Center for Sustainable Development at BROOKINGS

# MAXIMIZING NEW FEDERAL INVESTMENTS IN BROADBAND FOR RURAL AMERICA

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**ANTHONY F. (TONY) PIPA** is a senior fellow in the Center for Sustainable Development at the Global Economy and Development Program at Brookings.

**LAURA LANDES** is the senior manager of research and data at Rural Community Assistance Partnership Incorporated.

**ZOE SWARZENSKI** is a project manager and policy analyst in the Center for Sustainable Development at the Global Economy and Development Program at Brookings.

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# EXECUTIVE SUMMARY

Congress appropriated $65 billion through the Infrastructure Investment and Jobs Act (IIJA) to close the digital divide and ensure universal access to reliable, high-speed, and affordable broadband across the United States. The cornerstone—$42.45 billion—rests with the implementation of the Broadband Equity, Access, and Deployment (BEAD) program, a new program overseen by the National Telecommunications and Information Administration (NTIA) that entrusts execution and deployment of the resources to state governments.

A significant segment of the remaining unserved and underserved communities is located in rural places. The Federal Communications Commission (FCC) estimates that 17.3 percent of rural Americans and 20.9 percent of Tribal lands lack access to physical broadband, even using a methodology that had been widely criticized for undercounting. BEAD's success will hinge in large part on identifying and reaching those communities—many of which have relatively high levels of social vulnerability and low levels of civic capacity—which have limited their experience and abilities in accessing federal resources. Availability is not the only challenge: Once physical infrastructure is in place, adoption and use will be necessary to maximize the community benefit, so BEAD implementation should be complemented by states' efforts with resources available from the Digital Equity Act to increase digital inclusion.

Vulnerable rural communities are the type of community most likely to encounter significant barriers to broadband availability and adoption. In addition, rural communities of color score more poorly than their majority-white counterparts on measures of digital divide and digital inclusion, reflecting the dual burden of race and place.

NTIA recognizes the importance of having un- and underserved communities participate in designing and informing solutions intended to meet their needs. Its guidance to states and territories emphasizes the imperative of coordination and outreach to local communities. To be successful, planning and implementation processes must meet these communities where they are, enabling them to inform solutions that fit the unique context of their history, geography, and demographics.

Differences in geography, community governance, culture, politics, legacies of historic discrimination, preexisting policies, and arrangements among levels of government (local, regional, and state) all increase the complexity of successfully extending broadband infrastructure to these areas and driving widespread adoption. This policy brief offers analysis and recommendations to policymakers, internet service providers (ISPs or providers), and practitioners to enable authentic community engagement and increase the likelihood of successfully closing these gaps across rural America.

**Barriers to meaningful engagement:** Within these diverse contexts exist a set of recurring thematic barriers to successful deployment and adoption. These include: low levels of trust in the process and/or skepticism of the motivations of providers and state policymakers; limited capacity of local governments and local civil society; lack of community ownership and buy-in; financial constraints and burdens; and digital readiness. If neglected, these might result in a local solution that fails to meet the needs of the community it purports to serve.

**Key principles:** Authentic community engagement generally reflects a common set of principles that provide a roadmap for success. These include: involving trusted entities, prioritizing accessibility, enhancing inclusion, simplifying technicalities, and sustaining engagement over time. By integrating these principles into models of facilitation, ranging from nongovernmental to fully public, communities can increase their likelihood of developing a customized approach that leverages their unique combination of assets and addresses their unique barriers to improve overall outcomes.

**Success metrics:** Measuring the success of community engagement is difficult by nature. Quantifying indicators that are qualitative in nature, such as trust and inclusion, is difficult without losing the nuance to accurately interpret outcomes. It is imperative that the community engagement process mandated by NTIA not simply become a box-checking exercise by ISPs, with local interactions that do not result in meaningful input and trusted relationships. Transparency, accountability, and consistent engagement are critical to raising the bar. Ultimately, the best metric of success will occur later in implementation—whether unserved and underserved communities gain access to broadband through BEAD funding.

**Recommendations:** To maximize the opportunity that BEAD presents and to close the digital divide once and for all, we recommend the following:

## TRANSPARENCY AND ACCOUNTABILITY

1. **Allow rolling challenges to FCC maps and publish transparent adjudication in a timely manner.** Given the mixed historical track record of its maps and the importance of addressing trust deficits and skepticism within communities that are meant to benefit, it is imperative to ensure that the data is unimpeachably credible and builds—rather than potentially undermines—confidence among those stakeholders.

2. **Mandate annual reporting, preferably through an easily accessible and navigable website and map, by NTIA (in conjunction with United States Office of Management and Budget (OMB)) that measures progress in reaching people and communities that remain left behind.** It will be important for all stakeholders—residents, providers, and state agencies—to have access to the same authoritative community-level data that tracks the progress of BEAD's implementation in closing gaps. Such reporting should also map these gaps against critical demographic and economic data, including income and poverty, race, and age, to understand the types of communities and people that remain underserved.

3. **Create a community advisory committee for NTIA composed of representatives from across the federal government and community stakeholders from across the country.** This committee would provide a strong community voice for oversight, help shape and advise annual reporting on what communities remain left behind, and inform NTIA policy and practice.

## CAPACITY-BUILDING AND COMMUNITY ENGAGEMENT

4. **Encourage states to create dedicated funding, staffing, or public-service opportunities to support community engagement for unserved and underserved communities.** NTIA should encourage states to invest intentionally in technical assistance for community engagement as they create and submit their five-year plans. Successful community engagement at the local level will inform successful projects and will require intentional financial support to provide capacity, expertise, and coordination to communities.

5. **Develop clear guidance for meaningful community engagement.** NTIA should require that projects demonstrate effective engagement and develop specific guidance to identify such engagement.

6. **Ensure matching requirements are not a barrier for highly vulnerable unserved or underserved communities.** As NTIA creates guidance for states on requesting waivers of matching requirements for "high cost" areas, a useful model would be adopting the waivers currently used by USDA's ReConnect program: Allow a full waiver of matching requirements for projects serving persistent poverty counties and colonia, for communities that are in the bottom 25 percent of the CDC's Social Vulnerability Index, and for Alaska Native Corporations and Tribal lands.

7. **Increase and emphasize support for immediately available solutions that leverage community institutions.** NTIA should make clear to states that investment in broadband for community anchor institutions, such as rural libraries and schools, is encouraged and an excellent approach to quickly expanding access.

8. **Create statewide multistakeholder councils to guide implementation.** States should be encouraged to create advisory committees or councils to guide and provide feedback on implementation.

## IMPLEMENTATION

9. **Set a high standard for the preference for fiber-optic cable.** Doing so would guard against the need for subsequent public investments to keep pace with growing needs. Projects and locations that plan to use an alternative technology should be mandated to provide sufficient feasibility documentation to receive a waiver and clearly describe their ability to support 100/20 Mbps download/upload speeds.

10. **Address permitting barriers.** Both federal and state governments should recognize and try to address the difficulties that can emanate from complexity associated with construction and land-use permitting, especially across jurisdictional boundaries of different governance entities.

11. **Integrate workforce development strategies into broadband implementation projects.** Both the federal government and states should seek to maximize the opportunity for leveraging the workforce opportunities that broadband projects will provide. The right mix of outreach, training, incentives, and wraparound services could enable new opportunities for underemployed or unemployed people in local labor markets but will require targeted approaches and investment.

# INTRODUCTION

Through passage of the Infrastructure Investment and Jobs Act (IIJA), Congress approved $65 billion to close the digital divide and ensure universal access to reliable, high-speed, and affordable broadband across the United States.[1]

A significant segment of the remaining unserved and underserved communities is located in rural America. The Federal Communications Commission (FCC) estimates that 17.3 percent of rural Americans and 20.9 percent of Tribal lands lack access to physical broadband,[2] even using a methodology that had been widely criticized for undercounting.[3] The estimates show deployment is lowest in areas with the lowest median household incomes, lowest population densities, and highest household poverty rates.[4]

Internet service providers (ISPs) have historically failed to expand into rural areas without public intervention. Yet past federal efforts show that funding alone has been insufficient to improve availability for the hardest to reach. Reviews by the Governmental Accountability Office (GAO) and Congressional Research Service (CRS) have pointed to difficulties in delivering federal resources to benefit the most vulnerable communities.[5]

Additional research has questioned the extent to which these federal investments have had appreciable impact on closing the digital divide.[6] Coupled with the past criticism of the FCC's methodology, which created ongoing and widespread disagreement about the levels of availability and affordability, these past experiences have resulted in a trust deficit and skepticism about the effectiveness of federal broadband investments in rural communities.[7]

The cornerstone of the IIJA broadband investment—$42.45 billion in total—rests with the implementation of the Broadband Equity, Access, and Deployment (BEAD) program, a brand-new program overseen by the National Telecommunications and Information Administration (NTIA). State governments will have the responsibility for planning and deployment of BEAD funds.

BEAD's success will hinge in large part on the extent to which implementation of its resources reaches unserved and underserved rural and Tribal communities. Many of these communities have relatively high levels of social vulnerability and low levels of civic capacity, limiting the ability of their residents to act collectively toward shared goals.[8] They may have limited staffing in their local governments; weak civic infrastructure, with few nonprofit or local philanthropic organizations to support their efforts with advocacy or resources; limited fiscal ability to procure technical expertise, such as engineering, legal, and consulting services, and meet match requirements; and limited experience navigating, accessing, and managing federal and state programs, which often-include onerous reporting requirements. These communities may also encounter any number of barriers to successfully completing complicated infrastructure projects, such as the legal complexities around permitting and easements.[9]

Successfully enabling availability, affordability, and adoption in these unserved and underserved rural communities will require designing solutions that match the unique characteristics and barriers in these places. Planning and implementation processes must meet these communities where they are in terms of capacity and economic power, and enable them to inform solutions that fit the unique context of their history, geography, and demographics.

This policy brief will explore the importance of successfully deploying BEAD resources to reach these rural communities, examine the barriers to doing so, and offer recommendations to strengthen community engagement, enhance local rural communities' ability to inform proposed broadband solutions and link those solutions to improved community and economic well-being, and ensure maximum public benefit for this ambitious public investment.

# THE FEDERAL LANDSCAPE FOR BROADBAND

The concept of universal service originated with electrification in the early twentieth century and was expanded to include telecommunications and advanced services, such as broadband, in 1996.[10] NTIA has listed a total of 96 federal programs that offer resources to support broadband access and adoption in some way.[11] These existing programs are found across the federal government and vary in availability and amount of funds, type of funds, purpose, and eligible applicants.

Even a partial overview of major programs (Figure 1) relevant to increasing broadband access and adoption in rural places demonstrates the complexity. These programs alone span 13 agencies, each with its own application process and reporting requirements, definition of rural and other eligibility requirements, timeframe, and level of funding. Some of the programs exclusively serve rural communities, while others may require communities to compete with better-resourced geographies for funding.

Excluding the ReConnect program, USDA and FCC's broadband programs have produced mixed records of success and been criticized for burdensome application requirements,[12] experienced accusations of fraud and unaccountability,[13] and resulted in skepticism and distrust from rural communities.[14] As an example, FCC's own performance measures could not demonstrate definitively that its Connect America Fund/High Cost Program improved broadband availability;[15] likewise, a 2020 evaluation found insufficient evidence to determine its Lifeline program's impact on broadband adoption.[16]

The American Rescue Plan Act of 2021 (ARPA) established two new broadband relief programs and created the $350 billion State and Local Fiscal Recovery Fund (SLFRF), making expansion of affordable access to broadband internet one of the eligible uses of SLFRF funds. This was a prelude to the $65 billion in investment contained in the IIJA, which created several new programs and provided additional resources for selected existing programs depicted in Table 1:

FIGURE 1

## Selected federal broadband programs

Periodic Table of Federal Broadband Opportunities

| Department of Agriculture | Federal Communications Commission | National Science Foundation | Institute of Museum and Library Services | Department of Commerce | Regional Commissions | Other Departments |
|---|---|---|---|---|---|---|
| | Affordable Connectivity Program | | | | | |
| | Connected Care Pilot Program | | | Broadband Equity, Access, and Deployment Program | | |
| Community Connect Grant Program | E-rate Program | | | Broadband Infrastructure Program | | |
| Distance Learning and Telemedicine (DLT) Grant Program | Emergency Connectivity Fund | | | Connecting Minority Communities (CMC) Pilot Program | Denali Commission: Alaska Broadband Program | |
| ReConnect Program | High Cost Program (AKA Connect America Fund, Rural Digital Opportunity Fund and 5G Fund) | | | State Digital Equity Planning Grant Program | Appalachian Regional Commission: ARC POWER | Department of Housing and Urban Development: 12 other programs |
| Rural Broadband Loan and Loan Guarantee Program (Broadband Program) | Lifeline | | | Enabling Middle Mile Broadband Infrastructure Program | Appalachian Regional Commission: 1 other program | Department of Labor: 3 other programs |
| Telecommunication Infrastructure Program (Infrastructure Program) | Rural Health Care Program | Internet Measurement Research: Methodologies, Tools, and Infrastructure (IMR) | | Tribal Broadband Connectivity Program | Northern Border Regional Commission: 1 other program | Department of Treasury: 4 other programs |
| 6 other programs | 1 other programs | 3 other programs | 5 other programs | 1 other program | Delta Regional Authority: 2 other programs | Department of Education: 36 other programs |

**SOURCE:** National Telecommunications and Information Administration, "Federal Funding," https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding with inspiration from Connie Stewart, California State Polytechnic University, Humboldt.

TABLE 1

## New and additional programs from the Infrastructure Investment and Jobs Act

| New programs | Funding | Agency | Purpose |
|---|---|---|---|
| **Affordable Connectivity Program (ACP)** | $14.2 billion | FCC | Replaces the temporary pandemic-era Emergency Broadband Benefit Program to provide discounted broadband service to qualifying low-income households |
| **Broadband Equity, Access, and Deployment Program (BEAD)** | $42.45 billion | NTIA | States will deploy resources to build infrastructure and ensure access to unserved and underserved areas, with management and oversight by NTIA |
| **Digital Equity Act Programs (DEA)** | $2.75 billion | NTIA | States will complement BEAD infrastructure planning and deployment with objectives for promoting digital equity and inclusion across the country |
| **Middle Mile Infrastructure Grant Program** | $1 billion | NTIA | Broadband providers, including cooperatives and others, will construct, improve, or acquire middle-mile infrastructure |

| Additions to existing programs | Funding | Agency | Purpose |
|---|---|---|---|
| **Tribal Broadband Connectivity Program** | $2 billion | NTIA | Directs funding to tribal governments to be used for broadband deployment on tribal lands, as well as for telehealth, distance learning, broadband affordability, and digital inclusion |
| **ReConnect Loan and Grant Program** | $1.926 billion | USDA | Periodically furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas |
| **Rural Broadband Program** | $76 million | USDA | Also known as the Rural Broadband Loans, Loan/Grant Combinations, and Loan Guarantees Program, it furnishes loans and loan guarantees to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide service at the broadband lending speed in eligible rural areas |

# Broadband Equity, Access, and Deployment Program

As noted previously, BEAD will provide $42.45 billion in grants across all states and territories for broadband planning, deployment, mapping, equity, and adoption activities in underserved and unserved areas. States are tasked with creating a plan to achieve universal coverage within their boundaries and will be responsible for deciding upon the projects to support and for distributing the funds.

Each state will receive a minimum of $100,000,000. The remaining funds will be allocated across the states based on the proportion of unserved and underserved locations identified in the National Broadband Map[17] published by the FCC. Due to criticisms of past inaccuracies, Congress mandated the FCC change its methodology and create new maps; NTIA will make its BEAD allocations based on the updated data.

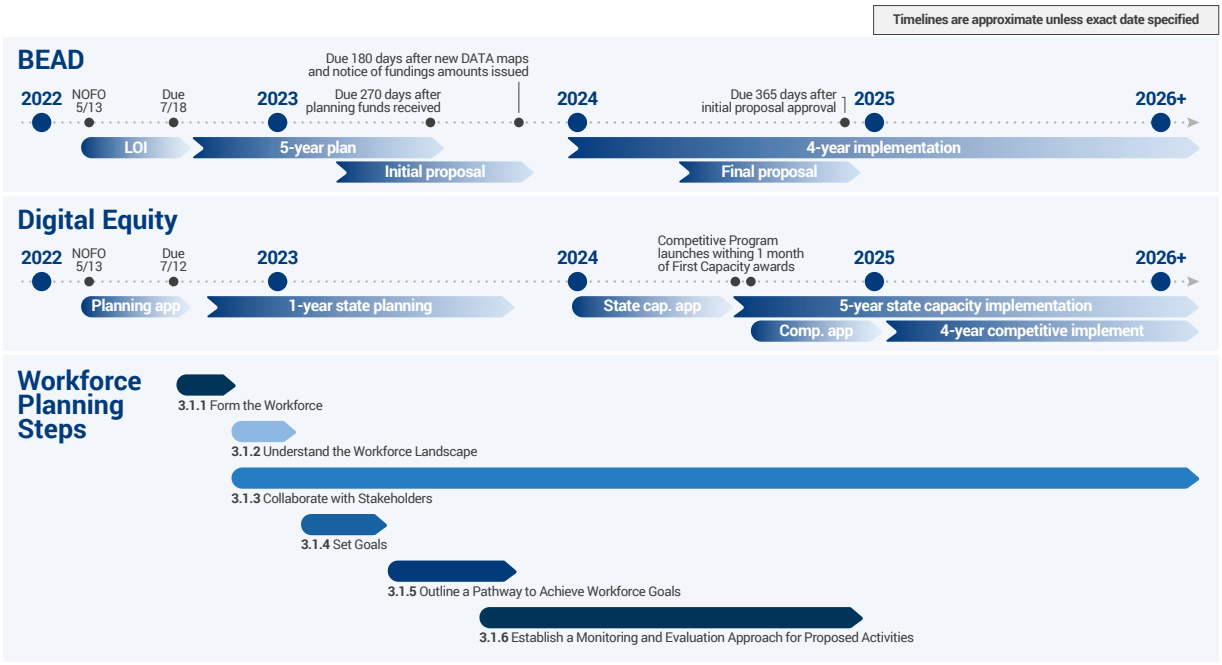
NTIA expects states and territories to conduct a great deal of coordination and outreach to local communities, describing it as "critical" to BEAD's success.[18] This recognition is clearly a positive step. Yet NTIA does not mandate specific outreach strategies or targets, nor does it clarify how coordination efforts will be evaluated, though it notes quantitative measures and quality of engagements will be considered.

The vagueness is intentional, to allow states and territories to tailor local coordination activities to the unique needs of their jurisdictions. It is important that this flexibility does not have the opposite effect of allowing states to skirt meaningful community engagement.

To ensure that community engagement is meaningful and results in locally-led solutions, states will need to apply proven tools and approaches for sustained and authentic community outreach. Communities will often require time and support to become informed partners in the process. Meaningful community engagement should include a strong focus on digital readiness, in addition to physical access. NTIA can play a leadership role by emphasizing the importance of stakeholder engagement to overall success and by developing clear transparency and accountability metrics to ensure that communities have genuine ownership over their participation in the process of design, planning, and adoption.

FIGURE 2

## BEAD Workforce Plan




**SOURCE:** NTIA Workforce Planning Guide pg. 17[22]

# Digital Equity Act programs

Physical availability is just one dimension of closing the digital divide. Through the IIJA, Congress also established and appropriated $2.75 billion for three new programs under the Digital Equity Act (DEA) to promote digital equity and inclusion. Taken together, the programs will provide both formula and competitive funding for states to develop and implement digital equity projects, including formula grants to develop statewide digital equity plans.[19]

NTIA expects that states will closely coordinate planning efforts for BEAD and DEA implementation by overlapping personnel, establishing formal direct communication and collaborating throughout the entire planning process of both programs. In other words, the Digital Equity Plan required by the DEA is considered a near necessary supplement to the BEAD program proposals.[20] All 50 states have declared their intent to request funds for the formula-based State Digital Equity Planning Grant Program and BEAD allocations.[21] The programmatic overlap aims to reduce duplication and make community outreach easier. NTIA's workforce plan (Figure 2) visualizes the simultaneous planning and implementation of these programs and provides suggestions to integrate workforce development.

# ReConnect

The IIJA added $1.9 billion to USDA's ReConnect program, which provides loans and grants to finance the construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas. While some aspects of the program were initially criticized for perpetuating barriers to access for un- and underserved rural communities, its rules have evolved based on community input. USDA has modified implementation with every round of funding and now includes preferences for local governments and nonprofits as applicants, for providing faster service, and for serving the least densely populated places. Experts are increasingly pleased with these improvements and the overall performance of ReConnect.[23]

In FY21 the program received $635 million via congressional appropriations and $100 million from the Coronavirus Aid, Relief, and Economic Security (CARES) Act. In addition to the injection of $1.9 billion through the IIJA, the legislation waived the match requirement for projects in areas that are comprised of at least 75 percent of persistent poverty counties and for projects serving tribes and Alaska Native Corporations.

The recent omnibus Consolidated Appropriations Act of 2023 appropriated $348 million more for the program, with a mandate that at least 10 percent of funds be allocated to persistent poverty counties. This reinforced ReConnect's role as a program of choice to address the challenges of persistent poverty counties; the 10 percent commitment is in keeping with the 10-20-30 formula that has been used in the past to focus attention on reaching persistent poverty counties. While this brief focuses primarily on BEAD implementation, it is important to note the bipartisan support for ReConnect and its critical role as a tool for serving rural communities most in need.

# IDENTIFYING UNSERVED AND UNDERSERVED COMMUNITIES

Successful and effective deployment of BEAD resources to reach unserved and underserved communities will rely upon accurate identification of those communities, a deeper understanding of their characteristics—including their level of vulnerability, capacity, and experience with public funding—and transparent reporting on their progress.

## Measuring broadband availability

The FCC currently defines broadband service at the benchmark of 25 Mbps download speeds and 3 Mbps upload speeds (25/3 Mbps);[24] BEAD defines unserved locations as those that lack access to 25/3 Mbps speeds and underserved locations as those that lack access to 100/20 Mbps speeds.[25] The program requires that funded networks provide at least 100/20 Mbps speeds and indicates a preference for the use of fiber-optic cable, widely considered to be "future-proof" technology.[26] But fiber can be costly to deploy, especially in rural areas where difficult topography and terrain add costs and challenges by requiring fiber lines to travel farther distances to reach users.[27] Some experts believe that 25/3 Mbps speeds are sufficient for many uses and mandating the deployment of high-cost, high-speed options like fiber are not the most effective use of public funds given that some households and communities lack service at any speed.[28]

The FCC produces the official federal broadband mapping and deployment data, but there has been widespread acknowledgement—and associated frustration—that the methodology prior to 2023 had significant shortcomings and produced an inaccurate picture. With the old methodology, the FCC measured minimum access at the census block level—the smallest geographic census unit, often equivalent to a city block. If just one location within the block reported access, the entire block was counted as served.[29]

A 2021 independent estimate conducted by BroadbandNow, a company that helps consumers compare local internet options, estimated that at least 42 million Americans lacked access to broadband, nearly three times the FCC estimate.[30]

Due to the acknowledged flaws in accuracy, the Broadband Deployment Accuracy and Technological Availability Act of 2020 (or the Broadband DATA Act) mandated that the FCC develop a new methodology, counting service by location—individual homes, commercial buildings, community anchor institutions, etc.—rather than census block and establishing a process for consumers and local governments to challenge the data.

The first iteration of the new map was shared with states and ISPs in September 2022 to provide them the opportunity to review and offer challenges where data was incorrect. The map was then made available to the general public in November 2022, with challenges open until January 13, 2023.[31]

The process has not been without controversy. After the challenge deadline passed in January, it surfaced that the next iteration of the map—the one that NTIA intends to use for its state-by-state allocation—will be based only on challenges received by October 30, 2022. This version is set to be published no later than June 30, 2023. Some states have protested, as the October deadline—and its importance—were not made clear during the process.[32]

Because NTIA will use these maps to allocate BEAD funding, inaccuracies in reporting mean that some communities may go unrecognized or be considered ineligible to access BEAD and other federal broadband resources, and that some states will not receive enough funds to close their gaps while others may receive more than they need.

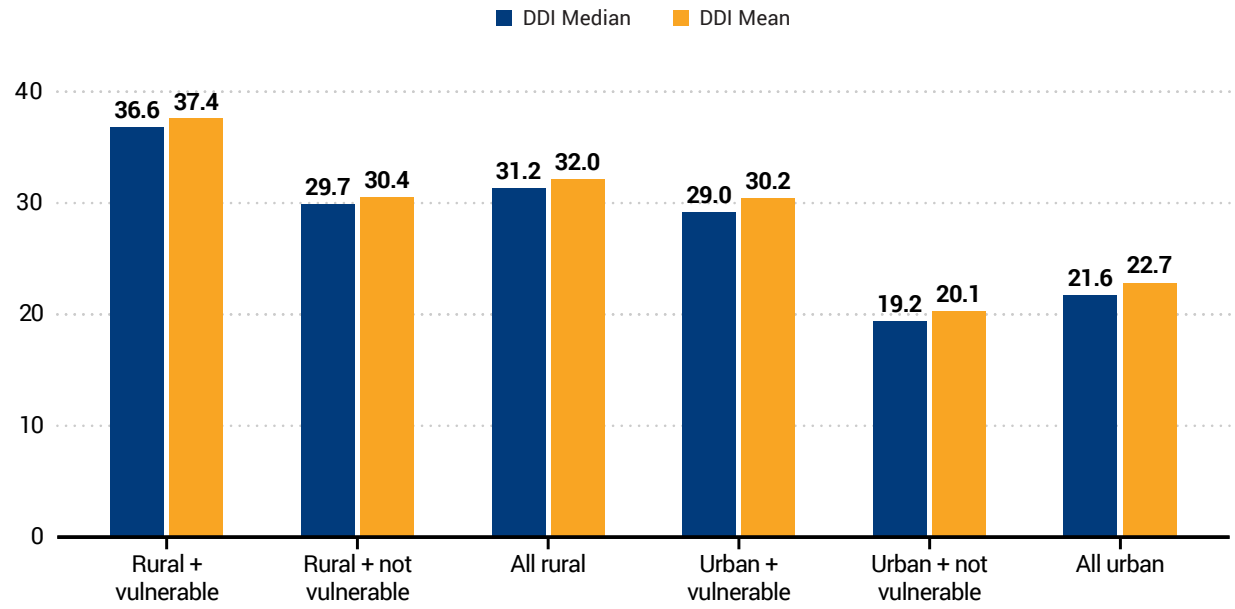
## Identifying communities in need

Given the acknowledged shortcomings of the FCC's data and maps on broadband access, state governments, private sector companies, and academic and research experts have engaged in additional analysis to deepen understanding of the current gaps. The Digital Divide Index (DDI), developed at the Purdue Center for Regional Development, offers a national-level scale that combines into a single score the extent of physical access to broadband—as measured by a set of infrastructure indicators—with rates of adoption, as captured in a set of socio-economic indicators.[33] The scores are normalized, so that a census tract with a higher score reflects lower levels of infrastructure access and adoption relative to its peers.[34]

Using the DDI, it is immediately clear that rural communities with high levels of vulnerability and low levels of capacity[35] are far more likely than any other type of community—whether an urban community or even a rural community with higher levels of capacity and well-being—to score highly on the DDI. The high DDI scores for highly vulnerable rural communities reflect a double whammy—they are the most likely to encounter significant challenges to availability of broadband infrastructure and actual adoption of broadband subscriptions.

FIGURE 3

## Analysis of Digital Divide Index scores by geographic vulnerability




**SOURCE:** Brookings analysis using data from Purdue Center for Regional Development (2020), Office of Management and Budget (2020), and Centers for Disease Control and Prevention (2020).

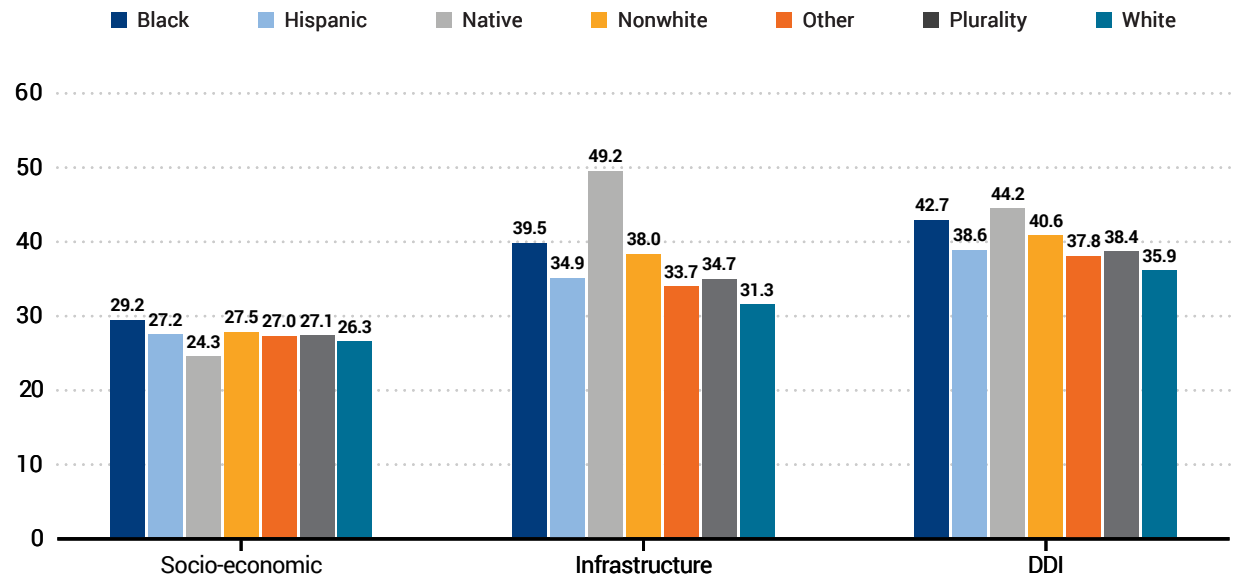
The infrastructure component scores are particularly sensitive to rurality, meaning that rural communities are especially challenged when it comes to availability. Healthy rural communities scored substantially worse than vulnerable urban communities on the infrastructure elements, despite outperforming them on the socio-economic elements, resulting in similar scores overall (Figure 3).

All of this suggests that the last mile infrastructure problem, which BEAD aims to solve, will require an intentional focus on meeting the unique characteristics and challenges of rural communities. A segment of these rural communities has high levels of vulnerability and is likely to have limited staff capacity, limited experience with complex public infrastructure funding and projects, and limited access to technical expertise.

A demographic analysis of these highly vulnerable rural communities reveals that census tracts that are majority-Black and majority-Native consistently score higher (Figure 4). Closing the gaps associated with the digital divide will require intentional and authentic engagement with populations that historically have been marginalized or left out of receiving federal support.[36]

FIGURE 4

## Average Digital Divide Index scores in vulnerable rural tracts by majority racial or ethnic group[37]




**SOURCE:** Brookings analysis using data from Purdue Center for Regional Development (2020), Office of Management and Budget (2020), American Community Survey (2021), and Centers for Disease Control and Prevention (2020).

The Purdue Center for Regional Development has also created another metric, digital distress,[38] to assess digital *inclusion*, the activities necessary to ensure that all individuals and communities can access and use the internet meaningfully.[39] This digital distress metric is based on four indicators: percent of homes with no internet access, percent of homes using only cellular data, percent of homes relying on mobile devices only, and percent of homes having no computing devices. The combination of these indicators thus provides a measure of how households engage with the internet.

Lack of internet access can prevent individuals from applying for jobs or public benefits, participating in distance learning, completing routine government services, or accessing telehealth services, among other essential tasks.[40] Households whose only access comes via cellular data on mobile devices face additional barriers, including data usage caps and difficulties leveraging digital applications on devices not designed to run them.[41]

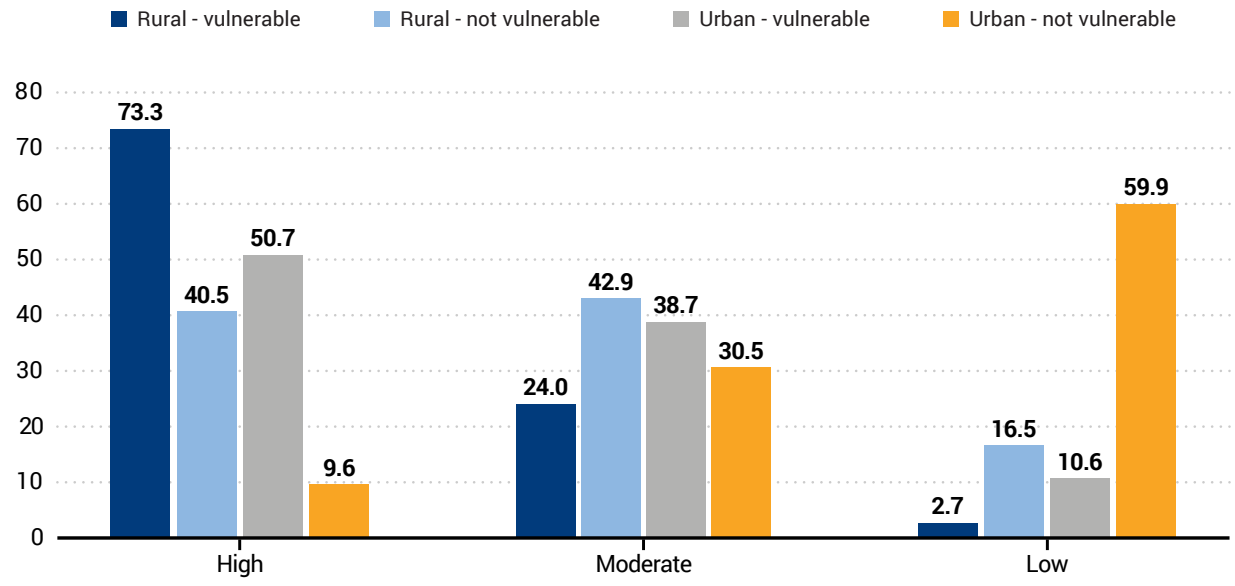
The digital distress metric takes three values: low, moderate, and high digital distress. Our analysis found that rural communities performed disproportionately worse than urban communities (Figure 5). Only 16 percent of census tracts included in the analysis are classified as rural, but they make up 32 percent of the tracts in high digital distress, 19 of those in moderate digital distress, and just 5 percent of the tracts in low digital distress.

A little less than 4 percent of all census tracts are rural and highly vulnerable—i.e., in the bottom quartile of the CDC's Social Vulnerability Index—but almost all of them are in moderate to high digital distress. Of that group, 73 percent are experiencing high levels of digital distress, and 24 percent are moderately digitally distressed. Any strategy that seeks to successfully achieve digital inclusion must be sensitive and responsive to the unique characteristics and challenges faced by highly vulnerable rural communities.

All majority-Black and Native vulnerable rural tracts face either moderate or high levels of digital distress Figure 6). Majority-Black rural communities with high levels of vulnerability are overwhelmingly likely to be in high digital distress, at 91 percent. The dual burden of race and place drives a higher degree of digital distress: Rural communities of color comprise a significant portion of the population where BEAD and DEA implementation must be well-integrated to maximize their complementarities.

FIGURE 5

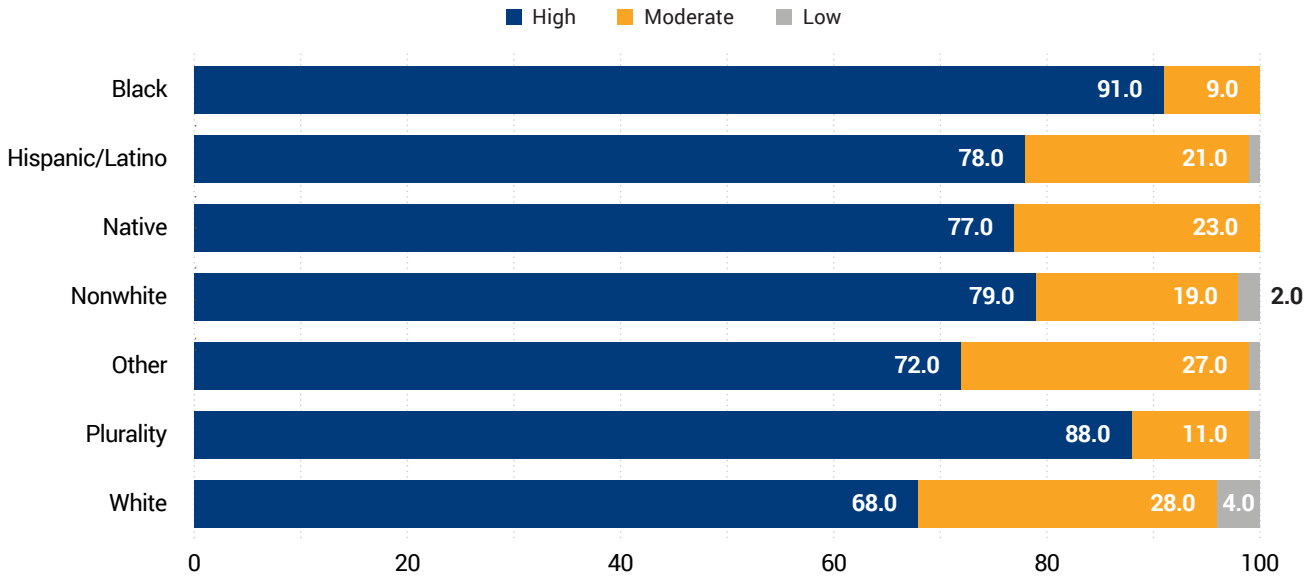
## Proportion of digital distress by geography and vulnerability




**SOURCE:** Brookings analysis using data from Purdue Center for Regional Development (2020), Office of Management and Budget (2020), and Centers for Disease Control and Prevention (2020).

FIGURE 6

## Digital distress of vulnerable rural census tracts by racial or ethnic group




**SOURCE:** Brookings analysis using data from Purdue Center for Regional Development (2020), Office of Management and Budget (2020), American Community Survey (2021), and Centers for Disease Control and Prevention (2020).

# BARRIERS TO MEANINGFUL ENGAGEMENT AND SUCCESSFUL DEPLOYMENT

The IIJA broadband funding, with BEAD at its center, reflects a growing consensus that broadband is an essential and basic input to modern social and economic life, rather than a luxury or simple demand-driven consumer product. It recognizes that market forces alone have been inadequate to achieve universal broadband coverage.[42]

For for-profit incumbent providers, the return on investment often does not make it cost-effective to build out broadband infrastructure in rural, remote, low-income, and/or geographically challenging areas. Smaller providers (whether for-profit, nonprofit, public-private partnerships, or cooperatives), particularly those owned locally, have often been more willing and likely to take on the challenge of building that infrastructure. Yet significant upfront costs associated with such infrastructure projects often make them extremely difficult to finance without some form of public assistance or incentives.

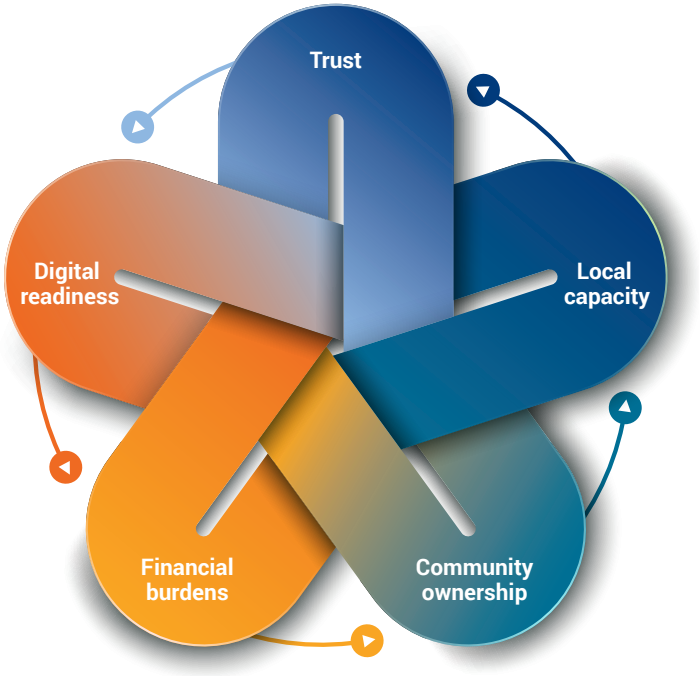
Market forces are but one of the barriers to universal service, complicated by the fact that "one size fits none" when it comes to the needs of rural communities. Differences in community governance, language and culture, politics, legacies of historic discrimination, existing levels of digital readiness, preexisting policies, remoteness and population density, and different arrangements among levels of government (local, regional, and state) all contribute to this phenomenon, preventing the government from funding or a provider from implementing a single approach to deployment.

Helping communities inform the solutions that providers pursue through authentic community engagement can result in successful adoption and links to economic and social objectives. In formulating community engagement plans and implementation proposals, state agencies will have to consider the many variations of communities in their jurisdiction.

Within these diverse contexts, the authors have catalogued a set of interconnected recurring thematic barriers to meaningful engagement through consultations and collective dialogue with local officials, rural practitioners, broadband experts, and policymakers (Figure 7). If neglected, these might result in a local solution that fails to meet the needs of the community it purports to serve—either through poor design, implementation, or underbuilding.

FIGURE 7

## Barriers to community engagement plans in broadband deployment




**SOURCE:** Authors' analysis.

### TRUST

Lack of trust is a fundamental barrier to successful community engagement and broadband deployment.[43] Many rural communities have deep-seated distrust or skepticism of government programs, particularly minority communities who have experienced decades of neglect and disinvestment from the state and federal government.[44]

In conversation with the authors, stakeholders in rural communities described feeling burned by previous public programs that were expected to bring broadband service and may have even funded companies to provide service to their location, only to deliver services that did not meet community needs.[45] In addition, communities have perceived the resistance of some telecom companies to changing the FCC's flawed mapping methodology[46] and the filing of challenges to prevent states from funding competitors in areas where they failed to provide adequate service[47] as prioritizing market interests over community interests.[48] Other localities may have natural resistance to federal intervention and see the requirements that come with federal resources as an encroachment on their autonomy. All of this increases skepticism and wariness.

Lack of transparency about negotiations—past and present—and information shared between state officials and incumbent providers, which often is justified as proprietary, can impede the building of trust and genuine collaboration. The frustrations regarding the

faulty methodology of the FCC's prior efforts and lack of transparency of its current efforts to measure and map service levels have also cast a shadow of skepticism over federal broadband programs for many communities.[49]

## LOCAL CAPACITY

Rural communities, especially highly vulnerable ones, are likely to have limited experience with navigating federal funding opportunities and putting together complex, technical applications and face more severe fiscal stress than their urban counterparts.[50]

Technical expertise, particularly the specialized engineering and project management needed for broadband proposals, is costly; it can also be difficult for rural communities to find technical expertise that is not in partnership with providers or seeking to sell proprietary services.[51] These challenges may be exacerbated by technical experts preferring to remain in urban markets because of efficiencies associated with less distance between potential engagements.[52] While there may be trusted technical assistance providers who provide services to rural places for little or no cost, they are not operating at the scale to serve all who would like to engage them.[53] Communities that are not successful in getting funding from their initial applications may not have the financial or human resources to reapply.[54]

For communities to have truly meaningful opportunities to engage with providers and state implementing agencies in the BEAD process, there are capacity needs on both sides. The community must be empowered and informed to effectively advocate for themselves, and implementing agencies will need to have the expertise and skills to enable engagement in a way that meets local communities where they are as they seek to understand and negotiate their options.

## COMMUNITY OWNERSHIP

Our conversations with experts emphasized the importance of communities feeling a sense of ownership and buy-in to broadband deployment plans. Customer-owned or mission-oriented providers can help build this sense of ownership, with greater incentives to ensure solutions truly represent and meet a community's needs for the future. This can guard against instances in which the implementation and contracting process seem pre-determined, damaging trust and credibility of public investments.

Rural electric cooperatives (co-ops) can offer advantages in community-first broadband deployment.[55] As member-owned providers, they are often more likely to offer broadband services that address a community's unique needs. Co-ops that have strong community representation are well positioned to expand their portfolio to broadband service due to their deep knowledge of local context, human and infrastructure capital, and in many cases, pre-existing fiber optic backbones that support the utility system and can be used as middle-mile infrastructure to support last-mile deployment.[56] Regional utility districts or municipal broadband networks can also offer an alternative; as publicly owned or supported entities, they can drive expansion and service into high-cost or low-profit areas.[57] Yet many states have laws restricting or prohibiting electric co-ops from expanding into broadband service[58] or restricting municipally-owned or led solutions.[59]

These restrictions raise the specter of limiting options for communities and can lead to perceptions that pre-existing relationships between states (either at the agency level or at the legislative level) and powerful incumbents influence state decisionmaking at the cost of local interests or (at a minimum) programmatic support for these alternative providers. Additionally, this can cause community leaders to perceive that states have different priorities than local jurisdictions and seek to champion different solutions than a community might for itself.[60]

**BOX 1**

## Wilson, NC: A successful municipal broadband network

In 2006 the city of Wilson, NC decided to build a publicly-owned fiber network after failed attempts to work with incumbent telecom companies to find a mutually beneficial arrangement to upgrade networks and increase their attractiveness to new businesses.[61] The city's success prompted legislation supported by major providers to ban the creation of municipal broadband networks.[62] In 2011, North Carolina became the 19th state at the time to create barriers to community-owned networks.[63] As of late 2022, two states had repealed theirs, bringing the total to 17 states.[64]

Research shows that municipal broadband restrictions are associated with lower levels of overall broadband availability, particularly lower levels of rural fiber availability.[65] NTIA is requiring states to disclose whether they will waive existing laws such as these concerning broadband or utility services before receiving funds. The guidance that NTIA has presented for BEAD preserves the right for municipalities to appeal to NTIA directly for funds if denied by a state.[66]

**BOX 2**

## Rural Electrification Administration

The Rural Electrification Administration (REA), a government agency created in 1936, was charged with supporting the electrification of rural areas, which overwhelmingly lacked service at the time due to prohibitive costs of deployment. The REA worked closely with newly formed electric co-ops, comprised of groups of farmers, to expand service.[67] Around the same time, the REA created the "Electric Circus," a program in which technical advisors traveled around the country teaching people how to use electricity and offering demonstrations of electric appliances to increase adoption rates.[68]

Within 25 years of inception, nearly all rural Americans had connected to the electric grid and were using power on their homes and farms.[69] The REA continues to exist today as the Rural Utilities Service within USDA. Almost 900 rural electric co-ops are still in operation and offer existing infrastructure that can play a helpful role in rural broadband expansion.[70]

## FINANCIAL BURDENS

Matching fund requirements are often required to participate in federal programs but too often preclude the most vulnerable and underserved communities, which have little access to funds that can be used to meet these requirements.[71] The ReConnect program's matching funds waiver for applicants serving persistent poverty counties and socially vulnerable communities offers a window into future possibilities of additional waivers, as well as the opportunity to track progress due to this change.[72]

NTIA has also made provisions for accommodating or waiving the BEAD match requirements, which ordinarily require a 25 percent financial or in-kind match.[73] Communities can use a number of existing sources of federal funds to meet their match, including the State and Local Fiscal Relief Funds (SLFR) allocated via formula by ARPA.[74] The assistant secretary also has the discretion to waive any part of the match requirement when those waivers advance objectives critical to the program's goal of bringing affordable broadband to all Americans.[75]

Deployment costs also create a significant barrier, particularly for smaller ISPs such as co-ops that have fewer options to access capital.[76] According to past FCC estimates, as much as 90 percent of the cost of deploying broadband is in burying the fiber optic cables and conduit underground.[77]

Operating and maintaining networks in rural and remote locations are also likely to be more expensive than the comparable costs in more densely populated areas.[78] Rural practitioners and experts expressed concerns about providers deferring maintenance due to the high costs or passing those costs on to rural consumers who might in turn struggle with the higher subscription rates.

## DIGITAL READINESS

Access to physical infrastructure alone will not unleash the full power of the internet for rural Americans if they cannot or will not get online. While in theory this is assumed as a natural consequence of infrastructure deployment, a significant portion of Americans lack the skills, tools, or trust to take advantage of broadband.[79]

Digital literacy, the ability to navigate technology, can be a foundational barrier to internet use, especially in rural communities where low-income and elderly populations are disproportionately represented.[80] Black adults and those with lower levels of formal education demonstrate lower levels of tech readiness.[81] The cost of adequate devices and internet subscriptions can create another barrier for low-income households to embrace broadband service.

Yet digital readiness goes beyond digital literacy to encompass issues of trust (that is, a person's beliefs about their ability to determine the trustworthiness of information online and protect their personal information), and the degree to which a person actually uses digital tools.[82] Groups with lower levels of readiness include less-educated, lower-income, and older people[83]—all of which are overrepresented in rural America.[84]

These are important considerations as states seek to complement their BEAD resources with DEA plans. The ecosystem to support digital inclusion will need to go beyond a skills-only focus if they are to help these communities reach high rates of adoption. Other common barriers are included in Table 2.

TABLE 2

## Other common barriers to adopting broadband service

| | |
|---|---|
| **Permitting and land-use policies** | Local communities and internet providers must navigate complex permitting processes, strict regulations, land ownership "checkerboards," and overlapping governmental jurisdictions to successfully build out broadband infrastructure.<br><br>These processes can also be opportunities to maximize efficiency and minimize cost via "dig once" policies that encourage broadband providers to coordinate installation of fiber cables during pre-planned construction work.[85] Such information and coordination can build trust and improve cooperation among local utility companies.<br><br>In Burkesville, Kentucky, a fiber broadband provider needed to determine the existing below-ground infrastructure before installing fiber, so it marked the location of water lines and shared video of those lines with the water utility. A technical assistance provider helped the water utility include that information in GIS maps of their distribution system and attach the videos to those data points in the map inventory. This information sharing not only improved both providers' infrastructure knowledge but also built trust across the organizations. |
| **Affordability** | Cost can be a major barrier for low-income households, even when their digital readiness is high, and they prioritize digital adoption. Affordable, subsidized, or free devices and service subscriptions are an important tool to close the broadband access gap. DEA funds can be used to provide devices, reaffirming the importance for states to integrate their BEAD and DEA planning, while the Affordable Connectivity Program (ACP) offers subsidies for broadband subscriptions and device purchases for eligible households[86]—though at its current rate, ACP is projected to exhaust its pool of funds by mid-2024.[87] |
| **Workforce** | Providers will be challenged to fill workforce shortages as the sector accelerates its efforts to build out infrastructure, especially workers that are local to the communities that providers are seeking to serve. Affordable workforce housing is also a challenge in selected areas, complicating the situation. |

BOX 3

# Workforce Development & Broadband

Broadband expansion can risk exacerbating socio-economic disparities if not recognized and intentionally mitigated.[88] In rural areas, the wage and employment increases associated with digitalization are not always seen by existing residents.[89] Quantitative research finds that an area's workforce composition plays a strong role in whether employment benefits will be enjoyed by locals; broadband access can result in negative employment effects in workforces without high levels of skill and educational attainment.[90] Expansion may also displace existing workers by making it easier for local rural businesses to outsource or automate business activities and may expose local rural businesses to increased competition.[91]

The Center on Rural Innovation found that there are at least 80,000 missing tech jobs in rural areas.[92] To prepare rural workers to take advantage of the industry changes that will accompany broadband expansion, states should prioritize and integrate workforce development strategies into broadband plans and dedicate specific funding. These workforce development strategies should be place-based and specific to and informed by local communities so that populations vulnerable to displacement are given the resources to succeed in the digital age.[93] The community engagement goals within BEAD and the DEA programs offer opportunities for states and communities to meaningfully shape workforce development.

# EFFECTIVE COMMUNITY ENGAGEMENT

## Principles of engagement

Successful engagement with communities will entail diverse approaches that depend upon a community's particular needs and existing resources. Despite that diversity, meaningful community engagement generally reflects a set of principles that distinguishes it from the equivalent of a sales pitch for a particular provider or technology. Consultations and roundtable dialogues suggested that it:

- *Involve trusted entities:* Community members must believe in the process and trust the engagers. Legacies of skepticism and distrust of federal programs and providers present additional challenges for historically underserved communities, particularly communities of color. Working with known and trusted intermediaries to facilitate community engagement can help ensure that rural communities are empowered to participate in the process.

- *Prioritize accessibility:* Community engagement must be accessible both thematically and logistically.
  - Processes held in locally neutral spaces, like a library or community center, are more likely to be successful. Engagement processes should also be planned to accommodate a variety of work schedules. Offering stipends or child care options can increase participation, encouraging the participation of community members who may otherwise be unable to attend.
  - Translation services or interpreters should be available if necessary.
  - Engagement processes held in person should be physically accessible for all community members. Processes held online, like a webinar or online survey, would be a poor choice in places with limited broadband access.

- *Enhance inclusion:* Community engagement should be intentionally inclusive of traditionally marginalized voices, especially those who may have experienced discrimination in the past or have limited experience in participating in such processes. Processes should also accommodate and seek out people who lack basic digital literacy skills and therefore are more likely to be dissuaded from taking a role in the process.[94]

- *Simplify technicalities:* Successful engagement is designed to educate community members in language and terms that they understand. Intentional efforts should be made to ensure that technical terms are translated into everyday language, so community members understand the implications of proposed solutions and the costs associated with them.

- *Ensure consistent engagement:* Meaningful engagement is sustained over time, creating a relationship that enables a community to shape the solution to their needs as it develops and is implemented. Consistent engagement promotes trust between stakeholders and ISPs and allows for inclusion of a broader set of voices—one-time events often reflect the views of stakeholders with the time, ability, and schedule to engage in that specific instance. Given the long-term nature of broadband deployment and maintenance, ongoing engagement is the preferred objective to ensure that a project successfully meets the needs of the community in every stage of the life cycle.

Honoring these principles increases the likelihood of community engagement that leads to improved outcomes. Each locale will have a unique combination of assets and barriers through which broadband deployment must be achieved. Successful engagement will leverage these circumstances to their advantage, and indeed the first step of engagement will assess the situation to develop a customized approach. Communities need not reinvent the wheel; many existing organizations have developed established models that can be tweaked and used.

# Emerging models

## COMMUNITY-OWNED, NONGOVERNMENTAL

Nonprofit and private models have emerged as valuable where governmental capacity or interest is limited.

**Digital inclusion coalitions:** The National Digital Inclusion Alliance (NDIA) champions the digital inclusion coalition model.[95] This is a collective of existing community organizations formed in partnership with advocates and practitioners, operating within a mutually-agreed upon structure based on a community's unique assets and needs. They facilitate an environment of trust, credibility, and community-first planning between providers and communities. Spread across the country, coalitions can be housed within a variety of institutions, including existing community-based organizations, educational institutions, or philanthropies. One example, the Charlotte Digital Inclusion Alliance, evolved into a standalone research center, the Center for Digital Equity, housed at the Queens University of Charlotte.

**Local digital navigators:** Also championed by NDIA, navigators are individuals in the community who support digital inclusion, from infrastructure to adoption to improved digital literacy, through repeated interaction with community members.[96] Often embedded in existing organizations, these navigators may be volunteers. Many county governments and community assistance agencies are also beginning to employ digital navigators. The

NDIA has launched a National Digital Navigator Corps to advance local digital inclusion work and strengthen digital equity in rural and Tribal communities.[97] Rural LISC is one of these organizations, working with nine sites across Appalachia to extend access to digital tools for nontraditional partners such as health providers, affordable housing developers, and financial opportunity centers.[98]

**Community benefits agreements (CBAs):** These agreements, typically enacted between developers or providers and community-based organizations who represent residents, spell out benefits that communities receive in exchange for supporting a project.

At their best, CBAs ensure that deployment is equitable and that providers continue to support ongoing maintenance and service. When written into the agreement, CBAs can also provide an enforcement mechanism and accountability for local communities after a plan is approved. For a high-quality CBA, community partners should center the voices of underserved and underrepresented groups, create a fully representative coalition of stakeholders that the developer or provider cannot influence, and be legally binding.[99]

The Department of Energy suggests the CBA as an accountability tool that applicants for its Energy Improvements in Rural and Remote Areas program can use as part of their required Community Benefits Plan engagement process.[100] It has created a CBA toolkit for communities to use and offers no-cost technical assistance that can be used to develop the plan.[101]

## PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships can increase community engagement and leadership to ensure broadband services are meeting the needs of rural communities where local governments may lack the capacity to independently plan and identify solutions. These models may draw on public resources or public agencies and typically include community-based organizations and/or third-party experts. These also offer entry points for local philanthropic organizations to be involved.

**Broadband action teams (BATs):** BATs are community-driven collaborations that identify connectivity and accessibility needs of their communities at the county-level.[102] Pioneered through a partnership between the Washington State Broadband Office and Washington State University Extension and now being used in other states, BATs generally provide a centralized node for engagement with the state officials and policymakers, assist with digital inclusion efforts, and seek to connect communities and participants with funding opportunities to achieve their goals.

**Publicly-funded intermediaries and technical assistance providers:** Through its new Appalachian Regional Initiative for Stronger Economies (ARISE), the Appalachian Regional Commission (ARC), which is federally chartered and funded, has launched a partnership with Connect Humanity to help 50 communities in every subregion of Appalachia develop plans and prepare to apply for federal broadband grants.[103] USDA is also considering partnerships with experienced technical assistance providers to work directly with underresourced rural communities in specific states and help them develop local coalitions, plans, and applications.

**Fellowship programs:** Facilitated by Lead for America and supported by AmeriCorps (a program overseen by the federal Corporation for National and Community Service), the American Connection Corps (ACC) places fellows across the country to increase broadband access and digital inclusion in underserved communities.[104] Fellows participate as a cohort, giving them access to a national network of peers and extensive trainings with experts to achieve their mission. These fellows "quarterback" the broadband deployment process—convening stakeholders, conducting community engagement, and applying for grants—in communities with limited permanent capacity.

There are examples of similar models at the state level, such as Lead for Minnesota[105] and Lead for North Carolina.[106] By embedding committed people into communities, these models often enable greater capacity that helps ensure community engagement is authentic and that communities maintain their momentum to complete processes, plans, and applications.

## PUBLIC TECHNICAL ASSISTANCE

Other capacity-builders are embedded within a government office itself—either at the local, state, or federal level.

**Dedicated "pathfinders:"** Canada's Universal Broadband Fund, launched in November 2020 to bring high-speed internet to rural and remote communities, includes a "pathfinder" service to help applying entities build partnerships, find potential sources of funding, and navigate the application process.[107] Individual pathfinders were assigned by jurisdiction, so that applicants engaged with the same person at every step of the way, ensuring continuity and familiarity on both sides. A similar model could be employed at the state level as BEAD implementation rolls out, ensuring that local jurisdictions have a single point of contact and partner at the state level.

Such a model is similar in conception to the Rural Partners Network (RPN), a whole-of-government initiative led by USDA Rural Development that embeds federal staff in highly vulnerable and low-capacity rural places, helping them navigate and access appropriate federal resources.[108] The major difference is that RPN's model establishes a physical presence that can be useful in overcoming trust issues.

This also reflects NTIA's own staffing structure to engage with the states. It has ramped up hiring, so that each state has a federal program officer charged with ensuring that states and other stakeholders are successfully navigating the program requirements.[109] These program officers are paired with an official from each state broadband office in their portfolio, and both parties are available to the public, as well.[110]

**Official task forces or advisory committees:** The Minnesota Broadband Task Force, established by the governor in 2011, consists of 15 members to advise the executive and legislative branches on broadband policy, and annually reports on the state of broadband deployment.[111] The appointed members represent a wide variety of stakeholders, including consumers, business and residential users, educational and health care

institutions, traditional telephone and cable companies, and wireless providers, as well as urban and rural local units of government.[112] Engaging a diverse set of voices in an official capacity can help ensure that the needs of all types of communities have a voice in state broadband deployment policy.[113]

**State-administered technical assistance:** States may offer public technical assistance programs to support communities either through their broadband offices or other appropriate agencies. The Alabama Community Broadband Technical Assistance Program (TAP), administered by the Digital Expansion Division of the Alabama Department of Economic and Community Affairs, is providing technical assistance to each county in the state to help prepare them for broadband deployment and digital opportunities.[114] The program includes three phases: stakeholder engagement and asset identification for broadband readiness; data collection and collaboration for baseline broadband needs and assessment of their current state; and strategy development for broadband deployment and digital opportunity partnerships.

State broadband offices vary in their approach.[115] Successful and experienced state offices have staff specifically dedicated to broadband deployment that include digital inclusion services; are visible and responsive to constituents; and are supported by strong leadership from governors, legislators, and agency heads. For example, Colorado's broadband office works with providers in the state on a semi-annual data collection cycle to identify and map areas eligible for grant funding, and partners with councils of governments to fund regional broadband coordinators.[116] The Colorado Broadband Advisory Board and Subcommittee on Digital Literacy and Inclusion enables transparency and accountability of the state office and facilitates collaboration among providers.[117]

# Measuring effective outreach

The models above provide examples that can be customized to a particular context, but actually measuring the success of such engagement is difficult by nature. Quantifying indicators that are qualitative in nature, like trust and inclusion, is difficult without losing the nuance necessary to accurately interpret outcomes. It is imperative that the community engagement process mandated by NTIA not simply become a box-checking exercise by ISPs who design local interactions that do not result in meaningful input and trusted relationships. Transparency, accountability, and consistent engagement will be critical to raising the bar.

## PROGRAM EVALUATION

The principles of program evaluation provide a starting point for creating metrics that measure the effectiveness of community engagement.[118] As NTIA seeks to assess the plans and approaches that states intend to use to support community engagement, as well as the effectiveness of those approaches as implementation rolls out, it will be important to distinguish between outputs and outcomes, as well as cursory and consistent, authentic engagement. Rather than simply counting the number of engagement opportunities or the amount of people who participate (outputs), the true measures of successful community

engagement will include the increase in community understanding, the participation of a diverse set of community members and their perceptions of the engagement, and the level and quality of input that the community can deliver to shape the solutions that providers offer and that public funds support.

Ultimately, the best metric of success will occur later in implementation—whether unserved and underserved communities truly gain access to broadband through BEAD funding. Embedding a set of digital inclusion principles from the onset of the community engagement process may help improve success and provide a framework for evaluation.

Rural communities without local coalitions or technical assistance, especially those that are fiscally constrained or experience high levels of vulnerability, face both the challenge and the opportunity of beginning and measuring the process from scratch. Access to financial support or technical assistance can facilitate and provide support. It will be important to invest in—and take the time to focus on—developing and using transparent and accountable metrics, even with the urgency of deployment. This may also be an opportunity for public-private partnerships or for philanthropy to play a key role.

Emerging models regarding measurement that may offer insights include:

**Sunlight Foundation:** The Sunlight Foundation created a Community Engagement Impact Framework to assess cities' use of open data, which can be adapted for broadband deployment programs.[119] The framework identifies examples of appropriate metrics to support the five components of a program evaluation above:[120]

- *Inputs:* Number of target outreach efforts, number of staff conducting outreach, community engagement budget
- *Activities:* Number of outreach initiatives completed, number of community meetings, number of newsletters or blog posts distributed
- *Outputs:* Number of active participants (i.e., asking questions or speaking), number of first-time meeting attendees, number of repeat meeting attendees, number of community organizations attending
- *Outcomes:* % changes in all outputs over time, background and demographics of engaged participants
- *Impacts:* Perception polls, increased adoption rates, increased broadband access rates, % of community with digital literacy skills

**NDIA:** NDIA has developed a Digital Inclusion Outcomes-Based Evaluation Report, which provides a roadmap for communities to develop and evaluate digital inclusion coalitions and ecosystems.[121] Establishing common indicators across the diverse array of underserved communities is extremely difficult and would even be a disservice to their needs. Instead, communities must individually develop a shared vocabulary and goals across a diverse set of stakeholders before beginning to define indicators and evaluate impact and outcomes.

Such a process is made more challenging by the limited pre-existing capacity and funding for digital inclusion within most communities—an opportunity for NTIA to encourage that states set aside support to meet BEAD's community engagement mandate.

**Institute for Museum and Library Services (IMLS):** The IMLS developed the Building Digital Communities framework to encourage engagement across all community sectors and ensure that all people, businesses, and institutions have access to digital content and technologies.[122] The framework identifies three sets of principles for organizing and measuring digital inclusion:

- *Access:* availability, affordability, design for inclusion, and public access;
- *Adoption:* relevance, digital literacy, and consumer safety; and
- *Application:* education and workforce development, education, health care, public safety and emergency management, civic engagement, and/or social connections.

# RECOMMENDATIONS

The opportunity that BEAD funding presents to close the broadband gap is significant, and it offers a chance for unserved and underserved communities to accelerate social and economic connections. Community engagement will play a central role in ensuring that solutions are designed to meet the unique characteristics of these communities, many of whom will be rural. To maximize the public benefit from these public resources and ensure their effective and successful implementation, we recommend the following:

## TRANSPARENCY AND ACCOUNTABILITY

1. **Allow rolling challenges to FCC maps and publish transparent adjudication in a timely manner.** The rushed and confusing nature of the challenge process during late 2022 into early 2023 has undermined confidence and increased skepticism that the new FCC maps will be precise and largely correct for an NTIA decision by June 30, 2023. Given the mixed historical track record of its maps and the importance of addressing trust deficits and skepticism within communities that are meant to benefit, it is imperative to ensure that the data are unimpeachably credible and build—rather than potentially undermine—confidence among those stakeholders. The FCC can take two important steps:

    - Ensure a public process that allows challenges from any stakeholder to its data at any time.
    - Publish its decision on each challenge and its rationale publicly and transparently in a timely manner after its decision.

NTIA would do well to delay its state-by-state allocations based on unserved and underserved areas until the majority of challenges from the first challenge round are adjudicated and transparently published. It could initiate an interim step to disburse the initial $100 million that is statutorily designated for each state, allowing implementation to begin in areas where there is little disagreement on the existence of unserved and underserved populations and where shovel-ready projects are at the ready.

2. **Mandate annual reporting, preferably through an easily accessible and navigable website and map, by NTIA (in conjunction with OMB) that measures progress in reaching people and communities that remain left behind.** While FCC's annual report offers an overall view of the state of broadband and telecommunications service in the United States, the critical performance metric relevant to BEAD will be the extent to which unserved and underserved communities are being reached and served. To build confidence and communicate the impact of implementation, it will be important for all stakeholders—residents, providers, and state agencies—to have access to the authoritative community-level data regarding broadband gaps, and to able to track progress through BEAD's implementation in filling those gaps.

   Such reporting should also map these gaps against critical demographic and economic data, including income and poverty, race, and age, to understand the types of communities and people that remain underserved. NTIA should layer into such a map the projects that are proposed and in process (per state reporting), so that stakeholders understand the plans, timing of projects, and level of investment that are intended to address the remaining gaps in specific locations.

3. **Create a community advisory committee for NTIA composed of representatives from across the federal government and community stakeholders from across the country.** This committee would provide a strong community voice for oversight, help shape and advise annual reporting on which communities remain left behind, and inform NTIA policy and practice. This group can provide counsel to NTIA's program officers who will work directly with states to ensure their broadband plans and implementation truly meet the needs of unserved and underserved communities. This committee should intentionally reflect a cross-section of underserved communities and people rather than special interest groups. It should play a key role in guiding transparency and accountability from NTIA and state broadband offices, and provide oversight of an appeals process for communities to directly challenge state broadband plans that fail to meet their needs or adequately address their concerns.

## CAPACITY-BUILDING AND COMMUNITY ENGAGEMENT

4. **Encourage states to create dedicated funding, staffing, or public service opportunities to support community engagement and technical assistance for unserved and underserved communities.** NTIA should encourage states to invest intentionally in technical assistance for community engagement and digital readiness as they create and submit their five-year plans. Successful community engagement at the local level will inform successful projects, and would benefit from investments of time, attention, and resources. States could be encouraged to set aside a pool of funds that communities could directly access for engagement and planning; create a dedicated office such as the one Alabama has launched; or create a dedicated service corps, such as the American Connection Corps, that provides embedded staffing through partnerships. States could also create public-private partnerships with appropriate civil society organizations that are trusted by local community stakeholders and have experience with broadband planning and project development.

5. **Develop clear guidance for meaningful community engagement.** NTIA should require that projects demonstrate effective engagement and develop specific guidance to identify such engagement. While the process may look different for each project and community, commonalities might include a description of how community outreach intentionally incorporated digital inclusion principles; outcome-based measurements such as an increase in community understanding, participation of a diverse set of community members, and level and quality of community input; or discussion of how the state's Final Proposal incorporated feedback and changes based on community input.

6. **Ensure matching requirements are not a barrier for highly vulnerable unserved or underserved communities.** As NTIA creates guidance for states on requesting waivers of matching requirements for "high-cost" areas, a useful model would be to adopt the waivers currently used by USDA's ReConnect program: Allow a full waiver of matching requirements for projects serving persistent poverty counties and colonia, for communities that are in the bottom 25 percent of the CDC's Social Vulnerability Index, and for Alaska Native Corporations and Tribal lands. It is imperative to ensure the rules apply to areas that offer a lower return on investment for providers for socio-economic reasons. States should also consider partnering with philanthropy and the private sector to build an investment fund that can be used for match requirements for smaller communities or providers which may not otherwise be eligible for waivers, and/or that could serve as loan funds for future projects.

7. **Increase and emphasize support for immediately available solutions that leverage community institutions.** NTIA should make clear to states that investment in broadband for community anchor institutions, such as rural libraries and schools, is encouraged and an excellent approach to quickly expanding access. It would be beneficial for community anchor institutions to receive the same level of priority for funding as unserved areas. States should be encouraged to prioritize investment for such institutions along with unserved areas and complement broadband funding with funding for additional services, staffing, and organizational development.

8. **Create statewide multistakeholder councils to guide implementation.** States should be encouraged to create advisory committees or councils to guide and provide feedback on implementation. They should include experts familiar with the challenges of rural communities, as well as residents or local leaders of unserved or underserved communities. The Oklahoma Broadband Expansion Council and the Governor's Task Force on Broadband in Minnesota provide useful models.

## IMPLEMENTATION

9. **Set a high standard for the preference for fiber.** Doing so would guard against the need for subsequent public investments to keep pace with growing needs. NTIA should make the use of fiber-optic cable the expected standard, allowing waivers only when physical deployment is not possible. States should incentivize fiber in their grant scoring criteria. Projects and locations that plan to use an alternative technology should be mandated to include sufficient feasibility documentation to receive a waiver and clearly describe their ability to support 100/20 Mbps download/upload speeds.

10. **Address permitting barriers.** Both federal and state governments should recognize the difficulties that can emanate from complexity associated with permitting, especially across jurisdictional boundaries of different governance entities. “Dig once” and expedited permitting policies can increase fiber broadband availability.[123] States should be encouraged to provide suggestions on reforms or streamlined processes regarding permitting in their five-year strategies. NTIA and other federal agencies, in partnership with Congress, should continue to pursue permitting reform at the federal level.

11. **Integrate workforce development strategies into broadband implementation projects.** Both the federal government and states should seek to maximize the opportunity for leveraging the workforce opportunities that broadband projects will provide. While BEAD requires states to incorporate workforce development strategies into their five-year plans, it is important that NTIA stress the importance of this pillar and measure its success accordingly as it partners with states on implementation. The right mix of outreach, training, incentives, and wraparound services could enable new opportunities for underemployed or unemployed people in local labor markets but will require targeted approaches and investment. States and federal agencies should seek assistance and partnership with state colleges, universities, and departments of labor to ensure that broadband workforce development opportunities meet local needs and benefit historically marginalized populations. This may require partnerships between state broadband offices and workforce boards or state departments of labor.

The implementation of BEAD presents a high-profile opportunity to showcase the federalism that defines the U.S. democratic system to deliver and meet the needs of its most vulnerable and underserved citizens. Getting it right will mean making sure that the community engagement envisioned by NTIA is effective and genuine during implementation by the states. Transparent accountability will be critical to building trust and credibility with communities that these funds are serving their interests. For unserved and underserved U.S. communities, many of them rural, their digital future depends upon it.

# APPENDIX

## QUALITATIVE METHODOLOGY

The research team conducted a series of individual interviews with practitioners, researchers, and other experts about their experiences with broadband deployment in rural and low-capacity communities. We leveraged our professional networks to develop an initial set of interviewees and snowballed based on their recommendations to form a second group of interviews. The interview protocol is as follows:

1. What are the key programs we need to look at? Which are particularly successful?

2. What have been the major barriers or constraints that you have encountered that would benefit from further examination?

   a. Are there particular issues that deserve a close look regarding the increased role that state governments will play in implementing the newly passed infrastructure funds?

3. Who else would you suggest talking to (especially those with direct experience trying to make use of these programs)?

4. Where is there analysis that is missing?

5. What is your quick elevator pitch for rural broadband? Why is broadband important?

6. What issue keeps you up at night when thinking about closing the rural broadband gap?

7. Is there anything else you would add at this point that you feel is important to mention?

Following the interviews, we held a closed roundtable discussion that included both interviewees and additional experts. The roundtable was held under Chatham House Rule to ensure candor and trust. The research questions are as follows:

1. Overcoming barriers to broadband access and adoption:

   a. What role can public agencies (federal, state, and local) and resources play in strengthening the capacity of unserved and underserved rural communities to maximize use of broadband funding?

   b. What methods of outreach to small and low-capacity communities are most effective?

   c. How can federal leaders most effectively measure local engagement, both quantitatively and qualitatively?

2. How should ReConnect and BEAD complement each other, especially as it relates to unserved and underserved rural areas?

3. What did we miss? What other recommendations and solutions would you suggest to NTIA, USDA, and the states in order to reach the most vulnerable and underserved rural areas? What else is important for us to know?

## DATA DEFINITIONS AND QUANTITATIVE METHODOLOGY

To assess intersections of rural, distress, and broadband access, we used four data sets. All analysis was conducted at the census tract level.

1. **Digital Divide Index (2020):** a descriptive and pragmatic tool developed by Purdue University to identify areas of digital divide based on infrastructure and socioeconomic indicators at the county or census tract level. DDI is not a strict measurement of broadband availability, but rather a descriptive and pragmatic tool to indicate where access and adoption exist at lower rates. DDI is made up of two individual indicator scores—infrastructure and socio-economic— which all range from 0 to 100, calculated using z-scores to standardize distributions. Scores are not comparable across different geography tiers (e.g., census tract vs county vs states). DDI was designed to show larger divides as the score increases.

2. **Digital Distress (2020):** a digital inclusion metric developed by Purdue University measured at the county or census tract level. The Digital Distress index equally categorizes all census tracts into one of three groups: low, moderate, and high digital distress. Each census tract is categorized based four categories: percent of homes with no internet access, percent of homes using only cellular data, percent of homes relying on mobile devices only, and percent of homes having no computing devices.

3. **CDC Social Vulnerability Index (2020):** measured at the county or census tract level. We defined distress as having a score of greater or equal to 0.75.

4. **OMB (2020):** Rural is defined at the county level as either a Micropolitan Statistical Area or Neither, as delineated by OMB. Urban is defined as Metropolitan Statistical Areas. Since our other metrics are measured at the tract level, we assume that a census tract takes on the same rural definition as its parent county.

5. **American Community Survey (2021):** used for demographic data at the census tract level.

Incomplete rows of data, 486 in total, were removed before analysis.

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