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Hearing on “Connecting Workers and Communities: Preparing and Supporting the Broadband Workforce”

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Chairman Hickenlooper, Ranking Member Braun, and distinguished members of the Health, Education, Labor & Pensions Subcommittee on Employment and Workplace Safety, thank you for the invitation to testify on the important issue of how the Infrastructure Investment and Jobs Act (IIJA) can sustainably and equitably create new, high-paying jobs in emerging industries, particularly from those created by major investments to expand universal broadband access. I am Nicol Turner Lee, Senior Fellow, Governance Studies and Director of the Center for Technology Innovation at the Brookings Institution. With a history of over 100 years, Brookings is committed to evidence-based, nonpartisan research in a range of focus areas. My research expertise encompasses data collection and analysis around regulatory and legislative policies that govern telecommunications and high-tech industries, along with the impacts of digital exclusion, artificial intelligence, and machine-learning algorithms on vulnerable populations. My forthcoming book, *Digitally invisible: How the internet is creating the new underclass* will be published by Brookings Press later this year.

The IJA is a historic, bipartisan step to ensure that every American is equipped with the necessary tools, resources, and structures to participate in a 21st century economy.^{1,2} The legislation includes high-speed broadband as one of the many critical infrastructure assets, which is both significant and transformative as getting online has become more of a necessity, instead of a luxury in these times.³ Having high-speed broadband access is fundamental for Americans to work, study, participate in religious or cultural activities, and socialize, in parallel with more traditional infrastructure. In other words, it is a pathway to first-class, digital citizenship. If the IJA is executed properly, the nation should be able to accelerate internet access for the millions of Americans who currently live without it. In turn, it will spur massive economic growth—granting access to millions of new 21st century jobs, as well as creating new career paths for livable earnings within industries enabled by direct access to more robust networks, in addition to industries indirectly benefitting from existing and emerging platforms.

In my written testimony, I propose solutions on how we can embolden an equitable and expansive workforce in the broadband sector of the U.S. economy. But first, Congress must implore the Department of Labor (DOL) to create taxonomies of the skills needed to fill vacancies in this and related technology sectors. Currently, there exists ambiguity in how we identify and define such opportunities, including fiber optics, 5G or wireless, and other related broadband infrastructure opportunities. Further, the U.S. must engage in national skilling

¹ “Fact Sheet: The Bipartisan Infrastructure Deal,” The White House, November 6, 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/>

² *Infrastructure Investment and Jobs Act*. Public Law 117-58. *U.S. Statutes at Large* 135 (2021): 429 – 1467.

³ <https://www.cantwell.senate.gov/imo/media/doc/Infrastructure%20Investment%20and%20Jobs%20Act%20-%20Section%20by%20Section%20Summary.pdf>

through the creation of policies and norms that engage workers in not just job opportunities, but career paths, especially for those individuals without four-year college degrees.⁴ These milestones can be attained via lucrative training and placement opportunities, including apprenticeships and industry credentialing in the existing and emerging careers in wireline and wireless broadband, as well as supportive industry roles in data analyses, customer service, cloudware, and more.

More important, federal and state governments must consider empowering the broadband workforce as a critical element of the IJJA, starting with the enlistment of education and community partners like community colleges, and K-12 schools who are critical to fueling the 21st century workforce. Congress might also support funding to the Corporation for National and Community Service for a national Digital Service Corps, where several under-skilled workers can engage in more experiential learning of these trades while receiving a modest stipend as part of their pathway into jobs, and then long-term careers.

My main point of my testimony is that the nation has a huge opportunity in the creation of new, high-paying jobs to build critical infrastructure like broadband access. These efforts should be an accelerant for entry, and involve deliberate and strategic efforts around equity, ensuring that no citizens are excluded based on their demographic background, geographic residence, or lack of competency in fairly nascent fields.

⁴ Sam Sabin, "5G Worker Shortages Could Provide Many Americans with Chance to Return to Work," Morning Consult, May 6, 2020, <https://morningconsult.com/2020/05/06/5g-wireless-workforce-shortage-coronavirus/>

The Infrastructure Investment and Jobs Act and Careers

An additional reason for accelerating high-speed broadband access is to help close the national digital divide that separates millions of Americans from fully participating in the digital economy. The global pandemic has surfaced the importance of online connectivity as millions obliged the calls for physical social distancing and transitioned online for remote work, school, health care, government services, and regular communications with friends and family members. As technology becomes more ubiquitously available and affordable for Americans of all socioeconomic levels, it has become a game changer for how citizens transact and interact in their daily lives, and will be foundational to the development of inclusive economic growth in the U.S.⁵ Yet new online dependencies have widened the nation's digital divide, leaving some people of color, older and low-income populations, and those from rural (and some urban) areas unable to consume certain products and services. These vulnerable groups were greatly impacted by the pandemic's social isolation at its onset, which restricted many people from applying for unemployment benefits, engaging in virtual education, or scheduling and receiving a vaccination.⁶

In February 2021, my testimony before the United States House of Representatives Committee on Economic Disparity & Fairness in Growth went into more detail about the \$65 billion toward high-speed broadband from the \$1.2 trillion IJA appropriation, and indicated

⁵ Nicol Turner Lee, "Building for the Future: Advancing Digital Competitiveness through Broadband Access and Adoption," <https://www.brookings.edu/testimonies/building-for-the-future-advancing-digital-competitiveness-through-broadband-access-and-adoption/>.

⁶ Nicol Turner Lee, "Why America Needs a 'Tech New Deal' to Build Back Better," *TechTank* (blog), January 12, 2021, <https://www.brookings.edu/blog/techtank/2021/01/12/why-america-needs-a-tech-new-deal-to-build-back-better/>.

that we needed a coherent and collaborative strategy to effectuate change, or a “Tech New Deal.” This is important because the IJA appropriated funds are more than quadruple the support granted in 2009 for the American Recovery and Reinvestment Act (ARRA), which allocated \$4.7 billion toward online access.⁷ In this new tranch of funding, Congress has authorized \$2.75 billion through the three Digital Equity Act programs to promote digital inclusion and increase broadband adoption—some of which must be used explicitly to consider and fund state, local, and community workforce development programs.⁸ The National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce, along with the Federal Communications Commission (FCC), are responsible for distributing these funds—first to states that are charged with developing broadband infrastructure and digital equity plans as part of their receipt of the funds.

Of the entire 2020 funds, the Digital Equity Act most likely will house the funds for local workforce development programs, but the remaining \$62.25 billion in high-speed broadband assets can also be thought of as stimulating workforce development. These monies not only will support short-term infrastructure needs: they are a prerequisite to supporting the long-term development and deployment of new, economically transformative technologies as well. For example, select areas in Chicago, Atlanta, Washington, D.C., and more have already deployed 5G networks. According to Verizon, one of the major internet service providers offering 5G, networks are enabling download speeds of 1 Gbps and latency rates of less than 30 ms, which

⁷ Nicol Turner Lee, “Building for the Future: Advancing Digital Competitiveness through Broadband Access and Adoption,” <https://www.brookings.edu/testimonies/building-for-the-future-advancing-digital-competitiveness-through-broadband-access-and-adoption/>.

⁸ Nicol Turner Lee, “Why America Needs a ‘Tech New Deal’ to Build Back Better,” *TechTank* (blog), January 12, 2021, <https://www.brookings.edu/blog/techtank/2021/01/12/why-america-needs-a-tech-new-deal-to-build-back-better/>.

will allow a vast range of new technologies—autonomous vehicles, smart home devices, telehealth monitors, agricultural or environmental sensors, virtual reality systems, and more—to be connected to the internet.⁹ But the design and development of 5G overall has been estimated to attribute \$13.2 trillion to the global economy, and create an additional 22.3 million jobs across the world.¹⁰

That is why to harness the massive potential for job creation, broadband must be a part of a broader strategy of 21st century inclusive economic growth, especially in the production of new opportunities for individuals with or without a four-year degree. Given the disproportionate access to broadband and the platforms and applications that it enables, an equity framework should be applied to such decisions on where to build and who to serve—at least, in the first iteration of broadband build-out and digital equity programs. The IJJA has indicated that unserved, followed by underserved, communities will be top priorities for new government spending. Simultaneously, these must be the same communities where programs investing in job creation, placement, and training for careers in these lucrative industries are focused first, offering a compounded benefit and multiplier of federal resources. Only this way can we ensure that all individuals—regardless of their educational status—can fruitfully work and earn in the existing and emerging communications ecosystems or, at minimum, be offered opportunities to learn the necessary skills.

⁹ Verizon. “What Is the Latency of 5G?,” February 2, 2020, <https://www.verizon.com/about/our-company/5g/5g-latency>; Larry Downes, “5G: What is it good for?” The Washington Post, February 3, 2022, <https://www.washingtonpost.com/news/innovations/wp/2018/06/05/5g-what-is-it-good-for/>.

¹⁰ “The impact of 5G: Creating new value across industries and society,” World Economic Forum, January 2020, https://www3.weforum.org/docs/WEF_The_Impact_of_5G_Report.pdf.

As mentioned, my own research offered a comprehensive framework to ensure the achievement of described milestones, which was encased in the concept of a “Tech New Deal.”¹¹ Parts of the Tech New Deal assert that “No Child Be Left Offline” to guarantee the closing of the “homework gap” because every K-12 student would have options for affordable broadband service, an internet-enabled device, hot spot, and relevant training resources for parents and other caregivers.¹² My research also presented the concept of Digital Service Corps to aid in closing the digital divide within their local communities, which will be discussed later in the testimony. Further, the creation of new broadband jobs should not solely happen among telecommunications and technology providers. There should be both critical interests and investments from industries benefitting from the technology ecosystem—from banks to retail companies. In sum, the federal government must develop policies that invite and reimagine public policies that include diverse industry stakeholders, as well as representatives from state and local workforce development boards, and civil society organizations to chart a path for how technology spurs economic growth and shifts in service delivery for citizens.¹³

Without a concerted, whole-of-society effort, the nation and these industries will lose generational opportunities to advance these sectors. The digital divide will continue to

¹¹ Nicol Turner Lee, “Why America Needs a ‘Tech New Deal’ to Build Back Better,” The Brookings Institution, TechTank, January 12, 2021, <https://www.brookings.edu/blog/techtank/2021/01/12/why-america-needs-a-technew-deal-to-build-back-better/>.

¹² Nicol Turner Lee, “No Child Deserves to Be Left Offline This School Year—Here’s How Congress Can Help,” The Brookings Institution, TechTank, August 2, 2021, <https://www.brookings.edu/blog/techtank/2021/08/02/no-child-deserves-to-be-left-offline-this-school-year-heres-how-congress-can-help/>.

¹³ Nicol Turner Lee, “Why America Needs a ‘Tech New Deal’ to Build Back Better,” The Brookings Institution, TechTank, January 12, 2021, <https://www.brookings.edu/blog/techtank/2021/01/12/why-america-needs-a-technew-deal-to-build-back-better/>.

complicate matters for populations without broadband access.^{14,15} These are the reasons why the U.S. needs coordinated national, state, and local level approaches to expediting skilling and job training for the broadband workforce to avoid the slower rollout of the broad infrastructure goals and the current shortage of available workers post-pandemic.¹⁶

Jobs and the Broadband Workforce

In 2021, Brookings Center for Sustainable Development estimated 160,000 broadband job-years alone will be directly created from the Infrastructure Investment and Jobs Act.¹⁷ Of these, telecommunications equipment installers and repairers are projected to require an additional 36,000 new positions to be filled (23% of the total), with an additional 12,000 new positions created in other installer and repairer roles (8% of the total). Particularly in this set of critical initial-deployment positions, as it stands today, there are not enough available trained workers to fill these in broadband occupations—mirroring the huge vacancies in cybersecurity jobs that also required a specialized approach to recruitment and training. An added challenge in fulfilling broadband roles is the geographic distribution of workers with these skills do not often match locations where jobs are most needed, like rural areas that will be laying fiber optics.¹⁸

¹⁴ Nicol Turner Lee, “Bridging Digital Divides between Schools and Communities,” The Brookings Institution, March 2, 2020, <https://www.brookings.edu/research/bridging-digital-divides-between-schools-and-communities/>

¹⁵ Harmeet Kaur, “Why Rural Americans Are Having a Hard Time Working from Home,” CNN, April 29, 2020, <https://www.cnn.com/2020/04/29/us/rural-broadband-access-coronavirus-trnd/index.html>.

¹⁶ Joseph Kane, “Biden Needs to Create an Infrastructure Talent Pipeline, Not Just More Jobs,” *The Avenue* (blog), January 29, 2021, <https://www.brookings.edu/blog/the-avenue/2021/01/29/biden-needs-to-create-an-infrastructure-talent-pipeline-not-just-more-jobs/>.

¹⁷ One job-year is equal to one job for one year. For example, ten job-years could be 10 jobs for 1 year, or 1 job for 10 years.

¹⁸ Marcela Escobari Strauss Dhruv Gandhi, and Sebastian, “How Federal Infrastructure Investment Can Put America to Work,” *Brookings* (blog), March 17, 2021, <https://www.brookings.edu/research/how-federal-infrastructure-investment-can-put-america-to-work/>.

Yet these 160,000 broadband jobs are the beginning count of the human capital needed to advance the IJJA’s broadband provisions. Projections sourced from the University of Massachusetts Amherst demonstrate that jobs directly created from new broadband funding will make up only 25% of the total number of jobs created by these monies. Including indirect and induced jobs into the calculation demonstrates that the \$65 billion in broadband funding alone will likely create 650,000 new job-years in the United States, including 84,000 jobs in the manufacturing sector.¹⁹

Previous Brookings research also backs these broadband-specific assumptions. Indeed, the vast majority (77%) of workers in infrastructure jobs are employed in the operation of physical assets, rather than their construction or design.²⁰ The 650,000 job-years created by the IJJA’s broadband funding provisions will be no different: most of these infrastructure jobs are long-term careers in a broad variety of roles, most of which are positions where “you don’t have to wear a hard hat” to carry out employment functions.²¹ Infrastructure jobs have also offered historically more competitive and equitable wages—up to 30% higher than other industries—particularly for low-income workers and those starting careers for the first time. And in some instances, workers have collective bargaining rights, especially for the roles embedded in the trades.

¹⁹ Robert Pollin and Shouvik Chakraborty, “Job Creation Estimates Through Proposed Economic Stimulus Measures” (Political Economy Research Institute: University of Massachusetts Amherst, September 2020), <https://peri.umass.edu/component/k2/item/1297-job-creation-estimates-through-proposed-economic-stimulus-measures>.

²⁰ Joseph Kane and Robert Puentes, “Beyond Shovel-Ready: The Extent and Impact of U.S. Infrastructure Jobs,” May 9, 2014, <https://www.brookings.edu/interactives/beyond-shovel-ready-the-extent-and-impact-of-u-s-infrastructure-jobs/>.

²¹ Joseph Kane and Jack Mills, “Harnessing the Infrastructure Investment and Jobs Act to Train the next Generation of Workers,” *The Avenue* (blog), February 23, 2022, <https://www.brookings.edu/blog/the-avenue/2022/02/23/harnessing-the-infrastructure-investment-and-jobs-act-to-train-the-next-generation-of-workers/>.

For policymakers and stakeholders across federal, state, and local governments, this should be welcome news—but equitably getting workers to the career ladder will undeniably pose challenges, especially for women and people of color who are underrepresented across these jobs.²²

While stakeholders should focus on a holistic view of broadband jobs, of particular interest to my work are the new remote or hybrid economic opportunities opened up in the technology sector to currently unserved or underserved Americans. Powered by the “Great Transition,” these stable and good-paying 21st-century jobs rank fourth in projected employment growth over the last year, and demand for emerging tech jobs (including in AI and cloud development) have grown over 200% in the past five years. Demand for these jobs is expected to continue in the next decade, with a projected growth rate twice the national jobs rate.²³ Demand from employers for qualified tech employees is currently outstripping the supply of qualified candidates, a clear sign of an “ongoing labor supply problem.”²⁴

Thus, reskilling and upskilling for workers offers an opportunity to fill the skills gap while maximizing the economic opportunities offered by (and to) newly-connected Americans. Recent research from Jason Jabbari, Wenrui Huang, and Michal Grinstein-Weiss has empirically demonstrated the success of a mixed non-traditional reskilling program containing both education and apprenticeship elements. LaunchCode, a St. Louis organization, offered flexible

²² Joseph Kane, “Five Ways Regional Leaders Can Prepare Future Infrastructure Workers Now,” *The Avenue* (blog), September 16, 2021, <https://www.brookings.edu/blog/the-avenue/2021/09/16/five-ways-regional-leaders-can-prepare-future-infrastructure-workers-now/>.

²³ CompTIA, “State Of The Tech Workforce: Cyberstates 2022” (Computing Technology Industry Association, March 2022), https://www.cyberstates.org/pdf/CompTIA_Cyberstates_2022.pdf.

²⁴ “CompTIA Jobs Report: Tech Hiring Eases Amid Labor Supply Constraints,” My TechDecisions, March 4, 2022, <https://mytechdecisions.com/news-1/comptia-jobs-report-tech-hiring-eases-amid-labor-supply-constraints/>.

and no-cost part-time evening programming for students interested in reskilling to tech-oriented jobs. After passing a workforce readiness check by staff, participants began paid, full-time apprenticeships, supplementing their learned technical skills with soft skills in the workplace. Not only did this program model lower barriers to participants, but it empirically improved economic outcomes for participants who completed apprenticeships, and increased the post-program odds of employment in STEM fields by 12 percentage points.²⁵ This combination of no-cost education programs that enable equity through apprenticeship programs and experiential soft skills training present promising models to pursue in the future, and could be incorporated into other similarly-minded programs.^{26,27}

While the creation of tens of thousands of good-paying broadband infrastructure jobs is a great start, IIJA monies will also create sizeable second-order demand for jobs like data analysts, customer service representatives, and more. These efforts to close the digital divide should result in people and their communities being moved from consumers to producers and innovators, who are prepared to accelerate our nation's global digital competitiveness.

Encouraging greater participation in the broadband workforce

To maximize the benefits of these IIJA investments, a holistic approach encompassing multiple aspects of workforce development is integral. To this, I have a few proposals to offer to the committee: (1) apply apprenticeship and credentialing programs in the IIJA to provide

²⁵ Jason Jabbari Grinstein-Weiss Wenrui Huang, and Michal, "Apprenticeships Increase Employment, Earnings, and Optimism in the Technology Sector," *TechTank* (blog), January 27, 2022, <https://www.brookings.edu/blog/techtank/2022/01/27/apprenticeships-increase-employment-earnings-and-optimism-in-the-technology-sector/>.

²⁶ "Six Ways to Tackle the Cloud Skills Shortage" (Deloitte), accessed April 27, 2022, <https://www2.deloitte.com/us/en/pages/consulting/articles/cloud-computing-skills-shortage.html>.

²⁷ "Using Modern Apprenticeship to Reskill America" (IWSI America, February 1, 2019), <https://www.iwsiamerica.org/itstime/>.

development opportunities; (2) engage community colleges to provide pathways to occupational skill reset; (3) create a Digital Service Corps for new entrants; (4) increase pipeline investments for youth programs to support the next generation; and (5) update government labor statistics practices.

- 1. Apply apprenticeship and credentialing programs in the IJA to provide development opportunities.**

Skilled jobs in fiber optic installation, data analytics, and customer service provide livable wages and employment security for workers. The number of positions in these fields will only continue to grow as our nation's broadband infrastructure continues to evolve, especially in wireless or fiber jobs, or related security and network management fields. Employing credentialing systems or adopting other industry models for apprenticeships can be useful starting points. For example, the DOL partnered with the White House and Department of Transportation on a 90-Day Trucking Apprenticeship Challenge to increase participants in the Registered Apprenticeship Model, and fill the transit gaps due to increased demand.²⁸

Whereas the skillsets for some of the broadband jobs may require more proficiency in logistics and installation (which do not require a college degree), the creation of apprenticeship programs around technology could have various worker incentives, like community-based hiring, private sector sign-ons, or accelerated career tracks. Here is also where the aforementioned \$2.75 billion Digital Equity Act and \$2 billion in tribal grants can support workforce development efforts, by ensuring access to local technology in computer labs, or partnerships between community-based organizations and workforce development boards.

²⁸ U.S. Department of Labor, 90-Day Trucking Apprenticeship Challenge, available through [Apprenticeship.gov](https://www.apprenticeship.gov/90-Day-Trucking-Apprenticeship-Challenge), [90-Day Trucking Apprenticeship Challenge | Apprenticeship.gov](https://www.apprenticeship.gov/90-Day-Trucking-Apprenticeship-Challenge)

Finally, existing Registered Apprenticeship models can help motivate career opportunities. In 2012, DOL joined with the Wireless Infrastructure Association and other industry partners to set up the Telecommunications Industry Registered Apprenticeship Program (TIRAP), the first Registered Apprenticeship Program in the telecommunications industry that seeks to “define career paths in a growing number of critical occupations, including tower technicians, wireless technicians, and utility workers, along with leads and foremen.”²⁹ Opportunities like these create valuable opportunities for retraining and career growth, preparing workers for a workforce with growing demands for workers in broadband and telecommunications. They should be continuously supported and upgraded to keep up with the innovation.

In February 2021, the Biden administration called on the DOL to reinstate the National Advisory Committee on Apprenticeships (ACA), appointing a diverse set of stakeholders across industries and educational institutions to establish and maintain a registered apprenticeship program.³⁰ Going forward, the ACA seeks to chart the course in creating equitable access for workers to find their place in the National Apprenticeship system.

Overall, the White House, federal and other local agencies, the private sector, and community colleges recognize the importance of apprenticeship and, in some instances, occupational credentialing programs, to create pipelines of workers for infrastructure and related support jobs. But to be effective, measurements to evaluate and track the general

²⁹ “TIRAP: Helping Build Our Nation’s Telecommunications Workforce,” TIRAP, accessed April 27, 2022, <https://www.tirap.org/>.

³⁰ “Fact Sheet: Biden Administration to Take Steps to Bolster Registered Apprenticeships,” The White House, February 17, 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/17/fact-sheet-biden-administration-to-take-steps-to-bolster-registered-apprenticeships/>.

progress and inclusivity of such programs must be employed, in addition to evaluating the existing difficulties workers face in accessing apprenticeship programs (e.g., transportation, safety apparel, computers, etc).

2. Engage community colleges to provide pathways to occupational skill resets.

Community colleges have always played an integral role in building our workforce and bridging gaps between labor demand and skills required. They are affordable and flexible means for those seeking to acquire new skills or pivot into new careers. According to research by the Federal Reserve Bank of New York evaluating community college engagement with statewide employers, community colleges engage with more than 100 employers across a range of sectors.³¹ Such employers are involved in curriculum advisory committees and provide mentoring support to students, seeking to help students find their place in the local economy. Community colleges have played integral roles in workforce retraining initiatives, taking for example the *Automotive Manufacturing Technical Education Collaborative* and the *Wisconsin Regional Industry Skills Education, Shifting Gear Initiative*, and other educational programs launched through partnerships with employers and community colleges to reform adult education and integrate industry-specific fields and skillsets into existing curriculums.³²

In the broadband sector, community colleges can bridge labor gaps and train/retrain the future broadband workforce. Through the facilitation of partnerships between community colleges and local businesses in the forms of articulation and guaranteed work agreements, the

³¹ Jaison R Abel et al., "Employer Engagement by Community Colleges in New York State," November 2018, <https://www.newyorkfed.org/medialibrary/media/outreach-and-education/workforce-development/nys-employer-engagement-community-colleges-report.pdf>.

³² U.S. Department of Education, Office of Vocational and Adult Education, "Integrating Industry-Driven Competencies in Education and Training Through Employer Engagement," Washington, D.C., 2011

telecommunications and technology industries can ensure the creation of a relevant curriculum based on the type of job or career, incentives that motivate worker entry of diverse candidates, relocation expenses, and even other individual and family supports, including transportation vouchers, life insurance, and bilingual training. Like with apprenticeships, evaluation data and analyses should ongoing to ensure that programs are effective and inclusive of all populations.

What is also important is that community colleges not be entirely perceived as the gap between high school and a four-year institution. Their engagement in the fulfillment of the IJJA workforce needs must position these opportunities as respectable, long-term, and with some potential for promotion and/or further certifications.

3. Create a Digital Service Corps for new entrants.

In the 1930s, former President Franklin Delano Roosevelt created the New Deal, a series of projects to stabilize the market and improve the country's economy, especially through infrastructure projects, such as the Rural Electrification Administration and the Tennessee Valley Authority which brought electricity to rural areas previously unconnected to power grids. Meanwhile, job programs like the Works Progress Administration and the Civilian Conservation Corps employed millions of Americans to build schools, hospitals, roads, and other improvements across the country.³³ The New Deal programs played a major role in reducing poverty and modernizing infrastructure during the Great Depression.³⁴

³³ "Civilian Conservation Corps," HISTORY.com, accessed April 27, 2022, <https://www.history.com/topics/great-depression/civilian-conservation-corps>.

³⁴ US House of Representatives: History, Art & Archives. "President Harry S. Truman's Fair Deal Proposal to a Joint Session of Congress." Accessed April 27, 2021. <https://history.house.gov/Historical-Highlights/1901-1950/President-Harry-S--Truman-s-Fair-Deal-proposal-to-a-Joint-Session-of-Congress/>.

In order to build and expand a broadband workforce that can meet future workforce demands, Congress could immediately allocate funds to the Corporation for National Service which is responsible for the nation's civic service workers. The agency could initiate a national Digital Service Corps similar to the CCC, which would recruit paid volunteers to assist in the adoption, utilization, and infrastructure development.³⁵ Digital Service Corps members could fill existing gaps in the broadband workforce and help build out much-needed infrastructure to advance broadband deployment. They could also earn monies while doing so, and engage in experiential learning around digital assets from installing fiber optics to providing internet training to seniors once the networks are built. Currently, there are no mechanisms to drive the supply of broadband workers, and leveraging the existing federal agency can make employment in these emerging industries part of the policy imperatives of the IJJA. A national Digital Service Corps can also promote diversity, equity, and inclusion by including marginalized workers, too.

4. Increase pipeline investments for youth programs to support the next generation.

To ensure inclusion in our future broadband and technology workforce, investments in youth programs and other education initiatives are needed to improve the pipeline. Among White, Black, Latino, tribal, and other vulnerable populations, the adverse impacts of not being connected severely limit their prospects of gaining access to new opportunities. When learning moved online, many K-12 students, and those from community colleges, were not connected to the internet. In fact, 34% of parents said their child encountered at least one technology-related obstacle to completing schoolwork in time, with 27% having to do work on a cellphone,

³⁵ AmeriCorps, accessed April 27, 2022, <https://www.americorps.gov/>.

16% without computer access, and 14% using public WiFi. Among Black teens, 25% were unable to complete their homework due to a lack of digital access compared to 4% of White teens and 6% of Hispanic teens, while 24% of teens with family income less than \$30,000 struggled compared to 9% of teens living in households earning \$75,000 or more a year.³⁶ Digital disparities pose educational setbacks with long-term learning impacts, and they leave many children on uneven footing, limiting their earning potential going forward. According to a 2020 analysis of US Census Bureau data by McKinsey and Company, while online schooling may have set white students between four to eight months behind in math, students of color may be six to twelve months behind.³⁷ Such setbacks can cost students \$61,000 to \$82,000 in lifetime earnings. Deprived of everyday technology, many of these future workers are slated to struggle to adapt to new coding skills and other aspects of technology work going forward.

Pipeline investments in digital inclusion, device access, and technology literacy are necessary to bridge the digital divide and resolve such inequities, providing our future workforce with the knowledge and access they need to access careers in broadband and tech. The U.S. Department of Education should establish an Office of Innovation in every school district with 21st-century occupational and knowledge skills being presented to students. While schools have been exemplary in bringing science, technology, engineering, and math (STEM) academies, they are not teaching students the basics of fiber optics, cloudware, and other necessary occupational lessons for students who may not continue into higher education.

³⁶ Katherine Schaeffer, "What We Know about Online Learning and the Homework Gap amid the Pandemic," Pew Research Center, accessed April 27, 2022, <https://www.pewresearch.org/fact-tank/2021/10/01/what-we-know-about-online-learning-and-the-homework-gap-amid-the-pandemic/>.

³⁷ Emma Dorn et al., "COVID-19 and Learning Loss—Disparities Grow and Students Need Help" (McKinsey and Company, December 8, 2020), <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help>.

Challenge grants and other private sector partnerships could be used to allocate resources to local projects. Lower-income and rural schools must also be prioritized for such ingenuities since many graduates may be charged to build their local infrastructures.

5. Update government labor statistics practices.

Right now, the U.S. does not fully know the first- and second-order jobs that will be supported by the \$65 billion broadband investment. That is partly due to the current format and presentation of national industry and occupational data in the Bureau of Labor Statistics (BLS) and the Census Bureau, which make it hard for all stakeholders to determine the exact industries and locations where the growth is happening, as well as the proportion of fully-remote jobs created from employers in different states.

To this end, the BLS should work with the Office of Management and Budget to determine what, if any, improvements to the structure of national employment data would be most useful to better capture where and in what occupations broadband-induced economic growth is felt. In the longer term, the Census Bureau should consider how best to capture and present the scale, impact, and localized growth of the broadband workforce from the data it collects in its 2023 and 2028 Economic Censuses. This would be particularly useful in measuring the impact and effectiveness of the monies allocated in the infrastructure bill. Finally, the DOL should develop and publish a broader taxonomy of skills and occupations encompassed by the broadband workforce for workers who are distanced from these emerging industries, or at least fund local partners to help get the word out. A more specific and immediate recommendation might be to add a banner and associated webpage to the O*NET landing page highlighting the

many different career paths and desired occupational skills encompassed in the broadband workforce.

Conclusion

Chairman Hickenlooper, Ranking Member Braun, and distinguished members of the Health, Education, Labor & Pensions Subcommittee on Employment and Workplace Safety, the issue at hand appears to be multi-faceted and complicated, primarily because we have always focused on the consumptive and not productive aspects of the digital economy. But investing in our broadband workforce goes beyond the installation of cell towers or fiber optic conduits. It is about investments in people and their communities where quality access to existing and futureproofed technologies and associated workforce development programs will contribute to their—and our nation’s—economic growth and personal livelihoods – regardless of one’s background and educational achievements.

Thank you again to the Members of the Subcommittee on Employment and Workplace Safety for the opportunity to testify, and I look forward to your questions. I also want to thank Brookings researchers James Seddon, Samantha Lai, and Mauricio Baker for their assistance in preparing my statement.