

Rural Communities and the National Broadband Imperative **2022**



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Executive Summary and Need

Executive Summary

Rural communities are an integral part of the American economy, security and identity. According to the 2016 U.S. Census Bureau, nearly one-fifth of the United States population resides in rural areas of the country. The individuals and businesses in these rural economic communities contribute to the urban way of life.

On the whole, rural areas lag behind urban and suburban areas in broadband deployment and adoption. The solution to the problem of rural needs for broadband will not, however, be one-size-fits-all; rural communities vary in the infrastructure already available for broadband development and vary in their demands for broadband resources. The broadband challenges of rural areas impact a large number of the people. Of the 24 million Americans living in households that do not have access to a non-mobile or satellite broadband provider, 80% of them live in rural areas, according to the latest FCC data.¹ Residents, businesses, and municipalities in rural areas are creating demand for the expansion of broadband infrastructure.

Broadband resources are critical elements of solutions being created to combat the rise in poverty across the nation. Increasing affordable broadband accessibility will likely offset challenges faced by rural populations by positively impacting rural economies.

Deploying broadband into rural America will require a variety of methods and solutions. Determining which method of broadband deployment to use will include a myriad of factors to take into consideration including geography, funding, and population density. These factors will lead to deployment via private, public, hybrid solutions and cooperatives.

Leveraging existing Public Infrastructure can facilitate connectivity of broadband resources with the community being served, who will in turn make more use of the resources.



¹ U.S. Department of Agriculture. *A Case for Rural Broadband*. American Broadband Initiative, Apr. 2019.

Why the Focus on Rural?

Rural needs for broadband access offer challenges that won't naturally resolve without special focus. Likewise, bringing affordable broadband access to the rural areas will uniquely benefit each community. Providers are looking for opportunities to meet the urgent demand for broadband infrastructure in rural and remote areas.

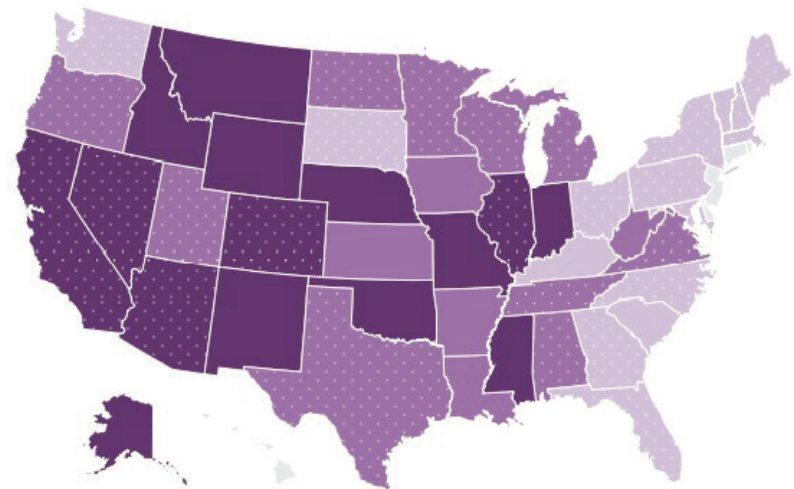
A significant number of Americans residing in rural parts of the country are in need of affordable broadband access. Rural and remote areas face unique challenges in the expansion of broadband infrastructure. In 2016, nearly one-fifth of the population (61 million people) lived in rural areas of the United States.² Definitions of what constitutes rural areas vary slightly. The U.S. Census Bureau describes rural areas as all geographic areas that are not classified as urban, with definitions of "urban" to include "urbanized areas" (containing 50,000 or more people) as well as "urban clusters" (containing 2,500 people but fewer than 50,000 residents).³ Rural areas can also be remote, indicating a combination of low population size paired with high geographic remoteness.⁴ Differences in resource provisions between rural and urban areas are well documented. Broadband is one of those measurable resources and its ease of availability is compounded by the lack of other resources in rural communities, such as public infrastructure including facilities, structures, equipment, services, and institutions.

"Digital divide" refers to the gap between people who have access to broadband services and know how to use the Internet and those who do not have such access or knowledge. Low-income, minority and rural communities have been neglected as broadband infrastructure has been deployed across more accessible, affluent and densely

populated communities,⁵ contributing to this digital divide. Survey data from the Pew Research Center reports 58% of adults in rural areas have high-speed broadband connection at home, as opposed to 67% of adults in urban areas and 70% of adults in suburban areas.⁶ Digital divide can also be characterized by a difference in digital literacy, or the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. These skills are developed through experience and education and are directly influenced by exposure to broadband technologies. The urban-rural digital divide is detailed in the map below.⁷

Urban-Rural Broadband Access Divide

In all states, broadband access is higher in urban areas than rural



Percent difference between urban and rural broadband access by state

- Slightly higher urban access
- Higher urban access
- Much higher urban access
- No data

State average

- States with broadband access higher than the average state access rate (86%)

Source: Federal Communications Commission, 2016

² U.S. Census Bureau, *Defining "Rural" Areas*. www.census.gov/content/dam/Census/library/publications/2019/acs/ACS_rural_handbook_2019_ch01.pdf. Accessed Dec. 13, 2021.

³ U.S. Census Bureau, *Defining "Rural" Areas*. www.census.gov/content/dam/Census/library/publications/2019/acs/ACS_rural_handbook_2019_ch01.pdf. Accessed Nov. 30, 2021.

⁴ USDA, *Frontier and Remote Area Codes*. www.ers.usda.gov/data-products/frontier-and-remote-area-codes/. Accessed Dec. 8, 2021.

⁵ Federal Reserve Bank of Dallas, *Closing the Digital Divide*. www.dallasfed.org/~media/documents/cd/pubs/digitaldivide.pdf. Accessed Dec. 3, 2021

⁶ Pew Research Center, *Internet/Broadband Fact Sheet*. Apr. 7, 2021. www.pewresearch.org/internet/fact-sheet/internet-broadband/. Accessed Nov. 30, 2021

⁷ National League of Cities, *Bridging the Urban-Rural Economic Divide*. 2018. www.nlc.org/wp-content/uploads/2018/03/nlc-bridging-the-urban-rural-divide.pdf. Accessed Mar. 18, 2022.

School closings and limited access to community resources following the onset of COVID-19 highlighted and exacerbated the urban-rural digital divide. Rural families went to great lengths to provide what Internet they could to their children, including some extreme cases of congregating at McDonald's and Starbucks to access WiFi for youth schooling.⁸ However, in some communities there were very few options for internet access.

Survey data has provided insight on the changing landscape of rural communities. As a result of the ongoing COVID-19 pandemic, residents are departing from cities; rural areas and smaller cities are experiencing an influx of individuals, many of whom are accustomed to high-speed broadband access. The availability of broadband, then, is a factor in attracting new community members. In one mid-pandemic survey, nearly 40% of respondents said bad or limited Internet access would prevent them from moving to rural areas.⁹

Importantly, individuals in rural communities have a desire to remain in their areas of residence. Bringing broadband access to these locations is key to existential survival for small towns and will enable people to stay in rural areas as desired. According to *Unlocking the Digital Potential of Rural America*, "Nearly 80% of rural small business owners agree the quality of life and cost of living are much better in rural areas."¹⁰

Rural broadband unlocks new economic, social and health potential for residents, businesses, and municipalities and making smart decisions for broadband deployment will create future opportunities for international and global trade of commodities and resources. The characteristics of rural communities are unique and need to be considered carefully when implementing broadband.



⁸ Dvorak. *When 'back to school' means a parking lot and the hunt for a WiFi signal*. Aug. 27, 2020. www.washingtonpost.com/local/when-back-to-school-means-a-parking-lot-and-the-hunt-for-a-wifi-signal/2020/08/27/0f785d5a-e873-11ea-970a-64c73a1c2392_story.html. Accessed Dec. 3, 2021.

⁹ Nextgov. *Remote Work has Two-Thirds of Americans Considering Moving from Cities to the Country*. Oct. 27, 2020. www.nextgov.com/cio-briefing/2020/10/remote-work-has-two-thirds-americans-considering-moving-cities-country/169598/. Accessed Nov. 30, 2021.

¹⁰ U.S. Chamber Technology Engagement Center. *Unlocking the Digital Potential of Rural America*. Mar. 2019.

PART II: What Makes Rural Unique

Rural communities pose unique challenges and opportunities for broadband deployment. Rural places often have similar attributes, but it is important to recognize that every community is unique and has unique assets from which to build.¹¹ Improving broadband access in rural areas will impact a wide variety of socioeconomic factors including, but not limited to, the topics detailed below.

Economic

Modern businesses are built on the backbone of access to the Internet. Established and future businesses in rural areas require high-speed Internet to survive and succeed. Improvements to broadband infrastructure holds potential for economic advancement in rural America. Rural areas have historically had higher poverty rates than their urban counterparts, though the most recent data from the U.S. Census Bureau indicates the poverty rate is similar in both rural and urban areas, with 16% in cities and 17% in rural areas.¹² While broadband access alone does not address systemic causes of poverty, a lack of access to such resources exacerbates its impact. The inverse is also true - Americans living in poverty can strategically use broadband resources to build economic stability. Contextually, the impact of poverty is not the same - rural areas have significantly fewer resources than their urban counterparts to provide a support network for impoverished residents. Affordable broadband access is one of those resources more difficult to come by in rural areas, and for many rural and remote areas broadband infrastructure is still being introduced.

Agriculture is an established, dominant industry in many rural economies and creates demand for broadband expansion. Already the industry is

implementing broadband tools in the workforce. Precision agriculture tools such as GPS, wireless sensors, soil moisture monitoring and mobile drip irrigation systems, and more are increasingly used daily by farmers and require the Internet. They use and create a lot of data. Smart-data collection to manage water and crop inputs enable farmers to waste less water and apply fewer pesticides and fertilizers, tying advancements in broadband access to relevant environmental concerns. At the same time, broadband access opens new market opportunities to rural businesses. Small farms and agricultural producers can source equipment to run their farms and seek previously unidentified markets to sell. The agriculture industry has the opportunity to thrive with new technology but the barrier of Internet access must be addressed.¹³

Broadband-based farming technology is already transforming the way farming is done. Colorado State University Extension, for example, is spearheading precision agriculture techniques that rely on data collection, transmission, analysis, and live-time feedback to the equipment all performed through broadband-based technology. These techniques have shown to increase crop productivity, profitability (\$17-\$54 per acre, depending on the technique), input use efficiency and sustainability of farming systems.¹⁴ Furthermore, these techniques benefit the growing ecosystem by balancing soil nutrient content and preventing pesticide leaching that harms ground water quality. The effective, wide-scale replication and use of these tools will rely heavily on broadband deployment.

Rural residents are motivated to work but fewer employers and businesses are creating new jobs in rural areas of our nation. The *Survey of Rural America* shows that rural Americans find a lack

¹¹ Kapp and Ohle. *Investing in Rural Prosperity*. "Building Locally Rooted Wealth: Achieving Results by Leveraging Community Assets, Leadership Development and Collaboration". Federal Reserve Bank of St. Louis, 2021, USA.

¹² U.S. Census Bureau. *A Comparison of Rural and Urban America: Household Income and Poverty*. Dec. 8, 2016. www.census.gov/newsroom/blogs/random-samplings/2016/12/a-comparison-of-rura.html. Accessed Nov. 30, 2021.

¹³ Intelligent Fiber Network. *How Broadband Can Change the Agriculture Industry*. www.intelligentfiber.com/how-broadband-can-change-the-agriculture-industry/. Accessed Nov. 30, 2021.

¹⁴ Colorado State University Extension. *Impact*. extension.colostate.edu/docs/comm/impact/PrecisionAgriculture.pdf. Accessed Mar. 15, 2022.

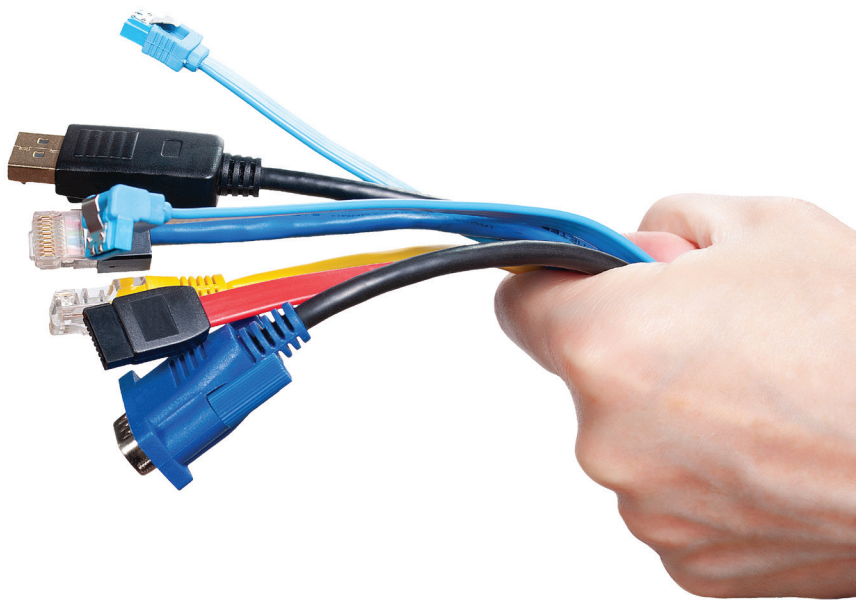
of employment opportunities to be the biggest problem facing their communities.¹⁵ A lack of new job creation in rural places can be offset by the expansion of remote and virtual jobs, enabled by broadband. Remote operations enable the hiring of people from geographic locations that otherwise might prohibit employment. Both the public and private sectors are increasing numbers of employees and contractors who work remotely.¹⁶ Mid-pandemic, for example, the National Nuclear Security Administration hired more than 300 virtual positions.¹⁷ Greater use of digital tools and technology could unlock potential in rural small businesses across the country.¹⁸

Entrepreneurship is a common solution to a lack of jobs in rural communities. Despite the looming threat of being disconnected from an urban economy, nonmetropolitan counties have higher rates of self-employed business proprietors than their metropolitan counterparts.¹⁹ Starting a new business requires access to professional resources such as legal advice, permitting paperwork, tax filings, and more. Traditionally these resources were accessed in-person but the modern business owner can meet these needs virtually when proper broadband access is available. Furthermore, the ongoing operations of a modern business necessitates an Internet presence through various Social Media and communication platforms, marketing, in-store checkout systems and credit card payment systems, and more. The ongoing pandemic increased the need for a business to operate online and while some customers have returned to in-person shopping, others have continued to choose online shopping and expect providers to meet that demand.

Social

Rural communities have unique social landscapes. Communities are often insular with a great sense of community care and pride. *Rural interconnectedness* is a term to refer to the tight-knit community experience of rural populations. People wear multiple hats in rural communities, meaning there is overlap in those who make up the community work, faith, education, government, and charitable groups. One person may be a teacher, a town council member, and a volunteer, giving them a high degree of social and community impact. This is just one example of rural interconnectedness.

High rural interconnectedness can also be demonstrated by one entity serving as a provider of multiple resources. Communities of faith, for example churches, often perform many services such as food provisions, celebrations and funerals, childcare, outreach to those experiencing homelessness, and more. In some rural areas these may be the only location serving as a multi-purpose resource hub, giving it a high degree of social impact. Establishing and improving broadband resources at a center that offers many needed resources multiplies the positive impact of the facility.



¹⁵ Roper Center. *Concerns of Rural America*. www.ropercenter.cornell.edu/concerns-rural-america. Accessed Nov. 30, 2021.

¹⁶ Nextgov. *COVID-19 Could Change Government Contact Centers Forever*. Jul. 10, 2020. www.nextgov.com/it-modernization/2020/07/covid-19-could-change-government-contact-centers-forever/166795/. Accessed Nov.30, 2021.

¹⁷ Nextgov. *3 Tips from Federal HR Pros on Recruiting Talent in a Pandemic*. Oct. 23, 2020. www.nextgov.com/cio-briefing/2020/10/3-tips-federal-hr-pros-recruiting-talent-pandemic/169515/. Accessed Nov. 30, 2021.

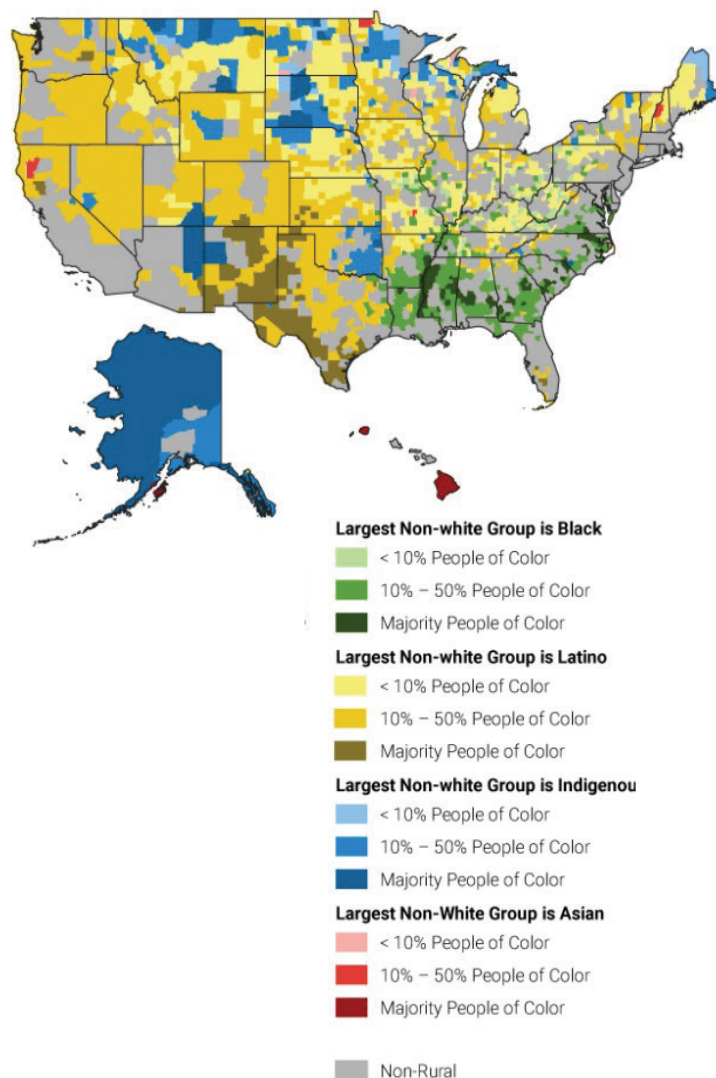
¹⁸ U.S. Chamber Technology Engagement Center. *Unlocking the Digital Potential of Rural America*. March 2019.

¹⁹ U.S.News. *The Divide Between Rural and Urban America, in 6 Charts*. Mar.20, 2017. <https://www.usnews.com/news/national-news/articles/2017-03-20/6-charts-that-illustrate-the-divide-between-rural-and-urban-america>. Accessed Nov. 30, 2021.

Underrepresented and Minority Communities

Rural communities encompass a diverse racial population. According to the Brookings Institute in 2020, 24% of rural Americans were people of color. The map below shows the makeup of rural populations of color is shaped by regionalized variations in the concentration of Black Americans, Latino Americans, and Indigenous Americans across the nation.²⁰

Figure 2. Rural Americans of Color in 2020



The challenges faced by individuals in rural areas are exacerbated when examined critically through the lens of race and socioeconomic status. This remains true when examining the status of broadband accessibility in rural areas for the underrepresented and communities of color. When it comes to accessing the internet, rural Americans of color are less likely to report in-home broadband services. Nationally, 22% of African Americans say they have no internet at home, compared to 18% of Americans more generally.²¹ Mobile devices play a larger role for Hispanic adults compared with White adults. A quarter of Hispanics are “smartphone-only” internet users and lack traditional home broadband services. By comparison, 12% of White adults fall into this category and 17% of Black adults.²²

Higher interconnectedness is one benefit of increased broadband accessibility. This is especially relevant in rural communities where populations are less dense and residents turn to the Internet for community engagement. One study, for example, which examined rural disparities in the relationship between loneliness and social technology use among older adults, found that rural adults over 50 years of age who use social technology less frequently experience higher levels of loneliness than their urban counterparts. Access to social technology via broadband connection may improve social wellness. This increased interconnectedness is also experienced by marginalized cultural communities who congregate online for support, resources, and networking. For example, Native Youth Network is an interactive online portal that empowers Native American youth to become leaders in their communities by connecting peers to resources and tools.²³

²⁰ The Brookings Institute “Mapping Rural America’s diversity and demographic change” www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/. Accessed Mar. 14, 2022.

²¹ Asher-Schapiro. “Digital divide hits rural Black Americans hardest.” Reuters, Oct. 2021. <https://www.reuters.com/article/us-usa-internet-race/digital-divide-hits-rural-black-americans-hardest-idUSKBN2GW1QQ>. Accessed Apr. 4, 2022.

²² Atske and Perrin. “Home broadband adoption, computer ownership vary by race, ethnicity in the U.S.” Pew Research Center. www.pewresearch.org/fact-tank/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicity-in-the-u-s/. Accessed Mar. 15, 2022.

Marginalized communities often experience barriers to adequate healthcare that can be offset through the use of telehealth, available through broadband expansion. As telehealth improves, individuals are empowered to seek healthcare providers that meet their unique needs. For example, physicians in rural areas may not be able to, or may choose not to provide care to rural patients who are members of the LGBTQ community. Those patients may not feel safe sharing aspects of their personal life with a local doctor. Online, patients can find primary care physicians that possess unique training, medical knowledge and share an understanding of the language, cultural values and variables that contribute to overall patient health.

Resources such as RADRemedy.com allow transgender, non-binary, intersex, and other people to share their experiences with healthcare providers, allowing for a digital word-of-mouth effect that might otherwise be difficult to create given that there are fewer LGBTQ people in rural areas overall.²⁴ Other foundations work with policy makers to educate them on the unique tech needs of LGBT individuals. One such company, LGBT Tech, conducts empirical research to develop programs and resources that support LGBT communities. Without the ability to access or afford Internet services, LGBTQ people living in rural communities are without means to retrieve important information about their health or find support from peers outside of their communities.²⁵

Public Institutions

Public institutions are leading the way in broadband deployment in rural areas. Public institutions are places that operate for public use including libraries, schools of varying levels, government offices, and

hospitals. These facilities have made broadband services integral to their operation and provisions and in some cases may be the reason broadband was initially deployed. Public Institutions are becoming highly interconnected within a network of providers operating through broadband services. Hospitals, for example, communicate to exchange patients, medical information and resources and in many cases, swift communication between institutions saves lives.

In addition to requiring broadband services for ease of operation, public institutions often provide an access point to the Internet in a way the public, particularly rural Americans, do not have at home.

In the case of libraries and schools, desktop computers provide access to high-speed Internet, and WiFi is provided for use on personal devices. Broadband services offered at libraries are especially impactful as these services are available at no cost. Some programs are already working to equip and assist libraries with acquiring needed services. The Federal Communications Commission's E-Rate program, for example, was established by the 1996 Telecom Act and taxed telephone calls to finance subsidies for rural broadband.²⁶ While not available to individuals and families, this program makes services more affordable for schools and libraries, providing discounts for telecommunications, Internet access, and internal connections.²⁷ Maximizing broadband access in rural Public Institutions will positively affect both those institutions and their community. In June 2022, a Memorandum of Understanding to jointly promote public awareness of federal funding opportunities for broadband was signed generate efforts to promote the availability of affordable broadband programs.²⁸

²⁵ Hunter, McGovern, and Sutherland, eds., *Intersecting Injustice: Addressing LGBTQ Poverty and Economic Justice for All: A National Call to Action*. p.41. Social Justice Sexuality Project, 2018. static1.squarespace.com/static/5a00c5f2a803bbe2eb0ff14e/t/5aca6f45758d46742a5b8f78/1523216213447/FINAL+PovertyReport_HighRes.pdf Accessed Dec. 30, 2021.

²⁶ Greenstein, "The Basic Economics of Internet Infrastructure." *Journal of Economic Perspectives*, volume 34, number 2, Spring 2020. www.hbs.edu/ris/Publication%20Files/jep.34.2.192_ae3b56d6-86a0-4cb2-af5c-e10413ac0068.pdf. Accessed Mar. 16, 2022.

²⁷ Federal Communications Commission. www.fcc.gov/consumers/guides/universal-service-program-schools-and-libraries-e-rate. Accessed Mar. 15, 2022.

²⁸ FCC and Library Agency Sign Agreement to Promote Broadband Access, <https://www.fcc.gov/document/fcc-and-library-agency-sign-agreement-promote-broadband-access-0>

Health Care

In rural areas, hospitals provide not only much needed medical care but also jobs and economic opportunity.²⁹ Hospitals are increasingly integrating broadband-based healthcare technology such as electronic patient files, machine interconnectedness, and data analyses. Broadband facilitates communication between hospitals which impacts patient care through organ donation, patient transport, and more. Hospital systems require reliable access to broadband in order to secure these lifesaving communications.

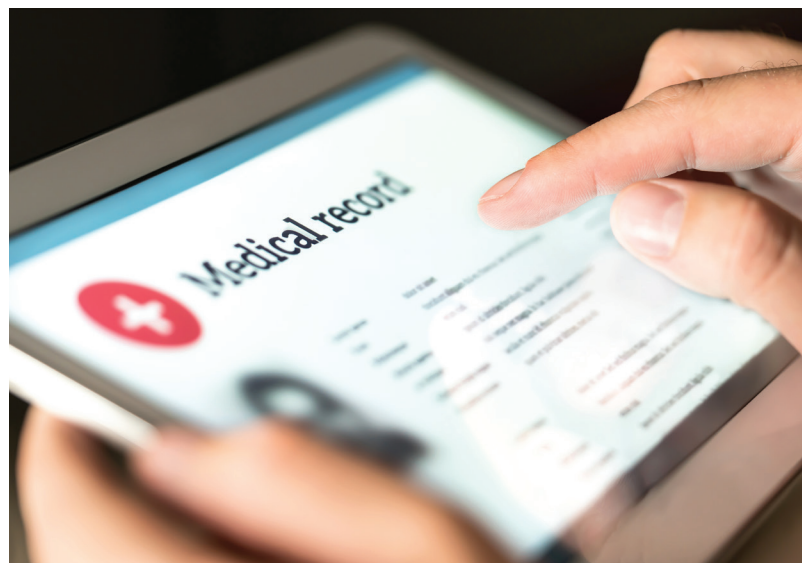
Consider also, the basic need of calling for medical help: some rural homesteads have no cell phone coverage so in the event of emergency, rely on a landline to call for assistance. This singular method of seeking help is inadequate and outdated. Broadband providers can use existing telephone lines to provide access to the Internet and WiFi, giving rural residents alternate methods of seeking aid.

One important health care broadband tool is FirstNet, the AT&T nationwide high-speed wireless broadband network dedicated to public safety when and where they need it most. It allows first responders, emergency personnel and other essential responders to communicate during an emergency situation and is designed to cut through the clutter of commercial traffic.

Residents of small towns and rural areas cite drug abuse as one of the biggest problems facing their communities.³⁰ The ongoing opioid crisis has hit rural America particularly hard and hospitals are tasked with facing this crisis head on. According to the CDC, the highest rates of opioid prescriptions are in the heavily rural South and Midwest, with the highest rates of opioid overdose deaths occurring in Appalachia.³¹ There are relatively few healthcare providers available in rural areas and they may not be equipped to supply long term addiction recovery

care. Addiction recovery often involves forms of care hospitals do not traditionally offer including counseling, psychotherapy, family therapy, and more. Some of these tools of therapy can be accessed online, privately in a patient's home. Bringing broadband resources to hospitals and residents of rural areas will expand self-help opportunities through interconnectedness and telehealth.

The unfortunate reality is hospitals across rural America are closing, with over 100 rural hospitals having closed from 2013 to 2020, forcing people living in those areas to travel farther to get the same health care services; about 20 miles farther for common services like inpatient care and double that for less common services like alcohol or drug abuse treatment.³² Access to routine healthcare is preventative care, and has long term positive impacts on an individual's health. When those resources are commonplace, the community flourishes. Telehealth and telemedicine, or the provision of remote medical care via the Internet and video conferencing, is one impactful method of providing that healthcare and outreach. Advancements in telehealth can be used to make up for expanding gaps in health service but will rely on improvements and expansion of broadband infrastructure.



²⁹ Movement Advancement Project. *Where We Call Home: LGBT People in Rural America*. April 2019. www.lgbtmap.org/file/lgbt-rural-report.pdf. Accessed Nov. 30, 2021.

³⁰ Hamel, Wu, Brodie. *The Health Care Views and Experiences of Rural Americans: findings from the Kaiser family foundation/washington post survey of rural America*. June 2017.

³¹ Movement Advancement Project. *Where We Call Home: LGBT People in Rural America*. April 2019. www.lgbtmap.org/file/lgbt-rural-report.pdf. Accessed Nov. 30, 2021.

³² U.S. Government Accountability Office. www.gao.gov/products/gao-21-93. Accessed Mar. 14, 2022.

Education

Education institutions are a central component of rural communities for youth and adults alike. Preschools, grade schools, and post-secondary institutions provide education, employment, and a shared sense of identity for rural residents. As another example of multi-resource providers in rural areas, schools offer a primary point of access to broadband some residents do not have at home. The FCC has taken note of the impact at-home Internet access has on a child's learning. According to them, nearly 17 million school children lack internet access at home, creating a nationwide Homework Gap that left unsolved could become an opportunity gap.³³ The Homework Gap was exacerbated by the COVID-19 crisis and many providers are working now to accelerate broadband deployment to rural communities.

Within the school setting, schools may provide alternative educational paths for students such as English as a Second Language, American Sign Language interpreters, accelerated programs, preschool options, special education, and more. These resources are not readily available in rural areas as they often are in urban areas. The demand for some of these provisions can be met with broadband tools that provide access to education alternatives and/or remote learning. Properly training teachers to integrate technology into the classroom pulls more resources into classrooms, improving education. The use of technology and broadband in rural schools helps bridge the digital divide, equipping students with the know-how to use these tools when entering the modern workforce.



Childcare

Childcare facilities in rural American communities are less commonplace than in urban areas. Towns are smaller and more spaced out and businesses specializing in childcare such as daycare, pre-kindergarten, and after school care are limited. Families live further away from one another, posing logistical challenges to recruiting care from neighbors.

Where childcare resources exist, they may still lack reliable broadband engagement. More often, childcare options in rural areas are one branch of outreach provided by a larger provider, such as a center of faith or a community center. In these cases, the childcare facility and its patrons are benefactors of the broadband resources provided by the larger provider. Increasing the strength of broadband resources in multi-purpose centers improves existing childcare facilities and the establishments in which they are nested, creating new opportunities for childcare and youth enrichment.

Transportation

Modern public transit systems are increasingly designed with broadband capabilities that necessitate Internet access including Global Positioning Systems (GPS), messaging systems, automated payments, and more. Data from these systems are used to understand and optimize public transit. These tools are for the benefit of the user as well as the provider. Public transit that has integrated broadband tools facilitates connectivity of those resources to the community, who will in turn make more use of the transit resources. Unfortunately, public transportation in rural areas is limited, so rural Americans are not experiencing this integration of broadband services into public transportation. Rural residents who rely on public transit tend to have few options making inadequate public transportation a major challenge for rural residents. Given long distances between locations and low population density, transportation providers argue there is little economic incentive to bring

³³ Federal Communications Commission. "Homework Gap and Connectivity Divide." www.fcc.gov/about-fcc/fcc-initiatives/homework-gap-and-connectivity-divide. Accessed Mar. 14, 2022.

public transportation to rural areas. The options that do exist may be poorly marketed, intermittent in their supply or outdated in their offerings. Personal vehicles are essential to travel in rural areas to access provisions and other people. According to the U.S. Department of Agriculture Economic Research Service, 92.7% of rural households have access to a car, as compared to 88.9% of urban households.³⁴ A majority of Americans are navigating the rapid integration of broadband features into personal transportation, making digital literacy increasingly necessary for the general public. New and even recently used personal cars have engine computer units equipped with broadband connectivity capability, GPS, emergency roadside assistance that can remotely communicate car accidents, satellite radio to provide on-demand music access, and more.

Workforce Development and Training

Workforce training is more essential than ever in rural areas. The downsizing and closing of one industry in rural communities (such as coal mining) leaves residents unemployed and new jobs will require many of those workers to be retrained. The automation of many industries (i.e., manufacturing) also requires additional digital literacy training to prepare and maintain workers' for the workforce. Workforce training also provides an opportunity for technology-specific careers enabling remote work and more career opportunities. Small businesses also rely on obtaining online training opportunities for their employees. Additionally, the logistical deployment of broadband will require training of additional workers.

Elderly residents of rural areas will benefit from digital literacy training, enabling them to access online community resources and everyday tools like grocery shopping and bill pay. Rural immigrants can access cultural community resources and language training tools.

From a workforce development perspective, closing the gap in digital literacy is critical to ensuring individuals can participate in an economy that is increasingly digital. In workforce development, job seekers use the internet for job searches and communication with potential employers. There are many opportunities to take advantage of free training, but only if the infrastructure, hardware, access and skill training are available to use them.³⁵ Furthermore, the development of technology is rapid leaving open the opportunities for broadband integration into workforce development training.

Food, Nutrition and Food Insecurity

Paradoxically, despite the fact that much of America's food comes from rural communities, food, nutrition, and food insecurity are prominent concerns of rural communities. According to Feeding America, rural communities make up 63% of counties in the United States but account for 87% of counties with the highest rates of overall food insecurities; 2.2 million households in rural communities are facing food insecurity.³⁶ Food insecurity is characterized by logistical challenges accessing food suppliers including, but not limited to, poverty, distance to nearest grocery stores, and lack of transportation. Food insecurity also means families have difficulty accessing enough food to supplement a balanced, routine diet.

Many available retailers such as Dollar General, offer the convenience for basic groceries and necessities, however, these retailers generally do not offer fresh options. One rural community has launched a FARMacy program to promote healthy living through better eating, farmer's markets, Community Supported Agriculture (CSA) boxes, food pantries, and food distribution, forming cooperatives to provide local products to the local markets. This is a creative solution for food insecurity that also offers an outlet for farmers and growers to sell their products. Networks like these require communication marketing and logistical access to the Internet.

³⁴ U.S. Department of Agriculture Economic Research Service. *Agriculture Information Bulletin*. Jan. 2005. www.ers.usda.gov/webdocs/publications/42593/30151_aib795full_002.pdf?v=41262. Accessed Mar. 15, 2022.

³⁵ Towards Employment. "Workforce and the Digital Divide." www.towardsemployment.org/digital-access/. Accessed Mar. 14, 2022.

³⁶ Feeding America. *Hunger in Rural Communities*. www.feedingamerica.org/hunger-in-america/rural-hunger-facts. Accessed Dec. 13, 2021.

Food shipping direct to consumers is becoming more commonplace, but expensive. This will prove beneficial for communities where food stores are few and far between. With food shipping made possible through the Internet, residents in rural areas are not limited to the grocery stores that may or may not be in their area. Meals can be ordered directly to the home through businesses such as HelloFresh, Blue Apron, and more. Food groups like vegetables and fruit can be ordered as well through businesses like Imperfect Foods and Misfit Market. Broadband access is required to use these businesses that provide fresher, more healthy meals.

Stores and restaurants established in rural areas drive demand for adequate broadband access. These businesses must be able to connect to suppliers in order to operate. Most suppliers receive orders through online portals, necessitating Internet access. A majority of stores and restaurants have integrated mobile phone “apps” which provide customer interactions, coupons, and convenience. Furthermore, restaurants act as a social hub for community members and providing customers complimentary WiFi is now commonplace and a measurement of a quality establishment.

Fast food restaurants can become a de facto Internet provider not only during hours of operation but 24/7. Look no further than the recent school closings following the onset of COVID-19: in addition to gathering in parking lots outside of schools and county libraries, families congregated at McDonald’s and gas stations to access WiFi for youth schooling.³⁷ A number of rural communities lack fast food restaurants. For those that do, however, improvements to broadband access for these establishments makes for a more efficient supply chain for the businesses as well as better quality of life for residents.

Housing and Homeownership

Homeownership status is a factor for many Americans when purchasing broadband services at home and choosing which technologies to have in home. Modern features of home are increasingly making use of technology such as security systems, which operate using broadband connection. When it comes to connecting to the Internet, homeowners and renters are subject to the infrastructure tools in place in their area. Solutions for connectivity, then, are varied.

The U.S. Census Bureau has found that a householder who rents rather than owns a home is associated with lower broadband subscription rates.³⁸ For some renters and homeowners, broadband subscriptions are replaced with cell phone plans. While many households have home-based Internet connections (such as Fiber-Optic or satellite), others rely on a cell phone provider and connect to the Internet through a smartphone.³⁹ Home-based Internet connections are considered high-speed broadband connections while smartphone Internet connections are not. Cellular access is many times not an option for rural households with spotty to no coverage in many rural areas.

Rural residents take great pride in their homesteads and have higher homeownership rates than urban residents, 81% and 60% respectively.⁴⁰ Despite this higher rate of homeownership, fewer rural residents have high-speed broadband connection at home. Rural households also have fewer types of computers than their urban counterparts whose households may report having multiple smartphones, tablets, laptops, computers, and more. This difference in technology used in the home contributes to the widening urban-rural digital-divide.

³⁷ Dvorak. *When ‘back to school’ means a parking lot and the hunt for a WiFi signal*. Aug. 27, 2020. www.washingtonpost.com/local/when-back-to-school-means-a-parking-lot-and-the-hunt-for-a-wifi-signal/2020/08/27/0f785d5a-e873-11ea-970a-64c73a1c2392_story.html. Accessed Dec. 3, 2021.

³⁸ U.S. Census Bureau, *American Community Survey Reports*. April 2021. “Computer and Internet Use in the United States: 2018.” www.census.gov/content/dam/Census/library/publications/2021/acs/acs-49.pdf. Accessed Mar. 15, 2022.

³⁹ U.S. Census Bureau, *American Community Survey Reports*. April 2021. “Computer and Internet Use in the United States: 2018.” www.census.gov/content/dam/Census/library/publications/2021/acs/acs-49.pdf. Accessed Mar. 15, 2022.

⁴⁰ Kim. *Urban-Rural by the Numbers*. Sept. 27, 2018. National League of Cities. www.nlc.org/article/2018/09/27/urban-rural-by-the-numbers/. Accessed Dec. 13, 2021.

Public Infrastructure

Public Infrastructure refers to facilities, structures, equipment, services, and institutions that are developed, owned, and operated by the government. Basic facilities such as roads, water supply, electricity, and telecommunications are classified as Public Infrastructure. Additionally, there is political, educational, health, and recreational infrastructure. Public Infrastructure is financed in a number of ways including publicly (through taxes), privately (through private investments), and through public-private partnerships.⁴¹ All sectors of Public Infrastructure are being impacted by the global trend towards broadband. The rate at which broadband is integrated into these systems differs between urban and rural areas.

Leveraging and modifying established Public Infrastructure is one effective means of advancing broadband accessibility in rural areas. Rural Public Infrastructure, however, poses unique demands that must be taken into consideration when planning broadband deployment. Public Infrastructure in rural areas is often less modern and may be in poor condition, forcing municipalities to spend money on repairs rather than new development. Tax money available to address inadequate infrastructure is limited as there is less of it.

Modern Public Infrastructure is being developed with Internet access in mind. As existing infrastructure is repaired and updated, the integration of broadband infrastructure becomes necessary. For example, modern water systems are increasingly adding live-time monitoring equipment which makes use of the Internet to identify harmful pathogens and detect water quality issues earlier.

In rural and tribal communities, water and wastewater systems are constantly facing stress due to many factors, including aging equipment, few employees, lack of training, budget constraints, and more. Internet access to equipment allows for better diagnostics or improved equipment with more computerized options.

Roads are managed differently in rural communities: there is often less public investment in infrastructure per mile, many roads are gravel and dirt roads not equally accessible by service vehicles, and easements and right-of-ways often require negotiations with private landowners. These infrastructure barriers make some methods of broadband deployment difficult, impractical, or costly.

Established copper wire telephone lines, aka POTS (“Plain Old Telephone System”), might serve as an effective means to “piggyback” and be modified to transmit broadband data. Alternatively, networked roads might be used as rights-of-way for laying cable and accessing wireless networks and Fiber-Optic cables.

Pandemic Impact on Rural

Like everywhere else in the world, the challenges faced by individuals in rural areas have been exacerbated by the impacts of the COVID-19 pandemic. Health care systems and emergency response services have been gravely impacted in ways that have directly, negatively affected the well-being of every resident, patient, and provider. Education access has been compromised across the board, impacting those it employs and educates. Multi-purpose resource providers have had disruptions to their outreach in learning, meal plans, care, and other support systems. Public transportation dipped in service to reduce transmission of COVID-19, eliminating transportation options altogether in some areas. With fewer places open to patrons and social gatherings discouraged, individuals have reported higher levels of loneliness and isolation. Unemployment has risen and businesses, especially small businesses, have been priced out of continued operation. Banking and financial services have become strained from the economic downturn and accompanying public policy passed for economic stimulus. Likewise, the public institutions responsible for providing community safety nets and government benefits (student loans, SNAP, Medicaid, and Medicare) have been severely impacted.

⁴¹ *Public Infrastructure*. Corporate Finance Institute corporatefinanceinstitute.com/resources/knowledge/economics/public-infrastructure/. Accessed Dec. 11, 2021.

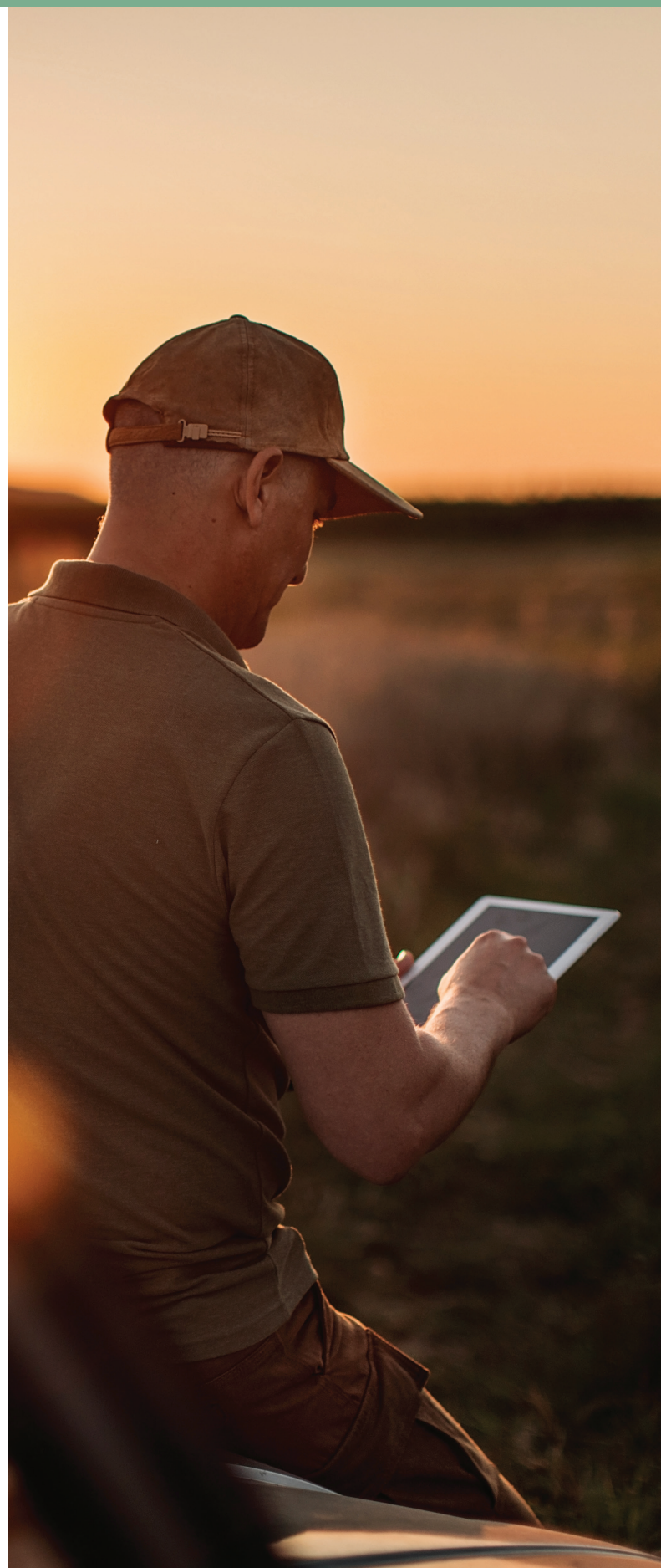
⁴² Kapp and Ohle. *Investing in Rural Prosperity*. “Building Locally Rooted Wealth: Achieving Results by Leveraging Community Assets, Leadership Development and Collaboration”. Federal Reserve Bank of St. Louis, 2021, USA.

All of these challenges have continued to contribute to the urban-rural digital divide. Those with strong internet capabilities were able to move their citizens to online platforms to reduce disruptions in economic activity, education, health care and other services. Those without broadband have fallen further behind and have been hit harder by the devastating economic impacts of the pandemic. Furthermore, lacking digital resources compounds these challenges. For these reasons, the expansion of broadband infrastructure into rural and remote areas is all the more imperative.

Statement of affordability

Costs associated with accessing the internet do affect an individual's ability to bring broadband into their place of residence. Costs can be even higher in rural areas which is why programs exist that assist rural communities with internet acquisition. E-Rate, Lifeline, and the Affordable Connectivity Program (ACP), are examples of government-funded programs assisting individuals and families with the costs of broadband access.

During the negotiations, bills around the Infrastructure Investment and Jobs Act (IIJA) the monthly stipend for the ACP was determined through collaboration between industry providers. The benefit provides a discount of up to \$30 per month toward internet service for eligible households. This creates transparency in the marketplace which allows for more options for the customer.



PART III - Rural Broadband Options and Administrators

Options for Broadband Infrastructure in Rural Communities

The need for broadband access is universal and will be achieved through widely distributed broadband infrastructure. Broadband Infrastructure refers to the networks of deployed telecommunications equipment and technologies necessary to provide high-speed Internet access. When it comes to deploying broadband in rural and remote areas, there are a number of infrastructure options from which to choose. The following are types of broadband infrastructure, contextualized in the demands of rural communities. Importantly, each has benefits and drawbacks. In all cases, cost is a consideration.

Broadband Infrastructure Options

INFRASTRUCTURE TYPE	DEFINITION	BENEFIT	DRAWBACK
Plain Old Telephone Service (POTS)	Refers to the traditional, analog phone service operating through physical copper wires.	Copper wires in good condition can be enhanced with the addition of a modem, or a digital device that converts phone data into a format transmissible through the POTS. Established telephone lines in rural areas are commonplace. Modems physically connect a computer to the Internet through a cable. Ethernet connections are faster and more stable than WiFi connections.	Signal interference; infrastructure damage; attenuation (loss of signal over distance); asymmetrical speeds for uploading and downloading.
Fiber-Optic Cables	Broadband- specific cables buried underground that create a communicating network of glass and/or plastic carrying light (data) emitted by a laser.	Buried cable provides fast and reliable connection; quality of connection is not impacted by weather. This technology has been used for decades and will remain the dominant method of transmission information for the fore-seeable future.	Costly; labor-intensive to deploy; difficult to install in rough terrain; Right-of-way concerns.
Satellite Internet	A satellite dish facilitates two-way (upload and download) data transmission.	Direct, wireless communication with an Internet satellite; easy to install in rural and remote areas.	Signal interference due to weather and geography; infrastructure damage.
Mobile/Cellular Carriers	4G (fourth generation) and 5G (fifth generation) networks of cellular communication that enable Internet connection	Handheld and commonplace.	Cellular access is many times not an option for rural households with spotty to no coverage in many rural areas. Some carriers have low data packages that limit users' access, and purchasing more data is expensive.
Fixed-Wireless Networks	Stationary towers carry data through radio waves transmitting a carrier's signal across frequencies. This technology advances 4G and 5G networks of cellular communication that enable Internet connection.	Affordable; cell phones are commonplace; has the potential to match Fiber-Optic Internet speeds.	Attenuation; shared access reduces speed; less capacity for data-intensive streaming; and signal interference; existing cell phone coverage.

Internet “Miles”

FIRST MILE

The greater internet. Big “pipes” transmitting data between large servers.

MIDDLE MILE

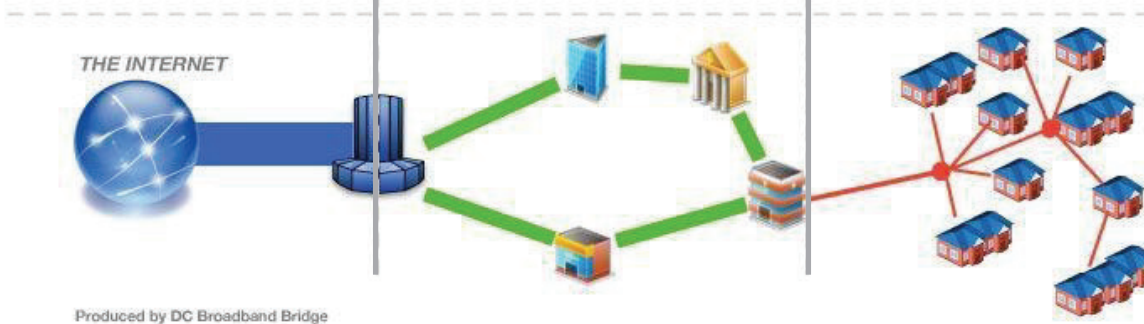
The network connection between the last miles and greater internet. Often looped through major metro centers.

CONNECTS: Big housing buildings, large office and non-profit buildings

LAST MILE

The final leg of a connection between a service provider and the customer, i.e., into your home.

CONNECTS: small offices, homes



Rural and Internet “Miles”

The varying broadband infrastructures connect to create communication networks, called miles (detailed in the graphic above from DC Broadband Bridge). The First Mile refers to global internet networks that facilitate the internet as a resource. The Middle Mile refers to the physical infrastructure required to connect those global internet networks with local networks. The Last Mile refers to the final connection points an individual or business uses to connect to the internet.

An individual’s proximity to these networks will impact the quality and cost of their broadband connectivity; the further from the Middle Mile, the more expensive the Last Mile becomes. Having Middle Mile networks in place can reduce costs associated with expanding Last Mile service to unserved areas.⁴³ The challenges of closing the gap between the Last Mile and the Middle Mile are compounded by geography, demographics, and the numbers and types of entities that provide service.⁴⁴

In a rural area, a Middle Mile may not exist. The Middle Mile is where users are most likely to experience connection problems and the greater the distance covered by the Middle Mile, the more likely there is to be attenuation.

⁴³ Pew Research Center. *How States are Expanding Broadband Access*. Feb, 27, 2020. www.pewtrusts.org/en/research-and-analysis/reports/2020/02/how-states-are-expanding-broadband-access. Accessed Nov. 30, 2021.

⁴⁴ Pew Research Center *How States are Expanding Broadband Access*. Feb, 27, 2020. www.pewtrusts.org/en/research-and-analysis/reports/2020/02/how-states-are-expanding-broadband-access. Accessed Dec. 30, 2021.

Selection Costs and Considerations

A number of factors contribute to the cost and selection of broadband infrastructure:

- A. **Population Density:** The most ubiquitous challenge to deploying broadband infrastructure in rural areas is low population density, with providers choosing historically to deploy broadband services to areas with high population density. The costs of supplying internet service to a given area may reflect economies of scale: that is, when installing and operating cell towers, data centers, and content delivery networks, these structures are located near a greater number of densely located users because they facilitate faster returns on investment.⁴⁵
- B. **Geographic Terrain:** Difficult terrain is costly to navigate with construction machinery and the remote location of these regions makes accessing them for construction and maintenance more costly. Wireless broadband options avoid many issues associated with geographic terrain.
- C. **Weather Patterns:** Wireless broadband options can experience signal interference and damage from weather systems that can delay or destroy broadband connectivity.
- D. **Regulatory Factors:** Some special metropolitan districts, nature preserves, easements and right-of-ways have particular regulations dictating construction in their area.
- E. **Pole Attachment and right-of-ways:**
- F. **Funding Available:** The origins of project funding will create incentives for providers to target certain areas with certain technologies.
- G. **Service Providers and Administrative Options Available:** Collaboration on broadband deployment is critical and established providers and administrators in a region will play a key role in deployment advancement.

Administration Options

Broadband infrastructure is administered through a variety of administrative methods.

Private Entities

One popular option to administer rural broadband programs are private entities such as companies and corporations. Examples of private broadband providers include cell phone carriers like AT&T, T-Mobile, or Verizon. Not only do these cellular providers facilitate phone coverage, they are key participants in the acceleration of broadband deployment, working to deploy fixed-wireless technology in their service areas. Geographic distance and dispersed population make it difficult for private businesses to profit in rural areas with the same tech and business models used with dense populations.⁴⁶

Public Entities

Broadband deployment can be led by the federal government or state and local actors. The efforts put forth by states to expand broadband infrastructure emphasize extending wired and fixed wireless infrastructure to the last mile.

Public-Private Partnership

A public-private partnership occurs when a government institution partners with a private sector Internet service provider (ISP). Municipalities can provide incentives such as tax cuts to encourage broadband investment in neighborhoods targeted for development or rights of way on public lands. Municipalities and private companies can collaborate to share the risks and rewards of development.

Cooperatives

Cooperatives are formed and democratically owned by members to meet a common need. One example of a broadband cooperative is Hardy Telecommunications, a customer-owned provider of communications and information services.⁴⁷

⁴⁵ Greenstein, "The Basic Economics of Internet Infrastructure." *Journal of Economic Perspectives*, volume 34, number 2, Spring 2020. www.hbs.edu/ris/Publication%20Files/jep.34.2.192_ae3b56d6-86a0-4cb2-af5c-e10413ac0068.pdf . Accessed Mar. 16, 2022.

⁴⁶ Association of Public and Land-Grant Universities. *E-Connectivity in Rural America*. www.aplu.org/library/e-connectivity-in-rural-america/file. Accessed Mar. 18, 2022.

⁴⁷ Hardy Telecommunications. *Rural Telephone Cooperatives*. hardynet.net/about/rural-telephone-cooperatives/. Accessed Dec. 30, 2021.

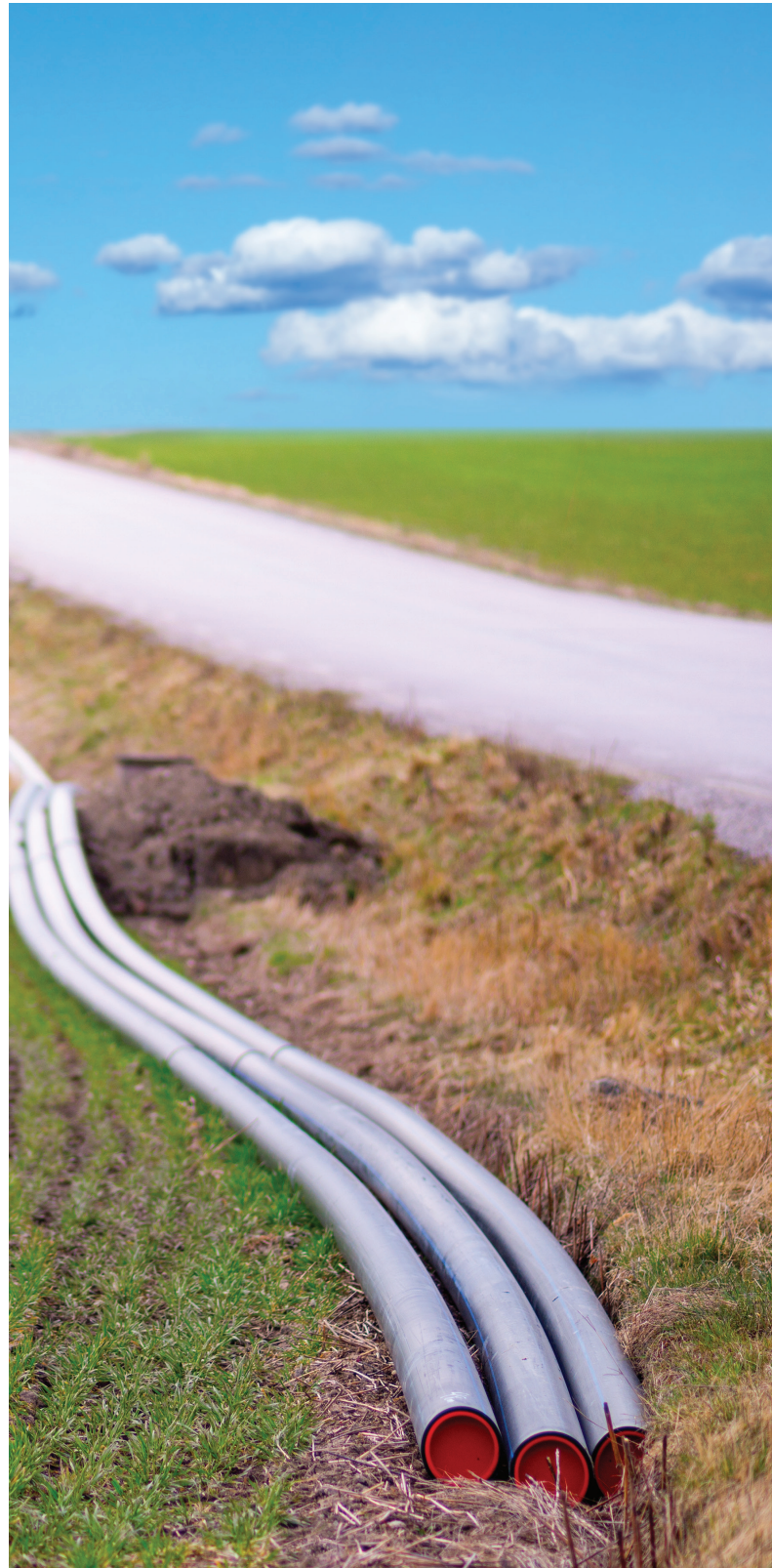
Electrical cooperatives are also offering broadband access to rural areas, according to NRECA, about 200 electric cooperatives are providing or building out broadband and up to 200 more are assessing the feasibility of providing service to more than 6 million households in co-op service areas that don't have access to high-speed internet service.⁴⁸ Electric cooperatives are cable companies that are committed to integrating broadband services into their services.

Non-profit - Public Partnership

Public institutions like local and state municipalities may recruit nonprofit sponsorship to achieve broadband expansion.

Combinations of administrative options can be used to provide broadband services. The number of entities that may be invested in an area's broadband infrastructure varies greatly. As the number of organizations involved increases, so does the likelihood of other challenges such as a more diffuse scope of responsibility, more incongruent geographical service areas, and fewer organizations reaching economies of scale. When multiple types of organizations are responsible for community infrastructure though, the geographic overlap of areas of responsibility can impact the ability of stakeholders to collaborate on infrastructure investment. When there is little overlap or only partial overlap, the incentives for collaboration may be weak.⁴⁹

The needs of communities receiving broadband vary in their own ways, so there is no single best option for broadband provisions. With a smaller market of demands to meet, one new business or provider can make a significant impact on the population in a rural community. Partnerships can be highly effective in advancing broadband deployment but must be chosen carefully in the context of community needs.



⁴⁸ NCECA, <https://www.electric.coop/issues-and-policy/broadband>

⁴⁹ Tanner, Wolfe. *Rank and Selection of Infrastructure Projects: A Local Perspective*. Farm Foundation. www.farmfoundation.org/wp-content/uploads/2018/09/FP-TannerWolfe.pdf. Accessed Dec. 30, 2021.

PART IV - Inputs

RuralRISE is a grassroots, locally driven community of leaders focused on creating supportive environments for rural entrepreneurship (often called “entrepreneurial ecosystems”) that brings together hundreds of local and regional leaders in a national network to create and share best practices. Meeting every month via Zoom and annually at in-person gatherings, RuralRISE provides opportunities for leaders focused on supporting entrepreneurship in their communities to share ideas, successes and challenges that can help other communities learn how to drive new industry and business creation.⁵⁰

Virtual RuralRISE Summit

RuralRISE hosted a virtual Broadband Summit in 2021. Guests reported on current broadband concerns of rural communities. The Federal Communications Commission (FCC) Commissioner Brendan Carr provided a leading voice on broadband issues to the RuralRISE stage that hits home on an immediate need in accelerating innovation and entrepreneurship in rural and tribal communities.



Survey Summary

In January 2022, RuralRISE conducted an online study, “National Rural Broadband Survey.” Participants provided basic personal information as well as responses to open-ended questions about broadband in their community.

According to our survey, a majority of rural communities do not have complete broadband coverage. Digital literacy, or the ability for an individual to find, evaluate, and clearly communicate information through digital platforms, is a concern in rural communities.

Many rural communities are in the planning and development stage of broadband deployment and would like to learn from other cases of success. It was noted in survey results that the lack of a long-term strategy was a learning point for many. Education and understanding of broadband deployment is essential – are there examples of broadband plans that did not work but were later corrected. Tribal land, for example, only has service into school and town office, are there examples of how residents corrected this and were able to get broadband into the community.

Policies must be implemented at all levels: local, state, and federal. Advocating to local and state leaders is essential in developing broadband plans. Nonprofits and other agencies are attempting to fill gaps in rural broadband, for example education, digital literacy, planning and development, and deployment.

Funding is varied in rural broadband plans from ARPA, grants, federal and state funding, self-funded, private, and cooperative funding.

Accurate mapping of current broadband resources needs to be conducted.

⁵⁰ Kapp and Ohle. *Investing in Rural Prosperity. “Building Locally Rooted Wealth: Achieving Results by Leveraging Community Assets, Leadership Development and Collaboration”*. Federal Reserve Bank of St. Louis, 2021, USA.

Partnerships are the key to a sustainable broadband plan. Many rural organizations are working nationwide or in large regions in specific areas and were identified by survey respondents:

- **Rural LISC Digital Navigator Program** trains and supports Digital Navigators at thirty-two sites in twenty states across the Appalachia region, the Deep South, the upper Midwest and the Navajo Nation. Digital Navigators assess client access to technology and baseline digital skills, and advise clients on free or affordable home Internet service options and sources of affordable computers or other Internet-connected devices, helping clients more fully participate in their communities, the economy and society in the short and long-term.⁵¹
- **Center on Rural Innovation (CORI)** works with rural communities to develop compelling and actionable digital economy strategies that provide opportunities for shared learning, broader cross-pollination with other communities across the country and, ultimately, tech jobs in rural America.⁵²
- **Connecting the Heartland** is a multi-pronged, multi-state initiative to boost Internet availability, speeds, and adoption rates across America's heartland.⁵³
- **American Connection Corps** is the nation's largest fellowship program focused on bridging the digital divide.⁵⁴ Fellows attend a two-year training that covers community engagement, broadband and digital inclusions, leadership networking, and a project that delivers digital literacy to marginalized communities.
- **Cooperative Extension System**, in partnership with the National Institute of Food and Agriculture (NIFA), empowers farmers, ranchers, and communities of all sizes to meet the challenges they face, adapt to changing technology, improve nutrition and food safety, prepare for and respond to emergencies, and protect our environment. County-based educators work with local citizens and interest groups to solve problems, evaluate the effectiveness of learning tools, and collect grassroots input to prioritize future research.⁵⁵



⁵¹ Rural LISC, www.lisc.org/rural/our-work/broadband-infrastructure/digital-navigators/. Accessed Mar. 14, 2022.

⁵² Renter on Rural Innovation, ruralinnovation.us/about/. Accessed Mar. 14, 2022.

⁵³ Connecting the Heartland, connectingtheheartland.com/mission/. Accessed Mar. 14, 2022.

⁵⁴ American Connection Corps, www.leadforamerica.org/american-connection-corps. Accessed Mar. 14, 2022.

⁵⁵ National Institute of Food and Agriculture, [nifa.usda.gov/about-nifa/how-we-work/extension/cooperative-extension-system#:~:text=Cooperative%20Extension%20System%20\(CES\)%20empowers,emergencies%2C%20and%20protect%20our%20environment](http://nifa.usda.gov/about-nifa/how-we-work/extension/cooperative-extension-system#:~:text=Cooperative%20Extension%20System%20(CES)%20empowers,emergencies%2C%20and%20protect%20our%20environment). Accessed Mar. 14, 2022.

Part V - Policy Considerations, Recommendations, Conclusion

Policy Considerations

A. The Infrastructure Law

The Infrastructure Law signed into action by President Biden is a bipartisan bill providing significant, historical investment in public broadband infrastructure. This bill has set aside \$65 Billion to improve Internet access.⁵⁶ The National Telecommunications and Information Administration (NTIA) will manage the dissemination of the \$42 billion Broadband Equity, Access and Deployment Program. Through this program, grants will be administered to make advancements such as broadband maps and plans, WiFi and Internet infrastructure at multifamily residential buildings, and connectivity at community institutions. Rural Americans will experience significant positive impacts from this investment in rural broadband accessibility.

In regards to the broadband needs of tribal communities, the Infrastructure Law created a \$1 billion Tribal Broadband Connectivity Program. This program will disseminate grants to be used for the expansion of access to and adoption of broadband services on tribal land or remote learning, telework, or telehealth resources.⁵⁷ Through this program, tribal communities are encouraged to access the State Digital Equity Capacity Grant Program, the Middle Mile grant program, and the Emergency Broadband Benefit Program.

Tribal needs for broadband infrastructure go beyond the provisions made possible through the new Infrastructure Law. For that reason, the federal government continues to pursue mechanisms for effective coordination and consultation with tribes on broadband issues, policies to promote wireless broadband

deployment on tribal lands, addressing permitting and environmental review issues for deploying broadband infrastructure on tribal lands, and rights-of-way policies to enable broadband infrastructure deployment on public lands. The need for financial assistance to expand broadband infrastructure in Native American communities has been well documented, especially from a 2010 National Broadband Plan which recommended Congress establish a Tribal Broadband Fund. To date, this fund has not been enacted.

B. Philanthropy and Grants

Grants offered by private and public entities are funding opportunities that provide incentive for broadband expansion in rural areas. Costs associated with broadband deployment are high and money available is in high competition. Providing incentive for grants to be made available for broadband infrastructure will encourage network growth in rural areas.

Philanthropic, grant-making organizations typically take income earned from investments and use it to fund causes that align with their missions. With broadband connectivity becoming an ever-more integral part of everyday life, ensuring everyone has affordable access to broadband as well as the skills and technology to reap its benefits will align with the mission of many philanthropic organizations. Community leaders and philanthropic organizations can work together to advance digital literacy, broadband infrastructure, and policy. One such organization is the Maine Community Foundation, with a variety of programs to support statewide broadband advocacy, technical assistance and planning, coalition-building and digital literacy training through libraries and universities.

⁵⁶ Willcox. *Infrastructure Law Includes \$65 Billion for Improving Internet Access*. Consumer Reports, Nov.15, 2021. www.consumerreports.org/Internet/infrastructure-bill-includes-65-billion-for-Internet-access-a6861027212/. Accessed Dec.30, 2021.

⁵⁷ H.R.3694, *the Infrastructure Investment and Jobs Act Tribal Provisions*. p. 10

⁵⁸ Hegle, *Investing in Rural Prosperity*. "Bringing Broadband to Rural America: The Role for Philanthropy." Federal Reserve Bank of St. Louis, 2021, USA.

Recommendation Introduction:

Due to the heterogeneous nature of rural communities, solutions to provide broadband necessitate any approach to providing broadband services to require a combination of solutions. Effective services will be determined by rural and remote communities' unique needs.

Understanding the unique broadband needs of residents in rural and remote areas is necessary to address the digital divide. Research on community needs is ongoing and will highlight resource gaps and current rural broadband use. Data reporting on the broadband needs of these American communities can be used to support policies advancing broadband resources, digital literacy, and education.

The need is clearly outlined, and the importance of affordable broadband is unarguable. Broadband deployment to underserved and unserved rural communities should be one of the top priorities of Congress and state leaders. Funding from Congress will facilitate unprecedented opportunities for rural America to become connected and close the digital divide; however, we must first look at policy to do this correctly. Now more than ever, it is essential to put in place policies that support and deploy broadband networks in rural and remote areas without undue hardship on the consumer. It is recommended that the increase in Congressional funding be adopted and continue for broadband to be deployed in rural areas. Investment in affordable rural broadband will increase access to healthcare, education, economic development and improve life in rural America.

As with all facets of rural life, there is not a one-size-fits-all policy solution. The following recommendations are aimed at addressing specific, various rural broadband challenges.

Recommendations:

1. Create a rural broadband information clearinghouse:

Create an easy to locate, accessible resource clearinghouse that centralizes solutions, data, and information for rural communities to leverage and develop broadband solutions for their own community.

In a recent report, GAO⁵⁹ noted: Federal broadband efforts are fragmented and overlapping, with more than 100 programs administered by 15 agencies. Many programs have broadband as their main purpose, and several overlap because they can be used for the purpose of broadband deployment. This overlapping can lead to the risk of unintended duplication of federal funding support and confusion.

An effective clearinghouse will reduce the administrative burdens of rural communities seeking to build out their broadband networks. A Clearinghouse will also assist in ensuring that communities understand funding availability, , eligibility, and correct utilization of funding.

2. Reduce regulatory impediments:

Eliminate and reduce unnecessary rules and regulations around broadband deployment. Broadband policies should improve the availability of affordable broadband services in rural areas, including the underserved and unserved areas in rural America. In addition to reducing Federal regulatory issues, local communities and public policy individuals need to reduce state and local impediments. To do this effectively, unnecessary red tape should be eliminated.

⁵⁹ "Broadband: National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide" United States Government Accountability Office Report to Congressional Requesters May 2022 BROADBAND National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide GAO22104611

3. Identify and leverage local rural technology champions:

Consultation and inclusion of rural community members is paramount to the success of the roll out of rural broadband. It is imperative that all levels of policy conversations around broadband include the input of people living and working in those rural communities. Obtaining buy-in from local communities assists with adoption and affordability.

4. Leverage technology as an enabler and not an end:

Broadband solutions will need to be tailored to specific community needs. Policies should remain technology-neutral to allow for current and future deployment. Funding should be available for technologies that provide acceptable broadband service and is readily available to meet the future needs of rural communities. However, it is essential to include that funding applicants and/or partners must have a proven track record, including the financial and technical capacity to build, manage, and operate a sustainable network.

5. Mapping for rural communities:

Mapping on a house-by-house, location-by-location basis is important to understand where broadband internet service is available and to show where broadband issues and connectivity are lacking. There are examples of states and other agencies taking on the responsibility of determining the availability of coverage in their areas. These local or statewide programs assist with ascertaining a valid coverage map/plan. The **BEAD (Broadband Equity, Access, and Deployment) Program**⁶⁰ will announce available funding following the FCC's public release of its **Broadband DATA Maps**⁶¹, and give applicants 180 days to apply to the fund. The FCC has announced that its Broadband DATA Maps will be released in November 2022.

The identification of underserved and unserved areas will assist in closing the digital divide and deployment.

6. Affordable access:

Providers should be encouraged to offer programs for adoption addressing broadband affordability for the consumers. Providers should be made aware of and encouraged to participate in the existing and future federal broadband affordability programs. If possible, states should have consistent eligibility criteria with federal affordability programs, enabling providers to quickly address affordability and make all available options known to rural and remote communities.

7. Leverage local anchor institutions and other partners:

Anchor institutions like schools, libraries, hospitals, medical or healthcare providers, community colleges and other institutions of higher education can be leveraged for greater adoption. Programs providing broadband to anchor institutions should be taken into consideration. Anchor institutions often have high-capacity fiber connections that can provide a jumping-off point to facilitate broadband connectivity to the surrounding residential and business community.⁶²

Rural broadband policies must include creative and non-traditional partnerships. Support for broadband deployment and adoption will need to include local partnerships that help drive programs to deploy broadband cost-effectively.

8. Increase digital literacy:

Increasing availability doesn't guarantee adoption. Consider having local rural organizations drive adoption by developing programs specifically geared toward specific demographics (i.e., aging, immigrants, etc.). For successful adoption by rural community members, the daunting world of cell phones

⁶⁰ <https://broadbandusa.ntia.doc.gov/broadband-equity-access-and-deployment-bead-program>

⁶¹ <https://techblog.comsoc.org/2022/09/02/fcc-to-release-u-s-broadband-maps-in-november-2022/#:~:text=Today%2C%20the%20Federal%20Communications%20Commission,draft%20of%20the%20new%20map.>

⁶² (Ref: The Schools, Health & Libraries Broadband (SHLB) Coalition is a nonprofit, 501(c)(3) advocacy organization based in Washington, D.C.)

and the internet must be shown to be helpful in everyday life. Early literacy programs assist with this as more and more educational, healthcare, and business opportunities are only available online. Funding should be available for literacy training, ensuring consumers have the equipment and information they need to get online.

9. Middle Mile:

The term “middle-mile infrastructure” means any broadband infrastructure that does not connect directly to an end-user location, including an anchor institution; (**Infrastructure Investment and Jobs Act**).⁶³ Approving the funding for middle-mile infrastructure reduces the cost of rural community members while simultaneously ensuring that the anchor institutions which are essential to rural life have broadband. Federal and state regulations can greatly impact connecting the middle-mile with the last-mile assists in providing affordable broadband services to unserved areas.

10. Workforce development:

Rural broadband offers significant opportunities to live and work in rural communities, creating and maintaining jobs that sometimes pay higher than local wages. Additionally, rural broadband will require a trained workforce to deploy broadband in each state, creating job opportunities in rural and remote communities. Policy should include workforce development training to successfully and correctly deploy broadband.

11. Change matching grant requirements for rural communities:

Many funding programs often require matching funds that rural communities simply do not have. To deploy grant funding, change requirements for matching funds to accommodate the funding challenges that rural communities will face.

12. State framework:

Policies should provide a framework for states to determine the application process in a fair and straightforward manner. There should not be a blanket prioritization and strategies for states, each state is unique, and the counties within each state may vary considerably in broadband availability, population, geography, or demographics. This is especially true for very rural counties, which may not have any or very limited broadband. As more and more states establish a broadband office, it is essential for local, state, and federal programs and resources to understand the challenges and opportunities that successful broadband deployment can bring to rural America. The **BEAD Program**⁶⁴ provides \$42.45 billion to expand high-speed internet access by funding planning, infrastructure deployment and adoption programs in all 50 states, Washington D.C., Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.



⁶³ <https://www.congress.gov/bill/117th-congress/house-bill/3684>

⁶⁴ <https://broadbandusa.ntia.doc.gov/broadband-equity-access-and-deployment-bead-program>

Resource guide

Resource Guide:

Qualitative and quantitative understanding of broadband needs in rural areas is key in effective deployment of broadband infrastructure. Surveys including the National Rural Broadband Survey provide insight into gaps of provision, inform policy makers, and encourage the distribution of broadband resources.

Rapid advancements in broadband infrastructure beg the question of future-proofing current infrastructure investments. Autonomous vehicles, drones, the Internet of Things (IoT), the Metaverse, and more new technology we have not begun to imagine is being built on the use of broadband. A combination of all broadband tools and administrative providers will be required to ensure quality rural connection to the Internet of the future.

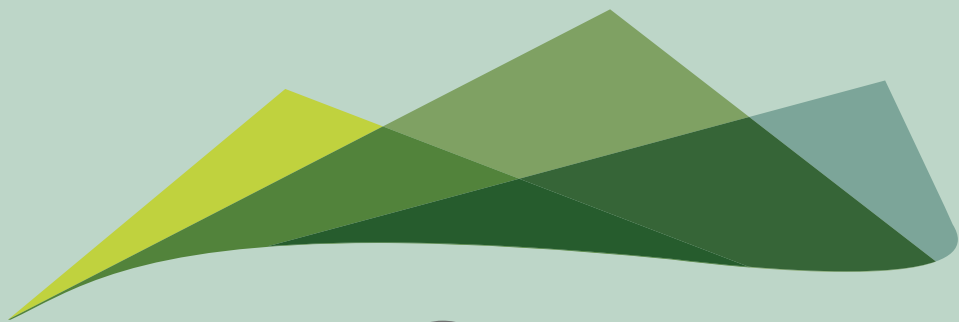
In most rural areas, outside intervention will be required to increase accessibility of broadband services. RuralRISE Tech will host a self-populated resource guide for rural community leaders, non-profits, and others to share best practices as well as challenges.



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