



National
Urban League

THE LEWIS LATIMER PLAN FOR DIGITAL EQUITY AND INCLUSION

A COLLABORATION COMMISSIONED BY THE NATIONAL URBAN LEAGUE

This Plan was inspired by, and is offered in memory of, the life of **Lewis Howard Latimer** (1848-1928), a Black American draftsman, soldier, scientist, and researcher whose parents were born into slavery. Despite the severe limitations of his time, Latimer made groundbreaking contributions to science that changed the course of human history. Working with Alexander Graham Bell, Latimer helped draft the patent for Bell's design of the telephone. Latimer also was involved in the field of incandescent lighting, a particularly competitive field in the late 19th century, working for Hiram Maxim and Thomas Edison. Latimer wrote the first book on electric lighting, entitled *Incandescent Electric Lighting* (1890), and supervised the installation of public electric lights throughout New York, Philadelphia, Montreal, and London.

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FOREWORD

MARC H. MORIAL

PRESIDENT AND CEO
OF THE NATIONAL
URBAN LEAGUE

For decades, the National Urban League has warned of dangers of a persistent digital divide, some obvious and others more subtle but equally troubling. We've reinforced those warnings with our Digital Inclusion Index, providing statistical evidence related to one foundational question: "Are the new job, business and educational opportunities created by increased digitization of our world being equally shared?"

The answer, sadly, remains no. But despite that evidence and those warnings, government actions to address the divide have been at best modest and intermittent.

Then COVID-19 hit. The pandemic has accelerated an already-speedy migration to "remote everything," particularly for such essential activities as employment, health care, and education. The benefits of being connected grew even faster, as did the costs to communities who were not connected.

COVID-19 proved that broadband was no longer a nicety. It had become a necessity.

2020 also witnessed the brutal murder of George Floyd. Tens of millions of Americans saw with clearer eyes what the National Urban League and the people it serves have long known: that the legacy of slavery and systemic racism still plagues America.

These two crises flowed together in demonstrating how acutely the costs of disconnection disparately impacted communities of color. To its credit, many Americans raised their voices in calling on not just their neighbors, but also political actors, policymakers, and corporate leaders, to all address the need for digital equity and inclusion.

Recognizing that America needed a comprehensive plan to address the problem, the National Urban League called upon dozens of experts in a wide range of fields and collected their recommendations for how America could use the tools of the information economy to create a more equitable and inclusive economy and society, solving the problem those same tools had, in part, created.

The result is the Lewis Latimer Plan for Digital Equity and Inclusion. It is named for, and inspired by, the life of Lewis Howard Latimer (1848-1928), a Black American draftsman, who made groundbreaking contributions in his work with, among others, Alexander Graham Bell and Thomas Edison. Just as telephony and electricity changed the world in Latimer's time, digitization is changing ours, and we should act to assure that everyone has the opportunity to contribute to and benefit from that change.

This plan addresses “the three A's”—availability, adoption, and access to economic opportunity. Availability means that a home broadband service is available to all communities, including communities of color. Adoption means that households in these communities have subscribed to a broadband service. Access to economic opportunity means the industry must employ a diverse workforce and provide business opportunities to communities of color. Millions of American homes, businesses and other enterprises cannot fully participate in 21st-century society because we as a country have not adequately addressed those three A's.

Our goal in producing the Latimer Plan is to offer not only a comprehensive and detailed analysis of the problems of digital inequity and exclusion but, more important, to provide specific, detailed, and pragmatic solutions to these harms, organized as an integrated set of both strategic and tactical plans. Our proposals require action and collaboration across multiple institutions, public and private, and across all levels of jurisdiction. But there is no silver bullet.

The Latimer Plan, though comprehensive, will not be the last word or the only approach worthy of consideration. But whatever elements make up the ultimate solution, government must act quickly to assure that the essential goals of digital equity and inclusion are met: that there are broadband networks everywhere, that everyone can use and afford them, that we utilize those networks to improve the delivery of essential services, and that everyone has access to new economic opportunities and the ability to participate in the continuing growth of the digital economy. We offer the Latimer Plan to serve as the foundation for accomplishing those critical and urgent goals and accelerating their achievement in the next few years.



A CALL TO ACTION: STATEMENT OF THE EXECUTIVE DIRECTOR

EDWARD
“SMITTY” SMITH

SENIOR DIRECTOR OF
THE LEWIS LATIMER
PLAN FOR DIGITAL
EQUITY AND INCLUSION

Our nation’s vast resources and technological capabilities have never been greater, nor has the need for all Americans to be connected. It is time for us to acknowledge and embrace the reality that achieving digital equity and inclusion in the United States is not optional, nor is it charity. It is an existential imperative for a healthier, better educated, economically stronger country. The plan we outline herein is one step in the policy process toward achieving this goal, but it is only part of a much greater effort that will require us to marshal forces across government, non-profits, academia, and private enterprises to use technology to finally deliver on some of the old promises that our nation has failed to keep.

My father was a District of Columbia public school teacher who, in the early 1980s, taught himself COBOL, an old computer programming language, launching him into a career in government as an IT specialist and network engineer. At a time when computers were a rarity in the D.C. public schools, he realized early that computer literacy would soon become an indispensable skillset in our classrooms and beyond. At home, he taught himself how to program and then

how to build entire computer systems and networks – our home was always filled with modems, motherboards, and monitors. At school, he started offering computer literacy classes to other teachers, most of whom had never used a computer before, and developed materials and curricula for those teachers to teach computer literacy themselves.

From as early as I can remember, I was taught that computers and connectivity were essential technologies that could help create opportunity for anyone who could access them, afford them, and knew how to use them. This lesson has resonated with me throughout my life and, nearly three decades later, when I joined the Obama Administration, I had the opportunity to put these teachings to work designing and implementing programs that would help provide broadband to millions.

However, years later, one of the broadband grants we funded during my time in the Administration generated a report on the state of the digital divide in my hometown of Washington, D.C. What that 2015 report found was that, even in the heart of the nation's capital, over 160,000 residents remained without broadband at home. Furthermore, adoption rates in the poorer, largely Black American parts of the city where I grew up and where my father taught, trailed rates in more affluent parts of the city by over twenty percent. D.C. had grown larger and more prosperous but, as always, the poor were left behind.

Today, the rates of adoption have improved in my old neighborhood, but not nearly enough. Failings of digital equity and inclusion persist, and, in our country's lower-income communities, both rural and urban, those without broadband continue to languish in a state of digital poverty that compounds preexisting inequities and prevents them for fully participating in our increasingly connected society. My father saw both the opportunity of connectivity and the danger of being unconnected before the Internet revolutionized how we work, learn, play, and communicate. Larry Irving saw the danger in the 1990s when he coined the term the "digital divide." The team that drafted the National Broadband Plan in 2010 presented a prescription for how to close the divide. And Tom Wheeler leveraged the Federal Communications Commission's resources and expertise to help make parts of that plan a reality.

But, for all of our efforts, of millions still remain unconnected, even as the consequences of digital poverty are greater than ever. Today's crisis is the COVID-19 pandemic and economic and social turmoil. Tomorrow's crisis will test us further. But what is certain is that, from now on, the cost of being unconnected will be your livelihood and may be your very life. That is a price that no American should have to pay when we have the means and the knowhow to connect everyone.

What we present in this plan is a not simply a blueprint, or a prescription. It is a call to action. The time to act is now and the costs of inaction are grave. However, the real answers will not come from the pages of any report but, rather, from our ability to work together across sectors to direct our collective expertise and resources towards solving a broader societal problem that harms all of us, both the connected and unconnected. This plan intends to set in motion a greater effort, realized through legislation, regulation, executive action, corporate investment, and public-private partnerships.

Some of the plan's proposals will become new programs, others will be transformed into something better, and some will end up on the cutting room floor. But what is clear is that we can no longer afford halfway solutions that exclude tens of millions of our fellow citizens. All our communities and neighbors need to be connected and they need to be connected as soon as possible. Thank you for having this conversation with us. We look forward to working together.

ACKNOWLEDGEMENTS

This project was, in every way, a collaborative effort, drawing on a diverse and deep wealth of experience and expertise in the many different fields discussed in the Latimer Plan. In light of that collaboration--designed to enhance the discussion of how to best advance the goals of digital equity and inclusion--it is important to note that the views expressed in this paper are solely those of the National Urban League and the authors of the specific chapters, and not any sponsors of this plan or any others who assisted in this effort. Further, the views expressed in the chapters are the views of the authors in their individual capacity, and should not be attributed to any institution with which they are affiliated.

The first acknowledgements must go to the team at the National Urban League itself. Marc H. Morial, the CEO and President of the National Urban League, provided critical leadership in framing and pressing the project forward. Nicole Lazare, the former General Counsel of the League, initiated the discussions and structured the Plan, while Clint Odom, the former Senior Vice-President for Policy and Advocacy, shepherded the project through its initial drafting. Joi Chaney, the League's Executive Director for its Washington Bureau and Senior Vice President for Policy and Advocacy, assisted by Danielle Davis, the League's Tech and Telecom Fellow, took the project over the finish line. The League's Cara Morris and Robert Pierre provided additional support.

The project also benefitted enormously from the support provided to the League by Edward "Smitty" Smith, a partner at the firm DLA Piper, who served as the Senior Director of the Plan.

Of course any discussion of digital equity and inclusion builds on the foundations laid by many others, including, but not limited to, Larry Irving, the former head of NTIA who warned of, and coined the phrase, the "digital divide" more than two decades ago, Brookings Scholar Nicol Turner-Lee, the work of certain Think Tanks, particularly The Multicultural Media, Telecom and Internet Council (MMTC), founded by David Honig and now under the leadership of Maurita Coley, and the Joint Center for Economic and Political Studies and its President Spencer Overton. In addition, this document was constructed on various analyses of these issues by many at the FCC but most particularly former Commissioner Mignon Clyburn and current Commissioner Geoffrey Starks.

Larry Downes, the author of several best-selling books on business and technology, served as the Editor-in-Chief, and performed an extraordinary service in pulling together a diverse set of contributions and making them all better. Melissa Turcois, an associate at DLA Piper, also assisted with the drafting and editorial functions, particularly in weaving together feedback and suggestions from a number of outside readers.

While all the chapters reflect the input of a number of sources, there were principal authors for each of the chapters. These were as follows:

- Chapter 1: Blair Levin, Senior Non-Resident Fellow, Brookings Institution, Metropolitan Policy Project
- Chapter 2: Larry Downes
- Chapter 3: Paul de Sa of Quadra Partners and Carol Matthey of Matthey Consulting
- Chapter 4: John B. Horrigan, PhD, and Angela Siefer, Executive Director of the National Digital Inclusion Alliance

- Chapter 5: Blair Levin
- Chapter 6: Melissa Turcois
- Chapter 7: Blair Levin and Larry Downes
- Chapter 8: Marcella Gadson, formerly with MMTC (now with CTIA)
- Chapter 9: Kerry McDermott, MPH
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- Chapter 13: Blair Levin
- Chapter 14: Professor Matt Perault and his Duke University class on technology policy, including Mihir Bellamkonda, James Eide, Lee Foster, Charlie Graham, Zachary Silverman Guffey, Abdur Rehman, and Niharika Vattikonda
- Conclusion: Blair Levin and Larry Downes

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EXECUTIVE SUMMARY

Ten years ago, the National Broadband Plan observed that as “more aspects of daily life move online and offline alternatives disappear, the range of choices available to people without broadband narrows. Digital exclusion compounds inequities for historically marginalized groups.” In light of these trends, that plan warned “the cost of digital exclusion is large and growing.”

Unfortunately, only modest efforts to address those costs have been expended in the last decade. Now, as the COVID-19 pandemic accelerates a shift to “remote everything,” the costs of exclusion have grown even larger. The need for policymakers to act has become even more urgent, compelling us to ask, *how can the tools of the information economy be employed to create a more equitable and inclusive society?*

The answer lies in accomplishing four big, but achievable, goals:

- Deploying networks everywhere.
- Getting everyone connected.
- Creating new economic opportunities to participate in the growth of the digital economy.
- Using the networks to improve how we deliver essential services, in particular in

workforce development, health care and education.

The National Urban League, working with other civil rights organizations and public policy experts, has commissioned the Lewis Latimer Plan for Digital Equity and Inclusion (the “Plan”), a detailed and comprehensive agenda to reach these goals and erase several persistent and dangerous gaps:

The Availability Gap. For millions of American homes, businesses and other enterprises, there is no available broadband network capable of allowing them to participate fully in 21st century life. This is generally a rural problem, where higher capital costs are required to reach fewer customers. In sparsely populated areas of the country, private capital alone is unable to economically justify the investment needed to build high-speed broadband infrastructure.

Currently, the federal government has not gathered the necessary data to accurately define and identify what constitutes an

unserved area, nor does it have a good map of the locations where no networks are available. Further, the current system of subsidizing high-cost deployments is under significant stress, unable to fund the necessary build-out for many years, if not decades.

To Close the Availability Gap, the Plan recommends that Congress provide the FCC with sufficient appropriations to fund capital expenses necessary to deploy broadband networks to all Americans.

The Plan also recommends that the FCC:

- Re-examine, based on network usage during the COVID-19 crisis, the performance standards below which an area is deemed unserved by broadband at home, and above which subsidized networks are required to perform in order to qualify for capital funding support;
- Produce an accurate map of broadband availability, pinpointing unserved by broadband services;
- Eliminate the Eligible Telecommunications Company (ETC) requirement, which disqualifies existing and future broadband providers who could otherwise deliver service quickly and efficiently;
- Produce a set of best practices for reducing deployment costs and times; and
- Hold a series of reverse auctions to allocate subsidies necessary to close the Availability Gap. These investments should be based on technology-neutral criteria, supporting a mix of solutions that can be rapidly deployed. Further, the FCC should adopt stronger guardrails for the short form process to examine more closely whether an entity seeking to bid has the actual technical, operational, and financial resources necessary to meet its commitments. Enterprises should not be allowed to bid on the basis of unproven technology.

In addition, the Plan recommends that the National Telecommunications and Information Administration (NTIA), which has information on its website about dozens of federal

programs that support broadband deployment efforts, provide a search engine that enables stakeholders to more effectively find the programs that serve their needs, and, to the extent feasible, create a common application that enables those applying for funding from more than one program to save time and effort on the application process.

The Adoption Gap. Even among those Americans for whom a broadband network is available, there are still tens of millions who have not adopted broadband in their homes. Indeed, in terms of number of Americans affected, the Adoption Gap is approximately three times larger than the Availability Gap. There are two principal causes of the Adoption Gap. One is a lack of digital readiness. A second, and more significant cause, is the unaffordability of entry level broadband services for a significant portion of the American population.

To Address Digital Readiness. Digital readiness refers to the skills and equipment needed to effectively use information and communications technology to find, evaluate, create, and communicate online. The lack of such skills is a significant barrier for certain demographic groups, hindering their ability to adopt and fully utilize broadband at home.

The Plan's principal recommendation for addressing digital readiness is to create a national Office of Digital Equity to help coordinate training targeted to demographic groups with the lowest rates of adoption.

Among specific recommendations for the Office, the Plan proposes:

- Establishing a Digital Navigators Corps to help unconnected persons solve a wide range of adoption issues;
- Creating an Online Digital Readiness Portal to provide every American with access to free, age-appropriate curricula that teaches digital skills and enhances digital readiness, offered in multiple languages;
- Issuing reports on the effectiveness of different digital readiness strategies.

To Address Affordability. The principal government program addressing broadband affordability today is Lifeline, which provides a \$9.25 monthly subsidy to qualifying low-income households for communications services. There is a broad consensus that Lifeline is deeply flawed, with too small a subsidy, ineffective distribution, and reliance for funding on an unsustainable model that is based on a regressive tax on traditional telephone services. Given these limits, Lifeline today is used almost exclusively for mobile, rather than in-home broadband services.

While mobile services have significant value, broadband at home creates better opportunities with enormous public benefits, benefits that today are not being captured. We all gain, for example, when the unemployed can train online for new careers, and use the same tools everyone else does to search, apply for, and interview for new jobs, getting them back in the work force quickly. Likewise, everyone benefits when at-risk communities can receive telehealth at home, improving community health outcomes and lowering costs for government medical programs. Finally, everyone wins when all children have the tools to do their homework and engage in online learning in their homes, improving educational achievements.

To capture these benefits, the Lifeline program requires substantial overhaul. The simplest solution, and the approach we favor, would be for Congress to appropriate funds for the FCC to create a permanent version of the Emergency Broadband Benefit that Congress passed earlier this year, which the FCC is currently implementing.

Alternatively, Congress could create a new program to address both mobile and broadband at home needs to assure access to essential government services for workforce development, healthcare, and education. While the program we propose would not have the simplicity—an important virtue in public policy design—of making the EBB permanent, it would have advantages in terms of distribution and cost savings.

The new program, which we call Lifeline+, would include a mobile benefit and a broadband at home benefit, which consists of three related programs:

1. **LifelineMobile**, which would continue the current Lifeline subsidy for basic voice and mobile functions with some limited data, albeit with comprehensive reforms; and
2. **LifelineHome**, composed of:
 - a. **LifelineJobs**, which would provide broadband at home to the unemployed, empowering them to utilize online programs to upgrade their skills, as well as search, apply and interview for jobs;
 - b. **LifelineMed**, which would provide broadband at home to low-income persons, to utilize the full suite of telehealth services; and
 - c. **LifelineEd**, which would provide broadband at home to low-income families with K-12 schoolchildren and members of their households, to utilize all forms of digital learning.

All eligible families or individuals would be eligible for both the mobile and one broadband at home benefit. Use of the broadband at home benefit would not be restricted, so that regardless of the specific service, the person or family could use broadband for any purpose.

The Plan proposes that LifelineMobile and LifelineEd be funded by direct Congressional appropriations. LifelineJobs and LifelineMed should be funded through mandates added to existing government unemployment and medical insurance programs. Providing beneficiaries of these programs with broadband would, if properly designed, largely pay for itself in the form of savings to the delivery of critical services currently provided only through in-person activities.

Broadband provided through one of the LifelineHome programs will likely support several program goals. For example, approximately 70% of school children without broadband at home and who would be eligible for a benefit under LifelineEd are also covered by Medicaid, and would therefore already be eligible for LifelineMed. Providing broadband through Medicaid and other government health insurance plans would also improve the distribution of the benefit.

As with infrastructure support, the Plan recommends eliminating the ETC requirement for Lifeline service providers, and recommends that support be provided directly to beneficiaries in the form of any efficient means, such as a debit card, to enhance consumer control and choice and to reduce the possibility of waste and fraud. We note that the FCC will gain experience through the Emergency Broadband Benefit program, and such experience should inform any ultimate permanent broadband benefit.

The Access to Economic Opportunity and Participation Gap. Several decades ago, famed venture capitalist John Doerr said the personal computer industry's growth from zero to \$100 billion in 10 years was "the greatest legal accumulation of wealth in history." Subsequently he had to amend his comment. Noting that the Internet dwarfed the PC revolution by going from zero to \$400 billion in five years, Doerr said "There are waves and then there is a tsunami." That tsunami has continued. Today the top five American companies by market capitalization (Microsoft, Apple, Amazon, Alphabet, and Facebook) all rode the tsunami Doerr described.

Unfortunately, opportunities for wealth accumulation are not equitably distributed. Jobs, especially the higher paying jobs in the technology industry, have not been filled by Blacks and Latinxs in any significant way. The National Urban League's 2018 State of Black America Report found that of the 40,000 employees of four major Silicon Valley technology firms, only 1,000 were Black; the number for Latinx is paltry. Moreover, business inclusion and opportunity in the growing tech sector has lagged miserably for Blacks and Latinx.

This is not a new problem. The person for whom this Plan is named, Lewis Latimer, was a free Black patent-holder and the son of slaves, whose achievements were critical to the success of his employers, Thomas Edison and Alexander Graham Bell. Unfortunately, but typically, while Latimer was a key contributor to Edison's and Bell's seminal wealth-creating inventions, he had no ownership stake in the vast businesses they spawned.

We need to break that historic pattern. While much of the Latimer Plan is focused on

assuring that all Americans, regardless of race, income, or location, have the tools and skills to fully participate in the economy and society of the 21st Century, we also want to close gaps that limit opportunities to participate meaningfully in the business of value creation as broadband and broadband-enabled enterprises continue to innovate, grow, and prosper. We must also ensure that job opportunities are available for the country's growing Black and Latinx communities at every level in the technology and technology-related business sectors.

The causes of limited access to economic opportunity and inclusion are complex, but the gap can be closed with public and private intention, leaving our nation stronger, more equitable, and more prosperous. In truth, this gap was created by legal and historic barriers to capital access and legal barriers to full citizenship and opportunity. In the last decades of the 20th century, government and industry began to address some of these barriers, but these efforts lack sustainability or face legal challenges that raise the specter of "reverse racism." The televised murder of George Perry Floyd, Jr. and the Black Lives Matter movement have prompted a renewed interest in a holistic government response and intentionality by many corporations to close the economic opportunity and participation gap. Corporate America, in a number of ways, has accepted accountability to ingrain diversity, equity, and inclusion into their corporate DNA, including creating racially and gender diverse corporate boards, staffing, C-suites, procurement, philanthropy, and community investment.

Civil rights organizations, led by the National Urban League, have pioneered the negotiation of written memorandums of understanding with several communication companies to set forth goals, timetables, and initiatives to achieve greater diversity, equity, and inclusion. As a nation, we should move forward with new vigor and intentionality in utilizing these techniques to drive towards greater economic opportunity for those who have historically been left behind.

To close the economic opportunity and participation gap, industry, government, and community organizations must work together to improve and increase commitments to racial equity in corporate board membership, staffing, the C-suite, procurement,

philanthropy, and community investment. To facilitate this collaboration, the Plan recommends:

- **Infrastructure.** As part of any future infrastructure legislation, Congress must include mandates for companies that will directly benefit from increased federal investment in infrastructure to improve their performance in providing access to economic opportunity and participation in the categories noted above.
- **Measure Diversity.** The Department of Commerce and the FCC should collect information that allows the government and the public to understand and evaluate how the private sector, and the technology and related sectors in particular, are improving economic opportunity and participation in the categories noted above.
- **Incentivize Diversity.** The Department of Commerce, the FCC, the Small Business Administration, and the Securities and Exchange Commission should evaluate annually and report to Congress on measures that could be adopted to enhance the performance of private enterprise in improving economic opportunity and participation in the categories noted above.
- **Highlight Sustainable Success.** The Department of Commerce, the FCC, the Small Business Administration, and the Securities and Exchange Commission should publish an annual report on best practices for enhancing the performance of private enterprise in improving economic opportunity and participation in the categories noted above.

The Utilization Gap. Deploying networks everywhere and assuring that everyone has the skills and means to connect are necessary first steps. But they are not sufficient to achieve digital equity and inclusion. We also need to increase the utilization of digital platforms, which requires substantial improvement to essential government services offered online. The COVID-19 crisis has forced our economy and society to run a massive—if unplanned—experiment in “remote everything.” While that experiment has produced some positive trends, including

greater utilization of telehealth, it has also shown that we have a long way to go in other areas, such as education. We need to be more intentional in developing new capabilities, to assure that they lift up, rather than disadvantage, low-income persons and communities of color. The Plan details recommendations on policies that can, in conjunction with universal availability and adoption, improve the delivery of essential services.

Workforce Development. Governments should improve digital tools that enable people interested in every job type to upgrade their skills and to search, apply, and interview for jobs, and ensure that small businesses can use broadband-based tools to improve their prospects.

The Plan makes several recommendations, including:

- The White House and Congress should expand access to digital resources and technical assistance for enterprises located in rural areas and among communities of color;
- The Department of Labor should develop more broadband, technology, and communications sector-related registered apprenticeship training programs;
- The federal government should provide incentives for companies, states, municipalities, nonprofit organizations, and the private sector to create and scale new workforce development and digital skills training programs;
- Federal agencies should increase and improve data collection related to workforce development; and
- States should modernize their unemployment benefits systems to more effectively offer unemployed citizens access to opportunities for future employment.

Health Care. With healthcare services increasingly provided online, government must assure that everyone has access to user-friendly, health-enabling tools that connect them to high-quality, affordable

health services and medical information they can understand.

To do so, the Plan recommends that federal and state governments act to reduce disparities in access to health care services by:

- Adopting consistent policies across state Medicaid programs;
- Removing geographic and originating site restrictions;
- Removing limitations on eligible services, providers, and facilities, and removing unnecessary restrictions on practitioners eligible to provide telehealth services; and
- Funding programs supporting digital health care infrastructure and technical assistance, digital health literacy, and workforce diversity.

In addition, the Plan recommends:

- The Department of Health and Human Services should allocate funding to develop, recruit, and retain health care professionals from underrepresented groups; and
- The FCC should modify the Connected Care Pilot Program and the Telehealth Program to focus more on improving health outcomes for low-income communities and communities of color.

K-12 Education. Technology is creating a new educational infrastructure with a vast expanse of new, diverse, and relevant opportunities. Unfortunately, uneven implementation of these technologies is widening rather than narrowing existing gaps in educational outcomes. We must assure that new educational infrastructure provides all students with equal access to the tools and content of fast-evolving digital learning. Further, we need to provide teachers the support they need to enable students to maximize the value of digital content.

To do so, the Plan proposes to:

- Ensure students have support for digital learning from teachers and other

appropriately trained adults, such as online tutors;

- Invest in a federal research and development agenda focused on advancing new models of technology-empowered teaching and learning that promote equity and improve outcomes for all students;
- Invest in culturally responsive and relevant online learning tools;
- Reform funding systems to ensure adequate and equitable distribution of resources, particularly to advance digital learning;
- Improve access for students of color and others to educational experiences that improve their ability to utilize technology; and
- Develop a National Strategic Agenda for Education Technology Research & Development, focused on improving outcomes for students of color.

Higher Education and R&D. Colleges and universities, with some of the best broadband networks in the world, remain an underutilized resource for digital equity and inclusion. We also underfund research and development in improving teaching and training.

To address those shortfalls, the Plan recommends:

- Using university resources to help institutions servicing those who have been disadvantaged by failings of digital equity and inclusion;
- Focusing future research on understanding how digital education can improve outcomes and overcome persistent performance gaps;
- Understanding and promoting best practices for using digital education to build a more equitable and inclusive society; and
- Increasing efforts to identify, develop, test, and deploy applications of digital

educational technologies that foster economic and social mobility.

Government Services. Low-income and minority communities would benefit significantly from greater online access to government services. Many government information systems, however, are outdated. Further, budget gaps lead to failures in upgrading and maintaining digital infrastructure. Overall, governments must systematically improve their ability to use technology to deliver services.

To address these issues, the Plan recommends that federal, state, and local governments:

- Optimize government websites for mobile use;
- Establish a one-stop-shop for citizens to access and control personally-identifiable information held by government agencies; Improve automated online government customer support;
- Take steps to eliminate data poverty, the social and economic inequalities that result from a lack of collection or use of data about an individual or community;
- Require all government forms be provided digitally for data entry, signing, and submission; and
- Modernize and secure existing government systems, and facilitate low-contact and remote access to government websites and services.

Civic Engagement. Failings of digital equity and inclusion limit many Americans from full engagement in the political and civic lives of their communities. Misinformation is overwhelming accurate information and poisoning the digital conversation, particularly for communities of color. Online platforms have created new problems related to micro-targeting in advertising, algorithmic bias, digital redlining, and other uses that make the Internet problematic for communities of color.

To address these problems, the Plan recommends that:

Congress:

- Hold a series of civil rights-focused hearings with high-level executives from companies that have been major repositories of disinformation;
- Increase investment in reliable, relevant, and trusted information for underserved communities by grants through the Corporation for Public Broadcasting to local noncommercial stations, for journalism by and for underserved communities; and
- Restore funding to the Office of Technology Assessment.

The White House:

- Empanel a commission to study how information on COVID-19 was made publicly available, how this information affected societal response, and what should be done to limit the impact of false and dangerously misleading information moving forward, while preserving First Amendment rights and values;
- Promote the establishment of a private industry-led information accuracy certification body.

The FTC:

- Establish social media best practices;
- Propose recommendations with respect to limiting the potential damage of political microtargeting; and
- Mandate real-time ad transparency and access to archives.

Institutionalization. Achieving digital equity and inclusion requires a sustained, systemic, and appropriately resourced effort that is highly reliant on intergovernmental coordination and collaboration. Currently, policymakers do not have the tools or data to monitor and evaluate efforts to close the gaps identified in the Plan. To address these needs, the Plan recommends that the federal government:

- Examine biases that could affect its existing collection, analysis, and interpretation of data;
- Collect the data necessary to review use of governmental information and digital services by each population it serves, and track how constituents interact with each agency;
- Partner with state and local governments to collect relevant data, including as part of efforts to expand broadband availability, adoption, and utilization carried out at the local level; and
- Convene an annual National Digital Inclusion Summit to review progress, determine key barriers to progress, and adjust policies, as necessary.

Conclusion. While the COVID crisis appears to be ending, the need for digital equity and inclusion is not. Indeed, the economic and societal trends the health crisis accelerated make the task more urgent. We need a surge of government action that produces sustainable results.

Chapter 1.



WHERE DO WE GO FROM HERE WITH BROADBAND: CHAOS OR COMMUNITY?

In 1967, the Reverend Dr. Martin Luther King isolated himself in a house in Jamaica to write about the crossroads he believed the Civil Rights movement faced. The resulting book, tragically his last, is titled: *Where Do We Go from Here: Chaos or Community?* While King thought the movement could look back with pride on its many accomplishments, he candidly acknowledged the mountains yet to climb, and the fissures in the movement that might prevent future progress, or even lead the movement backwards.

Written in the wake of substantial legislative victories, including the Civil Rights Act of 1964 and the Voting Rights Act of 1965, King soberly acknowledged that “Laws only declare rights; they do not deliver them.” The book attempts to chart a path for America, and the world, to move from a society that continued to degrade and exclude millions to a society comprising a “beloved community” that valued and offered opportunity to all.

Much has changed in the United States since then, but the battles that King fought so valiantly continue to rage. As he said then,

and as he might say today, “The fight is far from over, because it is neither won, as some assert, nor lost, as the calamity-ridden declare.”

The battlefield, however, has changed. One of the most significant shifts from King’s time is how broadband has emerged as the commons of collaboration in our modern economy, in our society, and in obtaining access to critical services such as health care, education, and job training.

Those skilled in using that commons have enjoyed extraordinary gains in the past several decades. But those who have been kept off the digital platform have experienced exactly the opposite. Ten years ago, the National Broadband Plan observed that as “more aspects of daily life move online and offline alternatives disappear, the range of choices available to people without broadband narrows. Digital exclusion compounds inequities for historically marginalized groups.” In light of these trends, that plan warned the cost of

“[D]igital exclusion is large and growing. For individuals, the cost manifests itself in the form of lost opportunities. As more aspects of daily life relocate online and offline alternatives disappear, the range of choices available to people without broadband narrows. Digital exclusion compounds inequities for historically marginalized groups. People with low incomes, people with disabilities, racial and ethnic minorities, people living on Tribal lands and people living in rural areas are less likely to have broadband at home.”

The Plan further projected that “our accelerating reliance on digital technology appears to be driving greater disparities; left unaddressed, those gaps will likely grow.”

Sadly, despite inspiring public and private efforts to close the gaps, disparities in digital life have grown. Worse, the costs to the digital have-nots have become even more evident with COVID-19. A growing “homework gap,” which kept millions of school children from being able to use the Internet to complete schoolwork at home, has become a total “education gap,” where they are unable even to attend classes. The traditional summer slide in educational achievement—which could be mitigated through a thoughtful summer online tutoring program—is

becoming a catastrophic [COVID slide](#), with unconnected students falling even farther behind.

A similar story can be told about healthcare. We see the problem in the specific problem of [inequality in obtaining the vaccine](#) for COVID-19. But the relationship between access to broadband and access to healthcare is not a short-term story but rather, part of what will be a critical long-term trend.

Telehealth, which has become a critical necessity since the start of the COVID-19 pandemic, putting health care out of reach for those without home broadband. A recent [study](#) found that only 38.6% of the people who live more than a 70-minute drive from a primary care physician subscribe to an Internet connection capable of handling telehealth services.

Another illustration of how our country is paying a cost for our failure to close broadband gaps was the [scene in Florida](#) at the outset of the health crisis, with hundreds of people risking their safety to line up to obtain an unemployment form, because the state’s website crashed. In employment, as well as other critical government services, we could point to other, similar examples, all of which make painfully clear that [the public sector is still far behind](#) where it should be in terms of providing services over the Internet.

As these examples suggest, ten years since the publication of the National Broadband Plan, it is undisputable that Internet services and applications have evolved to provide significant benefits, general and specific, to millions of users. In key areas of daily life, broadband service is quickly becoming a necessity, a reality made more urgent amid the COVID-19 pandemic. Those who, for whatever reasons, are not active Internet users are not just missing out on the latest innovations in entertainment, home automation, and electronic commerce. Increasingly, they are shut out of basic access to essential applications in education, health care, and employment services, among others.

While access to broadband is the latest challenge in the struggle for equal opportunity, the technology itself offers new and innovative avenues to achieving it.

Broadband can be a platform for significant economic, cultural, and social transformation, overcoming distance and transcending the limitations of one's physical surroundings. Because of how it scales, the best applications for one can become available to everyone. Ironically, however, Internet technologies, which have always demonstrated tremendous potential to level playing fields and lower costs, are disproportionately benefiting the most affluent Americans, widening rather than closing social, economic, and political divides.

Digital equity and inclusion offers a means to achieve the more perfect union our founders envisioned, and for which we must constantly strive. By "digital equity and inclusion," we mean the *full participation in digital life by virtually all Americans, using a home broadband Internet service that is available, adopted, and affordable.*

This document lays out an agenda for achieving that vision. It recommends policies, programs, and strategic plans directed to a wide range of public and private stakeholders, aimed at closing the gaps. Our goal, quite simply, is to achieve digital equity and inclusion. This Plan starts by asking *how can we use the tools of the information society to create a more equitable and inclusive economy and society?* It then answers with a comprehensive set of recommendations. It also makes abundantly clear that if we do not act on this Plan our failure will not simply leave us where we are today. It will result in the situation getting much worse, not just for the digitally disconnected, but for everyone.

The case for digital equity and inclusion is animated by the same moral and political philosophy engrained in our country's founding philosophy: that all are created equal, having the same rights to life, liberty, and the pursuit of happiness. It is also grounded in an economic understanding of the common good that King touched on in writing that:

From time immemorial men have lived by the principle that 'self-preservation is the first law of life.' But this is a false assumption. I would say that other preservation is the first law of life. It is the first law of life precisely because we cannot preserve self without being concerned about preserving other selves.... We are in the fortunate position of having our deepest sense of morality coalesce with our self-interest...In a real sense, all life is interrelated. The agony of the poor impoverishes the rich; the betterment of the poor enriches the rich. We are inevitably our brother's keeper because we are our brother's brother. Whatever affects one affects all directly.

While King uses the language of morality and biblical texts, there is evidence to support his view embedded in the economics of networks. The value of any network grows, according to Robert Metcalfe, "proportional to the square of the number of nodes in the network." That is, the more users there are, the faster overall value increases for everyone. Conversely, the exclusion of millions decreases the potential value of the network many-fold, including if not especially for those who are already connected.

While the Plan we propose is bold in its call for changes, we take comfort in knowing the new Administration recognizes the importance of equity in access to services and opportunities. As a recent Executive Order mandates, the federal government is now committed to pursuing “a comprehensive approach to advancing equity, including for people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is now the responsibility of the whole of our government. Because advancing equity requires a systematic approach to embedding fairness in decision-making processes, executive departments and agencies (agencies) must recognize and work to redress inequities in their policies and programs that serve as barriers to equal opportunity. By advancing equity across the federal government, we can create opportunities for the improvement of communities that have been historically underserved, which benefits everyone.” The Executive Order further mandates that “each agency must assess whether, and to what extent, its programs and policies perpetuate systemic barriers to opportunities and benefits for people of color and other underserved groups.”

Such an assessment will inevitably find that today, and to an even a greater extent in the future, those opportunities and benefits are either best or exclusively provided online. It is not surprising that in a report by the Partnership for Public Service on [“Federal Success Stories from the COVID-19 Pandemic”](#), the exemplars of improving service to customers all involved an online innovation. One example was the Veterans’ Administration developing a COVID-19 “chatbot” to triage veterans based on their specific questions and needs. Another was the CDC developing a coronavirus “self-checker,” used by over 13 million users, that assists people in checking their symptoms and instructing them what to do next, reducing the burden on health care systems across the country. These models, while deserving of praise, are not available to those who are not online. Therefore, as discussed throughout this Plan, a foundation stone of the efforts called for in the Executive Order should be universal access to the tools of the digital economy and society.

Businesses have also come to recognize that equity and inclusion are critical for sustainable growth. Chapter Two describes in more detail the economic imperatives to close persistent and significant gaps in Internet use by Americans of color, those with lower educational levels, lower income, and those who live in sparsely populated areas of the country.

What are the critical gaps? We focus particular attention on four distinct but interrelated challenges. While the pandemic has shined a glaring spotlight on each of them, these gaps have persisted for at least the past decade:

The Availability Gap. Broadband network availability is the most basic pre-requisite to achieving digital equity and inclusion. Unfortunately, millions of American homes, businesses, and other enterprises cannot connect to a broadband network capable of allowing them to fully participate in the economy, obtain an education and health services, train, search, and apply for a job, and otherwise participate in society. In Chapter 3, we propose a number of policies that, if implemented, would close this gap within three years.

The Adoption Gap. Even among those Americans for whom a broadband network is available, there are still tens of millions who have not adopted broadband in their homes. In Chapter 4, we review the causes of that gap, including digital literacy and digital readiness, and how they can be overcome to assure that all families can both have and benefit from broadband in their homes.

The Affordability Gap. For millions of Americans who do not subscribe to broadband, the cost of service remains an overwhelming obstacle to adoption. Though the current Lifeline program has been adapted to subsidize broadband for the poorest households, legacy features and other limitations of the program’s basic design make it a poor fit as a long-term and sustainable solution. In Chapter 5, we propose more efficient funding and distribution mechanisms to close the affordability gap within three years through a new program we call Lifeline+.

The Access to Economic Opportunity and Participation Gap.

While the digital economy has created the greatest opportunity for wealth accumulation in history, those opportunities are not equitably distributed throughout society. This means that the jobs especially the higher paying technology industry have not been filled by Blacks and Latinxs in any significant way. The National Urban League's 2018 State of Black America Report found that of the 40,000 employees of four major Silicon Valley technology firms, only 1,000 were Blacks; the number for Latinxs is paltry. Moreover, business inclusion and opportunity in the growing tech sector has lagged miserably for Blacks and Latinxs. In Chapter 6, we address ways that the public and private sectors, working together, can help close that gap.

There is an additional challenge, which while it receives less attention in public policy debates, nonetheless presents a serious obstacle to digital equity and inclusion. That is the challenge of improving how we actually utilize the digital platform to improve essential services for all. COVID-19 has forced our economy and society to run a massive—if unplanned—experiment in “remote everything.” That experiment is yielding some positive trends, such as in the utilization of telehealth, while also showing that we have a long way to go to use the new capability more effectively, such as in education.

We need to be more intentional in developing these new capabilities to assure that they lift up, rather than disadvantage, low-income and communities of color. In Chapters 7 through 13, we propose specific and detailed public and private actions to utilize broadband networks and the applications that run on them to deliver essential services more effectively and efficiently in health care, education, workforce development, general government services, and civic engagement.

In designing policies to overcome the gaps, we have approached the challenge in a *technology-neutral* fashion. We believe the availability gap, for example, may be addressed through a number of different technologies, including fiber, cable, hybrid wired networks, fixed wireless, mobile or fixed cellular, Wi-Fi, and satellite. So long as they facilitate digital equity and inclusion, and meet defined standards for broadband

service, we should be agnostic as to the technology or technologies of preference.

The Plan is also *provider neutral*. ISPs can be commercial, governmental, public/private, utility, or community-based, so long as they deliver broadband that enables full participation.

While we see the Plan as critical for making progress towards a more equitable and inclusive America, we recognize that the lack of home broadband Internet services is only one of the many severe challenges experienced by the poorest Americans. Millions today have difficulty, especially during times of economic downturns, paying their rent or mortgage or of having enough food to eat. Many live in substandard housing. According to the U.S. census, 1.6 million Americans still live in homes that do not have running water. Home electricity is a prerequisite for using any Internet service. Yet many low-income households cannot afford electricity, if not on an on-going basis, then during times of particular economic hardship. According to a recent survey, in the early months of the COVID-19 crisis, “13% of respondents had been unable to pay an energy bill during the prior month, 9% had received an electricity utility shutoff notice, and 4% had had their electric utility service disconnected.” Such homes are unlikely to be able to enjoy a home Internet service at any price.

These and other social and economic challenges are outside the scope of this Plan, though they play a significant part in our ability to fully close the remaining broadband gaps. Over half a million Americans are homeless, for example, rendering “home” Internet service impossible. And 43 million U.S. adults are functionally illiterate, creating a severe if not complete obstacle to deriving the benefits of Internet connectivity.

The inability to solve every problem, however, is not an excuse for failing to solve those we can, particularly problems for which the kind of targeted policies we propose can quickly and efficiently generate significant and sustainable improvements. The recommendations in this Plan do not take away from efforts to solve other problems. Rather, to a significant extent, they lay the groundwork for addressing a number of problems that have their roots, for example, in

inadequate access to quality education, health care or job training for jobs of the future.

Further, while the policies proposed here will accelerate the availability of networks everywhere, with everyone connected and utilizing broadband Internet at home to access essential services more effectively and efficiently, we also know that achieving these goals is not a straight path. What King wrote about the Civil Rights movement applies here: “We will err and falter as we climb the unfamiliar slopes of steep mountains, but there is no alternative, well-trod, level path.”

In that light, we need institutional capacity to experiment, evaluate and, when necessary, course correct. In Chapter 14, we propose ways the government can build that capacity, and continually improve how it facilitates digital equity and inclusion. As the National Broadband Plan stated less eloquently than King but in the language of the technology ecosystem, “this plan is in beta and always will be.”

King closed his book with words that ring true for this effort: “We are now faced with the fact that tomorrow is today. We are confronted with the fierce urgency of now. In this unfolding conundrum of life and history there is such a thing as being too late.”

We don’t think it is too late. But given the speed with which our economy and society is now moving towards “remote everything,” we need to move swiftly on this Plan. Otherwise, we risk increasing rather than decreasing the dangerous chasms that have already formed. We have the capacity to move much closer to the community King envisioned. But if, instead, technology continues to breed a society and economy that is less equitable and less inclusive, chaos will be the inevitable and tragic outcome.

Chapter 2.



THE ECONOMIC CASE FOR DIGITAL EQUITY AND INCLUSION

Achieving digital equity and inclusion is, first and foremost, a moral imperative. But beyond issues of human rights and racial justice, there are potent economic reasons to ensure that broadband service at home is available to all Americans, and for helping those who remain offline for whatever reasons to overcome the obstacles that keep them from participating in digital life.

An extensive literature on digital equity and inclusion has persuasively established the social value of universal adoption, as well as the systemic and personal obstacles that make it an elusive goal. As noted in Chapter 1, the 2010 National Broadband Plan laid out the economic case for solving the “digital exclusion” crisis, noting how the cost of digital exclusion is large and growing and that cost “imposes inefficiencies on our society as one-third of Americans carry out tasks by means that take more time, effort and resources than if they had used broadband. Since government agencies must maintain both offline and online systems for transactions, many government services are not as effective or efficient as they could be.”

As the National Broadband Plan and the supporting literature suggests, economic rationales for sustained and increasing public

investment in digital equity and inclusion can be summarized into three main arguments:

The Rising Tide. Universal broadband can produce positive public externalities, creating a more just, educated, and affluent society.

The Magic of Network Effects. Increasing returns to scale, via network effects, of a more complete, robust, and equitable digital society.

The E-Government Win-Win. Decreasing the costs and increasing the benefits of government services.

This chapter briefly reviews each of these arguments.

2.1. RISING TIDE

As the pandemic has brought into sharp relief, universal broadband connectivity is a goal that would benefit not only those who do not currently use the Internet, but also those who are already online. In that sense, it is similar to public education, which provides benefits even to taxpayers without children. The more educated a society is, the lower the incidence of poverty and crime, for example, and the lower the costs of public health. Education, moreover, boosts earning potential and overall economic output, providing in turn a more stable tax base for services useful to everyone, including national defense, police and fire departments, basic research and development, and the social safety net. Broadband adoption, to use an economic term, generates positive externalities.

Even at the time of the National Broadband Plan in 2010, it was already clear that broadband Internet, both directly as infrastructure and as a platform for delivering services in better and cheaper ways, had the potential to generate substantial, even revolutionary, positive externalities. By now, value generated by the network and its growing range of incremental and disruptive innovations far exceeds even the immense costs already spent in its construction and continuing improvement. While over two trillion dollars has been spent building modern broadband networks in the U.S. alone, the market value of just the top twenty Internet companies—most of which didn't exist twenty years ago—is more than double that amount. From an economic standpoint, that is a profound example of a positive externality for the country.

Meanwhile, the virtual nature of digital information generates further positive economies of scale. No matter how many people are searching on Google, binge-watching the latest video content, or participating in video conferences for work, education, or family life, the information and software being “used” does not diminish in value or usefulness by simultaneous or future users. (Indeed, as noted below, it likely *increases* in value the more it is used).

The same could not initially be said for the network itself. In the early days of broadband, many of the delivery technologies, as well as

the network protocols themselves and the limits of early server capacity, constrained the number of simultaneous users who could be supported in the same local area or accessing the same websites, without performance degrading noticeably for everyone.

These capacity constraints, however, have been significantly reduced for many locations and applications. Three factors contributed to the solution: higher-capacity network technologies, including fiber-optic cable throughout the network and advanced mobile networks (4G LTE and now 5G), better-optimized networking protocols, notably DOCSIS 3.1, which is used by most cable providers, and improved applications and architectures, including data compression, streaming media, content delivery networks, and Internet exchange points. Each of these innovations have been the result of massive private investments, enabled by effective policy frameworks for most of the last quarter century. Device capabilities have also increased, in parallel with capacity enhancements.

The specifics of these innovations are not relevant here. What is relevant is the end-result: vastly improved efficiency and expanded capacity on broadband networks. Regardless of the last-mile technology on which broadband is delivered, nearly all broadband users have seen dramatic increases in speed. Today, the average is 157 Mbps, an increase of 3,825%. As network performance during the COVID-19 crisis has made crystal clear, even if the remaining millions of unconnected U.S. homes suddenly went online, broadband capacity could easily handle the volume. Similar durability—let alone upgrades—have not been seen in other infrastructure, such as power and water, which have deteriorated in quality in many parts of the country.

At the same time, the fixed cost of service per subscriber has declined, as capital and operating expenses are spread among millions of additional consumers every year. The result has been dramatic decreases in unit prices for transit, processing, and storage. For the last several years, the price of each gigabyte of cellular data usage has fallen approximately 50% each year. (Of course, most users are now sending, receiving, processing, and storing vastly

increased amounts of data, so those declining prices do not necessarily translate to lower bills.)

The net result is that we are now living in a world of abundant broadband capacity, enough to assume that the processing, storage, and transportation of all the information on the Internet can be used by millions of additional users in the near future without noticeable degradation.

This means there are compelling economic reasons, beyond profitability, to expand coverage and adoption as widely as possible. The benefits to broadband providers, as well as to society as a whole, favor universal adoption. More users mean more contributors to network fixed costs—the majority of the providers' cost of service—and opportunities to lower marginal operating costs through economies of scale. For the U.S. as a whole, more importantly, universal adoption means a more equitable society with, as has been shown with correlations to education and income, lower rates of crime, poverty, incarceration, and civil unrest.

Even if many of those users are unable to afford retail prices for broadband services, there are ample reasons for private, public, and private-public partnerships to subsidize costs through reduced rates, tax incentives, and direct government support to individuals. When marginal costs are low, and decreasing with scale, subsidizing costs for lower-income customers can benefit all users. That has been the theory behind public and private broadband support programs that have operated in the last decade. Though the design of the program has substantially limited its effectiveness, Lifeline provides subsidies for 7 million American homes, with an estimated 31 million more households who have not applied qualifying even under current program rules.

2.2. THE MAGIC OF NETWORK EFFECTS

The second economic argument for digital equity and inclusion is related to the characterization of broadband applications as public goods. As noted above, a non-rivalrous good, of which digitized information is a particularly good example, does not diminish in value through simultaneous or

serial use. Everyone can read the same digital texts, search the same databases, watch the same streaming content, and make use of the same video conferencing, e-commerce, and government services applications all at once. The use neither degrades nor diminishes the integrity or future value of the information.

In fact, digital information has an additional property that makes it even more valuable than other non-rivalrous goods. In many cases, as digital information sources are accessed, searched, annotated, and viewed, the underlying information not only retains its value but can actually become more valuable for subsequent uses and users. Economists refer to this phenomenon as network effects.

For information networks in particular, network effects offer perhaps the most potent economic argument yet for universal adoption. Consider the work of computer networking pioneer Robert Metcalfe, who in 1993 calculated positive returns to scale in computer networks in a formula known today as "Metcalfe's Law." The value of a computer network, Metcalfe said, was equal to the square of the number of connections, whether those connections were of devices, users, or any other component.

In networks governed by Metcalfe's Law, including today's broadband, the overall value of the network doesn't increase linearly by adding more possible connections. That's because each new node adds not just one potential new connection. A new user or computer can use the Internet to interact not just with its immediate neighbor, in other words, but with every other user or computer already online. The million-and-first Internet user adds a million new possible connections. The billion-and-first device attached to the Internet of Things adds a billion new possible connections.

In fact, Metcalfe may have understated the possibilities of network effects, as his formula assumes only connections between two end users. But many broadband applications, including video conferencing, and social networks, to name just a few, are n-way connections. You can video conference with all or any subset of your colleagues or students or family members. And each new connection adds that many more new

possibilities, each with its own unique potential to create non-rivalrous value.

Metcalf's Law goes a long way toward explaining where all the trillions of dollars of new value the Internet has created has come from, and why the possibility of connecting all the people, places, and things that are currently offline is so powerful, exerting almost a gravitational force on investors, policymakers, and society in general.

For our purposes, however, the essential point of network effects is that it makes digital equity and inclusion an even more urgent imperative. Not only does achieving digital equity and inclusion improve outcomes and reduce overall social costs, it actually generates new value—and does so at an accelerating rate the more people we can connect.

Diversity is also critical to network growth. The on-going digital conversation, which has become more robust on a daily basis as broadband infrastructure and applications improve, is missing essential voices. In the U.S., some communities—communities of color, older Americans, rural Americans, Native Americans, those with less education, those with lower incomes—are disproportionately absent. Their insights, their perspectives, and their needs are not being heard online.

Without them, the Internet risks becoming increasingly insular, parochial, and even fragile—a digital bubble. We need those who are offline to join the conversation just as much as they need the services connectivity makes possible. From an economic perspective, in fact, the Internet needs the disconnected even more than they need it.

2.3. THE E-GOVERNMENT WIN-WIN

Even before the COVID-19 crisis accelerated our reliance on the Internet, digital technology was quickly becoming a basic tool for economic and social well-being. That was particularly true for a wide range of both public and private activities, including shopping, entertainment, lifelong learning, and maintaining family and community connections, to name just a few.

The pandemic, however, has highlighted several acutely painful inequities and missed opportunities in applications central to government and government-supported initiatives, including education, public health, employment, housing, and the social safety net. The Internet has become critical for students to attend class, for seniors to receive timely and safe health care, and for everyone to exercise such basic rights and necessities as job training, preparing to vote, and accessing government programs and services, including unemployment insurance, SNAP, public housing, consumer protections, law enforcement, health insurance, and social security, among many others. For now, and the foreseeable future, those without broadband, quite simply, cannot effectively participate.

The growing importance of these services, particularly for members of at-risk communities, and the dangers, if not impossibility, of using them in person, has erased any remaining doubt about the importance or relevance of the Internet in the lives of those who have remained offline. Tragically, those who most need these services are also the least likely to subscribe to a broadband connection at home to access them.

That reliance is unlikely to disappear with the eventual end of the current COVID-19 related health crisis. For better and for worse, the pandemic has revealed an astonishing range of inefficiencies, inequities, and lost opportunities in pre-crisis systems, both those physically based and those already available in digital form. Despite trillions of dollars in both private and public spending on infrastructure over the last twenty years, key agencies and industries have not invested enough in basic digitization of their core services, nor have they begun to look for innovative ways to do more for current and future users. We need only remember the embarrassment of several governors having to put out urgent calls at the start of the crisis for retired COBOL programmers to work on antiquated benefit systems that could not handle sudden surges in volume. Or, at the start of the COVID-19 outbreak, of Floridians risking their health to stand in line for paper unemployment forms when the state's online system crashed and could not be repaired.

Under and mis-investment in IT, for a variety of reasons, create more serious problems for government supplied and supported services than they do for any industry in the private sector. And the painful irony is that it is precisely the members of communities least likely to have broadband connections who are the most reliant on government services, who may be deterred from subscribing in part because the essential services they need are often not available in efficient, reliable, secure, and easy-to-use digital forms. Americans who are the least likely to have broadband—older, rural, less-educated and lower-income—are all heavy users of government services. For example, 53% of benefits go to persons 65 and older.

Any program aimed at solving problems of digital equity and inclusion, as noted in the following chapters, must include not only support for individuals without available network services or the ability to adopt them but also to improve the applications that digital have-nots most require. Deploying e-government apps quickly would not only increase online adoption, it would simultaneously improve government performance and lower its cost.

Though doing so will of course require considerable up-front expenditures of public funds, the result will be systems that can deliver basic entitlements and services more efficiently. As in the private sector, modern information systems can dramatically lower on-going operating costs, generating surplus that can pay back the capital costs many times over during the lifetime of new and upgraded e-government systems.

Better systems will also ensure that those who today cannot gain meaningful access to government services for which they qualify, as well as such basic rights of democratic citizenship as voting and public education, will be served in a manner that is safer and more dignified, with fewer opportunities for waste, fraud, or abuse.

In that regard, a revitalized plan to achieve digital equity and inclusion offers policymakers a profound opportunity both to reduce the costs of delivering government services, and to maximize the benefits of those services for those who need them most. By making government more accessible online, moreover, newly-connected

Americans will quickly see the full potential of existing public and private online applications and services, giving them powerful incentives to embrace fully their new digital lives—a truly virtuous cycle of economic improvement, reversing a long history of failed efforts.

For example, the Department of Labor today funds nearly 2,500 American Job Centers to help the unemployed search for work. But due to the pandemic, many of these Centers are temporarily closed or have shifted to online-only access. Other employment-related services offered by government agencies, including some specific to older Americans, Native Americans, farmworkers, and refugees, are likewise only accessible online.

It is also worth noting that, to date, different federal and state government agencies provide these benefits, and in many cases some information is already on-line. To achieve digital equity and inclusion, we urgently need e-government apps that pull together relevant information across local, state, regional, and agency boundaries, and which are built with design principles focused on convenience for the user. It is one of the best ways to convince those who have not adopted the Internet in part because they do not see the value in doing so.

To jump-start digitization and adoption of these essential services, we need to harness entrepreneurial talent that today is focused on building the next great gaming or social media sensation. That is precisely the mission of the U.S. Digital Service, which recruits top designers, engineers, product managers, and policy experts and pairs them with forward-thinking civil servants, deploying high-powered teams “to untangle the most important government services.”

There’s also Data.gov, which has released hundreds of thousands of government datasets, open to “civic hackers, tech entrepreneurs, data scientists, and developers of all stripes.” Using Data.gov, hundreds of helpful apps have already been built, but there is much more to do. And data sources must be populated by information relating to the entire population, not just those who are already online. As more Americans adopt online services, the more complete—and therefore valuable—these datasets will become.

Chapter 3.



CLOSING THE BROADBAND AVAILABILITY GAP

3.1. PROBLEM STATEMENT

Despite a decade which saw private, public and hybrid organizations investing nearly \$2 trillion in broadband infrastructure, the unfortunate fact remains that millions of American homes, businesses and other institutions have no available option to connect to a broadband network capable of supporting full participation in the modern economy. That includes the ability to use the Internet to train, search, and apply for employment, obtain an education and health services, and otherwise benefit from life in an increasingly digital society.

Broadband availability and devices with which to access the Internet are the most basic pre-requisites to achieving digital equity and inclusion. We seek to close the broadband availability gap, which is generally found in less densely populated areas. Most of these areas are populated by low-income communities, including communities of color.

3.2. VISION

Every home, anchor institution, and business location in the United States should have available to them at least one broadband network capable of providing the benefits of current and future economic, social, civic, educational, medical, commercial and entertainment applications.

3.3. GOALS

To close the broadband availability gap, the federal government should take the following actions:

- By the end of 2021, the FCC should define the characteristics of Internet access that are necessary in order for a location to be considered as “served with broadband” and the minimum level of Internet service that government funds should support in efforts to bring broadband to an unserved area, based on reasonable prediction of excess capacity and future application requirements over the next 10 years, with “excess capacity” and “application requirements” to be defined by the FCC, following analysis of user requirements for

current and emerging applications and their technical and utilization characteristics.

- By the end of 2021, the FCC, in consultation with other federal, state, and local governments, should publish best practices for public entities to reduce the costs of, and time required for, broadband deployment.
- By early 2022, the FCC should produce an accurate map of broadband availability in America, including the identification, on a granular level, of those locations without an available network, based on the updated definition of broadband, so that public funding can initially be prioritized for areas lacking any option for broadband. The map should be updated frequently and distinguish different levels of broadband service. By 2022, Congress should provide additional funding to be used by the FCC or other government entity to hold one or more competitive processes to obtain for federal subsidies to deploy additional broadband infrastructure, closing the availability gap to less than 2% of American households.
- In 2022, the FCC or other government entity should hold a competitive process for federal subsidies, utilizing the FCC's improved map of broadband availability to target unserved locations.
- By the end of 2023, deployments from authorized winning bidders should be underway to provide broadband to at least 98% of premises in America.
- By the end of 2023, the FCC should update its map of broadband availability in America, again identifying on a granular level those areas still without an available network, now or scheduled for completion, so that public funding can be prioritized for the remaining areas lacking any option for broadband.
- The FCC should evaluate, on an on-going basis, the status of new delivery technologies, including but not limited to, low earth orbiting satellites, 5G mobile and fixed wireless, and any other new wireless technologies, and develop a plan to

connect the final 2% of premises in the United States.

- By the end of 2024, the FCC or other government entity should hold another competitive process designed to assure deployment of a network capable of providing broadband to any remaining unserved premises in the United States.

3.4. THE CURRENT SITUATION

3.4.1. BROADBAND IS STILL UNAVAILABLE TO MILLIONS OF AMERICAN HOMES.

In January 2021, the Federal Communications Commission [declared](#) in its 14th Broadband Deployment Report that, at the end of 2019, 14.4 million Americans lacked any option for subscribing to home broadband using a “fixed terrestrial” service with speeds of at least 25 Mbps download and 3 Mbps upload (“25/3 Mbps”). Of a total evaluated population of 328.2 million, the FCC estimated 304.3 million had 25/3 Mbps service available using wired technology (principally fiber and cable, and to a lesser extent DSL), and an additional 9.5 million with 25/3 Mbps service available only using fixed-wireless technology.

There are data that one could use to argue that the number of Americans lacking any option for home broadband may be, at least theoretically, much lower. For example, the FCC reports, but does not count towards its annual assessment of whether broadband is available, deployments of broadband that use non-terrestrial technologies, including cellular and satellite networks, many of which offer speeds that meet or even exceed the FCC's current definition of broadband (or “Advanced Telecommunications Capability” (ATC)). According to the Broadband Deployment Report, for example, “...deployment data for satellite broadband indicate that satellite service offering 25/3 Mbps speeds is available to nearly all of the population.” The agency does not count these deployments, however, because “satellite services have a relatively low subscription rate despite their apparent widespread availability.”

There may be other reasons to exclude, at least for now, mobile and satellite

technologies from any calculation of broadband availability. For purposes of this Plan, we will follow the FCC's analysis, and include as meeting the standard for "available" service only those premises that can be served by fixed terrestrial broadband, with speeds of at least 25/3 Mbps.

Using that criteria, the actual number of Americans lacking any option for fixed terrestrial service may in fact be significantly higher than the reported 14.4 million. Congress and the FCC both acknowledge that under the agency's long-standing data collection methodology, if a broadband provider tells the FCC that it can offer service to a single customer in a given census block, the agency treats that entire census block as served. This assumption overstates actual availability, particularly in rural areas. In addition, the FCC does not routinely verify or audit provider-supplied data, allowing, for example, one company to overstate its service coverage by tens of millions of people and another to find that it had overstated its coverage in thousands of areas.

A sampled check of availability by an independent group in 2020 compared actual availability findings to the assumptions made in the FCC's analysis of the data it collects, and found considerably greater gaps in availability. Their report [concluded](#) that the actual number of Americans without an available option for broadband network was probably closer to 42 million Americans, a number more than double the number estimated by the FCC based on the data set available at that time.

Criticism of the FCC's broadband mapping process has been offered on a bi-partisan basis, including in [a report by the GAO](#). In response, Congress in March 2020 passed the Broadband DATA Act, directing the FCC to collect data and prepare maps that report broadband availability in the United States much more precisely. In December 2020, Congress appropriated the FCC's requested funding to accomplish that task, and the FCC subsequently adopted final rules in January 2021.

While the precise number of Americans lacking any option for home broadband using fixed terrestrial service is not certain, it is clear that, given significantly higher costs of infrastructure deployment, the vast majority of

homes lacking broadband availability are in rural areas. This does not mean, however, that availability is not a substantial issue in some urban communities of color. There are also significant areas in the United States that lack broadband that are populated by Black Americans, Latinxs, and Native Americans.

It may also be the case that the FCC's current 25/3 Mbps definition is no longer sufficient. Indeed, there is currently a debate—one that has intensified with the increased use of broadband caused by COVID-19—as to whether those speeds are sufficient for a nation that has moved so much of its work, education, shopping, entertainment, civic engagement, and social connections online. Since the outbreak of the COVID-19 pandemic, more and more U.S. homes can be characterized as broadband-dependent, with multiple users relying daily on broadband for simultaneous video calling, streaming entertainment, shopping and maintaining social connections. Even once the current crisis eases, there is reason to believe that user behaviors will not revert to previous patterns. Americans have learned the value of broadband applications they may not have been familiar with, and will continue to rely on them, and at an accelerating rate.

More broadly, the agency has made little effort in the last decade to justify the speed standards it has adopted, or why download and upload speeds should form the basis—let alone the sole basis—for determining what constitutes ATC. Download and upload speeds capture only the connection from the ISPs closest node to and from the home. But many other factors determine the quality of a user's interaction with any given Internet service, including the design of the website, app, or Internet service being accessed and the demand on it at any given time, the kind of transit the Internet service utilizes, the performance of intervening services, such as cloud security intermediaries, and other network optimization technologies, which are constantly being introduced and updated.

3.4.2. BROADBAND AVAILABILITY IS ALSO A PERSISTENT AND UNIQUE CHALLENGE FOR TRIBAL LANDS.

Tribal lands present an important, persistent, and unique set of challenges. Ten years ago, the National Broadband Plan noted that the FCC had found, "[b]y virtually any measure,

communities on Tribal lands have historically had less access to telecommunications services than any other segment of the population.” The Plan noted that:

[M]any Tribal communities face significant obstacles to the deployment of broadband infrastructure, including high buildout costs, limited financial resources that deter investment by commercial providers and a shortage of technically trained members who can undertake deployment and adoption planning. Current funding programs administered by NTIA and RUS do not specifically target funding for projects on Tribal lands and are insufficient to address all of these challenges. Tribes need substantially greater financial support than is presently available to them and accelerating Tribal broadband deployment will require increased funding.

Unfortunately, the situation has not materially changed over the past decade. According to the FCC, as of December 31, 2019, fixed terrestrial 25/3 Mbps broadband service was deployed to 79.1% of Americans on Tribal lands, well under the 95.6% level for the entire U.S. population.

The FCC has concluded that the challenging geography and population density of Tribal areas means that addressing the broadband needs of Tribal areas is most likely to be accomplished with non-terrestrial networks, but tribes have not had the ability to control radio spectrum in their jurisdiction. The problem has its roots in the Federal “Reservation Era” policies of the late 1800s, which gave the federal government the power to sell Tribal frequency resources, along with other natural resources, to for-profit corporations, without Tribal consultation.

Unfortunately, today’s policies still are grounded in that history. [As the GAO found in a 2018 study](#), while the FCC has taken some steps to promote and support Tribal entities’ ability to license and utilize spectrum, these efforts were not sufficient to address Tribal spectrum needs. Among other problems, the FCC does not collect key information related to spectrum over Tribal lands or communicate it to Tribal entities, even though FCC has the information—including broadband availability data from providers, and information on geographic areas covered by spectrum licenses—that could be used for such analysis. Moreover, the GAO found that the tribes faced barriers in participating in spectrum auctions, as well as in purchasing spectrum rights in secondary market transactions.

3.4.3. MULTIPLE FEDERAL AND STATE PROGRAMS AVAILABLE TO ASSIST WITH BROADBAND DEPLOYMENT.

While the FCC Universal Service Fund is by far the largest source of funding for addressing the availability gap, the NTIA’s *Broadband Funding Guide* identifies nearly 60 direct and indirect federal programs, located in more than a dozen federal agencies, that also support broadband deployment efforts. In addition, there are several programs that either have been initiated or expanded through various COVID-19 relief legislation that provide broadband assistance. Most states also have *their own broadband deployment programs*. While there is information about all of these, there has been to date no coordinated effort that enables service providers, communities, or other stakeholders to efficiently determine which programs they may be eligible for, or to what extent these programs may serve their needs.

3.4.4 CONGRESS HAS APPROPRIATED FUNDS THAT CAN BE USED FOR BROADBAND DEPLOYMENT.

As we were concluding the writing of this Plan, Congress passed the [“American Rescue Plan Act of 2021.”](#) Two provisions related to broadband deployment. First, Congress appropriated \$350 billion to state, local and tribal governments for a variety of uses, but among the eligible uses are “to make necessary investments in “water, sewer or broadband infrastructure.” Second,

Congress appropriated \$10 billion to the Department of Treasury to distribute to states, territories and tribal governments to “carry out critical capital projects directly enabling work, education and health monitoring, including remote access...” These appropriations provide significant new funding for states, localities and tribal governments that maybe used to directly address availability gaps in their jurisdictions.

3.5. KEY CHALLENGE TO OVERCOME

Universal availability is necessary—but not sufficient—for full digital equity and inclusion. The fundamental challenge to achieving it is primarily one of economics. As is true with other networked infrastructure, such as electricity, water, sewage, and telephony, the costs of making service available to any individual household is largely a function of density. As one would expect, the broadband availability gap is greatest in areas of lowest density. Because service providers in these areas must build over larger areas, while at the same time earning revenues from fewer subscribers, as density declines it becomes less likely that providers can earn enough revenue to cover the costs of deploying and operating networks, including expected returns on capital, to justify the necessary private capital investments.

For over two decades, U.S. policymakers have understood that private capital alone cannot close the availability gap in the most sparsely populated areas of the United States. Federal, state, and public/private partnerships aimed at subsidizing capital and operating costs to overcome these economic realities have, to date, provided more than \$100 billion to extend broadband availability to high-cost areas, through a variety of grants, subsidies, loans, and other incentives to private, public, and private-public providers.

Continual upgrades in the performance, and reductions in the costs, of emerging access technologies may, on the plus side, continue to improve the business case for some areas, making private investment more likely. Still, deploying broadband networks similar in performance to those that are currently serving the vast majority of homes in the United States to areas that currently do not have them will require additional and

significant public funding, beyond what Congress and the FCC have established to date for this purpose, including the \$20.4 billion currently budgeted for the Rural Digital Opportunity Fund.

How will we fund the closing of the availability gap? Currently, the most significant source of funding for government-assisted deployments comes from the Universal Service Program, administered by the FCC, which supports deployment in rural areas, connectivity for schools, libraries and health care institutions, and subsidized service for low-income households. That program is funded by communications companies, which pay a percentage of their interstate and international voice revenues, and certain revenues associated with other services, to the FCC’s Universal Service Fund (USF). This percentage is called the contribution factor. The contribution factor is adjusted as necessary on a quarterly basis, and is increased or decreased depending on actual and expected participation by qualifying users of all [Universal Service programs](#).

The contribution factor has several problems. One is that, as interstate telecommunications revenues go down, the contribution factor must of necessity go up. In the second quarter of 2021, the contribution factor rose to a new high of 33.4%. Five years ago, the percentage was only 17.1%, and ten years ago, it was 13.6%. At some point, the factor will be so high that the system will collapse. Second, some view the fee as a regressive tax, as it applies equally to both high-income and low-income subscribers.

There are also significant challenges in determining just how much public funding will be needed to close the availability gap and how, where, and when funds should be distributed. These challenges are addressed, respectively, in Sections 3.6 and 3.8, below.

3.6. COST TO DEPLOY NETWORKS TO UNSERVED AREAS

The cost to close the availability gap will vary depending on policy choices and actions in four areas that we discuss below. However, given the ever-growing importance of broadband in daily life, we would urge decision makers to adopt *and fund* the most

ambitious goals possible to assure digital equity and inclusion.

3.6.1. SETTING THE FLOOR ON SERVICE: BELOW WHAT PERFORMANCE STANDARD IS A HOUSEHOLD DEEMED “UNSERVED” BY BROADBAND SERVICE?

Unlike telephony, electricity, or water—infrastructure-based services that are, by and large, either “available” or “unavailable”—the evolving nature of broadband makes the task of calculating the number of “unserved” Americans a significant policy choice in itself. This is inherent in the Congressional mandate which requires that the Universal Service system assure all areas of the country have “reasonably comparable” service at “reasonably comparable” prices. That statutory language implicitly recognizes that some variation across the country is acceptable, but policymakers do not agree on where to draw the line.

There is no disagreement that the demands of everyday applications on broadband networks have grown over time, and that consumer expectations for service quality have increased. Consequently, the minimum download/upload speeds used by the FCC to determine whether fixed terrestrial service is deemed available have been regularly increased as part of the agency’s annual report on deployment. This floor has risen over time from 0.2/0.2 Mbps in 1999, to 4/1 Mbps in 2010, to the current standard of 25/3 Mbps, adopted in 2015. Further, it has also become increasingly important to consider aspects of service quality other than speed to ensure that an available service can indeed meet users’ needs.

As the speed requirements have been raised, a number of locations transitioned from “served” to “unserved,” increasing the availability gap. For example, a location with only 10/1 Mbps broadband service counted by the FCC as served under a 4/1 Mbps standard became unserved when that standard was raised to 25/3 Mbps. Under the 10/1 Mbps standard in effect pre-2015, over 97% of the U.S. population would currently be deemed to have an available fixed terrestrial service.

More generally, a rising standard means that even as actions are taken to reduce the availability gap, its closing may only be

temporary, as the gap may reemerge if the standard is later raised. Indeed, this has occurred repeatedly, as the federal government has provided funding to service providers to deploy networks using delivery technologies that could not easily and/or cost-effectively be upgraded as the standard increased. As discussed in the recommendations, policy makers should seek to avoid this treadmill, and to achieve digital equity and inclusion in a more sustainable manner.

3.6.2. ASSESSING THE AVAILABILITY GAP: WHERE ARE THE UNSERVED LOCATIONS AND HOW MANY ARE THERE?

To assess the availability gap under a particular definition of “broadband,” policymakers need accurate and frequently updated data indicating where the unserved locations both are and will likely remain given expectations about future deployments, both subsidized and otherwise. A process to generate such data is discussed in detail in Section 3.8.1. Here we highlight that the size of the gap will vary greatly based on the performance standard adopted and whether some complying technologies (e.g., satellite service and some high-speed cellular services) nonetheless continue to be excluded for other reasons in calculating “unserved” areas.

Based on FCC deployment findings released in January 2021, as of 2019 the current 25/3 Mbps standard translates to an availability gap that ranges between 0 and 24 million people—24 million if only fixed wired offerings (principally fiber and cable) are counted, 14 million if fixed wireless offerings are added, and no availability gap at all if satellite offerings are also included (Exhibit 3.1).

If download and upload speeds were to be raised, however, the availability gap increases significantly. For example, at 100/10 Mbps, the gap in 2019 would have been 27-30 million people, growing to 42-43 million at a standard of 250/25 Mbps. At the same time, however, improvements over the next three to five years in fixed-wireless performance and, more speculatively, low-earth orbit (LEO) satellite constellations that may be able to offer higher speeds (and lower latency) than current high-earth orbit satellite

service, could change the availability equation dramatically in the other direction.

Likewise, including cellular offerings that already meet today's standard and potential increases (including some LTE and 5G offerings), but which are currently not counted by the FCC's availability findings, could likewise have a dramatic positive impact on the availability gap. This makes setting and regularly revisiting an appropriate standard, as noted above, increasingly critical, particularly in determining how best to spend limited public funds to support future deployments in unserved areas of the country.

Though the speed standards for what the FCC considers as service that constitutes available broadband and the minimum speeds the FCC and other agencies set to qualify for eligibility for public infrastructure funding are often conflated, policymakers may and in fact have used different standards for the two. For example, a rational policy choice may be to consider locations without access to 25/3 Mbps as unserved, but then to subsidize only deployments of higher speeds than the current standard to serve them. Indeed, such a "network leapfrogging" policy could supercharge the broadband-based benefits that closing the availability gap would bring to unserved communities and prove a more cost-effective use of public funds over the medium-to-long term.

3.6.3. SETTING THE FLOOR ON SUBSIDIZED DEPLOYMENTS: WHAT IS THE MINIMUM SERVICE QUALITY THAT SUBSIDIZED NETWORK DEPLOYMENTS MUST BE ABLE TO OFFER?

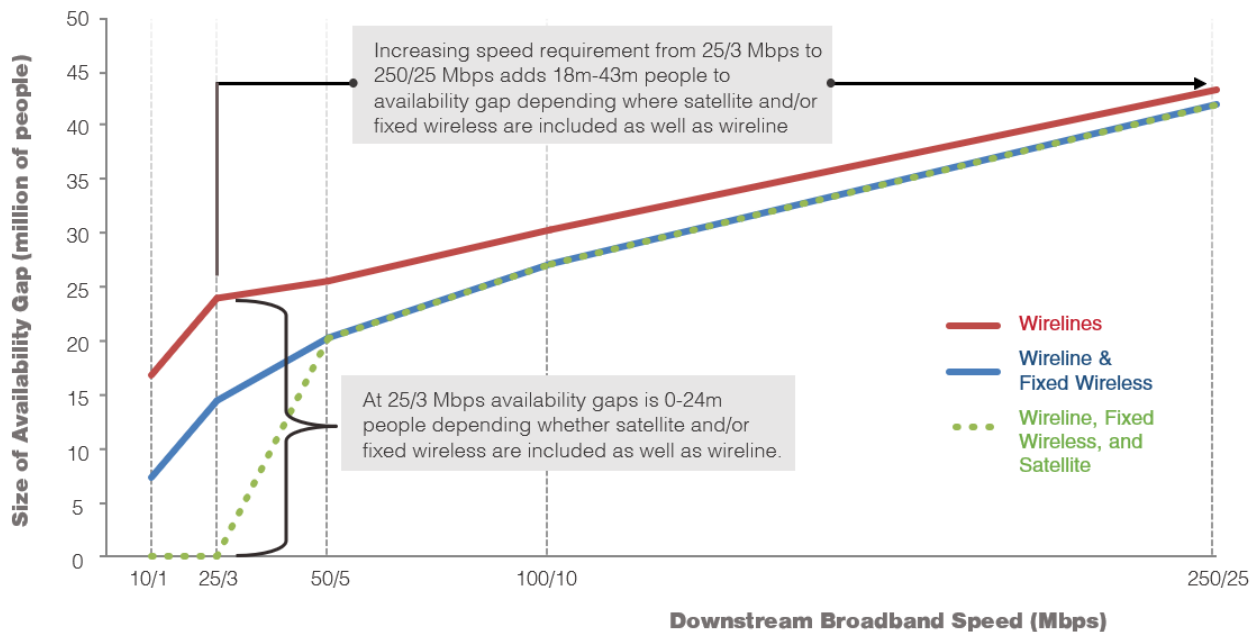


Exhibit 3.1. Size of fixed-broadband deployment gap at different performance standards.

3.6.4. DETERMINING THE COST CURVE: HOW MUCH SUBSIDY IS REQUIRED TO CLOSE—OR NARROW—THE AVAILABILITY GAP?

The cost to close the availability gap in a given geographical area, either entirely or partially, will largely be determined by the three drivers discussed in Sections 3.6.1-3 above, namely: (i) the standard below which broadband is deemed unavailable; (ii) accurate and frequently refreshed mapping to determine the location and number of unserved locations; and (iii) the standard at or above which subsidized networks are required to operate in order to receive funding support.

Assuming analytically sound and evidence-based choices for (i) and (iii), as well as adequate execution of (ii), an allocation mechanism that roughly aligns subsidies with actual costs, and which prioritizes locations that require the lowest subsidy to achieve deployment and sustain ongoing operation,¹ lessons learned from prior broadband deployments lead to two important conclusions about the cost of closing the availability gap:

- 1. Tradeoffs are necessary between universality and quality.** Ideally, the budget allocated to close the availability gap will be sufficient to achieve universal deployment, with room for future network upgradability to support expansion of the essential services that must be supported (see Exhibit 3.2). If this is not possible, policymakers face a choice between decreasing deployment to something less than 100% or lowering the standard at or above which subsidized networks are required to operate. As noted above, however, subsidizing deployments that may be difficult or impossible to upgrade creates long-term risks, including the risk of stranded assets, and that public funds are not put to their best and highest use.
- 2. Tradeoffs should be based on a conscious policy choice.** The most sparsely populated and geographically remote locations to serve are, by definition, the most expensive to serve on a per-person basis. As shown in Exhibit 3.3, variations in density distribution within any reasonably large set of unserved geographies means that the cost per location to close the available gap

increases substantially as one gets closer to eliminating the gap entirely. Funding deployment to these locations would require a disproportionately large share of the total budget. Though the ideal policy is to fully close the availability gap, depending on the size of, and potential alternative uses for the deployment budget, a pragmatic second-best alternative may be to close less than 100% of the availability gap, while funding cheaper options for the highest-cost areas.²

Policymakers have at times ignored these trade-offs and funded connections at the high end of the cost curve. For example, in 2020, the Rural Utility Service awarded Beehive Telephone Company Inc. a \$2.3 million ReConnect grant to deploy a fiber-to-the-premises network to four residents, four farms and four businesses in Washington County, Utah, and a \$2.7 million grant to deploy a fiber-to-the-premises network to connect 147 people in Elko County, Nevada. These average out to be more than \$33,000 per home passed.

This is not just a federal problem. For example, the California Advanced Services Fund (CASF), administered by the state's Public Utility Commission, provides grants to network operators, covering up to 100% of their total capital costs, for construction of broadband infrastructure in unserved areas of the state. One such grant of nearly \$11 million that went to Frontier Communications in 2019 covered only 222 homes, for an average price per household of over \$49,000.

To further illustrate the tradeoffs that should be examined at the national level, we note that a January 2017 FCC White Paper³ found that with (i) a performance standard defining "unserved" as lacking access to at least 25/3 Mbps-capable fiber-to-the-premises (FTTP) and/or cable service, and (ii) using then-current FCC's deployment data for residential and small business locations, there were approximately 22 million unserved premises. Adopting (iii) a policy of subsidizing only FTTP deployments going forward, the paper found that the total upfront capital expenditures required to fully eliminate the availability gap would be approximately \$80 billion. Critically, however, approximately 85% of the gap could be closed while still holding to a FTTP policy for about half that amount. That is, to connect

the first 85%, or 19 million premises, would cost about \$40 billion, or \$2,100 per location. To connect the last 15% of the unserved premises, or 3 million premises (approximately 2% of all premises) using FTTP, would cost another \$40 billion, or \$12,800 per location.

Alternatively, connecting the first 90% of the gap, or 20 million premises, would cost \$45 billion, or \$2,200 per location, with the last 10%, or 2 million premises, costing another \$35 billion, or \$15,600 per location. Further illustrating the shape of the curve, connecting the first 95% of the gap, or 21 million premises, would cost \$55 billion, or \$2,600 per location, with the last 5%, or 1 million premises, costing another \$25 billion, or \$22,300 per location.

In addition, while the first 85%, according to the White Paper, would only require a subsidy for capital expenses, the last 15%, even if the capital expense of the network deployment were to be completely subsidized, would

require ongoing support for shortfalls in operating expenses.

Though not technology neutral in its viewpoint, a September 2019 study⁴ by the consulting firm Cartesian, on behalf of the Fiber Broadband Association, a trade group whose mission is “to accelerate deployment of all-fiber access networks,”⁵ found that with (i) a performance standard defining “unserved” as lacking access to FTTP (i.e., both using a higher standard than the FCC study, and excluding other access technologies, most notably cable broadband), there will be (ii) approximately 70 million unserved households by 2025. Adopting (iii) a performance standard of only subsidizing FTTP networks, the total investment required to close 80% of the gap was estimated to be \$86 billion, but 63% of the gap could be closed for about half that amount. (The study did not assess the cost of entirely closing the gap, i.e., it excludes the last 20% of households that would be most expensive to connect with FTTP).

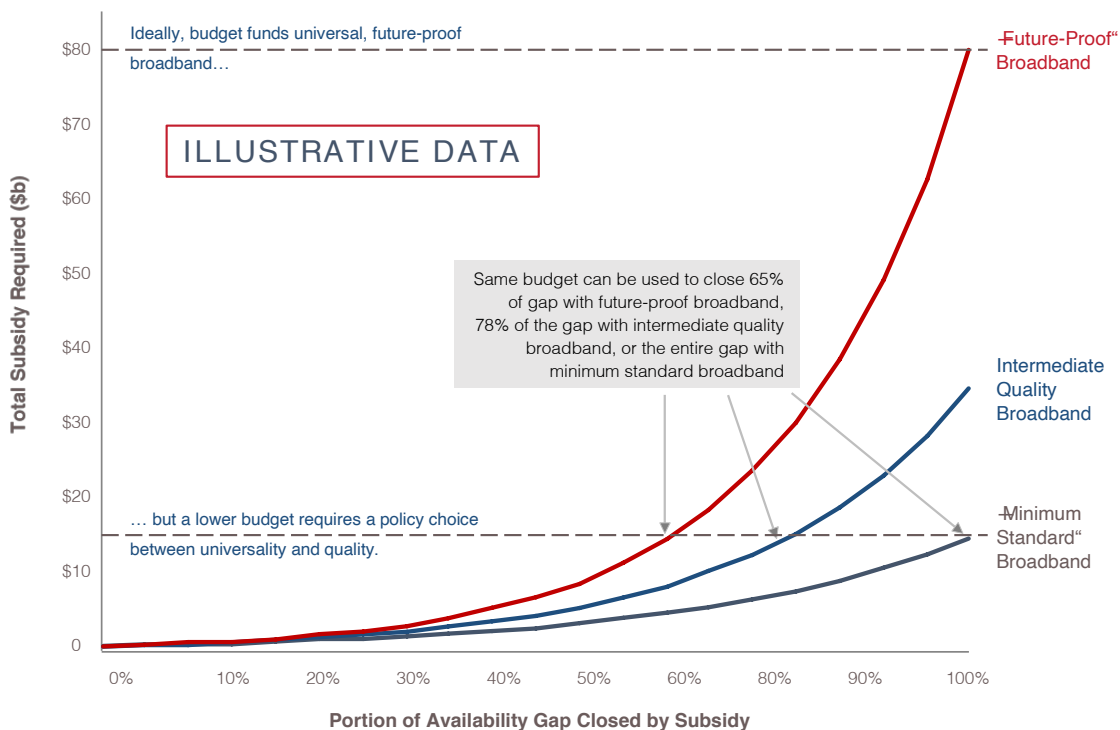


Exhibit 3.2: Depending on budget, a trade off may have to be made between the quality of network deployed and the degree to which the availability gap is closed.

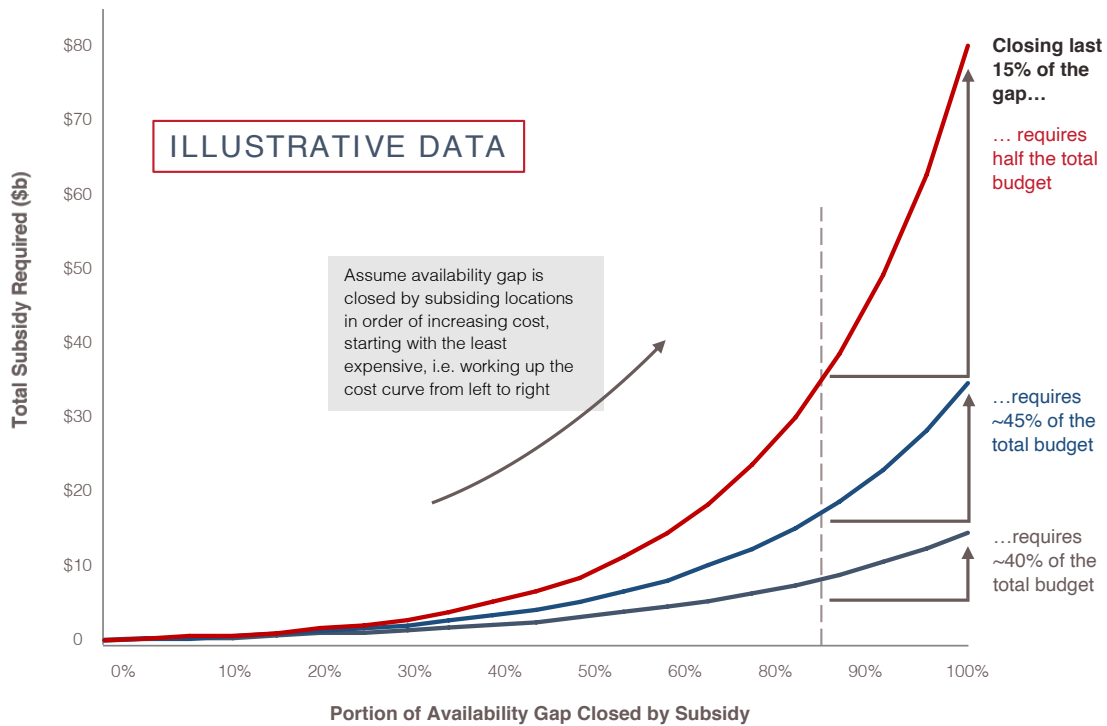


Exhibit 3.3: Even with sufficient budget, given the shape of the cost curve, it may be a reasonable policy choice to stop before the availability gap is completely closed.

3.7. CURRENT PLANS FOR FUTURE NETWORK DEPLOYMENTS

With private and public network operators announcing proposed or planned deployments of new and upgraded broadband infrastructure, it may seem that significant portions of the availability gap will be closed within a few years, largely without the need for public funding support. This section provides a high-level analysis of planned deployments by private and public operators.

1. Existing telephone companies have significant plans for fiber deployments, but even taken together, these plans would leave at least half the customers currently served by these providers using DSL technology without a higher-speed telephone-based offering.
2. Cable operators have already upgraded significant portions of their networks to offer gigabit downstream services and have plans to extend their networks further, but their networks are unlikely to

reach more than 90% of the U.S. population at the end of decade.

3. The most ambitious plans for extending next generation mobile wireless networks—those stemming from the government requirements on T-Mobile as part of its merger with Sprint—involve an expansion of its 5G cellular network to offer 100 Mbps speeds to 90% of the population by 2026. This 90% is likely to roughly match the geography of the area covered by cable. Additionally, after recently doubling its C-Band spectrum holdings, Verizon predicts that its mobile wireless networks will cover 175 million people by the end of 2023 and over 250 million people after 2024.
4. Municipalities, utilities companies and other public/private partnerships using a wide range of technical and business solutions plan to bring Internet coverage to specific local areas. Taken together, however, these deployments are unlikely to decrease the number of homes without a fixed terrestrial broadband option by more than 1%.

5. A promising technical and business initiative aimed at closing the availability gap, based on currently planned future network deployments, involves the launch of thousands of LEO satellites. While satellites have long been used for rural broadband, the distance between the home and the satellite has been a key impediment for the service, with speeds relatively slow and latency relatively high compared to terrestrial technologies. LEO service has the potential to overcome those limitations and satisfy the requirements of broadband service at home, but there is a level of uncertainty as to its ability to provide an acceptable level of service, particularly if LEOs are used to address the availability gap of a large population.
 6. Some believe that 5G fixed-wireless technology offers a compelling new technology for providing rural broadband. Proponents of the technology believe that it can provide 1 gigabit per second service over 4 miles from a cell site. One promising aspect for lowering the cost of 5G deployment, and therefore lowering the price for the service, is the development of Open Radio Access Networks (ORAN). In Chapter 11, we discuss how the government can help support and accelerate ORAN deployments through R & D efforts.
- **Change the current funding mechanism.** Alternatives to the current funding mechanism include changing the methodology to assess fees based on phone numbers or connections, or broadening the base of assessable revenues to capture a smaller percentage of a larger total. Any effort to reform the funding mechanism for Universal Service will probably take years. Contribution reform effort could also face lengthy legal challenges.
 - **Keep the current system but set a cap on total USF annual funding.** Given the shrinking revenue base, this would mean a longer process for closing the availability gap, and could reduce the effectiveness of other Universal Service programs.
 - **Keep the current system but do not set a cap on spending.** Given the necessary increase in the contribution factor for this option, this will likely lead to a collapse of the system.
 - **Use spectrum revenues.** In the recent debate on authorization for the C-Band auction, and in previous Congressional debates, there were bi-partisan suggestions that the government's share of auction proceeds should be allocated to closing the availability gap or addressing other Universal Service challenges. The idea is that the communications ecosystem that is paying for the spectrum should benefit from the use of those funds to provide services that market forces cannot. Spectrum auctions have produced tens of billions in revenues for the government but, it should be noted, they are not a routine or dependable source of funds.
 - **Use direct Congressional appropriations.** Many economists argue that USF should be funded, like other federal programs, through direct Congressional appropriations. While there are efficiency and fairness arguments for such a change, there is a fear that a future Congress could simply stop funding the program, either as a conscious choice, or due to a political stalemate on unrelated budget issues.

3.8. OTHER POLICY CONSIDERATIONS

In Section 3.6, we noted some of the trade-offs policy makers have to make to address the availability gap. Here, we note a few other policy considerations.

3.8.1. FUNDING SOURCE.

In Section 3.5, we noted that the current mechanism for funds to close the availability gap is under considerable stress, as it is based on a shrinking revenue stream. With the other programs funded by USF becoming more important in the era of COVID-19 and an economy of remote everything, USF is facing increasing demands. There are several options that have been proposed to address the issue. These include:

- **Use a combination of funding sources.** These would include direct Congressional appropriations, special appropriations, such as proceeds from a spectrum auction, and gradually changing the current contribution factor base to something more sustainable in light of market trends.

3.8.2. ELIGIBILITY TO RECEIVE FUNDING.

Providing government funding, whether for a network to address the availability gap, or to subsidize broadband service for a low-income person to close the affordability gap, raises the policy question of who should be eligible to receive the funds. At first blush, it might appear that the same criteria could be used to determine both who should qualify for infrastructure support and for the provision of subsidized service to low-income households. There is, however, a big difference between the two.

First, deployment funding carries an execution risk that the project may not be completed, while the low-income subsidy only goes to firms already offering a qualified service. Second, deployment funding creates a network that likely will not be subject to significant competition, while the low-income subsidy is likely to be used in markets where there are several firms competing for the consumer. We will address the low-income subsidy requirements in Chapter Five, but here we address the requirements for network providers to receive support for infrastructure deployment.

Currently, service providers seeking USF support for infrastructure deployments must be certified as Eligible Telecommunications Carriers (ETC), a designation that essentially limits funding to regulated, facilities-based telephone service providers. Under current law, providers obtain ETC designation from their state, or from the FCC in cases where the state lacks legal authority over the provider. Governing bodies must certify annually that allocated funding is being used as granted by ETCs within their jurisdiction.

The primary justification for the ETC requirement is that government funding should not go to operators who do not meet the kind of requirements that historically applied to common carrier telephone companies, including public interest

obligations, in exchange for obtaining a local monopoly to provide telephone service.

The ETC requirement has been criticized as outdated, excluded many providers who are otherwise qualified to deploy infrastructure but who cannot meet the technical definition of an ETC, potentially increasing costs and lowering performance for consumers. Critics of the ETC requirement note that as part of the process of awarding funding, the FCC already conducts an extensive review of the provider's "long-form" application, which ensures the provider is technically and financially capable of fulfilling all relevant funding obligations.

Further, those accepting funding are legally bound by the provision that the funds may be "used ... only for the provision, maintenance, and upgrading of facilities and services for which the support is intended" (see 47 C.F.R. § 54.314) and are obligated to provide service (subject to milestones) of a specified performance level, for a specific number of years, to the locations for which funding is awarded. Assuming a robust audit and/or oversight process, failure to meet these obligations will result in penalties. In that light, the ETC designation or ongoing oversight by states may be redundant, though others argue that having multiple regulators provides additional assurance that companies are complying with the rules.

As a middle ground, relevant ETC requirements could be incorporated into the FCC's long-form review process, making it possible to eliminate a separate ETC requirement. In particular, a service provider seeking FCC funding could be required to certify to the FCC:

- Compliance with applicable service requirements.
- Safeguards to facilitate continuing operations during emergencies, including back-up power sources, the ability to reroute traffic around damaged facilities, and being able to manage traffic spikes during emergencies.
- Compliance with applicable FCC consumer protection and service quality standards.

- Compliance with any specific requirements regarding the terms and conditions of broadband service supported by the government funding.
- Compliance with requirements that it has advertised the availability of the services and the charges for those services using media of general distribution, as required by the FCC.

Carriers' existing ETC designations and obligations – particularly legacy designations and obligations – should also automatically sunset once their funds terminate to avoid imposing costly and discriminatory obligations and burdens on providers. Such legacy obligations can effectively limit budgets that could otherwise support the deployment and maintenance of broadband services.

3.8.3. AUCTION DESIGN AND RULES.

In the last decade, the FCC drew on its long history of spectrum auctions to design rules and procedures to award funding to close the availability gap through competitive auctions. In 2011, the FCC first adopted the strategy of awarding funding on a competitive basis, after an initial period during which incumbent telephone providers would be offered a set amount of money to make relatively modest network upgrades. In areas where the incumbent turned down that initial offer, among others, the agency planned to accelerate competitive auctions. The FCC then finalized rules to implement this strategy for the Connect America Fund.

The FCC conducted the Connect America Fund Phase II auction in 2018, with winning bidders to be awarded approximately \$1.48 billion over a ten-year term, based on commitments to cover about 750,000 unserved homes and small businesses, or about 1.875 million people. That auction focused on areas where incumbents had turned down the initial offer, as well as those areas of the country that the FCC believed would require the highest subsidy.

The Connect America Fund program's 6-year initial support period was scheduled to end in December 2020, but carriers could elect to receive an optional 7th year of transitional funding. The FCC then held an auction for

Phase I of the renamed Rural Digital Opportunity Fund (RDOF) in late 2020, which will provide funding over a ten-year period. Nearly 400 entities qualified to bid in the auction, including large and small incumbent telephone companies, competitive fiber providers, cable operators, electric cooperatives, fixed wireless providers, three satellite companies, and consortia. Like the Connect America Fund Phase II auction, the RDOF auction was a multi-round, reverse, descending clock auction with bidders competing nationwide, with some local competition among bidders offering a lower price.

Bidders in the RDOF auction could offer service in one of four speed tiers, with either high or low latency. The speed tiers were 25/3 Mbps, 50/5 Mbps, 100/20 Mbps, and 1 Gigabyte/500 Mbps. By design, bidders in all performance tiers competed against one another, at least in the initial rounds, with a preference built into the auction design for faster service and lower latency. The rules included a complicated system of "weights," which effectively reduced the amount of support provided for slower speed and/or higher latency service.

Only census blocks that were unserved according to the FCC's 2019 broadband availability data by 25/3 Mbps fixed terrestrial broadband were eligible for bidding. Eligible areas also had to be deemed "high cost," meaning the estimated cost to serve was above a threshold that assumed a set level of cost would be covered by end user revenues. The maximum level of funding available for any given area and reserve prices were based on the estimated cost to deploy fiber in the area. Bids represented a percentage of the reserve price, with the weights reducing the effective amount of subsidy for individual bidders.

Ultimately, over 180 entities placed winning bids for \$9.2 billion of the \$16 billion budgeted for Phase I. Collectively, winning bids promised service to over 5.2 million homes and small businesses (roughly 13 million people), which covered more than 99% of the locations in the auction. More than 85% of the locations received winning bids at the highest speed tier, and virtually all of the remaining locations received winning bid that committed to deliver 100/20 Mbps.

Winning bidders now must undergo a more thorough review of their financial and technical qualifications, and meet certain other requirements, before they receive funding. In January 2021, a bi-partisan group of 157 members of Congress [asked the FCC](#) to thoroughly vet winning bidders to ensure that they can deliver the broadband service they have promised to unserved consumers.

For the Connect America Fund Phase II auction, the first group of winning bidders were authorized six months after conclusion of the auction, with other bidders authorized on a rolling basis over the following two years. Once authorized, RDOF winning bidders have six years to complete their deployments, with interim milestones beginning at the end of the third year.

The FCC currently plans to hold a second RDOF auction, RDOF Phase II, to address partially served areas and those areas for which there was no winning bid in RDOF Phase I. The FCC said that it would only hold the Phase II auction after it improved its broadband availability data and maps. In December 2020, the FCC [announced](#) that funding not allocated in the RDOF Phase I auction would be allocated to the RDOF Phase II auction, creating a budget of up to \$11.2 billion.

3.9. POLICY OPTIONS AND RECOMMENDATIONS

While we are generally supportive of several current and proposed efforts to close the availability gap, there are additional policy considerations that should be considered in the interest of achieving digital equity and inclusion.

3.9.1. THE FCC SHOULD CONDUCT AN EXPEDITED PROCEEDING TO DETERMINE CRITICAL BENCHMARKS FOR BROADBAND.

As noted above, the FCC's determination of service levels that constitute Advanced Telecommunications Capability (ATC) profoundly affect the determination of which areas are deemed "unserved," and, consequently, how limited funds are allocated to help close the availability gap. The FCC should commence an expedited proceeding to determine:

- What has COVID-19 taught the United States about broadband usage and how that should affect the threshold standard for what the FCC considers the definition of broadband? While we do not express a specific recommendation in this plan for what the definition should be, we believe the evidence is highly likely to demonstrate that the current definition is too low. Since the FCC last upgraded the definition in 2015, broadband usage has significantly increased and the COVID crisis accelerated those usage trends.
- What do technology and market trends indicate about future broadband usage?
- What is the level of broadband service necessary today to utilize essential services, such as education, health care and workforce development today? How might requirements change going forward?
- In light of those findings, what is the level of broadband service below which an area should be considered unserved by broadband?
- In light of those findings, what is the minimum level of broadband service the government should require in funding efforts to bring availability to an unserved area?

In completing this analysis, the FCC should look for guidance to Section 254 of the Communications Act, which defines the principles of Universal Service the FCC is directed to implement. That section states that "consumers in all regions of the Nation...should have access to" communications services "that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas."

"Reasonably comparable" does not necessarily mean identical, but the FCC should choose a level of service below which it cannot be fairly said that consumers are receiving reasonably comparable service. Section 254 also direct the FCC, in establishing the "evolving level" of service that constitutes universal service, to consider,

among other factors, “the extent to which” retail services have “through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers.”

In establishing and revising the level of broadband service that the government should fund to support an unserved area, the FCC should also seek to balance the objectives of both Sections 254 and Section 706 of the Telecommunications Act of 1996. As noted above, Section 254 promotes the concept of “reasonably comparable service,” and directs the FCC to define universal service in part with reference to retail services that have been subscribed to by a substantial majority of residential consumers.

Under Section 706, Congress directs the FCC to act to “encourage the deployment” of ATC to “all Americans” on “a reasonable and timely basis.” Congress defines ATC as “with regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.”

In assessing a forward looking element into the service levels that constitute ATC for purposes of infrastructure funding support, the FCC should include provisions for excess capacity that would reasonably accommodate predicted growth in use and application requirements over the next 10 years, with “excess capacity” and “application requirements,” to be defined by the FCC following analysis of user requirements for current and emerging applications and their technical and utilization characteristics. In defining these elements, the FCC should place particular emphasis on service levels necessary to utilize essential services in education, health care and workforce development, as detailed in succeeding chapters.

Through this and related proceedings, the FCC should then establish a set of minimum standards for deployments that qualify for government funds, referred to herein as “Qualifying Networks.”

3.9.2. THE DEPARTMENT OF TREASURY AND THE STATES SHOULD UTILIZE THE

NEW APPROPRIATIONS IN A MANNER CONSISTENT WITH THIS PLAN.

As noted above, Congress appropriated funds in the America Rescue Act of 2021 directly to States, territories and tribal entities, as well as to local governments and counties that can be used for broadband infrastructure. Congress also allocated funds to the Department of Treasury to distribute to the states funds that appear to be specifically designated for broadband infrastructure. We recommend that the funds be used in a manner consistent with this plan, including, but not limited, to the following:

- The priority for funding should be to serve unserved areas, according to an upgraded definition of what constitutes broadband, with further prioritization of areas that were unserved under the 25 Mbps/3 Mbps definition of broadband. We note that there are a number of areas where private enterprises already have publicly announced plans to deploy gigabit capable fiber networks. While such areas might currently meet the new definition of unserved, the priority should remain funding in areas where, but for the government funding, Qualifying Networks would not be built.
- The minimum service level required of awardees should be consistent with an updated definition of Qualifying Networks;
- The funds should be awarded through a competitive process with guardrails to ensure that an entity seeking funding has the actual technical, operational, and financial resources necessary to meet its commitments;
- Eligibility to compete for the funds should be consistent with the principles discussed in this Chapter;
- The FCC and NTIA should assist the Department of Treasury, as well as all the different government entities eligible to receive funds for broadband infrastructure projects, with issues related to mapping, definitions, and structuring competitive processes.

3.9.3 THE FCC SHOULD IMPLEMENT THE BROADBAND DATA ACT.

In December 2020, Congress appropriated funding for the FCC to implement the Broadband Data. The FCC should produce maps of fixed terrestrial broadband service availability consistent with the Act by early 2022. While taking care not to harm any privacy rights or confidential business information, the mapping effort should make greater use of existing data private enterprises already have and, where appropriate, use crowdsourcing techniques that provide more accurate and granular information about broadband availability than the FCC currently has. Further, in light of the Congressional appropriations to states and other government jurisdictions for broadband projects, the FCC should seek to accelerate its mapping to assist those governments with their own decision making. While mapping is underway, at the same time, the FCC should complete the necessary proceedings to adopt rules and procedures for the next auction. Upon completion of the mapping, the FCC should release an updated map of areas eligible for funding, solicit applications, and hold an auction to deploy broadband based on the findings of the updated maps.

3.9.4. CONGRESS SHOULD ELIMINATE THE ETC REQUIREMENT AND SIMILAR REQUIREMENTS THAT SUPPRESS SUPPLY.

Congress should instruct the FCC to eliminate the requirement that infrastructure funding recipients be designated as ETCs, and automatically relinquish the designation for existing ETCs in the serving area once their funding ends. Congress should further direct the FCC to incorporate those elements of the existing ETC designation process that remain relevant into its applicant review process, as discussed in Section 3.8.2, and authorize the FCC to consult with appropriate state and local officials, such as state broadband offices familiar with conditions on the ground, so that the FCC is able to develop meaningful audit and oversight capabilities over funding recipients to ensure they perform as expected.

3.9.5. THE DEPARTMENT OF TRANSPORTATION SHOULD STREAMLINE ITS PROCESS FOR GRANTING ACCESS TO FEDERAL RIGHTS OF WAY (ROW).

In the same way that the ETC requirement has suppressed the supply of enterprises

interested in obtaining federal assistance to deploy networks, current Department of Transportation policy that limits access to federal ROW to certified utilities and communications companies adds unnecessary costs for non-traditional providers who wish to lay fiber or other conduits. The Department of Transportation should create a national policy that (1) provides streamlined access to federal ROW (e.g., Interstate highway system) for non-utilities or non-certificated operators; (2) simplifies and improves transparency around the permitting process; and (3) creates one point of contact for all approvals required to deploy communications infrastructure.

3.9.6. CONGRESS SHOULD PASS LEGISLATION AND APPROPRIATE FUNDS TO BE DISTRIBUTED BY THE FCC OR OTHER GOVERNMENT ENTITIES THROUGH A SERIES OF COMPETITIVE PROCESSES TO CLOSE THE AVAILABILITY GAP.

We believe the best way to close the availability gap is with a significant one-time appropriation. The following guidelines should be included:

- 1.** The FCC should allocate the funds through multiple competitive processes as described below.
- 2.** Any appropriated funds left over after all auctions are completed should be redirected to Universal Service programs aimed at closing the adoption and affordability gaps, as discussed in Chapters 4 and 5. Congress should consider the appropriation as a unified effort to achieve digital equity and inclusion. In a well-designed reverse auction, market forces will encourage efficiency, so providing a cushion will not lead to over-expenditures. That cushion, however, should be spent on other programs to address digital equity and inclusion and in particular, to relieve pressure on the Universal Service Fund.
- 3.** Congress should require that the FCC report to Congress on the extent to which it is appropriate to rely on LEOs, next generation VDSL, fixed and/or mobile cellular, or other alternative technologies to completely close the availability gap, or

if other technologies will be required to meet the needs of the most remote premises. That report should take into account what the FCC learns from the performance of alternate technologies funded to date.

3.9.7. THE FCC SHOULD HOLD SEVERAL REVERSE AUCTIONS.

The FCC should hold multiple reverse auctions. There are several reasons why this is the preferable approach:

- First, it would allow the FCC to gain real-world experience with the performance of the networks it has financed to date, informing its determination of the service levels alternative technologies are capable of delivering.
- Second, it would provide the agency with market insight into the performance of 5G fixed and mobile networks, as well as the potential of other emerging technologies, such as low earth orbiting satellites.
- Third, a series of auctions will provide a second chance for communities to consider alternatives in the event there is no winning bidder for their area. Unserved communities that are desperate for available service are at different stages of organizing themselves to solve the problem. For some, the answer may be to work more closely with existing or nearby service providers to develop a more attractive business proposition to encourage entry. For others, it may be necessary to explore alternative approaches, including ways to leverage multiple sources of funding from federal, state, and local options.

The FCC should maximize the reach of the Congressional appropriation by considering an auction design that awards funding based on dollar-per-location basis, rather than a bid-to-reserve price ratio. It should prioritize those areas that require the least amount of funding per home.

To close the availability gap as quickly as possible, the FCC should adopt the following schedule:

- In 2022, the FCC should hold a reverse auction designed to assure deployment of a Qualifying Network to 98% of premises in the United States. The 98% goal is appropriate as it is the point at which the cost curve for connecting each additional premise begins to rise significantly.
- In 2023, the FCC should examine the performance of new delivery technologies, including but not limited to, low earth orbiting satellites and 5G fixed and mobile cellular networks, and develop a plan to provide the final 2% of premises in America with a Qualifying Network. To the extent that plan requires additional funding from Congress, the FCC should request, and Congress should appropriate, such funding.
- In 2024, the FCC should hold a reverse auction designed to assure deployment of a Qualifying Network to the final 2% of premises.
- The FCC should continually upgrade its availability maps, as noted above, to determine with greater accuracy which areas remain unserved by a Qualifying Network.

3.9.8. THE FCC SHOULD ADJUST ITS PROCEDURES FOR QUALIFYING TO PARTICIPATE IN REVERSE AUCTIONS.

We agree with bi-partisan criticism of the FCC's handling of the recent RDOF Phase I auction. To prevent the risk of having winning bidders who are likely to default on their commitments, we recommend the FCC adopt two additional principles in refining the its requirements for qualification in the next auction.

- The FCC should adopt stronger guardrails for the "short form" review process to ensure that an entity seeking to bid has the actual technical, operational, and financial resources necessary to meet its commitments. In the most recent RDOF auction, the FCC allowed entities to bid anywhere in the nation, subject only to a limitation that their bids not exceed the nationwide auction budget. The FCC used a case-by-case approach to assess the qualifications of applicants to bid. The short-form process – in which applicants

seek to qualify to bid in specific states at specific performance tier(s) – should be modified to include more bright-line rules designed to ensure the applicant can realistically meet the selected performance tier in the desired area(s) of interest. For example, the FCC could establish that no bidder is eligible to bid on more than a specified number of locations or for more than a given dollar amount of support, absent demonstration of operational history meeting a specific threshold. Absent that operational history, the short-form applicant could be required to demonstrate that project financing has been secured up to a set dollar amount, contingent on winning a specified level of support.

- The FCC should not allow enterprises to bid on the basis of unproven technology. In the most recent RDOF auction, the FCC qualified companies to bid that were not existing broadband providers and proposed to use technologies without a proven track record of being commercially offered in the marketplace at required RDOF service levels. In future auctions, the FCC should not allow applicants to bid on selected performance tiers in the absence of real-world market place experience as an existing broadband provider or with those technologies in a variety of relevant markets. At a minimum, there should be some limits on the ability to bid using technologies that lack operational experience.

3.9.9. THE FCC AND CONGRESS SHOULD INSTITUTE POLICIES TO CONNECT TRIBAL LANDS.

3.9.9.1. Congress should establish a Tribal Broadband Fund to support sustainable broadband deployment and adoption in Tribal lands.

Grants from a new Tribal Broadband Fund would be used for a variety of purposes, including bringing high-capacity connectivity to Tribal headquarters and other anchor institutions, as well as support for deployment planning, infrastructure buildout, feasibility studies, technical assistance, business plan development and implementation, digital literacy, and outreach. In addition, a portion of the fund should be allocated to provide

small, targeted grants on an expedited basis for Internet access and adoption programs. The goal should be deployment of high-capacity infrastructure on Tribal lands that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.

As part of this effort, Congress should also provide ongoing funding for federal facilities serving Tribal lands to upgrade and maintain their broadband infrastructure. Consistent with the widely held view that government entities actively seek out and leverage “dig once” coordination opportunities in all areas of the country, all federal agencies that upgrade network connectivity on Tribal lands should coordinate such upgrades with Tribal governments and the Tribal Broadband Fund grant-making process, exploiting opportunities for joint trenching, laying of conduit, or construction of additional fiber optic facilities. As part of that effort, the FCC, in consultation with relevant stakeholders, should develop a set of best practices that expedite review when infrastructure deployment utilizes existing rights of way, such as highways, utilities, and rail. In addition, we note that the two appropriations mentioned above in the American Rescue Act of 2021 provide funding to Tribal governments that can be used for broadband infrastructure. The fund we recommend here should be designed in light of the needs after an evaluation of how the Rescue Act funds were utilized.

3.9.9.2. Congress should amend the Communications Act to provide discretion to the FCC to allow anchor institutions on Tribal lands to share broadband network capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.

In recognition of the unique challenges facing Tribal communities, Congress should amend the Communications Act to provide discretion to the FCC to define circumstances in which schools, libraries and health care providers that receive funding from the E-rate or Rural Health Care programs may share broadband network access and capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.

3.9.9.3. Congress and the FCC should develop policies that allow Tribes significant influence over the use of spectrum over their lands.

Congress and the FCC should work together to allow Tribal communities to have an increased ability to utilize spectrum over their lands. This should be based on three principles:

- **Require Tribal consultation and approval regarding the use of spectrum over their lands.** Because of the way the FCC has allocated spectrum, wireless companies often license the spectrum that lies above Tribal lands, yet do not deploy networks in those areas, allocating their capital to build in more densely populated areas. Native Tribes were promised a level of sovereignty over their lands, and given the importance of spectrum and wireless communications, they should have the right to control that spectrum and deploy it in ways that best suits their needs. Congress should end the FCC's ability to license Tribal spectrum resources without Tribal consultation.
- **Require a Tribal Priority Filing Window for every spectrum auction.** To the extent that there are frequencies and uses for which automatic Tribal control is not practical, the FCC should create a Tribal Priority Filing Window for licenses over Tribal lands in advance of every spectrum auction, granting Tribes the right to license the spectrum on an exclusive or priority basis.
- **Institute a build it or lose it process for future licensees of Tribal spectrum.** Because of earlier allocation and licensing of spectrum, private entities hold licenses for significant portions of spectrum over Tribal lands. Often, the economics of serving these lands licensees from building out networks. As noted above, Congress should authorize the FCC to conduct a reverse auction or otherwise determine and provide the support necessary to incent existing spectrum holders to build out their networks over Tribal lands. For future spectrum auctions, the FCC could, with advance notice to all potential bidders, make build-out on Tribal lands a clear and explicit

condition of spectrum auctions over these lands.

3.9.10. IMPROVE ACCESS TO INFORMATION ABOUT FEDERAL AND STATE BROADBAND PROGRAMS AND IMPROVE THE APPLICATION PROCESS.

As noted above, according *to the NTIA's Broadband Funding Guide*, there are 59 direct and indirect federal programs, located in more than a dozen federal agencies, that support broadband deployment efforts. In addition, there are several programs that have either been initiated or expanded through COVID-19 relief legislation that also provide broadband assistance.

The multitude of these programs raises questions of whether they are being effectively used. Such an analysis is beyond the scope of this effort. But there are obvious problems with current efforts that could be easily addressed and which, if addressed, would improve broadband access.

3.9.10.1. Provide a search engine that enables stakeholders to effectively find the program that serves their needs.

NTIA currently has a search tool, but it only allows one to search for programs to the extent that the parties know the specific program they are looking for. It would be far better if the search engine allowed the party doing the search to enter certain relevant criteria, including the nature of the recipient (schools, libraries, non-profits, local governments, hospitals, etc.), the purpose of the funding (planning, capital expense, adoption, training, etc.), the location of the recipient (rural, exurban, suburban, metro as well as by zip code, as some programs, such as the Appalachian Regional Council, only service specific regions), and then the search engine would identify relevant programs. In other words, the search engine should be designed to do the searching, rather than forcing the person doing the inquiry to review all 59 programs to determine whether each program's mission and eligibility criteria fit their situation.

3.9.10.2. Require agencies to update their information.

A quick review of the information makes clear that many entries are out of date. There

should be a requirement for agencies to periodically update the information and to do so immediately when there is a significant event, such as Congressional action allocating new funds, that affects the nature of their programs.

3.9.10.3. For programs other than the those supported by the Universal Service Fund, create a common application that enables those applying for funding from more than one program to save time and effort on the application process.

The FCC process is unique in a number of ways but there is significant overlap between many of the other federal programs. NTIA should review the applications for those programs and develop a common application so that the applicant can fill out one, instead of multiple forms, and apply for multiple programs simultaneously. Further, NTIA should standardize, to the extent possible, the application process to ease the administrative burden on applicants. As an illustration, the Department of Education has an online Financial Aid Form application, known as the FAFSA, that is common to all eligible institutions.

3.9.10.4. The website should be designed so that states can also add their broadband related programs to the data base.

Several states have programs that subsidize broadband deployments. To assist communities seeking assistance, it would be useful to enable states to add links to their programs, so that potential providers can assess the full menu of available support.

Chapter 4.



CLOSING THE BROADBAND ADOPTION GAP

4.1. PROBLEM STATEMENT

The COVID-19 pandemic has wrenched much of our day-to-day life, learning, work, and socializing from the familiar world of the physical to digital equivalents many users had never heard of only a few months ago. One pernicious side-effect of the crisis has been to expose both the extent and the growing cost of persistent digital inequities. It is hard to live your life online if you do not have or know how to use a computer, and don't subscribe to a broadband service that connects it to the rest of the world.

The previous chapter reviewed gaps in broadband availability and the mechanisms that would solve them once and for all. But solely as a function of the number of people affected, the biggest divide remains that of adoption. The Federal Communications Commission estimates that at the end of 2019, the number of Americans with no available broadband service was less than 14.5 million, though other sources suggest the number may be as high as 40 million. Even at the higher end of that range, however, the number of Americans with available service who do not subscribe to broadband is significantly greater. This adoption gap afflicts a wide range of people and geographies, but is most acute among low-income households, those with lower

education levels, older adults, Black Americans, Latinxs, and Native Americans.

Extensive public and private surveys suggest that, since 2010, there are three principal causes of the adoption gap, broadly speaking: problems of affordability, digital readiness, and perceived relevance.

The first is obvious. Thirty-four million Americans living below the poverty line struggle with the most basic necessities of life—rent, food, electricity and water, transit, and basic communications. Adding the cost of monthly broadband service makes adoption untenable, even as it becomes increasingly clear that Internet service is more a necessity than a luxury. Issues of

affordability are discussed in the next chapter.

Digital readiness constitutes a more complex and interconnected set of issues. For many, including some who can and some who cannot afford a retail broadband service, adoption is complicated by a lack of computing equipment and training. This includes the ability to use a computer or tablet device, to access and use specific services on the Internet, and to set up and maintain connectivity equipment, including modems, routers, and home Wi-Fi networks. It also includes having the training necessary to overcome the fears, many of them justified, of personal and financial security while using online services.

Longitudinal surveys from both the NTIA and Pew Internet Research have consistently shown that a significant obstacle to broadband adoption is the belief, well-founded or otherwise, that the Internet is not “relevant” to the lives of many non-adopters. But on the problem of relevance, we think the pandemic has changed the environment, perhaps permanently. For now, and perhaps well into the future, education at all levels will take place online. Health care, crucial for all Americans but especially for poorer and older residents and those living in remote locations, has suddenly and irreversibly moved to virtual platforms, with doctor visits, prescriptions, and basic wellness services being delivered largely without physical interaction. Employment opportunities—everything from job training to applying for work and, in many cases, performing one’s job—require broadband. Government services and civic engagement are also increasingly more easily and effectively accessed online, not to mention social engagement, entertainment, shopping, news, and information. Any remaining doubts about the relevance of digital life, and the importance of digital equity and inclusion, have been largely erased.

But the COVID-19 pandemic has not so much created these new realities as it has accelerated paradigm shifts in daily life that were already well underway. The computer is a source of continual disruption across nearly all industries and activities precisely because it offers the promise, if used wisely, of lowering a remarkable range of costs, of improving efficiency and capacity, of equalizing quality of service and opportunity, and of opening

doors to new forms of human creativity, innovation, and interaction. In the reaction to many unfortunate but undeniable negative side effects of the digital age, we may forget just how much the technology has and can continue to improve the quality of life, especially for the most disadvantaged populations.

The pandemic, too, has brought that truth into stark focus. With the attention of both policymakers and their constituents acutely fixed on the importance and promise of digital equity and inclusion, the stars have aligned as never before for bold action to close the adoption gap. We must seize it.

4.2. VISION

The Communications Act of 1934 and the Telecommunications Act of 1996 both articulate a vision for communications policy that has taken on renewed importance today: universal and affordable communications services that are widely available.

Those acts were written in an era in which voice communications was dominant. Today, of course, voice is only a small part of the communication ecosystem. That, too, was a shift contemplated by Congress. As the 1996 Act noted “Universal service is an evolving level of telecommunications services that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services.” The Act also says that the definition of universal service should be functional, based on what is essential to education, health, and public safety, as well as whether a “substantial majority” of the public has subscribed to certain telecommunications services.

Our vision, therefore, is to reach levels of adoption among low-income households, less educated adults, older Americans, Black Americans, Latinxs, and Native Americans, and other groups who suffer from persistent digital inequity and exclusion, that equals adoption rates seen today among those for whom affordability and digital readiness are not barriers.

4.3. GOALS

By the end of 2023, all K-12 students should be active users of broadband services at home that enables them to attend virtual classes and complete their homework. They should also have devices capable of facilitating all learning activities.

By the end of 2023, all low-income persons on government health plans should be active users of broadband service in their residence that enables them to access the full range of telehealth services.

By the end of 2023, all persons who become unemployed should be active users of broadband service in their residence that enables them to engage in job training, job searching and applying for a job.

By the end of 2021, the Federal Government should establish an Office of Digital Equity (discussed further below in Section 4.5.1) with a mandate to coordinate across agencies and initiatives to increase home broadband adoption, and otherwise advocate for policies designed to achieve digital equity and inclusion.

By the end of 2023, all Americans should have access to programs and services that enable persons to be digitally ready.

4.4. THE CURRENT SITUATION: UNDERSTANDING DIGITAL ADOPTION GAPS

4.4.1. DEFINING BROADBAND ADOPTION.

We define “broadband adoption” to mean subscribing to an available Internet access service, where an individual or family lives, that is always available, offers full access to all parts of the Internet, is secure, and with speed, data, latency and other technical characteristics sufficient to use essential applications such as, but not limited to, education, health care, and employment, along with the necessary equipment and training to benefit from their full potential.

That definition suggests the need for policymakers to devise, enact, and fund solutions to address the persistent adoption

problems noted above: affordability, digital readiness, and perceived relevance. Ensuring that today’s non-adopters have the economic means to subscribe to broadband will erase a major obstacle; untangling and solving the many elements of digital readiness ensures that the newly connected can reap the same benefits of digital technology as long-time users, and will likely address remaining questions of relevancy.

A few features of adoption are worth highlighting. Together, fixed terrestrial broadband and large-screen computers or tablets allow users to carry out most online tasks with little or no constraints. But there is also the question of what kind of data package is sufficient to enable a household to achieve that full participation in digital life we discussed in Chapter 1. A [2018 study](#) on low-income households who use Wi-Fi hotspots for schoolwork shows that they consume 60 gigabits of data per month—above the 50 GB monthly threshold that many mobile carriers have before slowing access speeds for non-unlimited data plans. Wireline broadband plans generally have either no limits or limits of 1,024 GB per month—well above the average data usage of [344 GB](#) per month they experienced at the end of 2019. Since the pandemic, some mobile data plans have eased constraints on data caps, including within the context of “[single payer](#)” agreements between localities and service providers. These solutions are neither generally available nor guaranteed to be permanent but, as discussed later, next generation cellular and other wireless services may at some point change the analysis. In addition, we cannot lose sight of the fact that mobile network wireless hotspots offer unique advantages, including ease of set-up and pack-and-go internet for students with multiple home locations.

We also believe that non-smartphone devices are an important element of adoption. Though widely adopted and constantly improving their functional abilities, smartphones today are not a [full cure](#) for problems of digital equity and inclusion. As the pandemic unfolded and citizens sought unemployment benefits, for example, [86% of state unemployment websites](#) failed tests for “mobile friendliness.”

4.4.2. CURRENT DATA.

In chapter 3 we analyzed the state of broadband deployment and relied largely on FCC data, which, as discussed, has significant flaws but still provides some insight into the availability gap. For this chapter, we are focused on understanding adoption gaps across socio-economic lines. For these purposes we believe the American Community Survey offers the best information to analyze these gaps and we explain the choice to emphasize wireline connections below.

According to the American Community Survey's analysis of 2019 census data, 70.8% of U.S. households have adopted broadband at home using a wired service—using either cable, fiber, or DSL. This is captured in the ACS question that asks whether “you or any member of this household have access to the Internet using a ... broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?” It is worth noting that a “yes” answer to this question does not necessarily mean that the respondent has service that meets the FCC's current definition of ATC, which requires speeds of 25 Mbps download and 3 Mbps upload. DSL, an older technology that some providers are hoping to phase out, may not satisfy the FCC's definition.

The 2019 ACS figure of nearly 71% represents an increase from 67.3% in 2016, when ACS first began to report on broadband adoption. ACS also reports on non-wired services, finding in 2019 that, including cellular and satellite-based broadband services, adoption levels reached 86.4%, an increase from 81.4% in 2016. In addition to the 70.8% of those who have wireline subscriptions, cellular-only users make up nearly 12% of internet adopters, with satellite and other broadband technologies making up the rest.

This means that as of the end of 2019, ACS data suggest that nearly 36 million households, or approximately 96 million people, were not subscribing to broadband at home using a fixed terrestrial service (henceforth “broadband at home”). As noted in Chapter 3, of course, the lack of an available service plays a significant role in that finding.

Incomplete network availability data make it difficult to say with precision how many non-subscribing households could have

broadband at home but currently do not. If between 80% and 90% of all households have access to at least one available fixed terrestrial service, however, then between 29 to 32 million households, or approximately 69 to 78 million people, do not subscribe to broadband at home for reasons other than network availability.

4.4.2.1. Socio-economic factors and geography.

According to 2019 ACS data, six demographic characteristics correlated strongly to whether or not a household adopts broadband:⁶

Income. One of the most highly correlated variables in adoption of broadband at home is household income. For households with annual incomes of \$50,000 or less, 54.1% have adopted broadband at home, compared to households with annual incomes exceeding \$75,000, where 84.3% have adopted broadband at home. Non-adopting U.S. households with annual incomes below \$50,000 (representing 42% of all U.S. households), equate to 21.9 million households, or approximately 59 million people. **[FIGURE 1]**

Age. Only 59.0% of individuals aged 65 and older have adopted broadband at home, with a particularly sharp drop off for those older than 74, where only 48.7% have adopted broadband at home. This leaves 21.6 million older Americans without broadband at home, or 13.3 million households. **[FIGURE 2]**

Households with school-age children. 77.3% of households with children under the age of 18 have adopted broadband at home. This is higher than the national average, reflecting in part the relative youth of these households. Some [16.9 million children](#) under age 18 are estimated to live in households without broadband at home—or approximately 8.4 million households.

Geography. Fewer rural Americans have adopted broadband at home, in part, as noted in Chapter 3, due to a lack of an available fixed terrestrial service. In non-metropolitan areas, only 62.4% of households have adopted broadband at home, compared to 72.3% for those living in metropolitan areas. In 2019, 7 million households in non-metro areas had not adopted broadband at home.

Given the concentration of population in metro areas however, there are far more urban households who have not adopted broadband at home—an estimated 29 to 32 million households, or approximately 69 to 78 million people,

Race and Ethnicity. Broadband adoption has historically been adopted at higher rates by white Americans relative to Black Americans, Latinxs, and Native American/Alaskan Natives. The 2018 ACS data show this trend continuing. Compounding the problem, adoption rates for Black American, Latinxs, and Native American/Alaskan Natives are significantly lower even when controlling for household income, age, educational attainment, and other factors. **[FIGURE 3]** Specifically, broadband at home has been adopted in the following percentages:

- 82.2% of Asian Americans
- 72.2% of whites
- 65.7% of Latinxs
- 61.8% of Black Americans
- 60.3% of Native Americans or Alaskan Natives.

Educational attainment. Broadband adoption also correlates strongly with higher levels of educational attainment. Those with higher levels of educational attainment may, for example, have jobs that require digital skills, not to mention the income to afford broadband at home. For those with high school degrees or less, their jobs or income levels may contribute to lower levels of adoption for broadband at home. Each of the three groups below make up about one-third of the adult population. The data shows **[FIGURE 4]:**

- 54.4% of those with high school degrees or less have broadband at home.
- 72.5% of those with some college experience or an associate degree have broadband at home.
- 84.8% of those with college degrees or more have broadband at home.

4.4.2.2. Other demographic groups of special interest.

Government services are increasingly available and essential as Internet applications. But in many cases, those who would most benefit from the timesaving and convenience of e-government services have not adopted broadband at home. As of 2018, adoption rates lagged behind the average among beneficiaries of the most important government programs:

Health insurance. For Americans using Medicare as their health insurance, 57.9% have adopted broadband at home, a figure which tracks with the adoption rate for those age 65 or older. 52.1% of Medicaid beneficiaries have adopted broadband at home. Military personnel and their dependents with Tricare health insurance show higher rates of adoption of broadband at home, at 74.4%. Veterans have adopted at a lower rate, at 65.3%. **[FIGURE 5]**

Government benefits, including Supplemental Security Income (SSI) and Supplemental Nutrition Assistance Program (SNAP). These benefit programs are available to households whose gross incomes are no more than 130% of the poverty level (for SNAP), while SSI eligibility depends on age, income, and disability status. For adults eligible for either of these programs, only 52.5% have adopted broadband at home.

People with disabilities. Computers and many web-based interfaces are difficult if not impossible to use by people with certain visual, movement, and learning disabilities. Adults with disabilities have low rates of adoption, with 54.4% having broadband at home.

4.4.2.3. Broadband in Urban America—an analysis of cities

As noted in at home. As a result, much of the attention and funding directed to closing the availability and adoption gaps in recent years has been focused on rural America.

But given the higher concentration of population in urban areas, far larger numbers of non-adopting households are located in cities than in the more sparsely populated areas of the country. For example, a recent analysis of broadband adoption in [Baltimore](#),

[Maryland](#) showed that 40% of residents had not adopted broadband at home as of 2018. Among the poorest (those with annual household income of \$25,000 or less), 66% had not adopted. And one in three Baltimore City households did not have either a desktop or laptop computer.

One common denominator in these and other examples is poverty. Urban areas with high rates of poverty have low rates of broadband adoption.

There are also data that suggest lower adoption rates occur in neighborhoods that are more segregated. A possible explanation for that result pertains to network effects—or how behavior by others in one’s social networks influence behavior. The likelihood of someone adopting broadband at home is higher if nearby peers have already adopted. This dynamic first emerged for computer adoption generally in the late 1990s, when [research showed](#) that people were more likely to buy computers if a large share of their

friends had one, even when controlling for demographic and socio-economic factors.

The following table shows broadband adoption at home in the 50 cities with the lowest adoption rates, along with rates of poverty and residential segregation. The data on residential segregation comes from the [Diversity and Disparities](#) project at Brown University; a residential segregation figure of 50 or more indicates high levels of residential segregation. Figures on poverty use table [S1701](#) from the Census Bureau. The Appendix presents data for 100 of the largest U.S. cities. For all 100 cities, the average adoption rate for 2019 is 72.2%, and the poverty rate for 2019 is 15.9%. The broadband adoption rate for all 100 cities is 68.1% for 2016.

Table 1: 50 cities with lowest broadband adoption at home

City	Wireline Broadband 2019	Wireline Broadband 2016	Poverty 2019 Rate	White-Black residential segregation	White-Hispanic residential segregation	Number of households
Birmingham, Alabama	52.4%	55.7%	25.2%	62.6	52.4	93,300
Detroit, Michigan	53.7%	42.7%	30.6%	59.2	59.4	267,139
Cleveland, Ohio	54.0%	50.8%	30.8%	69	37.5	171,632
Memphis, Tennessee	55.8%	50.1%	21.7%	67.9	54.5	254,423
Newark, New Jersey	58.6%	53.5%	25.2%	71.2	47.4	102,155
Rochester, New York	59.3%	56.5%	25.3%	51.6	54.1	87,679
Baltimore, Maryland	59.4%	58.4%	20.2%	68.9	45	242,694
Des Moines, Iowa	62.8%	64.0%	15.5%	36.5	34.4	91,045
New Orleans, Louisiana	63.0%	56.9%	23.2%	67.6	40.6	151,753
Stockton, California	63.0%	60.8%	15.4%	37.2	40.5	96,149
Knoxville, Tennessee	63.4%	63.3%	21.8%	47.8	25.9	83,492
Toledo, Ohio	63.9%	61.2%	25.2%	53.4	33.9	121,022
Glendale, Arizona	64.0%	65.1%	18.9%	39.1	48.1	81,065
Winston-Salem, North Carolina	64.5%	66.5%	19.7%	50.4	48.2	94,884
Little Rock, Arkansas	65.2%	57.9%	12.3%	58.6	57.7	80,063
St. Louis, Missouri	65.6%	62.2%	19.1%	65.3	35.5	146,779
Indianapolis, Indiana	65.8%	59.2%	15.8%	62.3	18.8	340,639
Irving, Texas	65.9%	70.2%	10.3%	36.6	33.6	83,345
Milwaukee, Wisconsin	65.9%	57.9%	22.4%	70.1	60.7	232,176
Buffalo, New York	66.2%	57.8%	28.8%	65.9	43.4	109,163
Las Vegas, Nevada	66.6%	68.7%	14.9%	32.4	48.3	235,628
Baton Rouge, Louisiana	66.6%	64.0%	23.7%	66.9	38.1	82,097
Oklahoma City, Oklahoma	66.7%	66.0%	15.8%	46.7	51.6	249,615
Dallas, Texas	66.8%	57.7%	17.5%	66.1	61.1	518,998
Louisville, Kentucky	66.9%	68.8%	15.4%	66	36.2	252,784
Fresno, California	67.1%	63.9%	23.2%	42	42.4	172,815
El Paso, Texas	67.3%	62.9%	18.6%	30.8	39.7	223,076
Tucson, Arizona	67.6%	66.4%	19.1%	25.6	47.2	217,993
Richmond, Virginia	67.7%	58.4%	18.9%	63.5	60.8	89,878
Jacksonville, Florida	67.9%	68.0%	14.1%	47.5	22.4	349,171
Lubbock, Texas	67.9%	68.2%	20.6%	47.2	39.5	99,104
Kansas City, Missouri	68.3%	64.4%	15.3%	62.2	47.1	209,768
Chicago, Illinois	68.3%	64.1%	16.4%	82.5	60.9	1,080,345
Tulsa, Oklahoma	68.4%	63.7%	18.6%	49.8	44	163,801
Norfolk, Virginia	68.5%	63.2%	17.9%	50.8	26.8	88,387
Houston, Texas	68.5%	61.8%	19.7%	68.6	60.4	876,504
Akron, Ohio	68.7%	56.4%	23.6%	48.6	31.1	83,821
San Antonio, Texas	68.8%	61.8%	16.8%	43.1	46.8	512,273
Albuquerque, New Mexico	69.1%	64.7%	16.0%	28.5	37.1	227,179
Phoenix, Arizona	69.6%	66.4%	15.6%	49.9	57.7	586,878
Wichita, Kansas	70.2%	65.1%	14.2%	49.3	38.6	153,454
Corpus Christi, Texas	70.4%	64.7%	17.2%	40.2	39.8	119,184
Philadelphia, Pennsylvania	70.4%	60.6%	23.3%	73.4	62	619,505
New York, New York	71.3%	69.3%	16.0%	81.4	65.8	3,211,033
Salt Lake City, Utah	71.3%	66.8%	14.4%	40.5	55.4	81,839
Oakland, California	71.7%	69.9%	13.9%	51.9	66.9	168,413
Tacoma, Washington	71.9%	67.2%	12.6%	31.5	33.1	87,016
Bakersfield, California	72.0%	69.9%	14.6%	43.4	39.2	116,558
Greensboro, North Carolina	72.4%	60.6%	19.7%	56.6	49.2	118,046
St. Paul, Minnesota	72.5%	66.3%	15.9%	43.4	44.1	110,782

A striking pattern in Table 1 is the correlation between poverty and broadband adoption at home. For all 100 cities, there is a strong negative correlation of -0.79, which means that the higher a city's poverty rate, the lower its rate of broadband adoption at home. The same is true for residential segregation. For White-Black segregation, the negative correlation is -0.47; for White-Hispanic residential segregation, the figure is -0.32. Of course, there is a strong association between poverty and residential segregation, but multivariate analysis suggests that both variables have significant and negative associations with lower rates of broadband adoption at home.

Although poverty and residential segregation rates play a role in explaining differences in broadband adoption between different cities, it is possible that public policy decisions can make a difference. Evidence at the city level is, at best, suggestive. Detroit, for example, has shown significant growth in broadband adoption at home since 2016, during which time it has developed a digital inclusion plan and allocated funding to support digital inclusion programs. Philadelphia, despite high levels of poverty and residential segregation, has seen a 10-percentage point gain in broadband adoption at home since 2016, likely attributable, in part, to the establishment of a public-private digital inclusion alliance to promote digital literacy. By contrast, the City of Baltimore, before the pandemic had no digital inclusion initiatives, and Baltimore's broadband adoption rates have changed very little since 2016.

4.4.3. WHAT EXPLAINS GAPS IN HOME BROADBAND ADOPTION?

Three factors figure prominently in understanding the adoption gap: affordability, digital readiness, and perceived lack of relevance.

Affordability. Analysis of national data on broadband adoption at home shows that income is a highly significant predictor of whether a household subscribes to service. For non-broadband subscribers, the threshold for what constitutes "affordability" has no single answer. Research has shown that large portions of non-subscribers set their preferred price at zero. This may reflect extreme poverty on their part, and/or a lack of skills or interest in using the Internet.

Qualitative research shows that those unwilling to pay anything for broadband may be well aware of its value; but they lack the ability to pay for service or the devices necessary to access it. Most discounted service offerings aimed at non-adopters are \$20 per month or less, with a couple of programs including Comcast's Internet Essentials and Access from AT&T at \$10 per month. From the public interest perspective, an important objective is to ensure that discount Internet offers are widely available, that information about them is aggressively disseminated, and that sign-up processes for potential users is not burdensome.

Chapter 5 reviews the affordability problem in further detail and provides policy options for addressing the challenge. But while affordability is a significant issue, it is not a binary problem. That is, it is not a simple question of whether one can or cannot afford home broadband service and the devices needed to access such service. There are related financial issues, such as access to credit. For example, one of the most important service developments encouraging new subscribers to mobile broadband services was the introduction of pre-paid services, which mitigated credit issues limiting the market of potential subscribers. There are similar pre-paid options for broadband at home, such as with Internet Essentials which does not require a credit check, but these prepaid programs have not had the impact that such options have had in the mobile market. The situation is described in more detail in Appendix 4A.

Digital Readiness. The second substantial constraint on broadband adoption at home is often referred to as "[digital readiness](#)." Digital readiness is an evolving concept, generally referring to a set of skills associated with using information and communications technology (ICT) to find, evaluate, create, and communicate information. It is the sum of the technical skills and cognitive skills people employ to use computers to retrieve information, interpret what they find, and judge the quality of that information. It also includes the ability to communicate and collaborate using the Internet, which, of course, requires access to devices.

A lack of digital readiness reflects the uncertainty that new Internet users bring to their online experience. One component of

digital readiness are the skills required to access and use Internet services, including for example, how to operate a computer or upload a resume. Another component of digital readiness is trust, including confidence that the information they provide and access online is reliable. Concerns about the level of misinformation and, in particular, applications that can use personal financial information in problematic ways in today's Internet and social media environments, underscore the importance of information and media literacy in digital readiness programs.

Finally, there can be no digital readiness without access to computers and other devices, and the ability to use them. A lack of digital readiness limits the abilities of those new to the Internet to fully utilize online services. It may also affect some experienced users, who may struggle with new applications and services.

The prevalence of digital readiness issues is substantial. In the U.S., [one-third of adults](#) have low levels of digital skills for emerging applications, such as the Internet of Things. As many as [half of the population](#) exhibit some level of reluctance to use online educational resources, because they lack confidence on how to use such applications. In health care, inexperience with technology leaves more than [one-third of older adults](#) unable to have video visits with their doctors during the pandemic. In workforce preparedness, large [numbers of workers](#) lack the digital skills needed to perform many well-paying jobs that are in demand.

A lack of overall digital readiness fuels strong levels of demand for digital skills training, something that is unlikely to subside after the pandemic. A [2017 Pew Research Center](#) study, for example, found that 60% of all adults were interested in training on how to use online resources to find trustworthy information. Another 54% of all adults expressed interest in training on how to better use the Internet, computers, and smartphones generally.

Perceived lack of relevance. Some non-adopters of broadband service may view the Internet as something that is not relevant to their lives. Research findings vary on the degree of this problem. The NTIA finds that [58% of non-adopters](#) cite “don't need” or “not interested” as a reason they do not subscribe.

However, qualitative research [finds that](#), when digging into survey responses that cite lack of relevance, many respondents cite cost of service and insufficient digital skills as significant issues for them. Other [surveys](#) reach different conclusions, finding cost is the leading reason for non-adoption among 34% of respondents, with “don't need/not interested” cited by 22%.

Whatever the precise magnitude of the problem, significant numbers of non-adopters may benefit from information demonstrating the utility of being online. An unintended positive consequence of the pandemic may help address this. Online access, for example, can greatly facilitate finding out where to get the vaccine and signing up for a shot. The pandemic has also resulted in social isolation for some people—particularly older adults—which makes the consequences of not having online access more evident to people. The significant levels of non-users citing lack of relevance points to an informational component addressing barriers. Addressing informational needs in the context of broadband adoption is something addressed below as part of encouraging digital readiness.

4.5. CLOSING THE DIGITAL READINESS GAP

The recommendations in this section will help non-adopting Americans develop basic digital skills, lowering barriers to broadband adoption and encouraging full utilization.

We are not starting from a blank slate. In the past several years, digital readiness initiatives throughout the country offer templates for successful solutions to the adoption gap. Examples include:

- The Community Technology Network, which was established in 2008 and which has grown to serve the Bay Area in San Francisco and Central Texas.
- Older Adults Technology Services (OATS) which, as its name suggests, address the technology and digital skills needs of older adults.
- A number of local public libraries and community colleges, which have

spearheaded programs to provide their patrons digital skills training, often with an aim at job training and entrepreneurship.

- The National Science Foundation, which has funded a "rec-to-tech" project in Baltimore and Pittsburgh, which uses city recreation centers as sites to train young people in digital skills that they can take to the workforce.

4.5.1. ESTABLISH AN OFFICE OF DIGITAL EQUITY.

Congress should establish an Office of Digital Equity to coordinate across federal agencies and initiatives to increase adoption of broadband at home, and to advocate for policies designed to achieve digital equity and inclusion. As its principal role aligns with community development, we think it best suited for the Department of Commerce, but it could also be housed within the Departments of Education, Housing and Urban Development, or the FCC.

The Office would be the principal entity charged with meeting broadband adoption goals and tracking progress towards those goals. The Office would take on the responsibilities of the [American Broadband Initiative](#), with an expanded scope of functions and new funding to help meet the goals.

Specifically, the Office would:

- Expand and coordinate digital equity strategies and efforts within and among federal, state, and local governments, including coordinating with all stakeholders of the new affordability programs discussed in Chapter 5, to assure administrative ease and efficiency;
- Incentivize participation in digital equity strategies from all sectors, particularly employment training, education, health care, finance, and retail;
- Coordinate and streamline federal grant programs aimed at increasing broadband adoption and network deployment;
- Work with private and public affordable housing owners and agencies to

implement programs aimed at increasing digital literacy in their communities

- Establish or support existing local "hotlines" to answer digital literacy questions;
- Conduct research, if possible, with National Science Foundation Funding, on the effectiveness of digital equity strategies, including:
 - Identifying a threshold of affordability for discount home broadband offers. This should take into account household expenditures for other necessities including (but not limited to) rent, food, utilities, and medical care, and;
 - Evaluating the effectiveness of programs designed to increase broadband adoption.
 - With a working group of public and private experts, create and continuously update a digital skills framework for adult education, workforce, and training programs;
- Encourage Internet service providers (ISPs) to develop and strengthen voluntary low-cost broadband plans for low-income populations, with emphasis on aligning eligibility for low-cost offerings across providers;
- Encourage hardware, device, and other equipment manufacturers, software companies, and device-related service providers to make available low-cost laptop and computer purchase plans and essential software and other online tools for low-income populations.

4.5.2. ESTABLISH A NATIONAL DIGITAL LITERACY PROGRAM.

Congress should launch a National Digital Literacy Program that creates a workforce of "Digital Navigators, described further below, increases the capacity of local digital literacy programs, and creates an Online Digital Literacy Portal of up-to-date training resources.

4.5.2.1. Congress should create a Digital Navigators Corps to conduct training and outreach in non-adopting communities.

Congress should create a Digital Navigators Corps composed of skilled experts working to solve a wide range of identified adoption issues—including home connectivity, devices, and digital skills—on behalf of local community members, either remotely or in-person. Members of the Corps should include personnel from social service agencies, libraries, health centers, community-based organizations, private sector, volunteers, and other anchor institutions.

Many existing digital literacy training programs, both in the United States and abroad, rely on face-to-face training provided by trusted experts within local communities. Whether using intergenerational training that allows youth committed to community service to train senior citizens, peer-to-peer training that enhances connections among seniors or youth, or mentoring models under which skilled college graduates reach out to currently unconnected citizens, these programs help non-adopters become more comfortable with technology while also fostering volunteers' commitment to community service.

State and local efforts like these offer valuable lessons for digital literacy services delivered at scale. A national program can build on these successful models and ensure the expansion needed to address digital literacy barriers. Specifically, Congress should direct the NTIA and the Corporation for National and Community Service (CNCS) to create the Digital Navigators Corps. In collaboration, NTIA and CNCS can explore best-practice models for building and managing the Corps, leveraging lessons learned from existing programs like AmeriCorps, Senior Corps and Learn and Serve America. CNCS can also leverage its own experience with the digital television transition, during which it made sure that AmeriCorps members were in communities across the country helping individuals become more comfortable with unfamiliar technology,

The Corps should target segments of the population that are less likely to have adopted broadband at home, including low-income individuals, racial and ethnic minorities, senior

citizens, people with disabilities, those with lower education levels, people in rural communities, those on Tribal lands, and people whose primary or only language is not English.

4.5.2.2. The Office of Management and Budget (OMB), in consultation with the Institute of Museums and Library Sciences (IMLS), should develop guidelines to ensure that librarians and Community Based Organizations (CBOs) have the ongoing training they need to help patrons use next-generation e-government applications.

As government services increasingly go online, libraries shoulder responsibility for helping people learn how to use these online services. Already, eighty percent of libraries report that they help patrons use e-government applications. However, some librarians say they have been overwhelmed by patrons seeking help with government services and online programs, particularly in an emergency or with a new government program, such as Federal Emergency Management Agency forms following Hurricane Katrina and Medicare Part D paperwork. These librarians also say that they did not receive suitable training or information from the agencies that provided the e-government solutions.

OMB, in consultation with IMLS, should develop and update guidelines to help federal agencies develop e-government services that leverage the role of public libraries and CBOs as delivery points for new services and programs as well as for next generation technologies. Agencies should work with IMLS to develop online tutorials for using government websites and toolkits for librarians who help patrons use online government services.

4.5.2.3. Congress should fund an Online Digital Readiness Portal.

Every American should have access to free, age-appropriate content that teaches digital skills and enhances digital readiness. This content should be available in a user's native language and should meet the accessibility requirements applicable to federal agencies under Section 508 of the Rehabilitation Act. To achieve this, Congress should fund the creation of an Online Digital Readiness Portal (ODRP), and the relevant government

agencies (including but not limited to the NTIA, FCC, Department of Education, Department of Labor, the Department of Health and Human Services, the Bureau of Indian Affairs, and the Department of Housing and Urban Development (HUD)) should oversee the portal and partner with the technology industry and education sector to approve or create high-quality online lessons that users can access and use at their own pace. The collaboration between the agencies and non-government partners should be similar to efforts that have produced the online safety resources available through OnGuardOnline.gov.

Offline resources will be important complements to this online content. They should be made available for printing or ordering, and distributed by libraries, CBOs, and other community organizations.

The ODRP should build on the collaborative model that has been successful in programs such as the HUD Community Outreach Partnerships Program, which brings institutions of higher education and community partners together to revitalize communities, including the Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions Assisting Communities (HSIACs), Tribal Colleges and Universities (TCUs) and Tribal Libraries. In addition to their educational missions, through the Community Outreach Partnerships Program, these organizations provide links to community employment assistance, childcare, health care information, fair housing assistance, job training, youth programs and other services. As crucial community institutions and trusted sources of information, HBCUs, HSIACs and TCUs could also serve as ambassadors to promote digital literacy and other national digital priorities. HUD and NTIA should also use existing relationships—for example, with state broadband offices—to distribute outreach materials associated with the OLDP.

The OLDP should be evaluated after two years to assess its impact. The evaluation should consider, among other metrics, the total number of individuals accessing the portal, the number of individuals from specific target populations accessing the portal, and the effectiveness of different offline resources in promoting the portal.

4.5.2.4. Reinvigorate federal efforts to support digital literacy efforts through revitalizing the www.DigitalLiteracy.gov platform.

The Obama Administration launched DigitalLiteracy.gov to serve as a resource to practitioners delivering digital literacy training in their communities. The platform aggregated best practices, organized available educational content, and increased coordination among stakeholders. Unfortunately, the platform was not appropriately maintained, and has now been disabled. A revitalized and continually upgraded central website, administered by the NTIA, can serve as the foundation for digital equity and inclusion efforts, assisting with and improving the efforts of state and local digital inclusion organizations.

4.5.2.5. Integrate information outreach into digital readiness initiatives.

Providing information is key to addressing the view of some non-adopters that the Internet is not relevant. Conveying to such persons that the Internet is a pathway to a vaccine, a doctor, or a grandchild, bundled with access to digital skills and affordable service plans, can increase adoption. The federal government's current emergency broadband benefit program, which provides a \$50 per month subsidy for low-income households during the pandemic, does not include funds for outreach to communities. As the policymakers contemplate future broadband adoption policy interventions, providing funding for outreach (to, for example, community anchor institutions and community non-profits) can help address the relevance barrier.

4.5.3. CONGRESS SHOULD APPROPRIATE FUNDS TO SUPPORT DIGITAL EQUITY PLANNING AND DIGITAL INCLUSION INITIATIVES.

Congress should appropriate funding for development of adoption focused state, local, and Tribal digital equity plans, and competitive state and national grant programs for digital inclusion initiatives. State level planning provides an opportunity to identify existing assets, and for stakeholders to prioritize digital equity needs. One approach would be to pass and fund the proposed Digital Equity Act, which would spend \$250

million over each of the next five years for state level planning and digital inclusion grants.

FIGURE 1

HOUSEHOLD WIRELINE BROADBAND & COMPUTER ADOPTION BY INCOME (2018)

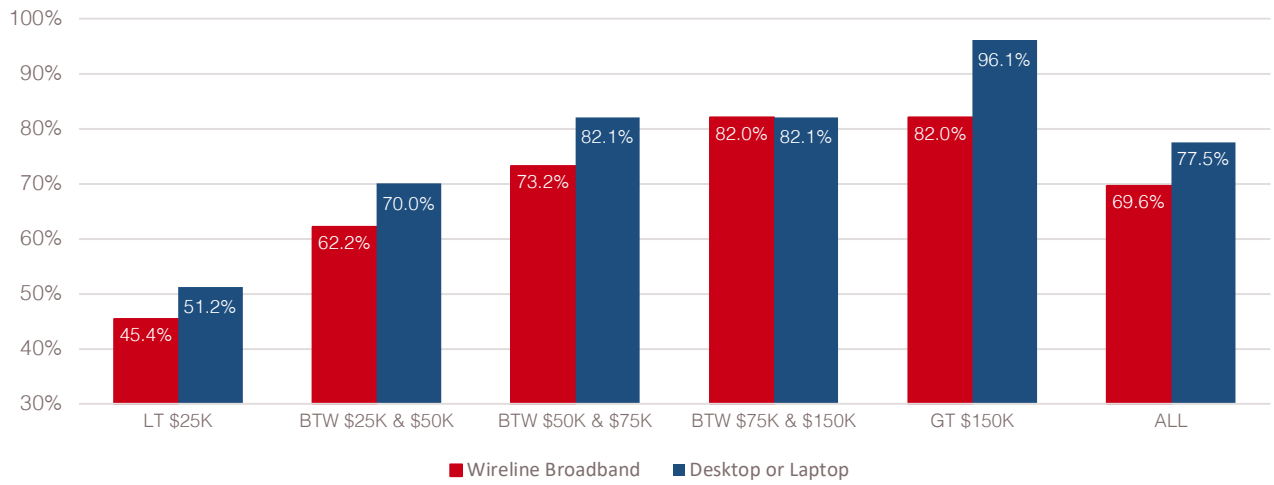


FIGURE 2

HOUSEHOLD WIRELINE BROADBAND & COMPUTER ADOPTION BY AGE (2018)

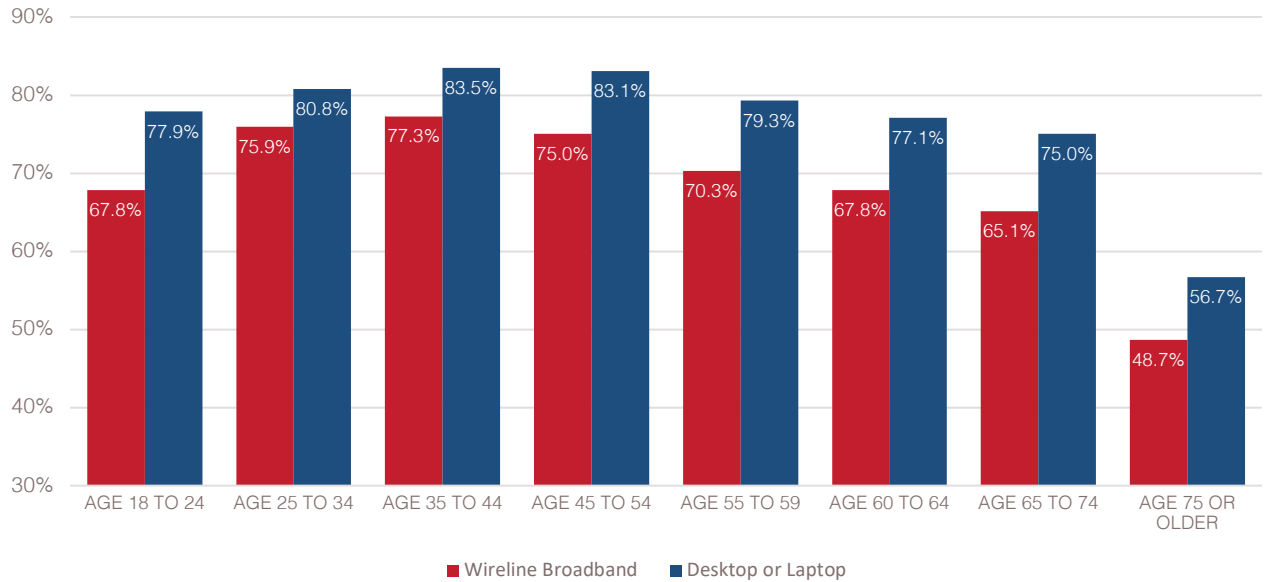


FIGURE 3

HOUSEHOLD WIRELINE BROADBAND & COMPUTER ADOPTION BY RACE & ETHNICITY (2018)

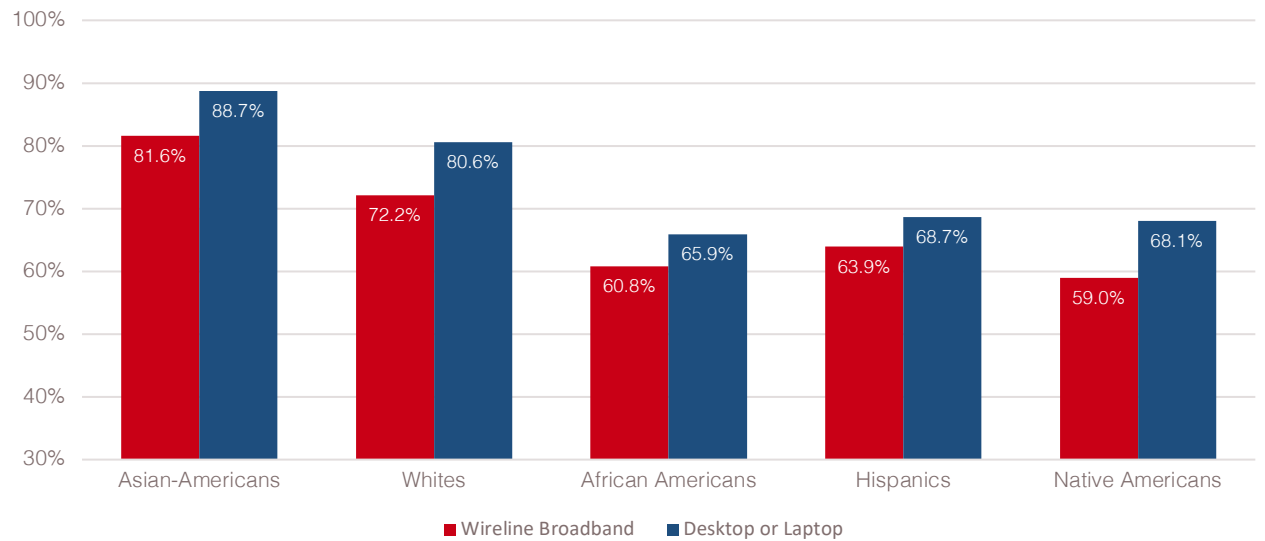


FIGURE 4

HOUSEHOLD WIRELINE BROADBAND & COMPUTER ADOPTION BY GOVERNMENT HEALTH INSURANCE PROGRAM (2018)

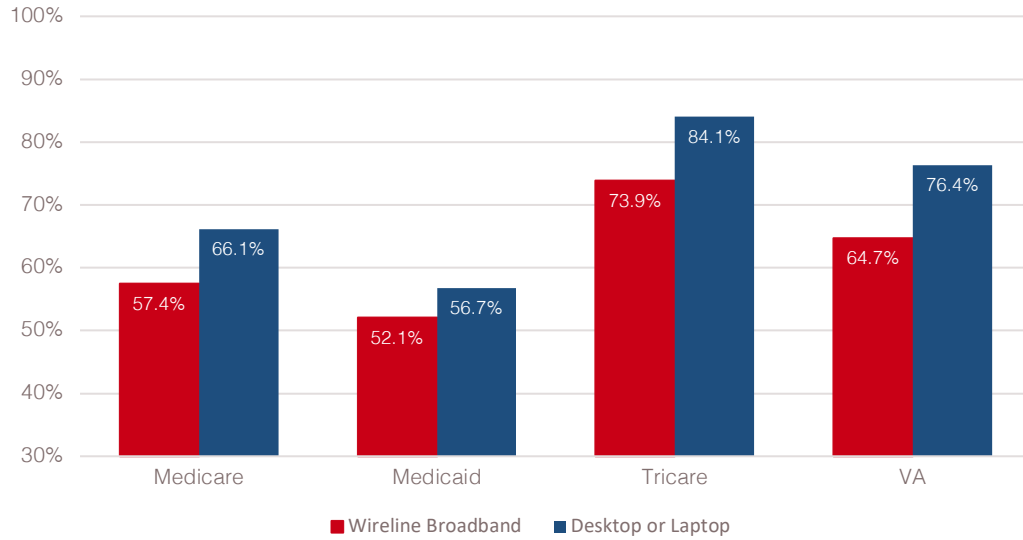
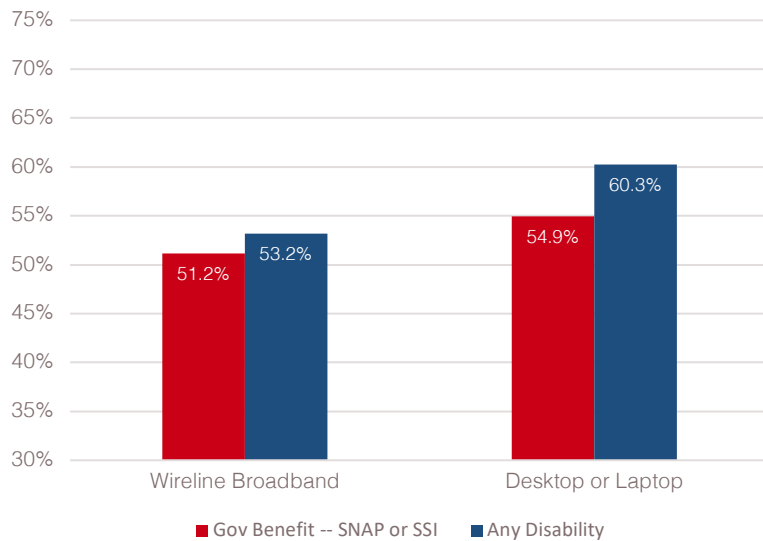


FIGURE 5

HOUSEHOLD WIRELINE BROADBAND & COMPUTER ADOPTION BY GOVERNMENT HEALTH INSURANCE PROGRAM (2018)



Chapter 5.



CLOSING THE AFFORDABILITY GAP

5.1. INTRODUCTION

In the previous two chapters, we described the state of broadband in the United States and identified the principal barriers to achieving digital equity and inclusion: an availability gap and an adoption gap, with the principal issues limiting adoption being affordability, digital readiness, and perceived relevance.

In this chapter, we describe the principal government effort to-date aimed at addressing affordability—Lifeline—and why that program has not succeeded in closing the affordability gap. Based on that analysis, we propose a plan to eliminate the affordability gap, based on a new federal program that we call Lifeline+. Adopting and funding Lifeline+ would yield significant public benefits, creating a more equitable and inclusive economy and society by expanding broadband utilization overall, and closing specific gaps in digital education, health care, and workforce development.

5.2. CURRENT PUBLIC AND PRIVATE EFFORTS TO ADDRESS AFFORDABILITY

5.2.1 THE LIFELINE PROGRAM.

The principal federal government program aimed at closing the adoption gap is Lifeline. The Reagan-era FCC created the program in

the mid-1980s to help low-income Americans pay for local telephone service. Lifeline lowers the cost of monthly service for eligible consumers by providing subsidies to service providers on behalf of consumer households.

A number of states also have their own programs to assist low-income persons afford communications services. While many provide critical funds, none is robust enough to solve the affordability gap we discuss here.

Further, as this Plan is focused primarily on federal policies, we will not discuss individual state efforts in this chapter.

In 2005, the FCC made two major reforms to Lifeline. First, it ruled wireless carriers could be eligible to provide phone service. Second, it eliminated a requirement that eligible providers own the facilities they use, permitting companies like TracFone, which leases wireless services from “facilities based” providers, to become major providers of Lifeline.

In 2015, the FCC reformed the program again, this time to allow the subsidy to be used for either broadband or voice service, or bundles that include broadband service. Given the cost of home broadband and the need for phone service, however, most Lifeline users continue to apply the subsidy to low-cost mobile service.

To participate in the program, subscribers must have either an income that is at or below 135% of the federal poverty guidelines, or participate in certain federal [assistance programs](#), including SNAP, Medicaid, or SSI. The Lifeline subsidy on qualifying monthly broadband service for eligible subscribers is \$9.25 per month, with up to an additional \$25 per month for qualifying Tribal subscribers. The subsidy for voice service is \$5.25 as of December 1, 2020; absent further action by the FCC, no subsidy will be provided for voice starting December 1, 2021. As of October 2020, 8.2 million households participated in the program.

5.2.1.1 Criticisms of the current program.

There is widespread agreement that Lifeline in its current form does not achieve the goals of digital equity and inclusion, nor is it designed in a way that would make that outcome likely over time. As a practical matter, the program has become a subsidy for a low-end mobile Internet service, not for broadband at home. Even with its more limited reach, the program has been less than successful. As of January 2021, only 8.7 million of the 33.2 million eligible households participate in the program.

Generally, there are three explanations for why the system is failing. First, many believe that the level of subsidy, at \$9.25, is insufficient to subscribe to broadband service

at home. A related argument is that when forced to choose between broadband at home or a mobile service, many low-income persons prefer the mobile service.

Second, many believe that not only is the cost of the monthly service a barrier to an in home subscription but in addition, the cost of a device capable of doing work, school work, telehealth or other such functions is a barrier to adopting.

Third, many believe that lack of information about the program and undue complexities in the administrative process for applying for it results in the vast majority of eligible households forgoing participation.

Fourth, many believe that because companies that offer Lifeline services must satisfy state requirements for “Eligible Telecommunications Carriers” (ETCs), the number and quality of Lifeline providers is artificially reduced, effectively limiting participation to niche voice communications providers. The ETC requirement unnecessarily undercuts market dynamics that, with more providers offering competitive products, could lower the costs and increase the quality of Lifeline programs.

5.2.1.2 The current funding mechanism.

Lifeline is part of the broader Universal Service Program (USF), which also subsidizes network infrastructure deployment in sparsely populated or geographically challenging areas, where expected returns on the capital necessary to build a broadband network do not justify private investment. USF also subsidizes equipment and network connections costs for anchor institutions (schools, and libraries facilities, generally known as the “E-Rate Program”), and rural health care facilities. [According to the Universal Service Administrative Co.](#), which collects funds and services USF programs, total USF disbursements have held steady at approximately \$8.5 billion over the last three years.

As discussed in Chapter 3, the sole funding mechanism for providing all USF programs to an increasing number of homes, institutions, and individuals has significant structural problems, and, it is generally agreed, is unsustainable. Under FCC rules, revenue to support USF programs, including Lifeline, is

paid by providers of certain voice communications services, primarily but not exclusively voice services, most of whom pass this cost along to consumers. The providers pay USF a prescribed percentage of the amount their customers pay for interstate and international services. That rate, known as the “contribution factor,” is [adjusted quarterly](#) based on rising or falling demand from eligible participants in USF-funded programs. There are several issues with this mechanism:

Not sustainable or expandable. Due to declining revenues for the services on which the contribution factor is based, the percentage assessed from consumers has continued to increase. Ten years ago, the rate was 12.9%. By 2017 it had risen to 16.7%. The 2Q21 contribution factor is 33.4%. As the associated revenue goes down, the contribution factor goes up, encouraging providers and their customers to substitute other services that are not assessed, putting the funding mechanism and the entire USF program into a death spiral.

Unfair regressive tax. Not only is the system structurally unsound, but it is also unfair. Since the percentage is applied regardless of the economic status of the consumer, it is in effect a regressive tax, hitting low-income consumers harder than more affluent users.

Support for broadband service has raised legal questions. In addition to these problems, some have raised legal concerns. [The DC Circuit Court of Appeals, in remanding parts of](#) the FCC’s 2017 Restoring Internet Freedom Order (RIFO) called on the FCC to explain the statutory basis for continuing Lifeline subsidies for broadband even though the FCC no longer classified broadband as a telecommunications service.

In its order responding to the remand, the FCC explained its finding that it has legal authority under section 254(e) of the Act to distribute Lifeline support for broadband service provided by ETCs, and that that authority is undergirded by the clear intent of Congress in Section 254(b) and elsewhere that universal service efforts should increase access to advanced services.

While the FCC addressed the issue, the situation demonstrates another potential question in relying on the current funding

mechanism to support expanded efforts to close the affordability gap.

5.2.2. NEW PUBLIC SECTOR EFFORTS TO ADDRESS THE AFFORDABILITY GAP.

As we were preparing this Plan, Congress, for the first time, directly appropriated funds for broadband subsidies for low-income persons. This effort, part of a COVID-19 relief package, the [Consolidated Appropriations Act of 2021](#), allocated \$3.2 billion for an Emergency Broadband Benefit Program (EBB) to connect low-income households. The funds will be used to reimburse broadband providers up to \$50/month per low-income household it serves, or \$75/month if the household is on Tribal land. The Act also authorizes reimbursements to providers of up to \$100 for providing the household with a connected device (desktop, laptop, or tablet computer), if the household contributes \$10-\$50 for the device. Households are only eligible for one device.

The EBB program is temporary, to last no longer than six months after the COVID-19 crisis ends. Funds will be administered through the FCC. Congress gave the agency sixty days to determine the details of administering the program.

On January 4, the [FCC released a Public Notice](#) seeking comments on how to best implement the program. Notably, the EBB program is not limited to ETCs, and the FCC, through its Notice proposes to establish an “expedited process” to approve non-ETC providers who wish to participate. The FCC process also asked several questions about devices, family or personal eligibility and verification, and how best to publicize the program. The FCC adopted [its order](#) on the program on February 25,.

In addition, as part of [the American Rescue Plan of 2021](#), Congress appropriated \$7.17 billion in funding to augment the E-Rate program. The appropriation makes available funds for elementary and secondary schools and libraries to provide Wi-Fi hotspots, modems, routers, and Internet-enabled devices. While E-Rate funding traditionally has only gone to connect educational institutions, this money could be used to fund Internet services for students, staff, and library patrons. Congress instructed the FCC to promulgate regulations concerning the

allocation of these funds within 60 days of the bill's passage.

While both programs represent one-time appropriations, they also provide opportunities for the FCC and our country to consider new ways of addressing the affordability gap.

5.2.3 PRIVATE SECTOR EFFORTS TO ADDRESS THE AFFORDABILITY GAP.

In addition to government efforts to close the affordability gap, there are also a significant number of voluntary private efforts to connect low-income persons from leading fixed and mobile broadband providers. These efforts have already resulted in millions of homes being connected to broadband at a greatly reduced price. Such efforts should not be considered a replacement for public programs, but their availability and operation provide important lessons for the design of new governmental programs aimed at overcoming barriers to adoption, including affordability.

Key findings from our review of these private sector efforts include:

- While private efforts are not available everywhere, companies offering low-income programs cover over 90% of American homes.
- Because of overlaps in footprints, two or more low income offers are probably available to about 50% of homes, though again, the eligible number of homes is likely to be less. Still, it is likely that a material percentage of non-adopting households are eligible for an available program.
- The private efforts offer broadband at significantly discounted prices. While the average price for a retail broadband service is almost \$70 a month, the cost of the low-income programs—which may be offered at lower speeds than the average service—ranges from \$10-\$20 a month.
- The private efforts are not integrated into public programs aimed at closing the affordability gap. For example, several of the largest private providers of broadband programs for low-incomes households are

not and could not easily become ETCs, and therefore cannot take advantage of the current Lifeline subsidy to further reduce the cost of participation. Further, even some ETCs that offer a private low-income program do not seek to offer those services in coordination with Lifeline, citing numerous administrative difficulties.

- The private efforts are not currently utilized to any significant degree in partnership with public programs aimed at closing the affordability gap.
- As noted earlier, the FCC has not updated its view on the functional requirements, such as speed, for accessing services. In that light, there is uncertainty as to the extent to which these private programs meet those needs. It is worth noting that while these programs may not be subject to the same market dynamics as competition for customers able to pay standard retail rates, there are forces in the market that drive improvements in the offering. For example, Comcast recently doubled its download speed for its Internet Essentials program from 25Mbps to 50Mbps.
- Similarly, while some of the programs have won significant praise for their outreach efforts, there is uncertainty as to how effectively some of these programs are marketed to eligible households. Again, on this issue, there has been no public assessment by the FCC or other public entity.

In addition to private retail efforts, there are several wholesale programs, such as that offered by AT&T and Verizon, which offer discounted services to local school districts whose administrators can in turn use to offer a low-cost service to students. These programs, however, generally limit the use to educational purposes only. If such efforts are expanded to achieve the goals of a reformed low-income subsidy program, it would be important to examine any limitations and modify such restrictions.

5.2.4. THE CHALLENGE: THE CURRENT SYSTEM CANNOT MEET CURRENT, LET ALONE FUTURE, NEEDS.

Existing public programs, even supplemented and supported by private efforts, have and will continue to fail to close the affordability gap. The two most obvious improvements—increasing the monthly subsidy and connecting all eligible households—would certainly be welcome, but both would require dramatic increases to Lifeline’s budget and major changes to its operating model. In any event, increasing the contribution factor to accommodate either, let alone both, would collapse the system. Further, the EBB is a temporary fix for a problem that will continue to exist after the COVID-19 crisis.

There are other limits to Lifeline. The program does not include support to acquire devices, which some of the private offerings do include, along with other forms of technical support not part of Lifeline. Some of the discounted mobile broadband plans, for example, come with data allowances that may be insufficient to complete essential tasks, especially for families with K-12 children or medical problems, or during times of job training or job searches. Many of the non-financial factors described in Chapter 4 are also not adequately addressed by any existing program.

5.2.4.1. The federal government has a history of setting national baselines for the delivery of critical public services that are now heavily reliant on broadband access.

In proposing a reform or restructuring of low-income broadband programs, it is worth considering, at the outset, the value of setting baseline requirements and identifying essential services, factors that regulators have historically relied on in program design. With particular relevance to workforce, health care and education, we note that:

- **Workforce.** The primary governmental support for unemployed persons is provided at the state level but receives at least partial funding from the federal government. Beyond financial assistance, public and private services provide education and job training. Many of these services can best be utilized through the Internet, especially during the current medical emergency, as many of the 2,400 in-person federal American Jobs Centers, for example, remain closed. As a visit to [the website for the federal](#)

[program](#) implicitly acknowledges, Internet access is essential for taking advantage of the training services and being about to obtain benefits, as the site has the following message: “Nearly 2,400 AJCs nationwide help people search for jobs, find training, and answer other employment related questions. *COVID-19 update: Please note that many AJCs are temporarily closed or shifted to virtual services; you will see a special note in red if we have information about closures or alternative services.* If you need to file for unemployment insurance, please visit [Unemployment Benefits Finder.](#)”

- **Health Care.** The federal government is the largest purchaser and provider of health care and health insurance in the country. It does so principally through Medicare, which covers over 60 million persons 65 years old or older, as well as covering some younger persons with disabilities; Medicaid, a partnership between the federal and state governments to provide health care coverage to low-income persons, covering over 75 million people, and services to over 9 million veterans, administered by the Veterans Health Administration, the largest component of the Department of Veterans Affairs. Here too, the government’s ability to deliver such services is increasingly dependent on the persons they cover having broadband at home. For example, In February 2020, [less than 1% of Medicare primary care visits](#) utilized telehealth. By April of that year, that number was 43.5%.
- **Education.** The federal government has long-supported local schools. In the 1940’s, for example, Congress recognized an obligation to make sure that all children attending school had a hot lunch. The National School Lunch Act provides nutritionally balanced, low-cost or no-cost lunches to children each school day in public and nonprofit private schools, and in residential childcare institutions. The Department of Education also provides direct funding to elementary and secondary school with economically disadvantaged students (the Elementary and Secondary Education Act (*ESEA*) Title I and children with disabilities through the *Individuals with Disabilities Education Act (IDEA)*).

Increasingly, many of the most basic tasks associated with workforce development, health care, education, and other critical aspects of daily life can be done most effectively, efficiently, and reliably when done online. As discussed further in Chapter 8 on workforce development, for example, a [2012 study](#) showed broadband use at home or in a public place such as a library reduced the probability that an unemployed person will stop their job search entirely by 50 percent relative to people who are unemployed and do not use Internet, while [a recent study from the Philadelphia Federal Reserve](#) found “promoting broadband device access and digital literacy training to households where an individual may have lost employment is crucial to ensuring people remain attached to the labor market following such an event.”

As discussed further in Chapter 9 on health care, here too, the government’s ability to deliver such services is increasingly dependent on the persons they cover having broadband at home. For example, In February 2020 [less than 1% of Medicare primary care visits](#) utilized telehealth. By April of that year, that number was 43.5%.

Not only has the use of telehealth increased, but the range of services has also increased as well. But there is a significant gap in who can utilize such services. According to [research from University of Pittsburgh and Harvard Medical School](#), more than 41% of Medicare patients lack access to a desktop or laptop computer with a high-speed Internet connection at home. Almost 41% do not have a smartphone, and more than 26% don’t have access to either.

Finally, as discussed in Chapter 10 on education, the inability to keep up with schoolwork or learn Internet skills at a young age puts students at a significant disadvantage in the future. [94% of low-income school districts](#) assign homework that is online, which makes Internet access a necessity for students. Yet [research based on the most recent census data](#) shows that 15-16 million K-12 students lack adequate access to the Internet and/or a device on which to do school work at home.

COVID-19 has now transformed a serious “homework gap” into a full-fledged learning gap, as schools are forced to offer only or mostly virtual learning. Computers and

broadband at home have become essential not just to complete homework, but for all or almost all classroom and school-related learning. While COVID-19 has shined a spotlight on the need for students to have connectivity in the homes, schools close for reasons other than the pandemic, including winter weather, extreme heat, wildfires, flooding, hurricanes, and tornadoes, which all cause extended disruptions to in-school instruction, and likely will increase in the future.

This transformation of in-person services long considered essential to digital alternatives necessitates access to an appropriate device and broadband at home, a trend that will only increase in the future. Policymakers will need to continuously adapt to new developments and challenges, creating programs that assure access to what are considered essential services by all citizens, most of all those facing significant obstacles due to financial, social, cultural, language, or other causes.

To the extent that lawmakers have long-supported the in-person versions of these essential services and activities through a variety of mechanisms, programs, and funding models, we believe it is now time to include an appropriate level of support for their Internet-based equivalents. Broadband-based delivery and full utilization of these essential services must become part of the DNA of the respective public, private, and public-private collaborations involved in, at a minimum, workforce, health care, and education. It is both the reason closing the availability and affordability gaps is so critical to achieving digital equity and inclusion, and the most compelling way, at the same time, to remove any remaining issues of relevance in closing the adoption gap.

Reforming current public programs to assure broadband adoption to utilize these essential services, described below and in more detail in succeeding chapters, is among the most critical recommendation in this Plan for improving digital equity and inclusion.

5.3. RETHINKING AFFORDABILITY: FIRST PRINCIPLES.

We need a program to ensure that everyone can afford broadband at home to access

essential services. By design and practicality, the existing Lifeline program will likely never be more than a lower-end mobility and voice program. While Lifeline certainly can and should be improved, and while mobile and fixed service capabilities are converging, we believe there remains a material difference between the lower priced mobile data and voice services we want everyone to have for purposes of emergency communications and other critical uses, and the broadband at home necessary for an entire household to participate in 21st century life.

We believe it is time for a new national strategy for universal broadband, one that supports the goals of digital equity and inclusion. That program, which we describe below, should be grounded in several basic principles, including:

5.3.1. DON'T TAKE AWAY EXISTING BENEFITS.

The purpose of the new programs is to expand broadband adoption and utilization. In so doing, the program should not take away benefits that people already have and rely on. We should not force low-income households to choose between a mobile service and broadband at home.

5.3.2. ADDRESS THE MOST URGENT NEEDS FOR BROADBAND AT HOME, INCLUDING BROADBAND FUNCTIONALITY, APPROPRIATE DATA PLANS, AND DEVICES THAT ENABLE THE DESIRED ACTIVITY.

Building on existing benefits, the new programs we propose must at a minimum provide for broadband at home that can support the essential services we have identified. Specifically, the new program must empower those who become underemployed or unemployed to train, search, apply, and interview for new jobs using the same online tools that have long since been adopted by higher-income workers, support K-12 students with the connectivity. Further the new program needs to provide devices recipients need to attend classes and complete schoolwork, and allow recipients of government health benefits to take full advantage of a growing range of online services.

5.3.3. ALIGN GOVERNMENT INSTITUTIONAL INCENTIVES.

As currently designed, Lifeline has created an inherent conflict of interest for those charged with administering it. On the one hand, the FCC is tasked with administering Lifeline to assure that low-income persons have access to communications services. At the same time, the agency is constrained by a regressive contribution factor. The more people it signs up, the higher the prices paid for voice services by everyone, especially the poor, even though most of the universal service funding goes to programs other than Lifeline.

A new program should seek to eliminate that conflict, by ensuring a more sustainable, stable, and progressive funding mechanism.

In doing so, it is worth considering ways in which in the achievement of digital equity and inclusion can promote, rather than conflict, with the goal of providing essential services in the most cost-effective manner possible. It might make sense for some institutions, public and private, to fund the new broadband services we propose because doing so, in the long run, would pay for itself in the form of reduced costs and improved service levels. Widespread use of online health care, for example, could reduce the incidence of post-natal complications for infants and chronic medical conditions for adults, which not only means better health outcomes for individuals but also lower long-term costs for public health. Similar improvements in workforce development and education are likely.

5.3.4. DESIGN PROGRAMS TO BE POLITICALLY SECURE.

To the extent that consumers or taxpayers will ultimately pay for the programs we propose, public perceptions of the benefits of digital equity and inclusion matter deeply. To the extent that the program we propose provides broadband for specific uses and essential services that the public sees as creating public benefits, ongoing support for the program is likely to be more sustainable.

5.3.5. STANDARDIZE PROGRAM REQUIREMENTS TO THE EXTENT POSSIBLE.

While the new program should be designed to meet different needs and use cases, it should be engineered to standardize eligibility, funding, participation, and reimbursement requirements, to the extent practical, to improve customer access and protection, lower administrative costs, and encourage participation by the maximum number of broadband providers, private and public.

5.3.6. MAINTAIN TECHNOLOGICAL AND PROVIDER NEUTRALITY.

The new program should be focused on achieving digital equity and inclusion. For reasons of practicality, timing, and budget, achieving those goals requires programs that are inherently technology neutral. So long as new or emerging technologies can support the effective use of the essential services we have identified, providers using those technologies should be eligible to participate in the programs. Any provider, or combination of providers, who can satisfy the requirements for delivering broadband at home should be considered eligible for participation in the programs. This could include public, private, and public/private partnerships, and both for-profit and not-for-profit enterprises. Technology and provider neutrality will not only close the remaining gaps more quickly and efficiently, but it will also encourage competition, lowering costs and improving choice.

5.3.7. DESIGN THE PROGRAM SO THAT THE GOVERNMENT CAN LEARN AND ADJUST TO REAL-LIFE, MAXIMIZING BENEFITS WHILE MINIMIZING COSTS AS TECHNOLOGIES AND MARKETS EVOLVE.

Any new programs will encounter unexpected issues. Further, markets and technology will change, producing impacts on the program that are not foreseeable today. This is especially true for digital innovations, which evolve quickly and often unpredictably. In that light, the programs we propose should be flexible, and designed to provide necessary information to those administering the program to be able to quickly modify the programs to maximize benefits while minimizing costs.

5.3.8. TAKE ADVANTAGE OF OVERLAPPING BROADBAND USE CASES TO IMPROVE THE EFFICIENCY OF THE PROGRAM.

As discussed throughout this document, those who currently have not adopted broadband could use broadband for multiple purposes with public benefits, including workforce development, healthcare, and education. The program should be designed to enable all such uses.

Further, the program should be designed to utilize those overlapping uses to lower costs and improve efficiency. For example, there is a significant overlap between the population that needs broadband at home for education and for healthcare. For 2019, [Medicaid reported](#) a total of 71.4 million people covered by the program (which includes the 6.7 million on the Children Health Insurance Program (CHIPs)). Roughly half of all people on Medicaid or CHIPs are between the ages 0-19. That translates to 34.7 million children on Medicaid/CHIPs. The American Community Survey reports that 66% of households with children under the age of 18 have broadband at home. That means approximately 11.8 million children (age 0 to 19) covered by Medicaid/CHIPs live in 5.9 million homes without broadband at home. The "homework gap," meanwhile, is 16.9 million kids, or 8.4 million households.

We believe that there is, deservedly, significant support for a new program to address the homework gap. We support any effort to do so. We note, however, that funding programs to eliminate the homework gap, while paying huge benefits to society in the long term, do not result in near term savings. On the other hand, providing a broadband benefit to low-income families to enable access to telehealth services, as discussed in Section 5.4.5.7 and Chapter 9, can result in both improved health outcomes and reduce the cost of health care services, cost reductions that could be used to provide the broadband benefit.

Here, a broadband benefit utilizing the savings to the Medicaid/CHIPs health insurance system could cover about 70% of those currently suffering from the homework gap. Using such a benefit to address the homework gap would not solve the whole problem. There would still be approximately 5 million school children living in 2.5 million households who would not be covered. Still, paying to address the homework gap through savings to be found for existing government health insurance systems would quickly

increase the number of connected homes with school children and significantly reduce the annual cost of program. Further, because of the existing relationships between the Medicaid/CHIPs programs and their beneficiaries, there are existing channels that would improve the efficacy of the distribution of the broadband benefit.

In short, in designing the Lifeline+ program, the government should look at all existing programs that serve low-income persons to determine how to provide a broadband benefit in ways that will both generate savings that can be used to pay for the broadband benefit while also improving distribution of the benefit.

5.4. RECOMMENDATIONS

Based on those principles, we have the following recommendations.

5.4.1. BUILD THE ADMINISTRATION OF A NEW PROGRAM ON WHAT THE FCC DOES AND LEARNS FROM IN ITS ADMINISTRATION OF THE EBB AND THE AUGMENTED E-RATE PROGRAM.

As noted above, the FCC set rules and just started administering the \$3.2 billion EBB program and is now developing rules for an augmented E-Rate program. Both programs are designed to address the affordability gap. As of this writing, we cannot know what lessons the FCC will learn in the implementation of the programs. We believe, however, that the administrative issues will be similar to those that the FCC would face in implementing the long-term program we propose. While we will make a number of design recommendations, we think that the real-world experience of the FCC is likely to be the best guide for how to implement such programs. Therefore, all of our recommendations should be reevaluated in light of how the COVID-19 related programs are implemented and their impact on adoption.

5.4.2. CONGRESS SHOULD IMPLEMENT A PERMANENT VERSION OF THE EBB.

We think Congress was correct in providing an EBB to address problems created by COVID-19. Further, we think making that benefit permanent through an ongoing

Congressional appropriation would accomplish the fundamental goal of largely eliminating affordability as an obstacle to adoption. Of course, the FCC should study its initial implementation of the EBB to refine and improve its effectiveness and should, with congressional direction, implement a direct-to-beneficiary distribution of the funding to enhance consumer control and choice. Still, making the EBB permanent would be the single most important action to increase the number of Americans connected to broadband in the home.

5.4.3. ALTERNATIVELY, CONGRESS COULD CONSIDER A FUNCTIONAL APPROACH THAT CREATE A NEW PROGRAM TO SERVE BOTH MOBILE AND BROADBAND AT HOME NEEDS TO ASSURE ACCESS TO WORKFORCE DEVELOPMENT, HEALTHCARE, AND EDUCATION.

While we favor a permanent program based on the EBB, we also understand that there are challenges to enacting such legislation. In that light, we present an alternative that focuses on addressing those in-home needs that create clear public benefits in the form of improved outcomes in workforce development, healthcare, and education. While the program we propose would not have the simplicity—an important virtue in public policy design—of making the EBB permanent, it would have advantages in terms of distribution and cost savings, as described below.

The remainder of this chapter relates to our recommendations concerning the implementation of a new program based on a functional approach, which we call Lifeline+. We note, however, that many of the recommendations for administering the program, set forth in 5.4.5 below, would apply to both a permanent EBB program and to Lifeline+.

5.4.4. THE BASIC STRUCTURE OF LIFELINE+ SHOULD SERVE BOTH MOBILE AND IN-HOME NEEDS.

Lifeline+ would consist of a mobile benefit and a broadband at home benefit. The in-home benefit would consist of one of three broadband at home services. The components of Lifeline+ are:

1. **LifelineMobile**, which, while in need of comprehensive reform, for purposes of these recommendations would continue the current Lifeline subsidy for basic voice and mobile functions; and
2. **LifelineHome**, which itself is composed of:
 - a. **LifelineJobs**, which would support the unemployed, empowering them to utilize online programs to upgrade their skills, as well as search and apply for jobs;
 - b. **LifelineMed**, which would support low-income persons in utilizing the full suite of telehealth services; and
 - c. **LifelineEd**, which would support low-income families with K-12 school children and members of their households utilizing all forms of digital learning.

All eligible families or persons would be eligible for both the mobile and one broadband at home benefit. Use of the in-home benefit would not be restricted, so that regardless of specific service, the person or family could use broadband for any purpose.

5.4.5. ADMINISTRATIVE RECOMMENDATIONS COMMON TO EITHER A PERMANENT EBB OR A LIFELINE+ PROGRAM.

5.4.5.1. Fund both services and devices.

The program should fund both connectivity and devices capable of performing relevant functions. This could include desktop, laptop, or tablet computers, but not, due to limited display and keyboard size among other factors, most current smartphones, unless the smartphones will be used as a mobile hotspot in conjunction with other equipment capable of performing the relevant functions.

5.4.5.2. Assure minimum standards for both the device and the broadband service.

As discussed in Chapter 3, the FCC should define standards for networks and services that qualify for subsidy support. This includes a determination of requirements for a device = capable of performing what the FCC determines are relevant functions (such as

those required to do school work or access health care), and update that definition periodically to assure that changes in requirements are reflected the program.

In addition, the FCC should determine a minimum standard for upload and download speeds, latency, data allowance and other technical and non-technical factors, but only to the extent necessary to support the essential services included in the programs. The FCC should perform periodic reviews of these standards and adjust them as needed to assure that changes in requirements are reflected in the program. All such FCC determinations should be done in consultation with the other relevant federal agencies, such as those involved with workforce development, healthcare, and education.

While we advocate for standardization, we also note that the experience of educators during the COVID-19 crisis suggests that with the LifelineEd program in particular, there should a level of flexibility that builds on the long-standing E-Rate relationship between schools and providers, and the flexibility of various technologies, such as mobile hotspots, to provide broadband for educational purposes. Not only can such solutions be deployed quickly, they also provide an important “pack-and-go” Internet to a student who may need service in a temporary new location or in multiple family locations. Granting flexibility in the distribution of the benefits by the school system or municipality can produce an efficient and focused use of funding to achieve digital learning objectives.

5.4.5.3. Establish standard protocols for transferring benefits.

The benefits in Lifeline+ should be granted directly to beneficiaries through a reloadable prepaid debit card, otherwise known as an Electronic Benefit Transfer (EBT) card. Ideally it would be a branded card (for example, Visa or MasterCard) which virtually all ISPs accept for payment. The cards should be coded with a Merchant Category Code that ensures funds in the card account are only used to make payments to certified providers. The program would enroll consumers, activate their card accounts, and distribute the cards and manage the monthly benefits.

Participating consumers would then use the funds in the card account to pay for, or help pay for, the home Internet service of their choice from certified providers. The consumer would be responsible for any monthly charges not covered by the benefit, such as additional video services from the provider. Participating providers would provide the service and accept payment, but not be otherwise involved in program administration, similar to SNAP. This safeguards consumer privacy and dignity, minimizes provider administrative burdens, and encourages the widest possible participation by ISPs. Providing benefits directly to beneficiaries avoids operational challenges that arise if the government were to contract directly with providers on behalf of individual consumers. For example, the government would avoid the need to contract with multiple service providers to ensure coverage for all beneficiaries and to adjust service arrangements as beneficiaries relocate, a particular challenge in transient housing situations.

5.4.5.4. Assure lowest possible price through volume discounts.

For both devices and broadband services, the government should negotiate discounts for equipment and service providers' retail prices to achieve the highest quality products and services at the lowest possible cost to participating consumers. These discounts would be and should be implemented in ways similar to those that providers offer in connection with sales to large volume commercial purchasers. Similar "master contracts" are used today by wireless carriers and state/local governmental entities, for example. Participating consumers would then be charged for devices and monthly service that reflect negotiated retail discounts. In all events, participating consumers should remain free to use their electronic benefit to purchase any generally available retail broadband product in the market from any participating provider, and not be limited to the products and rates established pursuant to the master contract.

5.4.5.5. Assure individual choice.

As noted above, while the federal government should negotiate reduced program rates with eligible providers, program beneficiaries should have the final choice over the specific

service provider they use. Beneficiaries should also choose the specific equipment they use, within guidelines established through the program. For devices, the guidelines should establish minimal requirements for memory, storage, display resolution, connectivity, and capabilities for upgrades. Purchases of the device and the service can be facilitated through a voucher or some other form of electronic payment. The exception to individual choice would be for the LifelineEd program, where school districts may have identified specific devices they need the students to use to facilitate administrative efficiency and coordination of curriculum.

5.4.5.6. Assure security and transparency.

In setting standards for the equipment and the service, the program should maximize user security and data transparency. This has been an issue, for example, in the FCC's current Lifeline program. [According to Malwarebytes Labs](#), at least one such provider—Assurance Wireless by Virgin Mobile—offered a \$35 smartphone with pre-installed apps to collect user data, create backdoors for future access, and enable auto-installers for other apps. These activities were undertaken without customer knowledge or consent, introducing the potential for malware to be installed when an app update becomes available. The program should prohibit any company from offering free or reduced-cost equipment that come with undisclosed or non-optional applications. Additionally, the program should require that providers whose devices include pre-installed apps report how they screen apps and updates, including disclosure of what user information is being collected and how it is being used. Customers should have access to this disclosure to ensure informed consent.

5.4.5.7. Work in partnership with the ISPs and other stakeholders.

The new program should build on existing public, private, and public/private partnership programs aimed at expanding digital equity and inclusion, which generally involve working in partnership with ISPs. The forms of partnership may differ somewhat between the different services. For example, with the general approach, the FCC should work with the ISPs offering low-income programs to assure efficiency and wide distribution.

With the Lifeline+ approach, the approach will differ with the specific service. With LifelineEd, ISPs should provide data that school districts need to help identify which students lack at-home broadband, and the ISPs and school districts should work together to standardize procedures and minimize administrative costs for connection and on-going operation. The COVID-19 experience has already produced these kinds of partnerships. For example, ChiefsforChange, a coalition of leaders of school districts, has documented several examples of [school districts](#) that have been working to quickly connect students in light of closings caused by COVID-19. One particularly notable example is [the Connected Chicago initiative](#), a partnership of the City of Chicago, the Chicago Public School system, community-based organizations, and several philanthropic entities and leading Internet Service Providers. The initiative has created a [detailed toolkit](#) aimed at connecting 100,000 currently offline school children.

Another example is [the K-12 Bridge to Broadband](#) program. The program arose as a partnership between local school districts, ISPs, local governments, and various philanthropic groups in the wake of the COVID-19 crisis, to facilitate home connectivity for low-income students. The program is developing a set of best practices for providing the kind of connectivity that LifelineEd would scale nationally. It recommends, for example, that as a starting point, ISPs should confidentially identify students that lack broadband at home, and work with school districts to standardize procedures and minimize administrative costs for getting these households connected. In allocating funds, the program could use formulas similar to those used for the ESEA and E-Rate programs, both of which are designed to assist similar population groups. In addition, the program should leverage the results of FCC E-Rate pilots in 2011-2012 that allowed funding for off-premises connectivity and devices.

For the LifelineMed program, designers should note [the success of the City of Liverpool](#) in improving health outcomes and cost savings through the provision of devices and broadband services to covered persons. Liverpool conducted a “Health and Social Care Testbed,” which used 5G connectivity to support health care delivery use cases. The

study found that, cumulatively, implementation of use cases could potentially result in cost savings to the Health and Social Care services of an estimated £247,688 per hundred users per year.⁷ These Internet-enabled interventions reduced hospital admissions, physician visits, medication costs, caretaker hours, and patient loneliness; and, increased health outcomes, medication adherence, the ability to manage one’s own health, comfort with using technology, and quality of life.

5.4.5.8. Improving awareness of the program.

Awareness of the current Lifeline program is very low, evidenced by the fact that as of January 2021, only 8.7 million of an estimated 33.2 million eligible households participate in the program. Congress should require the FCC and other relevant federal agencies to coordinate in marketing and outreach efforts to help ensure that all Americans, including those suffering from recent unemployment due to the COVID-19 crisis, those newly eligible for the Supplemental Nutritional Assistance Program, and those eligible for Medicaid, are informed of their eligibility for broadband support.

5.4.6. ADMINISTRATIVE RECOMMENDATIONS SPECIFIC TO THE LIFELINE+ PROGRAM.

5.4.6.1. Lifeline+ should be administered jointly by the FCC and the federal agencies responsible for each substantive area.

The administration of LifelineJobs, LifelineMed, and LifelineEd services should be a co-responsibility of the FCC and the relevant federal agencies who currently support the respective services. LifelineJobs would be coordinated by the FCC and the Department of Labor, with the broadband subsidy provided as part of unemployment benefits. LifelineMed would be coordinated by the FCC and the Departments of Health and Human Services and Veterans Affairs, with the broadband subsidy provided as part of the benefits package to qualifying persons covered by Medicare, Medicaid, or Veterans Health Administration Insurance. LifelineEd would be coordinated by the FCC, the Department of Education, and the Bureau of Indian Education (BIE), with the funds distributed to local school systems, similar to

programs like E-Rate, ESEA, and IDEA, with the local school systems then connecting qualifying students in ways similar to how local school districts are already using federal funds to connect their students on a temporary basis. Further, to the extent that Congress augments the E-Rate program as part of pending COVID-19 relief legislation, the FCC's administration of the LifelineEd program should be based on lessons learned in the implementation of that effort.

5.4.6.2. Lifeline+ should be administratively coordinated, adhere to similar standards, and be designed to facilitate ease of consumers obtaining the service, protect consumers, and optimize the benefits.

In administering the program, the FCC and other federal agencies should consider the following recommendations:

5.4.6.2.1. Set national standards for eligibility and program operations in ways that reduce start-up and ongoing costs.

To the extent feasible, the standards for eligibility for LifelineJobs, LifelineMed, and LifelineEd should use similar criteria and administrative mechanisms to lower costs of sign-up, communicating about the programs to eligible families, and on-going operations. Doing so requires that key elements of the programs be consistent across agencies and across the country. For example, while schools, state unemployment and government health care agencies would assist in enrolling consumers in the services and distribute and activate Electronic Benefit Transfer (EBT) card accounts, the FCC should establish a single type of card and account, determine benefit levels, and certify providers for the programs.

5.4.6.2.2. Enable family use for all broadband services.

To maximize benefits, the devices and the broadband subscriptions offered as part of the broadband at home Lifeline+ services should not be restricted solely to specified essential services, so that the other benefits of broadband adoption, including but not limited to education, job training, health care, access to other government services, and civic engagement, may be available to everyone in a participating household.

5.4.6.2.3. Coordinate and prioritize to minimize wasteful expenditures or duplicative payments.

Beneficiaries of LifelineHome may meet the qualifications for more than one broadband at home service, but should only be eligible to receive one benefit. LifelineHome should be coordinated through a national verification system, to assure that there are not duplicate payments to multiple persons in the same home. This can be accomplished through a national database (the "Duplicates Database") to identify households receiving benefits, with program personnel authorized to access this database to enter participating household data and confirm no duplication of benefits. The existing National Lifeline Accountability Database (NLAD), managed by USAC, can serve as a model for the Duplicates Database and should continue to be used to ensure that households participating in Lifeline+ receive no more than one mobile and one broadband at home benefit per household.

Congress or the FCC should determine rules for prioritizing the source of funds for a broadband at home benefit where the person or family qualifies for more than one in-home benefit. As noted in Section 5.3.8, which discussed how a LifelineMed benefit would cover approximately 70% of those needing a LifelineEd benefit, it may be advantageous to prioritize funding sources for which broadband would generate near-term savings.

5.4.6.2.4. Allow bundling of mobile and broadband at home benefits.

The program should encourage providers to create service offerings that maximize the value of the services to the customer. Some providers, for example, could develop plans that serve the needs of both the LifelineMobile and one of the at home services. In that light, the program should allow the bundling of the LifelineMobile benefit and any one of the three broadband at home benefits.

5.4.6.2.5. The Lifeline+ program design should include mechanisms that makes it easy for applicants to learn about, apply for and, if qualified, obtain the benefits.

Each service should adopt mechanisms that build on related public programs such as

SNAP, Medicare, Medicaid, and unemployment insurance. The goal should be to maximize the ease with which eligible beneficiaries learn about Lifeline+ and its benefits, apply for the programs for which they qualify, and, if approved, receive the benefits.

- For *LifelineMobile*, the FCC would coordinate with USDA and HUD to ensure that recipients of SNAP and other qualifying programs are proactively notified about their eligibility for LifelineMobile.
- For *LifelineJobs*, the Department of Labor would work with state unemployment offices to proactively inform those applying for unemployment of their eligibility.
- For *LifelineMed*, the administrators of government insurance policies would proactively advise covered persons of eligibility requirements and the potential benefits if they qualify.
- For *LifelineEd*, local schools would notify the parents of students qualifying for the free school lunch programs of their eligibility.

5.4.7. THE FUNDING MECHANISM FOR EACH PROGRAM SHOULD ALIGN WITH CURRENT PRACTICES, INSTITUTIONAL INCENTIVES, AND THE NEED FOR A SUSTAINABLE FUNDING MECHANISM.

In terms of funding a general or a functional approach to closing the affordability gap, we have the following recommendations.

5.4.7.1. Congress and the FCC should not wait for contribution reform to begin to create a new program.

As discussed in several chapters, the current mechanism for funding Universal Service is not sustainable, nor is it capable of providing the new funding necessary to close the affordability gap. Several alternatives have been proposed to replace the current system for financing USF. These alternatives include assessing fees based on each telephone number in service, the purchase of Internet connected devices, ISP revenues, or a fee attached to some broader revenue stream,

such as all revenues collected by communications providers and not just those currently counted in the contribution factor, as well as the revenues of companies engaged in a broad set of Internet-related activities. We express no view here on the policy merits or tradeoffs of any of specific method. We do, however, note that contribution reform is likely to take the FCC several years, and will likely be the subject of considerable political controversy and legal challenges. As we believe the need for digital equity and inclusion is urgent, we propose alternative means for funding the new programs that are more certain legally and can be done more quickly.

5.4.7.2. The FCC should reexamine the subsidy for the mobile service.

As noted above, many critics of the current Lifeline subsidy argue that the subsidy amount is too low. That criticism is generally premised on the need for the subsidy to enable eligible persons to subscribe to broadband at home. In developing the new program, the FCC should re-examine the subsidy level for the new mobile service but do so in light of the other components of it adopts.

5.4.7.3. Congress should directly fund Lifeline+ while also providing additional funding, as necessary, and authorizing existing programs to utilize savings to offer broadband benefits.

5.4.7.3.1. Direct appropriations.

In lieu of the current contribution system or any of the proposed reforms to it, Congress should instead appropriate funds for the Lifeline+ program from the following sources:

- First, to the extent that Congress appropriates funds to subsidize rural deployment (as discussed in Chapter 3), any allocated funds not disbursed through a reverse auction or other competitive mechanism should be repurposed to a fund whose assets should be used to support the Lifeline+ program.
- Second, Congress should dedicate all or at least some of the proceeds of any future spectrum auctions to a fund whose assets

should be used to support the Lifeline+ program.

- Third, Congress should appropriate at least five years of the necessary funding to fully support the Lifeline+ program with funding sources to revert to the existing USF contribution factor, or such methodology as Congress may authorize and as the FCC may adopt, if Congress does not renew appropriations at any time after the first five years.

The legal basis of some of these mechanisms is discussed in Appendix 5A.

5.4.7.3.2. Congress should mandate that existing government health insurance programs provide LifelineMed benefits.

Congress has, on various occasions, enlarged the benefits that government health insurance programs provide. For example, in 2003, Congress voted to add Part D to the Medicare program to cover various prescription drugs. Given that in-home broadband is an increasingly vital social determinant of health (see Appendix 9D), Congress should mandate that federal government health insurance policies, including Medicare, Medicaid, and veteran's medical support, provide subsidies for the LifelineMed service to enable the covered persons to take advantage of the full range of telehealth services, while also improving the effectiveness and efficiency of the programs.

5.4.7.3.2.1 As an initial step, the Center for Medicare and Medicaid Innovation (CMMI) should run a demonstration to determine the level of savings that could be achieved if all covered persons had in-home broadband and how to best structure the programs to take advantage of universal connectivity of the covered persons. As discussed in greater detail in Chapter 9 and Appendix 9B, there is already significant evidence that telehealth services can save significant funds for a health care system. For example, in 2012, the [VA ran a program providing telehealth services](#) to over 150,000 beneficiaries which resulted in average annual savings of \$6,500 per patient, compared to \$1,600 in annual costs. These savings come through a variety of means, including by enabling targeting and monitoring specific conditions, reducing transport costs, reducing emergency care costs, and increasing the ability to keep

patients in the home instead of more expensive medical facilities.

As also discussed in Chapter 9, the federal government has already recognized, albeit on a smaller scale than we propose here, the need for federal investment in patient connectivity to improve health care outcomes in current programs. There is no doubt that the need and urgency has increased in light of trends that were accelerated due to COVID-19. However, there is not an authoritative analysis of the cost savings across a broader spectrum of the population or an analysis of how the systems could, if they assume in-home broadband in the home of every covered person, both save funds and produce better outcomes. The institution best suited to do such an analysis is CMMI, which is charged with testing various payment and service delivery models for the purpose of achieving better care for patients, better health for communities, and lower costs through improvement in the health care system. As a starting point, CMMI should evaluate how universal adoption of broadband by persons covered by Medicare and Medicaid could lead to improvement in health care quality and a reduction in health care costs through, among others, expanded and unified access to affordable care, population health management (earlier detection of infectious diseases, chronic disease management, preventative medicine, etc.), increased administrative efficiencies, decreased paperwork, higher patient satisfaction, utilization of AI and other emerging technologies, and consistent and near real-time evaluations of health care effectiveness.

To be clear, we are not suggesting that providing the broadband benefits discussed herein should be dependent on or delayed while the analysis is undertaken. As an initial matter, there will likely have to be some additional funding to cover the benefits. The analysis, however, is critical to understanding how to account for the savings over time that the benefits will bring and how to redesign certain aspects of the program to take advantage of the universal connectivity.

We note that there are anecdotal reports that the increased use of telehealth resulting from COVID-19 has increased some costs due to increased utilization. However, as discussed in Chapter 9, this telehealth utilization was not

driven by persons of color; racial and ethnic minorities experienced a decline in access to care during the pandemic. While we can understand that such increased use could have occurred, we are skeptical that over the long term, connectivity increases costs. As noted above, the VA study and other similar efforts suggest otherwise. It is more likely that easier access led to visits that enabled preventive care, leading to lower costs over time. Further, we note that the general trend of business addressing customer concerns—and health care is different in many ways but is still about addressing customer concerns—is to use connectivity and a variety of mechanisms enabled by connectivity to improve intake, diagnosis, and treatment much more quickly and efficiently than they could without connectivity. Thus, the experience with both health care and in businesses generally suggest that designing systems in light of connectivity that result in improved outcomes and reduced costs.

5.4.7.3.2.2 The Administration and Congress should create a new matchable administrative expense in Medicaid for States to provide in-home broadband to Medicaid enrollees. Medicaid, which because of its focus on low-income persons, is likely to be the program to offer the broadband at home benefit to the greatest number of persons. It is a federal program administered and partially funded by the states. Due to the federal-state partnership model, programmatic changes are generally done at the state, rather than federal, level.

It is possible, however, for the federal government to incentivize and/or empower the states to act in preferred ways in their administration of Medicaid. Traditionally, the federal government only allows Medicaid to cover medical services. The question of when or whether a state Medicaid program can cover non-medical services is not novel. In light of the fact that medical care is not the only factor driving health outcomes, there has been a recognition that for low-income people, in particular, spending money on medical services alone—without a coordinated, effective strategy for addressing a range of socio-economic issues and social determinants of health—can result in inefficient use of health care dollars. As a result, there are numerous examples of government health insurance programs funding services that, while not strictly

involving a medical diagnosis or treatment, nonetheless improve health outcomes and/or lower health care costs. Some of these are discussed in Appendix 5B, entitled “Funding Non-Medical Services Through Medicaid.”

Our understanding of the program suggests that the most effective way to connect unconnected Medicaid recipients in the current framework would be through the Health Information Technology/Health Information Exchange (HIT/HIE) program. The federal government has in the past appropriated funds to increase the effectiveness of the Medicaid program through the utilization of information technology. It was done, for example, with [HIT/HIE expenses under ARRA](#), where the federal government legislation offered a 90/10 federal match for the specified technology costs. Here, we believe the easiest way to provide a broadband subsidy to connect low-income persons and families would be through that program. That same framework could be used here, with the federal government providing the funds and the states then distributing the benefit to unconnected covered persons, which effectively would serve as a means of increasing the efficacy of their health information technology systems, and therefore meet the definition of “activities that are proper and efficient for the administration of the Medicaid Electronic Health Records (EHR) Incentive Program.”. While we would support the federal government subsidizing 100% of the necessary amount, we note that states have demonstrated their recognition of the need to connect low-income persons, with many states using CARES Act funding to connect students and also having their own Lifeline like plans. In that light, we believe a 90% federal share, which is the current match for IT, could be sufficient.

5.4.7.3.2.2 The Administration and Congress should mandate that Medicare and the Veterans Health Administration provide a broadband benefit to unconnected recipients of the program. Medicare and VA health insurance programs are federally administered so the mechanics of offering the broadband benefits are simpler. Congress and the Administration can adjust the federal policy so that the programs fund broadband at home for eligible beneficiaries.

5.4.7.4.3. Congress should mandate that existing government unemployment insurance programs provide LifelineJobs benefits.

Congress, as we have seen most recently in temporary enlargement of unemployment benefits in the wake of the COVID-19 crisis, has enhanced the benefits to which unemployed persons covered by unemployment insurance are entitled. Likewise, Congress should mandate that federal unemployment insurance policies include as a benefit for persons who previously were employed in a job paying less than a threshold to be set by Congress, a new benefit for broadband at home as described above.

5.4.8. THE ETC REQUIREMENT SHOULD BE ELIMINATED AND REPLACED WITH MORE APPROPRIATE ELIGIBILITY CRITERIA TO ENCOURAGE MORE PARTICIPANTS.

ETC requirements should be eliminated as eligibility criteria for participation in the new program. Instead, any provider that voluntarily offers broadband service sufficient to utilize the essential services described above should be deemed eligible, and indeed encouraged, to participate. In Chapter 3, we proposed alternative and more appropriate requirements for participating ISPs to be eligible for receiving funds for network deployment, which would replace the ETC requirements. The same criteria should be adopted for a permanent EBB program or Lifeline+. To ensure that beneficiaries purchase services only from qualified providers, the FCC should administer a simple annual recertification process. Once the certification process is established, beneficiaries should be able to use their benefit to purchase service from any qualified provider. Like other consumers, beneficiaries should be free to choose among qualified providers, similar to choosing medical services under preferred provider health insurance plans.

5.4.9. TO ACCELERATE THE AVAILABILITY OF, AND LOWER COST FOR, DEVICES, THE FEDERAL GOVERNMENT SHOULD CONSIDER RUNNING A PROCUREMENT PROCESS.

In this chapter, we have proposed significant new expenditures on broadband services and on devices. We have no doubt about the capacity of existing broadband service providers to immediately meet the demands of potentially millions of new customers. Obtaining millions of new devices quickly, however, is another issue.

An increase in competition to obtain devices could expand rather than close the adoption and affordability gaps. Indeed, as a recent [New York Times story](#) reported “A surge in worldwide demand by educators for low-cost laptops has created shipment delays and pitted desperate schools against one another. Districts with deep pockets often win out.” That surge of worldwide demand by educators for low-cost laptops and similar devices of up to 41 percent higher than pre-pandemic numbers has created months-long shipment delays. The story further reported that those delays have “frustrated students around the country, especially in rural areas and communities of color, which also often lack high-speed internet access and are most likely to be on the losing end of the [digital divide](#)... That gap, with much of the country still learning remotely, could now be crippling.”

There are many factors driving the shortage of entry-level devices. The margins on low-end PC sales are close to zero, and with total PC sales flat or declining for a decade, manufacturing capacity is focused on higher-end machines. Another factor is a shortage of low-end chips. A third factor is the logistics and costs of shipping from China.

Given the current situation, and what we believe is the need for significantly greater supply of low-cost devices, the federal government should consider a national procurement RFP for what could be millions of appropriate devices, with pre-determined specifications, that could be manufactured in large part in the U.S. These would then be offered at wholesale price to institutions, such as school districts, charged with administering the broadband benefits. This could not only help with accelerating the availability of the devices for a permanent EBB or Lifeline+ program, but could also lower the overall cost of the program and promote job creation and advanced manufacturing in America.

5.4.10. SUPPORT RESEARCH INTO HOW ADDRESSING CREDIT ISSUES MIGHT CLOSE THE AFFORDABILITY GAP FOR BROADBAND AT HOME.

While most of the recommendations in this chapter relate to erasing affordability as a factor in broadband adoption for essential services, some non-qualifying households may still experience affordability issues in subscribing to and maintaining home broadband service. As part of an agenda to increase adoption, the government should work with providers of pre-paid services to examine the extent to which credit issues are keeping a significant number of persons from adopting broadband, and if so whether there are technologies, such as a router synched to a payment system, a financial mechanism perhaps assisted by philanthropic efforts, marketing efforts that make the availability of existing options more widely known, or other approaches that could provide a replicable model that does for broadband at home what prepaid wireless did to expand the adoption of mobile services, particularly for persons not eligible for the broadband at home programs described in this chapter. NTIA should fund a research program, and perhaps a demonstration project, to determine the dimensions of the problem and develop potential solutions for increasing the utilization of the prepaid model for currently unconnected persons.

Chapter 6.



CLOSING THE ACCESS TO ECONOMIC OPPORTUNITY AND PARTICIPATION GAP

6.1. PROBLEM STATEMENT

Several decades ago, famed venture capitalist John Doerr said the personal computer industry’s growth from zero to \$100 billion in 10 years was “the greatest legal accumulation of wealth in history.” As the Internet soon dwarfed the PC revolution, growing from zero to \$400 billion in just five years, Doerr was forced to update that claim. In Doerr’s words, “There are waves and then there is a tsunami.” Today, the top five American companies by market cap (Microsoft, Apple, Amazon, Alphabet, and Facebook) all rode the tsunami Doerr described.

Early tech optimists touted this tsunami as having the potential to be the great equalizer of society. Instead, it has exacerbated the historic divisions between the haves and have nots, leaving minority communities with fewer avenues to participate and develop economic opportunities in the Internet economy. The National Urban League’s 2018 State of Black America Report found that of almost forty thousand employees working for just four major Silicon Valley technology companies, fewer than one thousand were Black

American. Latinx employees are similarly underrepresented. Moreover, as the technology sector has increased in size and profitability, Black and Latinx entrepreneurs have continued to be left behind.

If anything, the pandemic has worsened these trends. While other industries reeled from lockdowns and abrupt changes in patterns of consumption, COVID-19 catalyzed enormous growth for many technology firms.⁸ Revenues soared as consumers and businesses turned

to digital solutions to access the basics of life—work (e.g., Zoom, Teams, and other video conferencing services), social interaction (e.g., Facebook and Twitter), entertainment (e.g., Netflix, HBO Max, Amazon Prime Video), food (e.g., GrubHub and UberEats), goods (e.g., Amazon and Instacart), and healthcare (e.g., Teledoc).

Many of these enterprises saw the ranks of their workforce swell, even as unemployment climbed in other sectors.⁹ In particular, employment among women and communities of color plummeted in 2020. Black and Latinx unemployment at the end of 2020 were 9.9% and 9.3%, respectively, while white employment had recovered from 14.2% unemployment in April 2020 to only 6.0% by December.¹⁰ Wealth among communities of color has likewise diminished. Sixty percent of Black households, 72% of Latinx households, and 55% of Native American households reported having serious financial problems during the pandemic, compared to just 36% of white households.¹¹

As the U.S. wrestles with another economic recession, we must be proactive to ensure that Black and Latinx communities—who face declining median wealth and who have still not recovered their pre-2008 recession incomes—do not continue to bear a disproportionate burden of financial hardship in the coming years.¹²

Stagnant wage growth for Black and Latinx workers over the past decade is a major reason for the slow recovery, due, in part, to their underrepresentation in high-paying jobs in the technology and information services sectors. And minority exclusion from the technology sectors is hardly a new problem. In 2002, Blacks accounted for nearly eleven percent of the workforce, but only eight percent of computer and mathematical jobs. Those numbers remained almost the same in 2016. While the percent of Latinx workforce has grown from 12.6% of the overall workforce in 2002 to 16.7% in 2016, the percent in the computer and mathematical professions only increased from 5.5% to 6.8%.¹³

Lewis Latimer, the person for whom this Plan is named, illustrates the longstanding problem of Black and Latinx participation in the tech sector. A free Black patent-holder and the son of slaves, his inventions and contributions were critical to the success of

his employers, Thomas Edison, and Alexander Graham Bell. Yet, unfortunately and all-too-predictably, he had no opportunity to take ownership or accumulate generational wealth from the vast businesses those inventions spawned.

6.2 VISION STATEMENT

We need to break these historic patterns. But the sad realities of today's economic opportunity and participation gaps should not discourage us from recognizing technology's essential role in building a more inclusive future. Much of this Latimer Plan is devoted to making sure that broadband is available, affordable, and deeply relevant to the lives of all Americans, regardless of where they live, the color of their skin, or how much money they have. It is motivated by the idea that broadband is a necessity, not a convenience, for living in a post-pandemic world.

Technology cannot be the great equalizer, however, if opportunities for wealth accumulation are not equitably distributed throughout society. While many of the proposals throughout the Plan are focused on assuring that all Americans have the tools and skills to participate fully in 21st century society and the digital economy, we also want to close gaps that limit opportunities to participate meaningfully and create value in the industry as broadband and broadband-enabled enterprises continue to innovate, grow, and prosper.

We must ensure that job opportunities are available for the country's growing Black and Latinx communities at every level in technology and technology-related industries. Entrepreneurs of color deserve a place in the governance of these companies. They should have equal access as vendors and collaborators in the building and utilization of new digital infrastructures and the prolific wealth creating ecosystem that controls it.

Protests for racial justice across the country have placed the onus not only on legislators and government regulators, but also on business leaders and private enterprises, to address with deliberateness and vigor these historic inequities. Communities of color are not simply hapless consumers of products marketed by brand-name companies. These

communities have become emboldened and now fearlessly demand corporate acknowledgement and respect. Americans at large are beginning to understand that we cannot continue a “business as usual” approach to eliminating racism embedded in our social, political, and economic systems in both the public and private sectors.

With public and private intention, the gaps of economic opportunity and participation can be closed, and our nation will be stronger, more equitable and more prosperous because of it. We must together attack these problems in an intentional way, rather than passively awaiting the tide to lift high all boats. Now is a time for action. We wholeheartedly agree with the principles set forth by the Business Roundtable in 2019, outlining a new standard of corporate responsibility that benefits all stakeholders—consumers, employees, suppliers, communities, and shareholders. Much of the private sector has accepted accountability in ingraining diversity, equity, and inclusion into their corporate DNA, including creating racially and gender diverse corporate boards, staffing, C-suites, procurement, philanthropy, and community investment.

For many years, civil rights organizations have put pressure on private enterprise to improve diversity, equity, and inclusion practices. Yet, as Marc Morial, President and CEO of the National Urban League, observed, “these gains lacked systems and structures to ensure certain things like continued growth and personal accountability for corporations. Thus, what we saw when we looked long and hard at the corporations with which we had worked were diversity programs that were more often than not catch-as-catch-can systems, that is, no systems at all. Many treated it as a compliance issue only.”¹⁴

There has been particular progress in the companies that build and operate the digital infrastructure. To create more sustainable improvements in economic opportunity and participation, civil rights organizations, led by the National Urban League, have pioneered the adoption of written memoranda of understanding with several communication companies, setting forth comprehensive strategic plans with goals, timetables, and metrics to measure progress toward diversity. Areas covered by such MOUs include governance, which includes the company’s

board; personnel, which includes the company’s C-suite; procurement, which includes the company’s spending on goods and services, and in philanthropy and community investment.

These voluntary commitments to civil rights organizations and the constituents they represent have been widely heralded. It is, however, cumbersome to approach hundreds of companies one at a time. We are interested in activating government resources and leadership to organize and accelerate this process, providing incentives, improving and tracking private sector engagement and collaboration on diversity, equity, and inclusion initiatives.

Communities of color have been waiting nearly sixty years since the passage of the Civil Rights Act of 1964 for corporations to implement and abide by anti-discriminatory policies. But only when companies move beyond anti-discrimination principles to embrace anti-racist principles can we hope to achieve sustainable and meaningful equity.

6.3 GOALS

- By the end of 2021, the Department of Commerce, the FCC, the Small Business Administration, and the Department of Labor should invite a broad coalition of civil rights organizations and industry stakeholders to form a task force to develop best practices, guidelines, and standards for Internet and communication service providers, device and equipment manufacturers, software companies, and related service providers, to promote more diverse and inclusive corporate leadership, workforce, and supplier practices;
- By the end of 2022, the Department of Commerce, the FCC, the Small Business Administration, and the Department of Labor should, in cooperation with civil rights organizations and industry stakeholders, publish and promote these best practices, guidelines, and standards;
- By the end of 2022, the Department of Commerce should publish a report identifying policies to incentivize private entities to adopt initiatives promoting more diverse and inclusive corporate

leadership, workforce, and supplier practices; and

- By the end of 2025, the Department of Labor should publish a report tracking trends in the demographics of individuals employed in jobs associated with the digital economy, and in the governance of the companies that build, operate, and utilize digital infrastructure.

6.4 THE CURRENT SITUATION

Working with outside multicultural civil rights organizations like the NAACP, the National Action Network, UnidosUS, LULAC, AAJC, and OCA, the National Urban League has organized active external advisory boards and committees to advise companies in their efforts to adopt sustainable accountability measures to ingrain diversity, equity, and inclusion into their corporate DNA. These measures include commitments to racial equity in corporate board membership, staffing, the C-suite, procurement, philanthropy, and community investment.

To date, these measures have yielded promising results in the quality of the products these companies produce and in the building of trust with the communities they serve. Since entering its MOU in 2016, Charter Communications has deepened its efforts to advance diversity and inclusion (D&I), focused on programming, procurement, corporate governance, workforce representation and philanthropic and community investments. The company subsequently adopted a holistic D&I strategy in 2018, anchored on providing high-quality products and services to its diverse customer base. This includes serving 21 of the top 25 Black American television markets and 20 of the top 25 Hispanic television markets in the United States. Charter has also expanded programming offerings, including enhanced and expanded carriage of Black American owned and Latinx-targeted networks. The company exceeded \$1 billion in diverse spend in 2018, 2019 and 2020, diversified its board, and took steps to both increase diversity in its talent pipeline and foster an inclusive environment where all employees, regardless of their background or experience, have equitable access to opportunities. Today, 48% of Charter's workforce are people of color.

Since Comcast entered into its MOU, supplier spending with minority-owned enterprises increased from less than \$1 billion to almost \$3 billion. The MOU also included a commitment for the company to offer programming owned by people of color, selected through a competitive process. Today, consumers see more diverse anchorpeople, programming, and channels at NBC, bringing much needed visual representation to mainstream media. In addition to bringing diversity into its supply chain and programming practices, Comcast committed to increasing the level of diversity on its corporate board, in its hiring practices, and in its lauded philanthropic efforts. The MOU approach, which moves beyond the ad hoc verbal agreements of yesteryear, has yielded measurable progress.

Similarly, other telecommunications providers and many of the nation's largest companies have seized this moment to reimagine corporate responsibility, working to address historic inequities that exist in their own businesses and industries. For example, AT&T recently announced that it has spent over \$3.1 billion with Black-owned suppliers over the last two years.

In June of 2020, for example, PayPal pledged \$530 million in short-term, medium-term, and long-term investments to support Black and minority-owned businesses and communities in the U.S., especially those hit hardest by the pandemic.

That month, PepsiCo unveiled a \$450 million, three-pronged plan to address systemic racial inequality at the community, business, and individual level through greater workforce diversity, investment and procurement from minority-owned businesses, and philanthropic contributions to racial justice social and community programs and organizations.

This past September, Citi and the Citi Foundation committed over \$1 billion towards strategic initiatives targeted to help close the racial wealth gap and increase economic mobility in the United States, including greater access to banking and credit in communities of color, increasing investment in Black-owned businesses, expanding homeownership among Black Americans, and advancing anti-racist practices in the financial services industry.

6.5 RECOMMENDATIONS

These efforts, though encouraging, are only the beginning. To close the economic opportunity and inclusion gap, it is imperative that industry, government, and community organizations work together to improve and increase commitments to racial equity in corporate board membership, staffing, the C-suite, procurement, philanthropy, and community investment within the entire digital ecosystem.

The Plan's recommendations include:

- **Infrastructure.** Congress must include mandates in any infrastructure legislation for companies that will directly benefit from increased federal investment to enhance their performance in providing access to economic opportunity and participation throughout the digital ecosystem.
- **Measure Diversity.** The Department of Commerce, the FCC, and the Small Business Administration should collect information that allows the government and the public to understand and evaluate how the private sector, and particularly the technology and related sectors, are improving diversity, equity, and inclusion in the categories noted above.
- **Incentivize Diversity.** The Department of Commerce, the FCC, and the Small Business Administration should evaluate and report to Congress annually on measures to incentivize the participation of private enterprises in improving diversity, equity, and inclusion throughout the digital ecosystem.
- **Highlight Sustainable Success.** The Department of Commerce, the FCC, and the Small Business Administration should publish an annual report on best practices for enhancing the performance of private enterprise in improving diversity, equity and inclusion throughout the digital ecosystem.

Chapter 7.



CLOSING THE UTILIZATION GAP

In the more than two decades since then NTIA Administrator Larry Irving coined the phrase “digital divide,” nearly all the public discussion of both meaning and the consequence of the idea has involved either the availability gap, the adoption gap, or the affordability gap. Often, the terms are used interchangeably, or combined unhelpfully and referred to simply as a lack of “access.”

To be sure, all three of these gaps are foundational. Unless there are networks everywhere and everyone is on them and can afford to use them, failings of digital equity and inclusion will persist, creating more inequality and exclusion. As noted in Chapter One, a recent Executive Order calls for every federal agency to assure that all persons, but particularly those in historically marginalized communities, have equal access to the benefits and services those agencies provide. Given the trends in how services are now delivered, it will be difficult to achieve such a goal without closing the gaps discussed in the Plan.

But there is another, less obvious gap that is increasingly relevant to how we use the tools of the information age to create a more equitable and inclusive economy and society. That is the utilization gap.

That utilization gap describes the difference between how our communications networks are being used today and how they could already be used to improve outcomes across

industries and in the public sector, particularly for applications identified by the National Broadband Plan as strategic. In particular, as many commentators have noted, [government services](#) have not digitized fast enough. Nor have government service providers taken full advantage of the availability of broadband to improve customer service, capacity, resiliency, adaptability, transparency, or security.

The COVID-19 crisis has not only brought the availability, adoption, and affordability gaps to the forefront, it has also demonstrated that, despite the capacity and capability of our networks, we are suffering from a [utilization diffusion lag, similar to that which accompanied electrification in the 1900s](#). Learnings from this unprecedented experience, however, could illuminate a better path forward. As author Nassim Taleb wrote in his book *Antifragile*, “The excess energy released from overreaction to setbacks is what innovates.” This crisis is likely to unleash that kind of innovation, particularly with telehealth, telecommuting, online education, and public services.

But we need to make sure that, in the process, this next wave of innovation also drives a more equitable and inclusive economy and society.

Yes, we need all unemployed persons on-line to be able to train, search and apply for jobs. But, as discussed in Chapter Eight on workforce development, we also need to be smarter about how we develop online training, particularly in tying such training to apprenticeship programs and orienting such programs to attract persons from communities of color.

Yes, we need all persons on-line to be able to take advantage of the improved outcomes and lower costs of telehealth, but we also need, as discussed in Chapter Nine on health care, to take steps so that telehealth will reduce disparities in access to care, quality of care and patient experience, including by enhancing digital health literacy among low-income persons and persons of color, and disseminating evidence-based research on improving care equity for communities of color.

Yes, we need all students on-line to be able to engage in virtual classes and educational work outside the classroom, but we also need, as discussed in Chapters Ten and Eleven on K-12 and Higher Education, equitable access to the tools and content of digital learning, to assist students wherever they are developmentally and personally, accelerating and supporting them to learn in ways that represent their diverse needs, and at a depth of mastery that is required to succeed in the modern economic and social context. We also need to provide teachers with the support they need to enable students to maximize the use of digital content, and allow them to foster a future where the vast expanse of opportunities available are truly open to all students. We face a huge challenge in helping students overcome the damage to their education done by COVID-19, but, [as McKinsey reports](#), there are ways, many dependent on better utilization of technology, to reduce that learning loss.

Even with everyone on-line, we need our government institutions to improve their online services, and offer solutions on par with the best private sector actors, where competition drives continuous innovation. But, as discussed in Chapter 12 on government services, we also need service providers to make it easier for all persons, but particularly those from low-income households and communities of color, to understand and benefit from the full range of available information and benefits, and to interact with those services, such as in making or receiving payments, and in enabling non-government organizations to assist Americans in receiving the help they need using government data.

Even with everyone on-line, the Internet ecosystem will not reach its full potential unless it becomes a healthy, self-sustaining environment, with effective mechanisms for quickly identifying and countering dangerous misinformation and toxic behavior. As discussed in Chapter 13, we can do so by reducing the amount, and negative impact, of dangerous misinformation and hate speech on the Internet, increasing the amount of content that addresses the concerns and needs of low-income communities and communities of color, promoting authoritative information relevant to these communities, and improving the tools available for low-income persons and persons of color to engage in civic discussions, giving them a stronger voice both offline and online.

In short, even as we close the availability, adoption, and affordability gaps, we need to address the utilization gap as well. The remaining chapters propose ways to do so.

Chapter 8.



WORKFORCE DEVELOPMENT

8.1. PROBLEM STATEMENT

Closing the gaps in broadband availability and adoption will provide an essential foundation for equity and inclusion. But to fully use the Internet ecosystem to improve economic and social prospects for persons from communities of color and low-income communities, we must go beyond those steps. Not enough is currently being done to ensure that the tools of the Information Age facilitate greater opportunities for our nation's labor force. These tools have enormous potential to bridge workforce gaps by:

- Connecting the unemployed with companies and industries that have unfilled positions;
- Enabling workers in every job type and industry to upgrade their skills and to search and apply for jobs; and
- Ensuring that new and small businesses can use available tools from both public and private sources to improve their prospects, spurring further opportunities and growth in and for low-income communities and communities of color.

Today, U.S. industry and policymakers do not adequately use data to identify in-demand jobs, particularly jobs aligned with the skills needed to fill them; provide easy access to online programs to help people develop the skills these positions require; or provide low- or no-cost cost certifications or other job-seeking tools to help those who develop new skills pursue new jobs. Policymakers also do not adequately fund research or other means to help persons holding jobs with a high risk of being eliminated, such as jobs with repetitive manual tasks, to develop the skills needed to qualify for the jobs of the future,

particularly given the drop-off in employer-based training investments over the past two decades.

Broadband can be the major driver for solutions to these problems. Through federal, state, private, and public sector action, we can create and improve programs that facilitate online access to general workforce development, training, skills building, Registered Apprenticeships, and specific workforce development in critical and growing fields of such as health care, technology, and transportation.

8.2. VISION

We envision a fully connected nation where, through federal, state, public, private, and hybrid initiatives, everyone has access to the tools and resources necessary to upskill, reskill, and earn certifications to fill workforce gaps. These programs will provide new, small, and industry-leading businesses with access to a larger talent pool of trained, capable, skilled workers, enabling businesses to fill positions more quickly and cost-effectively. Taken together, these actions will lead to new and increased investment in at-risk communities, as businesses and their employees flourish.

8.3. GOALS

We must first better understand where the greatest workforce gaps and disparities exist, and then use this information to develop models, best practices, and toolkits, improve existing programs, and create new programs. As noted in Chapter 3, efforts are underway to close the broadband availability gap. With new Congressional funding, the FCC is in the process of addressing the inaccurate and incomplete broadband mapping which has resulted in uncertainty about which areas need buildout and what the costs associated with fully connecting everyone will be.

Similarly, accurate data is necessary to address and fix workforce gaps. Here, we propose a two-pronged approach, where targeted research and data are first gathered, and then used to create effective programs, initiatives, and federal legislation that will provide funding to help address workforce utilization gaps in the most efficient manner.

The specific goals in achieving this vision are:

8.3.1. DATA COLLECTION AND RESEARCH GOALS.

- Increase funding support, through federal agencies and Congressional legislation, for new research, data collection, and data aggregation on workforce trends, and impacts and successes in various sectors. Data should particularly focus on race, economic status, and rural versus urban areas, with the goal of aiding in the creation, capacity-building, and scaling of

new state-based workforce development and digital skills training programs during 2021.

- Conduct ongoing outcomes-focused data collection, data aggregation, and research on workforce trends, federal, private, and nonprofit workforce development programs, public-private partnerships, and programmatic impacts and successes, with a particular focus on reporting training outcomes by race, analyses of best practices, and the development of best practices toolkits for replicating successful programs, with a new report released by the end of 2021.
- Use impact studies to implement widespread programmatic and rule changes that increase the effectiveness and impact of existing federal agency programs, such as DOL, SBA, and EDA workforce initiatives, by the end of 2022.

8.3.2. PROGRAM DEVELOPMENT AND IMPACT GOALS.

- Adopt the Lifeline+ program proposed in Chapter 5, which includes LifelineJobs, a service that would support the unemployed through a broadband subsidy provided as part of unemployment benefits, empowering the unemployed to use online programs to upgrade their skills, as well as search and apply for jobs.
- Use aggregated data to develop best practices and toolkits to aid federal, state, municipal, public, and private entities in the creation, development, scaling, and expansion of new and existing workforce development programs by 2021.
- Deploy at least three new national and ten new state workforce development and digital skills training pilot programs by 2022, with planned expansion to other states by 2025.
- Increase enrollment and diversity in state and nationwide upskilling, workforce readiness, workforce development, digital skills, and other training programs by 2023, redesigning programs and prioritizing programmatic changes around

new, diversity-focused data, setting goals and benchmarks, and implementing diversity and inclusion training.

- Identify, develop, test, and deploy applications of digital technologies that could foster economic and social mobility.
- Develop optional online components to in-person Related Technical Instruction required for Registered Apprenticeship certification, and all other Registered Apprenticeship-related trainings that do not require a hands-on component.¹⁵
- Develop online components for local career centers and other workforce-related community services, including American Job Centers under the U.S. Department of Labor, to supplement their in-person training programs and other offerings, which are largely unavailable at present due to the COVID-19 pandemic.

8.4. THE CURRENT SITUATION: UNDERSTANDING THE WORKFORCE GAP

The United States is currently experiencing high unemployment, but it is, ironically, also experiencing significant and growing unmet demand for labor. By Deloitte Insights' estimate, as many as half of all open jobs could go unfilled in certain industries in 2028.¹⁶ For now, millions remain out of work as a result of the COVID-19 pandemic, including workers from sectors that could take five or more years to recover, if they fully recover at all.¹⁷ This phenomenon is known as the “workforce gap,” where some industries, sectors, and occupations face a dearth of qualified workers to fill vacancies, but where the existing unemployed labor force lacks the skills needed to fill them.

To fill the skills and workforce gaps, it is necessary for us to grow, scale, and modernize our national and state workforce training programs—yet we are severely underutilizing broadband, arguably the most powerful tool at our disposal, as a solution to train our labor force. Traditional approaches to filling the skills and workforce gaps do not scale well, and they are unlikely to fully bridge the gap between potential employers and

potential employees. Meanwhile, increases in the availability and utilization of online tools to upskill, search, and apply for jobs underscore the importance of broadband connectivity as an essential means of closing the workforce gap quickly and efficiently.

America already is shifting to online environments for higher education. Training institutes, community colleges, and universities now offer a wide range of online certifications and degrees, enabling students to learn from anywhere. The Best Colleges 2020 Online Education Trends Report finds that 77% of online students enroll in these programs to help them reach career and employment goals, while 71% of institutions decide to offer a new online program primarily based on perceived demand from employers, and 94% of students of online learning programs say their programs have a positive return on investment. Demand for online programs continues to be high, with 99% of administrators saying they saw an increase last year or that demand has stayed the same in the past few years.¹⁸

Job searches, too, are increasingly performed online. National and global job search and recruiting sites host millions of job postings and visitors every month, with about 60% of job seekers using online job boards to search for new employment opportunities.¹⁹ For example, online job search platform Glassdoor has over 9 million jobs listed and 50 million unique visitors each month.²⁰ Job search platform Indeed reports over 250 million monthly visitors and about 10 jobs added per second globally.²¹ LinkedIn, the social network for professionals, is currently the 57th highest ranked website in the world in terms of global engagement, with over 722 million members as of Q3 2020.²² LinkedIn, too, has seen steady increases in quarterly usage, with increases ranging from 22% to 31% from Q1 2020 to Q1 2021.²³ Job seekers also apply for jobs through these tools, with online listing services boards accounting for almost half of job applications in 2018.²⁴

These trends coincide with a widespread shift of company recruitment and application processes to Internet-based platforms and services. The next logical step is to modernize our nation's workforce development programs, including Registered Apprenticeship Programs and American Job Centers, by shifting them online. Currently,

federal, state, and local training programs still require an upgrade of their online components, and brick-and-mortar career centers are largely closed for the duration of the COVID-19 pandemic.

The national shift to more online opportunities for job searches, applications, and training programs will expand more opportunities to more people, but it also is likely to isolate and exclude the digitally disconnected from opportunities for advancement and economic empowerment. Achieving digital equity and inclusion is increasingly vital for connecting unemployed and underemployed populations to workforce development and job search opportunities, particularly communities of color, low-income, and rural communities—all of which are facing long-term unemployment in jobs and industries that are shrinking due to the combination of natural market shifts and the COVID-19 pandemic. A top priority, therefore, is to ensure the unemployed have access to the Internet, and that upskilling, certification, and training programs are easily available online.

8.4.1. SECTORS HARDEST HIT BY COVID-19 PANDEMIC.

Prior to the COVID-19 pandemic, the United States already faced a workforce gap. In some traditional industries such as construction and manufacturing, Baby Boomers are retiring without enough skilled workers to replace them.²⁵ In new and evolving industries, such as the information and communications technology (ICT) sector, new jobs are being created that require specialized skills and training. The global economic impact of COVID-19 has exacerbated these issues, forcing businesses to cut back or shutter altogether, while also fostering new development in other areas such as broadband deployment and increased demand for online services from technology companies.

According to a McKinsey & Company analysis, “If the economic recovery from COVID-19 is muted ... some industries will take years to get back to their pre-pandemic normal.” Industries including arts, entertainment, and recreation, hospitality, and food services, educational services, transportation and warehousing, travel and tourism, and manufacturing, could take five years or more to get back to 2019-level

contributions to GDP.²⁶ Other hard-hit sectors could take two to three years to recover, including administrative and other support services and construction.

As a result, millions of people are out of work in occupations that are not expected to recover any time soon, yet lack the skills needed to qualify for occupations in sectors that are growing or need to replace their retiring workforce.

8.4.2. STATE AND NATIONAL INITIATIVES IN FACILITATING JOB REENTRY, UPSKILLING, AND WORKFORCE DEVELOPMENT.

Federal, state, and local authorities have long worked to bridge workforce gaps through programs that connect the unemployed with the skills they need to fill available jobs. Federal and state action has shifted in 2020 to address increasing unemployment resulting from the COVID-19 pandemic, of course, but many of the Congressional and administrative efforts are temporary, with most measures already having expired or due to expire by the end of the year. States are slowly rolling out a patchwork of solutions for their populations. In-person workforce development programs also are largely out of reach as social distancing measures are in effect for the foreseeable future. Facilities remain closed, and many programs are unavailable online, rendering most services inaccessible for the unemployed people who need them most urgently.

None of the Congressional directives or federal programs, such as the Workforce Innovation Opportunity Act, Work Opportunity Tax Credit, Registered Apprenticeship Programs, Career One-Stops, or other programs outlined below,²⁷ has any requirements to include online training components.²⁸ In fact, many government training programs lack sufficient virtual support, have antiquated websites and online tools, and consist of resources and training centers that are largely unavailable online.²⁹ With the majority of in-person programs and services temporarily suspended or closed, this poses a tremendous barrier to addressing emergency needs, let alone the longer-term goal of upskilling America’s workforce.

8.4.2.1. Pre-COVID-19 Efforts.

Registered Apprenticeship Programs. The U.S. Department of Labor is working to meet the shifting demand for labor through Registered Apprenticeship Programs (RAPs), a formalized, government-credentialed approach that prepares workers for jobs using an employer-driven, “earn-while-you-learn” model. This model was formalized in 1937, when U.S. leaders recognized the benefits of apprenticeships for individuals and industry, and passed the National Apprenticeship Act.

Today, there are more than 23,000 RAPs across the nation,³⁰ covering over 1,000 occupations across industries that include information technology, health care, cybersecurity, energy, advanced manufacturing, construction, engineering, hospitality, transportation, and financial services.³¹ The U.S. DOL has trained more than 812,000 new apprentices since 2017, with an average starting salary of \$70,000 and a lifetime earning potential of over \$300,000 more than their peers. RAPs include structured on-the-job training and classroom-based Related Technical Instruction. The COVID-19 pandemic, however, has caused significant disruption to education and training systems nationwide. The Department of Labor’s Employment and Training Administration has recognized COVID-19’s potential impact on RAPs, which require an individual to be employed while in the program.³²

Workforce Innovation and Opportunity Act. In 2014, Congress passed the Workforce Innovation and Opportunity Act (WIOA), which replaced the 1998 Workforce Investment Act (WIA), as the primary federal legislation that supports workforce development.³³ WIOA covers several areas, including workforce development activities, adult education and literacy, and amendments to the Wagner-Peyser Act of 1933 and Rehabilitation Act of 1973, which provide employment support for jobs seekers. The WIOA authorizes job training and related services to unemployed or underemployed individuals and establishes a governance and performance accountability system for WIOA. Additionally, the WIOA system provides central points of service through its system of about 3,000 One-Stop Centers nationwide. Services include state and local WIOA employment and training activities, as well as partner programs.³⁴

American Job Centers and Career One-Stops. The Workforce Investment Act, adopted in 1998 and superseded in 2014 by WIOA, established the American Job Centers (AJCs) system to provide job seekers and employers streamlined access to an array of education, training, and employment services.³⁵ WIOA emphasizes the importance of integrated intake, case management, reporting systems, and fiscal and management accountability systems. Services are delivered via a national network of One-Stop centers (sometimes branded as CareerOneStops). Each local area must have at least one comprehensive One-Stop center that provides access to the services of all associated partners.

In 2016, the U.S. Department of Labor Employment and Training Administration (ETA), in coordination with the Department of Education, established the American Job Center network under WIOA. WIOA Section 121(e)(4) requires each one-stop delivery system to include in the identification of products, programs, activities, services, facilities, and related property and materials, a common one-stop delivery system identifier, in addition to using any state- or locally developed identifier.

Today, there are over 2,548 AJCs nationwide, but the majority are listed as “closed to the public; available by phone and email,” “operating at limited capacity to ensure social distancing due to COVID-19,” or “closed until further notice due to COVID-19 health concerns.”³⁶ While the AJCs are largely closed, the CareerOneStop does offer a set of mobile apps for job seekers, including Find an American Job Center, Find a Job, Veterans Job Search, Salary Finder, Training Finder, and Unemployment Insurance.³⁷ The app is useful for research on jobs, industry, and wage trends, as well as providing information such as where to find local training programs for specific jobs. The app, however, remains difficult to navigate, and offers no information specifically targeting virtual training programs.

National Association of State Workforce Agencies (NASWA). The National Association of State Workforce Agencies (NASWA) is the national organization representing all 50 state workforce agencies, as well as those in D.C. and U.S. territories. These agencies deliver training, employment, career, and business

services, in addition to administering unemployment insurance, veteran reemployment, and labor market information programs. NASWA provides policy expertise, shares promising state practices, and promotes state innovation and leadership in workforce development.³⁸

In March 2020, NASWA released the first annual State of the Workforce Report, a first-of-its-kind compilation of data from the nation's state workforce agencies into one comprehensive report, showcasing key innovations from across the country that are enhancing the nation's workforce.³⁹ The report also presents a workforce profile for each state, the District of Columbia, and Puerto Rico, highlighting labor force data such as unemployment rates and wage growth, educational attainment data, key workforce industries, programs and services within each state's Department of Labor, total individuals served, unemployment data, number of local American Job Centers, and state workforce innovations such as apprenticeship programs and prisoner reentry initiatives.

Work Opportunity Tax Credit. The Work Opportunity Tax Credit (WOTC) is a federal tax credit jointly administered by the U.S. DOL and U.S. Department of Treasury through the Internal Revenue Service (IRS). WOTC is available to employers for hiring individuals from certain targeted groups who have consistently faced significant barriers to employment. WOTC-targeted groups include: (1) qualified Temporary Assistance for Needy Families (TANF) recipients;⁴⁰ (2) qualified veterans; (3) qualified ex-felons; (4) designated community residents; (5) vocational rehabilitation referrals; (6) SNAP benefits (food stamps) recipients; (7) Supplemental Security Income (SSI) recipients; (8) long-term family assistance recipients; and (9) qualified long-term unemployment recipients.⁴¹ Employers receive a tax credit for \$2,400 to \$9,600 per year, per employee. The WOTC was authorized until December 31, 2020, and is generally renewed annually, although some lapses have occurred before the credit was retroactively reauthorized.⁴²

Opportunity Zones. In December 2017, the Tax Cuts and Jobs Act created the Opportunity Zone program, designed to provide tax incentives to companies for investing in economically distressed

communities that have been designated as Qualified Opportunity Zones (QOZ).⁴³ QOZs are designed to spur economic development by providing tax incentives for investors who supply new capital to businesses operating in one or more QOZs. While the program is still maturing, it has faced some criticism, and progress stalled as a result of the COVID-19 pandemic. An Urban Institute report found that "although OZs were designed to spur job creation, the vast majority of capital appears to be flowing into real estate, not into operating businesses, because of various program design constraints and the undesirability of selling equity from both the business owners' and the investors' perspective."⁴⁴ The Brookings Institution has called it a "tax cut for gentrification."⁴⁵ Further, waivers allowing benefits to flow into zip codes adjacent to the originally-targeted zip codes have had the effect of subsidizing luxury apartments and office buildings in wealthy zip codes.⁴⁶

Municipal Efforts and Public-Private Partnerships. Public-private partnerships have been used across the country to build programs that benefit communities, provide jobs, and stimulate economic development. For example, in 2015, Seattle created a Priority Hire program for city public works construction projects of \$5 million or more, and, in 2017, expanded the program to public/private partnership projects with significant city investment. Using city-funded and public/private partnership projects, the Priority Hire Program prioritizes the hiring of residents that live in economically distressed areas, particularly in Seattle and King County. In addition, city projects and public/private partnership projects have apprentice utilization requirements and aspirational goals for women and people of color.⁴⁷

8.4.2.2. Post-COVID-19 Efforts.

There are numerous state and national efforts that have arisen in response to the severe unemployment and economic downturn resulting from the COVID-19 pandemic. Congress quickly passed legislation appropriating stimulus funding and extending unemployment benefits, and has extended benefits and created new waivers of taxes on unemployment benefits through the American Rescue Plan. Industry, state, municipal, and nonprofit efforts have filled some gaps, but many remain.

CARES Act Unemployment Insurance. In response to the COVID-19 pandemic, Congress has taken various actions, in the CARES Act and in the American Rescue Plan, to authorize states to provide additional weeks of federally funded Pandemic Emergency Unemployment Compensation (PEUC) benefits to people who exhaust their regular state benefits, followed by additional weeks of federally funded extended benefits (EB) in states with high unemployment.

Examples of State, Industry, and Nonprofit Virtual Training Initiatives. The pandemic has led to several innovative efforts to provide job training using broadband. In Maine, the Governor signed an executive order that provided flexibility to the Maine Community College System to quickly expand online training offered by the Maine Quality Centers (MQC) Program, in response to workforce demands and economic effects of COVID-19. MQCs are working closely with workforce training professionals at all seven of Maine's community colleges across the state to develop and implement free online training programs. MQC is coordinating its efforts with the state's Department of Labor and other workforce agencies for the recruitment and screening of participants for the new online programs.⁴⁸

In Connecticut, Governor Ned Lamont launched the SkillUp CT program, a statewide, free online job training program for unemployment claimants, including those who have been impacted by the economic fallout of the COVID-19 public health crisis. The program, coordinated by the Connecticut Workforce Development Council (CWDC) in collaboration with the Connecticut Governor's Workforce Council (GWC) and the Connecticut Department of Labor (CTDOL), significantly expands access to comprehensive online course work from Metrix Learning, a global provider of web-based learning management systems, for thousands of Connecticut residents. Eligible Connecticut residents receive email instructions on obtaining a license to access the Metrix Learning program, which provides access to about 5,000 online Skillsoft courses in areas such as information technology, business analysis, customer service, project management, and digital literacy, among others. The courses are available to anyone with an Internet connection and a computer. SkillUp CT also offers training tracks leading

to over 100 industry certifications, and will provide career coaching through the workforce boards.⁴⁹

In 2015, Seattle created a Priority Hire program for city public works construction projects of \$5 million or more and, in 2017, expanded the program to public/private partnership projects with significant city investment. Using city-funded and public/private partnership projects, the Priority Hire Program prioritizes the hiring of residents that live in economically distressed areas, particularly in Seattle and King County. In addition, city projects and public/private partnership projects have apprentice utilization requirements and aspirational goals for women and people of color.⁵⁰

Each of these initiatives can serve as a model to other states, federal agencies, and the private sector in developing and expanding programs to help train displaced workers in industries that have not been as significantly impacted or which may be experiencing labor shortages as a result of COVID-19.

Private companies are also responding to the emergency. Microsoft is launching a global skills initiative aimed at bringing more digital skills to 25 million people worldwide by the end of the year. This initiative will combine existing and new resources from Microsoft, as well as subsidiaries including LinkedIn and GitHub. It will be grounded in three areas of activity: (1) the use of data to identify in-demand jobs and the skills needed to fill them; (2) free access to learning paths and content to help people develop the skills these positions require; and (3) low-cost certifications and free job-seeking tools to help people who develop these skills pursue new jobs.⁵¹

Comcast has launched the Comcast RISE (Representation, Investment, Strength, and Empowerment) program to provide support for businesses owned by Black Americans, Indigenous Americans, and People of Color.⁵² Qualified small businesses can receive one or more of several services through Effectv, the advertising sales division of Comcast, and Comcast Business. These include local marketing consulting, a 90-day TV media campaign, a 30-second TV commercial, a "technology makeover" including computer equipment and Internet, voice and cybersecurity services for up to a 12-month,

and grants of up to \$10,000 for businesses that have been in operations for three to five years.

Several organizations and companies, including Charter Communications, Focus on Rural America, Family Business Coalition, Natural Rural Education Association, League of Rural Voters, and Schools, Health & Libraries Coalition, have partnered to create the Connect the Future coalition, focused on quickly connecting millions of unconnected Americans to high-speed Internet. The coalition plans to “shine a light on the barriers to Internet access, show the solutions to expand access to more homes and businesses, and shift the national conversation to enact those solutions—soon.”⁵³

CompTIA (the Computing Technology Industry Association) is [responding](#) to COVID-19 by conducting live, virtual training for unemployed and underemployed during the crisis. CompTIA also provides WIOA-approved training programs.

8.4.3. THE WORKFORCE GAP AND COVID-19'S IMPACT ON PEOPLE OF COLOR, LOW-INCOME, AND RURAL COMMUNITIES.

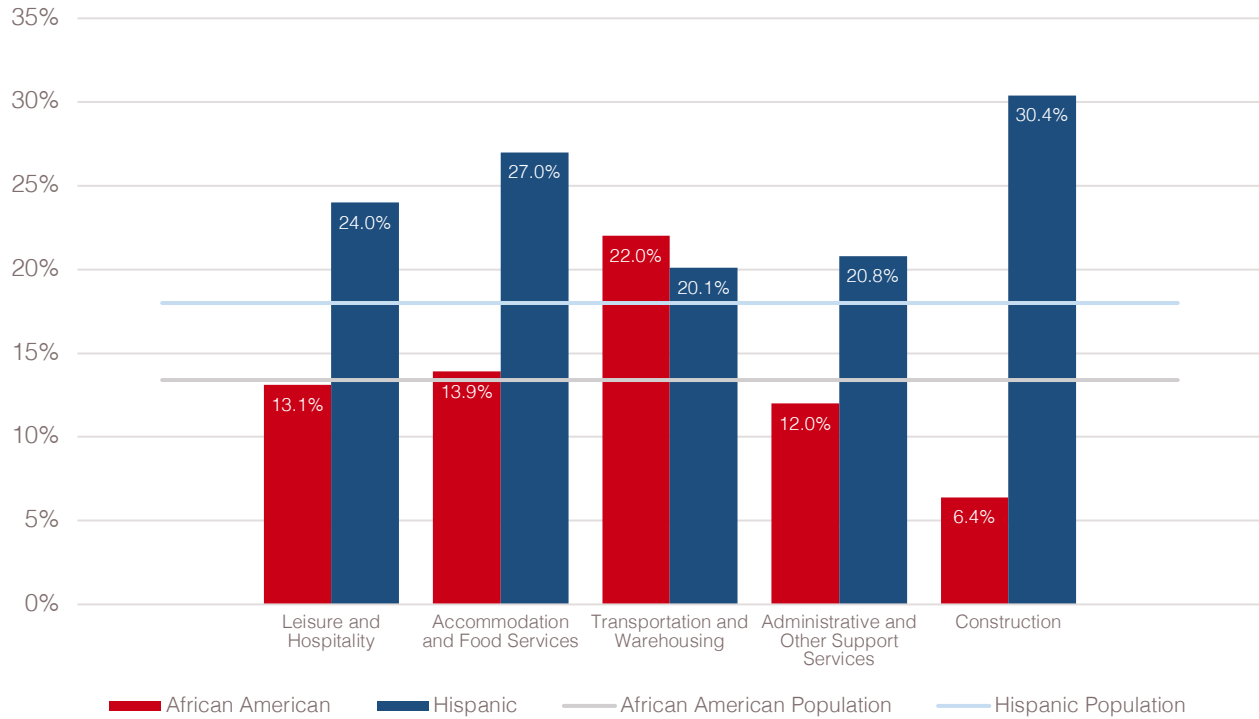
Despite these and other programs available across the nation, closing the workforce gap

is complicated by several factors. As discussed in prior chapters, millions of Americans lack any available options for broadband service. More have access to broadband but cannot or choose not to subscribe. For those who are not online, brick-and-mortar government services designed to assist individuals with signing up for unemployment benefits or with workforce development programs are only open in limited capacity or closed for the foreseeable future.⁵⁴ Additional workforce development programs, such as the Registered Apprenticeship Programs, offered through industry and the U.S. Department of Labor, include on-the-job learning and Related Technical Instruction components that are not available online.⁵⁵

The combination of these factors has had a significant impact on the overall U.S. unemployment rate, with a predictably outsized impact on communities of color. According to the Bureau of Labor Statistics, the national unemployment rate for Q3 2020 is 8.9%, compared with 3.7% for Q3 2019.⁵⁶ The unemployment rate for whites is somewhat lower at 7.9%, while the rate is several percentage points higher for Black Americans and Latinxs at 13.2% and 11.2%, respectively. Further, Black Americans and Latinxs are disproportionately represented in many of the hardest-hit sectors and subsectors, as shown in Figure 1.

FIGURE 1

HARDEST-HIT SECTORS AND SUBSECTORS DISPROPORTIONATELY REPRESENTED BY BLACK AMERICANS AND LATINXS



Hardest-Hit Sectors and Subsectors Disproportionately Represented by Black Americans and Latinxs Source: Bureau of Labor Statistics 2019 “Labor Force Statistics from the Current Population Survey” and McKinsey Global Institute “COVID-19 in Hardest-Hit Sectors” analysis

Communities of color and other marginalized groups, such as low-income and rural communities, are further harmed by the disproportionate impact of the COVID-19 pandemic itself. According to the Centers for Disease Control and Prevention (CDC), people of color are at increased risk of getting sick and dying from COVID-19 due to “[inequities] in the social determinants of health, such as poverty and health care access, [which] are interrelated and influence a wide range of health and quality-of-life outcomes and risks,” as well as “higher rates of some medical conditions that increase one’s risk of severe illness from COVID-19.”⁵⁷ Further, “community strategies to slow the spread of COVID-19 may cause unintentional harm, such as lost wages, reduced access to services, and increased stress, for some racial and ethnic minority groups.”⁵⁸

These groups also disproportionately work in sectors that lack the ability to work remotely, such as hospitality, food service, and transportation, and have consequently been hit hardest by COVID-19-related layoffs. For these populations, leaving their homes to work or seek employment puts them at much greater risk of contracting, falling seriously ill, and dying from COVID-19. Further, these populations are relatively lower-income and face significant financial hardship from the inability to work, hardships from which they are relatively ill-positioned to recover.

In this environment, it is essential that these groups have the tools and resources they need to reskill through virtual online training programs. Unfortunately, while numerous programs and initiatives exist, they are largely unavailable online.

8.4.4. IMPACT OF BROADBAND ADOPTION ON WORKFORCE DEVELOPMENT.

Persons out of work indefinitely should have the opportunity to enter workforce development programs and reskill. However, as outlined above, many workforce programs and local job centers are currently closed, operating at limited capacity, available by appointment only, or only available by phone or email.⁵⁹ In cases where opportunities are available virtually, access to online training is difficult or impossible without home broadband access and without overcoming digital literacy barriers.

As discussed in Chapter 4, Black Americans, Latinxs, and Tribal groups historically have adopted broadband at lower rates compared to white Americans. Rural and low-income Americans face similar discrepancies. These factors lead to a perpetuating cycle: without access to meaningful employment, households cannot afford broadband, and without broadband, they cannot upskill or search for jobs, training programs, and other opportunities. By establishing online workforce development and training programs, federal and state governments can close the broadband utilization gap, connect underrepresented groups to employment opportunities, and achieve digital equity and inclusion.

8.5. KEY CHALLENGES TO OVERCOME

The key challenges to overcome to close the broadband utilization gap through workforce development in the United States include:

- **Data Gaps.** More data is necessary to identify, predict, and fill workforce gaps. Additionally, few training programs report outcomes by race.⁶⁰ These data can have numerous applications, including improving existing programs, building out and expanding successful programs, and developing best practices and standards from existing programs.
- **Low Federal Investment Where Needed.** The federal government makes significant investments to harness science and technology to achieve some goals
- **Existing Workforce Development Programs Largely Lack Virtual Service and Training Support.** Existing programs such as Registered Apprenticeship Programs, Career One-Stops, and other offerings with classroom instruction components and brick-and-mortar service locations are largely paused, closed, or open with limited capacity in the wake of COVID-19.⁶² Prior to (and following) the pandemic, traveling to these locations placed burdens on low-income and other disadvantaged groups that needed additional supportive services such as transportation and childcare.⁶³ Virtual support and training programs would significantly improve ease of access for the groups that need them most.
- **Social Spending Not Currently Organized to Support the Development of Tech-Enabled Interventions.** Currently, funding for workforce-related and other social spending is generally provided through a block grant or a formula grant, based on several factors relating to local unemployment figures, to the states. While there are policy rationales for allocating funds in this way, it runs counter to key features of most technology-driven applications, which are characterized by high fixed start-up costs and very low marginal costs to train each additional participant. Under existing formulae for WIOA funding, for example, state funding allotment can only increase to 130% of prior-year budgets,⁶⁴ which is not enough to incentivize states to invest in the development of tech-enabled solutions that scale nationally.
- **Digital Literacy Gaps.** Despite strides to close the broadband availability, adoption, and affordability gaps, as well as changing perceptions of the

opportunities afforded by broadband use, many Americans still lack the digital literacy skills necessary to take advantage of online offerings, as discussed in greater detail in Chapter Four.

8.6. RECOMMENDATIONS

8.6.1. WORKFORCE DEVELOPMENT-RELATED RECOMMENDATIONS IN OTHER CHAPTERS.

There are several workforce-related recommendations in other chapters that we cross-reference here. These include:

- Creating a workforce of “Digital Navigators” to assist individuals and small businesses, particularly in communities of color and low-income communities, with obtaining digital readiness and literacy skills, as discussed in Chapter 4;
- Creating a broadband benefit for unemployed persons so that they can get and stay online to train, search, and apply for jobs, as discussed in Chapter 5;
- Creating a workforce of on-line tutors to focus on improving basic reading and math skills, particularly for students in communities of color and low-income communities, as discussed in Chapter 10; and
- Engaging in research relating to using AI for job training, as discussed in Chapter 11.

8.6.2. CONGRESS SHOULD DIRECT FEDERAL AGENCIES TO INCREASE DATA COLLECTION RELATED TO WORKFORCE DEVELOPMENT.

Congress should direct federal agencies to increase data collection, data aggregation, and research on workforce development program trends and programmatic impacts and successes, with a particular focus on reporting training program outcomes by race.

We also need to aggregate data on national, state, municipal, and public-private hybrid workforce programs, focusing on diversity, placement, virtual training elements, the prevalence and impact of such programs in

growing and shrinking sectors, and other measures of programmatic impact and success. The data, when gathered, should be used by Congress and federal agencies to develop and promote best practices, guidelines, and standards to build new programs, improve existing programs, and standardize virtual learning components.

To this end, Congress should pass legislation directing the Bureau of Labor Statistics, the Department of Labor, and the Small Business Administration to collect and apply this data. These agencies should work with State Workforce Agencies, through the National Association of State Workforce Agencies, to aggregate state-level data, and determine the factors that make up the most successful programs, particularly when it comes to diversity and job placement.

8.6.3. CONGRESS SHOULD INCENTIVIZE COMPANIES, STATES, MUNICIPALITIES, NONPROFIT ORGANIZATIONS, AND HYBRID ENTITIES TO CREATE, BUILD CAPACITY, AND SCALE NEW WORKFORCE DEVELOPMENT AND DIGITAL SKILLS TRAINING PROGRAMS.

Armed with the data collected by the BLS, DOL, and SBA, Congress can assess the funding needs and requirements for successful national, state, and local programs. Congress should use these data and recommendations to pass legislation that increases investment in innovation, including implementing virtual training tools to new and existing programs, as well as scaling up existing programs.

8.6.3.1. Congress should appropriate funding for the U.S. Department of Labor to dramatically scale up Registered Apprenticeship Programs.

The U.S. Department of Labor invests \$200 million per year in Registered Apprenticeship Programs. This represents just 2.1% of the agency’s \$9.4 billion discretionary budget authority.⁶⁵ Congress should increase the amount it appropriates to apprenticeship programs. This increased investment would allow the U.S. Department of Labor to vastly expand its efforts to improve and modernize training programs; increase apprenticeship opportunities through partnerships between companies, community colleges, technical schools, universities, nonprofit organizations,

states, municipalities, and other entities; and add new, 21st-century components to its Registered Apprenticeship Programs, including robust online training support.

8.6.3.2. Congress should direct the U.S. Department of Labor to institute new sectoral training programs.

Congress should establish new sectoral training programs to align training with local job markets, leverage the community college system, and, by designing training based on an entire sector, ensure that workers gain skills that are transferable across employers. This model already exists in several states and cities, with studies finding that participants in sectoral programs earned 18% more than control group participants and were more likely to work in jobs that offered benefits such as health insurance or paid leave, among other results.⁶⁶ Sectoral training would, in particular, assist low-income communities and communities of color.

8.6.3.3. Congress should direct the U.S. Department of Labor to formally implement integrated online training components in Registered Apprenticeship Programs.

The Department of Labor's Employment and Training Administration has acknowledged the potential impact of the COVID-19 pandemic on RAPs, which require an individual to be employed while in the program.⁶⁷ Congress should direct the Department of Labor to develop standards and tools for companies to support online learning options for the Related Technical Instruction portions of their Registered Apprenticeship Programs (e.g., any parts of the training that do not require hands-on training). Additional funding support for the development of online training components would enable widespread development and adoption of virtual training programs. Further, the investment would have a positive ROI, as entities would save on funds currently spent to provide supportive services such as transportation to training facilities, freeing up capital to improve the performance and outcomes of the training programs themselves.

8.6.3.4. Congress should direct WIOA to implement support for virtual trainings under its core programs federal funding.

Under the Workforce Innovation and Opportunity Act of 2014, the federal government distributes funding to states for six core programs, including the U.S. Department of Labor's Adult Services, Dislocated Workers, and Youth Services programs (for employment and training activities, including the American Job Center and Career One-Stop systems); Wagner-Peyser programs (employment services for job seekers); and the U.S. Department of Education's Division of Adult Education and Literacy (for basic skills) and its rehabilitation services programs (for employment services for individuals with disabilities). In 2017, the federal government distributed over \$7 billion in funding under WIOA. Congress should direct WIOA to include funding earmarked to develop and implement virtual training components for each of its core programs.

In addition, the Department of Labor should call out digital literacy as a priority activity or otherwise incentivize applicants to address this issue in their responses to existing federal discretionary Solicitations for Grant Applications, such as those for apprenticeship grants. Further, The Department of Labor should also issue a Training and Employment Guidance Letter (TEGL) that clarifies how and when digital literacy activities can be paid for by WIOA Title I dollars (e.g., as part of technical training for an Integrated Education and Training [IET] program)

8.6.3.5. Congress should provide additional funds to State Workforce Agencies to support the development of state and municipal efforts and public-private partnerships.

Congress should direct the U.S. Department of Labor to work with the NASWA and individual State Workforce Agencies to develop public-private partnerships. There are numerous examples of public-private partnerships between municipalities, companies, nonprofit organizations, and other groups that focus on economically depressed and historically underrepresented and marginalized groups. But these types of partnerships and programs do not exist in every area.

The U.S. Department of Labor and State Workforce Agencies can use the best practices and standards developed from the

data collection efforts listed in 8.6.1 to encourage the development and scaling of new partnerships across additional states and municipalities, which can learn from and replicate strategies from existing successful programs.

8.6.3.6. The Federal Government should ramp up efforts working with the private sector to provide apprenticeship opportunities and other efforts to address the labor shortfall in deploying next generation broadband networks.

The U.S. currently lacks a sufficiently trained workforce to meet the demand for deploying 5G and other next generation broadband networks. As additional federal investment is introduced to build broadband networks, it will create more demand on a workforce that is already under-supplied with the proper skills. Expanding and upskilling this workforce provides opportunities for diversification so those building the networks reflects the diversity of broadband consumers.

One way to address this need is through apprenticeships that provide paid work experience, classroom instruction, and a nationally recognized credential. The Department of Labor has mechanisms in place to immediately implement support for employers that seek to diversify and develop their workforce for deploying broadband networks. According to the Wireless Infrastructure Association (WIA), more than 50,000 new jobs through 2024 will be in occupations that have existing or planned apprenticeships—including 5G small-cell technician, tower installers, supervisors, engineers, project managers, and cybersecurity professionals. In that light:

- Congress should fund the Department of Labor to expand communications and 5G apprenticeships, directly support employers to provide apprentices with technical instruction, fund institutes of higher education to develop programs of study on broadband and 5G training and build pre-apprentice solutions.
- The FCC should lead an interagency working group that, in consultation with the Department of Labor (DOL) and other federal and non-federal stakeholders,

undertakes developing recommendations to address the workforce needs of the communications industry.

- The FCC, in consultation with DOL, should issue guidance on how states can address the workforce shortage in the communications industry by identifying all of the federal resources currently available to states for workforce development efforts.
- The Government Accountability Office should conduct a study to determine the specific number of skilled communications workers the United States needs to build and maintain broadband infrastructure, including in rural areas, and the 5G wireless infrastructure needed to support 5G wireless technology.
- As part of this effort the communications industry should continue in its current efforts to develop partnerships with institutions of higher education, including Historically Black Colleges and Universities (HBCUs) and Tribal Colleges and Universities (TCUs) to translate job requirements from employers during the curriculum development process.

8.6.3.7. Congress should fund public outreach campaigns to publicize online training programs and initiatives.

One key to closing the broadband utilization gap through workforce development is ensuring that the general public is aware of these opportunities. Congress should provide funding, and direct agencies such as the Department of Labor, Department of Education, Department of Commerce, and Small Business Administration to launch nationwide publicity and outreach programs to inform populations on available programs. Additional funding should also be dispensed to State Workforce Agencies to publicize programs within their respective states.

8.6.4. THE WHITE HOUSE AND CONGRESS SHOULD EXPAND ACCESS TO ADDITIONAL RESOURCES AND TECHNICAL ASSISTANCE FOR ENTERPRISES LOCATED IN RURAL AREAS AND COMMUNITIES OF COLOR.

The White House and Congress should support competitive grants fueling the private creation of urban and rural business incubators, technology campuses from dormant industrial sites, and other measures intended to foster targeted and localized small business growth.⁶⁸ This would help with digital equity and inclusion by expanding the technical skills of those in communities that to date have been largely excluded by the changes in technology. For example, one such initiative could support the development of a national network of small business incubators and innovation hubs on the grounds of Small Business Development Centers, public libraries, community colleges, Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and Minority Serving Institutions (MSIs). Such an initiative would provide essential support for needed services such as business coaching, opportunities to partner with national laboratories and commercialize federally funded research, and legal, human resources, accounting, regulatory compliance, and information technology services to aspiring entrepreneurs.

The initiative also would specifically emphasize the importance of establishing the digital footprint of small businesses and include coaching and training opportunities for digital engagement with businesses' communities, jobseekers, and staff. Such an initiative should direct upskilling resources to small and mid-sized companies, which are more likely to employ workers with digital skill gaps, and often the least able to mount ambitious in-house upskilling efforts.

8.6.4.1. The White House should reform the Opportunity Zone program in order to meet its economic and community development goals.

As discussed earlier in this chapter, the Opportunity Zone program has largely fallen short of meeting its stated goals, with investors tending to favor high-return projects such as luxury apartments rather than efforts focused on economic empowerment, such as affordable housing and local businesses. We propose several reforms to the Opportunity Zone program, including:

- Incentivizing Opportunity Funds to partner with nonprofit or community-oriented organizations, and jointly producing a

community-benefit plan for each investment, with a focus on creating jobs for low-income residents and otherwise providing a direct financial impact to households within the Opportunity Zones.

- Directing that Opportunity Zone benefits be reviewed by the Department of Treasury to ensure these tax benefits are only being allowed where there are clear economic, social, and environmental benefits to a community, and not just high returns—like those from luxury apartments or luxury hotels—to investors.
- Introducing transparency by requiring recipients of the Opportunity Zone tax break to provide detailed reporting and public disclosure on their Opportunity Zone investments, and their impact on local residents, including poverty status, housing affordability, and job creation.

In addition to the emphasis on affordable housing and local businesses, investors should be encouraged to invest in training centers that focus on digital skills training and workforce development programs. These centers can serve as technology hubs in the community where workforce and business development programs can rent space and community members can go for digital literacy and workforce development programs.

These actions, coupled with the research, investment, and online workforce development program efforts outlined above, could create opportunities for disenfranchised communities of color in urban and rural areas.

8.6.4.2. Support Federal Software Preference for Places Left Behind in the United States.

Congress should incentivize contractors who sell software to the federal government to locate part of their workforce in America, and specifically in rural areas and communities of color. By incentivizing relocation of work, there could be a move by government contractors to open software development locations in areas left behind and create good paying tech jobs.

8.6.5. STATES SHOULD MODERNIZE THEIR UNEMPLOYMENT BENEFITS SYSTEMS, TO ENABLE THE NEWLY UNEMPLOYED TO ACCESS BENEFITS AND OPPORTUNITIES FOR FUTURE EMPLOYMENT MORE EFFECTIVELY.

Chapter 12 discusses a number of steps governments should take to modernize and improve the delivery of general services in ways that benefit the public, and which would especially benefit persons in low-income communities and communities of color. Here, we focus on the specific need to modernize and improve the unemployment benefits system. A 2020 study by The Century Foundation, National Unemployment Law Project, and Philadelphia Legal Assistance reported that fewer than half of states have modernized their unemployment benefits systems. Many claimants have found systems that were touted as convenient and accessible to be in actuality challenging and counterintuitive.⁶⁹ We agree with the study and believe efforts at modernization should prioritize the following principles:

- Unemployed workers should have 24/7 access to online and mobile services.
- Unemployment websites and applications should be optimized for mobile devices. As discussed throughout this Plan, low-wage workers and workers of color are particularly likely to rely on their phones for Internet access.
- Call-back and chat technology should be used to deal with the large surges on incoming calls and be implemented as part of a permanent solution. Such technology would improve access while saving money for the government.
- All websites and applications should be translated into Spanish and other commonly spoken languages. Translating online materials would not only ensure equal access, but also be more efficient for those needing assistance who may never get through to a person on the phone or who get stuck on hold for hours.

8.6.7. CONGRESS SHOULD INCREASE HEALTH CARE WORKFORCE DIVERSITY.

As discussed in Chapter Nine on Health Care, greater diversity in the health care workforce can help address racial and ethnic health care disparities. Health care professionals who identify as racial or ethnic minorities are more likely to provide care to lower-income, minority, and uninsured populations. Only 23% of Black Americans, 26% of Latinxs and 39% of Asian Americans have a physician who shares their race or ethnicity, compared to 82% of white Americans. Racial concordance between the health care provider and patient correlates with improved health outcomes, patient satisfaction, and communication. It can help overcome harmful racial or cultural biases in the provision of health care, mistrust of the medical community, as well as cultural attitudes and beliefs about health care.

Although the overall health care workforce is becoming more diverse, the majority of people of color remain in entry-level and often lower-paying jobs with little opportunity for advancement. Further, BLS reports that 6 of the 10 fastest-growing occupations are related to health care,⁷⁰ presenting opportunities for people of color to seek stable, high-wage jobs in these fields. More investment in programs that combine social, academic, and financial support are needed to address the financial challenges, disconnected pipelines, unclear career pathways, and lack of academic and social supports hindering workforce diversity.

8.6.7.1. Congress should pass legislation increasing education support for workforce diversity in health care.

Congress should authorize assistance for increasing workforce diversity in underrepresented professions (e.g., allied health care fields including physical and occupational therapy, audiology, and speech-language pathology). This assistance might take the form of grants to education programs to provide scholarships, or support for recruitment and retention efforts for students of color.⁷¹

8.6.7.2. Congress should increase funding for workforce development of underrepresented groups in health care.

The Department of Health and Human Services (HHS) should increase funding to support the development, recruitment, and

retention of health care professionals from underrepresented groups. Funding should augment student training, internships, fellowships, and mentoring programs, as well as ongoing professional development. HHS should ensure coordination among efforts across agencies (e.g., HRSA, CDC's Office of Minority Health and Health Equity (OMHHE), Office of Minority Health, etc.).

Chapter 9.



HEALTH CARE

"OF ALL THE FORMS OF INEQUALITY, INJUSTICE IN HEALTH IS THE MOST SHOCKING AND THE MOST INHUMAN"
- DR. MARTIN LUTHER KING, JR., CHICAGO, 1966

9.1. PROBLEM STATEMENT

The failure to achieve digital equity and inclusion drives up health care costs for all Americans because it deprives the system of the full cost savings these technologies can generate. It particularly harms those with lower incomes and communities of color who cannot receive health care services that are increasingly provided online. Even when the tools to take advantage of online health care are available, members of these communities often lack the knowledge and skills to use them.

Instead of closing gaps in access, quality of care, and patient experience, ironically, digital technologies are exacerbating long-standing disparities, resulting in declining health outcomes for at-risk populations, as well as higher costs systemwide. In part, these problems are a function of existing regulations, which unintentionally hinder adoption of online health care services by patients, providers, and insurers.

9.2. VISION

We need a health care system that empowers everyone to attain their best possible health outcomes. Every American should be able to get the right care, at the right time, wherever they are. A zip code should no longer be a strong predictor of health outcome, as it is today. To do so, all persons should have access to user-friendly health-enabling tools and technologies that connect them to high-quality, affordable health care services and information they can understand.

9.3. GOALS

The key goals for the digital equity and inclusion agenda in health care are directed at improving health outcomes while lowering costs:

- Reduce disparities in access to care, quality of care, and patient experience.
- Ensure all individuals benefit from technology-driven advances in health

technology—including broadband-based service delivery—independent of race, income level, or location.

- Enable individuals receiving government-supported health care benefits (including Medicare, Medicaid, and state-level assistance) to enjoy the benefits of telehealth services to the same extent as other patients.
- Enhance digital health literacy among low-income persons and persons of color.
- Engage in and disseminate evidence-based research on improving care equity for communities of color.

9.4. CURRENT SITUATION

Low-income communities and communities of color face profound disparities in health status. They experience higher incidence or prevalence of disease, earlier onset or faster progression of disease, poorer daily functioning and quality of life, premature or excessive mortality, and greater global burden of disease.⁷² In particular, these communities suffer higher rates of heart disease, high blood pressure, diabetes, asthma, HIV/AIDS, and infant mortality. Infant mortality for Black Americans, a key indicator of a population's health, is almost twice the national average.⁷³ (Please see Appendix 9A—Health Disparities). As the National Broadband Plan noted a decade ago:

A significant problem plaguing the nation's health care system is the fact that there are health disparities across different ethnic groups. Black Americans, for example, experience the highest rates of mortality from heart disease, cancer, cerebrovascular disease, and HIV/AIDS than any other U.S. racial or ethnic group. Hispanic Americans are almost twice as likely as non-Hispanic whites to die from diabetes. Some Asian Americans experience rates of stomach, liver and cervical cancers that are well above national averages.⁷⁴ Further exacerbating this problem, members of ethnic groups are less likely than whites to have health insurance, have more difficulty getting health care and have fewer choices in where to receive care.

Challenges accessing care contribute to these disparities. Longitudinal research comparing quality measures across racial/ethnic minorities and lower income groups shows that while overall quality is improving for these groups, their access is worse and there has been no progress in lessening disparities.⁷⁴ A study in the greater Rochester, NY area showed that introducing telehealth to impoverished inner-city children redressed socioeconomic disparities in acute care access, thus contributing to a more equitable community.⁷⁵

Broadband has the potential to address many of the key failings of the health care system that contribute to disparities, including inadequate access to care, inconsistent quality of care, and variations in patient experience due to location. Because the Internet is indifferent to time, distance, location, and technology, it has great potential to erase many inequities. However, this is only possible if everyone is connected, and only if the tools for utilizing health care are usable by everyone, not just the tech savvy. Again, as noted in the National Broadband Plan, “Broadband is not a panacea. However, there is a developing set of broadband-enabled solutions that can play an important role in the transformation required to address these issues.”

Internet-based health care delivery is generally referred to as telehealth. The defining feature of telehealth is that the clinician and patient are not physically in the same room. Telehealth technologies today already include live video conferencing, mobile health (mHealth) apps, text messages, “store and forward” electronic transmission, and Internet-enabled and wearable devices for remote patient monitoring (RPM) that are used to provide care. The future, no doubt, will see many more exciting innovations in this area.

Telehealth is not a separate form of health care, but rather a means for health care professionals to provide care that is more convenient and less expensive for patients, to connect patients in rural and urban areas that are underserved in terms of specialists (such as cardiologists and neonatologists) who would be otherwise inaccessible, and to engage individuals in managing their health and wellness. It expands the reach of health care professionals so people can obtain

linguistically and culturally appropriate care. (Please see Appendix 9B—Benefits of Telehealth).

It is important to recognize that access to and utilization of telehealth by at-risk communities is a rural and urban issue, not a rural versus urban solution. However, the Medicare statute, which was waived during the pandemic, generally restricts telehealth eligibility to beneficiaries in rural areas. Further, setting up and maintaining telehealth infrastructure is expensive and most large health systems that would do so are located in urban areas. The private capital investment in telehealth infrastructure needed for rural areas is more likely to be financed if it can be leveraged to also care for local urban populations who suffer similar access challenges.⁷⁶

Telehealth is proving that it can improve health outcomes. It can also lower costs. (Please see Appendix 9B—Benefits of Telehealth). But a lack of digital equity and inclusion is making it more difficult to achieve potential cost savings in providing health care. The need to reduce costs is urgent, as the Department of Health and Human Services (HHS) projects health costs will grow to a staggering \$6 trillion by 2027,⁷⁷ and Medicare’s Trustees warn that the Medicare system will go bankrupt in 2026.⁷⁸

Although comprehensive, population-wide analysis is needed and should be undertaken by the Center for Medicare and Medicaid Innovation (as recommended and discussed in Chapter 5), there are numerous examples of Internet-enabled health care lowering costs.

- Research shows that telehealth could potentially save companies more than \$6 billion a year, for example, by keeping employees healthier and more productive.⁷⁹
- Goldman Sachs estimates that connected devices could reduce health costs by \$300 billion, by increasing access to diagnostic treatments, preventative care, and chronic disease management.⁸⁰

- Digital therapeutics, which are technology-based solutions that have a clinical impact on disease comparable to that of a drug, have the potential to provide effective, low-cost ways to prevent and treat chronic diseases and their consequences.⁸¹ (Please see Appendix 9C—Digital Therapeutics).
- One study estimated average savings of \$97 to \$145 per patient per month when digital therapeutics were used for type 2 diabetes and hypertension.⁸²
- For its Diabetes Telehealth Network, Mississippi became the first state to pay mobile connectivity fees for telehealth and projected Medicaid savings of \$189 million a year.⁸³
- A [more recent study](#) of a tele-video health care program found that “the majority of health concerns could be resolved in a single consultation and new utilization was infrequent. Synchronous audio-video telemedicine consults resulted in short-term cost savings by diverting patients from more expensive care settings,” with the net cost savings per telemedicine visit “calculated to range from \$19–\$121 per visit.”
- In recognition of the ability to improve outcomes and lower costs, Kaiser Permanente, one of the nation’s largest not-for-profit health plans, makes telehealth a key component of its integrated approach to high-quality care delivery.⁸⁴

Even a decade ago, it was clear that health care provided over communications technology could help reduce U.S. health care costs. As the National Broadband Plan noted:

The Veterans Health Administration (VHA) coordinates the care of 32,000 veteran patients with chronic conditions through a national program called Care Coordination/Home Telehealth (CCHT). CCHT involves the systematic use of health informatics, e-care, and disease management technologies to avoid unnecessary admission to long-term institutional care. Technologies include videophones, messaging devices, biometric devices, digital cameras, and remote monitoring devices. CCHT led to a 25% reduction in the number of bed days of care and a 19% drop in hospital admissions. At \$1,600 per patient per year, it costs far less than the VHA’s home-based primary care services (\$13,121 per year) and nursing home care rates (\$77,745 on average per patient per year). Based on the VHA’s experience, e-care is an appropriate and cost-effective way to manage chronic care patients in urban and rural settings. Most importantly, it enables patients to live independently at home.

In 2012, telehealth services provided to over 150,000 beneficiaries resulted in average annual savings of \$6,500 per patient, which equated to nearly one billion in annual savings for the VHA.⁸⁵

Although telehealth has been available for decades, the pandemic has greatly accelerated its adoption across all patient and provider populations.⁸⁶ The Centers for Medicare and Medicaid Services (CMS) reported unprecedented increases in telehealth, with 1.7 million beneficiaries receiving services in the last week of April, 2020, versus only 13,000 a week before the pandemic.⁸⁷ Early CMS data show telehealth to be an effective way for people to access health care safely during the COVID-19 pandemic, whether it is getting a prescription refilled, managing chronic conditions, or obtaining mental health counseling.⁸⁸

However, early signs of disparities in access to care via telehealth are emerging. COVID-19 both highlighted and added to these disparities, as the pandemic disproportionately impacts communities of color. Federal data show that Black American and Latinx individuals are nearly three times more likely than Whites to contract COVID-19, almost five times more likely to be hospitalized, and twice as likely to die from it.⁸⁹ Furthermore, vaccine appointments are largely made online, leaving persons of color that lack Internet access unable to sign up. The effects of missing care and having diseases go undiagnosed and/or untreated since the onset of the pandemic are disproportionately harming persons of color. According to the CDC, excess deaths increased nearly 15 percent for Whites, but almost 45 percent for Latinx and over 28 percent for Black populations last year.⁹⁰

Large primary care practices have found that patients identifying as Non-Hispanic White represent a higher proportion of provider visits once telehealth was scaled up; whereas, communities of color and those with a non-English language preference saw decreases in provider visits.⁹¹ Similarly, a study in the *Journal of the American Medical Informatics Association* shows that Black and Latinx patients in New York City during the early peak of the crisis had lower odds of using telehealth instead of the emergency room or an office visit compared to Whites or Asians.⁹² Another recent study found that 60

percent of Black and over 70 percent of Hispanic adults age 65+ are incapable, for different reasons, of conducting video visits.⁹³ These trends, coupled with excess-death data, are concerning as they suggest declines in primary care, inadequate chronic disease management, and increased mortality long-term due to lack of detection and treatment among marginalized populations.

9.5. KEY CHALLENGES TO OVERCOME

A reliance on digital technology to accomplish essential tasks, including disseminating health information and monitoring conditions, as well as communicating with and engaging patients in their health care, has the unfortunate potential to add to, rather than erase, current health disparities for patients without access to or the skills to use these technologies.⁹⁴ COVID-19 has brought new attention to some of the key challenges to achieving digital equity and inclusion in health care. These include the availability and adoption of home broadband (which includes, by definition, reliable and affordable service) and Internet-enabled devices; eligibility to receive telehealth services and corresponding reimbursement; limitations in digital literacy and workforce diversity, which affect interactions with providers; and limited research and data specific to telehealth and communities of color.

Further, there are few national standards for telehealth, and reimbursement for eligible services and type of technology used varies by state and insurer. These inconsistencies hinder broader telehealth adoption, especially for Medicaid beneficiaries, the majority of whom are people of color.

9.6. RECOMMENDATIONS

There are enormous disparities in health and health care. Telehealth is part of the solution to reduce them, but it can only be successful if low-income communities and communities of color are connected, have connected devices, and know how to use them for health care purposes (e.g., find and download a health care app, log into it using an email address, and comprehend the language on the screen). There is a confluence of factors

that adds to the urgency of driving telehealth adoption among communities of color. First, telehealth is growing and will remain a feature of service delivery even post pandemic. Second, telehealth is a path for achieving more equitable health outcomes while still containing costs. The recommendations below outline steps that Congress and the Administration should take to advance digital equity and inclusion in health care.

9.6.1. LEVERAGE THE FEDERAL ROLE IN FUNDING HEALTH INSURANCE TO CLOSE THE HEALTH CARE BROADBAND GAP FOR INDIVIDUALS

As discussed throughout this Chapter, Americans seeking health care rely increasingly on broadband services for essential services. Some of that increase is driven by COVID-19. Unfortunately, the benefits of telehealth have not been experienced by those without access to broadband, a population group that could most benefit from access to telehealth. As discussed in Chapter 4, broadband adoption is lowest among low-income communities and communities of color.

There are many reasons non-adopters would benefit significantly from telehealth. They are more likely to work in hourly jobs, so saving the time that would be taken up traveling to and from a doctors' office results in increased wages. They are less likely to have cars, and therefore being able to visit with a health care professional without having to resort to the use of public transportation, which may not be convenient to the doctors' office, or an expensive taxi ride, is also a significant benefit. Finally, non-adopters are more likely to lack affordable childcare, and might otherwise skip or delay necessary doctor visits if they are unable to access care from their homes.

But without access to broadband, such benefits are unlikely to be realized. The [Federal Health IT Strategic Plan](#) calls for advancing "equitable access to technology and broadband for individuals, families, and communities."⁹⁵ Policymakers must now proactively promote and support broadband at home, both to improve health outcomes, and to achieve needed cost savings for its covered population. As described in Chapter 5, the way to do so is through the proposed LifelineMed program, which would mandate

that federal government health insurance programs support broadband adoption by covered persons who are not connected and who are below a set income level, ensuring they have the necessary devices, training, and other tools needed to take advantage of the full range of expanding telehealth services.

9.6.1.1. Conduct a Large-Scale Study of Paying for Patient Connectivity.

As the nation's largest payer, and henceforth beneficiary of telehealth cost savings, CMS should explore creative approaches to ensuring communities of color can receive care via telehealth. Either as a step in designing the LifelineMed program described in Chapter 5, or in piloting it before a full-scale roll-out, CMS, in conjunction with the Federal Communications Commission (FCC), should create a scalable demonstration program to test the effect of providing patient connectivity and corresponding digital health education on health outcomes and the cost of care for communities of color.

Broadband access has been shown to be a crucial determinant in the use of digital health tools.⁹⁶ There is also growing consensus that broadband access is a social determinant of health generally (please see Appendix 9D—Social Determinants of Health), and disparities in access should be treated as a public health issue.⁹⁷ As such, participation in this demonstration program must purposefully target racial and ethnic minorities. Medicare beneficiaries are approximately 10% Black, 9% Hispanic, 4% Asian/Native Hawaiian/Pacific Islander, and less than 1% American Indian/Alaskan Native.⁹⁸ Conversely, nearly 60% of Medicaid and half of the 10.9 million dual eligible beneficiaries are from communities of color.

Aligned incentives, particularly the accrual of financial benefits to the payer, contribute to the feasibility and success of the VHA program. The demonstration program needs to recognize that the telehealth experience in fee-for-service may vary from that of alternative payment models, in which added incentive payments are given for providing high-quality and cost-efficient care. Program findings may help accelerate the transition to value-based care.

Such a program would require case management workers and coordinators to ensure that participating individuals receive the necessary education and support to take full advantage of telehealth. A large component of their role would be providing technical assistance and digital health literacy tools.

9.6.2. REMOVE REGULATORY OBSTACLES TO FULL TELEHEALTH EQUITY AND INCLUSION

Numerous existing policies and regulations unintentionally hinder telehealth equity and inclusion. We have the opportunity to elevate equity and inclusion as priorities in policymaking and revisit decisions ranging from funding and administration to reimbursement and eligibility through this lens.

9.6.2.1. Fund Broadband Networks for Eligible Health Care Providers and Ensure Programs are Accessible to Those Serving Communities of Color.

As discussed in Chapter 3, Congress should provide robust funding to close the Availability Gap, making it possible for telehealth services to be utilized nationwide. Many of the health centers, clinics and long-term care facilities that serve communities of color do not have adequate and/or affordable broadband connectivity to serve those populations. We should ensure that all such providers are able to offer a full spectrum of telehealth services. One way to do so would be to build on the FCC effort to help rural health care providers by broadening support to include non-rural providers and certain for-profit entities (which are currently excluded as the Communications Act limits eligibility to public or nonprofit entities) that cannot afford adequate broadband services to serve their populations. Results of the FCC's Connected Care Pilot Program (discussed below), which is open to non-rural clinics, should inform policy decisions. In allocating funds for underserved areas, the FCC should consider eligibility measures that focus on economically depressed areas, instead of population density alone.

The FCC, in conjunction with USAC, should review administration of the Rural Health Care Program and health care pilot programs, and make any modifications necessary to ensure

that those who stand to benefit most from funding programs are able to use them. They should assess the complexity of application processes, ease of navigating online systems, speed and duration of processes, ability to meet application requirements (e.g., procuring competitive bids), etc. The FCC should aim to simplify and streamline administrative aspects and reduce uncertainty (for example, surrounding subsidy amounts from year-to-year). The FCC should ensure USAC has adequate internal health care expertise to effectively manage infrastructure deployment and subsidy programs serving the health care industry.

9.6.2.2. Drive Consistency Across Medicaid Programs to Reduce Disparities in Access.

State laws, regulations and Medicaid program policies differ significantly. Telehealth policy on Medicaid reimbursement, private payer reimbursement laws, coverage parity, payment parity, covered modalities (e.g., audiovisual, audio only, store and forward, remote patient monitoring), establishing clinician-patient relationships, and professional requirements around interstate licensing compacts and informed consent also varies by state. For example, only 23 states reimburse for remote patient monitoring, and only 19 allow service to a patient's home under certain circumstances. Some laws require reimbursement be equal to in-person coverage, while others only require parity in covered services. And some states require in-person visits before telehealth can be used.⁹⁹ This creates a complex administrative landscape for health care providers to navigate, diminishes access to care, and reinforces disparities in health care and health outcomes. Some of these disparities among states are exacerbated by differences in Medicaid expansion, with state borders creating Medicaid haves and have-nots. HHS should work with state legislatures and the National Governors Association to increase consistency across Medicaid programs and ensure that state-based policies do not unintentionally discriminate against communities of color in accessing telehealth services.

9.6.2.3. Remove Geographic and Originating Site Restrictions.

The ability to connect clinicians and patients without regard to their respective locations is

one of the most compelling benefits of telehealth.¹⁰⁰ Current Medicare rules generally allow telehealth services only for beneficiaries in rural areas and specify the type of facility (known as originating site) where a patient must be located at the time of service. An unintended consequence of these geographic and originating site restrictions is the exclusion of the majority of members of communities of color from using telehealth, as these individuals live predominantly in non-rural areas.¹⁰¹ This can hinder linguistically and culturally appropriate access to mental health, specialty, and general care. Congress should remove both geographic restrictions on where a patient must be located to utilize telehealth services and originating site restrictions that limit access from home and other locations. The latter is particularly important for rural and Tribal residents who will rely increasingly on telehealth to access health care services.

9.6.2.4. Remove Limitations on Eligible Providers and Services.

Congress should remove the remaining statutory restrictions on practitioners eligible to provide services via telehealth, including licensed respiratory therapists, physical therapists, occupational therapists, and speech language pathologists, and allow these practitioners to provide telehealth services from their homes without updating their Medicare enrollment.

9.6.2.5. Remove Limitations on FQHCs and RHCs.

Federally Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs) serve highly vulnerable populations. Prior to the pandemic, FQHCs and RHCs were not eligible to furnish “distant site” (where the physician is located) telehealth services. Given the increasingly important role of telehealth in supporting low-income communities and communities of color, Congress should permanently authorize FQHCs and RHCs to provide distant site telehealth services.

9.6.2.6. Adjust State Licensure Requirements to Enable Greater Access to Care.

State laws vary, and clinicians may not be able to treat patients across state lines,

thereby hindering access to care. Notably, the VA telehealth program enables VA practitioners to treat veterans no matter where the veteran or physician are located.¹⁰² Progress is being made through the Interstate Medical Licensure Compact, an agreement among states (currently 29 and the District of Columbia)¹⁰³ to streamline the licensing process for physicians who want to practice in multiple states, the Nurse Licensure Compact, the Psychology Interjurisdictional Compact (PSYPACT), and a handful of reciprocity arrangements. CMS should work with the Federation of State Medical Boards, the National Governors Association and the National Conference of State Legislatures to ensure that Medicare, Medicaid, and CHIP beneficiaries are not denied the benefits of telehealth because of the state in which they reside.

9.6.2.7. Augment Organizational Resources to Reflect Equity and Inclusion Concerns Beyond Rural.

Recognizing that telehealth is a vital aspect of health care delivery, and that its application and current limits are not limited to rural areas, the Office for the Advancement of Telehealth (OAT) should be elevated within the Health Resources and Services Administration (HRSA.) Rather than house OAT under the Federal Office of Rural Health Policy (FORHP), OAT should be on par organizationally. It would then more easily coordinate with both FORHP and the Office of Health Equity (OHE), as well as other agencies.

9.6.3. LEVERAGE FCC CONNECTED CARE PILOT PROGRAM TO BROADEN IMPACT ON LOW-INCOME COMMUNITIES AND COMMUNITIES OF COLOR.

The current FCC pilot program makes available up to \$100 million over three years to support the provision of telehealth, in particular to low-income individuals and veterans. It differs from the current Rural Health Care Program in two important aspects: (1) it is open to eligible health care providers in non-rural areas and, (2) it allows funding for patient connectivity. Like the FCC COVID-19 Telehealth Program (please see below), this presents an opportunity to address broadband affordability, a major telehealth barrier for communities of color.

The FCC should work with the HRSA to solicit applications from appropriate non-rural providers (especially those unfamiliar with FCC programs) and assist them with the application process. The FCC should prioritize selection of eligible health care providers that serve low-income communities of color and request support for patient connectivity. The FCC should coordinate with CMS to (1) ensure that patients covered by the pilot are deemed eligible for telehealth services, and (2) evaluate the pilot results. The FCC and CMS should analyze the effects of providing patient connectivity on the provision of care (including types of services, providers, modalities, and locations), total cost of care (including savings and avoided costs), and health outcomes. The learnings from this pilot could substantively inform future policy recommendations for ensuring low-income communities and communities of color benefit from telehealth.

9.6.4. GENERATE TELEHEALTH RESEARCH & DATA SPECIFIC TO COMMUNITIES OF COLOR.

An important objective in the Federal Health IT Strategic Plan is to support research and analysis using health IT and data at the individual and population levels. It calls for research conducted to reflect the nation's diversity so that findings can be applied across populations. For too long, racial and ethnic minorities have been underrepresented in clinical research. There needs to be prospective research focused on the potential of and limitations to telehealth in improving care equity for communities of color. Collecting and reporting accurate race, ethnicity, and language (REAL) data is essential to advancing granular understanding of the impact of telehealth on communities of color. Data capture must be emphasized at the point of care and electronic health records updated accordingly.

9.6.4.1. Evaluate FCC COVID-19 Telehealth Program with Specific Focus on Impact on and Lessons for Communities of Color.

The FCC should conduct an ongoing assessment of and reporting on the results of the COVID-19 Telehealth Program. Understanding the composition of funding recipients, how recipients used the funds, and the corresponding outcomes on populations

served, will inform future policies. As this program includes funding for patient connectivity and devices necessary to provide telehealth services, evaluation findings will be useful in designing future program parameters. In the interests of promoting digital equity and inclusion, the FCC should seek a granular understanding of the populations served via telehealth and the health impact on end-user beneficiaries. The FCC should also evaluate the operational aspects of the program and apply those learnings to other programs as appropriate. For example, factors that may have simplified and/or streamlined the application process, reduced processing timelines, aided prospective awardees in navigating the system, helped target specific populations, etc.

9.6.4.2. Evaluate COVID-19 Telehealth Experience with Specific Focus on Communities of Color.

In light of the increase in telehealth usage stimulated by COVID-19, HHS should specifically collect and analyze data on telehealth and communities of color. Evaluation of utilization, outcomes, cost, patient/provider satisfaction, and other data, would help build an evidence base. Analyses should inform the work of several agencies within HHS, including CDC, CMS, HRSA, NIMHD (National Institute on Minority Health and Health Disparities), and AHRQ (Agency for Health care Research and Quality), as well as the VHA.

9.6.5. FUND TELEHEALTH INFRASTRUCTURE AND TECHNICAL ASSISTANCE WITH THE STRATEGIC INTENT OF REDUCING DISPARITIES.

Congress should provide funding to HHS for telehealth infrastructure and technical assistance. Funds would support clinician training in technologies, investment in telehealth infrastructure, and development of tools and resources to improve health-related digital literacy.

HRSA, specifically, should receive increased funding for the existing 12 Regional and two National Telehealth Resource Centers (TRCs), which provide real-time assistance to states, providers, and communities. TRC funding stands at \$29 million a year and has seen relatively modest increases over the last

decade, despite explosive growth in telehealth. Increasing the budget to \$50 million a year would improve TRC's ability to support members of communities of color in benefiting from telehealth.

9.6.6. ENHANCE DIGITAL HEALTH LITERACY.

As discussed in Chapter 4, digital readiness is a major barrier to broadband adoption and the need to improve digital literacy is urgent. In the health care context, lacking digital health literacy can adversely impact health outcomes. For example, many elderly persons of color, who are at greatest risk for COVID-19, are unable to sign up for vaccines without help from family or friends. The federal government states that “improving access to electronic health information—especially for populations in rural areas, persons with disabilities, racial and ethnic minorities, and those with low socioeconomic status—should be prioritized if we are to achieve equitable care outcomes for all. In addition, patients and caregivers should have access to resources that allow for improved health IT literacy so they understand how their health data may be used, how to choose safe and secure health apps, and how to set their privacy preferences.” Digital health literacy requires: (1) basic reading and writing skills; (2) working knowledge of using smartphones, laptops, computers, and other Internet-enabled devices; and (3) an understanding of how, why, and when online health information is created, shared, and received.¹⁰⁴ These skills are applied when using tools such as health apps, live video consults, online patient portals, and remote monitoring devices. Without these skills, low-income communities and communities of color will be unable to take advantage of telehealth. The Office of the National Coordinator for Health IT, in conjunction with the federal organizations that contributed to the Federal Health IT Strategic Plan and the proposed Office of Digital Equity, should ensure that its objective to improve individual access, particularly for those in low-income communities and communities of color, to usable health information is met.

9.6.6.1. Increase Support for Practitioners Promoting Digital Health Literacy to Their Patients.

HHS should support practitioners at the point of care in promoting digital health literacy.

First, HHS should work with organizations and professionals to make the health information and services that they provide more understandable and actionable and help develop education and training to teach patients digital skills to conduct video visits and navigate apps and portals. Second, HHS should collaborate with adult basic education programs to simultaneously meet the goals of providing relevant instruction while offering adult learners the chance to improve their health outcomes by building their digital health literacy. Third, HHS should increase the dissemination and use of evidence-based health literacy practices and interventions. Leveraging community health workers, faith-based organizations and schools can help reach those individuals most in need.

9.6.7. INCREASE HEALTH CARE WORKFORCE DIVERSITY TO IMPROVE ACCESS, QUALITY AND PATIENT EXPERIENCE FOR COMMUNITIES OF COLOR.

Greater diversity in the health care workforce can help address racial and ethnic health care disparities. Health care professionals who identify as racial or ethnic minorities are more likely to provide care to lower-income, minority and uninsured populations.¹⁰⁵ Only 23% of Black Americans, 26% of Latinxs and 39% of Asian Americans have a physician that shares their race or ethnicity, compared to 82% of White Americans.¹⁰⁶ Racial concordance between the health care provider and patient correlates with improved health outcomes, patient satisfaction and communication.¹⁰⁷ It can also help overcome harmful racial or cultural biases in the provision of health care, mistrust of the medical community, as well as cultural attitudes and beliefs about health care. Although the overall health care workforce is becoming more diverse, the majority of people of color remain in entry-level and often lower-paying jobs with little opportunity for advancement.¹⁰⁸ As discussed in greater detail in Chapter 8 on Workforce Development, Congress needs to appropriate more funds for programs that combine social, academic and financial support to address the financial challenges, disconnected pipelines and unclear career pathways, and lack of academic and social supports hindering workforce diversity. A lack of workforce diversity should not be allowed to

persist as a barrier to communities of color benefiting from telehealth.

9.6.7.1. Pass Legislation Increasing Education Support for Workforce Diversity in Health Care.

Congress should pass legislation, such as that proposed to authorize assistance for increasing workforce diversity in underrepresented professions (e.g., allied health care fields including physical and occupational therapy, audiology, and speech-language pathology). This assistance might take the form of grants to education programs to provide scholarships or support recruitment and retention efforts for students of color. As allied health services are increasingly provided online, it is important that individuals be able to receive linguistically and culturally appropriate care.

9.6.7.2. Increase Funding for Workforce Development of Underrepresented Groups in Health Care.

HHS should increase funding to support the development, recruitment, and retention of health care professionals from underrepresented groups. Funding should augment student training, internship, fellowship, and mentoring programs, as well as ongoing professional development. HHS should ensure coordination among efforts across agencies (e.g., HRSA, CDC's Office of Minority Health and Health Equity (OMHHE), Office of Minority Health, etc.).

HRSA should receive increased funding for programs within the Bureau of Health Workforce that advance diversity among health professions. These include the Centers of Excellence (COE) Program, Scholarships for Disadvantaged Students (SDS) Program, Area Health Education Centers (AHEC) Program, and National Health Careers Opportunity Program (HCOP) Academies. FY 2020 funding for these programs stands at \$131.4 million; the President's FY 2021 budget proposes continued funding only for the COE (\$23.7 million a year). The Bureau of Health Workforce should help further develop professional pathways for entry-level health professionals to advance in their careers and explore the impact of recruiting and hiring diverse faculty in higher education.

Chapter 10.



REIMAGINING CONNECTED EDUCATION

“IT IS REQUIRED IN THE PERFORMANCE OF OUR MOST BASIC PUBLIC RESPONSIBILITIES, EVEN SERVICE IN THE ARMED FORCES. IT IS THE VERY FOUNDATION OF GOOD CITIZENSHIP. TODAY IT IS A PRINCIPAL INSTRUMENT IN AWAKENING THE CHILD TO CULTURAL VALUES, IN PREPARING HIM FOR LATER PROFESSIONAL TRAINING, AND IN HELPING HIM TO ADJUST NORMALLY TO HIS ENVIRONMENT. IN THESE DAYS, IT IS DOUBTFUL THAT ANY CHILD MAY REASONABLY BE EXPECTED TO SUCCEED IN LIFE IF HE IS DENIED THE OPPORTUNITY OF AN EDUCATION. SUCH AN OPPORTUNITY, WHERE THE STATE HAS UNDERTAKEN TO PROVIDE IT, IS A RIGHT WHICH MUST BE MADE AVAILABLE TO ALL ON EQUAL TERMS.”
—*BROWN V. BOARD OF EDUCATION*

10.1. PROBLEM STATEMENT

Almost seventy years after the *Brown v. Board of Education* decision, America still does not provide all children with an equal opportunity to receive a high-quality education. Disparate educations lead to disparate achievements and opportunities to become fully engaged, active, and successful citizens.

Since the beginnings of public education, the level of investment made for each individual student has depended primarily on their zip code. Today, districts serving the greatest proportion of students of color spend \$1,800 less per student than districts serving the fewest students of color.¹⁰⁹ This disparity in funding creates a vicious cycle of disparity in

opportunity. Under-resourced, low-income school districts are unable to attract and retain well-qualified teachers, provide rigorous curricula and assessments, or meet even basic needs such as safe and adequate facilities. Investments in state-of-the-art technology solutions are even more unlikely.

Yet, for students in these districts, digital technology offers a tremendous opportunity to break free of barriers imposed by traditional models of instruction, where teaching was confined to the four walls of a classroom.

Unfortunately for many students, the opportunities offered by technologies including the World Wide Web and video conferencing, let alone self-paced learning tools with adaptive algorithms, digital

curricula and classroom materials, and augmented and virtual reality, are little more than additional opportunities that remain out of reach. Education Superhighway estimates that 9.7million K-12 students do not have reliable Internet at home. Students who lack home Internet risk falling behind, as well as being unable to learn the technology skills that are needed for many jobs.

This digital education gap has long been referred to, somewhat inaccurately, as the “homework gap.” But the problem goes far beyond an inability for some students to complete assignments that require broadband service at home, forcing them to use libraries and other public buildings or even fast-food parking lots to connect to free Wi-Fi networks, often with inadequate devices such as smartphones. As digital tools have become more deeply embedded in the education process, the homework gap has continued to increase, and now extends far beyond homework to every facet of learning.

The COVID-19 pandemic has turned the “homework gap” into a full-fledged classroom gap for students systemwide, as many schools are forced to offer virtual-only learning. Computing devices and broadband service instantly mutated from helpful learning tools to necessities, essential for all in and out of classroom and school related learning. And while some schools are returning to more normal classrooms, most are still using virtual mechanisms in a hybrid manner. There is no certainty as to how long this will last or whether other health situations will cause a similar shut down of physical classrooms.

Digital inequity and exclusion in education, moreover, does not just manifest itself solely through lack of broadband services and devices in the home. We also see it in digital literacy skill gaps; the inability of curricula authors to keep up with evolving technologies; a dearth of research and development, leading to curricula which itself enables increased digital inequity and exclusion, a lack of access to respectful and culturally responsive content; the lack of evolving teacher training and support; the challenges faced by working parents (particularly in sectors not conducive to telecommuting) in supervising and assisting their kids’ remote learning throughout the school day; and the absence of a coherent

strategy across all levels of education to address these issues.

10.2. VISION

We should develop a new educational infrastructure that supports all students, that provides equitable access to the tools and content of fast-evolving digital learning, that uses those tools to assist them wherever they are developmentally and personally, that accelerates and supports them to learn in ways that represent their diverse needs and at a depth of mastery that is required to succeed in the modern economic and social context, that provides teachers the support they need to enable students to maximize the use of digital content, and provides a future where the vast expanse of opportunities available are truly open to all students.

10.3. GOALS

1. By the end of 2023, every K-12 student and teacher in America should have broadband service at home, Internet-connected devices that support basic and advanced learning applications, and the offline support they need to engage securely in effective remote or online learning.
2. All policymakers should fully embrace education as a national strategic priority and fund a robust research and development agenda focused on advancing models of digital teaching and learning to promote equity, and advance outcomes for all students.
3. Governments at the federal, state, and local levels should provide funding sufficient for adequate and equitable education outcomes, ensuring that the most vulnerable students have access to the resources they need for digital learning.
4. By the end of 2024, every K-12 student in America should have access to culturally responsive and relevant curricula for their core subjects in a form usable for online learning.
5. By the end of 2023, every K-12 teacher should have the tools, training,

infrastructure, resources, and support they need to deliver effective online or remote learning experiences for their students.

6. Federal and state education agencies should employ executive level technology leaders (CTO/CIO) to advance policy and program initiatives designed to unlock the value of technology safely and securely and infrastructure.

10.4. BACKGROUND: DIGITAL DIVIDES WIDEN PRE-EXISTING OPPORTUNITY AND ACHIEVEMENT GAPS

All students have valuable and unique perspectives, skills, and knowledge, as well as an innate drive to learn more, gain greater expertise, and contribute to a future where the full range of opportunities are truly available to them. Yet not all students are given equal opportunities and support to develop themselves in these ways.

Inequities in education continue to create a gap between students in well-funded, well-supported public and private educational systems, and those students who attend schools that are poorly funded and inadequately organized. The gap in funding and organization in educational systems correlates strongly along racial, ethnic, and income lines. These long-standing problems are much broader than the issues of educational technology and infrastructure, but gaps in education technology are accelerating the growth of an increasingly steep divide for students of color and/or poverty.

Despite valiant efforts to address achievement gaps in public education over several decades, the pattern of disproportionality in academic achievement and attainment remains stubbornly resistant to correction. Students of color read on average at 2 to 3 grade levels below their white peers. They drop out of high school at twice the rate and are four times more likely to attend a low performing school.

Poverty accounts for some of this difference, but not all. Only in the last 20 years have

researchers begun to understand the many factors contributing to these gaps. They have found that students of color are significantly more likely to be:

- Learning in a significantly [under-resourced school](#).
- Taught by [underprepared teachers](#).
- Enrolled in a school with few, if any, rigorous courses like [Advanced Placement](#) or International Baccalaureate.
- Taught by adults who are teaching across cultural divides, with little understanding or appreciation for the culture of the [students they serve](#).
- [Disciplined, even suspended](#), for minor infractions that would not lead to a similar response if the student were white.

The combination of these and related factors result in a school system that, by default, rations the quality of education to students of color and other minorities. That rationing has only been increasing during the COVID-19 crisis.

The COVID-19 crisis has made abundantly clear that few if any American schools were prepared for a sudden transition to online learning.¹¹⁰ In a May 2020 survey, more than 70% of teachers did not feel their schools were prepared for the pandemic. Students also lacked the digital literacy needed for the transition to remote learning.

That lack of preparation made life more difficult for almost everyone involved in the educational ecosystem - students, parents, teachers, administrators, vendors, and others have all been scrambling to catch up and adapt to the new normal, with little time or opportunity to figure out the best approach. An April 2020 survey of over 5,600 teaching professionals from across the United States found that 55% of teachers said that less than half of their students were attending remote classes. Thirty-four percent of respondents reported that only 25% of their students or fewer were attending remote classes.¹¹¹

The most vulnerable students have clearly suffered the most. More affluent learners with

home broadband, digital devices, and support have been afforded alternative opportunities and choice. Students without access to these resources, whether through a lack of connectivity or lack of tools/resources or devices, are either denied learning or have to do additional work just to gain their previous level of access, introducing additional barriers that set them further back in their learning. Furthermore, the parents of Black and Hispanic students are less likely to work jobs that allow for telecommuting, and so are less likely to be present at home to assist their kids with remote learning throughout the school day.

When mandatory COVID-19-driven remote learning is lifted, schools are likely to continue relying on technology and digital forms of learning to a much greater degree than ever before. Having seen the potential of technology-supported learning in a crisis, learning will never go back to exclusively happening within school walls for most students. Additionally, since technology and digital learning are constantly evolving, inequities for lower income communities, Black, indigenous, people of color (BIPOC), English learners (ELs), and students with special needs will become increasingly pronounced.

The global pandemic has uncovered how unprepared educational systems nationwide were to respond to evolving and quickly changing situations. So, we must also focus on reorganizing education systems at all levels to ensure that they can evolve with and achieve maximum benefit from continued improvements in technology, including analysis of costs and benefits to allocate resources where they are most needed. The risk in not evolving is that the system will continue to enable those who already have access and will further exclude those who do not, ensuring that they will be left further behind.

10.5. KEY CHALLENGES TO OVERCOME

The key challenges to overcome to create a more equitable and inclusive digital learning environment in the United States include:

- Funding for connections, devices, and support, both in schools and at home, is inadequate, especially for schools and students with the greatest need.
- Lack of a holistic long-term national strategy to use technology to enhance educational outcomes in an equitable and inclusive manner.
- Pervasive systemic and structural racism that impedes equitable distribution of resources to educational systems that enable them to provide a high-quality education to communities of color and poverty. These include:
 - Local funding disparities.
 - Structurally enforced biases.
 - Market incentives against creating solutions for all students.
 - Learning content is not designed for diverse learners, and when developed with public funds, is not released or shared freely often enough.
 - Training for LEAs, teachers, students, and families around online learning is often ineffective or unavailable.
 - Technical standards and platforms do not do enough to enable and secure data privacy, security, or interoperability of learning systems and data.

10.6. RECOMMENDATIONS

To overcome these challenges and to meet our goals, students, educators, and families first need to be connected to broadband services and have access to devices for learning in and out of the classroom. We must invest in a national research and development agenda to learn and act on solutions that create measurably more equitable and inclusive digital learning for the most vulnerable populations of students. These solutions should be shared and implemented with funding assistance as needed so that students, educators, and families will have ongoing and evolving access to improved content, aligned tools, and more

comprehensive support. Additionally, all solutions should be implemented in a way that appropriate and actionable data are gathered to inform additional research and development activities and that the privacy and security of students, educators, and families are guaranteed.

10.6.1. PROVIDE FEDERAL FUNDING TO ASSURE THAT ALL K-12 STUDENTS AND TEACHERS HAVE THE CONNECTIVITY AND DEVICES THEY NEED TO CONTINUE LEARNING OUTSIDE THE CLASSROOM.

As discussed in greater detail in Chapter 5, the federal government has long-supported local schools in situations where it is clear that a federal commitment is necessary to create a more equitable and inclusive education system. That is at the heart of U.S. Department of Education's programs that provide funds to elementary and secondary school with economically disadvantaged students (the Elementary and Secondary Education Act (ESEA or "Title I") and to support children with disabilities (*Individuals with Disabilities Education Act (IDEA)*). The same principle should be applied to the increasing importance of digital learning and assuring that all students have access to that learning platform. In that light, Congress should fund the LifelineEd program described in Chapter 5 to guarantee that every K-12 student and teacher, regardless of their financial circumstances, has access to broadband and Internet connected devices needed for basic and advanced schoolwork and teaching.

10.6.2. REVISE FUNDING SYSTEMS TO ENSURE ADEQUATE AND EQUITABLE DISTRIBUTION OF RESOURCES, PARTICULARLY THOSE THAT WILL ADVANCE DIGITAL LEARNING.

Ensuring equal access to education is at the core of the Department of Education's mission, and has been since the Elementary and Secondary Education Act of 1965 (ESEA). The ESEA has been amended and reauthorized many times, but with every iteration, Title I, the section that earmarks federal funding for poor children, remains at the heart of the legislation and accounts for the lion's share of the funds authorized under the Act.¹¹² When President Johnson signed ESEA, along with several other complementary measures such as the Head

Start and the Higher Education Act, he hoped, "to bridge the gap between helplessness and hope for more than 5 million educationally deprived children."¹¹³

Johnson's vision has yet to materialize for many reasons, including lack of commitment to policy choices outside the sphere of education that were meant to complement ESEA. Funding problems, some associated directly with ESEA and its progeny, are chief among them. Overall, school districts that serve predominantly nonwhite students receive \$23 billion less per year than school districts with predominantly white student bodies based on the total amount of funding per student from federal and local funding sources.¹¹⁴ While the challenges facing educators have only increased since the great recession, federal support has not kept pace. Authorized funding for Title I, Part A programs has decreased from \$26 billion in 2002 to \$16.3 billion for the fiscal year ended September 30, 2020.¹¹⁵ These funds are distributed through four separate programs, and inefficiencies and poor design result in drastically more money going to help rich school districts or kids not living in poverty, rather than focusing investments on the students the program was intended to help in the first place.

Not only is money failing to reach the poorest districts or helping the poorest children in those districts, but it is also not necessarily being spent effectively or strategically. Those districts most in need and most severely underfunded may have to spend all their funding solely on teacher salaries or basic needs like textbooks, rather than being able to invest in digital learning resources or methods, innovative curricula, or other improvements that may be considered luxuries rather than necessities when operating on shoe-string budgets heavily dependent on local tax revenue, especially in times of severe economic downturns.

10.6.2.1. Target funding on areas of need based on quantifiable technology deficits.

To advance the use of digital learning to further equitable outcomes, Congress should appropriate additional Title I funding in the form of formula grants targeted for school districts in areas with quantifiable technology deficits. Areas with the highest barriers to online learning will need more funding, so

additional appropriations should be based on criteria associated with computer ownership, home Internet adoption and affordability, etc. This funding should be in addition to any funding associated with ensuring students and teachers have home broadband connections and appropriate devices (Recommendation 10.6.1.1), because areas with quantifiable technology deficits are likely to face serious challenges in taking advantage of digital learning. Use of funds should be flexible, so long as funding is used to promote online learning.

In addition, the U.S. Department of Education should:

- Require states to produce Ed Tech plans to access federal funding/technical assistance, even for non-technology related funding streams;
- Ensure solutions focused on cultural and linguistic equity also consider students with special needs and vice versa; and
- Require procurement processes to identify open-source solutions, where possible, before opening procurement to proprietary alternatives (similar to the Department of Defense's [policy on open source procurement](#)).

10.6.3. INVEST IN A ROBUST FEDERAL RESEARCH AND DEVELOPMENT (R&D) AGENDA FOCUSED ON ADVANCING MODELS OF TECHNOLOGY-EMPOWERED TEACHING AND LEARNING THAT PROMOTE EQUITY AND ADVANCE OUTCOMES FOR ALL STUDENTS.

Though not a cabinet level agency until 1980, the federal Department of Education's goal of helping states establish effective school systems by collecting information on schools and teaching has been a core part of its mission since the first incarnation of the Department in 1867.

That mission took on heightened significance in 1958, when Congress passed the first comprehensive federal education legislation, the National Defense Education Act, in response to the Cold War.¹¹⁶ In doing so, Congress explicitly recognized the vital role that education plays in national defense and in global competitiveness. The mission

evolved further during the 1960s with the passage of civil rights legislation that expanded the role of the Department of Education to ensure all students had equal access to education.

Despite the critical significance of education and the persistent inequality, however, the U.S. has never invested meaningfully in a holistic national strategy or in R&D efforts aimed specifically at improving educational outcomes and increasing equity the way that it has invested in other national strategic priorities.

The result is an extremely fragmented and ad-hoc approach to advancing digital learning across the country. While state education agencies have made some progress in adopting digital learning tools, as evidenced by posted state-level education technology plans and the presence of digital literacy guidelines or standards in most states, there is still a fundamental disconnect between the plans and the equitable use of technology envisioned in this chapter. Evidence also suggests that even though states are investing in new technologies, they aren't necessarily investing wisely or efficiently. Roughly 14,000 school districts across the country spend more than \$13.2 billion on over 6,000 ed-tech tools each year, but surveys suggest that only 15% is spent on tools that are a good fit and implemented correctly.¹¹⁷

Several independent groups like [Ed Tech Evidence Exchange](#) or [Learning Policy Institute](#) are stepping in, with philanthropic or nominal government support, to provide guidance or highlight best practices for certain aspects of advancing schools' use of ed-tech tools or strategies. But they cannot compensate for the lack of a national, coordinated effort that can:

- Shape policy more directly, including by working with other parts of government;
- Ensure diverse voices are involved in both shaping and implementing policies;
- Make large scale strategic investments; and
- Effectively share information at scale

To address chronic underinvestment at the national level, there should be a comprehensive National Educational Technology and R&D Strategic Plan, focused on ensuring efforts across all levels of government are complementary and on technological breakthroughs that have the power to transform education and promote equity.

10.6.3.1. The Department of Education should increase its in-house technical expertise and encourage state and local education agencies to do the same.

The U.S. Department of Education should create a CTO role, reporting to the Secretary, to work alongside the Education Technology Director, to advance policy and program initiatives around technology infrastructure, such as broadband access, device utilization, information security, data privacy, and data and systems interoperability.

Congress and the Department of Education should incentivize states and districts to create education specific CIO/CTO roles to develop strategy and coherent systems for equitable and inclusive technology access, adoption, and systems innovation, in addition to Education Technology Directors to set policies to increase utilization.

10.6.3.2. Develop a National Strategic Plan for Education Technology Research & Development.

The U.S. Department of Education should:

- Oversee the creation of a strategic plan for education technology research and development, and work closely with key partners to ensure that equity remains a central theme of that plan. The Department should seek input from the White House Initiative on Educational Excellence for Black Americans, the White House Initiative on Educational Excellence for Latinxs, the White House Initiative on American Indian and Alaskan Native Education, state and local leaders, and interested members of the public. In developing the strategic plan, the Department of Education may also consider input from other federal partners, such as Institute of Education Sciences, National Telecommunications and Information Administration, National

Science Foundation, Department of Defense, National Institutes of Health, and the Bureau of Indian Affairs, who may have overlapping areas of interest, as well as private industry.

- Establish the plan's research agenda by identifying priorities coordinated across all areas of federal education technology R&D investments, particularly in the areas of basic and applied research, and directed development efforts focused on specific problems and needs in K-12 education. The plan should also include estimated levels of investment, a description of the mechanisms that will be used to implement and oversee the recommended portfolio of R&D initiatives, and an explanation for how the proposed initiatives will advance equity.
- As part of the implementation of the plan, research and promote innovations across the spectrum of digital and equitable learning needs including content, features, tools, instructional approaches, etc. to create increased and more equitable student motivation, efficacy, and learning. Update this agenda regularly to account for progress.

10.6.3.3. Establish technical expertise and organizational infrastructure necessary to implement the education technology R&D Strategic Plan.

Congress should consider investing \$1B over 10 years in a major educational R&D effort to strengthen the state of educational innovation and capability.

The Department of Education should provide executive oversight and implementation leadership for the R&D Strategic Plan, and Congress should invest in building additional organizational capacity and technical expertise necessary to operationalize a visionary and robust R&D agenda expected from this Strategic Plan. For example, Congress could authorize the Department of Education to sponsor one or more Federally Funded Research and Development Centers (FFRDC),¹¹⁸ or a separate initiative within the Department of Education, similar to either the Advanced Distributed Learning Initiative in the Department of Defense or Advanced Research Project Agency - Energy (ARPA-E),

could be established within the Department of Education.

Historically Black Colleges and Universities (HBCU), Hispanic-serving Institutions (HSI), Minority Serving Institutions (MSI), or other universities with established expertise and programs focused specifically on using technology to meet the educational needs of minority students should be selected as partner laboratories or FFRDCs.¹¹⁹

The Department of Education and any federally funded research partners should also seek to leverage other sources of funding from private philanthropic organizations, with oversight by the government.

The Department of Education and partner institutions should pursue a comprehensive approach towards promoting the R&D agenda by:

1. Providing strategic and technical assistance for content and tool development funded through federal funding.
2. Supporting and funding product and design level work, through seminars, workshops, and multi-vendor/stakeholder design sprints to advance the innovation agenda.
3. Procuring or developing practical solutions to address specific ed-tech and equity problems, where the market is not meeting specific needs.
4. Incorporating agile approaches to curriculum development and authoring to speed up curriculum development, so that curricula can more quickly and easily evolve as technology evolves.
5. Recognizing that open educational resources (OER) can be a driver for creating more agile curriculum development, and encouraging the development of additional OER curricular products.
6. Recognizing that funding or developing open source, open standards, open APIs, and open data can speed up and improve the quality of technology innovation in education.

7. Promoting and convening “plugfests” to show how curriculum and technology tools can interoperate and create complete learning solutions that work for targeted student populations, creating coherence between curricula and delivery tools. Plugfests are events where creators and designers come together to demonstrate how their content and products can work with other content products from other creators and designers.

10.6.4. INVEST IN COHERENT, CULTURALLY RESPONSIVE, AND RELEVANT ONLINE LEARNING CONTENT AND TOOLS.

There has been a curriculum renaissance¹²⁰ over the last five years. The introduction of new standards in most states, an influx of cognitive science research into the educational landscape, which emphasizes the importance of building knowledge and conceptual understanding, and the proliferation of open educational resources (OER) have all contributed to an explosion in new materials. Several private and non-profit organizations have engaged in efforts to provide free or reduced cost learning content and tools, which are widely available to educators, families, and students. Some of those resources are also openly licensed and available digitally, so that educators and other organizations can improve on them and redistribute them for increased access.

Despite increased access, teachers do not always use those materials with all students. Teachers are expected to fill many roles in the lives of their students and tackle all kinds of issues, while also teaching rigorous, standards-aligned content. They are more often than not asked to do that with pieces of disconnected content that are not always optimized for digital learning, a handful of digital tools that are not integrated and which don't work with the content they have available to them, and limited support to make it all work together to provide a positive and coherent learning experience for students. Add to this the obstacle of having to do all of this remotely, and it is not surprising that the learning gaps for students are increasing during the COVID-19 pandemic.¹²¹

The TNTP, Inc. report, “[The Opportunity Myth](#),”¹²² describes a pernicious issue in K-12

education: Students believe they are getting an education that will prepare them for life after high school, but the quality of education many of them receive fails woefully to deliver on that promise. Without the effective knowledge, skills, funding, access, and support to set up coherent and integrated digital learning systems (e.g., structures, environments, learning management processes), and access to and support in using high-quality instructional materials that promote learning experiences which communicate that all students belong and can be successful (“identity safe” learning experiences), teachers are set up to perpetuate the opportunity myth.

Additionally, there is significant and ongoing research that has shown that learning environments which focus on identity safety,¹²³ cultural responsiveness (the sense that a student’s unique identity and culture is seen and embraced as an asset rather than an obstacle), and a growth mindset can lead to greater self-efficacy and increased motivation, engagement, and learning outcomes.¹²⁴ Relatedly, culturally responsive teaching has been shown to raise expectations for all students and create cultural competence.¹²⁵ Research has also shown that having a coherent curriculum from which to teach has contributed to improved learning.¹²⁶ However, there has never been a national investment in creating curricula that actualizes the findings of research in identity safety, culturally responsive teaching practices, mindset, and curriculum effectiveness.

10.6.4.1. Establish Curriculum Innovation Centers Specifically Focused on Equitable Online Learning.

Curriculum developments continue to lag technology developments. This became obvious during the COVID-19 pandemic as curriculum vendors, including several private and non-profit vendors developing open educational resources, scrambled to redesign their content. Given the lack of time, they resorted to putting out written guidance and relying on teachers to do the heavy lifting of actually revising the content and putting it into a technology delivery platform.

Learning content is often integrated into learning systems in haphazard or inadequate ways, resulting in learning experiences that

fall far short of what the content and the learning systems are actually capable of delivering. In addition, digital learning content is often designed for use in printed or PDF formats, and when it is adapted into interactive learning systems, its usefulness is impaired, often significantly.

Less well-resourced schools often have to make do with assembled curriculum and material, manually adapting those resources into whatever digital learning systems are accessible. If more learning content (especially openly licensed educational resources) were designed to work well within a variety of learning systems, more disadvantaged students could be engaged with content that works well for them.

To satisfy the need for continued research in what makes curricula effective in ensuring improved learning outcomes for students in lower income communities, communities of color, ELs, and students with special needs, the U.S Department of Education should create centers of excellence for curriculum innovation, which exist to research and find solutions to specific problems of practice for learning content and curriculum.

The focus of the centers should be on product innovation research, and development of student-interactive curriculum delivery systems and tools that enable the use of digital educational content that promotes equitable and inclusive technology use and identity safe learning environments. That may include prototyping various online learning platforms and features to determine which ones provide equitable access for all students, or on what features most support educators in implementing a culturally responsive curriculum with integrity. These centers may use openly licensed content and tools from the private and non-profit organizations to jumpstart the work.

In light of the above, the U.S Department of Education should:

- Establish Curriculum Innovation Centers to catalog and demonstrate best practices, and create and share OER Professional Development materials for supporting teachers around digital learning. Set up these Curriculum Innovation Centers either within the organizational capacity set up through the

R&D Strategic Plan, through existing FFRDC, or through State-run consortia.

- Convene a series of learning content design workshops to advance the state of the art on how to design and author content for digital platforms.
- Convene an ongoing series of learning content and systems plugfest conferences to demonstrate and explore how content can be effectively embedded into learning systems.
- Fund the development, adoption, use, and advancement of data standards for integrating learning content more usefully into learning systems and transferring content between content management and among learning systems.
- Develop and publish standards and best practices for content/platforms/teaching practices for technology-enabled learning environments.
- Disseminate information and make innovations from the curriculum innovation centers widely available, and tie them to competitive grant programs for communities interested in adopting methods.

10.6.4.2. Build Digital Curricula Designed for Equitable Use.

There is an enormous, untapped opportunity to push the creation of curricula which connects high quality, coherent digital content with advances in developing growth mindsets and in creating identity safe learning environments that are culturally responsive. Additionally, the digital curricula should promote the equitable and inclusive use of technology platforms, tools, etc. for content delivery and implementation.

In creating that curricula, the solutions should be developed by those in the communities who are most affected by digital inequities.¹²⁷ Those working with students most directly should be empowered with the best research in content, product, and learning design from the curriculum innovation centers, the support of experts in digital curriculum design and development and historically black colleges and universities (HBCUs), Hispanic-Serving

Institutions (HSIs), minority-serving institutions (MSIs), and the Bureau of Indian Affairs to create, distribute, and support the implementation of high-quality, coherent digital instructional materials which can be used flexibly for different tech-enabled learning environments and which are targeted at improving learning outcomes for students from lower income communities, communities of color, ELs, and students with special needs.

Additionally, to ensure that the curricula created are able to be widely distributed and used, those authoring the content will need to have increased access to culturally relevant texts and the rights to share those texts for educational use. To create such curricula, the U.S. Department of Education should establish a competitive grant program to award funding to States or a consortium of states to create, distribute, and support the implementation of high-quality, coherent digital instructional materials which can be used flexibly for in-person, remote, and hybrid learning, and which are targeted at improving learning outcomes for students from lower income communities, and black, indigenous, and students of color. Pursuant to this program:

- Grantees should create design and authoring committees of individuals from communities most affected by digital inequities, and work with the curriculum innovation centers and other curriculum and/or education technology vendors, as appropriate, to create, distribute, and support the digital curricula, which may include the creation of supporting digital products (e.g., websites, delivery platforms, applications, software). The materials developed should reflect the needs and cultures of the populations who use them.
- Grantees should demonstrate how they will maintain and continuously improve their digital curricula rapidly and efficiently, drawing on continued research and development in how to make the digital instructional materials more equitable and inclusive.
- Grantees should demonstrate to the Department of Education how they will fund the maintenance and continued use

of the digital instructional materials after they are released.

Also, Congress should consider taking legislative action to encourage copyright holders to grant educational digital rights of use for texts, without prejudicing their other rights.

10.6.4.3. Promote Collaboration and Sharing of Research to Improve Digital Curricula.

To encourage collaboration and sharing of research, best practices in content, product, and learning design, and open-source technology for wider use, there should be a yearly convening of grantees, researchers, education technology specialists, and others involved in the work of the competitive grants. During this time, grantees will get the opportunity to collaborate with other grantees and experts to improve their products. There should also be a focus throughout the competitive grants and the yearly convenings on studying the impact of the grant and whether it is creating more equitable and inclusive technology use, and whether and how more equitable and inclusive technology impacts learning outcomes for students from lower income communities, communities of color, ELs, and students with special needs.

While additional research is necessary and can be accomplished through the development of curriculum innovation centers, there is a need to make that research practical in the service of providing solutions for educators. As curricula are created and implemented, educators who work with students in lower income communities, communities of color, ELs, and students with special needs can provide much needed feedback on what works and does not in light of the research and then the curricula can be improved accordingly. This kind of information should be emphasized and made available as part of the yearly convening. The Department of Education should host an annual convening of grantees, researchers, education technology specialists that will focus on collaborating and sharing research, best practices, content, and digital tools developed as part of the competitive grant to improve the curricular products and ensure they reflect the needs and cultures of the populations who use them.

10.6.4.4. Create Coherent Digital Tools that Support the Use of Digital Curricula Designed for Equitable Use.

With the global pandemic, educators and families are having to provide instruction flexibly in different types of technology-enabled learning environments. Digital tools that educators are using must be integrated into the digital learning systems within schools, and they must work with the content teachers are using. Additionally, given that students are often learning at school and at home, students, educators, and families need consistently easy and open access to the digital products and tools (e.g., digital texts, websites, delivery platforms, applications, software) that enable the effective distribution and implementation of the high-quality, coherent digital instructional materials produced through the competitive grant. Without that access, the curricula go unused.

Some of those digital products and tools will be designed and created as part of the competitive grant process and should be done using open-source technology. Some digital products and tools will likely already exist, and states will select them for the distribution and/or implementation of their high-quality, coherent digital instructional materials. In these cases, it is important that the digital products and tools are built with open-source technology so that they can be accessed for educational use or the product owners should be encouraged to make the product openly available for educational use. Equitable and inclusive use of the technology should be promoted by having:

- The U.S. Department of Education require all digital content, online learning systems, tools, and resources produced under federal funding be openly licensed as the default, with exceptions granted only with publicly released justification.
- Congress appropriating funding incentives for video companies to open their infrastructure to educational systems (whiteboards, classroom management, process, etc.).

10.6.5. ENSURE STUDENTS HAVE SUPPORT FROM TEACHERS AND OTHER APPROPRIATELY TRAINED ADULTS.

As research has begun to show how much curriculum matters for learning, there has also been a shift in where to focus training and support for educators and families.¹²⁸ There is now a shift from training and support in creating content to training and support in implementing content, so that all students realize the intended outcomes of the curriculum.

The job of the teacher is to get really good at teaching, and the job of the family is to get really good at supporting students in their learning. However, this assumes that educators have access to a high-quality, coherent digital instructional materials which can be used flexibly for different tech-enabled learning environments, and which are targeted at improving learning outcomes for students from lower income communities, communities of color, ELs, and students with special needs, the necessary digital texts that are used with that curriculum, and the aligned digital products and tools needed to distribute and deliver that curriculum. If these assumptions are true, then they will be better equipped to create an equitable and inclusive learning environment.

However, that is just one part of the job of educators and families. Educators must also have the knowledge, skills, funding, access, and support to set up coherent and integrated digital learning systems (e.g., structures, environments, learning management processes) that promote equitable and inclusive technology use and promote identity safe learning experiences. Furthermore, educators must have the knowledge, skills, and support to use technology to prepare and deliver curricula and support all students equitably. If an educator has a high-quality curriculum and is expected to teach that curriculum digitally with no training on how to use the curriculum or the associated digital tools, then the likelihood that educator will be effective in implementing that curriculum is low.

10.6.5.1. Support educators during their transition to digital and remote learning.

Professional development and training for K-12 public school teachers has led to uneven

and unreliable outcomes, despite the billions of dollars invested in it.¹²⁹ Additionally, training and support often focus on classroom management or superficial details (e.g., strategies for grouping, questioning techniques, etc.) which can be boiled down into hour-long PowerPoint presentations. This kind of training doesn't advance teacher knowledge or skill enough to make a difference for student learning. Educators need training on how to set up identity safe and equitable learning environments and structures, and how to implement content using aligned tools in a variety of tech-enabled learning environments. While this needs to happen for current educators, there is a real need to ensure that those entering the teaching profession are equally as equipped.

- The U.S. Department of Education should provide funding to allow states to extend the development of equitable, technology-enhanced teaching and learning standards.
- The U.S. Department of Education should provide additional funding to states to develop and provide openly licensed professional learning materials and training programs specifically organized to help teachers work with minority and disadvantaged groups.
- The U.S. Department of Education should provide funding to state consortia to develop and provide openly licensed professional learning resources and training programs that are specifically aligned to the open educational digital curriculum used by those States.
- The U.S. Department of Education should establish a program to fund year-long digital learning residency programs for preservice teachers with a trained mentor teacher, focused on providing digital learning for schools in lower income communities and schools which serve a majority of communities of color, ELs, and students with special needs. Preference for funding should be given to HBCUs and HSIs.
- The U.S. Department of Education should provide additional funding, advocacy, and support for its "[Future Ready Leaders](#)" initiative, to train school and

state education leaders to be more knowledgeable about and effective with technology.

10.6.5.2. Support families and educators in establishing partnerships that enable greater coherence between learning digitally at home and school.

As we have seen with the global pandemic, families and other adults in communities also play an important and expanded role in the learning experience of students. As students were no longer able to go to school regularly, their homes and their communities became their classrooms. As such, there must be a dynamic partnership among families, educators, schools, and educational support organizations with a focus on supporting student learning. There should be increased interaction and coherence across in-school and at-home learning (e.g., technologies, tools, learning systems, content) led by educators and supported by families. Students should be able to access and use digital tools both in school and at home easily. Features like single sign-on can support this.

Additionally, families should also have the access, knowledge, and support to help students leverage technology outside of school, promoting equitable and inclusive technology use. Families need clear and actionable guidance on what technologies and digital tools are needed for learning, how to access them, and how to support students in using them. States should accordingly develop and/or update digital literacy content for students and families. Whether through SMS messaging or other familiar and easily accessible communication methods, families need consistent, clear, and open access to the guidance and information in how to support their learners outside of school.

- The U.S. Department Education should provide funding to states to provide greater coherence between the technologies and digital tools used at school and at home.
- State education systems should update digital literacy standards to incorporate a focus on supporting families and digital learning happening outside of the school building.

- State education and local education systems should develop communication systems and relevant content, so that they can easily and consistently share guidance and information with families about the digital learning content students are receiving in school and how to support student learning at home.

- The U.S. Department of Education should provide funding to develop digital resources for parents and educators around Transitional Kindergarten.

10.6.5.3. Support the development and adoption of online platforms that connect at-risk students with college students, recent graduates, and others willing to act as tutors, coaches, or other supports.

Digital platforms can support students far beyond the day-to-day activities associated with distance learning or online activities associated specifically with classroom instruction. Services such as one-on-one tutoring, supplemental small-group instruction, and personalized coaching to encourage students to plan for life after high school can play an important role in helping students succeed.

Individualized tutoring is a proven intervention that improves children's educational competencies and increases their self-confidence.¹³⁰ Online platforms that deliver a tutoring curriculum addressing the concepts with which students need additional time and support can make it easier for qualified tutors to provide students with support during school and after hours. Other philanthropically funded groups at the state level like the [Tennessee Tutoring Corps](#) were created specifically to help stave off the "COVID slide" of learning loss likely to occur as a result of the educational disruption caused by the pandemic.

In addition to tutoring, organizations like [Beyond12](#) rely on mobile applications to connect students with personal coaches, and track progress towards transitioning from high school to college and beyond.

While the technology is novel, the value of all these services depends primarily upon their ability to connect individuals who are willing and able, and who have access to high-

quality tutoring content to help students who need assistance. Many of the organizations closest to at-risk students may lack funding or the technical expertise needed to develop those sorts of solutions. Groups with funding and technical expertise, similarly, may lack the access to high-quality tutoring content or cultural connections to communities or individuals most likely to connect well with at-risk students to attract individual users that make the service valuable.

The federal government can help bridge these gaps by promoting existing applications that serve at-risk students or funding the development of new services aimed at at-risk students or groups whose needs are not being met by existing solutions. The government can also encourage participation from existing government employees, offer additional financial assistance to the organizations operating these platforms to attract individuals who can serve as tutors, coaches, or offer other individual support to students.

The Department of Education should support the creation and development of platforms that can connect at-risk K-12 students to supplementary services like individualized tutoring or coaching by:

- Providing financial support to grantees who are willing to make these platforms available to at-risk students free of charge, and who have the organizational capacity to attract tutors and students in need of the services.
- Investing in the development of open-source platforms that local organizations can easily white-label to create platforms of their own.
- Hosting an online platform to help students, teachers, parents, or interested volunteers identify resources such as local organizations that provide additional support, including individualized tutoring and coaching.

10.6.6. FUND EDUCATIONAL-FOCUSED TECHNOLOGY STANDARDIZATION AND INNOVATION ACTIVITIES FOCUSED ON DATA USE, INTEROPERABILITY OF CONTENT, AND DIGITAL PRIVACY AND SECURITY.

With the immediate disruption of in-person instruction, vendors, educators, and families have been scrambling to figure out how to navigate remote learning. One approach that has been used is to make non-educational digital tools and applications available for free educational use for a limited amount of time. While this has helped solve immediate access problems, these kinds of practices risk creating longer term issues that could further perpetuate inequities in technology use.

For example, if educators build lessons based on short-term access to a digital application and then that application is no longer offered for free, will educators and families be able to afford the costs to continue using the application, or will teachers have to locate another tool and rebuild their content? Additionally, if the applications and tools educators and families are using were not built for educational use, do those applications and tools have the appropriate data use, privacy, and security needed by law for student data? Can the data gathered through those tools and applications be accessed by educators and families?

The security of students' data as well as the schools' infrastructure are an important but generally overlooked and underfunded area of Education Technology. To start, schools, educational support organizations (e.g., nonprofits that offer educational programming, tutoring organizations), educators, students, and families need to be confident in the reliability and security of the technology they are using for digital learning in school and at home.

Inequities in student access and progress are often hidden in areas where data are not collected, or not used effectively. The lack of systems interoperability, data access, and needed standards and innovation tools often impede the ability to serve all students, and particularly to ensure that each student receives the support they need.

Accurate, timely data about every student is vital for providing effective services, especially in large urban school systems, where struggling students or students with special needs are more easily overlooked.

10.6.6.1. Unlock the underutilized value of data.

Data have the potential not only to help us better understand how and why technology systems are helping students learn, but can themselves act as an intervention, targeting resources where need is greatest, the discontinuation of strategies that are not proving fruitful, and the acceleration of those that are. But to serve this powerful role, several critical revisions must be made to create better alignment and focus, to strengthen the data infrastructure, and to build necessary transparency.

According to the Committee on Developing Indicators of Educational Equity from The National Academies of Sciences and Engineering and Medicine, “To be useful to policy makers, educators, and other stakeholders, two types of equity indicators are needed: (1) indicators that measure disparities in students’ academic achievement and attainment outcomes and engagement in schooling; and (2) indicators that measure equitable access to resources and opportunities, including the structural aspects of school systems that may impact opportunity and exacerbate existing disparities in family and community contexts and contribute to unequal outcomes for students.”¹³¹

Measuring success against the goals above will require investment in significant capacities in data collection and data integration. Understanding the benefits of the investments recommended here will require multivariate analysis and multi-modal data collection, which should include the lived experiences of teachers, students, and parents whose capacity we are looking to expand. As a baseline, there is a need to track change in the following rates over time:

- Percent of students powerfully and persistently connected to digital learning opportunities (by state, race, gender, class, grade level, school type, community and home language, special needs, and school type).

- Average costs borne by families to connect to digital learning opportunities powerfully and persistently (by state, race, gender, class, grade level, school type, community and home language, special needs, and school type).
- Student performance variation by connection to powerful digital learning opportunities (by state, race, gender, class, grade level, school type, community, and home language, special needs, and school type).

In all of these we would be looking for the impact of equitable resourcing on the rate of growth, i.e., the students furthest from success, who pay the least and who grow the most over the same period.

Once the measure of baseline success is possible, we need to understand how the learning system infrastructure changes based on the investments suggested herein:

- Percent of teachers trained to integrate tech-based, culturally responsive materials in their instruction.
- Percent of teachers effectively leveraging on-line learning as a part of their classroom instruction.
- Percent of teachers using technology to connect with parents on the learning needs of their students.
- Percent of schools and districts able to achieve and maintain 100% online enrollment in district sponsored platforms.
- Percent of families who are using effective tools and resources to support their children and connect with their teachers.
- Variations of these data based on the demographics of interest (by state, race, gender, class, grade level, school type, community and home language, special needs, and school type)

Lastly, we need to understand whether changes measured in the first two groupings influence patterns of achievement and attainment. In short, we need to see some of

the long-standing gaps in achievement and attainment begin to close:

- Percent of students on grade level at 3rd grade in reading and, mathematics.
- Percent of students successfully passing algebra by the end of 8th grade.
- Percent of students meeting high school readiness standards by 9th grade.
- Percent of students graduating on time.
- Percent of students graduating college and career ready.
- Percent of students enrolling in 2 and/or 4-year colleges.
- Variations of these data based on the demographics of interest (by state, race, gender, class, grade level, school type, community and home language, special needs, and school type)

Additionally, to establish robust systems which will make it easier to collect these data:

- The U.S. Department of Education should provide direct, competitive grant funding for the development, adoption, use, and advancement of data standards for electronic education records. This funding should include efforts to increase the accuracy and the timeliness of electronic education records.
- The U.S. Department of Education should set specific learning record interoperability targets for schools receiving Federal funding to enable the movement of learning data securely and with explicit authorization, both between systems within a school system, and between school systems and states, where appropriate.
- The U.S. Department of Education should fund additional investments in State Longitudinal Data Systems to improve data quality/accuracy, scope, security, and timeliness of the data collected by these systems.

- The U.S. Department of Education should fund data systems upgrades to school financial and educational program systems, to enable schools to effectively track the progress and investment in educational services, cost, and progress of each individual student.
- The U.S. Department of Education should fund the development of more specialized and capable interoperability standards to ensure easier transfer of content and data across technical platforms.
- US Government entities such as the U.S. Department of Education, the Federal Communications Commission, and other federal agencies should collate and publish data on their use of funds around technology in an easily located and navigable website hosted by the U.S. Department of Education.

10.6.6.2. Ensure learning data are secure and private.

Students deserve privacy protections to secure their information and protect it from unauthorized use. While legally mandated, information security in education is often overlooked and underfunded.

- The U.S. Department of Education and state education agencies should require schools who invest in technology using their funding to ensure the products they purchase comply with Information Security and Data Privacy Standards. While not unique solutions, the Student Data Privacy Pledge program, the Student Data Privacy Consortium, and Project Unicorn interoperability, as well as ISTE's emerging Ed Tech Product standards work, represent potential requirements that would assist schools in identifying qualifying products.
- The U.S. Department of Education should host an ongoing series of information security and privacy plugfest conferences to demonstrate and showcase products that meet information security and data privacy standards, and to encourage and educate vendors and educators on how to acquire, configure, and operate technology with effective security and privacy.

10.6.7. IMPROVE THE ACCESS OF STUDENTS OF COLOR AND OTHERS TO EDUCATIONAL EXPERIENCES THAT WILL IMPROVE THEIR ABILITY TO UTILIZE THE TECHNOLOGY.

10.6.7.1. Assure computer science is part of every student's educational experience.

We recommend amending the Elementary and Secondary Education Act to add "Computer Science" to the list of subjects for which states create academic standards. Currently, that list requires "mathematics, reading or language arts, and science" to be part of the base curriculum for all K-12 students nationwide. Computer science should be added to the list.

10.6.7.2. Revive Rural and Minority STEM Scholarship Program.

We recommend reviving and improving the now-defunct "SMART grants" which were a smaller scholarship program for students studying STEM that ended in 2010. To do so, the Department of Education should fund scholarships for students of color and students from rural communities studying STEM in undergraduate, graduate, or certificate programs.

Chapter 11.



HIGHER EDUCATION AND A RESEARCH AND DEVELOPMENT AGENDA

11.1. PROBLEM STATEMENT

While colleges and universities have some of the best networks and highest levels of connectivity in the world, problems persist. Some students, forced to study from home or facing greater economic difficulty due to COVID-19, risk being disconnected from an education that increasingly relies on broadband at home. A larger problem is that colleges and universities remain an underutilized resource for digital equity and inclusion. Colleges and universities that directly serve students negatively impacted by failings of digital equity and inclusion often lack the resources to assist students in developing skills to thrive in the digital economy and society. Broadband skills and resource that are in abundance in leading universities has not been tapped to reach locations where robust networks are absent. Research has failed to close the gaps in performance in our current educational system with digital solutions.

11.2. VISION

Today, some American campuses enjoy the highest performing networks, highest adoption rates, and most effective use of digital technology anywhere in the world. We should engage knowledge transfer, so that all colleges and universities, particularly those institutions educating disadvantaged

students, can enjoy the same benefits, improving utilization, enhancing education, and providing equal opportunities.

11.3. GOALS

- All college and university students stay connected, regardless of their financial

situation and the mode of classroom instruction.

- Existing and underutilized university and college talent is used to help those institutions educating disadvantaged students.
- Existing and underutilized university and college resources are used to help connect unserved or underserved communities.
- Greater research on digital education and how it can improve outcomes.
- The development of best practices for using digital education to build a more equitable and inclusive society.

11.4. BACKGROUND

11.4.1. THE OPPORTUNITY UNIVERSITIES AND COLLEGES TO IMPROVE DIGITAL EQUITY AND INCLUSION.

Viewed from the outside in, universities and colleges encapsulate many of the problems caused by a lack of digital equity and inclusion. Poor relationships between campuses and surrounding urban centers are hardly new and have grown to include gaps in digital access and opportunity.

Plato's academy set up shop outside the walls of the city of Athens to escape the mundane concerns of life in the city. Centers of learning moved back into the city when it was convenient to share and make common purpose of available infrastructure. Medieval Oxford University, for example, appreciated the availability of town water and early sewage systems. Dozens of Oxford scholars died during an "invasion" of the campus by local townspeople. Infighting and deteriorating relations between the university and the town led to a spin off university called Cambridge.

About 50 years ago, in some of American's great research universities, the infrastructure of what would become known as the Internet was being designed and to connect parts of the same institution in different locations, across town or across the country. These new networks, as with previous academic

infrastructure, bypassed surrounding communities. The Internet opened new opportunities for the universities and surrounding research parks, as well as the campus-like settings of new Internet enterprises. But those in the urban centers surrounding the campus were left out.

The time is right for colleges and universities to re-think community service, the traditional third pillar of academic life that includes learning and research.

Universities and colleges can collaborate with city and private sector partners to help address the broadband availability, adoption, affordability, and utilization gaps. Universities are uniquely positioned to provide engineering expertise, technical support, and outreach and digital literacy support to promote adoption. Universities and community education partners also control educational content that can be leveraged to fulfill the vision of universal learning.

11.4.2. THE IMPORTANCE OF CONTINUED RESEARCH AND DEVELOPMENT FOR IMPROVING OPTIONS FOR AVAILABILITY, ADOPTION AND UTILIZATION.

Federal investments in research and development, coupled with private research and product development, have created the robust broadband ecosystem users enjoy today. In the 1970s, research funded by the Defense Advanced Research Projects Agency (DARPA), and later the National Science Foundation (NSF), played a vital role in the development of Internet protocols. In the late 20th century, likewise, American companies led in the development of nearly all of the key technologies involved in digital networks, including digital switching technologies, optical communications, cellular communications, Internet hardware and Internet applications. These investments facilitated the creation of multibillion-dollar companies that are global leaders in networking, search, and other Internet-based businesses.

As with other key technologies, R&D activity drove innovation and productivity gains, which aided economic growth. The National Research Council found that in the case of information technology (IT), "The unanticipated results of research are often as important as the anticipated results." Further,

“[t]he interaction of research ideas multiplies their impact,” and “[p]ast returns on federal investment in IT research have been extraordinary for both United States society and the United States economy.”

America’s top research universities and laboratories continue this R&D leadership. Their efforts accelerate the pace of innovation, placing next-generation technology in the hands of individuals, investors, and entrepreneurs. The next generation of networks will undoubtedly lead to even more exciting, unanticipated discoveries that will improve how people connect, work, learn, play, and contribute online.

The broadband ecosystem—networks, devices, and applications—has benefited from research breakthroughs in a variety of areas, including networking, software, semiconductors, material sciences, applied mathematics, construction, and engineering. Continued investment and advancement in all these fields, and many others, is essential for future innovation. For U.S. companies to continue leading in the global broadband ecosystem, they must continue to generate and benefit from scientific innovation.

The gap between R&D returns for private companies, on the one hand, and those for society on the other, however, presents a challenge. Government can help fill an R&D investment gap by funding research that would yield net benefits to society, but that would not earn sufficient returns to be privately profitable, or at least not on a predictable timetable. The federal government needs to create a clear agenda and priorities for broadband-related R&D funding in particular. The government can also promote R&D through regulatory policies that promote increased use of government resources, such as by establishing research centers of excellence, or allowing experimental access to radio spectrum to evaluate new technologies in ways that theoretical studies and simulations cannot.

11.5. RECOMMENDATIONS

11.5.1. KEEP ALL STUDENTS CONNECTED WITH FREE TECHNOLOGY LOAN PROGRAMS FOR STUDENTS.

Universities and colleges should ensure that students remain connected. Many students enrolled at American’s colleges and university now live in poverty. Half of community college students and nearly half of four-year college students experience food insecurity. More than a third of college enrolled students have insecure housing, many with nowhere to live other than a car or on the street.

During the pandemic, colleges and universities, in part through funds provided by the CARES legislation, have made hundreds of thousands of laptops and hotspots available through library lending programs, keeping computing labs open, and using personalized notification systems to keep all students motivated. While these efforts are far from perfect, colleges and universities have demonstrated that it is possible to close the adoption gap through intentional policies and commitments to at-risk students and employees.

As the state of the classroom remains uncertain, future COVID-19 relief packages should ensure that all institutions of higher education have the resources they need to keep students connected.

11.5.2. USE UNIVERSITY RESOURCES TO HELP THOSE INSTITUTIONS SERVICING THOSE WHO HAVE BEEN DISADVANTAGED BY THE DIGITAL DIVIDE.

As discussed in Chapter 10, failings of digital equity and inclusion affecting K-12 students is about more than networks, devices, and other technology. There is also a need for teachers and students to utilize technology to improve educational outcomes. Institutions of higher education whose mission is to serve the disadvantaged, specifically community colleges and HBCUs, are generally those most lacking in resources to help students develop skills needed to thrive in the digital economy. Congress acknowledged and acted on this concern in its December 2020 COVID-19 relief package, appropriating \$285 million to NTIA to for a grant program for HBCUs, Tribal Colleges or Universities (TCU), a minority-serving institution, or their respective consortiums, for the purchase of broadband Internet access service, or any eligible equipment, or to hire and train information technology personnel.

That amount, however, will not be sufficient to fully address the need. Further, community colleges have not received new funding. We need to supplement Congressional efforts by applying underutilized resources in other institutions of higher education, particularly the technical expertise of faculty and students, to address unmet needs.

11.5.2.1. Create A National Urban Service Education Project (NUSEP).

NUSEP would advance a new role for America's colleges and universities, encouraging them to scale up their involvement with and commitment to assisting K-12 institutions in improving utilization of digital tools. The project would create a network of National Service Universities, and a coalition of university partners, HBCUs, community colleges and national urban organizations, working together to design, promote, and support scalable and sustainable adoption practices informed by the needs and priorities of those it serves.

The project would build on existing infrastructure that encourages students to perform public service and otherwise supports intentional and sustainable participation in community life by colleges and universities by extending their physical facilities and program offerings. For example, dental medicine students may participate in community dentistry curriculum, and provide oral health sealants to all school-aged children in a local metropolitan school district. Social work departments are co-locating in public housing facilities and mental health facilities. Engineering students and fashion design students are setting up techshops, fablabs, and hackerspaces embedded in the local community. College clubs may likewise support Girls Who Code, or offer computing classes to those living in homeless shelters to help them apply for public housing. Community service learning programs offer college students an opportunity to assist small local businesses get online and set up e-commerce sites. Business and economic students are partnering to deliver digital financial literacy to residents of senior citizen facilities.

The project would build on these efforts, but provide a national platform through which programs can be evaluated, best practices can be identified, and practitioners can come

together to discuss how to continually improve on the effectiveness of their efforts. The project could be housed in the Digital Equity and Inclusion Office, discussed in Chapter 4.

11.5.3. USE UNIVERSITY RESOURCES TO HELP CONNECT COMMUNITIES WHERE CONNECTIVITY REMAINS A PROBLEM.

As discussed in Chapter 3, our country has a significant availability gap. The Plan proposes numerous methods for closing that gap.

But it may be that there are areas where neither market forces nor government support will fully close the gap. In those areas, we should consider whether, in addition to or as alternative, there are university resources that can be called upon. America's colleges and universities are among the most connected "cities" in America. When an institution acquires property around its campus for housing or other services, the communications network is often extended beyond the traditional boundaries to connect these new assets.

Likewise, universities and colleges who are now extending Citizens Band Radio Services (CBRS) networks, using shared spectrum, to support the wireless needs of the campus and extend wireless beyond the traditional campus. Low-powered wide area radio networks (LoRa) are specifically designed to extend research, monitoring, and the burgeoning Internet of Things networks that touch both the campus and extend well beyond it. Millimeter Wave mesh wireless networks are used by campuses to support point-to-point (connecting one building to another) or multi-point (one building to more than one building) at very high speeds.

In addition, we note that the broadband service levels we expect to become ubiquitous will not serve every need. It is likely that some kinds of institutions, such as those providing STEM education or health care, may need upgraded or otherwise different kinds of connectivity.

Every major research university is using tools known as software defined networking to provision different kinds of networks for different kinds of users with different attributes across the campus. As an example, the network needs of a research lab working on

high energy physics is very different from the needs of students majoring in English. Software defined networking allows providers to provide virtual “swim lanes” unique to the specific needs of different user groups.

Using these and other resources, technologically advanced, colleges and universities should partner with other public sector technology leaders along with legacy, incumbent, and new entrants in the communications marketplace, to assure that specialized needs for institutions serving low income and communities of color, including HBCUs, and community college, obtain the networks they need to advance digital equity and inclusion.

11.5.4. FOCUS RESEARCH ON UNDERSTANDING HOW DIGITAL EDUCATION CAN IMPROVE OUTCOMES AND OVERCOME PERSISTENT PERFORMANCE GAPS.

The pandemic forced educators across the country to flip the entire education delivery model to remote everything. Key lessons regarding availability and adoption across the education landscape were learned, often painfully. One major and largely unanticipated challenge was the absence of a 21st century pedagogy for teaching 100 million learners, based entirely on a live remote model. Once a vaccine is widely deployed, we will likely be faced with new questions regarding classroom experiences. Should we go back to the previous approach, support the continuation of 100% live remote offerings, or evolve a hybrid model based on the insights of educators and the preferences of families and their students? The response to that question the coming years may be as important as any development in education for the last century.

To help resolve these issues, the Administration should commission the President’s Council of Advisors on Science and Technology (PCAST) and the National Research Council to urgently assess and present the potential for 21st century, technology-enhanced, adaptive, and personalized learning opportunities, based on lessons learned from the global pandemic. It is now twenty years since the publication of Bransford et al’s *How People Learn: Brain, Mind, Experience, and School*, which presaged the need for comprehensive

insights on the potential and risks of fully immersive, digitally remote learning into the 21st century. The time is right to investigate our capacity to leverage human knowledge, augmented by the Internet, and mediated through both human and machine interactions. The academic research community, in partnership with HBCUs and community colleges, working across disciplines including cognitive science and educational technology research, should be engaged in documenting, assessing, and recommending how we preserve and advance the art and science of learning. Particular attention should be paid to digital tools that can help overcome persistent performance gaps that have characterized educational outcomes in our current system.

11.5.5. UNDERSTAND AND HONOR BEST PRACTICES FOR USING DIGITAL EDUCATION TO BUILD A MORE EQUITABLE AND INCLUSIVE SOCIETY.

The COVID-19 pandemic tested our educational institutions as never before. Many efforts, understandably, were disappointing, but some schools, administrators, and teachers seized the moment to create effective platforms for digital education.

To recognize that achievement, the White House should convene a ceremony for *America’s Great Teachers During the COVID-19 Pandemic*, nominated by students and institutional leadership, honoring their commitment, innovation, and resilience. The White House and OSTP, in partnership with NSF and other agencies and private companies, has previously used its convening power to advance and celebrate STEM education through White House Olympiads and the like. As the country works its way through the pandemic, the White House should similarly recognize urban teachers, rural community teachers, elementary school, middle school, high school, community college, and university teachers exemplifying the best of human ingenuity, adaptation, and commitment to the craft of teaching.

11.5.6. THE FEDERAL GOVERNMENT SHOULD CONTINUE TO FOSTER THE DEVELOPMENT OF RESEARCH NETWORKS AND BROADBAND TESTBEDS THROUGH A CLEAR R&D FUNDING AGENDA THAT IS FOCUSED ON DIGITAL NETWORKS, EQUIPMENT, SERVICES, AND APPLICATIONS, WITH A PARTICULAR FOCUS ON DIGITAL EQUITY AND INCLUSION.

11.5.6.1. Support efforts to identify, develop, test, and deploy applications of digital technologies that could foster economic and social mobility.

As discussed in Chapter 8 on workforce development, there is a mismatch between the jobs people from communities of color and low-income communities often have training to do and the jobs of the future. In that light, the government should seek to identify, develop, test, and deploy applications of digital technologies that foster economic and social mobility, including development of a technology-enabled, short-term workforce training that can enable low-income workers to obtain the skills they need for higher-paying jobs.

There are several barriers to such an effort. The federal government currently undertakes significant investments aimed at harnessing science and technology to achieve some goals (national security, health, energy, space, basic science), but not others (education, workforce development, economic and social mobility, racial disparities). As a result, agencies like HUD, Education, Labor, and the human service components of HHS have little or no capacity to engage with researchers and entrepreneurs to develop and deploy breakthrough applications of technology that would advance equity and inclusion.

Further, while there are notable private and philanthropic efforts offering online education and training, the private sector systematically underinvests in applications of technology that serve low-income communities. For example, there are currently approximately 36 million adults reading at the third-grade level or below, yet no private enterprise has committed itself to developing tools to solve that problem.

In addition, the development and rigorous evaluation of technology-enabled solutions is likely to be characterized by high fixed costs but low marginal costs—meaning that upfront costs may be substantial, but that, once developed, the resulting tools can be deployed widely and cheaply. Government social spending is not generally organized to support scalable applications. Funding is historically provided as a block or formula grant to states. States in turn then typically provide smaller amounts to local service providers. There is no national approach to developing scalable applications.

There are, however, examples of how such an approach could pay significant dividends. Over the last decade, DARPA sponsored the development of [a digital tutor by a Silicon Valley firm](#) that uses AI to model the interaction between an expert and a novice. Navy recruits who use the tutor to learn IT systems administration can outperform Navy experts with 9 or more years of experience. The firm believes that, with an investment of \$40 million, they could adapt their technology to dramatically improve the performance of students who are currently failing 8th grade math. Although this is the kind of experiment worth doing, the Department of Education does not have the capacity to support it.

11.5.6.2. Support R & D efforts in developing alternatives to current network architecture, particularly relating to 5G.

One of the most promising developments in broadband is the deployment of 5G mobile networks. Over time, 5G holds the promise of greatly improving the coverage and availability of broadband networks, increasing competition and reducing costs to consumers.

5G technology can also be used to improve both the character and quantity of jobs in the United States. One promising example involves the development of Open Radio Access Networks (ORAN). Today, mobile operators rely exclusively on closed, end-to-end Radio Access Networks (RAN), hardware and software primarily supplied by non-American companies. The current RAN Architecture is based on proprietary interfaces, which increases the costs of deployment and upgrades. Industry has begun to coalesce around a different approach, which utilizes a non-proprietary,

multi-vendor ORAN, an approach that has already demonstrated its ability to lower capital and operational costs. That in turn, can improve the economics for closing the availability gap, enabling broader deployment and adoption by lowering the costs to build and therefore the price to use.

The federal government can support and accelerate the ORAN effort through R & D efforts including the following:

11.5.6.2.1. Create an innovation fund to spur R&D and deployment based on open, interoperable standards, including ORAN, and software-based wireless technologies.

To accelerate the development of ORAN, the federal government could, as it has done with other technologies, create an innovation fund that would help the private sector create viable 5G alternatives from all ends of the supply chain, while at the same time laying the foundation for increased employment in the United States. Such a fund could be managed by NTIA, with input from the Defense Advanced Research Projects Agency (DARPA), the National Institute of Standards and Technology (NIST) and the FCC, among others.

11.5.6.2.2. Design a program to incentivize investment and job creation in the U.S. by offering R&D credits and other incentives for network technology suppliers, including incentives to contract with minority owned enterprises.

As has been true of other industries where global leadership began with federal government support, there is an opportunity to improve the competitiveness of the U.S. in next-generation mobile networks based on targeted incentives to build local capacity. Policymakers should include in such efforts specific incentives for contracting with minority owned enterprises.

Chapter 12.



GENERAL GOVERNMENT SERVICES

12.1. PROBLEM STATEMENT

As documented in Chapters Three and Four of this Plan on the availability and adoption gaps, digital equity and inclusion requires all Americans to have networks available to their communities, the means to afford broadband and the skills necessary to use it. But it also requires that those providing services to low-income and communities of color also have the necessary digital tools to provide those services in an effective manner. There are a myriad of ways that government could be more effective in delivering such services but, unfortunately, many government IT systems are outdated, government budgets are constrained in upgrading and maintaining digital infrastructure, government agencies do not face competitive pressures that force private sector actors to stay on the cutting of digital services and to prioritize citizen-centric experiences.

These problems all result in a lack of innovation and poorer service that negatively impacts all Americans, but they have a particularly problematic impact on those who depend more on government services. Further, there are several government technology shortfalls, such as with mobile transfer payments and mobile applications that disproportionately affect lower income persons and communities of color who rely more on mobile phones than the general population. The current situation also creates a data divide, where certain communities do not have sufficient data collected about them, creating social and economic inequalities. In

addition, there are opportunities, such as by creating APIs to enable non-governmental organizations to link Americans to services, to better serve low-income and communities of color that our country has utilized.

12.2. VISION STATEMENT

We should have our government institutions improve their online services to offer solutions on par with the best private sector actors, where competition drives continuous innovation. The government should take advantage of digital technology to make it

easier for all persons, but particularly those from low-income communities and communities of color, to understand and benefit from the full range of government services, interact with those services, such as in making or receiving payments, and in enabling non-government organizations to assist Americans receive the help they need. The government should also collect data that fairly represents the activity of all Americans, not just those currently online.

12.3. GOALS

- Surveys should reflect that Americans are as satisfied with their interactions with government digital interactions as they are with the best private sector actors.
- In order to improve usability and measure use, by the end of 2021, all federal and most state and local government agencies should monitor and report metrics about their website performance to a public dashboard.
- By the end of 2022, interactions with federal government websites should be as easy to do on a mobile device as on laptop.
- By the end of 2022, all government forms should be able to be accessed and filled out online.
- The government should end the data divide by collecting data that fairly reflects the activity of all Americans, not just those currently online.

12.4. THE CURRENT SITUATION

Broadband provides access to critical government information and services, such as obtaining reliable health information, applying for and receiving government benefits, searching for community news and activities, and accessing voting resources. Many government agency leaders recognize that citizens and businesses have grown accustomed to high-quality digital services in the private sector and increasingly expect the same from the public sector, whether it is on their mobile device or personal computer.

Even before the COVID-19 pandemic, many federal government agencies have been pursuing digital strategies to improve government service delivery and organizational efficiency. Unfortunately, governments at all levels often fail to meet the standards set by the private sector or leverage the full potential of emerging technologies to deliver better and more efficient services. There are several reasons this is the case.

First, many government IT systems are outdated. The Government Accountability Office (GAO) has identified multiple federal government IT systems that are more than 30 years old, with some over 50 years old.¹³² Another GAO analysis found that only about 11 percent of federal IT systems run in the cloud.¹³³ One recent analysis found that the federal government had more than 930 million lines of code using more than 70 obsolete programming languages, like COBOL and Fortran.¹³⁴ These systems not only present significant security risks, but they also can be difficult and expensive to maintain, especially when agencies cannot find programmers with this experience or must pay a premium for their services. GAO sampled 10 legacy systems in the federal government and found that they cost \$337 million per year just to maintain.¹³⁵ These systems make it harder for government agencies to provide the kind of seamless, online experience citizens expect.

Second, agencies typically do not receive sufficient funding to invest in necessary IT upgrades, let alone state-of-the-art innovation in adopting new IT systems and applications and using them in cutting-edge ways. Federal agencies have massive IT budgets, but most of this funding goes to operations and maintenance: “keeping the wheels from falling off.” The federal government spent more than \$90 billion on IT in 2019, but 80 percent of these expenses went to operating and maintaining existing systems, up from around two-thirds a decade earlier.¹³⁶ Upgrading IT systems requires substantial investments, even if they reduce operating costs in the long-run, and appropriators at all levels of government usually prefer to commit funds to other purposes.

Third, government agencies do not face competitive pressures that force private sector actors to stay on the cutting of digital services and to prioritize citizen-centric

experiences—people do not move to another jurisdiction because their government’s website is lousy.¹³⁷ In contrast, when a private sector firm fails to effectively embrace the Internet, it loses market share, its profits shrink, and it may go out of business. That focuses the mind of business leadership. As a result, the bar for excellence is relatively low and government agencies tend to lag in effective digital adoption, which affects their performance and how citizens feel about these government institutions. And all too often, online or “e-government” services are organized around the interests and needs of the particular agency, rather than the citizen or business user. To take one example, Montgomery County, Maryland was named the top digital county in the United States in 2019, yet its citizens rate their experiences on county websites as mediocre, at best. But, compared to other counties, Montgomery County received top marks.¹³⁸

Moreover, government services must be usable for everyone cannot merely cater to a target market. Governments must build digital experiences that can be used by the less literate, less digitally literate, non-English speakers, and citizens of all ages, backgrounds, and disabilities. This makes usability and user testing even more important for government products at all levels. Unfortunately, government products frequently lag private-sector equivalents in terms of usability and user testing. This is why usability is the first goal of this chapter and is featured across multiple recommendations.

Recently enacted bipartisan federal legislation has prioritized efforts to digitize government: the 21st Century Integrated Digital Experience (IDEA) Act requires government agencies to produce modern, mobile-friendly websites, mobile applications, and online forms; the Modernizing Government Technology (MGT) Act established the Technology Modernization Fund, albeit initially with only around \$100 million to fund IT modernization projects in federal agencies; and the Open, Public, Electronic and Necessary (OPEN) Government Data Act mandates federal agencies to publish information online, using standardized, machine-readable data formats.¹³⁹

While all helpful, these initiatives have had relatively little funding, as has been the case in most states and localities.

12.5. RECOMMENDATIONS

To improve online government services, as well as government adoption of digital technologies more broadly, there are several things governments should do. We have organized these into three sections.

12.5.1. EMBED INNOVATION IN GOVERNMENT.

At the core of improving digital government is innovation. Americans experience innovation every day, and they expect continued innovation. But innovation is hard and is often not seen as essential to accomplishing the mission of government. As a result, it is as if the government is living in a 20th-century analog world full of bureaucracy, paper, and delay, with users of federal services suffering from higher costs, less functionality, and lower quality.

There are several unique challenges that make innovation in government more difficult than in the private sector. Federal agencies suffer from all the limitations large businesses suffer from—including bureaucracy and middle-manager resistance—plus a host of other challenges unique to government. First, it is harder for older organizations to innovate, because innovation would require challenging a status quo that, for federal agencies, is decades old. In addition, compared to businesses, agencies have limited funds to pursue novel ideas. Finally, unlike private companies, agencies face no competition that will take their market away if they do not innovate, but they do face consequences if they try to innovate and fail. This means senior government leaders have little incentive to innovate, and even significant disincentives to do so, therefore opportunities to pursue digital innovation get short shrift.

While there are many steps that government can take to pursue digital innovation, these steps would be strengthened by embedding innovation into the DNA of government itself. By transforming itself through a combination of bottom-up efforts that foster innovation and top-level leadership that encourages and

prioritizes innovation, the federal government can improve the lives of Americans, boost productivity, and restore faith in government.

12.5.1.1. Establish a position of Chief Innovation Officer within the White House.

The major challenge in transforming the federal government into an innovation-based enterprise is that there is no one who “owns” the challenge. Presidents do not have the time or usually the inclination to focus on innovation. And they face little electoral consequence for not innovating. If voters must fax in an employment form to the Office of Personnel Management (OPM) instead of emailing it, this issue likely won’t be the key one that swings their votes. As a result, issues of innovation are relegated to the second tier, with agencies generally having leeway to call their own shots. At the same time, political appointees running agencies all too often ignore the innovation agenda in favor of a more front-facing political agenda. Why do the hard work of improving the internal operations of an agency when the average tenure of political appointees is just two-and-a-half years? In short, no one is on the bridge steering the federal “ship” toward innovation.

To solve this, the next administration should establish a chief innovation officer (CINO) whose responsibility would be to coordinate and drive innovation within the federal enterprise. The CINO would complement the chief technology officer (CTO), whose role should be focused on supporting technological innovation in the broader society and economy, and the federal chief information officer (CIO), whose job is to focus on the federal IT enterprise. The CINO would work closely with the CIO but would not necessarily be a tech-centric role. For instance, if the CINO is tasked with leading a cross-agency process improvement project to streamline services for low-income working mothers, the CINO would leverage process improvement, human-centered design practices, and other innovation methods to define and tackle the challenge—some solutions pursued would involve digital government tools and some might be nontechnical.

12.5.1.2. Increase the size of the Presidential Innovation Fellows Program.

Change agents are key drivers of innovation in many organizations. While many private sector firms seek to embed change agents in their companies, doing this in government can be a struggle. One program to address this challenge is the Presidential Innovation Fellows (PIF). The PIF program brings in a diverse group of product designers, engineers, and executives with industry expertise and entrepreneurial perspectives to pursue digital innovation in the federal government. This program is an important avenue from bringing in outside talent but is relatively small with only around 20 individuals per year entering the program.¹⁴⁰ To rapidly increase the rate of digital innovation, the next administration should increase the program to an annual new cohort of at least 100 individuals and maintain this new rate going forward.

In addition, we recommend that the Administration consider adding a new intergovernmental element to the expanded Presidential Innovation Fellows Program. While federal government services are important, many citizens witness government most frequently at a local level. When it comes to innovation (performance management, process improvement, digital services, open data, replacing legacy systems), there is high variability across city and county governments in the United States. Presidential Innovation Fellows could provide remote and in-person project-based consulting to local governments seeking advice on best-in-class e-gov implementations that could then be shared with other jurisdictions. This resource could be invaluable, especially to more rural or resource-strapped areas who have the political will to innovate but lack the time and expertise to start.

12.5.1.3. Establish a bottom-up innovation tool for federal employees.

Frontline workers often generate important new ideas for how an organization should operate. Unfortunately, the federal government is not well-designed to harness ideas from these workers. It still by and large embraces a hierarchical management culture, where frontline workers’ job is to perform, not innovate. A survey by the Partnership for Public Service and the Hay Group found that just 39 percent of federal employees felt that creativity and innovation

were rewarded.¹⁴¹ And according to a recent survey by Eagle Hill Consulting, 72 percent of federal employees say their agencies rarely or never seek their ideas for improving their agency, while half say that they don't know how to submit ideas to their agencies.¹⁴²

But the emergence of powerful and scalable social-networking technologies could allow federal workers to easily engage in generating innovation ideas. The OMB should develop a tool to enable any federal employee to propose innovation ideas, especially for the better digital delivery of services, in a structured format. In reviewing these ideas, the focus should be on ideas that can be implemented across government, not just a single agency. The initiative could be akin to an internal challenge.gov.

12.5.1.4. Expand the number of innovation "skunk works" in federal agencies.

Because innovation in government is not a key electoral issue, it is often deprioritized. Government agencies can accelerate innovation by creating dedicated spaces to develop and debate ideas that can solve challenges and create new approaches to agency practices. Pioneered by Lockheed Corporation in the 1950s, several major corporations have created "skunk works"—separate organizational entities not constrained by the dominant corporate mindset or rules. The idea behind skunk works is to create a dedicated space, less encumbered by the day-to-day concerns of providing services or products, as well as the rules and routines governing companies. Many of these skunk works are not just focused on identifying and launching new ideas, but on killing old ones. For example, the National Security Agency (NSA) has an internal accelerator called "Incubation Cell" that views its mission as killing bad ideas because they will otherwise persist. A few agencies, such as the NSA, CIA, and HHS, have skunk works-like efforts. However, the next administration should establish a pilot program where four or five additional agencies establish skunk works focused on disruptive digital innovation within their operations.

12.5.1.5. Establish a digital innovation ideas panel within OMB.

The private sector often has valuable knowledge and extensive expertise about potential solutions to problems in government agencies, but the process of proposing new ideas to the federal government is complex and opaque to many outsiders. This prevents agency leaders from learning about potential solutions to problems that are common across government. To address this issue, the next administration should create a process to allow individuals in the private sector to apply to present digital solutions to a panel of OMB officials, who could then work with agencies to ensure relevant solutions are considered in the procurement process.

12.5.1.6. Allow agencies to divert a small share of their budgets to innovation projects.

Agencies need funds for innovation. For an agency that truly wants to innovate, most have limited capital for internal "venture" investing, and many lack the ability to quickly prototype, refine, fail, and try again, because it can be almost impossible to get sign-off on new projects quickly. To solve this, Congress should allow agencies to allocate a small share of their operating budgets to serve as an internal innovation seed fund, so they can start pilot projects more easily. In particular, agencies should prioritize projects that deliver better government services or improve government productivity. The authority could be set to expire after five years, at which point GAO could assess the results.

12.5.2. IMPROVE GOVERNMENT SERVICE DELIVERY.

Digital technologies offer many opportunities to improve government services. Indeed, the widespread availability of broadband and mobile Internet means that government services can always be accessible, allowing for more convenience and flexibility. However, agencies should continue to improve their online services to offer solutions on par with the best private sector actors, where competition drives continuous innovation.

To start, agencies should meet basic standards such as ensuring every website loads quickly, meets all accessibility requirements, and is optimized for both mobile devices. Moreover, they should ensure every form is digital, allowing for electronic data entry, signing, and

submission. The federal government should also require its internal teams and vendors undertake representative UX/UI (user experience/user interface) testing be done before web products are launched or revamped.

Unfortunately, more than two decades after the federal government started on its digital journey, many have still not even accomplished these basic steps. And the track record of many state and local governments is no different. This means agencies have a significant opportunity for improvement. First, they should all receive the resources needed to meet these basic standards. Second, they should develop roadmaps to start leveraging emerging technologies like artificial intelligence, the Internet of Things, augmented reality and virtual reality (AR/VR), and blockchain to offer next-generation e-government services.

12.5.2.1. Monitor and report metrics about federal agency website performance to a public dashboard.

As noted, too many federal websites perform poorly compared to the best-in-class private ones.¹⁴³ The federal government should better track website metrics to promote agency accountability. OMB should require that federal agencies participate in the Digital Analytics Program (DAP) hosted by GSA, and OMB and GSA should expand DAP to include additional metrics, such as page-load speeds, mobile friendliness, and accessibility. The government also should consolidate the data it collects on federal websites into a single public dashboard. Since most website tests can be automated, OMB should mandate that each agency regularly test its websites against each of these metrics and provide the data to the public dashboard. States should mandate the same kind of measures, perhaps collected by an organization like the National Association of State CIOs (NASCIO).

12.5.2.2. Launch a website modernization sprint to fix known problems with federal websites.

Many federal agencies have known problems with their websites but lack clear solutions to resolve them. OMB should direct agencies to launch a series of “sprints” to address known problems, especially failures to meet security

and accessibility requirements. Through the sprint process, agencies can identify the underlying technical or functional causes of these issues and determine the best approach to mitigate them. This approach to problem solving is widely used in product development and allows for rapid, iterative responses to known issues. Addressing security weaknesses quickly is especially prudent given the threats that cyberattacks pose to the U.S. government. The U.S. Digital Service playbook offers recommendations for iterative product design that agencies can use as a starting point to launch these sprints.¹⁴⁴

12.5.2.3. Improve automated and personalize online government customer support.

One of the major opportunities to improve service in government is by providing more automated and personalized online experiences. In particular, government agencies can use automation technologies including machine learning, robotic process automation, and chatbots to deliver faster and better services. For example, online chatbots leverage technologies like natural language processing and analytics to answer questions from users. Multilingual chatbots could prove to be particularly helpful to help non-English-speaking populations navigate government resources, such immigration services. Similarly, robotic process automation can streamline routine services, such as automatically processing an email request.

These technologies not only expedite government services for the end user, but they also make government significantly more efficient by freeing up government staff from routine activities and allowing them to focus on higher-value work. For example, if all state unemployment insurance agencies had adopted this technology prior to the pandemic, they likely would have been able to handle many more transactions more effectively. For this reason, federal, state, and local IT investments should focus on increasing productivity and online service through digital transformation and automation.

12.5.2.4. Expand use of user-centric design interfaces.

Virtually all best-in-class private sector companies that depend on the Internet for survival spend considerable amount of money and time improving the design of the user interfaces of their websites to make it easy for users to find what they want. They leverage design-thinking processes to immerse themselves in the customer experience which allows them to develop and test online services that meet the specific needs of their customers.¹⁴⁵ For example, the financial services and tax software company Intuit employs individuals with a variety of skills to “design for delight” by taking steps to deeply understand the needs of their users and conduct user testing to make decisions based on actual user behaviors.¹⁴⁶ The U.S. Digital Service has developed a comprehensive web design framework for federal agencies, and while some 200 agencies have adopted this modern code base, many more have not.¹⁴⁷ The next administration should require federal agencies to adopt this standard for all new websites. In addition, states should either adopt the federal codebase or pool their resources, perhaps through NASCIO, to develop similar code libraries that they can deploy across similar services (e.g., employment services, parks, etc.).

12.5.2.5. Establish desktop and mobile page-load speed benchmarks for websites.

Users will expect government websites and apps to load at speeds similar to their private sector counterparts. But many local, state, and federal agencies have yet to optimize their websites to ensure they load quickly on desktops and mobile devices. This could further slow development and adoption of digital government services as users will find less value in online alternatives that they see as inconvenient. The federal government already has established standards and best practices for federal websites based on consumer convenience, accessibility, and security. Given that the majority of federal websites still need to significantly improve their page-load speeds, OMB should work with the federal CIO to develop federal guidelines on page-load speed across devices. And state and local CIOs should do the same.

12.5.2.6. Establish video streaming best practices for all public government events.

Many government events—conferences, panel discussions, and speeches—take place all over the country. For most Americans, attending these events in person is not an option, especially with the pandemic. While many federal agencies put some or all of their events online through streaming video, they do this inconsistently and using a variety of platforms, many with significant capacity restrictions which limits their potential audience. Moreover, some of these platforms are not accessible, such as not enabling live automatic captioning when manual captioning is not provided. To address this problem, OMB should establish video streaming best practices for all public government events and provide agencies with funding to implement these requirements. Federal agencies should no longer procure event video streaming services from contractors that do not meet these best practices.

12.5.2.7. Launch a federal website consolidation initiative.

There are so many federal government websites that finding the right information, or up-to-date information, can be a major challenge. While it is important to provide comprehensive information about government agencies in an accessible online format, this complex system of agency-affiliated websites complicates the user experience and reduces the efficiency of digital services. OMB should launch a website consolidation initiative with the goal of eliminating and consolidating duplicative or unnecessary websites. Additionally, each newly created website should have a planned life cycle, which sets a specific date when it should be removed and archived or renewed and refreshed. The same planning mechanism should be employed for old government websites.

12.5.2.8. Optimize government websites for mobile use.

As with other web services, government website visitors do not necessarily use a desktop computer to access them. During the summer of 2020, half of all visits to government websites participating in the Digital Analytics Program used mobile devices.¹⁴⁸ Not only are a significant portion of visitors using mobile browsers; for around 20 percent of Americans, mobile devices are

their only form of home Internet access.¹⁴⁹ Despite the demand for mobile-friendly websites, many government websites are not optimized for mobile use, which excludes a significant portion of the population, particularly from low income and communities of color who rely more on mobile devices than the general population, from using web-based government services. Government agencies should ensure all websites are mobile-friendly to make these services more accessible to the communities that need them. This includes informational website pages as well as web forms or other interactive elements.

12.5.2.9. Expand the use of mobile payments.

Compared to other developed economies, contactless payment adoption in the United States has been relatively slow, but concerns about spreading disease are changing this: 60 percent of users report feeling more comfortable making contactless payments now than before the pandemic.¹⁵⁰ Greater adoption of mobile payments would allow individuals to make payments without making physical contact with others or other devices, reducing the risk of transmitting infections during the pandemic. While many high-contact government services, such as transit, are provided by state and local authorities, the federal government can provide funding and best practices to encourage adoption of these technologies, including working with private sector payments systems innovators. In addition, while some states have adopted mobile payments for electronic benefits transfer (EBT) programs like the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in ways that particularly benefit low income and communities of color, others have not, and the federal government should expand these programs.

12.5.2.10. Make all government forms digital.

Given the unnecessary costs involved in ordering, sending, preparing, and filing paper and non-fillable electronic forms, all federal agencies, including the IRS, should upgrade their automated processing systems so they can receive fillable electronic forms and implement an e-filing system. Agencies can

base their e-filing systems off the Business Services Online program provided by the Social Security Administration, which provides several services, such as allowing employers to electronically complete and file up to 50 W-2 forms through its website. And if agencies want to offset the costs of building an e-filing system or processing scanned paper filings, they can do so by charging fees for government customers to obtain and file paper forms. This will both fund the development of new systems and cut costs by discouraging filers from using the more expensive paper-based filing options.

12.5.2.11. Create an “offline mode” for government apps to allow use when not connected.

Some people, such as those in rural areas, do not always have full-time access to the Internet. Others, particularly in low income and communities of color, may only connect to the Internet through public Wi-Fi hotspots. Government agencies should design apps with an “offline mode” that would, for example, allow individuals to complete a form offline, but then submit the results when they are back online. These would also allow individuals to work when they are offline, such as on an airplane. Many government websites require an active connection which limits the utility of these apps for individuals with sporadic connectivity.

12.5.2.12. Mandate the use of Login.gov across all federal government services.

GSA has developed Login.gov as a shared service for federal agencies to use to authenticate users to online services. Not only does this simplify the authentication process for users and provide a single trusted authentication service for both users and developers, it also allows agencies to replace outdated methods for remote verifying the identity of online users. Many agencies rely on “knowledge-based verification” where users must provide certain information from the credit files about themselves to prove their identity. However, since many individuals have had sensitive personal information stolen from data breaches, this method is not reliable. Instead, services like Login.gov use more secure methods, such as verifying physical credentials like a driver's license or passport, or verifying someone's possession of a mobile device with a cell phone carrier.¹⁵¹

While many government agencies have begun using the Login.gov service, it is not yet universally adopted. The next administration should require all government agencies to move to this newer platform to ensure citizens can securely and easily access government services. GSA should expand the program to also allow state and local governments to join the program.

12.5.2.13. Establish a one-stop-shop for citizens to access and share personal data held by government agencies.

To provide necessary services and allocate resources, many government agencies collect personally identifiable information about individuals as part of their day-to-day operations. This often results in individuals having to provide the same information to multiple government agencies, adding both time and cost to multiple government services. This information should be consolidated in a single secure online location that can be accessed by individuals as well as authorized government agencies.

This consolidation will improve the efficiency and accessibility of digital government services. When collecting personally identifiable information, GSA should offer individuals a single website where they can access all the information federal government agencies have collected about them, and share this information as necessary with others, such as when applying for government benefits. Ideally, GSA would form a partnership with states to allow the same functionality across all levels of government.

12.5.2.14. Build more government APIs to enable non-government organizations to link citizens to services.

Government agencies provide access to many important services and information online, but citizens may prefer to access these services and information through non-government websites and applications, particularly given the fact that best-in-class private sector web applications are usually significantly better in terms of user interface and ease of use. Rather than only building government apps and websites, government agencies should build application programming interfaces (APIs) that allow third-party developers to integrate

government services into their own applications, while ensuring that consumer data and privacy remains protected. For example, rather than requiring people to use a government website to make reservations and purchases at state and national parks, open APIs would enable qualified travel websites to allow individuals to book reservations for campsites or pay for day passes.

Likewise, it is an arduous process for small businesses to find out what their regulatory requirements are or what help they can get from governments, including in the COVID-19 crisis. And while most agency websites try to list these things, figuring this out is extremely difficult for companies. Open APIs, powered by better technology, could let businesses and individuals enter into private sector for-profit or non-profit applications information about their company or themselves and have the applications automatically identify the right information and resources tailored specifically to them.

12.5.2.15. Establish a Federal Grant Program to Eliminate Data Poverty.

One of the primary reasons that individuals go online is to get information. But sometimes individuals cannot find the information they want or the information they find is not very accurate for themselves or their community. For example, cities may only collect air quality data or traffic data for wealthier areas of the city creating pockets of data deserts in communities. Or certain hospitals serving higher-income individuals may have better data sharing practices than those in lower-income neighborhoods, limiting the availability of data that researchers can use to address health conditions disproportionately affecting people with lower incomes. As an increasing number of digital services are built to make sense of data, people living in data-rich environments stand to benefit considerably, but others living in data poverty will miss out on these opportunities.^[4] Similarly, decisions made from these datasets may overlook important opportunities to identify and serve the needs of all citizens.

The answer to this problem is not to limit the use of data, but rather to ensure that everyone stands to benefit from data-driven innovation. To close the gap, the next administration should establish a \$100 million grant program

to eliminate data poverty. The goal of this program would be to fund projects that take concrete steps to close the data divide, such as by training citizens in under-represented communities how to submit feedback through city mobile apps or subsidizing wearable medical devices to increase representation in health datasets. The program should focus on updating legacy systems that limit data generating and reporting capacities; equitable deployment of IoT—likely in partnership with universities; building data trust and literacy; Research grants for under-examined and analyzed local topics with community demand; and support for local anchor institutions to conduct data inventorying and auditing, open data platform building, internal training.

12.5.3. INVEST IN MORE MODERN SYSTEMS, INCLUDING NEW APPLICATIONS.

To fully equip the government for a digital future, agencies should not only update current practices, but also invest in systems at the cutting edge of innovation. In the private sector, such investments have yielded higher productivity and efficiency. Government agencies can similarly benefit from investments in digital technologies that will help them become more productive, such as by automating routine processes, benefiting from digital economies of scale, and using data analytics to make better decisions.

To accomplish this, the federal government should introduce investment programs and initiatives that focus on modernizing existing systems and strengthening them against disruptions such as those from the COVID-19 pandemic. Many government websites and digital tools are outdated, vulnerable to cyber-attacks, and lacking low-contact or contactless alternatives necessary to protect employees and maintain a largely virtual workforce. Government agencies should invest in modernizing and securing existing systems, as well as developing low-contact and remote alternatives to existing practices.

Further, as technologies continue to evolve, systems that align with industry standards today could become outdated in a matter of years. Agencies' digital transformation

should include policies and practices that enable them to keep pace with innovation in Internet of Thing (IoT) devices, blockchain, robotic process automation, immersive reality, cloud computing, and emerging technologies of the future. Government agencies should consistently explore potential uses for these new and emerging IT systems to improve government services and facilitate effective digital transformation.

12.5.3.1. Launch a "Digital New Deal" to modernize outdated government systems.

Many government agencies have critical operations running on outdated computer systems. During the spike in unemployment applications due to COVID-19, many government unemployment systems crashed because they were unable to handle the surge in demand. Given the capabilities of cloud computing today, this was an eminently preventable problem. In addition, making changes to these older systems can be difficult due to a lack of programmers with the right skills. For example, at least 12 states use COBOL, an outdated programming language from the 1970s, in their unemployment agency.¹⁵² All government agencies using outdated systems should move to modern, cloud-based systems that can accommodate fluctuating demand and provide services more efficiently. Similarly, many local governments have not digitized property parcel data and property tax records, an improvement that would not only help broadband mapping, but also potentially significantly reduce title search costs when people buy residential properties.

As Congress pursues further national recovery legislation, it should allocate substantial funds to federal, state, and local governments to modernize their IT systems. Too many government agencies are using systems that are outdated, not customer-friendly, and expensive to maintain. These older systems pose a drain to their budgets and limit their ability to meet future challenges. The Technology Modernization Fund (TMF) established an innovative funding vehicle for government agencies to obtain funding for IT projects. While the TMF has received some funding, it has been significantly lower than originally proposed. Congress should provide at least \$3 billion in funding to significantly expand the TMF for federal agencies and dedicate the funding to

modernizing IT systems that support public-facing services.

12.5.3.2. Develop and fund a globally competitive smart-cities program and national Internet of Things (IoT) strategy.

When governments implement new policies, such as stay-at-home orders, they struggle to understand the impacts these decrees have on their communities. To prevent this barrier in the future, Congress should allocate at least \$2 billion for smart city funding. This program could be jointly managed by HUD, NIST and NSF. Increasing adoption of IoT devices is necessary to generate key datasets that could help communities better respond to a pandemic, such as smart thermostats to track public health trends and fitness trackers to understand how people's fitness habits, sleep behavior, and overall health indicators change during a pandemic. Moreover, as discussed in the recommendation on eliminating data poverty (12.5.2.15), our country faces a data divide—where certain communities do not have sufficient data collected about them, creating social and economic inequalities. Smart city data can be another tool to help ensure national datasets are diverse and representative, helping to close that data divide.¹⁵³

Local governments can also use connected technologies to better manage public services and resources, thereby improving their resilience in times of crisis, whether it be a health epidemic, terrorism, or natural disaster. All of this would also make broadband adoption, particularly mobile, more valuable to citizens.

12.5.3.3. Fund a government blockchain pilot projects program to expand the number of blockchain initiatives.

Many transactions, such as buying or selling property, require using a trusted intermediary such as a bank or a government agency, which creates a constraint during physical distancing when these institutions are unavailable. Blockchain allows multiple parties to engage in secure, trusted transactions with one another without an intermediary and without physical contact. Government agencies could benefit from greater adoption of blockchain technology to improve the accessibility and security of digital services. Blockchain-driven solutions

not only reduce physical contact, but also allow for more efficient, timely, and cost-effective processes and services in both the public and private sectors.

The federal government should fund a dedicated blockchain pilot projects program to facilitate development and deployment of these solutions, in collaboration with the private sector, which has been innovating across a range of blockchain use cases. By investing in and supporting blockchain projects, government agencies can accelerate the deployment of this technology, thereby creating more opportunities for automation and digitalization in the economy and taking steps to increase financial inclusion.

12.5.3.4. Develop and implement policies to enable long-term teleworking.

While virtually all major corporations in the United States seamlessly transitioned to enabling telework, including for their customer service representatives, too few government agencies were fully prepared to enable much of their workforce to telework long-term. This meant many lower-level GS workers were without work for months because their agencies could not adequately provision them for remote work.

Preparing to adapt for long-term telework now can mitigate the potential workforce impacts of such a transition in the future. Due to improvements in technology, many jobs, especially public-facing customer service jobs, can be performed remotely at home. For two-income working families, caregivers, multigenerational households, and individuals with disabilities, teleworking presents enormous opportunities. Government agencies should ensure they have the technology systems and organizational procedures in place to enable long-term telework. Doing so would also have benefits long after physical distancing requirements are lifted, as telework has been shown to improve productivity, cut costs, and improve employee morale if done effectively.

Congress should establish a one-time telework modernization fund for government agencies to upgrade their IT to modern standards—and to qualify, their agencies would be required to act within the next six

months. They should also institute a fund for state governments to do the same.

12.5.3.5. Establish an “18F” for cybersecurity.

One factor that is critical to ensuring adequate use of e-government services is that systems are secure. Unfortunately, many government agencies lack the resources and expertise to fully address their systems’ cybersecurity risks: a 2018 GAO study identified addressing “cybersecurity workforce management challenges” as one of ten critical actions needed to address cybersecurity vulnerabilities in the U.S. government.¹⁵⁴ Without a fully equipped cybersecurity workforce, government systems continue to lag behind their private sector counterparts in security measures, making government systems particularly vulnerable. As digital services expand and more Americans rely on these systems, these vulnerabilities will be exacerbated. Private sector expertise would improve agencies’ capacity to build and maintain more secure e-government systems.

The next administration should direct the General Services Administration (GSA) to establish an office that brings in top private-sector talent to collaborate with other agencies on cybersecurity issues to improve government security. This team should be modeled off some of the most successful aspects of the existing GSA office known as 18F, which focuses on user-centered product development, rapid prototyping, reviewing, and refining of its products, and coaching peers throughout government. The goal of this initiative would be to incorporate private-sector knowledge and nongovernment culture into high-impact, high-priority federal government cybersecurity projects. Members of this team could serve short-term stints based on new projects, agency needs, and available funding.

12.5.3.6. Invest in augmented and virtual reality (AR/VR) solutions.

Augmented and virtual reality (AR/VR), immersive technologies that enable users to experience digitally rendered content in both physical and virtual space, can reduce costs and increase productivity in the federal workforce. AR/VR offers a range of potential uses in government, including providing realistic scenario-based training for

emergency response, enabling government employees to communicate more effectively with members of the public, and improving efficiency of high-tech manufacturing and machine repair. These technologies also support health care training and patient care, education, job skilling, infrastructure planning, and new opportunities for small businesses through retail and commerce. As technological improvements make AR/VR more affordable and user-friendly, government agencies should explore opportunities to utilize these technologies. Several agencies including FEMA, Veterans Affairs, and NASA have already started to explore AR/VR-based solutions for workforce development and public engagement. Rather than continue this ad-hoc approach to investment in these technologies, the federal government should develop a government-wide procurement strategy for AR/VR investment.

12.5.3.7. Replace annual reports with dashboards.

Almost every government agency, no matter its size, publishes a yearly report about its activities. While these reports are a useful tool for providing insight and accountability on public-sector operations, they are no longer the best option for an increasingly digital government. Annual reports do not accurately reflect the current activities and priorities of an agency at a given moment, nor do they offer readers the ability to easily seek out answers to specific questions or concerns. To function within a more digital government, annual reports should be dynamic, accessible, and easy to read.

Agencies should begin replacing annual reports with dynamic dashboards that provide real-time information on government programs. GSA can provide the technical building blocks for agencies to implement dashboards, and OMB can provide guidance on best practices for data visualizations so that dashboards present information in the most user-friendly way possible. This transition will be an important element of any agency’s digital transformation.

12.5.3.8. Expand FedRamp Metrics

To improve the overall efficiency of e-government services, agencies will have to rely on cloud computing services more now

than in the past. FedRAMP is a federal program that helps federal agencies procure secure cloud computing services, but it suffers from long timelines, high costs, and review processes that are inconsistent across federal agencies. These issues have created barriers to businesses offering their services to the federal government, thereby slowing agencies' access to cloud services.

To ensure FedRAMP is not acting as a competition barrier for cloud providers, especially smaller ones, OMB should track how long it takes different sized vendors to get through the authorization process and pilot a tiered authorization approach that would allow providers to operate on a provisional basis. This will accelerate agencies' adoption of necessary cloud computing services and ensure consistency in procurement across the government.

CONCLUSION

A variety of Internet applications like e-commerce, streaming video, online banking, social media, and more have driven broadband adoption, both fixed and mobile. Building better e-government services can continue to support adoption and provide more value to those who are online. More importantly, taking bold steps to bring government agencies at the federal, state, and local levels much closer to private sector best practice will go a long way to improving opportunity, boosting quality of life, and ensuring a better civic life for all.

Chapter 13.



CIVIC ENGAGEMENT

13.1. PROBLEM STATEMENT

Failings of digital equity and inclusion limit the ability of all Americans, and particularly those with lower incomes and communities of color, from full engagement in the political and civic lives of their communities, both offline and online. At the same time, while broadband and applications such as social media have encouraged and facilitated new forms of civic engagement, misinformation, online voter suppression tactics, and hate speech have endangered those who live in low-income communities and people of color. Further, social media platforms have created new harms related to micro-targeting in advertising and other uses that results in discriminatory outcomes for communities of color.

13.2. VISION

We need improved sources of accurate and relevant information, and tools that enable Internet users to improve their own welfare, and to engage productively with the democratic and civic institutions of their communities and the nation. The Internet ecosystem must become a healthy, self-sustaining environment, with effective mechanisms for quickly identifying and countering dangerous misinformation and toxic behavior.

13.3. GOALS

The key goals for the digital equity and inclusion in civic engagement are to:

- Reduce the amount and negative impact of harmful misinformation, online voter suppression, and hate speech on the Internet;
- Increase the amount of content that addresses the concerns and needs of low-income communities and communities of color;
- Improve the tools available for low-income persons and persons of color to engage in

civic discussions, giving them a stronger voice both offline and online in policy decisions.

13.4. CURRENT SITUATION

Civic engagement is the lifeblood of any democracy and the bedrock of its legitimacy. Increasingly, our national conversation, our sources for news and information and our knowledge of each other ride on broadband networks and applications. The transition to new information technologies and services have opened new doors that enhance America's media environment, but have left traditional sources of news and information, including journalism, under severe stress.

Broadband holds the potential to strengthen our democracy by dramatically increasing public access to news and information, and to provide new tools for Americans to engage with their government and one another online. For example, we have seen how social media responded to some of the problems with the 2016 elections [by improving the information provided in the 2020 election](#). We have also seen efforts by social media to [keep people informed and limit misinformation about COVID-19](#). However, there are still misinformation campaigns about the pandemic and vaccine that proliferate on social media platforms and target people of color.

The Internet has enabled the wide-spread dissemination of misinformation that can weaken our country. Unfortunately, we have seen several examples of that phenomenon recently, with a particularly negative impact on communities of color. Without better controls, both public and private, there is genuine risk that the Internet could widen racial, partisan, educational, gender and other divides, rather than achieve its potential to close them.

One example involves information about public health. The COVID-19 pandemic provides a tragic, and important, example of what can happen with information targeted to minority communities. As the report, [Canaries](#)

[in the Coal Mine: COVID-19 Misinformation and Black Communities](#), documented:

[T]he Black community was awash in medical misinformation about the coronavirus pandemic, even as Black people were dying from COVID-19 at a rate much higher than other demographics. Dangerous health misinformation hit the community like a second virus, a confounding and inflaming new factor injected into an already depleted immune system, making it that much harder for the Black community to survive the pandemic.

The damage done by the misinformation is exacerbated by a long history of medical abuses against the Black community. The report noted that "Black people across the U.S. have for centuries and for good reason been skeptical of government interventions and the medical community, relying on community knowledge for their very survival. That necessary self-reliance, when it comes to matters of health, can make the community a vulnerable target for disinformation." The report further noted that the risk was compounded "by failures of tech companies and elected officials to speak to the Black community in ways that are culturally accessible." The report found that the predominant narratives spreading in Black communities in the United States posed "an immediate threat to the health of Black people and is a symptom of an information ecosystem poisoned by racial inequality. Black lives are consistently put in danger, and it is incumbent upon community actors, media, government, and tech companies alike to do their part to ensure that timely, local, relevant, and redundant public health messages are served to all communities."

A second example involves Internet disinformation campaigns directed at minority communities aimed at suppressing voting rights. As documented in *The State of Black America 2020*, in a chapter titled “The Vote and the Virus: Inoculating the Election From Disease and Disinformation,” the 2016 election was marred by a number of “hoaxes (that) were aided and abetted by Russian internet trolls whose systematic attempts to suppress the Black vote were motivated by geopolitical rather than political objectives.” While the authors viewed the impact of those efforts as likely to have been minimal, they suggest the impact of similar efforts could be much larger in 2020. As the authors point out, “one of the time-tested truisms of disinformation is that it thrives in times of uncertainty when there is both a large demand for information and a short supply of available facts. Thus, any change to standard voting procedures, however reasonable, necessary, or lifesaving, will create a potentially nightmarish scenario where the increased demand for up-to-date information is met with a manipulated supply meant to misinform parts of the electorate.”

A third example relates to the decennial census disinformation. As Spencer Overton, President of the Joint Center on Political and Economic Studies recently wrote to Congress, related to his testimony at a hearing on “A Country in Crisis: How Disinformation Online is Dividing the Nation,” census disinformation threatens to result in an undercount of underserved communities, which would fall short of the constitutional mandate that apportionment of Representatives be based on “persons” counted by a census conducted in such a manner that Congress directs by law. In 2016, the Russian Internet Research Agency coordinated a campaign to impersonate Black Americans and encourage Black Americans to “boycott the election” (Black Americans made up 12.7 percent of the U.S. population but accounted for 38 percent of the U.S.-focused ads purchased by the Russian Internet Research Agency). These kinds of targeted ads discourage Black communities from participating in the political process. A similar disinformation campaign targeted at marginalized groups attempting to sow distrust of the census or boycott the census could result in a serious undercount of marginalized communities, which could result in diminishing the votes and resources of these populations and their fellow residents, and unfairly inflating the political influence and government benefits enjoyed by those

communities where there was not an undercount.

The danger of misinformation campaigns has become more acute, due to the crisis affecting traditional news outlets, particularly those designed to serve communities of color.

As the authors of the [report](#) “African American Media Today: Building the Future from the Past,” [summarized](#) their findings:

Today, the Black press struggles to remain in operation. While the virtual disappearance of traditional advertising has challenged the news industry as a whole, it has been particularly damaging to the Black newspaper industry. Shrinking staffs have left many operations without tech savvy or the manpower to quickly pivot to new revenue building operations. And while some

mainstream news institutions establish paywalls for their digital media platforms, many in the Black American community understand that readers are unlikely to accept news through the paywall model.

That report did hold up hope. In looking at the most prominent Black American oriented web sites, it noted that “Each of these sites seems positioned for future growth” and that “Many social trends also seem to be fueling the bright futures of Black American-oriented news and culture sites.” To serve Black American audiences, these digital news platforms will need funding to be sustainable. That potential, however, may not be achieved, unless we address the availability, adoption, and affordability gaps discussed in Chapters Three, Four, and Five.

13.5 KEY CHALLENGES TO OVERCOME

Information technology legal scholar Ellen Goodman suggests that we find mechanisms that increase the “signal” and decrease the “noise” in information delivered through the Internet. “Signal,” in this context, is information that is truthful and supportive of democratic discourse. “Noise” misinforms and undermines discursive potential. “When signal overpowers noise, Goodman write, “there is high fidelity in the information environment.” She further explains “Digital platforms can overwhelm signal with noise. Scale and speed, user propagation, automated promotion, inauthentic and hidden amplification, and the mixture of sponsored and organic speech all make digital discourse different...It is therefore not shocking that platform architecture not only tolerates but even favors low-fidelity speech.”

The challenge then, is improving the mechanisms by which key stakeholders, including public institutions and individuals have the resources to eliminate or at least reduce the noise, while elevating the signal. Of course, there are First Amendment issues here that must be respected. Government

should not be in the position to compel or censor speech. But just as the government can prohibit certain kinds of speech that create a public health hazard or sponsor speech designed to provide information to enhance public health and safety, so here, we should search for ways that, consistent with First Amendment precedents, address the challenges of improving signal to noise ratio.

This also applies to social media companies that allow users to promote ‘noise’ online. Companies have the power to prohibit speech that are unhealthy and unsafe for Black and Brown communities. Online content has real-world consequences for people of color, and, unlike Government, social media platforms have the authority to remove content that is harmful. Tech companies must publish and update rules or community guidelines to create strong mechanisms to eliminate the noise.

13.6 POLICY RECOMMENDATIONS

In light of the above, we offer the following recommendations related to elevating relevant and reliable information and providing tools for individuals and countering misinformation.

13.6.1. CIVIC ENGAGEMENT RELATED RECOMMENDATIONS IN OTHER CHAPTERS.

There are several civic engagement related recommendations in other chapters that we cross-reference here. These include:

- *Provide Digital Readiness Training.* To enable greater use of broadband functionality, including for purposes of civic engagement, state and local governments should ramp up digital readiness efforts, as described in Chapter Four.
- *Optimize Websites to Facilitate Engagement.* To enable greater civic engagement, state and local governments should improve their websites to facilitate utilization and feedback on policy issues, such as budgeting, as described in Chapter Twelve.

13.6.2. HOLD HEARINGS TO HELP INFORM PUBLIC.

Congress should hold a series of civil rights-focused hearings with high-level executives from the companies that have been the major sources of disinformation to discuss their content moderation practices and how those practices can be augmented to protect public health, civic engagement, and civil rights.

13.6.3. PASS LEGISLATION TO PREVENT VOTER SUPPRESSION ON SOCIAL MEDIA.

As a follow-on to those hearings and as part of a broader effort to restore and enhance voting rights, Congress should enact laws that prevent deceptive voter suppression tactics on social media.

13.6.4. CLARIFY THAT SECTION 230 DOES NOT IMMUNIZE RACIALLY DISCRIMINATORY AD TARGETING BY PLATFORMS.

Social media companies should be held accountable if they target (and/or deliver) employment or housing ads away from communities of color and other protected groups or target (and/or deliver) voter suppression ads toward Black users and other protected groups. Congress should consider making this an explicit carve-out to Section 230—that Section 230 does not provide a defense to federal and state civil rights claims of underlying discrimination through online ad targeting and delivery. Section 230 carve-outs already exist for violations in various areas of the law. A clear congressional carve out would prevent companies from asserting that the Civil Rights Act of 1964, the Fair Housing Act, and other landmark civil rights laws are inapplicable simply because a platform discriminates online rather than at a brick-and-mortar storefront.

13.6.5. RESTORE FUNDING OF OTA.

Congress should restore funding for the Office of Technology Assessment and add to its mandate that it help Congress understand and address how best to combat disinformation and other practices that discriminate against communities of color and create barriers to civic engagement.

13.6.6. EMPOWER FTC TO ADDRESS NEW DECEPTIVE PRACTICES.

Congress should specifically empower the FTC to address deceptive practices related to public health and safety, voting, and other actions related to civic participation such as the census.

13.6.7. EMPANEL A COMMISSION TO STUDY PUBLIC INFORMATION ON COVID-19.

The President or Congress should empanel a Commission to study what information about the pandemic was made publicly available, how this information affected societal response, and what should be done to limit the impact of false and dangerously misleading information moving forward, while ensuring robust opportunity for debate and expression. There should be particular attention to what information was targeted at low-income communities and communities of color. The purpose of the Commission should not be to impose civil or criminal liability for misinformation spread during the COVID-19 pandemic. Rather, the Commission should seek to understand and explain how different media platforms—and the ideas shared on them—shaped societal response to the pandemic and to provide advice to all stakeholders for how to better provide information in a public health emergency.

13.6.8. EMPANEL A COMMISSION TO STUDY THE IMPACT OF THE DIGITAL DIVIDE ON THE 2020 CENSUS.

The accuracy of the 2020 Census, which relied heavily on online answers, has been called into question because of how failings of digital equity and inclusion may have skewed the results, a situation likely made worse by COVID-19. An expert panel should be commissioned to study the impact on the results and if necessary, the Census results should be adjusted to reflect a more accurate count.

13.6.9. ESTABLISH BEST SOCIAL MEDIA PRACTICES.

Social media platforms should provide banner notices with accurate information, redirect to deradicalizing sites, and refuse ads that promote voter or public health misinformation or that link to websites promoting such

misinformation. In addition, social media should be transparent about how they are acting to ensure that algorithms used are not biased and serve all communities.

13.6.10. ESTABLISH RULES RELATED TO POLITICAL MICROTARGETING.

Political microtargeting involves using large data sets to tailor and deliver messages to small subgroups of the electorate. It has some benefits, for example, in terms of get-out-the-vote and community mobilization ads. But it has also been used to spread targeted misinformation. As Spencer Overton of the Joint Center for Political and Economic Studies has noted, microtargeting “allows those intending to deploy misinformation about elections the opportunity to target ads at those most likely to believe the misinformation, while steering it away from those more likely to challenge and correct the misinformation, thereby hardening polarization.” Senator Ron Wyden has asked platforms for a moratorium on political microtargeting, which would be useful to preventing disinformation, but such an action should be done in a way that ensures that the actions do not prevent less-wealthy candidates that lack resources for television ads from targeting their supporters online and mobilizing them and marginalized communities to the polls.

13.6.11. ENABLE REAL-TIME AD TRANSPARENCY AND ARCHIVES.

Congress should enable real-time ad transparency and access to archives, such as proposed in the bipartisan Honest Ads Act, by requiring digital platforms that reach a critical size with to display information about the audience targeted, the number of views generated, the dates and times of publication, the ad rates charged, and contact information for the purchaser. The information should be made available in a public, online file that should be user-friendly, easily searchable, and sortable through an application programming interface (API).

13.6.12. PROTECT PRIVACY ON SUBSIDIZED DEVICES AND SERVICES.

Privacy protection is also a fundamental bedrock of civic engagement so, as described in Chapter Four, the FCC should take actions to assure that recipients of

Lifeline subsidies or other broadband related subsidies are not provided devices or services that violate privacy rights consistent with the FTC’s privacy framework policy by using preloaded tracking software to collect personal information from the user without disclosing this practice to the user.

13.6.13. INCREASE INVESTMENT IN RELIABLE, RELEVANT AND TRUSTED INFORMATION FOR UNDERSERVED COMMUNITIES.

To enable greater civic engagement, the federal government should make grants through the Corporation for Public Broadcasting to local noncommercial stations for journalism by and for underserved communities.

Chapter 14.



INSTITUTIONALIZING DIGITAL EQUITY AND INCLUSION IN THE POLICY PROCESS

14.1. PROBLEM STATEMENT

Achieving digital equity and inclusion requires a sustained, systemic, and appropriately resourced effort. It also depends on inter-agency coordination, and collaboration with federal, state, and local governments. Currently, policymakers do not have the tools to monitor and evaluate the success of efforts to close the digital equity gap. Responsibility is diffused across multiple agencies and stakeholder groups. Data collection practices are inadequate to capture the obstacles individuals face in broadband availability, adoption, and affordability. A lack of effective outreach results in provider-centric coverage maps that do not reflect the challenges faced by diverse communities.

To achieve full utilization, agencies will need to centralize efforts, and coordinate with federal, state, and local partners to collect data and implement programs. Without a coordinated approach, agencies will continue to solve disparate pieces of the problem, leaving holes in otherwise-potent efforts to close the gaps.

14.2. VISION

Governments must develop tools they currently lack to evaluate and improve, in a centralized and systematic manner, efforts to achieve digital equity and inclusion, ensuring

that as the economy, society, and technology change, policymakers can find and address evolving and emerging sources of inequity. Agencies expanding broadband access at the federal level will need to collaborate effectively and share data while developing partnerships with state and local authorities

who are working on on-the-ground efforts to expand broadband access in their communities.

Robust data collection, including individual and household data, should be available for decision-making, and made open to the public so that governments can be held accountable. Additionally, considerations of availability, adoption, and affordability should be included in all new legislation on the digital economy.

14.3. GOALS

- By the middle of 2022, the federal government should have the data it needs to evaluate progress towards digital equity and inclusion.
- By the end of 2021, personnel in key positions in federal, state, and local governments should be hired to ensure that digital equity and inclusion remains an on-going, high-priority goal.
- By the end of 2021, mechanisms should be in place to disseminate information through an Office of Digital Equity and a Digital Equity and Inclusion Administration Task Force. These entities should have the tools they need to review data on past performance, and make and communicate necessary adjustments to strategies and policies adopted to achieve digital equity and inclusion.

14.4. THE CURRENT SITUATION

The 2010 National Broadband Plan was clear in noting that, “This plan is in beta and always will be.” The authors emphasized that a constantly evolving economy, society, and technology required continuous review and update of the plans, goals, strategies, and measurement. The same is true for the digital equity and inclusion agenda. But to evolve, policymakers seeking to achieve digital equity and inclusion will need to have data, personnel, and information sharing strategies essential to understanding changing conditions, and to develop and communicate needed course corrections.

Today, that is not the case. Federal programs to expand digital equity and inclusion have

been channeled through a variety of executive departments and agencies, coordinated through the American Broadband Initiative, an inter-departmental effort launched in 2019. According to the American Broadband Initiative’s [2019 Milestones Report](#), over twenty federal agencies have been tasked with some level of responsibility for achieving the overall goal. Agency staff also lack the data, personnel, and institutional structure needed to achieve their goals. There are inadequate mechanisms for bringing agencies together to evaluate progress and align on tactics and strategies.

While access to information on digital equity and inclusion, such as the FCC’s public [interactive Broadband Map](#), has become more readily available over time, the value of this information cannot be fully realized without a clear central vision. There are also significant limits to the value of the information that is being collected. The FCC’s dataset, for example, is updated based on Form 477 data, submitted twice a year by service providers. As discussed in Chapter 3, however, there are structural and procedural flaws to the current data collection process. These flaws are expected to be addressed through implementation of the 2020 Broadband DATA Act, which requires the FCC to collect data and prepare maps that report broadband availability at a much more granular level.

Additionally, each agency participating in the American Broadband Initiative relies on their own personnel to carry out specific agency workstreams. Without dedicated staff to carry out the broader vision of institutionalizing digital equity and inclusion, it remains difficult to adapt to changing conditions. The USDA and FCC carry out the bulk of the federal government’s grant, loan, and subsidy programs for broadband, for example, but there is little coordination between these organizations, and no centralized staff focused on the issue of equity in broadband access, adoption, and utilization.

Finally, the agencies included in the American Broadband Initiative lack a common review and oversight process to bridge their separate information and personnel. There is no incentive for public-private partnerships between industries and government agencies to collaborate. Many of the American Broadband Initiative’s problems are

structural; the program lacks authority, incentives, and adequate budgeting. There are inherent conflicts which affect chain of command and reporting. Without better data, a deep well of personnel, and a coherent review and oversight structure, efficient and sustainable solutions are impossible to achieve.

14.5. KEY CHALLENGES TO OVERCOME

14.5.1. DATA COLLECTION.

A fundamental challenge to institutionalizing a digital equity and inclusion agenda is how the federal government defines and prioritizes the data that need to be collected. If surveys and maps leave out crucial segments of the population or limit the respondents who can provide their input, the data will not be useful for improving overall broadband utilization.

Much of the focus so far has appropriately been on coverage maps. Unfortunately, as Congress has recognized on a bi-partisan basis, the maps are updated infrequently, limiting their accuracy and consistency. Moreover, coverage maps are often inaccurate due to differences in the criteria for determining “unserved” areas, with rural areas served poorly by definitions that may work well in urban areas. For instance, the assumption that all households in a given Census Block Group (CBG) are covered if any one household in that CBG is covered is less applicable to rural areas, where a few households may be separated by hundreds of miles.¹⁵⁵ These maps do not have a defined level of geospatial granularity, such as household level, so it is difficult to find households affected by poor coverage, and for households to advocate for better coverage from their local politicians. Most important, coverage maps often have missing or incomplete data.¹⁵⁶ This can impact the frequency of updating coverage maps, since dealing with missing data can take valuable time and resources. Again, these flaws are expected to be addressed through implementation of the 2020 Broadband DATA Act.

14.5.2. EQUITY IN DATA COLLECTION.

As with any type of data, the federal government needs to examine critically any biases that could affect its collection, analysis, and interpretation. Fundamentally, when collecting survey data and coverage statistics, sampling bias is a concern—if surveys are conducted exclusively online, households who already have broadband access will be more easily able to fill out the survey. Data collection efforts need to have alternative ways for people to fill out surveys, such as a booth set up at a library or local park that provides devices and broadband access for the survey. Self-selection bias or ambiguously worded questions can also lead to confusion for respondents and generate poor quality results.

Data collections efforts should also be designed to consider how different methods can underrepresent the challenges facing specific demographic groups. For example, if data collection methods primarily involve surveys conducted by public schools, these methods may overrepresent households with school-age children, and underrepresent older individuals who may face additional challenges to participating in surveys. A survey that is collected only in English may exclude individuals who are not fluent in English. Surveys should be easily completed, ideally within 5-15 minutes per household, so that individuals are not burdened by the request for data collection. A burden of several hours of data collection, for example, will privilege individuals who have the time and resources to dedicate to filling out these surveys.

When collecting survey data, collection efforts should promote community engagement at the local level so that anchor institutions and groups are mobilized to participate in the data collection process. Local legislators, public schools, community organizations, houses of worship, and other focal points in the community can be excellent advocates for data collection efforts.

Data collection is fundamentally linked with public policy and accountability. Non-confidential survey data should be open to the public in accessible formats, so that individuals and organizations are able to hold local, state, and federal offices accountable for enforcing broadband policy. Transparency also requires an open forum for complaints, such as a helpline or federal point

of contact that can process reports of broadband issues or incorrect coverage statistics and coverage maps.

14.5.3. PERSONNEL.

Institutionalizing digital equity and inclusion requires hiring people with strong technical expertise, structuring teams so that they are incentivized to make progress toward achieving the goals and ensuring coordination across teams. Right now, ownership of digital equity is thinly spread across several individuals in a variety of agencies, preventing coordinated efforts and progress. Many people have diffuse responsibilities, with digital equity as only one goal among many. Even if the individuals appointed to work on digital equity and inclusion have the right expertise and skill set, split responsibilities and part-time assignments distract individuals from making necessary contributions.

14.6. RECOMMENDATIONS.

The recommendations for institutionalization involve three basic strategies: Data Collection, Dissemination of Information, and Personnel. Each strategy is discussed below.

14.6.1. DATA COLLECTION.

The federal government should collect the necessary information for agencies to monitor, evaluate, and course-correct policies related to digital equity and inclusion. That includes but is not limited to affordability, devices, digital literacy, digital readiness, technical support, and applications and content. This leads us to make the following recommendations:

14.6.1.1. Federal agencies should expand broadband data collection.

Federal agencies, including the proposed Office of Digital Equity (see Chapter 4), should expand the collection of data on broadband use by target populations, particularly underserved communities. This data would be in addition to the indicators specified below in Table 1, as the goal is to have specific data related to how constituents interact with federal agencies. Each federal agency should collect the data necessary (the broadband availability, adoption, affordability

challenges, etc.) of each population it serves, and more specifically, should track how constituents interact with the agency. Areas of data collection could include:

- percentage of case files that were created via in-person, telephone, or online mechanisms;
- percentage of respondents who use online platforms from home, via mobile devices, or at anchor institutions such as libraries, community centers, or schools;
- the ratio of cost of broadband relative to the average income in the community.

The data should be made public in a format that can be collated and compared across agencies and programs. The FCC could leverage government websites like Data.gov and Strategydata.gov, which have demonstrated a willingness to improve data user interfaces. These websites are ideally positioned to inform the public on broadband access and adoption throughout the country. For information deficits that require additional personnel to gather the data, a crowdsourced option sponsored on social media or popular public forums can reduce the time required and stimulate participation.

14.6.1.2. The FCC should explore alternatives to coverage maps to contextualize geographic data with additional indicators focused on broadband availability, affordability, and adoption.

Coverage maps, while useful for gauging access, are limited in their ability to pinpoint concerns related to quality of availability, affordability, and adoption, which are the three factors driving utilization and the achievement of digital equity and inclusion. Table 1 below lists possible questions and indicators in each of the key goals that would elicit more granular and actionable data, measuring whether individuals are truly seeing a positive impact of broadband in their lives. Collection of this information should primarily be through individual or household surveys as the goal is to assess the practical impact of broadband in people's day-to-day lives, though care should be taken to avoid imposing burdensome disclosure obligations on consumers and service providers as well

as avoiding disclosure of competitively sensitive or proprietary information.

Current coverage maps are limited in that they only report whether an area does or does not have broadband availability. Ideally, the data collection suggested in Table 1 would be layered over coverage maps. For example, one layer could include the original coverage map, but another layer could include a gradient of upload and download speeds to determine where broadband quality needs improvement. In addition to presenting

layered digital maps, the FCC should also maintain a public database that would include county-by-county census data which we propose should be supplemented by the indicators in Table 1. This would allow researchers and policymakers to cross-reference coverage with the contextual data provided in Table 1.

GOAL	KEY QUESTION	INDICATOR(S)
Availability: Do households have access to broadband?	Does the area have broadband service?	<ul style="list-style-type: none"> • Number of broadband providers in the area
	Do the services meet minimum federal requirements?	<ul style="list-style-type: none"> • Upload speed • Download speed • Latency
	Is the broadband service of good quality?	<ul style="list-style-type: none"> • Number of interruptions to service per day • Number of customer complaints
Affordability: Are households using broadband?	Is broadband affordable for the households in an area?	<ul style="list-style-type: none"> • Median net income of household • Size of household • Household members by gender, race, national origin, and immigration status • Median price of broadband plan
	How is broadband being made more affordable?	<ul style="list-style-type: none"> • Local or federal programs in the community that provide discounted or free broadband plans • Programs operated by providers to provide discounted/subsidized service • Programs operated by NGOs to provide discounted/subsidized service
Adoption: How are households using broadband?	What is broadband used for?	<ul style="list-style-type: none"> • How often do members of households use broadband for education, health care, and jobs? • Are you able to access telework/remote learning/social media/streaming with your household's broadband plan? • How many interruptions to any of the above services – especially telework and remote learning – do you generally experience in a day?
	Do broadband plans meet the needs of different customers?	<ul style="list-style-type: none"> • Number of available broadband plans that vary in speed and cost • Key locations where broadband is free • Are you aware of any low-cost/no-cost broadband services in your area? • If you are aware, do you subscribe to one of these services? • If you are aware and do not subscribe, what is

	the primary reason for not subscribing?
Are broadband services available in the languages spoken in the area?	<ul style="list-style-type: none"> ● Number of languages spoken in the area ● Number of languages of broadband services
Does broadband usage correlate with more job opportunities?	<ul style="list-style-type: none"> ● Unemployment rate in the area ● Number of people actively looking for jobs online

Table 1. Supplemental Data Collection for Coverage Maps

To collect these data, which appropriately rely significantly on individual/household participation, the federal government would need to embrace novel approaches to data collection, leveraging existing federal data collection infrastructure. The Census Bureau, for example, conducts the American Community Survey on an annual basis to gauge certain community indicators. This survey currently collects data on how many households have a computer, how many households have a broadband Internet subscription, and the population over age 65 that does not have a computer in the household. Expanding that data collection could include incorporating additional coverage statistics, as described in Table 1, to better understand how broadband is being adopted and utilized, beyond how many households have broadband availability.

Expanding data collection efforts, though necessary, could prove costly, as it is labor intensive. The federal government should rely on existing outreach infrastructure to avoid duplicative efforts while collecting data. For example, the federal government could provide additional funding for USPS employees to conduct surveys (either online or paper) when delivering mail to various households, and the seasonal workforce that supports the U.S. Census every decade could also be charged with collecting more detailed data on broadband experience in years when the Census is not running.

14.6.1.3. The federal government should conduct mobile surveys to isolate problems with broadband access.

One way to conduct online research would be to use underlying data from coverage maps to develop a machine learning model that isolates areas of low coverage. Individuals in low coverage areas could then be asked to complete surveys on mobile devices that ask

questions similar to those in Table 1. Individuals without mobile devices can be reached by federal workers from a partnering agency. If these surveys are conducted once a quarter, this could help generate relevant, timely, and accurate coverage statistics that cover not only broadband access, but also adoption and utilization.

14.6.1.4. The federal government should identify, study, and publish research on the benefits of universal availability and adoption.

The federal government should identify, study, and publish potential benefits to national goals and agency goals if all people in the U.S. fully utilized broadband with increasing performance and efficiency. This Plan identifies many benefits in areas such as education, health care and workforce development, and has identified new funding sources and mechanisms to obtain those benefits. But as the economy, society and technology evolve, the federal government should continually identify and reevaluate the benefits, so that federal agencies can focus attention and resources on issues that would yield the greatest benefit. Identifying targeted benefits of universal availability, adoption, and affordability will also help the federal government effectively prioritize work streams within efforts to achieve digital equity and inclusion, and to determine funding mechanisms that are closely aligned to expected benefits.

14.6.2. THE FEDERAL GOVERNMENT SHOULD ESTABLISH AN OFFICE OF DIGITAL EQUITY.

Once the government has collected the data, it should develop strategies for making it public. The result will be a more informed debate about how to improve digital equity and inclusion. It will also lead to greater

accountability for agencies charged with improving digital equity and inclusion. This leads us to make the following recommendations:

14.6.2.1. The Office of Digital Equity should create an online hub that catalogues digital inclusion resources.

As described in Chapter 4, we recommend that the federal government create an Office of Digital Equity. That office, working with the FCC and its Consumer Advisory Committee (CAC), and in partnership with other agencies working to promote broadband adoption, such as NTIA, HUD, and the Department of Education, should create an online hub that catalogues digital inclusion resources, including those provided by states and local governments, non-governmental organizations, and private enterprises. The hub should list resources according to the component of digital inclusion that they address, including but not limited to affordability, devices, digital literacy, technical support, and applications and content. With a growing number of organizations working on digital inclusion initiatives, this would help groups avoid duplicating efforts, and to inform those groups of multiple available resources. For example, a community organization that is operating a successful digital literacy program in a public housing community may be able to secure funding for teachers, and to give devices to students, but be unable to afford antivirus security or operating software. In that instance, the organization could access the online portal and learn about programs like Microsoft's Citizenship Licenses, or the software lending libraries offered by several public libraries.

14.6.2.2. The Office of Digital Equity should convene annual National Digital Inclusion Summits.

The Office of Digital Equity should convene a series of in-person and online National Digital Inclusion Summits to bring together stakeholders with digital inclusion organizations, Tribal leaders, and community anchor institutions including community media organizations, libraries, faith-based organizations, schools, civil rights organizations, foundations, and disability rights advocates. These gatherings should include press and media outlets, as well as

content creators who may be able to inform campaigns to promote the relevance of broadband for underrepresented communities. Grassroots digital inclusion organizations would also be able to share the challenges they are facing and connect with local and federal government representatives as well as businesses who may be able to assist in filling the gaps.

14.6.2.3. The federal government should set minimum standards for federal benefits programs' use of websites.

As discussed in Chapter 12, the federal government should pursue steps to improve government performance that would also help to promote digital equity and inclusion. To institutionalize digital equity and inclusion in ongoing policy considerations, the government should study, identify best practices, and adopt policies to set minimum standards for federal benefits programs' use of websites and online web portals. Increased availability of broadband means that more individuals can apply for federal benefits online, as well as monitor their applications, receive communications, or update eligibility information. This kind of access can benefit both applicants and agencies. Conversely, poorly created online portals or web sites can make the application process more difficult, or jeopardize security.

Best practices, evaluation, and timelines for compliance should be replicated government wide. Developing and promoting a foundational template for how online portals and websites are created can help further institutionalize digital equity and inclusion. The inter-agency process should share information across institutional silos, identifying the best agency resources for creating websites and portals, and a common set of evaluation benchmarks for these tools. These evaluation benchmarks should include ease of use, cybersecurity precautions, digital accessibility, and language translation capacity. The federal government should publish clear data use policies, so citizens understand how their data is being used.

14.6.3. PERSONNEL.

Government must have personnel with the authority and accountability for promoting digital equity and inclusion. This leads us to make the following recommendations:

14.6.3.1. Create a Digital Equity and Inclusion Administration Task Force within the Office of Digital Equity.

Digital equity and inclusion require inter-agency collaboration, and the expertise of a broad set of stakeholders. To guide the progress of digital equity and inclusion, the President should sign an Executive Order to create a Digital Equity and Inclusion Administration Task Force housed within the Office of Digital Equity. The task force will differ from the American Broadband Initiative, serving in a consulting capacity instead of an administrative role. The Office of Digital Equity should consult the Task Force on its collaborations with state and local digital equity offices, process for data collection, and progress toward national digital equity goals. The Task Force should recognize where its respective agencies can support the Office of Digital Equity's efforts, especially in terms of data sharing and identifying permanent federal personnel needs to maximize long-term progress.

Task force membership should include agency leaders from the FCC, NTIA, Department of Education, HUD, HHS, and Department of Labor, and experts in technology infrastructure, city planning, community development, workforce development, and education technology. For accountability purposes, the task force should publish a semi-annual report of its findings and progress, with a goal to dissolve once processes are put in place to streamline data collection and cooperation across agencies. Once these benchmarks are met, the task force should dissolve in two years.

Experts on the task force can also provide input on potential bias in the data collection process (see 14.5.3 Equity in Data Collection) and develop mechanisms to address concerns. A multi-stakeholder approach, as opposed to government-only representatives, increases opportunity for diverse discussion surrounding best practices for equity in data collection.

14.6.3.2. Designate staff responsible for implementing agency digital equity and inclusion plans and require them to provide updates on progress on a regular basis.

At least two staff positions should be created within the Office of Digital Equity to monitor the

implementation of digital equity and inclusion programs. One would be responsible for overseeing the data collection process, including the collection of relevant broadband-related data and the assessment of evolving benefits of availability, affordability, and adoption. A second staff member would be responsible for overseeing the dissemination of information, including the creation of an online resource hub for digital access, the organization of national digital inclusion summits, and the creation of a minimum standard for federal benefits programs' use of websites.

Both staff members should regularly report to the head of the Digital Equity and Inclusion Administration Task Force, described in 14.6.3.1. The staff members should submit a publicly available report detailing progress semi-annually.

14.6.4. COVID-19.

The ongoing COVID-19 pandemic has laid bare stark disparities in broadband availability, affordability, and adoption, and in the ownership of devices needed to connect to remote schooling, telehealth, job search and training, and other critical services that have shifted operations largely or entirely online. Any plan that the federal government undertakes regarding COVID-19 needs to integrate with longer-term digital equity and inclusion efforts.

14.6.4.1. The federal government should partner with state and local governments to collect relevant data, including efforts to expand access, adoption, and utilization carried out at the local level.

State and local agencies, including public schools, have taken significant action to expand broadband and device access to help individuals engage with services and programs that have been moved online, especially during the COVID-19 pandemic. As a result, local authorities may be best equipped to provide up-to-date information on new initiatives to improve broadband utilization in partnership with schools, transportation services, parks, and other community centers. Federal agencies should work with state and local authorities to determine best practices, and to evaluate the impact of these programs to identify community-based programs that would

benefit from increased federal funding or guidance for implementation.

14.6.4.2. The federal government should advocate for funding for short-term programs that are temporarily bridging the broadband access gap.

Given the rapid shift to virtual delivery of critical services, including education, workforce, and health care, state, and local governments, along with private sector providers, have raced to fill gaps in broadband utilization, providing everything from mobile hotspots for individuals to use at home to equipping school buses with Wi-Fi to support students in neighborhoods with limited broadband access. In many cases, these are short-term solutions that have emerged that only temporarily bridge availability and affordability gaps. But significant expenditure on mobile hotspots and other equipment creates a strain on school districts and local governments, which are already facing the economic effects of the pandemic. The federal government should fund short-term programs to expand broadband access, and the Office of Digital Equity could promote these efforts to state or local digital equity offices as they distribute broadband access grants to school districts, libraries, park authorities, and any other state or local agency that is operating a short-term program to support individuals in the community who do not have broadband access.

14.6.4.3. The Office of Digital Equity should be charged with collecting data related to the minimum standards for critical service delivery during COVID-19 and racial disparities related to how these services are currently being provided.

During the COVID-19 pandemic, critical services, including public education, workforce, and health care, have experienced a significant transition to virtual delivery. The federal government should collect data about these critical services to determine minimum and optimal standards for online delivery. These benchmarks could include speed, latency, service design, website and application design, and data utilization characteristics. Once the Office of Digital Equity has determined the minimum and optimal standards in these key scenarios, the benchmarks should be incorporated into the

coverage statistics shown in Table 1, so that data collection efforts can include whether individuals have broadband service necessary to effectively utilize these services. The Office of Digital Equity should conduct further analysis to understand any racial disparities that may result in communities of color having limited access to remote schooling, workforce, telehealth, and other critical services that are now being delivered online.

Conclusion



THE FIERCE URGENCY OF CONNECTING NOW

As we finished the writing of this Plan, the Biden Administration and Congress had just begun developing a comprehensive infrastructure plan for the U.S., one that will consider substantial steps toward ending the longstanding failings of digital equity and inclusion described in this Plan. It is our firm hope that our detailed recommendations will prove helpful in designing and implementing those efforts.

In politics, as elsewhere, timing is everything. The awful combination of 2020's pandemic and the multiple incidents demonstrating continuing racial discrimination, most notably with George Floyd's murder, has reignited stalled efforts to address many forms of inequity. Both crises revealed in the starkest terms what it means, among other hardships, to be without broadband at home, whether the reason is because one cannot get it, cannot afford it, or cannot make effective use of it. What was once considered a luxury instantly became essential to prepare for and secure employment, to get a basic education, and to receive health care of nearly any kind.

With the arrival of multiple COVID-19 vaccines, there is strong hope of a return to normalcy sometime in 2021. But we will never return to a time when debates about the importance of Internet availability, adoption, and affordability seriously entertain the possibility that the millions without connections don't need or want them. That bridge has been crossed.

Now it's time to do something bold to reap the benefits of full utilization of a wide range of digital tools and services to improve the economic, social, and political life of the U.S.; not just for those without service but for everyone.

It's time because we now have clear and convincing evidence of both the need and the value of universal adoption. It's time because the failures of digital equity and inclusion are vivid in the minds of Americans and their elected representatives. It's time because this moment of clarity will not last long, despite how clear the calculus of costs and benefits of equity and inclusion has been conclusively proven.

In the next few months Congress will consider major legislative initiatives to address long festering areas of public underinvestment. Broadband must be one of those areas that receives new funding.



In the next few years, the Administration will consider many steps for how to create a more equitable and inclusive economy and society. Digital equity and inclusion must be on that agenda.

Not every need will be funded. Not every positive action will be taken. But we must aggressively and deliberately seek to use the tools of the information age to close the many gaps discussed in this Plan. Our country has gone through regular economic and societal transformations in its short but illustrious history. So far, each one has excluded substantial populations from the full benefits of those transitions.

The accelerating pace of change means that avoiding those failings this time requires what Dr. King referred to as the “fierce urgency of now.” We need a surge of government action that produces sustainable results. The actions recommended in this Plan represent a collective understanding of the need to take concrete actions, and to take them quickly and decisively. As Dr. King also said in 1967, as the United States faced a similar crossroads, “If we do not act, we shall surely be dragged down the long, dark, and shameful corridors of time reserved for those who possess power without compassion, might without morality, and strength without sight.” Let us use our power, our might, and our strength to ensure our transition to an information economy is at last the one that achieves the vision of the Declaration of Independence, that all Americans are created equal.

Endnotes



¹ See Section 3.8.5. It should be noted that the FCC’s CAF II auction and RDOF Phase I auction fail to meet these criteria.

² For example, New York’s “Broadband for All” program “called for applications for funding to provide access to broadband at speeds of at least 100 [Mbps] (download) in most places, and 25 Mbps (download) in the most remote, unserved parts of the State.” [www.ny.gov/programs/broadband-all].

³ Paul de Sa, *Improving the Nation’s Digital Infrastructure*, Federal Communications Commission, available at https://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0119/DOC-343135A1.pdf

⁴ Cartesian, available at <https://www.cartesian.com/fiber-broadband-association-new-study-finds-all-fiber-deployments-to-90-of-households-achievable-in-next-decade/>

⁵ See Fiber Broadband Association, About Us, available at www.fiberbroadband.org/about-us

⁶ Except where noted, the data below is from the 2019 ACS; Figures in the appendix offer more granular detail on some of the following datapoints, such as income.

⁷ <https://liverpool5g.org.uk/wp-content/uploads/2020/04/Liverpool-5G-Testbed-Benefits-Outcomes-Impact.pdf>

⁸ Laura LaBerge et al., *How Covid-19 Has Pushed Companies Over the Technology Tipping Point and Transformed Business Forever*, McKinsey (Oct. 5, 2020), <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>.

⁹ Lance Whitney, *Where the Jobs Are: Tech Hiring is On the Rise*, Tech Republic (Nov. 12, 2020), <https://www.techrepublic.com/article/where-the-jobs-are-tech-hiring-is-on-the-rise/>.

¹⁰ Jhacova Williams, *Laid Off More, Hired Less: Black Workers in the COVID-19 Recession*, The RAND Blog (Sept. 29, 2020), <https://www.rand.org/blog/2020/09/laid-off-more-hired-less-black-workers-in-the-covid.html>.

¹¹ [Blacks, Latinos And Native Americans Bear Heaviest Financial Burden Of Pandemic : Shots - Health News : NPR](#)

¹² Valerie Wilson, *10 years after the start of the Great Recession, black and Asian households have yet to recover lost income*, Economic Policy Institute (Sept. 12, 2018), <https://www.epi.org/blog/10-years-after-the-start-of-the-great-recession-black-and-asian-households-have-yet-to-recover-lost-income/>.

¹³ Mark Muro, Alan Berube & Jacob Whiton, *Black and Hispanic underrepresentation in tech: It’s time to change the equation*, Brookings Instit. (Mar. 28, 2018), <https://www.brookings.edu/research/black-and-hispanic-underrepresentation-in-tech-its-time-to-change-the-equation/>.

¹⁴ Marc Morial, *The Gumbo Coalition* at pp. 173-180 (HarperCollins Leadership, 2020).

¹⁵ Federal and state-certified Registered Apprenticeship programs are made up of five components: (1) involvement from employers; (2) structured on-the-job training; (3) related technical instruction (RTI), comprised of technical education at community colleges, technical schools, apprenticeship training schools, or provided online or at the job site; (4) apprentice rewards, such as wage increases, for skill gains; and (5) a resulting nationally-recognized credential that lets employers know apprentices are fully qualified for jobs. See U.S. Department of Labor “*A Quick-Start Toolkit: Building Registered Apprenticeship Programs*” at 9, available at https://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf (last visited November 16, 2022).

¹⁶ See Deloitte Insights and Manufacturing Institute, *The Jobs Are Here, But Where Are the People?* at 2, available at <https://www.themanufacturinginstitute.org/wp-content/uploads/2020/03/MI-DI-The-jobs-are-here-where-are-the-people.pdf> (last visited November 16, 2022).

¹⁷ See McKinsey & Company, “*COVID-19 Recovery in Hardest-Hit Sectors Could Take More Than 5 Years*” (July 29, 2020), finding that in a “muted-recovery” scenario, some industries, including arts, entertainment and recreation; accommodation and food services; transportation and warehousing; and manufacturing, could take more than five years to return to 2019-level contributions to GDP, available at <https://www.mckinsey.com/featured-insights/coronavirus-leading-through-the-crisis/charting-the-path-to-the-next-normal/COVID-19-recovery-in-hardest-hit-sectors-could-take-more-than-5-years> (last visited October 22, 2020).

¹⁸ See BestColleges “2020 Online Education Trends Report,” available at <https://res.cloudinary.com/highereducation/image/upload/v1584979511/BestColleges.com/edutrends/20-Online-Trends-in-Education-Report-BestColleges.pdf> (last visited November 6, 2020).

¹⁹ See LinkedIn Talent Solutions “The Ultimate List of Hiring Statistics for Hiring Managers, HR Professionals, and Recruiters,” available at https://business.linkedin.com/content/dam/business/talent-solutions/global/en_us/c/pdfs/Ultimate-List-of-Hiring-Stats-v02.04.pdf (last visited November 6, 2020).

²⁰ See About Glassdoor, available at <https://www.glassdoor.com/about-us/> (last visited November 6, 2020).

²¹ See About Indeed, available at <https://www.indeed.com/about> (last visited November 6, 2020).

²² See Mansoor Iqbal, Business of Apps, “LinkedIn Usage and Revenue Statistics (2020)” (November 6, 2020), available at <https://www.businessofapps.com/data/linkedin-statistics/> (last visited November 6, 2020).

²³ *Id.*

²⁴ See J. Clement, Statista, “Online and social media recruiting - Statistics & facts” (November 29, 2019), available at <https://www.statista.com/topics/2727/online-recruiting/> (last visited November 6, 2020).

²⁵ See Richard Fry, Pew Research Center, “Millennials Are the Largest Generation in the U.S. Labor Force” (April 11, 2018), stating, “The youngest Boomer was 53 years old in 2017, while the oldest Boomers were older than 70. With more Boomers retiring every year and not much immigration to affect their numbers, the size of the Boomer workforce will continue to shrink. While the Millennial labor force is still growing, partly due to immigration, it is unlikely that the Millennial labor force will reach the peak size of the Boomer labor force (66 million in 1997);” available at <https://www.pewresearch.org/fact-tank/2018/04/11/millennials-largest-generation-us-labor-force/> (last visited October 22, 2020).

²⁶ See McKinsey & Company, *supra* note 3.

²⁷ See Section 8.4.2.1, *infra*, detailing these programs and other pre- and post-COVID-19 efforts.

²⁸ See, for example, U.S. Department of Labor, “Create a New Program” webpage, listing “a few key steps involved in creating your very own Registered Apprenticeship Program.” The steps show that the Department of Labor allows, but does not require, employers to add virtual components to the classroom training components of their RAPs. The page states, “For the classroom educational component, you may select a provider that is either internal to your organization or external (e.g., Community college, vocational school, online provider) which can be delivered in-person or virtually.” For these programs, virtual components to classroom training is allowed, but not required. Available at <https://www.apprenticeship.gov/employers/registered-apprenticeship-program/build/create> (last visited November 16, 2020).

²⁹ See, for example, the Career One-Stop website, which includes a search tool for the nearly 2,400 American Job Centers nationwide, available at <https://www.careeronestop.org/LocalHelp/AmericanJobCenters/find-american-job-centers.aspx?&location=20006&radius=25&ct=0&y=0&w=0&e=0&sortcolumns=Distance&sortdirections=ASC&curPage=1&pagesize=25> (last visited November 16, 2020). The page currently has a COVID-19 update that says, “Many AJCs are temporarily closed or have moved to virtual services. You may see updates for individual centers below. Please call or email a center for the latest information on their current services.” A search of the American Job Center Finder for AJCs within 25 miles of the Washington, DC, area, for example, yields 17 results. Ten locations are listed as “closed to public; available by phone and email”; six are listed as “closed to the public due to the COVID-19 until further notice”; and one is listed as “operating at limited capacity to ensure social distancing due to COVID-19.”

³⁰ See Elka Torpey and Ryan Farrell, Bureau of Labor Statistics, “Apprenticeships: Outlook and Wages in Selected Occupations” (updated November 2019), available at <https://www.bls.gov/careeroutlook/2019/article/apprenticeships-outlook-wages-update.htm> (last visited October 23, 2020).

³¹ See U.S. Department of Labor, “Discover Apprenticeship: A Proven Solution for Your Workforce” (updated September 2020), available at https://www.apprenticeship.gov/sites/default/files/Employer_Fact_Sheet.pdf (last visited October 23, 2020).

³² See Employment and Training Administration, U.S. Department of Labor, “COVID-19 Frequently Asked Questions,” available at <https://www.dol.gov/agencies/eta/coronavirus> (last visited October 23, 2020).

³³ See David H. Bradley, Congressional Research Service, “*The Workforce Innovation and Opportunity Act and the One-Stop Delivery System*” (October 27, 2015), available at <https://fas.org/sgp/crs/misc/R44252.pdf> (last visited November 4, 2020).

³⁴ *Id.*

³⁵ See WorkforceGPS, U.S. Department of Labor, “*One-Stop Center Service Design (Transcript)*” (December 12, 2016), available at <https://www.workforcegps.org/resources/2016/03/30/09/20/One-Stop-Center-Service-Design> (last visited October 28, 2020).

³⁶ See American Job Center Finder, available at <https://www.careeronestop.org/LocalHelp/AmericanJobCenters/find-american-job-centers.aspx> (last visited October 28, 2020).

³⁷ See CareerOneStop, About Us, available at <https://www.careeronestop.org/Site/about-us.aspx> (last visited October 28, 2020).

³⁸ See National Association of State Workforce Agencies, “About NASWA,” available at <https://www.naswa.org/about> (last visited October 26, 2020).

³⁹ See National Association of State Workforce Agencies, “*2019 State of the Workforce Report*” (released March 27, 2020), available at <https://www.naswa.org/system/files/2020-03/naswastateofworkforce2020-03-27.pdf> (last visited October 26, 2020).

⁴⁰ Specifically, the WOTC categorizes these groups as “IV-A recipients”—individuals or members of a family receiving assistance under a state plan approved under part A of title IV of the Social Security Act relating to Temporary Assistance for Needy Families (TANF). See Employment and Training Administration, U.S. Department of Labor, “*Work Opportunity Tax Credit Eligibility Desk Aid*” (August 9, 2018), available at https://www.dol.gov/sites/dolgov/files/ETA/wotc/pdfs/WOTC_EligibilityDeskAid.pdf (last visited November 16, 2020).

⁴¹ See Employment and Training Administration, U.S. Department of Labor, “*Work Opportunity Tax Credit Fact Sheet*” (February 2020), available at https://www.dol.gov/sites/dolgov/files/ETA/wotc/pdfs/WOTC_Fact_Sheet.pdf (last visited October 26, 2020).

⁴² See Congressional Research Service, “*The Work Opportunity Tax Credit*” (updated September 25, 2018), available at <https://fas.org/sgp/crs/misc/R43729.pdf> (last visited October 26, 2020).

⁴³ See Internal Revenue Service, “*Opportunity Zones Frequently Asked Questions*” (September 19, 2020), available at <https://www.irs.gov/credits-deductions/opportunity-zones-frequently-asked-questions> (last visited November 5, 2020).

⁴⁴ See Urban Institute, “*An Early Assessment of Opportunity Zones for Equitable Development Projects*” (July 28, 2020), available at https://www.urban.org/research/publication/early-assessment-opportunity-zones-equitable-development-projects/view/full_report (last visited November 5, 2020).

⁴⁵ See Adam Looney, The Brookings Institution, “*Will Opportunity Zones help distressed residents or be a tax cut for gentrification?*” (February 26, 2018), available at <https://www.brookings.edu/blog/up-front/2018/02/26/will-opportunity-zones-help-distressed-residents-or-be-a-tax-cut-for-gentrification/> (last visited November 16, 2020).

⁴⁶ See Samantha Jacoby, Center on Budget and Policy Priorities, “*Potential Flaws of Opportunity Zones Loom, as Do Risks of Large-Scale Tax Avoidance*” (January 11, 2019), available at <https://www.cbpp.org/research/federal-tax/potential-flaws-of-opportunity-zones-loom-as-do-risks-of-large-scale-tax> (last visited November 16, 2020).

⁴⁷ See Department of Finance and Administrative Services Purchasing and Contracting, City of Seattle, “*2019 Priority Hire Annual Report*” (June 15, 2020), available at <https://www.seattle.gov/Documents/Departments/FAS/PurchasingAndContracting/Labor/fas-2019-priority-hire-annual-report.pdf> (last visited October 28, 2020). Since the program’s beginning in 2013, workers living in economically distressed communities have earned \$25.7 million in wages, which the City estimates is \$12.4 million more than they would have earned without Priority Hire. By working on the City’s big construction projects, Latino men earn an estimated 43% more per hour than the average

Latino man working in King County, and African Americans saw a 100% increase in their share of 2019 hours over past performance by Priority Hire.

⁴⁸ See Office of Governor Janet Mills, “Governor Mills Signs Executive Order to Fast Track Free Online Job Training at Maine’s Community Colleges,” (March 30, 2020), available at <https://www.maine.gov/governor/mills/news/governor-mills-signs-executive-order-fast-track-free-online-job-training-maines-community> (last visited October 27, 2020).

⁴⁹ See Office of Governor Ned Lamont, “Governor Lamont Announces Statewide Launch of Free Online Job Training Program for Unemployment Claimants” (May 4, 2020), available at <https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2020/05-2020/Governor-Lamont-Announces-Statewide-Launch-of-Free-Online-Job-Training-Program> (last visited October 27, 2020).

⁵⁰ See Department of Finance and Administrative Services Purchasing and Contracting, City of Seattle, “2019 Priority Hire Annual Report” (June 15, 2020), available at <https://www.seattle.gov/Documents/Departments/FAS/PurchasingAndContracting/Labor/fas-2019-priority-hire-annual-report.pdf> (last visited October 28, 2020). Since the program’s beginning in 2013, workers living in economically distressed communities have earned \$25.7 million in wages, which the City estimates is \$12.4 million more than they would have earned without Priority Hire. By working on the City’s big construction projects, Latino men earn an estimated 43% more per hour than the average Latino man working in King County, and African Americans saw a 100% increase in their share of 2019 hours over past performance by Priority Hire.

⁵¹ See Brad Smith, Microsoft, “Microsoft launches initiative to help 25 million people worldwide acquire the digital skills needed in a COVID-19 economy” (June 30, 2020), available at <https://blogs.microsoft.com/blog/2020/06/30/microsoft-launches-initiative-to-help-25-million-people-worldwide-acquire-the-digital-skills-needed-in-a-COVID-19-economy/> (last visited October 22, 2020).

⁵² See Comcast, “Comcast Offers Thousands of Grants, Equipment, Marketing and Tech Resources to Small Businesses Hardest Hit by COVID” (October 13, 2020), available at <https://corporate.comcast.com/press/releases/comcast-grants-resources-small-diverse-businesses-COVID-19> (last visited November 5, 2020).

⁵³ See Connect the Future website, available at <https://connectthefuture.com/> (last visited November 6, 2020).

⁵⁴ See Section 8.4.2, *supra*.

⁵⁵ *Id.*

⁵⁶ See Bureau of Labor Statistics, “Labor Force Statistics from the Current Population Survey” (last modified October 5, 2020), available at https://www.bls.gov/web/empsit/cpsee_e16.htm (last visited October 23, 2020).

⁵⁷ See Centers for Disease Control and Prevention, “Health Equity Considerations and Racial and Ethnic Minority Groups” (July 24, 2020), available at <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html> (last visited October 22, 2020).

⁵⁸ *Id.*

⁵⁹ See Section 8.4.2, *supra*.

⁶⁰ See Joint Center for Political and Economic Studies, “Improving Training to Brighten the Future of Black Workers” (September 14, 2019), available at <https://jointcenter.org/wp-content/uploads/2019/10/Skills-Report-6-Page-Fact-Sheet-Infographic-9-12-19-1049am.pdf> (last visited October 27, 2020).

⁶¹ See Spotlight on Poverty and Opportunity, “Leveraging Science and Technology to Confront Social Challenges: A Conversation with Tom Kalil” (July 3, 2019), available at <https://spotlightonpoverty.org/spotlight-exclusives/leveraging-science-and-technology-to-confront-social-challenges-a-conversation-with-tom-kalil/> (last visited November 16, 2020).

⁶² See Section 8.4.2, *supra*.

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