Expanding Digital Opportunity in Rural Communities

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KEY INSIGHTS

Many rural and Native American communities have the largest digital divide in access to high-speed infrastructure. Research shows the benefits of expanding digital opportunity in these areas.

Landmark legislation is expanding digital opportunity by investing in digital access, adoption, and skill building. Examples include the BEAD Program, the USDA Community Connect Program, and the Tribal Broadband Connectivity Program.

Other effective strategies for expanding digital opportunity in rural and tribal areas have included subsidized subscriptions and devices, combined workforce and digital skills training programs, expanded public Wi-Fi at community anchor institutions, and mobile Wi-Fi lending programs.

Expanded internet access and adoption in rural areas is associated with **more small and women-owned businesses and higher crop yields, land prices, and home values.**

To learn more, see the following case studies:

"Digital Opportunity Increases Economic Mobility" **urbn.is/4hMZdOa**

"Strengthening Health Outcomes through Digital Opportunity and Inclusion" **urbn.is/41jPh9r**

The digital divide—the gap between those with affordable access, skills, and support to engage effectively online and those without[1]—is particularly stark in many rural areas, with rural communities lagging behind cities, suburbs, and larger towns in both access to and adoption of high-speed internet, owing largely to the higher costs of installing and maintaining internet infrastructure and services in areas with lower population densities (Dawson 2021). This can inhibit people in rural communities from seeking and securing employment, starting and operating competitive businesses, accessing education, securing health care services and information, and engaging online in an increasingly digital world. With the widespread integration of digital technologies across all aspects of life, these deficits, if unaddressed, risk further widening economic and other quality-of-life disparities between rural and other areas, leaving rural communities behind.

THE PROMISE OF DIGITAL OPPORTUNITY AND INCLUSION FOR RURAL COMMUNITIES

Bridging the digital divide is a pressing necessity for expanding digital opportunity and achieving digital equity in rural areas, such that all individuals and communities have the information, technology, and capacity to fully participate in society. In rural communities, strengthening digital equity and expanding digital opportunity requires the following:

- **Developing infrastructure**, which means securing the presence and reliability of physical infrastructure needed for high-speed internet connectivity. For remote rural areas and some low-income neighborhoods (particularly in urban areas), this includes ensuring households have the physical connectivity to access broadband internet services and have options for internet service providers (Mack et al. 2024; Reddick et al. 2020).
- **Getting people connected**, which means ensuring they adopt, take up, and can afford the internet service connections and devices available to engage in workforce development and entrepreneurship and find, secure, and retain employment. This

includes addressing the barriers to broader adoption among many low-income households, households of color, older adults, and people living in rural areas (Dickes, Crouch, and Walker 2019; Mack et al. 2024; Reddick et al. 2020).

- **Teaching digital skills,** which means helping people develop the digital skills and literacy needed to access and retain employment, access public and private services, receive education, engage in job training and career development, receive health care and manage health, and otherwise effectively navigate the digital world without having to leave rural areas.

It is well established that increased digital connectivity has extensive benefits for individuals, households, communities, and society (see *Expanding Digital Opportunity: A Framework and Road Map for Strengthening Digital Inclusion*). There is a growing body of evidence that in rural contexts, expanding digital opportunity by increasing deployment, digital subscriptions, and investments to expand meaningful use has similar benefits, some of which are specific to rural contexts.

For example, in a 2022 study of agricultural-sector impacts in rural areas with increased broadband deployment, it was found that a 1-megabit-per-second (Mbps) increase in download speed was associated with a 0.281 percent increase in farmland sale prices and a 0.071 percent increase in county-level cash rent. In addition, a 1 percentage point increase in download speed was associated with a 0.094 percentage point increase in the growth rate of cash rents at the county level (Qu et al. 2022). At the commodity level, researchers found that increased broadband deployment was associated with a 3.79 percent increase in corn yields (LoPiccalo 2022).

There is also evidence that internet access and adoption is associated with entrepreneurial benefits and the presence of internet infrastructure is associated with increased home prices. One study found that broadband deployment supports entrepreneurship in rural areas and is associated with increases in the number of rural small businesses and women-owned businesses (Conroy and Low 2022). In the housing sector, a 2019 study found that the price of single-family homes with access to a 25 Mbps broadband connection was about $5,099 more than similar homes in areas with 1 Mbps (Molnar, Savage, and Sicker 2019).

There is also evidence that once infrastructure is deployed, rural communities with higher adoption rates experience more industry and employment benefits than those with lower adoption rates. For example, a 2024 study of rural Georgia, Minnesota, and Montana communities found that counties with higher broadband use had 213 percent greater business growth than counties with lower use, and that rural counties with the highest use (over 80 percent adoption) had 18 percent higher per capita income growth than those with lower use (Weinstein, Erouart, and Dewbury 2024). On average, this growth equated to nearly $500 per person per year.

OPPORTUNITIES AND SOLUTIONS

Policy Interventions That Prioritize Rural Communities

Multiple recent landmark policy interventions are expanding digital opportunity for rural communities with deep investments in digital access, adoption, and skill building.

The Broadband Equity, Access, and Deployment (BEAD) Program, authorized through the Infrastructure Investment and Jobs Act of 2021 and administered by the National Telecommunications and Information Administration (NTIA), provides $42.45 billion in block grants to states and territories to fund planning, infrastructure deployment, and adoption. BEAD was designed to address the digital divide by prioritizing broadband deployment in areas without reliable internet access, which are disproportionately rural. BEAD marks the first time the US government has provided funding to states for these purposes.[2] Funding can support infrastructure deployment and upgrades, broadband data collection and planning, device provision to promote broadband adoption, digital equity programs and investments, and reduced-cost internet access for multifamily

EXPANDING RURAL BROADBAND DEPLOYMENT THROUGH PUBLIC-PRIVATE PARTNERSHIPS

Contractual agreements between public-sector agencies and private-sector companies to deliver broadband services and projects can provide advantages including improved efficiencies and shared or reduced risk. With landmark federal investments in rural broadband expansion in recent years, local governments have access to new funding streams and financing tools to enable them to partner with internet service providers and others to expand rural broadband in their areas. Below are two recent examples.

In 2022, **Stafford County, Virginia,** partnered with **Comcast** on a $5.7 million project to expand Comcast's high-speed fiber network to 700 new homes in unincorporated areas of the county. The project was funded through a $3.4 million grant from the Virginia Telecommunications Initiative, with original funding from the American Rescue Plan Act; a $1.5 million county match; and the balance from Comcast. The project was completed in 2024.

In 2024, **Pierce County, Washington,** partnered with **Astound Broadband** on a $12.1 million project to deploy 113 miles of fiber optic infrastructure to underserved rural and island areas of the county. The County contributed $7.15 million from federal American Rescue Plan Act funds and Astound provided the remaining $4.95 million. Permitting is under way and the project is scheduled for completion by the end of 2026.

housing units. At the time of writing, the program is in early stages of implementation as states and eligible grantees process their multistage application packages. Once the NTIA approves initial proposals, applicants can request access to at least 20 percent of their allocated funds to begin implementation activities.[3]

The USDA Community Connect Program is designed to help rural communities extend infrastructure access where broadband service is least likely to be commercially profitable, but where it can make a substantial difference for people's quality of life and businesses.[4] The program provides financial assistance in the form of grants to support broadband service that fosters economic growth and delivers enhanced educational, health care, and public safety benefits. There is evidence that the program has had a positive impact on broadband speeds, with download speeds increasing by an average of 45 percent in beneficiary areas (Goldstein and Pender 2024).

The Tribal Broadband Connectivity Program provided $3 billion to tribal governments to improve quality of life for Native and tribal communities through investments in broadband deployment, adoption, and digital training and opportunity. Funds can be used for broadband deployment, telehealth, distance learning, broadband affordability, and digital inclusion on tribal lands. Applicants that have incorporated workforce development projects and digital-capacity-building strategies in their proposals have been prioritized for funding. As of November 2024, all awards were in various stages of implementation.

Effective Rural Strategies

Multiple strategies have proven effective for increasing access to, adoption of, and meaningful use of digital technologies in rural communities.

Subsidized subscriptions and devices can make wired infrastructure more financially feasible and boost subscription rates. For example, Connect Humanity, a nonprofit impact investment fund, provides investments and strategic advice to help communities build internet infrastructure. The organization makes investments to catalyze and scale community-focused ISPs to meet the needs of underserved communities, reducing the cost of backhaul and expanding access to devices. It prioritizes rural communities, low-income communities, and communities of color, with 75 percent of its investments going to minority- or women-led ISPs.[5]

Combined workforce and digital skills training programs targeted to rural communities can address rural workforce and industry needs while expanding pathways for digital skill building. The Rural LISC Digital Navigator pilot program helps people in rural communities

participate in the economy, society, and their communities by accessing subscriptions and devices, learning how to use digital services, building digital skills, and accessing resources for online courses and other opportunities. The program is also optimized to complement (rather than duplicate) training services already provided by other organizations, including Community Action Agencies, financial opportunity centers, affordable housing organizations, and human services agencies.

Public Wi-Fi in anchor community institutions such as schools and libraries can enable connection and use by rural residents and businesses without a quality, high-speed in-home connection. Evidence suggests that strengthening community-level connections, such as providing Wi-Fi in community rooms of affordable rental housing communities, as well as establishing connections at personal residences can strengthen connectivity (Harris, Judge, and Burger 2022). For example, schools can increase student connectivity and success by allowing students on campus before and after school, extending the reach of school-provided Wi-Fi to school parking lots, and installing Wi-Fi hot spots on school buses. These investments expand the physical footprint of students' digital access and help reduce the time needed to complete online homework, which in turn promotes the success of students in homes with limited or no in-home connectivity (Evans 2019). Libraries can also play a critical role in bridging digital gaps and fostering digital literacy by providing or extending the reach of their digital connections (Wang and Si 2024).

For people who are underserved by infrastructure or cannot connect in their homes for other reasons, mobile Wi-Fi lending programs can support internet connections. These programs can be particularly beneficial for people living in rural areas. For example, college students participating in Montana State University's hot-spot lending program, created to expand internet connections for students who lacked access because of cost, availability, or other reasons, reported that the program helped them succeed in their coursework and other programs (Salsbury and Hansen 2022).

BARRIERS AND CHALLENGES

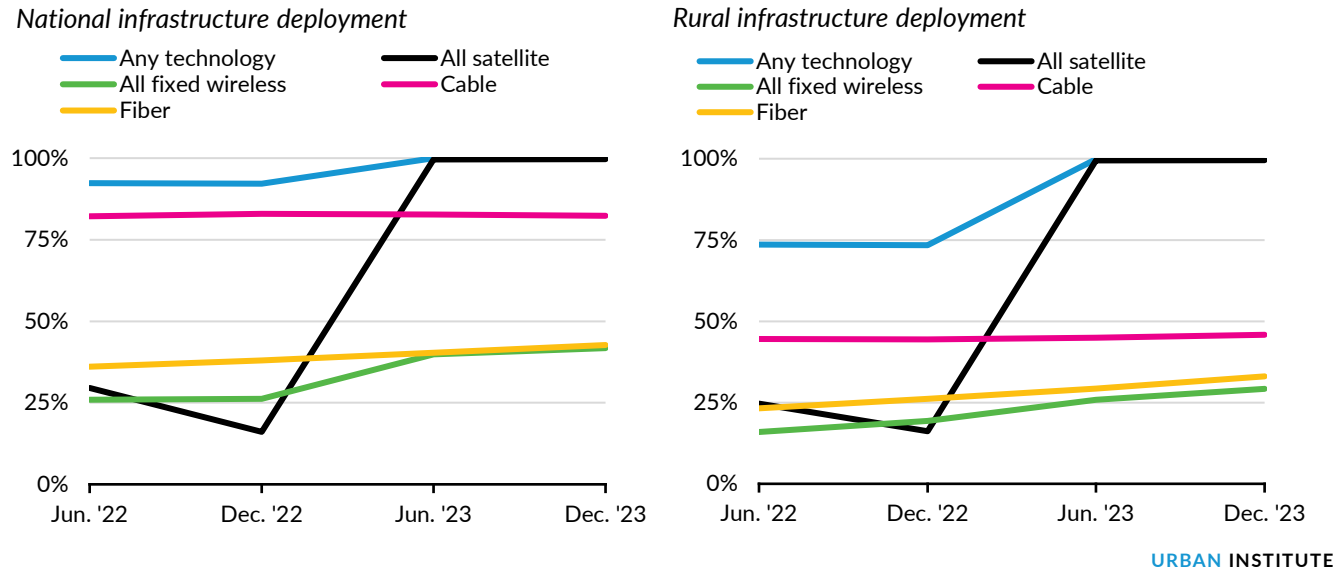
Rural Communities, Especially Rural Black and Native American Communities, Have Significantly Less Access to High-Speed Infrastructure

Under the current broadband definition, rural areas have significantly less access to broadband internet from any technology type than urban areas, as just 65 percent of people in rural areas have access compared with 97 percent of people in urban areas (figure 1). For example, cable broadband, one of the most widely available broadband technologies, is available to most people (93.8 percent) in urban areas but only 36.7 percent of people in rural areas. Likewise, fiber optic technology is available to approximately 1 out of 2 urban residents but just 1 out of 4 rural residents (Garnett, Jeffrey, and Johnson 2024).

Research shows that people living in low-income rural communities tend to have the least choice of broadband ISPs. Among Native American households in low-income and rural areas, more than two out of three (68.3 percent) have no access at all (Garnett, Jeffrey, and Johnson 2024). However, low Earth orbit satellite internet offerings and fixed wireless internet are increasingly available in these areas (Shayea et al. 2024).[6]

FIGURE 1

National and Rural Broadband Internet Infrastructure by Type, 2023



Source: Authors' calculations using December 2023 FCC national broadband data.
Notes: The substantial growth in satellite infrastructure between December 2022 and June 2023 coincides with significant growth in Starlink internet service, including rapid expansion of its user base, a substantial increase in subscribers, the introduction of its upgraded V2 Mini satellite, increased numbers of satellite launches, and improved user terminal availability. See Jack Kuhr and Mo Islam, "Estimating SpaceX's 2023 Revenue," Payload Space, January 2024, https://payloadspace.com/estimating-spacexs-2023-revenue/.

Rural Communities Face Gaps in Subscriptions to High-Speed Internet Services

Rates of subscription to internet services are lower in rural areas. According to Pew Research Center's 2023 internet-use poll, in-home fixed internet subscriptions were highest in the suburbs (86 percent) and substantially lower in urban areas (77 percent) and rural areas (73 percent).[7]

In addition, people living in rural areas are more likely to rely on wireless subscriptions and satellite connections (Boik 2017), which tend to be less reliable than wired connections. Although satellite costs are declining, in many rural areas—especially geographically remote regions where only extremely expensive satellite or mobile plans are available—the expense of a connection can be prohibitive. Harsh terrain, such as mountainous areas, combined with low population density can drive up the costs associated with wired broadband infrastructure such as cable or fiber, making reliable wired services prohibitively expensive.

Researchers have found that gaps in infrastructure access explain some of the divide in adoption between rural and nonrural areas, but not all of it. Key factors linked to lower adoption rates also include income and age, with low-income households and older people less likely to subscribe to available internet services (Zahnd, Bell, and Larson 2022).[8] These groups account for a relatively larger share of rural populations, which may also partially explain why adoption rates in rural areas tend to be lower.

Racial characteristics are also a predictor of subscription differences in some rural regions. An older study using American Community Survey data from 2014 to 2018 found that census tracts with larger shares of Black residents had lower broadband adoption rates than those with larger shares of white residents, particularly in geographically remote, rural tracts. Researchers found that the areas with the lowest broadband adoption rates were spatially clustered in rural areas with large shares of Black and Native American people, including the northern plains, the Southwest, and the Southeast (Zahnd, Bell, and Larson 2022).

Rural Students Lack Digital Connections at Higher Rates Than Students in Other Geographies, Particularly at Home

Rural children have less internet access than children in other areas. According to the National Center for Education Statistics, in 2021, 15 percent of families with children living in metropolitan areas reported not having internet access at home, compared with 18 percent of families living outside of metropolitan areas.[9] Similarly, from a sample of 4,000 school leaders and administrators across the country at the beginning of the 2023–24 school year, rural schools were less likely to provide internet-access supports for students in need of internet services at home (37 percent) than schools nationwide (44 percent).[10]

Rural Industry and Business Productivity Can Lag without High-Speed Internet Infrastructure

High-speed broadband internet infrastructure is necessary for rural communities to participate in the tech economy and essential to tech-based economic development. Without it, rural communities will struggle to achieve local wealth creation and quality tech employment.[11] For example, researchers used internal FCC form 477 data submitted by broadband providers detailing internet connections by subscription speed to examine farm production expenses and crop yields from the USDA's Census of Agriculture. They found that farm productivity may receive a boost from the installation of broadband infrastructure (LoPiccalo 2022).

CONCLUSION

Recent federal programs such as BEAD hold the potential to address many of these persistent challenges and expand digital opportunity in rural and tribal areas. Effective implementation will require collaboration between government agencies, ISPs, and rural community stakeholders to identify needs and develop targeted solutions. With such collaboration, historic investments in infrastructure upgrades and network expansion will greatly increase high-speed internet access in historically underserved rural communities, increasing access to health care, economic opportunities, education, and overall-quality-of-life benefits.

NOTES

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