum, federal rulemaking (or lack thereof) does have implications for municipalities' ability to develop broadband services. One recent development that exemplifies how federal rulemaking can affect cities in this way is commercial operators increasingly offering LTE (cell phone data when not on WiFi) services that individuals can use on unlicensed spectrum. Some argue that this crowds out space in the already crowded unlicensed spectrum (Breitbart 2017). The lack of unlicensed spectrum on the market makes it difficult for municipalities to develop affordable, large-scale initiatives.

The most recent wave of digital expansion has been in wireless broadband connection through devices like tablets and smartphones. In fact, wireless deployment became the cornerstone of the Obama administration's ten-year broadband plan, to be paid for by selling spectrum to large telecommunication monopolies like Comcast and Verizon (FCC 2010, Department of Commerce).

| CONCLUSION

In a world where the digital divide is not just stratified by income but is specifically racialized, strategies to close the divide, including public policy, must employ a racial equity lens. Creating universal access to broadband should take an equity approach, ensuring access for those who face the highest barriers: low-income communities of color. Though digital equity is about more than access to broadband, we must first clear the way for universal, residential high-speed internet access before we can create equity in Big Data and foster data sovereignty.

We have argued that infrastructure investments have historically benefited white communities at the expense of communities of color. The urban renewal of the 1950s and 1960s displaced Black and Latino communities, and highway expansion re-segregated and erased them from investments (Silver et al. 2016). Private broadband markets entrench those disparities, and the current monopolized environment compounds them, leaving huge barriers for communities of color in accessing high-speed internet.

One city alone can't undo this history and restructure an entire nationwide market, but it can make significant progress towards equity. New York City started this effort with the Queensbridge project. The administration committed to principles of public ownership, community engagement, and support for adoption, while ensuring opportunities for local hiring by contracting with the Minority and Woman-Owned Businesses Enterprise, and leveraging private and non-profit partnerships.

The Queensbridge demonstration project offers the following lessons for policymakers and practitioners in how to follow through on those principles and alter broadband market incentives on the local level:

- Providing free, high-speed internet access to communities living in public housing is a high-impact use of city resources and physical infrastructure, and this entry point provides a concrete way to approach digital equity. Other cities should consider this approach as a strategy for closing the digital divide.
- To truly create equity, the gold standard of municipal broadband projects is to provide free or very low-cost service to low-income communities without sacrificing quality or speed of service.
- Leveraging municipal ownership can create accountability for equity in build-out and services. There is a range of tools that local governments can use, from creating a public option for broadband connected to a municipal electric utility to leveraging public ownership of physical infrastructure. Purely private provision of broadband is vulnerable to recreating and entrenching the racial digital divide, but public accountability can be a force for ensuring equity. The Queensbridge model shows how there is a spectrum of public regulatory tools; this project utilized the city's ownership of physical infrastructure to create conditions for equity in the contract.
- Leaning on non-profit and Tenant Association partnerships helped to facilitate community engagement and provide support for adoption, with services for training elderly and teen residents on how to use the new high-speed services available to them.

Queensbridge as a case study of building broadband equity illustrates what cities can do beyond municipal utility models. Public options for broadband provide an excellent way to close the digital divide, provided they are executed in a racial equity framework. For cities that see this model as an obstacle to taking any positive step towards digital equity, we hope this case study serves as a reminder of the various ways public tools can be used to make significant advancements in closing the digital divide. Doing so will allow us to then take steps toward digital equity's broader horizon: Big Data, data sovereignty, and augmented and virtual realities that instill racial hierarchy in technology and data. Connecting communities to the web is the pathway, not the end goal, for true equity and empowerment.

APPENDIX

A: Definitions of digital equity

The deeply rooted exclusion of low-income communities of color from broadband is preventing those communities from full participation in our economy and society. Internet access is essential for daily participation in public life, from greater civic engagement to more efficient interactions with government systems. It is essential that low-income communities of color be able to innovate with broadband and use it for all the benefits it can produce, from business development to data mining and ownership that can drive solutions to large social problems. In fact, true economic, civic, and social inclusion requires that low-income communities have ownership of digital technologies and the infrastructure that enables them.

Digital equity then embodies not just access (to internet infrastructure) and literacy (knowing how to fully utilize the internet), it also means self-determination, where all communities are able to create and implement solutions that digital technologies can help produce for their lives. To get there, we must start with ensuring everyone has access to world-class internet infrastructure, speeds, and data capacity, regardless of the level of wealth or poverty in their community. But there are many steps towards building this reality. This charge requires that we ask key questions: How should the internet be regulated and deployed as a telecommunication service? How does our policy landscape need to transform to accommodate this 21st century utility and its role in our lives?

B: List of individuals interviewed for this project

James Baller
Joshua Breitbart
Joanne Hovis
Alphonso Jenkins
Christopher Mitchell
Brittney-Jade Saunders
Richard Sherwin
Angela Siefer
April Simpson
Deb Socia
Lenese Vergara
Maya Wiley
Matt Wood

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