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ACLP - Broadband Planning Tool Kit - October 2022

New York Law School

State & Local Policymakers' Broadband Planning Tool Kit

Data-Driven Best Practices, Guiding Principles, and Recommendations to Close Digital Divides and Bolster Connectivity

October 2022

ACLP
ADVANCED COMMUNICATIONS LAW & POLICY INSTITUTE
at New York Law School

NEW YORK LAW SCHOOL

The Advanced Communications Law and Policy Institute (ACLP) at New York Law School is an interdisciplinary law and public policy program focused on identifying and examining the key legal, regulatory, and public policy issues impacting – and impacted by – more robust broadband connectivity across the United States. The ACLP pursues and promotes a holistic approach to the study of broadband. Its focus includes the examination of: supply-side issues like infrastructure availability; demand-side issues like the myriad barriers hindering greater, more meaningful, and more equitable adoption and utilization of broadband across key demographics and sectors; state, local, and federal funding of broadband initiatives; and the intersectionality of broadband and other key public policy goals and objectives. The ACLP's research and writing is grounded in data relating to broadband connectivity and focuses on the development of practical, solution-oriented recommendations for policymakers at all levels of government and other stakeholders across the broadband ecosystem.

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EXECUTIVE SUMMARY

With a historic amount of funding available for broadband projects, policymakers and other stakeholders need to develop action plans for effectively and efficiently putting these resources to work in their communities.

This Tool Kit is offered to help state and local policymakers navigate the many issues and considerations involved in the development and implementation of broadband plans.

STATE OF PLAY: BROADBAND CONNECTIVITY IN THE U.S.

The Tool Kit begins by providing a tutorial on the state of broadband in the U.S. today.

The surge of federal funding aims to fill availability gaps and increase broadband adoption in a marketplace already defined by widespread availability, increasing "intermodal" competition (where different platforms – cable, fiber, wireless, etc. – compete with one another for customers), rapidly increasing data speeds and quality, and declining prices.

- **Availability.** According to the FCC, an estimated 98% of Americans have access to one or more fixed broadband providers – the result of decades of investment and competition between providers and technologies. But availability gaps persist in areas where private network infrastructure investments are unlikely to pay back their construction costs due to low population density, challenging terrain, or other factors.
- **Adoption.** Data from the FCC and Census Bureau indicate that 66% to 71% of U.S. households had a broadband subscription as of 2019. Over half of residential fixed broadband subscribers had download speeds of 100 Mbps or above.
- **Prices.** Over the past 20 years, the price-per-megabit of consumer internet service has plummeted nearly 98%. Even unadjusted for speed, in the past five years consumer prices have declined 14% for plans in the 25 – 100 Mbps speed tier, declined 33-35% in the 100 – 499 Mbps speed tier, and declined 42% in the 500+ Mbps speed tier.

It is essential for policymakers to understand, appreciate, and account for this context as they develop their plans for addressing remaining connectivity challenges in their communities.

AVAILABLE BROADBAND FUNDING

In the aftermath of the COVID-19 pandemic, Congress committed a historic amount of funding to state and local governments for broadband projects. Sources of these funds include:

- The **CARES Act** (enacted March 2020) committed at least $3.3 billion towards distance learning, broadband infrastructure, and other broadband-related uses.
- The **Consolidated Appropriations Act** (enacted December 2020) invested $3.2 billion to establish the Emergency Broadband Benefit program, $1.6 billion for NTIA grant programs; and an additional $250 million for the FCC's Telehealth Program.
- The **American Rescue Plan Act** (enacted March 2021) committed $350 billion to state, local, and Tribal governments, with investments in broadband infrastructure among the authorized

uses. The Act also created a $10 billion Coronavirus Capital Projects Fund to support digital connectivity projects.

- The **Infrastructure Investment and Jobs Act** (enacted November 2021) invests $65 billion "to help close the digital divide and ensure that all Americans have access to reliable, high speed, and affordable broadband."

These funds supplement billions of dollars that states have invested in broadband deployment over the last few years via grant programs and that the FCC has allocated to ISPs in support of rural broadband deployment via programs like RDOF.

ASSESSING BROADBAND NEEDS AND DESIGNING EFFECTIVE STATE BROADBAND PROGRAMS

State broadband programs will play a prominent role in allocating this surge of federal broadband funding. To assure timely and targeted allocation of funding, policymakers should engage in a holistic assessment of their community's broadband market and needs. Key elements of such an assessment should include:

- **Bring all stakeholders together.** Convene ISPs, consumer groups, business groups, nonprofits, and other relevant stakeholders for data-driven, solution-oriented discussions.
- **Take a long-term view.** Instead of a one-time snapshot, a smart assessment considers recent market trends and providers' future buildout plans.
- **Gather as much data as possible.** Smart, data-driven planning allows for more precise solutions to meet the community's connectivity needs.
- **Work from accurate maps.** The forthcoming federal DATA map, to be issued by the FCC, will have the accuracy and granularity to meet most state and local policymaker needs. Decision-makers should look to this federal map first before duplicating efforts with state-level mapping.
- **Engage objective, independent experts.** Where states or localities lack the in-house expertise or experience with the data analysis needed to build an effective broadband plan, credible, carefully vetted, and objective outside experts should help fill this gap.

With a thorough assessment in hand, the following best practices can help states and localities maximize the impact of broadband funding and decrease the risk of waste, fraud, and abuse as they operationalize their plans:

- **Focus funds on finally bringing broadband to remaining unserved areas.** Despite significant progress towards universally available broadband, far too many households in the U.S. remain without access to a high-speed internet connection. Grant applications seeking to serve these areas should receive priority. Applications that seek to deploy networks in areas that are already served – commonly known as "overbuilding" – should not be considered.
- **Support broadband adoption and digital skill development** with locally tailored solutions to reach those who do not subscribe.
- **Encourage robust participation by local entities** in state planning processes and application development.

- **Assure a technology neutral approach** to allocating grant funding. This means that policy should not preference one platform over others. Instead, grant programs should encourage ISPs of all ilk to compete for funding so that unserved areas ultimately benefit from the technology that is most appropriate to eliminate their digital divide.
- **Evaluate applications objectively** to assure a level playing field, emphasizing criteria like expertise and experience in building and operating networks.
- **Resist imposing unnecessary or burdensome requirements on grantees** that could limit competition for funds by discouraging eligible and qualified entities from applying.
- **Deploy a robust challenge process** that allows entities to challenge determinations of "served" versus "unserved" areas, helping to reduce wasteful duplication.
- **Highlight further policy reforms** that would help spur additional broadband investment to speed universal deployment.
- **Strive for maximum transparency and accountability**, such as by requiring regular reporting by grant recipients of progress toward promised deployments.

BEST PRACTICES FOR DEPLOYING FEDERAL BROADBAND FUNDS

Decades of real-world experience from successful and unsuccessful broadband projects yield clear lessons that should now guide state and local funding decisions.

Best practices for effectively and efficiently bolstering broadband availability include:

- **Leverage accurate data to identify real needs.** Outdated or incomplete information can lead to wasting scarce resources on duplicative projects.
- **Partner with experienced providers.** Given the risks and costs, states and localities should avoid the temptation of building a municipal broadband network and instead focus on leveraging the expertise of established ISPs. Such public-private partnerships have a long track-record of success in bringing broadband to unserved areas.
- **Demand accountability.** Hold grantees, private partners, and public agencies accountable for delivering on their promises.
- **Continue to revisit, revise, and reform policies.** Even after networks are built, policies encouraging more private investment will ensure networks are maintained, upgraded, and expanded.

Best practices for accelerating broadband adoption include:

- **Understand the challenge.** A complex set of barriers keep many households offline. These include lack of awareness of discount programs, a belief that broadband is not relevant to one's life, digital literacy gaps, and the cost of service and/or a computing device. Tackling this challenge requires understanding these factors.
- **Encourage enrollment in the Affordable Connectivity Program (ACP).** The federal ACP gives eligible low-income households up to $30 a month to buy broadband service – enough to cover the full cost of service for most households.

- **Support, enable, and fund local community partners.** Community groups often have the reach and trust to engage with unconnected households more effectively than state or local government agencies. Look for opportunities to support and work through this local social infrastructure.
- **One size does not fit all.** The barriers keeping different communities offline are subtly different. Accordingly, interventions aimed at bringing the unconnected online should be tailored to address these specific needs. The most effective adoption strategies will recognize and reflect these hyperlocal dynamics.
- **Leverage the "bully pulpit."** Policymakers should help raise awareness of the benefits and opportunities unlocked by broadband and digital literacy skills.
- **Integrate digital literacy skills into school curricula and workforce development.** Developing skills in both students and adult learners will build a long-term workforce better prepared to capitalize on digital opportunities.

Section 1

Broadband 101

KEY TAKEAWAYS

- Broadband connectivity encompasses both supply-side and demand-side issues. Impactful policies and approaches address both sets of issues.
- Overall, broadband in the U.S. is thriving thanks to supportive policies that empower consumers with multiple choices for going online.

1.1.1 WHAT ARE THE COMPONENTS OF BROADBAND CONNECTIVITY?

Broadband connectivity encompasses critical issues on both the supply-side and the demand-side:

Supply-Side	Demand-Side
▪ Availability	▪ Awareness
▪ Competition	▪ Adoption
▪ Speed	▪ Affordability
▪ Pricing	▪ Barriers
▪ Consumption trends	▪ Digital literacy

1.1.2 WHAT IS THE RELATIONSHIP BETWEEN SUPPLY-SIDE AND DEMAND-SIDE ISSUES?

Supply and demand issues interrelate in many respects. For example, broadband adoption rates have climbed in tandem with a greater availability of broadband connections. Consumers' perceptions regarding whether broadband is relevant to them, which stems from, among other things, possessing digital literacy skills, impacts how much they are willing to pay for it. (The interplay of supply and demand issues is discussed at more length in **Section 6**.)

1.1.3 HOW DOES POLICY IMPACT BROADBAND CONNECTIVITY?

Impactful broadband policy, including the establishment of grant programs and related efforts, recognizes the close relationship between supply-side and demand-side issues and deploys funding and other support accordingly and based on data.

Broadband policy in the U.S. has long focused on empowering consumers to shape the marketplace via enhancing the number of choices available to them. To that end, U.S. policy supports intermodal competition among *all* broadband platforms (an overview of these platforms can be found in **Section 1.2**). Effective policy has not sought or attempted to pick "winners and losers" – *e.g.*, by prioritizing deployment of one type of broadband platform over others.

1.1.4 WHAT DOES DATA SAY ABOUT THE MERITS OF THIS APPROACH?

As detailed in this section, U.S. policy has succeeded in fostering an intensely competitive broadband marketplace. Consumers can choose from a range of on-ramps to the internet that are offered on terms and conditions and at price-points that meet almost every need.

As discussed in **Section 1.3**, the economics of broadband deployment supports investments in most areas where consumer demand for high-speed internet access is evident and where key factors (*e.g.,* population density) meet or exceed certain thresholds. In areas where deployment is deemed "uneconomic" due to, for example, low demand, geographic challenges, or sparse population, then subsidies are needed to facilitate network expansion. This is what federal funding being made available via the Infrastructure Investment & Jobs Act is seeking to do – steer funding to projects that will bring broadband to unserved areas.

Where broadband is already available, consumers are reaping an array of benefits.

- **Section 1.4** provides a high-level summary of broadband **availability** in the U.S. In the vast majority of areas, several options for high-speed internet access are available, and additional options (*e.g.*, 5G) are being expeditiously deployed.
- **Section 1.5** details the state of broadband **adoption** in the U.S. Are consumers subscribing to broadband when it is available? Adoption trends have been generally positive in recent years, with overall take-rates continuing to inch up. However, adoption continues to lag in certain demographic groups.
- **Section 1.6** summarizes recent data about broadband **pricing** trends. In general, consumers are paying much less for much more bandwidth, reflecting the robustly competitive and consumer-driven marketplace in the U.S.

Bottom Line: With a historic amount of funding being made available for broadband, it is critical for policymakers, ISPs, and other stakeholders to appreciate the policies and practices that have worked vis-à-vis bolstering broadband connectivity and those that have not. This Tool Kit is offered as a means of navigating the many questions and issues that are likely to arise as grant programs are developed, funds are allocated, and networks are built.

KEY TAKEAWAYS

- "Broadband" encompasses a variety of wired and wireless methods for delivering high-speed internet connectivity.
- For the last few decades, technological advances and multi-modal competition has resulted in a steady increase in the speed of internet connectivity available to consumers.

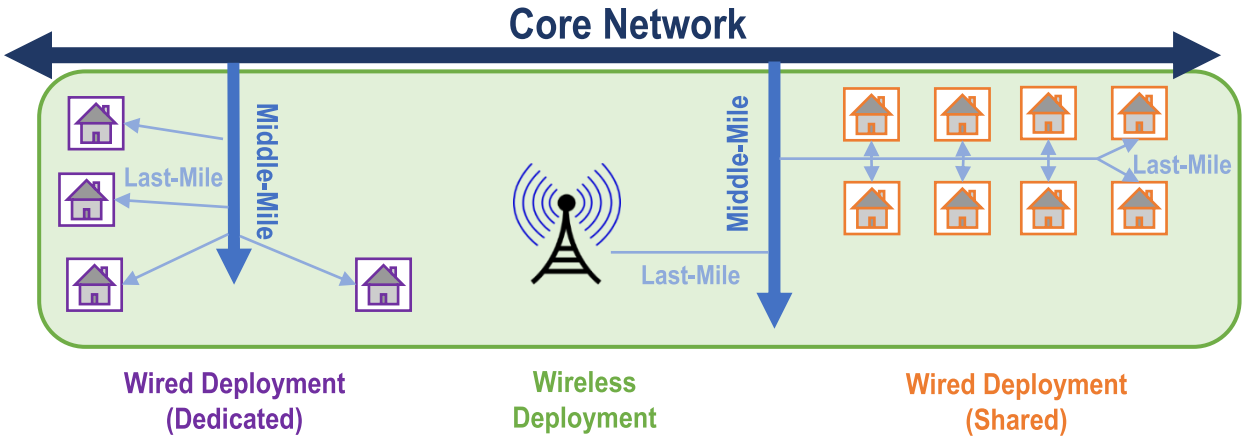
1.2.1 WHAT IS BROADBAND?

Broadband is a high-speed connection to the internet. Broadband is currently defined by the Federal Communications Commission (FCC) as any connection capable of delivering download speeds of at least 25 Megabits per second (Mbps) and upload speeds of at least 3 Mbps. Higher broadband speeds are sometimes measured in Gigabits per second (Gbps), which are equivalent to 1,000 Mbps.

1.2.2 HOW IS BROADBAND DELIVERED?

Broadband can be delivered in several different ways.

The following illustrates, at a high level, the three primary broadband deployment models being used in the U.S. As discussed more fully below, many areas in the U.S. have multiple choices for broadband service.



The **Wired Deployment** model involves an internet service provider (ISP) providing each customer with a wireline connection to their home. Depending on the provider, this wire can be either the existing copper wire of the telephone network, which is known as a **DSL** line, a **hybrid-fiber coaxial** cable, or a **fiber-optic** cable. Often, ISP networks utilize a mix of these technologies.

- Given its relationship to the telephone network, DSL was one of the original broadband technologies. It is provided via a dedicated line from a customer's house to the backbone network. DSL can theoretically deliver speeds of about 35/10 Mbps. Speeds can be increased if the ISP upgrades parts of its network with fiber.
- With a hybrid fiber-coaxial (HFC) architecture, data is transmitted over fiber until the last mile, when the data goes over coaxial cable to the end-user. Cable networks historically used the "shared" deployment model, which means ISPs run fiber to a node in a neighborhood and then

deliver portions of that bandwidth to customers over coaxial wiring. Broadband speeds continue to increase via HFC due to innovation in how data is compressed and transmitted over that coaxial wiring. The current iteration of the system used by cable ISPs to provide broadband service – DOCSIS 3.1 – can support speeds up to 10 gigabits per second.

- Fiber-optic cabling uses glass strands to transmit data at the speed of light. Fiber typically delivers broadband speeds symmetrically, meaning upload and download speeds are equal. Fiber ISPs use both the direct and shared deployment models.

In the **Wireless Deployment** model, households are connected to their ISP's network wirelessly. There are two types of wireless broadband: fixed wireless and mobile broadband. Both rely on antennae to beam internet connectivity to end-users.

- Fixed wireless customers typically affix an antenna on their house that has a clear line of sight between it and a tower that transmits data to and from the end-user. In many cases, fixed wireless reliably delivers broadband of at least 25/3 Mbps.
- Mobile broadband is the most popular on-ramp to the internet in the U.S. Current 4G networks support broadband speeds of 25/3 Mbps, while emerging 5G networks enable connections that are significantly faster, with top download speeds approaching 1 gigabit per second.

Both fixed and mobile wireless networks rely on wired backhaul to transmit data received wirelessly to and from the core internet. In most instances, this backhaul is comprised of fiber-optic cable.[1]

Almost every household in the U.S. can also subscribe to satellite service. Satellite broadband operates like satellite TV – subscribers affix an antenna on their house and receive signals directly from a satellite orbiting earth. A new approach to satellite broadband, utilizing low-earth orbiting satellites, can deliver broadband speeds well in excess of 25/3 Mbps.

1.2.3 WHAT IS THE MIDDLE-MILE?

The way a household actually receives broadband – via wired or wireless connectivity – is described as the "last mile" of service. The "middle-mile" is the intermediate portion of a network that connects the core network to the last mile. Middle-mile is used to describe everything from the fiber connections that link wireless towers to the core network, to the cabling connecting pole-to-pole within cities and neighborhoods. Middle-mile networks do not provide connectivity directly to end-users, and they always require a connection to a core/backbone network to reach the internet.

The "core" network in the illustration above represents the ultra-high-bandwidth fiber networks connecting the middle-mile to data centers and other key points in the internet architecture.

1.2.4 DO BROADBAND PLATFORMS COMPETE WITH ONE ANOTHER?

A distinguishing feature of the U.S. broadband market is its "intermodal" nature. Put simply, this means that policy has long supported private investment in the development of different platforms that compete with one another for customers (when available, government subsidies in support of broadband deployment have *always* been limited to unserved areas, underscoring another key aspect of U.S. broadband policy – not subsidizing wasteful overbuilding in markets that are already served). Today, most consumers in the U.S. can choose from multiple high-speed on-ramps to the internet. Indeed, most households are in neighborhoods where ISPs offering cable, DSL/fiber, fixed wireless, 4G/5G, and

satellite are all vying for market share. Such robust organic competition translates to lower prices and higher speeds. (For data regarding the wide availability of each broadband platform and the overall competitive nature of the U.S. broadband market, please see **Section 1.4**.)

NOTES

[1] *See, e.g.,* Marguerite Reardon, *Why Fiber is the Key to Getting 5G Everywhere,* July 22, 2022, CNET, https://www.cnet.com/tech/mobile/why-fiber-is-the-key-to-getting-faster-5g-everywhere.

KEY TAKEAWAYS

- Broadband networks are deployed by ISPs as an investment, with the expectation that systems will recoup initial costs and generate positive net income to sustain themselves over the long-term.
- The feasibility of a given network is a function of subscription revenues, infrastructure costs, and ongoing expenses.
- In areas that are unserved due to a lack of financially feasible deployment options, government funding can help make deployment economically viable.

1.3.1 WHAT FACTORS ARE ASSOCIATED WITH SUCCESSFUL BROADBAND NETWORKS?

Broadband networks are deployed by ISPs with the intent that a network will generate positive net income, allowing the provider to recoup its initial investment and generate sufficient revenue to sustain the project over the long-term. As such, ISPs tend to deploy networks in areas where they expect them to be self-sustaining.

The long-term feasibility of a broadband network depends on the right balance of three key revenue and expense factors:

- **Subscription Revenues.** The primary source of revenue for broadband networks is subscription payments from customers. To generate positive net income, a key indicator of the sustainability of a broadband network, revenues must exceed a network's total expenses. A network's **take-rate** – *i.e.*, the percent of eligible households and businesses that subscribe to the service – is thus a fundamental determinant of project success.

  A network will typically have a **breakeven take-rate**, or percent of potential customers that must subscribe for the network to cover its expenses. Any subscription in excess of that rate results in profitability; a network that falls below that threshold will incur losses.

  Take-rates are dynamic. They are impacted by a range of market forces, including competition from other providers, changing consumer preferences, technological innovation, and the effectiveness of marketing efforts. While other factors, like buildout costs and operating expenses, can be estimated with some reliability, the dynamic nature of take-rates makes them difficult to predict. They are therefore one of the biggest risk factors for broadband network investments.

  How broadband services are priced directly affects subscription revenues – if service is priced too high, it will discourage many potential subscribers; if it is priced too low, it will be difficult for the system to cover its costs. Determining the proper price-point is difficult and involves a complex set of considerations (see **Section 1.6** for additional discussion). For example, a network that is below its breakeven take-rate – *i.e.*, has fewer customers than expected – may not be able to rely on a simple price increase to boost revenues, as this could cause customers to switch to other services, further driving down revenues.

- **Infrastructure Costs.** ISP investments in building broadband infrastructure – formally known as capital expenditures, or CapEx – comprise the majority of upfront capital costs associated with deploying a new network. Capital expenditures are also made on an ongoing basis by ISPs to maintain and upgrade broadband networks. Often, these costs are financed with debt (as opposed to being paid in full upfront); paying down this financing is a recurring expense for providers.

  Cost overruns during construction, damage due to natural disasters, technological disruption, and other unpredictable phenomena can result in unexpected infrastructure costs that tighten profit margins or lead to losses.

- **Operating Expenses.** Broadband networks also involve an array of recurring operating and maintenance costs. These include staffing, marketing, customer service, programming fees, and any other costs associated with offering broadband service. These day-to-day costs are an ever-present item on a network's income statement.

  Operating costs grow in the long-run due to both inflation and real increases in the cost of providing service. Total operating expenses also grow as a network expands. Like infrastructure costs, operating expenses can increase due to unexpected events and trends, ranging from labor shortages to rising video programming fees (if an ISP offers a double-play of video and broadband), tightening a network's margins.

Overall, a network's subscription revenues must exceed the sum of infrastructure costs and operating expenses for it to have positive net income. A change in any of those three key factors can alter the network's ability to self-sustain, for better or worse. The fundamental risk of deploying a network is based on the difficulty of accurately predicting these factors in advance.

1.3.2 FINANCING A NETWORK

Entities deploying broadband networks can cover infrastructure costs using a combination of several financing methods, including:

- **Cash.** For entities with sufficient cash reserves and no need for leverage, upfront capital costs can simply be covered out-of-pocket.

- **Debt.** ISPs can utilize different forms of debt to cover deployment costs. Which type of debt (*e.g.*, bonds, bank loans, etc.) is used depends on a myriad of factors, including the ISP's corporate structure, credit rating, desired timeframes for repayment, and financing rates. Networks using debt financing will have debt servicing as a recurring line item that must be covered, along with other costs, for the network to generate positive net income.

- **Outside Funding.** Network deployments can also receive funding from outside sources in the form of grants or loans. This funding can help offset the cost of infrastructure deployment or provide financing that is more favorable than that available through the issuance of debt. Oftentimes, however, such funding only covers infrastructure costs and cannot be used to offset OpEx

1.3.3 WHY DO SOME AREAS STILL LACK BROADBAND SERVICE?

Since broadband deployments are an investment seeking to recoup upfront costs and generate positive net income, areas where such an investment is not feasible or involves excessive risk will not receive service. Often, the expected subscription revenues in these areas are not adequate to cover the sum of infrastructure costs and ongoing expenses. This can be due to low density of customer premises, challenging terrain, and inadequate demand, among many other factors.

Given the expensive nature of broadband deployment, government subsidies can help to alter the balance of revenues and expenses by significantly lowering or covering upfront deployment costs. This effectively reduces or eliminates ongoing debt service payments, meaning that a network needs less total revenue to generate positive net income. In other words, this outside funding can turn a network from an “uneconomic” investment into a feasible one and incentivize providers to build. Because of this, government subsidies are a simple, powerful tool to bring broadband to unserved areas.

KEY TAKEAWAYS

- Broadband availability in the United States is robust, with strong investment and competition having made broadband connections available to nearly every household in the nation.
- Challenges remain, especially in low-density and geographically challenging areas, providing an opportunity for targeted funding efforts to address that aspect of the digital divide.

1.4.1 WHAT DOES "BROADBAND AVAILABILITY" MEAN?

Broadband availability is the question of whether a given household, business, institution, or other entity has the ability, if it chooses, to subscribe to a high-speed connection to the internet. Currently, the FCC defines broadband as a connection that provides a download speed of at least 25 megabits per second (Mbps) and an upload speed of at least 3 Mbps, which is often abbreviated to 25/3 Mbps.

Availability should not be conflated with *adoption*, which refers to households that have chosen to subscribe to an available broadband connection. The current State of Play for broadband adoption is discussed in **Section 1.5.**

1.4.2 WHAT IS THE STATE OF BROADBAND AVAILABILITY TODAY?

According to the most recent data available, broadband availability in the United States is robust, with the vast majority of Americans having a wired or fixed wireless broadband connection meeting or exceeding the FCC's 25/3 Mbps threshold. It is important to note that the following figures are as of June 2021 and do not include the array of network expansions in 2021 and 2022, including of ultra-high-speed broadband service.

- **Overall.** Nationwide, 98% of the U.S. population has access to 1 or more fixed connections with speeds of 25/3 Mbps or higher.[1]
- **Speeds.** Higher speeds are broadly available, with connections of at least 100/10 Mbps available to 94% of Americans.[2] Gigabit speeds (around 1,000 Mbps) are rapidly increasing in prevalence, with 88% of American households able to subscribe to them.[3]
- **Competition.** Competition is also robust, with 87% of Americans having 2 or more broadband providers available, and 61% having 3 or more available.[4] These figures do not consider the rapidly expanding availability of both cellular and low-earth orbit satellite services that exceed the FCC's 25/3 Mbps threshold, further bolstering intermodal competition.

1.4.3 WHAT RECENT TRENDS IN BROADBAND AVAILABILITY ARE EVIDENT IN THE DATA?

The strong level of broadband availability in the United States is the result of decades of investment and competition between providers and technologies. The availability of broadband has been on a constant uptrend, with a broadband onramp to the internet now available to nearly every American. Some recent trends include:

- **Expansion of High-Speed Broadband.** The availability of connections exceeding the FCC's 25/3 Mbps threshold has increased rapidly. The share of households with access to a 100/10 Mbps connection has increased by 25.8 percentage points since 2016.[5]
- **Technological Innovation**. This steady increase in broadband speeds comes thanks to strong investments in technology by providers. Expansions of fiber service,[6] updated cable broadband protocols,[7] and fixed wireless infrastructure improvements[8] have all increased the throughput of our nation's broadband infrastructure. In addition, 4G connectivity is widely available, and 5G cellular broadband connections are rapidly expanding and offer speeds well in excess of 25/3 Mbps.[9]
- **Continued Gains in Upload Speeds.** The rapid shift to remote everything – work, school, healthcare, etc. – during the early days of the COVID-19 pandemic highlighted the importance of upload speeds, which measure the rate at which end-users can send information rather than receive it. Robust upload speeds are critical to enabling video-conferencing tools like Zoom, which played essential roles during and after the pandemic. Data collected in real-time during the pandemic indicate that, for the vast majority of Americans, their upload speeds were more than enough to support the services and applications they needed to stay connected.[10] In short, there remains little evidence that consumers want or need symmetrical broadband connections (*i.e.*, connections that provide the same upload and download speeds) to support increased data consumption stemming from the likely permanent shift to a hybrid remote/in-person lifestyle post-pandemic. To the contrary, data indicate that most consumers are satisfied with their current broadband service.[11]
- **Increased Broadband Competition.** The number of households with two or more fixed broadband connections available at speeds of 25/3 Mbps or higher has increased by 31.8 percentage points since 2016.[12] This figure does not include the rapidly expanding availability of 4G/5G mobile broadband and low-earth orbiting satellite services that exceed the FCC's 25/3 Mbps threshold.

1.4.4 IS MOBILE BROADBAND A VIABLE COMPETITOR WITH AND SUBSTITUTE FOR A WIRELINE BROADBAND CONNECTION?

Yes, mobile broadband has emerged as a viable head-on competitor with and substitute for wireline broadband. This is due to significant ongoing investment by wireless carriers in the spectrum, physical infrastructure, including fiber backhaul, and other aspects of building mobile broadband networks across the country.

From a speed standpoint, many 4G and most 5G connections offer bandwidth and reliability that is similar to that available on wireline networks. Download speeds on 4G networks average anywhere from 14 Mbps to just over 25 Mbps, while upload speeds average 8 Mbps.[13] 5G networks promise to at least triple, if not quadruple, those speeds. In addition, latency on mobile broadband networks – *i.e.,* the time it takes for a device to send and receive information – improves considerably on more modern networks. On 5G networks, average latency is on par with cable and fiber connections.[14]

T-Mobile's 5G Home Internet product offers an illustrative example. It delivers speeds of up to 100/23 Mbps, is priced at $50/month, and does not come with data caps, positioning it very favorably vis-à-vis wireline competitors.[15] In addition, its latency has outperformed wireline competitors in some instances.[16]

1.4.5 WHAT FACTORS IMPACT THE AVAILABILITY OF BROADBAND IN CERTAIN AREAS?

Despite this progress, challenges remain, especially in low-density areas, providing an opportunity for targeted funding efforts to bring service to the unserved. Some of these challenges include:

- **Rural Availability.** An availability gap persists in rural areas, where 90.7% of residents have a broadband connection available, compared to 99.3% availability in urban areas.[17] Largely due to significantly higher per-household buildout costs in these low-density areas, this gap has been specifically targeted in the IIJA and other funding programs. (For additional discussion, see **Section 1.3**.)
- **Availability in Tribal Lands**. 25/3 Mbps broadband is only available to 88% of the residents of Tribal areas, lagging the national average of 98%.[18] These areas have also been the target of specific funding efforts intended to bolster broadband availability.[19]

1.4.6 HOW DOES BROADBAND AVAILABILITY VARY AT THE STATE AND LOCAL LEVELS?

While the above figures speak to broadband availability on aggregate across the entire nation, there is notable variation when analyzing at the state and local levels. For example, while broadband is available to 97% of Americans, availability varies by over 13 percentage points between the highest- and lowest-availability states.[20] This variation is even more pronounced at the county level.[21] These variations underscore that no two areas are the same and that efforts to close availability gaps must holistically analyze their target market and its unique characteristics.

NOTES

[1] Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[2] *Id*.

[3] *See, e.g.,* NCTA, Industry Data, https://www.ncta.com/industry-data/88-of-us-homes-have-access-gigabit-internet-speeds.

[4] Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[5] Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2016, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[6] *See, e.g.,* Jeff Baumgartner, *AT&T's Fiber Expansion Could Reach 30 Million Locations,* Sept. 21, 2021, Light Reading, https://www.lightreading.com/opticalip/atandts-fiber-expansion-could-reach-beyond-30-million-locations/d/d-id/772225.

[7] For a brief discussion, *see* Jeff Baumgartner, *Cable Also Fitting Into the Fiber Frenzy*, March 21, 2022, LightReading, https://www.lightreading.com/cable-tech/cable-also-fitting-into-fiber-frenzy-/d/d-id/776192.

[8] *See, e.g.,* Crown Castle, Fixed Wireless, https://www.crowncastle.com/infrastructure-solutions/fixed-wireless.

[9] *See, e.g.,* Francesco Rizzato, *How the 5G experience has improved across 50 US states and 300 cities*, March 10, 2022, OpenSignal, https://www.opensignal.com/2022/03/10/how-the-5g-experience-has-improved-across-50-us-states-and-300-cities.

[10] *See, e.g.,* Phil Britt, *COVID-19 Drives Internet Speed Increase; Wide State-by-State Disparity,* Jan. 11, 2022, Telecompetitor, https://www.telecompetitor.com/covid-19-drives-internet-speed-increase-wide-state-by-state-disparity/; Roger Entner, *US Broadband Network Performance During COVID-19 and Beyond,* Recon Analytics (Nov. 2021), http://reconanalytics.com/wp-content/uploads/2021/11/ReconAnalytics-Networks-in-the-Pandemic.pdf.

[11] *See, e.g., Broadband Survey – A Nationally-Representative Multi-Mode Survey*, at p. 17, Consumer Reports (July 2021), https://advocacy.consumerreports.org/wp-content/uploads/2021/08/CR_Broadband-Survey_8_2021_VF.pdf.

[12] Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[13] *See, e.g.,* Babu Jackson and Sabine Neschke, *Difference Between 3G-4G-5G,* May 4, 2021, Bipartisan Policy Center, https://bipartisanpolicy.org/blog/cellular-data-and-digital-divide/ ("*Difference Between*"); Liane Cassavoy, *How Fast is 4G LTE Wireless Service?*, Feb. 11, 2021, Lifewire, https://www.lifewire.com/how-fast-is-4g-wireless-service-577566.

[14] *See, e.g.,* Stephen Shankland and Shara Tibken, *5G Latency: Why Speeding up Networks Matters,* July 1, 2021, CNET, https://www.cnet.com/tech/mobile/5g-latency-why-speeding-up-networks-matters-faq/.

[15] T-Mobile Home Internet, FAQ, https://www.t-mobile.com/isp/faq.

[16] *See, e.g.,* Eli Blumenthal, *I Tried Out Verizon's and T-Mobile's 5G Home Internet to See if I Could Truly Ditch Cable,* May 26, 2022, CNET, https://www.cnet.com/home/internet/i-tried-out-verizon-t-mobiles-5g-home-internet-to-see-if-i-could-truly-ditch-cable/.

[17] Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[18] Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[19] *See, e.g.,* NTIA, Tribal Broadband Connectivity Program, https://broadbandusa.ntia.doc.gov/resources/grant-programs/tribal-broadband-connectivity-program.

[20] Compares availability of 99.9% in Rhode Island and 86.3% in Mississippi. Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

[21] For example, compare 15% in Uptown County, TX, to over 99% in Hillsborough County, FL. Excludes connections classified by the FCC as "satellite" and "other." Data from Fixed Broadband Deployment as of June 2021, FCC, https://broadbandmap.fcc.gov/#/area-comparison.

KEY TAKEAWAYS

- Broadband adoption rates in the United States have shown strong, consistent growth over the past decade.
- The speeds of broadband subscriptions chosen by U.S. households have also steadily increased.
- Several factors are correlated with broadband adoption rates, including income, education level, and age.

1.5.1 WHAT IS "BROADBAND ADOPTION"?

Broadband adoption refers to whether a given household is currently subscribed to a high-speed internet connection. The FCC currently defines broadband as a connection that provides a download speed of at least 25 megabits per second (Mbps) and an upload speed of at least 3 Mbps, which is often abbreviated to 25/3 Mbps.

Adoption is a function of *availability – i.e.,* a broadband connection must be available for it to be adopted. A household that does not have a connection *available* cannot *adopt* it. The current State of Play for Broadband Availability is discussed in **Section 1.4**.

Numerous factors beyond availability influence broadband adoption and can motivate a household that has a connection available not to subscribe to it. An in-depth discussion of the factors influencing adoption, and approaches to bolster it, is provided in **Section 6**.

1.5.2 WHAT IS THE CURRENT STATE OF BROADBAND ADOPTION IN THE U.S.?

The most recent data on broadband adoption, summarized below, dates to 2019. While these figures show strong levels of broadband adoption, they do not include the progress made in the last three years to bring more Americans online, and do not capture any adoption effects due to the COVID-19 pandemic.

- **Overall.** As of June 2019, FCC data showed that 66% of households had a broadband subscription of 25/3 Mbps or above.[1] Household surveys by the Census Bureau provide a similar figure, with 71% of households reporting that they had an internet connection via "broadband such as cable, fiber optic or DSL."[2]
- **Speed.** Among those households subscribing to internet service, the FCC reports that, as of June 2019, median download speeds were 100 Mbps and median upstream speeds were 10 Mbps.[3] These findings are supported by recent reports from private speed testing firms; Ookla, for example, reports median wireline broadband speed of 152/21 Mbps as of May 2022.[4]
- **Technology.** Consumers are choosing to access the internet with broadband connections of all kinds. Cable broadband remains the most popular choice across all households, but fiber-optic connections are growing rapidly.[5] In addition, mobile broadband remains a popular choice of internet on-ramp among a sizeable – and growing – portion of the population. It is becoming particularly popular among younger uses. Indeed, smartphone-only internet connectivity has

risen most prominently among adults aged 18-29 in recent years.[6] These trends are likely to proliferate even more broadly as 5G becomes widely available.

1.5.3 WHAT BROADBAND ADOPTION TRENDS ARE EVIDENT IN THE DATA?

The data indicate several consistent, positive trends in broadband adoption over the last decade. Some of these trends include:

- **Strong Growth in Broadband Adoption.** Between 2009 and 2019, the total number of fixed internet connections grew from 78 million to 113 million, an annual growth rate of 4% per year.[7] Specifically, the percent of households with a fixed internet connection increased from 60% to 79%.[8]
- **Growing Preference for Higher Speeds**. The number of households with a downstream connection of at least 100 Mbps more than tripled between 2016 and 2019, from 18 million to 61 million.[9]
- **A Move Away from DSL.** Coupled with the preference for higher speeds has been a gradual decrease in the percent of broadband-adopting households that subscribe to DSL. That share has dropped from 29% in 2015 to 18% in 2019, reflecting growing availability of and demand for both fiber and hybrid-fiber broadband services.[10]

1.5.4 WHICH KEY DEMOGRAPHIC FACTORS CORRELATE WITH BROADBAND ADOPTION?

While the many factors influencing broadband adoption decisions are discussed in-depth in **Section 6**, three core correlations exist between demographic characteristics and broadband adoption.

- **Income**. According to both FCC[11] and ACS data,[12] broadband adoption rates are positively correlated with income. In other words, households with higher incomes are more likely to subscribe to broadband than those with lower incomes. This effect is quite pronounced at the extremes: the lowest 10% of U.S. counties by household income have an average adoption rate of 52%, while the highest 10% have an average adoption rate of 89%.[13]
- **Education**. A similar positive correlation is evident in both data sources between education levels and broadband adoption.[14] Households whose head-of-household has a bachelor's degree or greater have an adoption rate of 95%, compared to 83% for those without.[15] In addition, the lowest 10% of counties by college degree attainment subscribed at an average rate of 59%, while the top 10% subscribed at a rate of 89%.[16]
- **Age**. Broadband adoption rates appear to be negatively correlated with age. This means that households with older residents are less likely to subscribe to broadband than those with younger residents. Indeed, households where the head-of-household was 65 or older had an adoption rate of 76%, compared with 91% for those below 65.[17]

NOTES

[1] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[2] *S2801 – Types of Computers and Internet Subscriptions*, ACS 2019 1-Year Estimates, U.S. Census Bureau, https://data.census.gov/cedsci/table?tid=ACSST1Y2019.S2801.

[3] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[4] *United States' Mobile and Fixed Broadband Internet Speeds*, May 2022, Ookla, https://www.speedtest.net/global-index/united-states.

[5] *See, e.g.,* Diana Goovaerts, *FBA Report: 43% of U.S. Households Now Have Access to Fiber,* Jan. 5, 2022, Fierce Telecom, https://www.fiercetelecom.com/broadband/fba-report-43-us-households-now-have-access-fiber.

[6] *Internet/Broadband Fact Sheet,* April 7, 2021, Pew Research Center, https://www.pewresearch.org/internet/fact-sheet/internet-broadband/?menuItem=2ab2b0be-6364-4d3a-8db7-ae134dbc05cd.

[7] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[8] This figure includes all internet connections, including those below the FCC's 25/3 Mbps threshold, for a connection to be considered broadband. *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[9] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[10] *Id.*

[11] *Id.*

[12] *B28004 – Household Income in the Last 12 Months by Presence and Type of Internet Subscription,* ACS 2019 1-Year Estimates, U.S. Census Bureau, https://data.census.gov/cedsci/table?tid=ACSDT5Y2020.B28004.

[13] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[14] *Internet Access Services: Status as of June 30, 2019*, FCC; *B28004,* ACS 2019 1-Year Estimates, U.S. Census Bureau.

[15] *S2802 – Types of Internet Subscriptions by Selected Characteristics,* ACS 2019 1-Year Estimates, U.S. Census Bureau, https://data.census.gov/cedsci/table?tid=ACSST5Y2020.S2802.

[16] *Internet Access Services: Status as of June 30, 2019*, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[17] *S2802 – Types of Internet Subscriptions by Selected Characteristics,* ACS 2019 1-Year Estimates, U.S. Census Bureau, https://data.census.gov/cedsci/table?tid=ACSST5Y2020.S2802.

KEY TAKEAWAYS

- Across the U.S., broadband prices have steadily declined, providing increasing value to consumers.
- Looking strictly at subscription prices can paint an incomplete picture of value and affordability, as other factors like household income levels, inflation, and indirect costs are not considered.

1.6.1 WHAT IMPACT DOES THE PRICE OF BROADBAND HAVE ON ADOPTION?

The price of a broadband connection can be a key determinant in whether a household, business, or other entity decides to subscribe to it. Broadband prices are themselves a function of buildout and maintenance costs, competitive pressures, consumer demand, and other market forces. As such, the price of a connection provides an important barometer for the state of, and trends in, the broadband marketplace.

There are two main ways to consider the value offered to consumers from broadband connectivity:

- **Subscription Price.** Broadband subscription prices can be compared directly, typically using their monthly costs. When this is done across markets, providers, or timeframes, it is sometimes difficult to find directly comparable connections, as speeds and technologies on offer may not match up one-to-one.
- **Price per Unit of Speed.** Broadband subscriptions can be broken down into a price per unit of speed, typically as **dollars per megabit**.[1] For example, a connection that costs $70 per month and offers download speeds of 100 Mbps offers a value of $0.70 per megabit, while a similarly priced connection at 250 Mbps offers a better value of $0.28 per megabit. Analyzing prices this way allows for easier value comparisons across different speed tiers, providers, technologies, and timeframes.

1.6.2 DOES THE DATA INDICATE THAT CONSUMERS ARE BEING OFFERED MORE OR LESS VALUE NOW FOR BROADBAND THAN IN PREVIOUS YEARS?

Using both methods of analyzing price, broadband connections in the United States have been consistently providing increasing value to consumers.

- **Decreasing Price per Megabit.** Over the last 20 years, consumer price-per-megabit of internet service has plummeted from $28.13/megabit to $0.64/megabit.[2] This reflects a nearly 98% decrease in price per unit of speed. This decrease is the result of several downward pressures on price, such as technological innovations and robust intermodal competition.
- **Decreasing Subscription Costs.** Looking more closely at the last five years, prices across all popular speed levels have also decreased greatly, especially at higher tiers. Over that period, data indicate that average prices for a:
  - 25 – 99 Mbps connection decreased by $8.80 or 14%[3]
  - 100 – 199 Mbps connection decreased by $32.35 or 33%[4]

- 200 – 499 Mbps connection decreased by $34.39 or 35%[5]
- 500+ Mbps connection decreased by $59.22 or 42%[6]

- **Customers Moving to Higher Speeds.** Along with potentially reducing their broadband expenditures, decreasing price-per-megabit allows broadband customers to get a faster subscription at a similar price. This is reflected in the steady upward trend in overall average broadband speeds evident in the U.S. (see **Section 1.5.2** for additional discussion).

1.6.3 WHY IS EXAMINING SOLELY THE PRICE OF A BROADBAND SUBSCRIPTION NOT ADEQUATE WHEN SEEKING TO ANALYZE THE VALUE OFFERED?

Looking solely at the price of a broadband subscription ignores several factors that also influence the affordability of broadband:

- **Income Differences Across Markets.** Differences in income levels between different markets, and within a given market, mean that simple price comparisons may not fully capture the actual perceived value and affordability of broadband. As such, these types of comparisons often require more complex methods that attempt to adjust for these differences.
- **Inflation Over Time.** Evaluating changes in broadband prices over long timeframes without considering the effects of inflation results in an incomplete measure. Generally, ignoring inflation and comparing dollar-for-dollar means that an analysis will **underestimate** how much a price has decreased. For example, if the same broadband connection cost $100 in 2017 and 2022, the real (inflation-adjusted) price of that connection has actually decreased by 14%.[7]
- **Technological Differences.** Price comparisons across broadband technologies may not fully capture the differences in consumer experience. Factors like latency, reliability, and customer service experience can all influence the perceived value of a given option. In addition, consumers may be responsible for a number of other costs beyond subscription prices, such as equipment purchases and installation fees.

1.6.4 HOW CAN LOW-INCOME CONSUMERS OFFSET THE PRICE OF A BROADBAND SUBSCRIPTION?

There are several ways in which a low-income consumer can reduce their monthly broadband costs.

First, almost every major ISP offers a low-cost internet package for qualifying households. These include, among many others, AT&T's Access;[8] Charter's Spectrum Internet Assist;[9] Comcast's Internet Essentials;[10] Cox's Connect 2 Compete;[11] and Verizon's Fios Forward.[12]

Second, following the success of the FCC's Emergency Broadband Benefit program, established by the American Rescue Plan Act, the FCC recently launched the Affordable Connectivity Program (ACP), which provides a $30 monthly subsidy to eligible households for use on offsetting their broadband subscription.[13]

Third, the ACP also makes available device subsidies to ensure that households also have the equipment needed to harness a broadband connection. Via the ACP, "[e]ligible households can also receive a one-time discount of up to $100 to purchase a laptop, desktop computer, or tablet from participating providers if they contribute more than $10 and less than $50 toward the purchase price."[14]

These subsidies and programs are detailed in **Section 6.3**.

NOTES

[1] In a complete sense, the complete unit is *dollars per megabit-per-second, per month*.

[2] NCTA, Industry Data, https://www.ncta.com/industry-data/price-per-megabit-shrinks.

[3] Jason Shevik, *Broadband Pricing Changes: 2016 to 2022*, March 3, 2022, BroadbandNow, https://broadbandnow.com/internet/broadband-pricing-changes.

[4] *Id*.

[5] *Id*.

[6] *Id*.

[7] Adjusting for inflation, $100 in 2017 has the same purchasing power as $116 in 2022. For a simple CPI-U inflation calculator, *see CPI Inflation Calculator*, U.S. Bureau of Labor Statistics, https://www.bls.gov/data/inflation_calculator.htm.

[8] AT&T, Access, https://www.att.com/internet/access/.

[9] Charter, SIA, https://www.spectrum.com/internet/spectrum-internet-assist.

[10] Comcast, Internet Essentials, https://www.internetessentials.com/.

[11] Cox, Connect 2 Compete, https://www.cox.com/residential/internet/connect2compete.html.

[12] Verizon, Fios Forward, https://www.verizon.com/home/fios-forward.

[13] FCC, Affordable Connectivity Program, https://www.fcc.gov/acp.

[14] *Id.*

Section 2

Overview of Recent Federal Broadband Funding Programs

KEY TAKEAWAYS

- Recent stimulus and infrastructure spending bills, along with existing federal programs, are providing a historic amount of funding for broadband projects.
- This Section offers policymakers an overview of major federal broadband programs, including the magnitude of funding provided, program timelines, and which projects and entities are eligible to receive funds.

2.1.1 WHAT RESOURCES ARE AVAILABLE TO POLICYMAKERS INTERESTED IN BOLSTERING BROADBAND CONNECTIVITY?

Grant funding and other subsidies, as discussed in detail in **Section 1**, can play a key role in bringing broadband connectivity to the nation's remaining unserved areas. In these areas, where deployments are not economically viable due to density, geography, or demand issues, outside funding can bridge the gap and incentivize deployment of robust broadband infrastructure.

In areas where broadband is available but usage is lagging, funding can enable targeted adoption and digital literacy efforts. Government funding can also subsidize the cost of service for cost-sensitive households, further helping to expand broadband adoption.

For years, broadband funding resources have come primarily from federal programs like the FCC's Rural Digital Opportunity Fund (detailed in **Section 2.4**) and from state broadband programs. In the aftermath of the COVID-19 pandemic, a historic amount of funding has been made available to state and local governments via federal stimulus and infrastructure spending efforts. If leveraged properly, this funding is poised to address all or nearly all remaining supply- and demand-side broadband concerns.

2.1.2 OVERVIEW OF POLICYMAKER RESOURCES PROVIDED IN SECTION 2

This section provides state and local policymakers with a comprehensive overview of the broadband funding that has been made available via stimulus, infrastructure spending, and existing federal programs.

Section 2.2 unpacks the broadband funding included in the three major federal COVID-19 stimulus packages. The **CARES Act, Consolidated Appropriations Act of 2021**, and **American Rescue Plan Act** each included funding that is either targeted at or applicable to broadband. Combined, these Acts are channeling tens of billions of dollars in funding to broadband projects at the state and local level.

Section 2.3 unpacks the broadband funding programs included in the **Infrastructure Investment and Jobs Act**. Combined, the Act provides $65 billion in broadband funding, with $42.45 billion to be disbursed via state grant programs overseen by the National Telecommunications and Information Administration. Additional funds are available for use on digital equity programs and middle-mile infrastructure initiatives.

Section 2.4 provides an overview of two pre-existing federal broadband funding programs. The first, the **FCC's Rural Digital Opportunity Fund**, is providing $20.4 billion to expand broadband availability. The second, the **USDA's ReConnect** program, has provided over $1.5 billion to rural deployments since its inception. Additional federal broadband funding programs are also identified.

KEY TAKEAWAYS

- Significant funding has been made available to states and localities via several major federal COVID-19 stimulus packages. The three programs discussed here – CARES, CAA, and ARPA – included funding that was either applicable to, or directly intended for, broadband uses.
- The Coronavirus Aid, Relief, and Economic Security (CARES) Act allocated $450 million directly for broadband programs and resulted in at least $3.3 billion in additional funding being dedicated to broadband projects via state and local allocations.
- The Consolidated Appropriations Act (CAA) provided over $5 billion in funding directly to broadband-related programs.
- The American Rescue Plan Act (ARPA) will provide $10 billion directly to broadband projects via the Capital Projects Fund. Separately, ARPA included broadband projects as an eligible use of an additional $350 billion in funding for state and local governments.

2.2.1 HOW MUCH BROADBAND FUNDING WAS MADE AVAILABLE IN THE CORONAVIRUS AID, RELIEF, AND ECONOMIC SECURITY (CARES) ACT?

The Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law in March 2020 and was intended to provide "fast and direct economic assistance for American workers, families, small businesses, and industries."[1] The Act "implemented a variety of programs to address issues related to the onset of the COVID-19 pandemic"[2] and included both direct broadband-related allocations and funding that was potentially useable for broadband purposes.

- **Direct Allocations.** The CARES Act included $450 million in broadband allocations: $200 million for the FCC's COVID-19 Telehealth Program;[3] $100 million to the Rural Utilities Service Distance Learning, Telemedicine, and Broadband Program; $50 million to the Institute of Museum and Library Services for digital divide efforts;[4] and $100 million for the USDA's ReConnect program.[5]
- **Broadband-Applicable Funding.** The CARES Act's Coronavirus Relief Fund provided $150 billion in "direct, flexible funding to state, local and tribal governments."[6] Broadband, especially in the context of distance learning, was one of several eligible uses of these funds, and the majority of states allocated some portion of their CARES Act funding to broadband-related uses.[7]

Overall, at least $3.3 billion in CARES Act funding went towards distance learning, broadband infrastructure, and other broadband-related uses.[8]

2.2.2 HOW MUCH BROADBAND FUNDING WAS MADE AVAILABLE IN THE CONSOLIDATED APPROPRIATIONS ACT OF 2021 (CAA)?

The Consolidated Appropriations Act (CAA) was signed into law in December 2020. Along with new allocations, the Act "extend[ed] several provisions of the Coronavirus Aid, Relief, and Economic Security

(CARES) Act."[9] The Act included several broadband allocations, including: $3.2 billion to establish the Emergency Broadband Benefit program (which has since evolved into the Affordable Connectivity Program; see **Section 6** for additional discussion); $1.6 billion for grant programs to be administered by the NTIA; and an additional $250 million for the FCC's Telehealth Program.[10]

The NTIA grant programs included:

- **The Broadband Infrastructure Program**, which received $288 million via the CAA to encourage broadband deployment to unserved areas using a partnership-focused approach.[11] Over $277 million in grants were announced in February 2022; a final tranche of $10.5M in grants was announced in June 2022.[12]
- **The Tribal Connectivity Program**, which received $980 million via the CAA support "broadband deployment on tribal lands, as well as for telehealth, distance learning, broadband affordability, and digital inclusion."[13] As of July 2022, over $91 million in grant funding had been allocated.[14]
- **The Connecting Minority Communities Pilot Program,** which received $268 million via the CAA to support the "purchase of broadband internet access service and eligible equipment or to hire and train information technology personnel" by "to Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and Minority-Serving Institutions (MSIs)."[15] As of July 2022, $10.6 million in funding had been allocated via this program.[16]

2.2.3 HOW MUCH BROADBAND FUNDING WAS MADE AVAILABLE IN THE AMERICAN RESCUE PLAN ACT (ARPA)?

The American Rescue Plan Act (ARPA) was signed into law in March 2021 and "builds upon previously enacted aid measures" by providing "$1.9 trillion in mandatory funding, program changes and tax policies aimed at mitigating the continuing effects of the pandemic."[17] Broadband funding from ARPA stems from two parts of the law, which are discussed below.

2.2.3.1 Coronavirus State and Local Fiscal Recovery Funds (SLFRF)

The Coronavirus State and Local Fiscal Recovery Funds (SLFRF) program provides "$350 billion to state, local, and Tribal governments...to support their response to and recovery from the COVID-19 public health emergency."[18] Included in the applicable uses of SLFRF funds are investments in "broadband infrastructure...to expand affordable access to broadband internet."[19]

The Department of the Treasury, which is overseeing this program, released its Final Rule for the SLFRF in January 2022. The Final Rule "implements the ARPA statutory provisions on eligible and ineligible uses of SLFRF funds."[20] The Final Rule lays out requirements for how funding "may be used to make necessary investments in broadband infrastructure" via a broad set of eligible projects.[21] Treasury encourages funding recipients to "prioritize projects that are designed to serve locations without access to reliable wireline 100/20 Mbps broadband service"[22] but says that they "are broadly able to invest in projects designed to provide service to locations with an identified need for additional broadband investment."[23] Recipients are given "broad flexibility to define need in their community."[24] In cases where there are "existing and enforceable federal or state funding commitments for reliable service of at least 100/20 Mbps, recipients must ensure that SLFRF funds are designed to address an identified need for additional broadband investment that is not met by existing federal or state funding commitments."[25]

The first half of funding to local governments was provided beginning in May 2021, with the remaining funding to be delivered starting "approximately 12 months later."[26] States received either a full allocation or two equal allocations depending on their net increase in unemployment during the COVID-19 pandemic.[27]

As of September 2022, states had allocated over $10 billion in SLFRF funds to broadband, while several billions of dollars in additional allocations had been made by localities.[28]

2.2.3.2 Coronavirus Capital Projects Fund

The Coronavirus Capital Projects Fund "provides $10 billion for payments to eligible governments to carry out critical capital projects that directly enable work, education, and health monitoring, including remote options, in response to the public health emergency."[29] Specifically, the Capital Projects Fund allows "recipients to invest in capital assets that meet communities' critical needs in the short- and long-term, with a key emphasis on making funding available for broadband infrastructure."[30] Recipients include "states, the District of Columbia, and Puerto Rico; territories and freely associated states; and Tribal governments and the State of Hawaii."[31]

The program's "key priority...is to make funding available for reliable, affordable broadband infrastructure and other digital connectivity technology projects."[32] As such, it is expected that the large majority of the program's $10 billion in funding will go towards broadband infrastructure and other related projects.

Eligible projects must invest in "capital assets designed to directly enable work, education, and health monitoring," and must meet "a critical need of the community... that resulted from or was made apparent or exacerbated by the COVID-19 public health emergency."[33] The final date by which states must submit their grant plans was September 24, 2022.[34] As of September 2022, over $1.4 billion in Capital Projects funds had been distributed.[35]

NOTES

[1] *About the CARES Act and the Consolidated Appropriations Act*, U.S. Department of the Treasury, https://home.treasury.gov/policy-issues/coronavirus/about-the-cares-act.

[2] *Id.*

[3] *COVID-19 Telehealth Program*, FCC, https://www.fcc.gov/covid-19-telehealth-program-invoices-reimbursements.

[4] *CARES Act Addresses Broadband*, Local Government, April 1, 2020, NATOA, https://www.natoa.org/news/cares-act-addresses-broadband-local-government

[5] Joan Engebretson, *CARES Act Telecom Funding Includes $300M for FCC Telehealth, USDA ReConnect Program*, March 30, 2020, Telecompetitor, https://www.telecompetitor.com/cares-act-telecom-funding-includes-300m-for-fcc-telehealth-usda-reconnect-program/.

[6] How States Are Spending Their Stimulus Funds, NCSL, April 9, 2022, https://www.ncsl.org/research/fiscal-policy/how-states-are-spending-their-stimulus-funds.aspx.

[7] Austin Reid and Jocelyn Salguero, *States Use CARES Act Funds to Address Digital Divide*, NCSL, https://www.ncsl.org/ncsl-in-dc/publications-and-resources/states-use-cares-act-funds-to-address-digital-divide-magazine2020.aspx.

[8] Bailey McHale and Abigail Simmerman, *Why Didn't the CARES Act Solve the Digital Divide?*, March 15, 2021, SHLB, https://www.shlb.org/blog/2021/03/Why-didnt-the-CARES-Act-solve-the-digital-divide/.

[9] *Summary of the Consolidated Appropriations Act, 2021*, NCUA, https://www.ncua.gov/regulation-supervision/letters-credit-unions-other-guidance/summary-consolidated-appropriations-act-2021.

[10] Davis Wright Tremaine LLP, *Summary of Consolidated Appropriations Act's Broadband Network Deployment Provisions*, January 29, 2021, JDSurpa, https://www.jdsupra.com/legalnews/summary-of-consolidated-appropriations-8990404/.

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[12] *Department of Commerce's NTIA Awards $277M in Grants to Expand Broadband Infrastructure,* Feb. 25, 2022, NTIA, https://www.ntia.gov/press-release/2022/department-commerce-s-ntia-awards-277m-grants-expand-broadband-infrastructure; *Biden Administration Awards $10M to Expand High-Speed Internet Infrastructure in Michigan,* June 27, 2022, NTIA, https://www.ntia.doc.gov/press-release/2022/biden-administration-awards-10m-expand-high-speed-internet-infrastructure.

[13] NTIA, Tribal Broadband Connectivity Program, https://broadbandusa.ntia.doc.gov/resources/grant-programs/tribal-broadband-connectivity-program.

[14] *Id.*

[15] NTIA, Connecting Minority Communities Pilot Program, https://broadbandusa.ntia.doc.gov/resources/grant-programs/connecting-minority-communities-pilot-program.

[16] *Biden Administration Announces More Than $10 Million in Grants to Expand High-Speed Internet to Minority-Serving Colleges and Universities,* July 22, 2022, NTIA, https://www.ntia.doc.gov/press-release/2022/biden-administration-announces-more-10-million-grants-expand-high-speed-internet.

[17] NCSL, American Rescue Plan Act of 2021 – Overview, https://www.ncsl.org/ncsl-in-dc/publications-and-resources/american-rescue-plan-act-of-2021.aspx.

[18] *Coronavirus State and Local Fiscal Recovery Funds*, U.S. Department of the Treasury, https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-funds.

[19] *Id.*

[20] *Final Rule – Coronavirus State and Local Fiscal Recovery Funds*, January 2022, U.S. Department of the Treasury, https://www.govinfo.gov/content/pkg/FR-2022-01-27/pdf/2022-00292.pdf.

[21] *Coronavirus State & Local Fiscal Recovery Funds: Overview of the Final Rule*, January 2022, U.S. Department of the Treasury, https://home.treasury.gov/system/files/136/SLFRF-Final-Rule-Overview.pdf.

[22] *Id.*

[23] *Id.*

[24] *Id.*

[25] *Id.*

[26] *Id.*

[27] *Id.*

[28] ACLP estimates (research on file).

[29] *Capital Projects Fund*, U.S. Department of the Treasury, https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/capital-projects-fund.

[30] *Id.*

[31] *Id.*

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] U.S. Dept. of Treasury, Capital Projects Fund, https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/capital-projects-fund.

KEY TAKEAWAYS

- The Infrastructure Investment and Jobs Act (IIJA) provides $65 billion in broadband funding targeted at closing the digital divide, with over $48 billion being disbursed through several NTIA grant programs.
- The Broadband Equity, Access & Deployment (BEAD) Program provides $42.45 billion in funding to bolster broadband availability.
- Two Digital Equity programs provide $2.75 billion for broadband adoption and digital literacy initiatives.
- The Enabling Middle Mile Infrastructure Program provides $1 billion to expand and extend middle-mile infrastructure.

In November 2021, the Infrastructure Investment and Jobs Act (IIJA) was signed into law. The IIJA "includes a significant investment of $65 billion to help close the digital divide and ensure that all Americans have access to reliable, high speed, and affordable broadband."[1]

Some $48.2 billion of that funding will be administered by the National Telecommunications and Information Administration (NTIA) through a set of broadband grant programs detailed below. In addition to these programs, the IIJA "provides an additional $2 billion to the Tribal Broadband Connectivity Program, a NTIA program previously implemented under the Consolidated Appropriations Act, 2021"[2] (see **Section 2.2** for additional details).

2.3.1 HOW WILL THE BROADBAND EQUITY, ACCESS & DEPLOYMENT (BEAD) PROGRAM BE ADMINISTERED?

The largest single allocation of IIJA broadband funding – $42.45 billion – will be steered to states via the Broadband Equity, Access & Deployment (BEAD) Program. NTIA will oversee disbursement of funding to each of the 50 states, the District of Columbia, and the U.S. territories. They, in turn, will allocate grants to eligible partners in support of (1) the deployment of broadband networks to unserved and underserved areas and (2) adoption and digital literacy efforts.

Disbursement of BEAD funding depends on two trigger events:

- **NTIA Issues NOFO.** NTIA issued a Notice of Funding Opportunity (NOFA) on May 13, 2022.[3] In response to the Notice, each of the 50 states submitted letters of intent indicating their interest in participating in the BEAD program.[4] Thereafter, states can request up to $5 million for planning, which is deducted from their final award. A state that requests and receives the $5M must submit a 5-year action plan detailing how it will deploy the grant funding.
- **FCC Publishes BDC Maps.** The amount of BEAD funding awarded to a given state is based on the number of locations in a state that are unserved by broadband. This count of unserved locations will be sourced from maps being developed as part of the FCC's Broadband Data Collection (BDC) program. BDC will replace the Commission's previous mapping process with a "more detailed and precise"[5] system based on address-level data on broadband availability. The FCC has indicated that the new maps will be available by fall 2022[6] (the BDC program, and its predecessor, are detailed in **Section 4.3**).

The BEAD program prioritizes (1) unserved locations without 25/3 Mbps service, then (2) underserved locations without 100/20 Mbps service, and then (3) community anchor institutions without gigabit connections.[7] Entities receiving funding "must also prioritize persistent poverty / high-poverty areas, speed of proposed network, build time and demonstrated records on compliance with federal labor & employment laws."[8] ISPs that receive BEAD funding will "be required to offer a low-cost plan to all their subscribers."[9]

If a state has funds leftover after addressing each of these priority areas, then it may allocate those remaining BEAD funds for a variety of eligible non-deployment uses. These include:

- "User training with respect to cybersecurity, privacy, and other digital safety matters.
- "Remote learning or telehealth services/facilities.
- "Digital literacy/upskilling (from beginner-level to advanced).
- "Computer science, coding and cybersecurity education programs.
- "Implementation of [state] digital equity plans…
- "Broadband sign-up assistance and programs that provide technology support.
- "Multi-lingual outreach to support adoption and digital literacy.
- "Prisoner education to promote pre-release digital literacy, job skills, online job-acquisition skills, etc.
- "Digital navigators.
- "Direct subsidies for use toward broadband subscription, where the [state] shows the subsidies will improve affordability for the end user population (and to supplement, but not to duplicate or supplant, the subsidies provided by the Affordable Connectivity Program).
- "Costs associated with stakeholder engagement, including travel, capacity-building, or contract support."[10]

Estimated state-level allocations of BEAD funding are provided in Appendix 1 (these do not include high-cost areas). The estimates are based on the most recent data from the FCC. As noted above, final awards will be based on the FCC's more granular DATA maps, which are forthcoming in fall 2022. As such, the final awards may differ significantly from the estimates included in Appendix 1. Even so, these projections offer a reasonable estimate of the forthcoming distribution of BEAD funds among the states.

Resources to support BEAD-related planning, structure effective public-private partnerships, and otherwise support the grant-making process are provided in **Section 5**.

2.3.2 HOW WILL THE IIJA DIGITAL EQUITY PROGRAMS BE ADMINISTERED?

The IIJA includes two grant programs focused on bolstering digital equity across the country.[11] Combined, the two programs will make available a total of $2.75 billion in grants over the next five years to support a range of digital equity initiatives. Funding from the programs is meant to supplement, and not supplant, other federal and state funds for digital equity purposes. NTIA issued Notices of Funding Opportunity (NOFOs) for the Digital Equity programs in May 2022.

2.3.2.1 State Digital Equity Capacity Grant Program

The Capacity Grant Program is established to "promote the achievement of digital equity, support digital inclusion activities, and build capacity efforts by States relating to the adoption of broadband by residents of those States."[12]

IIJA requires states to choose an agency to administer the program; develop and implement a digital equity plan; and make grants to further digital equity efforts in the state.[13] The IIJA includes $60 million in funding to assist states in the development of their digital equity plans, which must be submitted by states seeking funds.[14] Digital Equity Capacity grants will begin flowing to the states no later than two years after NTIA begins awarding funding for digital equity plan development.[15]

Both the state-level administering entity and the entities receiving grant funding from that entity must comply with a series of statutory reporting requirements, many of which revolve around offering data to demonstrate progress toward achieving the digital equity goals detailed in the state's plan. Resources to support digital equity planning and related demand-side efforts are provided in **Section 6**.

The IIJA allocates a total of $1,500,000,000 to the Capacity Grant Program, with $240,000,000 awarded in fiscal year 2022, $300,000,000 "for each of fiscal years 2023 through 2026," and $60,000,000 to assist states in developing digital equity plans.[16] Initial NTIA estimates of how much each state might receive for planning purposes are included in **Appendix 2**, along with ACLP estimates of how much funding states might receive for digital equity activities.

2.3.2.2 Digital Equity Competitive Grant Program

The purpose of the Competitive Grant Program is to "award grants to support efforts to achieve digital equity, promote digital inclusion activities, and spur greater adoption of broadband" among key populations.[17] Accepted uses include digital inclusion and adoption efforts, digital literacy training programs, providing devices and software, funding public computing centers, and any other project deemed by NTIA to be consistent with the overarching purposes of the Program.

The total amount of funding available via the Competitive Grant Program is $1.25 billion over five years; $250 million will be available for the next five fiscal years.[18] The program will be launched by NTIA no later than 30 days after the Capacity Grant Program begins.

2.3.3 HOW WILL THE IIJA'S ENABLING MIDDLE MILE BROADBAND INFRASTRUCTURE PROGRAM BE ADMINISTERED?

The Enabling Middle Mile Broadband Infrastructure Program provides $1 billion "for the construction, improvement or acquisition of middle mile infrastructure."[19] The program is intended to "expand and extend middle mile infrastructure to reduce the cost of connecting unserved and underserved areas to the internet backbone."[20]

The Middle Mile program is open to a variety of eligible applicants, including states, ISPs, utilities, cooperatives, nonprofits, regional planning entities, and economic development authorities.[21] Details regarding the implementation of the Middle Mile program were provided by NTIA in a Notice of Funding Opportunity (NOFO) that was issued in May 2022.

APPENDIX 1

ESTIMATED BEAD ALLOCATIONS TO THE STATES[22]

State	Est. Allocation
Alabama	$1,104,869,954
Alaska	$198,084,807
Arizona	$1,190,846,652
Arkansas	$783,286,367
California	$2,744,903,451
Colorado	$869,040,371
Connecticut	$100,000,000
Delaware	$100,000,000
D.C.	$100,000,000
Florida	$1,547,981,540
Georgia	$1,109,713,140
Hawaii	$100,000,000
Idaho	$616,223,558
Illinois	$1,204,030,242
Indiana	$1,046,498,116
Iowa	$373,108,511
Kansas	$492,791,645
Kentucky	$571,180,675
Louisiana	$904,468,282
Maine	$100,000,000
Maryland	$387,686,944
Massachusetts	$259,294,690
Michigan	$1,318,877,433
Minnesota	$397,048,586
Mississippi	$1,264,508,042
Missouri	$1,335,972,888

State	Est. Allocation
Montana	$379,395,802
Nebraska	$316,059,724
Nevada	$305,901,627
New Hampshire	$100,000,000
New Jersey	$194,870,051
New Mexico	$568,262,453
New York	$292,716,307
North Carolina	$921,648,480
North Dakota	$100,000,000
Ohio	$888,825,868
Oklahoma	$1,119,298,918
Oregon	$579,806,077
Pennsylvania	$885,281,572
Puerto Rico	$665,721,268
Rhode Island	$100,000,000
South Carolina	$679,182,947
South Dakota	$110,011,763
Tennessee	$752,924,473
Texas	$4,127,790,732
Utah	$343,068,005
Vermont	$100,000,000
Virginia	$1,123,167,062
Washington	$845,893,094
West Virginia	$584,437,191
Wisconsin	$817,899,301
Wyoming	$220,321,391

APPENDIX 2

ESTIMATED DIGITAL LITERACY GRANTS TO THE STATES

State	Capacity Grant[23]	Planning Grant[24]	Total Funding
Alabama	$25,891,719	$981,081	$26,872,800
Alaska	$7,200,000	$567,885	$7,767,885
Arizona	$31,775,692	$1,116,111	$32,891,803
Arkansas	$16,371,092	$843,673	$17,214,765
California	$154,275,305	$4,001,525	$158,276,830
Colorado	$23,524,041	$897,119	$24,421,160
Connecticut	$12,508,828	$736,568	$13,245,396
Delaware	$7,200,000	$516,096	$7,716,096
District of Columbia	$7,200,000	$463,126	$7,663,126
Florida	$85,837,023	$2,407,224	$88,244,247
Georgia	$45,680,562	$1,429,213	$47,109,775
Hawaii	$7,200,000	$570,883	$7,770,883
Idaho	$9,455,548	$564,706	$10,020,254
Illinois	$51,650,724	$1,515,353	$53,166,077
Indiana	$30,075,225	$1,039,734	$31,114,959
Iowa	$13,597,817	$708,924	$14,306,741
Kansas	$13,056,987	$692,664	$13,749,651
Kentucky	$20,239,683	$874,236	$21,113,919
Louisiana	$23,220,708	$941,542	$24,162,250
Maine	$7,200,000	$542,222	$7,742,222
Maryland	$23,611,284	$966,659	$24,577,943
Massachusetts	$24,355,674	$1,003,764	$25,359,438
Michigan	$43,586,533	$1,332,441	$44,918,974
Minnesota	$21,660,455	$881,905	$22,542,360
Mississippi	$19,308,655	$875,586	$20,184,241
Missouri	$29,746,839	$1,007,144	$30,753,983
Montana	$7,200,000	$601,337	$7,801,337
Nebraska	$8,481,466	$598,746	$9,080,212
Nevada	$12,732,091	$754,459	$13,486,550
New Hampshire	$7,200,000	$525,034	$7,725,034
New Jersey	$32,118,388	$1,176,741	$33,295,129
New Mexico	$11,426,054	$740,535	$12,166,589
New York	$73,873,316	$2,180,035	$76,053,351
North Carolina	$44,142,919	$1,415,614	$45,558,533
North Dakota	$7,200,000	$516,393	$7,716,393
Ohio	$46,862,810	$1,470,551	$48,333,361
Oklahoma	$21,248,212	$882,088	$22,130,300
Oregon	$17,658,285	$782,193	$18,440,478
Pennsylvania	$50,677,369	$1,604,132	$52,281,501

State	Capacity Grant[23]	Planning Grant[24]	Total Funding
Rhode Island	$7,200,000	$781,987	$7,981,987
South Carolina	$23,312,479	$506,100	$23,818,579
South Dakota	$7,200,000	$953,478	$8,153,478
Tennessee	$30,102,586	$527,052	$30,629,638
Texas	$128,189,775	$1,092,244	$129,282,019
Utah	$11,802,826	$3,110,148	$14,912,974
Vermont	$7,200,000	$676,685	$7,876,685
Virginia	$36,904,086	$518,154	$37,422,240
Washington	$30,255,407	$1,222,392	$31,477,799
West Virginia	$10,008,536	$1,076,249	$11,084,785
Wisconsin	$25,205,870	$728,066	$25,933,936
Wyoming	$7,200,000	$952,198	$8,152,198
Puerto Rico	$19,167,131	$530,006	$19,697,137

NOTES

[1] NTIA, Grants – Infrastructure Investment and Jobs Act Overview, https://www.ntia.doc.gov/category/grants.

[2] *Id.*

[3] NTIA, Notice of Funding Opportunity, May 13, 2022, https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf ("*BEAD NOFO*").

[4] NTIA, Internet For All – Has Your State Signed On?, https://www.internetforall.gov/has-your-state-signed-on.

[5] *Broadband Data Collection*, FCC, https://www.fcc.gov/BroadbandData.

[6] *FCC Chair: Broadband Maps Will Be 'Absolutely' Done in Fall*, April, 1, 2022, GovTech, https://www.govtech.com/network/fcc-chair-broadband-maps-will-be-absolutely-done-in-fall.

[7] *NTIA IIJA Broadband Programs*, January 2022, NTIA, https://broadbandusa.ntia.doc.gov/sites/default/files/2022-02/State_Local%20IIJA%202-Pager_Final%2001.27.2022.pdf.

[8] *Id.*

[9] *Id.*

[10] *BEAD NOFO* at p. 39-40.

[11] Infrastructure Investment & Jobs Act, Pub. Law No. 117-58, https://www.congress.gov/bill/117th-congress/house-bill/3684/text ("*IIJA*").

[12] IIJA § 60304(a)(1)(A).

[13] *Id.* at § 60304(b)(1) *et seq*.

[14] *Id.* at § 60304(k)(1).

[15] *Id.* at § 60304(d)(2) *et seq*.

[16] *Id.* at § 60304(k)(1).

[17] *Id.* at § 60305(a)(1).

[18] *Id.* at § 60305(l).

[19] *Enabling Middle Mile Broadband Infrastructure Program*, NTIA BroadbandUSA, https://broadbandusa.ntia.doc.gov/resources/grant-programs/enabling-middle-mile-broadband-infrastructure-program.

[20] *Id.*

[21] *Id.*

[22] For several important qualifications and the complete methodology used to arrive at these estimates, *see An Overview of the Infrastructure Investment & Jobs Act's Broadband Equity, Access & Deployment (BEAD) Program*, ACLP at New York Law School (December 2021), https://www.nylscomms.com/ACLP/ACLP-Overview-of-BEAD-Program-December-2021.pdf.

[23] For several important qualifications and the complete methodology used to arrive at these estimates, *see An Overview of the Infrastructure Investment & Jobs Act's Digital Equity Programs*, ACLP at New York Law School (Feb. 2022), https://digitalcommons.nyls.edu/cgi/viewcontent.cgi?article=1003&context=reports_resources.

[24] NTIA, Notice of Funding Opportunity, May 13, 2022, https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/DE%20PLANNING%20GRANT%20NOFO.pdf ("*Digital Equity NOFO*").

KEY TAKEAWAYS

- Recent stimulus- and infrastructure-related broadband funding supplement a range of additional broadband funding programs administered by several federal agencies.
- The FCC's in-progress Rural Digital Opportunity Fund will provide up to $20.4 billion to expand broadband availability.
- The USDA's ReConnect program has provided over $1.5 billion in broadband funding to unserved rural and tribal areas.

Alongside broadband funding made available in recent COVID-related stimulus and infrastructure funding legislation, several existing federal broadband programs provide significant funding to infrastructure and adoption efforts. Several of these, including major programs overseen by the FCC and the U.S. Department of Agriculture, are profiled below.

Additional federal broadband funding programs are listed in **Appendix 1**.

In addition to the programs mentioned here, there are numerous housing, education, transportation, and economic development programs that provide funding that is potentially applicable to broadband projects.[1]

2.4.1 HOW MUCH BROADBAND FUNDING IS AVAILABLE VIA THE FCC'S RURAL DIGITAL OPPORTUNITY FUND (RDOF)?

The Rural Digital Opportunity Fund (RDOF) is a $20.4 billion program "to bring high speed fixed broadband service to rural homes and small businesses that lack it."[2] Established by the Federal Communications Commission (FCC) in 2019 as one part of its Universal Service Fund, the program is currently ongoing. RDOF provides funding to broadband providers via two phases of reverse auctions.

The first RDOF auction phase ended in November 2020 and awarded $9.2 billion in "support to bring broadband to over five million homes and businesses in [areas] that were entirely unserved by voice and broadband with download speeds of at least 25 Mbps."[3] Disbursement of RDOF funding, and the buildout of broadband infrastructure, is currently ongoing.

The second RDOF phase will also involve a reverse auction and will "cover locations...that are partially served, as well as locations not funded in Phase I."[4] Phase II will allocate the remaining $11.2 billion in RDOF funding, and currently awaits the release of the FCC's new, granular Broadband Data Collection maps, which are detailed in **Section 4.3**.[5]

RDOF-funded broadband projects are "nearly all...expected to receive access to broadband speeds of at least 100 megabits per second downstream and 20 megabits per second upstream, and more than 85 percent are in areas where the winning bidder has committed to provide gigabit-speed service."[6] While funding will be disbursed over a 10-year period, service providers "must complete deployment by the end of the eighth year to all locations in areas eligible for support and must meet interim deployment milestones along the way."[7]

2.4.2 HOW MUCH BROADBAND FUNDING IS AVAILABLE VIA THE USDA'S RECONNECT PROGRAM AND OTHER INITIATIVES?

The U.S. Department of Agriculture's ReConnect Program "offers loans, grants, and loan-grant combinations to facilitate broadband deployment in areas of rural America that currently do not have sufficient access to broadband."[8] Since its introduction in 2018, the ReConnect program has provided over $1.5 billion in funding via grant and loan awards.[9]

The program allows private entities, cooperatives, and state/local governments to apply for funding, which can be used deploy broadband infrastructure and/or fund "the acquisition of an existing system that does not currently provide sufficient access to broadband."[10] Depending on the size and type of funded project, ReConnect funding takes the form of either 100% grant funding, 50/50% grant-loan funding, or 100% loan funding.[11]

Along with the ReConnect program, the USDA offers several other recurring grant and loan programs via its Rural Utilities Service (RUS).[12] These include the Community Connect Program, which has provided $160 million in funding for rural broadband deployment since 2013,[13] a distance-learning and telemedicine grant program,[14] and two loan/loan guarantee programs for rural deployment.[15]

These and other federal broadband funding programs are listed in **Appendix 1**.

APPENDIX 1

BROADBAND-SPECIFIC FEDERAL FUNDING PROGRAMS

Agency	Program	Description	Funding Frequency	Most Recent Funding Amount
Department of Agriculture - Rural Utilities Service	Community Connect Grant Program	Grants to "construct, improve, or expand broadband networks in rural areas."	Recurring	$35,000,000
Department of Agriculture - Rural Utilities Service	Distance Learning Telemedicine (DLT) Grant Program	Broadband grants to entities "that provide education or health care through telecommunications."	Recurring	$62,510,000
Department of Agriculture - Rural Utilities Service	Rural Broadband Access Loan and Loan Guarantee Program (Broadband Program)	Loans and loan guarantees to cover "the costs of construction, improvement, or acquisition of facilities and equipment needed to provide" broadband in rural areas.	Recurring	$11,200,000
Department of Agriculture - Rural Utilities Service	Rural eConnectivity Pilot Program (ReConnect)	Large program provides loans and grants "for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas."	Recurring	$1,150,000,000
Department of Agriculture - Rural Utilities Service	Telecom Infrastructure Loan Program	Loans "for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas."	Recurring	$690,000,000
Department of Housing & Urban Development - Office of Public and Indian Housing	Neighborhood Networks	Grants "to Public Housing Authorities (PHAs) to establish, expand and/or update community technology centers."	Recurring	$73,000,000
Federal Communications Commission (FCC)	Rural Digital Opportunity Fund (RDOF)	Large 10-year rural broadband grant program.	One-Time	$9,200,000,000

Agency	Program	Description	Funding Frequency	Most Recent Funding Amount
National Science Foundation	Smart and Connected Communities	Grants for research and deployment of "smart and connected community" technologies.	Recurring	$43,000,000
U.S. Department of Commerce - National Telecommunications and Information Administration (NTIA)	Broadband Infrastructure Program	Grants for "covered partnerships for covered broadband projects."	One-Time	$288,000,000
U.S. Department of Commerce - National Telecommunications and Information Administration (NTIA)	Tribal Broadband Connectivity Program	Grants "directed to tribal governments...for broadband deployment on tribal lands, as well as for telehealth, distance learning, broadband affordability, and digital inclusion.	One-Time	$980,000,000

NOTES

[1] For a listing of the myriad federal programs that provide funding potentially or directly applicable to broadband, *see Federal Funding*, NTIA, https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding.

[2] *Auction 904: Rural Digital Opportunity Fund*, FCC, https://www.fcc.gov/auction/904.

[3] *Id*.

[4] *Id*.

[5] *Rural Digital Opportunity Fund*, USAC, https://www.usac.org/high-cost/funds/rural-digital-opportunity-fund/.

[6] *Id*.

[7] *Id*.

[8] *ReConnect Program Overview*, USDA, https://www.usda.gov/reconnect/program-overview.

[9] *ReConnect Loan and Grant Program,* USDA, https://www.usda.gov/reconnect.

[10] *Id.*

[11] *ReConnect Program Overview*.

[12] *Telecom Programs*, USDA Rural Development, https://www.rd.usda.gov/programs-services/telecommunications-programs.

[13] *Community Connect Program*, USDA Rural Development, https://www.rd.usda.gov/community-connect.

[14] *Distance Learning & Telemedicine Grants*, USDA Rural Development, https://www.rd.usda.gov/programs-services/telecommunications-programs/distance-learning-telemedicine-grants.

[15] *See Rural Broadband Loans, Loan/Grant Combinations, and Loan Guarantees* and *Telecommunications Infrastructure Loans & Loan Guarantees*, USDA Rural Development, https://www.rd.usda.gov/programs-services/telecommunications-programs/rural-broadband-loans-loangrant-combinations-and-loan-guarantees and https://www.rd.usda.gov/programs-services/telecommunications-programs/telecommunications-infrastructure-loans-loan-guarantees.

Section 3

Overview of Effective State Broadband Programs

KEY TAKEAWAYS

- To date, state broadband program offices have played invaluable roles in facilitating broadband deployment to unserved areas across the country. With significant new federal funding being made available to states to expand these efforts, state broadband programs are poised to play an even more prominent roles in closing the country's digital divide.
- This Section offers policymakers insights into the current structure and reach of state broadband programs and best practices for ensuring that these entities are effective and efficient in allocating federal resources in support of continued broadband expansion.

3.1.1 OVERVIEW OF POLICYMAKER RESOURCES PROVIDED IN SECTION 3

This section examines the roles that state broadband programs have played and will continue to play in helping to bridge digital divides across the country.

Section 3.2 details the many functions that state broadband programs, offices, task forces, and related initiatives have played to date in supporting and facilitating infrastructure expansion into unserved areas. This section also highlights the more prominent role that these entities are poised to play in allocating federal resources via the NTIA's forthcoming BEAD program.

Section 3.3 articulates a range of best practices for use by policymakers and other stakeholders in maximizing the positive impacts of their states' respective broadband programs vis-à-vis allocating grants to address real, fact-based broadband challenges.

KEY TAKEAWAYS

- To date, state broadband programs/offices have played many key roles in helping to spur greater broadband availability and adoption across the country.
- These programs, which have been established in almost every state, are poised to play more prominent roles going forward as they serve as the primary vehicle through which federal broadband funding will be allocated.

3.2.1 WHAT ROLES HAVE STATE BROADBAND OFFICES AND PROGRAMS PLAYED IN ENHANCING BROADBAND CONNECTIVITY TO DATE?

Over the last decade, nearly every state in the country has established a broadband office, program, task force, or related initiative to address connectivity issues (an overview of these efforts is provided below in **Section 3.2.2**). Although each effort may be unique in its structure and mission, collectively, these initiatives share a common mission of seeking bolster broadband availability and adoption. As an overview, these roles have included:

- **Coordinator of Policy**. Broadband offices have emerged as drivers of broadband policy in many states. Although such offices typically lack formal policymaking authority, they do have significant ability to highlight where legislative, regulatory, and policy reforms might be needed to facilitate additional broadband deployment. This stems from the leading role that many offices play in focusing the resources and attention of policymakers, ISPs, and other stakeholders on broadband issues and areas of greatest need in the state.
- **Convenor of Stakeholders**. Importantly, broadband offices often serve as a convenor of myriad stakeholders – ISPs, state and local officials, business groups, nonprofits, etc. – engaged or interested in bolstering broadband connectivity. Often, interactions by stakeholders with divergent interests can be ad hoc in nature, leading to an adversarial dynamic in some instances. State broadband offices, however, can help to create more regular interactions between these stakeholders and help to focus conversations on productive and mutually beneficial issues.
- **Aggregator of Broadband Access Information.** A natural outgrowth of regular interactions with key stakeholders is the identification of resources that might be helpful in spurring broadband deployment. These resources might include the development of best practices for addressing discrete connectivity issues; a database of state-owned resources (*e.g.*, rights-of-way along transportation corridors) that might be leveraged by ISPs when extending networks; and lists of potential partners that might be engaged in a broadband project. Such resources can prove invaluable when engaged in broadband planning at any level.
- **Allocator of Grants**. By the end of 2021, some 44 states had established grant programs to support the expansion of broadband.[1] Many of these were administered by the state's broadband office. Leveraging broadband offices for these purposes makes sense given their statewide purview, knowledge of the issues impacting supply-side and demand-side issues, and relationships with key stakeholders. In terms of impact, state grant programs have been found to have an overall positive impact on broadband availability.[2]

- **Collector of Data**. In some cases, broadband offices have been tasked with collecting and analyzing data to assist in identifying areas where additional investment is needed to bolster broadband connectivity. Oftentimes, these data form the basis for interactive maps that are used when reviewing grant applications and allocating funding.
- **Promoter of the Benefits of Broadband**. State broadband programs can play important roles in educating the public about the benefits of broadband connectivity. Through events, webinars, online resources, and related efforts, broadband offices help to highlight how broadband can transform lives by enabling key services like telemedicine, spurring economic development, and empowering users.

3.2.2 WHICH STATES HAVE ESTABLISHED BROADBAND OFFICES/PROGRAMS?

By April 2022, every state in the U.S. had established a broadband office, program, task force, or related body charged with bolstering connectivity.[3] Many of these are standalone programs situated in the executive branch of state government. Others have been created as new offices or divisions in existing executive agencies (*e.g.,* as part of a state economic development office). Still others had been convened under the auspices of a branch of government (*e.g.,* a governor's broadband task force or legislative special committee) to produce a discrete output (*e.g.,* strategic plan).

Appendix 1, below, catalogs each state's broadband program/office/task force.

3.2.3 WHAT ROLES WILL STATE BROADBAND OFFICES AND PROGRAMS PLAY IN ALLOCATING FORTHCOMING FEDERAL FUNDING?

State broadband programs are poised to play an even more prominent role in bolstering broadband connectivity given the historic amount of funding that Congress has made available for broadband. As discussed in **Section 2**, tens of billions of dollars will make their way to the states over the next few years to support broadband expansion in unserved areas and to enhance demand-side activities aimed at increasing broadband adoption rates. This is in addition to billions of dollars from CARES and ARPA that have already been allocated by states for broadband purposes; in some instances (*e.g.,* Louisiana), state broadband programs have overseen these efforts.

State broadband programs will play key roles in overseeing and doling out funding made available via the Infrastructure Investment & Jobs Act (IIJA). For example, the Broadband Equity, Access, and Deployment Program (BEAD), which will be administered by NTIA, will steer some $42.45 billion to states for facilitating broadband expansion in unserved and underserved areas. NTIA, echoing the IIJA, has positioned state broadband programs as primary vehicles through which the funding will be given out to partners (*e.g.,* ISPs) as grants in support of broadband projects.[4] Not every state, however, will leverage a broadband program for the BEAD program – Nebraska, for example, has tasked its Public Service Commission as the administrator of its forthcoming BEAD grant program.

Similarly, the IIJA's State Digital Equity Capacity Grant Program, which will make available $1.5 billion to states for demand-side broadband projects, also positions state broadband programs as likely overseers of these efforts in many instances (governors can ultimately choose which entity they wish to lead these efforts on a state's behalf).[5] Regardless of whether these entities play a formal role in allocating digital equity funding, state broadband offices will still be consulted by NTIA as part of its efforts to monitor and evaluate how those funds are being used to increase broadband adoption and digital literacy.[6]

APPENDIX 1

LISTING OF STATE BROADBAND PROGRAMS/OFFICES

State	Broadband Office
Alaska	Governor's Broadband Task Force
Alabama	ADECA Digital Expansion Division
Arkansas	Arkansas Department of Commerce Broadband Office
Arizona	Arizona Commerce Authority
California	California Broadband Council
Colorado	Colorado Broadband Office
Connecticut	Connecticut Office of State Broadband
Delaware	Delaware Broadband Initiative
Florida	Florida Office of Broadband
Georgia	Georgia Broadband Program
Hawaii	Hawaii Broadband & Digital Equity Office
Iowa	Iowa Office of the Chief Information Officer
Idaho	Idaho Governor's Broadband Task Force
Illinois	Illinois Office of Broadband
Indiana	Indiana Broadband Strategic Partnership
Kansas	Kansas Office of Broadband Development
Kentucky	Kentucky Communications Network Authority
Louisiana	ConnectLA
Maryland	Maryland Office of Statewide Broadband
Massachusetts	Massachusetts Broadband Institute
Maine	ConnectMaine Authority
Michigan	Michigan High-Speed Internet Office
Minnesota	Minnesota Office of Broadband Development
Missouri	Missouri Office of Broadband Development
Mississippi	Mississippi Broadband Commission
Montana	Montana Broadband Task Force
North Carolina	North Carolina Division of Broadband and Digital Equity
North Dakota	Broadband ND

State	Broadband Office
Nebraska	Nebraska Broadband
New Hampshire	New Hampshire Office of Strategic Initiatives
New Jersey	New Jersey Office of Information Technology
New Mexico	Office of Broadband Access and Expansion
Nevada	Nevada Governor's Office of Science, Innovation & Technology
New York	NYS Broadband Program Office
Ohio	BroadbandOhio
Oklahoma	Oklahoma Rural Broadband Expansion Council
Oregon	Oregon Broadband Office
Pennsylvania	Pennsylvania Broadband Development Authority
Rhode Island	ConnectRI
South Carolina	South Carolina State Broadband Office
South Dakota	ConnectSD
Tennessee	Tennessee Department of Economic and Community Development
Texas	Texas Comptroller's Broadband Development Office
Utah	Utah Governor's Office of Economic Opportunity
Virginia	Virginia Department of Housing and Community Development
Vermont	Vermont Community Broadband Authority
Washington	Washington State Broadband Office
Wisconsin	Wisconsin Broadband Office
West Virginia	West Virginia State Broadband Office
Wyoming	Wyoming State Broadband Program

NOTES

[1] Kathryn de Wit and Anna Read, *How State Grants Support Broadband Deployment,* Dec. 23, 2021, Pew Charitable Trusts, https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2021/12/how-state-grants-support-broadband-deployment.

[2] *See, e.g.,* Brian Whitacre and Roberto Gallardo, *State Broadband Policy: Impacts on Availability*, Telecommunications Policy 44 (2020), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7444981/pdf/main.pdf.

[3] ACLP analysis (on file). *See also* Anna Read and Lily Gong, *Which States Have Dedicated Broadband Offices, Task Forces, Agencies, or Funds?*, Nov. 30, 2021, Pew Charitable Trusts, https://www.pewtrusts.org/en/research-and-analysis/articles/2021/06/28/which-states-have-dedicated-broadband-offices-task-forces-agencies-or-funds.

[4] *See, e.g.,* IIJA § 60102 (e)(1)(B)(ii)(I)(aa)*; BEAD NOFO.*

[5] *See, e.g.,* IIJA § 60304 (b).

[6] *See* IIJA § 60306 (c)(13).

KEY TAKEAWAYS

- With state broadband programs poised to play leading roles in the allocation of significant federal grant funding for broadband, it is critical that these entities strive to be effective and efficient in how they allocate these resources.
- This Section offers policymakers and other stakeholders a broad range of best practices for use in maximizing the impact of state broadband grant programs.

3.3.1 WHAT ARE SOME BEST PRACTICES THAT MIGHT ENHANCE THE ABILITY OF STATE BROADBAND PROGRAMS TO EFFECTIVELY AND EFFICIENTLY ALLOCATE BROADBAND GRANT FUNDING?

State broadband programs will play prominent roles in the allocation of billions of dollars in federal funding aimed at bolstering broadband connectivity from both the supply-side and demand-side (see **Section 3.2** for additional discussion). The following best practices are offered to state and local officials for use in maximizing the impact of their state's broadband program vis-à-vis allocating funds to address real broadband challenges. In addition, NTIA has created an Office Creation Checklist which provides high-level guidance for operationalizing a state broadband office.[1]

3.3.1.1 Focus on Unserved Areas

Most of the funding being channeled to states by NTIA is earmarked for broadband infrastructure expansion. The IIJA makes clear that these funds must first address unserved areas, which are defined as those lacking 25/3 Mbps service.[2] State broadband programs should be laser-focused on addressing the broadband needs of these areas.

That certain areas remain unserved is unfortunate but unsurprising given the enormous costs involved in building networks in them. These costs render certain areas "uneconomic" to serve in the absence of substantial public subsidies (see **Section 1.3** for additional discussion of the economics of broadband deployment). Characteristics of these areas include very low population density, being remote (*i.e.,* far from existing middle- and last-mile broadband infrastructure), and challenging geographic conditions (*e.g.,* dense forest; mountains; etc.). Each factor contributes significantly to the costs of building a broadband network.[3]

To date, most state broadband grant programs have prioritized funding for unserved areas, so continuing forward with this focus should be uncontroversial. Indeed, many states have consciously avoided the allocation of grant funds to areas where broadband is already available. This reflects a broad consensus that it is generally unwise to use public funding to support projects that will result in the deployment of duplicative broadband network infrastructure.[4] Such is known as "overbuilding" and should be avoided because it steers funds away from unserved areas; artificially skews market forces by subsidizing competition; and rarely yields sustainable networks because new entrants in served markets, even those that enter with an advantage like public funding, tend to struggle to build market share.[5] As such, there is no reasonable case to be made for using public dollars to subsidize overbuilding.

To avoid overbuilding, policymakers can (1) leverage accurate maps to pinpoint where broadband is and is not available (as discussed above, such maps are forthcoming from the FCC); (2) coordinate across grant/subsidy programs to ensure that a currently unserved area has not already received

funding for future deployment (NTIA's BEAD NOFO wisely requires states to consider such areas served for the purposes of allocating grant funding in unserved areas);[6] and (3) deploy a robust challenge process that invites relevant stakeholders, including incumbent ISPs, to offer additional data and insight regarding the availability of broadband in a given area (see **Section 3.3.1.5** for additional discussion of challenge processes).

3.3.1.2 Encourage Participation in Planning Processes by Local Entities

The IIJA requires NTIA to "establish local coordination requirements for [states] to follow, to the greatest extent practicable," during the planning and grant-giving process.[7] In its NOFO, NTIA articulated an extensive set of local coordination requirements, framing them as "critical to…eliminating barriers to broadband access and adoption, and to rapidly and economically building out new broadband networks."[8] NTIA requires states to "document its local coordination and outreach efforts" throughout the entirety of the BEAD process – *i.e.,* from development of the 5-year plan, to the state's Initial and Final proposals for their BEAD allocation.[9]

State broadband offices should be proactive in engaging political subdivisions – and all other relevant stakeholders – during the planning and application development stages. In practice, however, coordinating the input of dozens, if not hundreds, of localities might prove daunting. To that end, state broadband offices should consider processes that streamline interactions with localities while also ensuring that all input is heard and, as appropriate, reflected in a state's plans and proposals. Potential ways of accomplishing this include:

- Creating an orderly comment process that provides localities and other stakeholders with an opportunity to offer feedback on every aspect of a draft plan or application;
- Splitting states into regions and creating holistic processes by which input from individual cities and towns is collected by a regional group, which then reconciles the comments and offers a single package of input to the state broadband program; and
- Empowering certain organizations – *e.g.*, an association of cities or counties or regional planning groups – with the ability to serve as a single voice for their members on certain issues.

Input from localities can help to inform and shape a state's broadband plan for BEAD funding. However, states retain full authority to establish a single vision for broadband. To the extent a state receives conflicting input from localities or recommendations that contradict a state's preferred approach to enhancing broadband connectivity, that state should feel secure in moving forward with a particular plan so long as localities have had a meaningful opportunity to weigh in.

3.3.1.3 Assure a Technology Neutral Approach

Bringing broadband to the country's remaining unserved areas will require an all-of-the-above approach. Policymakers should thus approach this challenge with a technology neutral mindset, which recognizes that broadband challenges – and their potential solutions – vary greatly from state to state, region to region, city to city, and even neighborhood to neighborhood. Technology neutrality reflects the country's longstanding embrace of intermodal competition – *i.e.,* the ability of broadband to be delivered over multiple platforms.

Some argue that all new broadband networks should be fiber. Indeed, the BEAD NOFO includes several provisions that give greater weight to grant applications built around fiber deployments than other similarly robust technologies.[10] Such an approach is not technologically neutral because it artificially

narrows the solutions available to broadband challenges. It also disregards substantial evidence regarding the ability of different broadband platforms to serve as a more efficient solution in certain instances. Fixed wireless, for example, has played and will continue to play a key role in plugging availability gaps and enhancing competitive choice in states across the country.[11] 5G mobile broadband is quickly emerging as a competitor of wireline networks. Emerging satellite services could very well deliver service on par with wireline networks in the not-too-distant future.[12] And cable, the most popular wireline service in the country, continues to increase download and upload speeds to reflect actual customer demand and usage patterns. (See **Sections 1.2 and 1.4** for additional discussion.)

Ultimately, policy – and programs that implement and further policy – should be supportive of *all* platforms capable of delivering broadband speeds. Most consumers do not care about how they access the internet so long as the service they subscribe to meets their needs.

3.3.1.4 Implement a Competitive Grant Application Review Process Guided by Objective Evaluation Criteria

To receive BEAD funds, states must develop "plan[s] to competitively award subgrants to ensure the timely deployment of broadband."[13] Those plans, which must be submitted to and approved by NTIA, must include details regarding how a state will evaluate proposals received from prospective grantees.[14] States have "discretion" in determining which "competitive process" that is used to vet grantees and allocate grant funding.[15]

The notion of "competitively" indicates an intent by Congress to ensure that all applicants are assessed on equal terms and given the same opportunity to secure funding. That said, NTIA requires states to prioritize grant applications that encompass the deployment of "end-to-end fiber."[16] NTIA details how much weight states must give to other aspects of an application if it must choose between competing fiber-based deployment proposals.[17] Similar criteria must be used by states when evaluating competing proposals that do not include a fiber-based option.[18] This is where states can develop clear standards for their ideal grantees.

Deploying objective evaluation criteria can assure a level playing field among applicants. These criteria should prize experience and expertise in building broadband networks with public funding. Participation in previous programs involving public funds – *e.g.,* state grant programs, the FCC's RDOF, NTIA's BTOP program – should be considered and given appropriate weight when evaluating an applicant's track record in the broadband space. Using objective evaluation criteria can help to reduce opportunities for waste, fraud, and abuse, outcomes that are all too frequent in large-scale government programs.[19]

These criteria will be especially useful in the context of BEAD because Congress has indicated an intention to encourage a broad range of firms and entities to apply for grant funding. For example, per the IIJA, states "may not exclude cooperatives, nonprofit organizations, public-private partnerships, private companies, public or private utilities, public utility districts, or local governments from eligibility for [BEAD] grant funds."[20] In addition, the availability of an historic amount of funding is inviting a range of new entities to explore the provision of broadband services for the first time or to offer their services (*e.g.,* consulting, mapping, etc.) in support of an applicant's efforts. As such, it will benefit states to develop and apply robust objective criteria when evaluating what will likely be a significant number of grant applications so that they can easily identify those entities that have little or no experience in the broadband space and therefore represent a risk vis-à-vis efficiently and effectively investing public funds in broadband. This not only protects against unnecessary waste, fraud, and abuse – it also furthers the requirement in the IIJA that states "ensure that any prospective subgrantee…is capable of carrying out activities funded by the subgrant" and "has the financial and managerial capacity" to do so.[21]

3.3.1.5 Resist Imposing Unnecessary or Burdensome Requirements on Grantees

Echoing text in the IIJA, NTIA has set forth a range of "obligations" that grant recipients must meet as a condition of receiving funds. These include, among other provisions, "prudent cybersecurity and supply chain risk management practices," the incorporation of "best practices…for ensuring reliability and resilience of broadband infrastructure," and a variety of labor and workforce development requirements.[22] Subgrantees will also be required to offer a low-cost broadband service option available to low- and middle-income households, the parameters of which will be set by states and approved by NTIA.[23]

States should minimize the imposition of additional obligations on grant recipients in order to encourage as many ISPs as possible to apply for funds. For example, some have called for states to use the BEAD grant process as a means of requiring subgrantees to adhere to net neutrality principles.[24] Others have called for creating programs that will support *only* fiber networks or open-access broadband systems.[25] Approaching the design of a grant program in this manner – *i.e.,* prioritizing the achievement of certain policy goals over the need to fund the most viable and realistic approach to serving an unserved area – risks artificially limiting the pool of grant applicants at a time when a state should be doing everything it can to attract expert firms.

3.3.1.6 Deploy a Robust, Data-Driven, and Inclusive Challenge Process

Before allocating grant funding, states will be required to deploy a "transparent, evidence-based, and expeditious challenge process" that allows an entity to "challenge a determination made by [the state]…as to whether a particular location" is unserved and therefore eligible for grant funds.[26] These challenges will stem in large part from the use of forthcoming FCC DATA maps, which will, in theory, identify unserved locations at the most granular level possible (*i.e.,* the address level) (for additional discussion, please see **Section 4.3**). However, these data and any other data leveraged by the state in its identification of unserved areas need to be verified. Hence the need for a robust challenge process.

Why are robust, data-driven, and inclusive challenge processes important? At bottom, challenge processes help to ensure that grant funding goes to truly unserved areas. A variety of factors make it difficult for any one source to correctly identify every unserved area in the country. For example, data from ISPs regarding their service territory might be inaccurate; areas that are technically served might only have access to unreliable broadband connections;[27] or an area that is currently unserved might be "subject to an enforceable federal, state, or local commitment [*e.g.,* a state grant; RDOF funding; an ARPA-funded project; etc.] to deploy qualifying broadband," which would render it served for the purposes of allocating BEAD funding.[28] Challenge processes that leverage localized knowledge of broadband deployment – *i.e.,* local officials and ISPs – can help to ensure that public funds are expended in a fiscally prudent manner and not used to enable unnecessary and inefficient overbuilding.

To date, a number of states have created challenge processes as part of their own grant programs. Many of these have sought to reconcile the array of publicly funded broadband projects that are in various stages of deployment. These have included projects funded by state grant programs, the FCC's RDOF program, various NTIA grant programs, loan programs administrated by the U.S. Department of Commerce (USDA), the USDA's ReConnect program, and broadband projects funded in part by CARES and/or ARPA. A common theme across many of these challenge processes is a desire to ensure that new dollars are not spent in areas where other public funds have already been committed.

Existing state challenge process might therefore offer a template that other states might adapt and build upon. Ohio's challenge process includes many of these criteria: it clearly identifies the entities that are

eligible to offer challenges; sets forth the manner in which challenges are to be made; establishes a baseline of evidence needed to make a successful challenge; details a timeline to guide when and how the broadband program must resolve the challenge; provides an opportunity for the applicant to revise and resubmit a challenged application; and holds accountable the challenging entity if it fails to provide service in an area where it said it would in its challenge.[29]

As part of the BEAD grant process, NTIA has provided the states with some latitude for developing their own challenge processes, but NTIA must ultimately approve the proposed process before it can be deployed.[30] States must allow localities, relevant nonprofits, and ISPs the opportunity to participate in the challenge process. Otherwise, states have flexibility in designing their challenge processes. Since the goal of these processes is to enhance the accuracy of existing maps so that grant funds are steered towards unserved areas, a straightforward system for challenges is likely most efficient. The Ohio challenge process summarized above could therefore serve as a model that other states might use as a starting point.

3.3.1.7 Draw Attention to the Need for Policy Reforms Aimed at Spurring Additional Broadband Investment and Deployment

As discussed in **Section 3.2**, state broadband programs have numerous opportunities to collaborate with stakeholders to identify legislative and regulatory reforms that can unlock additional broadband investment. Grant funding by itself will not solve every broadband challenge in the U.S. Continued investment in infrastructure by ISPs is critical to assuring that near-term gains in broadband availability facilitated by grant funding are sustainable over the long term. To these ends, state broadband programs can highlight the myriad areas where additional reforms are needed to encourage further investment (*e.g.,* reforms to pole attachment and ROW siting rules). A listing of areas in need of reform and further discussion regarding the importance of undertaking these reforms is included in **Section 5.6**.

3.3.1.8 Strive for Maximum Transparency and Meaningful Accountability Mechanisms

Those doling out grants (*i.e.,* state broadband programs) and those receiving grants should be held to strictly account for the funding they grant and that they receive.

As a first step, states should strive to be as transparent as possible during every stage of the grant process. Applications should be posted online; public meetings with stakeholders should be live-streamed and archived online; interactive maps of broadband availability and adoption should be posted online; etc. NTIA requires states participating in the BEAD program to engage in many of these activities and requires states to make their plans and applications available for public comment.[31] States should strive to exceed NTIA's baseline requirements for transparency throughout every phase of the BEAD program. At the same time, states must respect the confidential and proprietary nature of certain data and include procedures for exempting categories of sensitive information from transparency rules.

Policymaker accountability should revolve around the use of data to guide where investments are made to ensure that funds go to where they are needed most. A robust challenge process, as discussed above, will help to ensure that states are as precise as possible in identifying truly unserved areas.

Both the IIJA and BEAD NOFO include a range of transparency and accountability provisions; these provisions will greatly influence how states operationalize these measures in their grant programs.[32] At a minimum, grant recipient accountability should include regular reporting of progress towards promised deployments – *e.g.,* how much money has been spent, how many new customers have been served to date, when the project might be completed, etc. States like Michigan and Ohio, among others, have implemented such reporting requirements as part of their state grant programs. Several other states

have deployed additional accountability measures, offering potential models that can be used elsewhere. In North Carolina, for example, a state official will visit a broadband project site at least once to monitor its progress.[33]

3.3.2 HOW CAN STATE AND LOCAL POLICYMAKERS ENSURE THAT BROADBAND PROGRAMS CONTINUE TO DELIVER IMPACTFUL RESULTS?

When implemented, the preceding best practices can help to ensure that a state broadband program is well positioned to allocate grant funding and otherwise assist in facilitating broadband deployment in the most effective, efficient, and fiscally prudent manner possible. Over time, though, these programs should evolve as the broadband challenges facing a state evolve. To that end, an overarching best practice is for states to continually revisit and revamp, as needed, their broadband program/office to ensure that it remains a relevant and useful vehicle for affecting change. For example, state programs should evolve from grant givers to monitors of broadband projects to assure adequate accountability. Thereafter, state broadband programs might continue to monitor grant-funded projects to determine their ability to self-sustain over the long-term. In addition, state broadband programs might continue to serve as a central hub for collecting and publishing data regarding availability and adoption of broadband.

NOTES

[1] *Office Creation Checklist*, NTIA, https://broadbandusa.ntia.doc.gov/sites/default/files/2022-08/Office-Creation-Checklist-for-states.pdf.
[2] IIJA § 60102(h)(1)(i)(I).
[3] For a general overview of these dynamics, *see The Broadband Availability Gap,* OBI Technical Paper No. 1, FCC (April 2010), https://transition.fcc.gov/national-broadband-plan/broadband-availability-gap-paper.pdf.
[4] *See, e.g., National Strategy Needed to Guide Federal Efforts to Reduce the Digital Divide,* at p. 15-19, GAO (May 2022), https://www.gao.gov/assets/gao-22-104611.pdf ("*National Strategy Needed*").
[5] *See, e.g.,* Geoffrey Manne et al., *A Dynamic Analysis of Broadband Competition: What Concentration Numbers Fail to Capture,* ICLE White Paper (July 2021) https://laweconcenter.org/wp-content/uploads/2021/06/A-Dynamic-Analysis-of-Broadband-Competition.pdf.
[6] *BEAD NOFO* at p. 36-37.
[7] IIJA § 60102(e)(4()(A)(ii)(I).
[8] *BEAD NOFO* at p. 52.
[9] *BEAD NOFO* at p. 52.
[10] *See, e.g., BEAD NOFO* at p. 42-43.
[11] *See, e.g.,* Joan Engebretson, *RDOF Will Put Gigabit Fixed Wireless to the Test,* Dec. 18, 2020, Telecompetitor, https://www.telecompetitor.com/rdof-will-put-gigabit-fixed-wireless-to-the-test/.
[12] *See, e.g.,* Michael Kan, *Starlink: Here are the Download Speeds You Can Expect Across North America,* May 5, 2021, PCMag, https://www.pcmag.com/news/starlink-here-are-the-download-speeds-you-can-expect-across-north-america.
[13] IIJA § 60102(e)(3)(A)(i)(IV).
[14] *BEAD NOFO* at p. 35-46.
[15] *BEAD NOFO* at p. 37.
[16] *BEAD NOFO* at p. 42.
[17] *BEAD NOFO* at p. 43-44.
[18] *BEAD NOFO* at p. 44-46.
[19] Numerous allegations of waste, fraud, and abuse were made, and many were substantiated, during the previous large-scale federal broadband grant program in 2009, BTOP, which was also administered by NTIA. *See, e.g.,* Edward Wyatt, *Waste is Seen in Program to Give Internet Access to Rural U.S.,* Feb. 11, 2012, N.Y. Times, https://www.nytimes.com/2013/02/12/technology/waste-is-seen-in-program-to-give-internet-access-to-rural-us.html. More recently, several COVID-related stimulus programs have been the source of considerable fraudulent activity. *See, e.g.,* Tony Romm, *'Immense Fraud' Creates Immense Task For Washington as it Tries to Tighten Scrutiny of $6 trillion in Emergency Coronavirus Spending,* Feb. 17, 2022, Wash. Post, https://www.washingtonpost.com/us-policy/2022/02/17/stimulus-aid-oversight-fraud/.
[20] IIJA § 60102(h)(1)(A)(iii).
[21] IIJA § 60102(g)(2)(A)(i)-(ii).
[22] IIJA § 60102(g)(1)(A)-(C). *See also BEAD NOFO* at p. 56-66.
[23] IIJA § 60102(h)(5); *BEAD NOFO* at p. 66.
[24] *See, e.g., Comments of Broadband Connects America,* at p. 7, NTIA Docket No. 220105-0002 (Feb. 4, 2022), https://nextcenturycities.org/wp-content/uploads/2021/05/BCA-IIJA-Implementation-COMMENTS.pdf.
[25] *See, e.g.,* Chao Liu, *How the NTIA Can Fund Future-Proof Open Access Fiber*, March 10, 2022, EFF, https://www.eff.org/deeplinks/2022/03/how-ntia-can-fund-future-proof-open-access-fiber.
[26] IIJA § 60102(h)(2).
[27] *See, e.g., BEAD NOFO* at p. 15, fn. 13 (noting that areas served only by DSL connections could be considered unserved if those connections are deemed unreliable).
[28] *BEAD NOFO* at p. 36.
[29] ORC §§ 122.4030-4037.
[30] *BEAD NOFO* at p. 34-35.
[31] *See, e.g., BEAD NOFO* at p. 55.
[32] IIJA § 60102(i)(1)-(2).
[33] *See Memo: Monitoring Deployment Project Period "Construction Period,"* March 1, 2022, N.C. Department of I.T., https://www.ncbroadband.gov/media/322/download?attachment.

Section 4

Evaluating Broadband Conditions in Your City/State

KEY TAKEAWAYS

- The most impactful broadband projects tend to be those that result from a holistic planning process. Comprehensive, data-driven examinations of broadband connectivity yield key insights into real areas of need.
- Section 4 offers state and local policymakers a range of tools and resources for use when engaging in such assessments.

4.1.1 WHAT DOES A HOLISTIC ASSESSMENT OF BROADBAND MARKETS ENCOMPASS?

Holistic broadband assessments are comprehensive, data-driven explorations of broadband connectivity from both the supply-side and demand-side. Such assessments can range from large-scale examinations (*e.g.,* of a state's broadband market), to small-scale investigations (*e.g.,* connectivity in a particular neighborhood), and everything in-between.

The notion of "holistic" is essential to these inquiries because it connotes an inclusive process that seeks data and input from all relevant stakeholders. As discussed throughout this Tool Kit, planning processes that fail to bring *all* stakeholders together for solution-focused dialogues targeting real broadband connectivity challenges are incomplete and therefore unlikely to solve issues in an effective, efficient, or timely manner.

4.1.2 WHAT ROLE(S) SHOULD HOLISTIC ASSESSMENTS PLAY IN BROADBAND PLANNING?

Being able to deploy a range of data-gathering tools and techniques in support of such assessments is particularly pertinent given the array of often vague parameters and rules impacting how states and localities pursue broadband projects generally and in the specific context of federal funding programs. Indeed, many funding programs offer only general guidance regarding the kinds of planning activities that cities and states will have to engage in to generate the outputs (*e.g.,* applications, maps, broadband plans, etc.) needed to secure funding and otherwise move forward with a broadband project. The following provides a high-level overview of the imprecise guidance often offered to cities and states in this context.

- **State and Local Fiscal Recovery Funds** (ARPA). Use of SLFRF funds for broadband requires that states and localities leverage data to highlight an "identified need" for a project targeting an unserved or underserved area (an overview of these funds is provided in **Section 2**).[1] Guidance provided by the Department of Treasury regarding the kinds of data that can be used for this purpose is broad and offers little guidance to states and localities regarding how to perform these critical inquiries.[2]
- **Broadband Equity, Availability & Deployment Program** (IIJA). The BEAD program, which is being administered by NTIA, requires states to prioritize the allocation of available funding to unserved and underserved areas within their borders.[3] To receive funds, states, localities, and other stakeholders will have to collaborate in the development of plans that, among other things, outline how BEAD funds will be used to expand broadband networks into these areas. The BEAD NOFO includes extensive guidance detailing the universe of **potential** activities states

might engage in when developing their plans and applications. States have flexibility in determining the best approach for them vis-à-vis meeting the NOFO's local coordination requirements. In the absence of clear guidance, some states might be unable to develop a sufficiently robust engagement plan, which could put their BEAD allocation at risk of being held up or denied.

- **Relevant State and Local Laws.** Many states maintain laws and regulations that guide major infrastructure undertakings – *e.g.*, public bidding processes, required engineering designs, public hearings, etc. The same is true in the broadband space. Some states require non-expert entities exploring a broadband network (*e.g.*, municipalities and electric cooperatives) to follow a series of steps, including developing formal business plans, convening public hearings, etc., before moving forward.[4] NTIA requires states with these kinds of laws to waive them in the context of the BEAD program so that a broader range of entities can apply for and potentially win grant funding.[5] NTIA does not offer guidance regarding how a state might waive duly enacted laws (waiving or rolling back these laws entirely likely requires a legislative act). In addition, the BEAD NOFO implies that refusal to waive these laws will not result in a state losing its BEAD allocation. Instead, NTIA requires states to document the extent to which non-waiver of these impacted the grant applications of non-traditional providers like municipalities and electric cooperatives.[6] NTIA does not offer guidance to states that refuse or are unable to waive these rules regarding how they can satisfy these requirements.

Given this relative dearth of guidance, state and local policymakers should develop a standardized planning process that can be deployed in any of the above-mentioned circumstances. Using the tools and best practices offered in this Section will be useful in developing those processes and ensuring that they yield robust data and insights regarding where funding and intervention by expert entities is needed most.

4.1.3 OVERVIEW OF POLICYMAKER RESOURCES PROVIDED IN SECTION 4

Section 4.2 offers a range of **best practices** that might inform how state and local policymakers develop and deploy holistic assessments of broadband markets.

Section 4.3 describes the **mapping tools** that are available or will be available soon to assist in assessing broadband availability and precisely identifying where real broadband challenges exist.

Section 4.4 identifies a range of objective and easy-to-use **broadband adoption data** sources that might supplement and augment information collected by states and localities during their holistic assessments.

Section 4.5 details the **pros and cons of "crowdsourced" data collection**. This popular method of generating data should be carefully studied by policymakers before pursuing it.

Section 4.6 discusses how states and localities can successfully deploy **consumer surveys** during their assessments. Well designed and carefully administered surveys can yield insightful data regarding broadband availability, adoption, and use.

NOTES

[1] *See generally Coronavirus State and Local Fiscal Recovery Fund – Final Rule*, 87 Fed. Reg. 4338 (Jan. 27, 2022), https://www.govinfo.gov/content/pkg/FR-2022-01-27/pdf/2022-00292.pdf.

[2] Specifically, the Final Rule states that:

> "…in determining areas for investment, recipients may choose to consider any available data, including but not limited to documentation of existing broadband internet service performance, federal and/or state collected broadband data, user speed test results, interviews with community members and business owners, reports from community organizations, and any other information they deem relevant."

[3] IIJA § 60102(h)(1).

[4] According to an ACLP analysis, 25 states maintain laws that specifically impact the ability of municipalities to pursue a broadband project. Of those, only two – Nebraska and Pennsylvania – prohibit GONs. Sixteen states have statutory frameworks in place that, when followed by a municipality, ultimately permit a GON. Many of these frameworks require some manner of collaborative planning. For a relevant example of such a law, *see* Fl. Stat. §350.81.

A number of states maintain similar rules regarding broadband projects being pursued by electric cooperatives. For example, Mississippi requires an electric cooperative to "have an economic feasibility study conducted and adopt a plan that will provide service to its entire certificated area" before it pursues a broadband project. *See* MS Code § 77-17-5.8.

[5] *BEAD NOFO* at p. 50-51.

[6] *See, e.g., BEAD NOFO* at p. 49.

KEY TAKEAWAYS

- With state and local policymakers increasingly interested in understanding the nuts-and-bolts of broadband connectivity, it is essential that they deploy well-designed planning processes to generate the data, insights, and partnerships needed to effectively address any challenges that are identified.
- To assist in these efforts, this Section offers high-level best practices that should inform how states and localities deploy holistic broadband assessments.

4.2.1 WHAT ARE SOME BEST PRACTICES THAT MIGHT GUIDE AND INFORM HOLISTIC ASSESSMENTS OF BROADBAND MARKETS BY STATE AND LOCAL GOVERNMENTS?

With state and local policymakers increasingly interested in understanding the array of forces impacting broadband connectivity, it is essential that they deploy well-designed planning processes to generate the data, insights, and partnerships needed to effectively address any challenges that are identified. To assist in these efforts, the following offers high-level best practices that should inform how states and localities deploy holistic broadband assessments. Subsequent parts of **Section 4** drill down into specific aspects of the planning process and focus on the array of data-gathering tools available to policymakers. A comprehensive checklist that captures these and related planning elements is included in **Section 5.8**.

- **Bring All Stakeholders Together.** A core theme of this Tool Kit is inclusiveness and collaboration. It is critically important to solicit the input and help of all relevant stakeholders. This extends to – and is a foundational aspect of – the broadband planning process. Engaging in "closed-door" deliberations or processes that only bring together some stakeholders will yield an incomplete picture of the relevant broadband marketplace and of the competitive and consumer-oriented dynamics therein. The default approach of all broadband-related planning processes should be that of inviting all stakeholders – *e.g.*, ISPs, consumer groups, business groups, nonprofits, philanthropic groups, etc. – to the table for data-driven, solution-oriented discussions.
- **Set the Proper Context.** Planning processes should encompass more than just a static evaluation of a broadband market at a particular moment in time. Rather, policymakers should endeavor to set the proper context for the inquiry by gathering data sufficient to understand how the relevant marketplace has evolved over time. For example, how has broadband availability improved over the last decade? What were consumers' options for broadband 10 years ago? What speeds were being offered at what price-points, compared to what is being offered today? How has broadband adoption, in general and across specific demographic groups, changed? What demand-side challenges remain? This kind of information is essential to properly situating planning processes against the backdrop of a market's ongoing evolution and educating stakeholders about the iterative nature of broadband connectivity.
- **Determine Where Broadband Is Headed.** What are the buildout plans of ISPs? Which areas will benefit from subsidized buildout in the near-term (*e.g.*, projects in areas supported by funds from RDOF or ARPA)? Is a locality working with a new ISP to facilitate entry? Planning

processes that fail to include ISPs risk developing recommendations that could result in inefficient overbuilding or related interventions that might be unnecessary and costly. As such, working closely with ISPs from the start can help to ensure that all local stakeholders, including policymakers, are apprised of those entities' plans for investing in, expanding, and upgrading their networks and offerings.

- **Gather and Analyze as Much Data as Possible.** As discussed throughout this section, there are numerous ways in which state and local policymakers can gather ample, meaningful data regarding broadband availability and adoption. Policymakers and other stakeholders should avail themselves of these and all other relevant data to inform planning processes. Such data-driven planning will allow for greater precision in identifying where connectivity challenges exist and developing approaches to address those issues.
- **Engage Independent, Non-Vested Experts Whenever Possible.** Robust data-driven broadband planning involves a host of complex undertakings. These include gathering and analyzing significant amounts of data; using those data points to create detailed maps; and parsing data to understand the unique nuances of broadband adoption decisions in a given market. Accordingly, states and localities that lack the expertise to do these analyses should seek to engage outside experts whenever possible. These experts should be thoroughly vetted to ensure that they are truly independent, objective, not vested in any specific outcome, and capable of delivering high-quality work-product.
- **Revisit and Update Broadband Plans as Appropriate.** Effective broadband planning is not a one-time initiative. Rather, broadband planning should be an ongoing project for a state or locality. This ensures that plans and recommended interventions change in response to new developments. Ongoing planning also creates a vehicle for the consistent collection and analysis of useful data, which should be consulted when developing updated policy recommendations.

KEY TAKEAWAYS

- Efficient, targeted broadband efforts require granular information about where internet service is available, and at what speeds.
- The most comprehensive set of broadband availability data is collected and published by the FCC via Form 477.
- The FCC is currently operationalizing a new Broadband DATA program, which will provide location-based mapping that promises to increase the accuracy and usefulness of availability data. A growing number of states are also pursuing more granular maps to precisely target grant funding in support of new broadband deployments.

4.3.1 WHY MAP BROADBAND?

A foundational requirement for targeted efforts to bolster broadband availability is understanding where internet service is available, and at what speeds. Gaining such an understanding of broadband connectivity at the local, state, and federal level requires the collection, aggregation, and distillation of a large amount of complex data. Currently, the most comprehensive set of broadband availability data is collected by the Federal Communications Commission (FCC), though a number of other government, non-profit, and private entities have also undertaken mapping efforts.

4.3.2 WHAT IS FCC FORM 477?

Since 1999, the FCC has been collecting and publishing telecommunications availability data collected via Form 477. Among the required filers of Form 477 are all "facilities-based providers of fixed and mobile broadband internet access who have one or more end user connections in service," which includes all ISPs.[1]

Form 477 Fixed Broadband Deployment data is the most robust and granular publicly available source of nationwide information about broadband availability. It has long been the primary source of data for state and local broadband mapping efforts because only the federal government possesses the authority to require submission of such data by ISPs.

In general, the benefits of Form 477 data have been:

- **Data Is Highly Granular.** Form 477 collects and provides broadband availability information by provider at the Census Block level. Census Blocks are the smallest geographic division used by the Census Bureau; the U.S. has over 11 million blocks.[2] They range in size from actual city blocks in dense urban areas to many square miles in rural parts of the country. This granularity means that Form 477 data can be used for local-level analyses or aggregated up to the county, state, and national level. However, as noted below, additional granularity is essential to precisely identifying remaining unserved households.
- **Data Is Provider-Reported.** Data is collected from providers, who provide a list of "Census Blocks in which they can or do offer service to at least one location."[3] This leads to an important caveat: an ISP reporting its service "may not necessarily offer that service everywhere in the block."[4]

- **Additional Information Is Provided.** For each Census Block where they offer service, providers also report other metrics including the type of technology used (DSL, fiber, cable, fixed wireless, etc.) and their maximum advertised upload and download speeds.

The Form 477 data, while by far the most comprehensive nationwide look at broadband availability, has long faced criticism that it likely overstates broadband availability since providers report coverage for any Census Blocks where they service one or more location. In practice, this means that if an ISP only serves one household in a Census Block, then that entire Block is considered "served." The magnitude of this effect has been debated, including to what degree it affects larger Census Blocks, which tend to be in more rural, lower-density areas. On aggregate, the "difference between the Form 477 data and actual availability is somewhat small."[5]

4.3.3 WHAT IS THE BROADBAND DATA COLLECTION PROGRAM AND WHY IS IT IMPORTANT TO BROADBAND DEPLOYMENT EFFORTS GOING FORWARD?

Motivated by a need for increased granularity and accuracy of federal broadband maps, the Broadband DATA Act established the new Broadband Data Collection (BDC) Program.[6] The BDC Program is intended to yield broadband availability data based on which ISPs provide service at the location (*i.e.,* household, business, etc.) level.

- **Serviceable Location Fabric.** Foundational to the BDC Program is the development of a Broadband Serviceable Location Fabric (BSLF), which is a spatial database of every location (household, business, etc.) across the country from which providers can report what locations they service. This is an incredibly complex undertaking that will result in one of the most detailed address/location datasets ever developed by the federal government.
- **More Accurate.** Like with Form 477 data, the BDC Program relies on ISPs reporting where they offer service and at what speeds. Unlike with Form 477, providers will report availability using accurate geographic shapefiles, which should eliminate the overstated availability issue that has long bedeviled Form 477. This means that, even at the hyperlocal level, the new maps should provide an exact look at which ISPs are providing broadband service.

The BDC Program is intended to guide all future federal broadband allocations, including the BEAD Program (for an overview, see **Section 2.2**). While the BDC Program is intended to replace the broadband availability portion of Form 477, the FCC has stated that "it would continue the census-based deployment data collection under Form 477 [for fixed service providers] for at least one reporting cycle after the new granular reporting collection commences."[7]

4.3.4 WHAT ARE STATES DOING ON THE MAPPING FRONT?

Alongside federal efforts, a growing number of states have undertaken their own initiatives to map broadband availability. While some of these efforts utilize Form 477, several states have sought to gather their own broadband availability data. Some notable programs include:

- **Georgia.**[8] The Georgia Broadband Map utilizes "a location-level methodology that precisely maps the availability of broadband services to every home and business."[9] Released in 2021, the map is methodologically similar to the in-development federal DATA map, allowing providers to report service at the location level. Statewide, the map showed that current Form 477 data overstates broadband availability by about 3.5 percentage points.[10]

- **California.**[11] The California Public Utilities Commission collects broadband availability data annually. The state's Broadband Mapping Program is similar to the FCC's Form 477, asking providers to report service information at the Census Block level, though service can also be reported at the address level.

- **Michigan.**[12] The state is currently in the process of a CARES Act-funded "Broadband Infrastructure Audit and Validation project," which will "identify and map the precise location of existing high-speed internet assets in the state."[13] The project is focused on mapping broadband infrastructure, including "assets located in public easements."[14]

Recently, a few states have issued solicitations for development of location-based mapping systems akin to the FCC's BDC and the Georgia Broadband Map:

- **New York.**[15] In September 2021, Governor Kathy Hochul "announced the launch of a Broadband Mapping Consumer Survey," part of a broader effort by the state to map the "availability, reliability and cost" of broadband.[16] The project, which was completed in June 2022, successfully mapped "the status of broadband service at the address level."[17]

- **Massachusetts.**[18] In January 2022, the Massachusetts Technology Collaborative issued a Request for Proposals for creation of a "statewide broadband coverage map that shows...served and unserved locations."[19] The project is intended to include creation of a "statewide address point dataset" that will "serve as the master location data of serviceable locations to which all service provider coverage information will be compared."[20]

- **Colorado.**[21] In February 2022, the Colorado Governor's Office of Information Technology issued a Request for Proposals seeking to "create more accurate and expanded maps to assist in deploying funding for the purpose of broadband coverage."[22] Specifically, the state sought "Serviceable Location Fabric data" that would "provide a comprehensive statewide dataset of locations that could utilize broadband service."[23]

4.3.5 HAVE LOCALITIES LAUNCHED MAPPING EFFORTS?

County and municipal governments have engaged in a variety of broadband mapping efforts, typically utilizing existing datasets like the FCC's Form 477 to generate maps of local broadband availability. In some cases, these entities have sought to obtain their own availability data via methods like crowdsourcing (discussed in **Section 4.5**), physical surveys of infrastructure located in rights-of-way, and collaboration with ISPs.

4.3.6 WHAT ARE SOME BEST PRACTICES THAT STATES AND LOCALITIES MIGHT APPLY WHEN DEVELOPING A MAPPING PROGRAM?

The following best practices are offered to state and local policymakers as they consider whether and how to expend funds on developing their own broadband maps.

- **Look To Federal Maps First to Identify Whether Additional Maps Are Needed.** Not every state or locality needs to create its own broadband map. Indeed, the forthcoming federal DATA map will be sufficiently granular to assist every state and locality in their broadband explorations. States should avoid duplicative efforts in order to maximize the impact of broadband funding.

- **Engage Experts**. Data collection and mapping is a highly complex endeavor with many opportunities for substandard methodologies to introduce issues and inaccuracies. Policymakers should engage GIS experts when developing these programs – and especially before laying out specific technical guidelines. In addition, states and localities should collaborate with the intended end-users of these maps (*e.g.*, ISPs) to determine what features are most important.
- **Be Transparent and Operate in The Sunshine.** States and localities should be open about their mapping efforts. Methodological details should be clearly communicated and open to outside comment. Data collected regarding availability should be made available at the most complete level possible given privacy concerns and other limitations.
- **Solicit Feedback to Further Enhance Accuracy.** Broadband availability maps should be open to outside feedback from the public and from providers. Mapping programs should include a clearly defined challenge process that maximizes the accuracy of availability data (as discussed in **Section 3.3.1.6**).
- **Revisit and Update Regularly**. One-time mapping efforts are limited in their usefulness. Instead, states and localities embarking on their own mapping efforts should design these programs with a regular schedule of updates and revisions.

NOTES

[1] Information for Filers, FCC, https://www.fcc.gov/BroadbandData/filers.

[2] Tallies, U.S. Census Bureau, https://www.census.gov/geographies/reference-files/time-series/geo/tallies.html.

[3] Fixed Broadband Deployment Data from FCC Form 477, FCC, https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477.

[4] *Id*.

[5] *A Quality Check on Form 477 Data*, The Phoenix Center, https://www.neca.org/docs/default-source/wwpdf/public/102721phoenix.pdf.

[6] S.1822 – Broadband Data Act, https://www.congress.gov/bill/116th-congress/senate-bill/1822.

[7] Public Notice DA 22-182, FCC, https://docs.fcc.gov/public/attachments/DA-22-182A1.pdf.

[8] Georgia Broadband Mapping, Georgia Department of Community Affairs, https://broadband.georgia.gov/maps.

[9] *Id*.

[10] *A Quality Check on Form 477 Data*, The Phoenix Center, https://www.neca.org/docs/default-source/wwpdf/public/102721phoenix.pdf.

[11] Broadband Mapping Program, California Public Utilities Commission, https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-mapping-program.

[12] *Governor Whitmer & Lt. Governor Gilchrist Announce Planning Project to Connect Michiganders to High-Speed Internet*, The Office of Governor Gretchen Whitmer, https://www.michigan.gov/whitmer/0,9309,7-387-90499_90640-578041--,00.html.

[13] *Id.*

[14] *Id.*

[15] *Governor Hochul Announces Launch of Mapping Survey to Examine Quality and Availability of Broadband Across the State*, New York State, https://www.governor.ny.gov/news/governor-hochul-announces-launch-mapping-survey-examine-quality-and-availability-broadband.

[16] *Id.*

[17] *Id.*

[18] RFP No. 2022-MBI-02, Massachusetts Technology Collaborative.

[19] *Id.*

[20] *Id.*

[21] RFP 2022000237, Colorado Governor's Office of Information Technology.

[22] *Id.*

[23] *Id.*

KEY TAKEAWAYS

- Addressing demand-side broadband issues requires an ability to collect, analyze, and understand data regarding broadband adoption, *i.e.,* which households are currently subscribing to broadband.
- The most comprehensive and current adoption data is provided by the Census Bureau in its American Community Survey (ACS) estimates. The FCC also provides robust adoption data in its Internet Access Services Reports.
- Survey data (from well-designed surveys) can also be helpful in identifying and understanding barriers to broadband adoption and the factors that influence whether a person elects to subscribe to an available broadband connection.

4.4.1 AVAILABILITY VS. ADOPTION

Broadband availability and adoption are distinct topics that are often conflated as part of general discussions on broadband access.

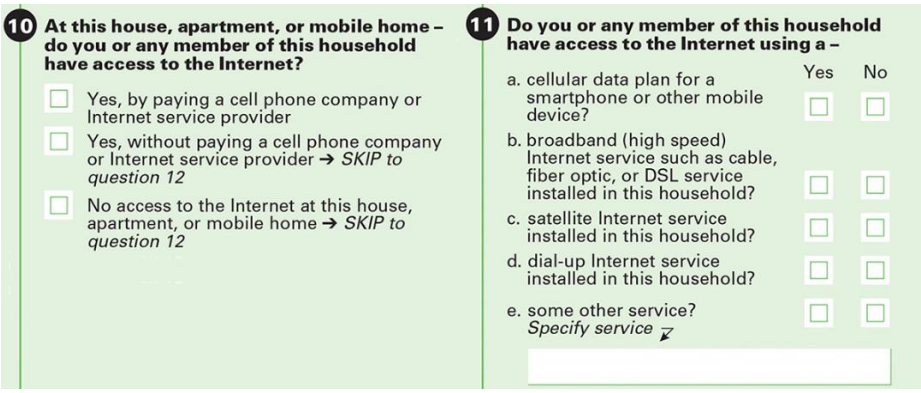
- **Availability.** Availability data indicates which, if any, internet service providers in an area offer connections to households and/or businesses. This information is typically collected directly from ISPs. Data on availability is discussed in **Section 4.3**.
- **Adoption**. Adoption data indicates which households in an area are actively subscribing to an internet connection and which ones are not. This data can be gathered via surveying residents and businesses or collected from ISPs.

An overview of the two primary sources for adoption data is provided below.

4.4.2 AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) is a rolling survey administered by the Census Bureau that "provides vital information on a yearly basis about our nation and its people."[1] The Bureau obtains responses to a comprehensive questionnaire from over 3.5 million households each year, and, thanks to a robust sampling methodology, publishes highly granular and accurate data across a variety of topics.[2]

Included in the ACS questionnaire[3] are three questions regarding computer and internet use, two of which ask about the presence and type of internet subscription(s) in a given household. These two questions, shown below, result in the most comprehensive and up-to-date set of adoption data currently available.



10 **At this house, apartment, or mobile home – do you or any member of this household have access to the Internet?**

- ☐ Yes, by paying a cell phone company or Internet service provider
- ☐ Yes, without paying a cell phone company or Internet service provider → *SKIP to question 12*
- ☐ No access to the Internet at this house, apartment, or mobile home → *SKIP to question 12*

11 **Do you or any member of this household have access to the Internet using a –**

	Yes	No
a. cellular data plan for a smartphone or other mobile device?	☐	☐
b. broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?	☐	☐
c. satellite Internet service installed in this household?	☐	☐
d. dial-up Internet service installed in this household?	☐	☐
e. some other service? *Specify service*	☐	☐

Adoption data from the ACS is easily obtained from Census Bureau's data portal – https://data.census.gov/cedsci/.[4]

Benefits and features of this data include:

- **Household-Reported.** ACS broadband adoption data is based on responses to the questions shown above. Given the straightforward wording and simple set of options, there is likely little room for error on the part of households filling out the questionnaire. ACS adoption information is limited solely to whether or not a household has an internet connection and what kind of technology they use to access the internet. It does not provide information on the speeds to which consumers have subscribed, nor does it distinguish between whether wired broadband subscribers use cable, fiber, or DSL.
- **1- and 5-Year Estimates**. The Census Bureau provides two formats of ACS data: 1-year estimates and 5-year estimates.[5] The 5-year estimates aggregate survey responses over five years (for example, the 2020 5-year estimates include 2016-2020), and because of the larger number of total surveys, are provided down to a more granular geographic level than the 1-year estimates. Since broadband adoption has seen relatively rapid change year-over-year, the 1-year estimates are best suited for broadband adoption analyses, except when data is needed at a more granular geographic level.
- **Data Since 2016**. The ACS has included broadband-related questions since 2013 (the questions were modified into their current format in 2016).[6] Due to the changes made to the questions, choices, and wording in 2016, ACS data from before then cannot easily be directly compared to data from 2016 forward. In addition, due to the impact of the COVID-19 pandemic, the Census Bureau did not release its standard set of ACS data for 2020. Instead, the Census Bureau provided a set of "experimental estimates" that include "a limited number of data tables for the nation, states, and the District of Columbia."[7]
- **Breakdowns by Other Relevant Metrics**. Along with the broadband questions, the ACS queries households across a variety of demographic, economic, and social categories. This means that information on broadband adoption can be broken down by several key measures, including income,[8] race, age, and employment status.[9] These metrics allow policymakers to further understand the patterns of broadband adoption in their communities and allows them to precisely tailor efforts to close the digital divide.

4.4.3 FCC SUBSCRIPTION DATA

As part of its Form 477 data collection, detailed in **Section 4.3**, the FCC collects data from internet service providers regarding the number of subscriptions currently active in each Census Tract they serve.[10] Unlike the FCC's Form 477 data on broadband availability, this adoption data is not provided to the public in its full detail. Instead, the FCC publishes an Internet Access Services Report and accompanying map twice a year.[11] The Reports provide summary information at the national and state level, and the maps indicate the number of connections per 1000 households at the Census Tract level.[12] Census Tracts are an intermediate level of granularity made up of many Census Blocks; the FCC's most recent analysis included 73,767 census tracts.[13]

Compared to the ACS data discussed above, the FCC's Subscription Data is:

- **Provider-Reported.** The FCC's data is part of mandatory Form 477 reporting by ISPs. As such, the data does not rely on surveying households.
- **Slower to Release.** The FCC's Internet Access Services Reports and maps are released approximately 2 years after data is collected.[14] By comparison, except in the case of recent COVID-19 related delays, the ACS 1-Year Estimates have been released approximately 9 months after data has been collected.[15]
- **More Detailed on Speeds**. Since providers report the speed of their subscriptions, the FCC's Internet Access Services Reports include details on adoption of different speed levels.[16] However, the Census Tract maps are only provided at two speed levels: 200Kbps or more, and 10Mbps or more.

4.4.4 OTHER SOURCES OF ADOPTION DATA

While the ACS and FCC datasets provide the most robust and updated broadband adoption statistics, several other avenues exist for state and local policymakers interested in accessing relevant adoption data.

Organizations like the Pew Charitable Trusts regularly release broadband adoption data gleaned from nationwide consumer surveys.[17] NTIA, which will administer the BEAD broadband grant program, also releases survey data on broadband adoption matters from time to time.[18] Other organizations that have released broadband adoption data and analyses on a regular basis include the Brookings Institute and Connected Nation, among others.

Local governments and other stakeholders have in some cases attempted to gather their own information on broadband adoption, primarily via surveys of residents and businesses. Given the difficulty of incorporating robust methodology into these small-scale efforts, such local surveys may be significantly influenced by statistical biases and other issues. An overview of such surveys and common methodological concerns is provided in **Section 4.6**.

4.4.5 WHAT ARE SOME BEST PRACTICES THAT STATES AND LOCALITIES MIGHT APPLY WHEN ANALYZING BROADBAND ADOPTION?

The following best practices are offered to state and local policymakers as they seek to analyze broadband adoption trends among their constituencies.

- **Leverage Robust Federal Data**. The American Community Survey and FCC Internet Access Services Reports provide two robust sources of adoption data. These should serve as the initial jumping-off point for a look at broadband adoption, and in many cases should provide all the detail needed to understand local needs and issues.
- **Engage Experts**. Notwithstanding that adoption data from the ACS and FCC are publicly available, processing and interpreting the data can be a complex endeavor. Policymakers should leverage experts on statistics, demography, and other forms of data analysis to ensure that these data are properly understood.
- **Supplement with Local Efforts**. While the ACS and FCC sources provide thorough metrics of broadband adoption, policymakers may wish to supplement them with local data collection efforts. These can range from anecdotal observations like focus groups and conversations with stakeholders, to custom broadband surveys. Insofar as policymakers intend to survey residents and business, they should be aware of several key considerations discussed in **Section 4.6**.

NOTES

[1] About the American Community Survey, U.S. Census Bureau, https://www.census.gov/programs-surveys/acs/about.html.

[2] Top Questions About the Survey, U.S. Census Bureau, https://www.census.gov/programs-surveys/acs/about/top-questions-about-the-survey.html.

[3] 2022 ACS Questionnaire, U.S. Census Bureau, https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2022/quest22.pdf.

[4] Explore Census Data, U.S. Census Bureau, https://data.census.gov/cedsci/.

[5] ACS Information Guide, U.S. Census Bureau, https://www.census.gov/content/dam/Census/programs-surveys/acs/about/ACS_Information_Guide.pdf.

[6] Computer and Internet Use, U.S. Census Bureau, https://www.census.gov/acs/www/about/why-we-ask-each-question/computer/.

[7] 2020 ACS 1-Year Experimental Data Release, https://www.census.gov/programs-surveys/acs/data/experimental-data.html.

[8] HOUSEHOLD INCOME IN THE LAST 12 MONTHS (IN 2019 INFLATION-ADJUSTED DOLLARS) BY PRESENCE AND TYPE OF INTERNET SUBSCRIPTION IN HOUSEHOLD, U.S. Census Bureau, https://data.census.gov/cedsci/table?q=internet%20income&tid=ACSDT1Y2019.B28004.

[9] TYPES OF INTERNET SUBSCRIPTIONS BY SELECTED CHARACTERISTICS, U.S. Census Bureau, https://data.census.gov/cedsci/table?q=internet&tid=ACSST1Y2019.S2802.

[10] Form 477 Instructions, FCC, https://us-fcc.app.box.com/v/Form477Instructions.

[11] Internet Access Services Reports, FCC, https://www.fcc.gov/internet-access-services-reports.

[12] Residential Fixed Internet Access Service Connections per 1000 Households by Census Tract - December 2018, FCC, https://www.fcc.gov/reports-research/maps/tract-level-residential-fixed-connections-dec-2018/.

[13] Internet Access Services: Status as of June 30, 2019, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[14] Internet Access Services Reports, FCC, https://www.fcc.gov/internet-access-services-reports.

[15] 2019 American Community Survey Single-Year Estimates, U.S. Census Bureau, https://www.census.gov/newsroom/press-kits/2020/acs-1year.html.

[16] Internet Access Services: Status as of June 30, 2019, FCC, https://docs.fcc.gov/public/attachments/DOC-381125A1.pdf.

[17] *See, e.g., Internet/Broadband Fact Sheet,* April 7, 2021, Pew, https://www.pewresearch.org/internet/fact-sheet/internet-broadband/.

[18] *See* NTIA, Data Central Blog, https://www.pewresearch.org/internet/fact-sheet/internet-broadband/.

KEY TAKEAWAYS

- Crowdsourcing is an increasingly popular tool for collecting broadband data at a more granular level than is currently possible via existing federal programs.
- Properly used, crowdsourcing can be a complementary tool for enhancing coverage maps and providing additional detail regarding services on offer.
- Improperly used, crowdsourcing can introduce bias and yield flawed data.

4.5.1 WHY CROWDSOURCING?

In recent years, the limitations of publicly available broadband data, along with a desire for more geographically granular data, have motivated a range of mapping and speed-testing efforts. Some efforts have focused on obtaining data directly from broadband users via a "crowdsourcing" methodology, which involves surveys and other voluntary data submission by consumers.

Typically, entities involved in crowdsourcing collect data from residents and businesses to provide more detail regarding availability and/or connection speeds at the hyper-local level. Broadband surveys are themselves a form of crowdsourcing, as is encouraging users to test and report the speed of their internet connection (broadband surveys are discussed in detail in **Section 4.6**).

Potential inaccuracies from crowdsourcing are discussed in **Section 4.5.4** below. Best practices are discussed in **Section 4.5.6**.

4.5.2 PREVALENCE OF CROWDSOURCING

Crowdsourcing has seen growing use by public and private entities attempting to map or measure broadband at the state and local levels. These analyses tend to use relatively simple methods and serve primarily as "sentiment" surveys, as opposed to robust quantitative metrics. Emerging crowdsourcing efforts by broadband advocacy groups involve similar processes, albeit on a wider scale and often employing more sophisticated techniques and platforms.

Crowdsourcing at the state and local levels will likely be tempered by release of the FCC's Broadband DATA Maps.[1] That program, which will yield broadband availability data at the address/location level, will largely satisfy needs for granular broadband data at the local level, which is currently one of the primary drivers of crowdsourcing efforts. (The FCC's Broadband DATA program is detailed in **Section 4.3**)

4.5.3 RISING INTEREST IN CROWDSOURCING

Crowdsourcing has gained traction with policymakers and regulators, including at the federal level. In the Broadband DATA Act, "crowdsourcing" is specifically listed as one means by which the government can "improv[e] data accuracy," stating that the FCC "shall develop a process through which entities or individuals...may submit specific information about the deployment and availability of broadband internet access," which "may be used to verify and supplement information provided by [ISPs]."[2]

Crowdsourcing is also discussed in a recent FCC order[3] regarding the implementation of the Act via the Commission's Broadband Data Collection program.[4] In that context, crowdsourcing is again framed as

a secondary tool that works in tandem with a formal challenge process to identify potential issues in first-party data.

4.5.4 POTENTIAL INACCURACIES

Since they rely on voluntary collection of end-user data, many crowdsourcing initiatives introduce a unique set of potential data accuracy issues. These include: (1) inaccuracies due to technological limitations, and (2) inaccuracies due to sampling issues. These are discussed in turn below.

- **Technological Inaccuracies.** Particularly in the case of crowdsourcing programs that involve an end-user speed testing component, these systems involve several factors that are likely to artificially bias results towards underreporting speeds available to users. By their nature, speed tests that are run using internet-enabled devices test the speed at the given device. This means that they include the effects of home networking setups, speed loss due to wireless connections, throughput limitations of the devices themselves, and concurrent use within a home network.

  For example, a consumer subscribing to gigabit service running a speed test on their tablet over Wi-Fi is unlikely to measure speeds of 1,000 Mbps due to likely technical limitations associated with the router and tablet. These factors are significant because there are few, if any, reasons why speeds would be over reported. In other words, all potential error factors bias results downward. Consequently, these issues will not be eliminated by large sample sizes. This means that, by their nature, crowdsourced speed tests will suggest that internet speeds are slower than those available in a market. In addition, crowdsourced data only measures the maximum subscribed speed of a test-taker's connection, which means that there is no data generated regarding the maximum speeds on offer in an area. As such, a neighborhood with universal gig availability but low subscribership to that tier might appear to be underserved when, in fact, it is well served.

- **Sampling Issues.** Crowdsourcing introduces a second potential source of bias since it relies on voluntary responses by individuals. Statistically representative data depends on obtaining a truly representative sample of the population being studied. Response bias, or the tendency for different groups to respond at higher or lower rates, can introduce significant and hard-to-measure biases, even when sample size appears adequate. Unfortunately, the advanced techniques needed to measure and account for potential sampling issues are beyond the scope of most crowdsourcing efforts.

4.5.5 NOTABLE CROWDSOURCING EFFORTS

Entities currently engaged in crowdsourcing broadband data include a range of governments, private companies, and advocacy groups. Some notable efforts are profiled below.

- **Connected Nation.** A long-time advocate in the broadband space, Connected Nation is a nonprofit entity focused on bridging the digital divide. Among other things, the group offers communities and local governments "location intelligence solutions" that they argue "result in higher broadband data quality than what is currently available on the national scale."[5] Via a standardized survey[6] provided both in paper and online formats, the group crowdsources geographic and broadband data that is then used to develop maps[7] intended to inform subsequent planning efforts.

- **National Association of Counties (NACo).** In early 2020, the NACo released a report, "Understanding the True State of Connectivity in America,"[8] outlining the results of its crowdsourced speed and connectivity initiative. Utilizing a smartphone application, the effort sought to quantify both residential and cellular broadband speeds on a national scale. The effort's scale and reliance on wireless connectivity and smartphones underscored the daunting methodological difficulty of obtaining accurate data on speeds via crowdsourcing.
- **Kentucky.** In early 2021, Kentucky announced the "launch of the Kentucky Broadband Speed Test, a crowd-sourcing project that will gather data from Kentuckians needed to expand internet home access for distance learning, telework and telehealth."[9]
- **Maine.** In 2018, the state began efforts to collect speed test data from residents,[10] intended to "create better maps and show state officials where service is (and is not)."[11] The results of the testing program, which is still ongoing, are used to generate an interactive map showing speeds across the state.[12]
- **New York.** The state used a crowdsourcing program to collect data on residential and business broadband speeds. To increase the accuracy of results, the state urged respondents to perform the test "on a computer or tablet that is in [their] home or office and that is NOT on the cellular network."[13]

4.5.6 WHAT ARE SOME BEST PRACTICES FOR STATES AND LOCALITIES CONSIDERING CROWDSOURCING?

The following best practices are offered to state and local policymakers as they consider utilizing crowdsourcing methods to gather broadband data.

- **Explore Existing Data Sources.** Before deciding to crowdsource, state and local policymakers should explore existing data sources, including publicly available data from the FCC and Census Bureau, to determine if the information they are seeking already exists (see **Sections 4.3 and 4.4** for additional information). In addition, they should consult with ISPs and other stakeholders to see if answers to their data-driven inquiries are available from proprietary sources.
- **Engage Experts.** As discussed above, crowdsourcing broadband data requires the implementation of a robust methodology to ensure accurate results. Policymakers should leverage experts in survey design and statistical methodology when considering and developing these programs.
- **Understand and Measure for Bias and Inaccuracy.** Policymakers utilizing crowdsourcing should understand the potential for bias and inaccuracy due to methodological issues and attempt to quantify those effects. Specifically, demographic data should be collected from respondents and compared to known quantities from sources like the Census Bureau to gauge the representativeness of samples. Where possible, speed testing programs should collect information on device and connection methods to understand the effects of within-household factors on reported speed.
- **Use Crowdsourcing as a Supplement.** Obtaining robust quantitative results via crowdsourcing is very challenging. Even so, these efforts can supplement existing datasets by providing bits of information that might not otherwise be available. Properly designed and implemented, surveys and other crowdsourced methods can provide useful information about consumer sentiments,

digital literacy levels, reasons for non-adoption, and other topics that can help target much-needed demand-side initiatives.

NOTES

[1] FCC, Broadband Data Collection, https://www.fcc.gov/BroadbandData.

[2] S. 1822 - Broadband DATA Act, U.S. Congress, https://www.congress.gov/bill/116th-congress/senate-bill/1822.

[3] FCC, Order 21-20, https://docs.fcc.gov/public/attachments/FCC-21-20A1.pdf.

[4] FCC, Broadband Data Collection, https://www.fcc.gov/BroadbandData.

[5] *Mapping & Analysis*, Connected Nation, https://connectednation.org/mapping_analysis/.

[6] *See, e.g., Bastrop County Community Technology Assessment*, Connected Nation Texas, https://www.co.bastrop.tx.us/upload/page/0160/docs/BastropCountyResSurveyEnglish.pdf.

[7] *See, e.g., Bastrop County, Texas – Broadband App*, Connected Nation Texas, https://gis.connectednation.org/portal/apps/webappviewer/index.html?id=eb6c0370cc004a03be2dc4806e330ebc.

[8] *Understanding the True State of Connectivity in America*, National Association of Counties, https://www.naco.org/resources/featured/understanding-true-state-connectivity-america.

[9] Kentucky Broadband Initiative, Kentucky Education and Workforce Development, https://educationcabinet.ky.gov/Initiatives/Pages/KBI.aspx.

[10] Shara Tibken, *States couldn't afford to wait for the FCC's broadband maps to improve. So they didn't.*, Feb. 23, 2021, CNET, https://www.cnet.com/home/internet/features/states-couldnt-afford-to-wait-for-the-fccs-broadband-maps-to-improve-so-they-didnt/.

[11] Speed Testing, Maine Broadband Coalition, https://www.mainebroadbandcoalition.org/speed-test-info.

[12] *Id.*

[13] New York State Broadband Assessment Information About the Assessment, New York, https://www.empirestatebroadband.com/about-the-broadband-assessment-and-adoption-tool.

KEY TAKEAWAYS

- Surveys are a popular method for gathering broadband data and can be an effective part of broadband-related analysis.
- Careful survey design, administration, and interpretation is necessary to obtain meaningful, actionable results.

4.6.1 WHAT ROLES CAN BROADBAND SURVEYS PLAY?

Surveys have long been a popular method for gathering data directly from consumers about broadband. Some of the most robust broadband-related data is gathered via survey, such as the Census Bureau's American Community Survey, detailed in **Section 4.4**. Surveys are also one of several "crowdsourcing" data collection methods, which are discussed more broadly in **Section 4.5**.

Surveys can be utilized at the state and local levels when publicly available sources of broadband data may not be sufficiently granular or otherwise do not provide the necessary details to guide policymaking. However, despite their popularity and widespread use, surveys involve several core methodological considerations and must be carefully designed, administered, and interpreted to yield actionable conclusions.

The following presents an overview of key considerations of a proper survey process. This Section is not intended as an all-encompassing guide to survey design. Ultimately, policymakers should engage and closely collaborate with independent and objective experts on any formal survey efforts. This Section is intended to provide a "101"-style overview so that policymakers can make educated decisions about whether and how to use surveys in support of their broadband efforts.

4.6.2 SAMPLE SIZE AND REPRESENTATIVENESS

At their core, surveys involve collecting answers to questions from a subset of a larger population with the intent of drawing conclusions regarding the sentiments, choices, etc. of that population. As such, a key aspect of accurate surveying is ensuring that this subset, or sample, accurately reflects the population as a whole. Generally speaking, this involves two primary considerations:

- **Sample Size.** A sample needs to be adequately large to provide a comfortable level of certainty regarding how well it reflects the population. In the case of surveys, sample size is the number of responses received. The minimum sample size to provide a desired level of statistical confidence can be computed mathematically.[1]
- **Representativeness.** Along with being adequately large, a survey must also be representative, meaning that it accurately reflects the population from which it was obtained.[2] This can be reframed as making sure that the survey responses are not affected by biases that skew which groups are represented in the pool of responses. Survey administrators can measure the representativeness of a sample by collecting demographic information from respondents and comparing the composition of the sample to known quantities from robust data sources like the Census Bureau. For example, if respondents to a county broadband survey report a median household income of $150,000, but the American Community Survey indicates median

household incomes of $80,000, it may suggest that the survey is not representative of the population being analyzed.

4.6.3 (NON-)RESPONSE BIAS

One of the main factors that can negatively impact a survey sample's representativeness is non-response bias. Non-response bias is the tendency of certain factors about respondents that make them less (or more) likely to respond. In the case of broadband surveys, many factors might influence households' motivations to respond. For example, households satisfied with their current internet service may be less likely to respond to a broadband survey than those who are unserved or unsatisfied. Households that are more civically engaged and trusting of their local governments may be more likely to fill out a survey asking for their address and complete an associated broadband speed test.

The effects of non-response bias can be significant and can heavily skew the results of survey efforts. Survey administrators can check for potential non-response bias issues by collecting demographic information about respondents and comparing them to known population metrics from reliable sources like the U.S. Census Bureau.

4.6.4 QUESTION WORDING AND DESIGN

The way survey questions are written and presented can influence the thought processes of respondents and affect their choice of response. As such, survey questions should be as straightforward and basic as possible while clearly communicating what they are asking. Some common pitfalls of question design include:

- **Leading Questions.** These are questions that, intentionally or unintentionally, support one response more than the other. For example, compare "Does your current internet service provide adequate speeds for your needs?" with "Are you negatively affected by slow internet service that is woefully inadequate for your needs?" The former's phrasing is preferred because it is straightforward; the latter exemplifies, in an exaggerated manner, how a leading question might be phrased.
- **Loaded Questions.** These questions presuppose certain sentiments or qualities about respondents. For example, asking respondents "Do you support government subsidies to fund improvements to our town's slow, inadequate broadband speeds?" presupposes respondents feel that current speeds are too slow, and a Yes/No answer set does not provide adequate detail to capture that sentiment.
- **Overly Technical language.** Broadband survey questions should be worded in such a way that they are comprehensible to as many respondents as possible. This is especially important for a topic like broadband, which is replete with jargon. For example, compare "How often do you experience packet loss, excessive jitter, buffering, and other short-term upstream/downstream service interruptions?" with "How often to do you experience short-term (under 5 minutes) problems with your internet connection (for example stuttering/freezing videos, websites not loading, etc.)?" The former question is laden with jargon that few people would understand; the latter question is preferred because it captures the same sentiment in a much more plainspoken manner.

- **Too Many Choices.** Survey designers may be tempted to provide questions with many possible responses to collect detailed data. This can be overwhelming for respondents, and just like the questions themselves, the list of potential answers should be succinct and easy for respondents to parse. A question with many potential answers may be better off split into multiple, simpler questions.
- **Mandatory Questions.** Survey designers may also be tempted to set many or all survey questions to mandatory-response, such that they cannot be left blank. Mandatory questions can skew responses by forcing respondents to select an answer even if they are unsure or do not have a strong sentiment. Whenever possible, questions should be optional and should include responses like "I'm not sure," "Don't know," or other similar non-answer response.
- **Compound Questions.**[3] Compound questions, sometimes referred to as "double-barreled" questions, roll two or more questions together in a way that could result in inaccurate or incomplete information. For example, asking respondents "Are you satisfied with the speed and reliability of your internet service?" would be better designed as two separate questions, one asking about "speed" and the other about "reliability."

4.6.5 ORDERING EFFECTS

Along with how questions are worded, the order of the questions and the menu of answers can influence the choices made by respondents.[4] For example, if a broadband survey begins with several detailed questions regarding the prevalence of speed and reliability issues, and then asks about satisfaction with current internet service, this will likely lead to lower satisfaction scores than if the order were reversed.

There are two main approaches to dealing with ordering effects. The first is to lay questions out in an order that takes respondents through a logical thought process regarding the issue(s) being explored. The other approach is to randomize questions and/or their answers between respondents.

4.6.6 SURVEY FATIGUE

Survey respondents are typically not compensated for their responses and are asked to voluntarily fill out surveys or stay on phone calls to walk through all questions and answers with the surveyor. As such, surveys should be designed with the goal of collecting the desired information in as few, simple, straightforward questions as possible. Surveys that take a long time to complete may cause respondents not to respond or to rush through their responses. Certain types of questions, like open-ended written-answer questions, can be especially fatiguing and should be optional and used as sparingly as possible.

4.6.7 WHAT ARE SOME BEST PRACTICES FOR STATES AND LOCALITIES PERFORMING SURVEYS?

The following best practices are offered to state and local policymakers as they utilize surveys to collect broadband data.

- **Engage Independent Experts.** Although free and low-cost platforms exist for the rapid deployment of online surveys, obtaining accurate data requires careful design and administration to ensure that results are not biased. In addition, proper interpretation of results requires an understanding of the statistical reliability of a survey's findings. Policymakers should collaborate with independent expert entities that are experienced in market surveys and should

be skeptical of surveys performed by non-experts or vested parties (*e.g.*, consultants that design and administer their own surveys).

- **Obtain Good Samples**. Survey administrators should ensure that their samples are of adequate size and representativeness. Necessary sample size can be computed mathematically, and demographic information should be collected and compared to known population values to ensure the survey sample is representative.
- **Combat Non-Response Bias.** As part of their effort to obtain a good sample, survey administrators should consider potential reasons for non-response bias and attempt to minimize its effects. This could include efforts like providing both online and paper surveys and advertising the survey via a diverse set of avenues. When bias is present, results should be properly weighted to adjust for its effects.[5]
- **Properly Word Questions.** Survey questions should be written in simple, neutral, straightforward language that avoids jargon. Whenever possible, question responses should not be mandatory and should include an "I'm not sure," "don't know," or other similar non-answer response.
- **Consider Ordering Effects.** When designing surveys, authors should be cognizant of the potential effects of question order and utilize either a logical question ordering or randomized order to account for them.
- **Prevent Survey Fatigue.** Surveys should be designed with the goal of collecting key information in as few questions as possible.

NOTES

[1] For a discussion of sample size computation, *see* Del Siegle, *Sample Size – Educational Research Basics*, University of Connecticut, https://researchbasics.education.uconn.edu/sample-size/.

[2] For an in-depth discussion of sample representativeness, *see Sample Representativeness and Nonresponse Bias: Frequently Asked Questions*, Education Development Center, https://preventionsolutions.edc.org/sites/default/files/attachments/Sample_Representativeness_Nonresponse_Bias_FAQs_0_0.pdf.

[3] *See, e.g., Double-barreled questions*, PickFu, https://www.pickfu.com/blog/double-barreled-questions/.

[4] For additional discussion of ordering effects, *see Writing Survey Questions*, Pew Research Center, https://www.pewresearch.org/our-methods/u-s-surveys/writing-survey-questions/.

[5] For a discussion of weighting, *see How Different Weighting Methods Work*, Pew Research Center, https://www.pewresearch.org/methods/2018/01/26/how-different-weighting-methods-work/.

Section 5

How to Best Deploy Funds for Bolstering Broadband Connectivity

KEY TAKEAWAYS

- State and local policymakers can play many key roles in supporting broadband deployment. From enacting legislation to updating regulations, spearheading planning, and setting broad policy goals, government actions can have profound impacts **–** good **and** bad **–** on network deployment.
- Section 5 of the Tool Kit provides policymakers with insights and recommendations for engaging in the most impactful actions possible vis-à-vis bolstering broadband availability.

5.1.1 WHAT ROLES DO STATE AND LOCAL POLICYMAKERS PLAY IN BOLSTERING BROADBAND AVAILABILITY?

State and local policymakers play many roles in helping to bolster broadband availability. **Section 5** evaluates these myriad roles in more detail and offers resources for state and local policymakers to use as they attempt to enhance broadband availability (an overview of these resources is provided below in **Section 5.1.2**).

In general, **state policymakers** enact legislation, adopt regulations, and set policies that impact numerous decisions by ISPs, including whether to continue investing in existing networks and where to deploy new networks. States can also act to preserve a level playing field for all providers of broadband service, helping to foster intermodal competition on the same or similar terms and conditions for all ISPs (for additional discussion and ideas for such reforms, see **Sections 1.2 and 5.6**).

In addition, state policy can directly impact the costs of broadband deployment (see also **Section 1.3**). For example, states can adjust tax policies to create incentives for investing in certain networking equipment or allow for the recoupment of costs for extending existing networks into unserved areas.[1] Legislation and regulation can also be adjusted to facilitate more cost-effective access to utility poles and public rights-of-way (ROW). These types of adjustments can alter the business case for deployments in unserved and underserved areas and incentivize investment by ISPs.

State policymakers are poised to play a more prominent role in the broadband space as they prepare to receive billions of dollars in funding from the federal government for broadband expansion (for an overview of these funds, see **Section 2**). This section offers state policymakers a range of resources for use in effectively establishing and deploying programs that will allocate funding in support of broadband deployment projects.

Local policymakers also possess the ability to directly impact broadband network deployment. Cities generally have significant authority to manage their ROW and, in the absence of state rules guiding their actions, set prices and processes for accessing these key infrastructure inputs.

Cities and counties can also spearhead inquiries into the state of broadband connectivity at a very granular level. Local officials have a unique point-of-view, allowing them to precisely identify where broadband might remain unavailable in a community, instances in which certain groups are choosing not to adopt broadband despite a connection being readily available, or where digital literacy can be enhanced (*e.g.,* schools).

5.1.2 OVERVIEW OF POLICYMAKER RESOURCES PROVIDED IN SECTION 5

Section 5.2 sets forth **high-level guiding principles for broadband efforts** at the state and local levels. Among other things, these principles highlight the importance of state and local governments not going it alone when seeking to address broadband challenges.

Section 5.3 provides **parameters of effective broadband planning.** Optimal planning processes are collaborative and transparent, ensuring that all voices are heard and that all potential partnerships are explored.

- **Appendix 1** provides a Framework for Effective Broadband Planning
- **Appendix 2** provides Vetting Questions/Due Diligence re firms seeking to assist states and localities with broadband planning & initiatives

Section 5.4 discusses **the roles of public-private partnerships (PPPs) and offers a taxonomy of partnerships** that cities and states might explore when seeking to address specific broadband availability challenges.

Section 5.5 provides **examples of successful and failed PPPs** that have been pursued by state and local government entities in the broadband space over the last few years. Policymakers should study these examples and integrate relevant lessons learned into new partnerships forged going forward.

Section 5.6 underscores **the importance of law and policy reforms in ensuring that broadband deployment gains are made in a timely and sustainable manner.** Targeted reforms can cut costs, unlock additional investment, and speed deployment. Reforms discussed in the section include streamlining access to key rights-of-way (ROW); updating the rules governing how utility poles are leveraged for broadband deployment; and modernizing relevant tax policies.

Section 5.7 examines the **roles that Requests for Proposals (RFPs) and related solicitations can and should play in enhancing broadband availability.** Among other things, this section highlights the importance of developing solicitations in a collaborative and transparent manner.

Section 5.8 provides **a comprehensive checklist to assist state and local policymakers** as they consider how best to use available funding to support broadband deployment.

NOTES

[1] *The Impact of Tax Policy on Broadband Connectivity: The Good, The Bad & The Ugly,* ACLP at New York Law School (Sept. 2015), http://comms.nyls.edu/ACLP/ACLP-Policy-Briefing-Tax-Policy-BB-Connectivity-September-2015.pdf.

KEY TAKEAWAYS

- Before engaging in the nuts-and-bolts of broadband planning, state and local policymakers should study the array of guiding principles evident from successful and unsuccessful broadband projects pursued in the U.S. over the last few decades. These principles revolve around notions of transparency, accountability, and collaboration, and highlight the importance of state and local governments not going it alone when seeking to address broadband challenges.
- The risks of going it alone are evident in the poor track-record of government-owned broadband networks (GONs) (aka municipal or community broadband) in the United States and in the wasteful spending typically associated with duplicative infrastructure deployments (aka "overbuilding").
- Consequently, broadband connectivity issues tend to be most effectively addressed via public-private partnerships (PPPs).

5.2.1 WHAT PRINCIPLES SHOULD GUIDE BROADBAND POLICYMAKING & INITIATIVES?

The following principles are evident from studying an array of successful and unsuccessful broadband connectivity initiatives at the state and local levels:

- **Leverage Accurate Data to the Maximum Extent Possible.** Too often, broadband projects are pursued based on outdated or incomplete data. Fortunately, a torrent of more precise data is forthcoming via the FCC DATA map. This will assist states and localities in more accurately identifying where broadband is and is not available, or where it will soon be available due to an enforceable deployment obligation.. **Section 4** provides an overview of available and forthcoming data sources that should be leveraged whenever possible.
- **Use Data to Identify Real Needs.** When properly collected and analyzed, broadband data can tell an insightful story about connectivity in an area. Policymakers can then respond as appropriate. Going beyond the scope of the real needs laid bare by the data could dilute scarce resources and hinder, rather than encourage, continued connectivity gains.
- **Do Not Go It Alone.** It might be tempting for some states or localities to attempt to solve every problem themselves by, for example, building a municipal broadband system. As discussed below in **Section 5.2.3** and throughout this Section, such projects are fraught with risk. More productive approaches on the supply-side typically revolve around partnerships with expert ISPs.
- **Assure Accountability.** Regardless of the approach taken by a state or locality, it is essential that policymakers assure adequate accountability when any project is undertaken using public funds. This includes accountability on behalf of states and localities themselves to ensure that funds are spent wisely (see **Section 5.3** for additional discussion).
- **Continue to Revisit, Revise, and Reform Policies.** As noted, state and local policymakers can greatly impact broadband connectivity beyond steering funding to deployment projects. To unlock additional private investment in networks, which will be needed to sustain and expand

networks over the long-term, policymakers at the state and local levels should consistently revisit and revise, where appropriate, laws and regulations that no longer reflect modern market dynamics. Additional details are offered in **Section 5.6**.

- **Bottom Line: Your Decisions Matter.** Every action by a policymaker has an impact. This is especially true in the context of allocating grant funding for broadband deployment. It is essential that decision-makers do everything in their power to ensure that the once-in-a-lifetime allotment of federal funding is spent wisely and not gambled on inexperienced or unknown firms.

5.2.2 HOW IS "GOING IT ALONE" RISKY FOR STATES AND LOCALITIES?

In general, actions by policymakers that result in unnecessary government intervention into a broadband market tend to have the most negative impacts. Municipal broadband is the most illustrative example of this dynamic.

Government-owned broadband networks are rarely deployed in unserved areas, where broadband is most needed. To the contrary, municipal broadband has typically been pursued in localities already served by one or more private ISPs.[1] Such overbuilding is wasteful and ultimately pits government against the private sector in competition for customers, something that almost never happens in the provision of other goods and services (the harms of overbuilding are discussed more fully below).

Generally speaking, government is poorly equipped to compete with the private sector. The history of government-owned broadband projects in the U.S. is replete with examples of projects that failed or struggled because a locality could not out-compete private ISPs (examples are included in the **Appendix** below). Private ISPs can adjust prices, enhance offerings, lock-in customers, and otherwise act much more nimbly than government can ever manage.

Other reasons government-owned broadband projects tend to falter or fail include:

5.2.2.1 Unrealistic Business Plans

Most municipal broadband projects are based on business plans developed by consultants who are hired to help cities evaluate the financial feasibility of such projects. Unfortunately, most consultants produce outcome-oriented plans that almost always recommend a GON regardless of what the local data might say (for additional insight, see **Section 5.3**). Moreover, these plans tend to include unrealistic take-rate projections, figures that form the basis for determining long-term financial feasibility.

Proceeding with unfounded assumptions about real consumer demand often proves fatal to a GON, as in cities like Groton, CT, and Mooresville & Davidson, NC. Even a healthy subscribership can sink a GON whose long-term financial success is tied to an unrealistically high projected take-rate. (See the **Appendix**, below, for additional examples.)

5.2.2.2 Tepid Uptake by Customers

Even if a business plan passes muster among local policymakers, there is no guarantee that what appears to be a viable project on paper will translate into real-world success. In practice, convincing enough customers to subscribe is difficult, especially when many people trust their private provider, and not their local government, to deliver reliable broadband service.[2] Accordingly, the history of GONs in the United States is littered with systems that failed to appeal to enough customers.

This dynamic has played out in cities like Provo, UT, and Salisbury, NC. In both cases, the public networks failed to attract enough customers to keep the GON afloat. Provo eventually sold its failed network to Google for $1; Salisbury leased its GON to a private company in the hopes of reviving its business. (See the **Appendix**, below, for additional examples.)

5.2.2.3 Costs of Running a GON Become Burdensome

GONs can encounter financial trouble in several ways. For example, revenues generated from customer subscriptions might be lower than expected due to tepid demand for the GON's broadband offerings. This leads to subpar revenues, which might not be able to pay for the system's operating expenses. If that happens, then the GON will operate with negative net income and require some other source of revenues (*e.g.,* a loan or transfer from the city) to keep the system afloat. Ultimately, the ability of a GON to weather these kinds of financial difficulties is limited vis-à-vis private ISPs, leaving many cities to leverage public funds to prop up a struggling system. In short, a government-run broadband system has much less flexibility than a private ISP to absorb subpar financial outcomes. As such, when too few customers sign up, or when a GON costs more to build and/or operate than initially projected, a city has few choices for adjusting on the fly. The default is to dip into general funds and subsidize the network so that its financial performance can match what was projected in the business plan. (See the **Appendix**, below, for examples.)

The availability of significant federal funding for broadband will do little to reduce the financial risks of building a municipal broadband network. These funds can only be used to build a network; they cannot be used to operate the network (*i.e.,* pay for its operating expenses). Even if a GON can be built without any debt, it must still generate enough revenue to pay its operating expenses and reinvest in the network over the long-term. These recurring costs are substantial and will not abate over time. As such, state and local policymakers interested in pursuing a GON should look beyond the first five or ten years of a network's projected performance and evaluate whether the GON is well positioned to self-sustain over multiple decades.

5.2.2.4 Mismanagement and Corruption

Building, maintaining, operating, and upgrading a broadband network is a complex business. This can prove overwhelming for a city. Mismanagement can reveal itself when a GON struggles or fails because of cost overruns. This happened in Lake County, MN, for example, where a large-scale fiber network was built almost exclusively using government loans. Despite these public funds, the system struggled to finance last-mile buildout, thereby impeding its ability to pay off its loans in a timely manner. Eventually, the system was sold at a $40 million loss.

Bad actors can leverage mismanagement to engage in corruption. This happened in Bristol, VA, where executives of the GON's parent utility were found guilty of kickbacks, bid-rigging, and a range of other corrupt practices that drained money from the system. Eventually, the system was sold at a steep loss. (See the **Appendix**, below, for additional examples.)

5.2.3 WHAT IS BROADBAND "OVERBUILDING" AND WHY SHOULD IT BE AVOIDED?

Overbuilding refers to the use of government funds or other resources to support broadband deployment in areas where broadband infrastructure already exists. The term is used in the context of broadband deployments by private ISPs and public entities and applies to duplicative buildout of middle-mile and last-mile networks.

Overbuilding should be avoided because it shifts funds and focus away from unserved areas and other priorities (*e.g.,* broadband adoption). For decades, there has been broad bipartisan consensus that government resources made available for broadband should prioritize unserved areas. Unfortunately, there have been many instances when government has steered funding to projects that resulted in the deployment of redundant infrastructure (*e.g.*, a second fiber-optic middle-mile network). The result is government subsidization of a new entrant in an already served area. Such projects, as discussed above, rarely succeed.

5.2.4 LOOKING AHEAD, WHAT IS THE BEST WAY FOR STATE AND LOCAL POLICYMAKERS TO BOLSTER BROADBAND AVAILABILITY?

As discussed throughout this Tool Kit, broadband connectivity challenges – on both the supply-side and demand-side – can be effectively addressed via partnerships with expert entities.

In the context of bolstering broadband availability, PPPs can leverage the core competencies of each partner – public partners bring funding to the table and the ability to streamline deployment (*e.g.,* by updating ROW rules), while private partners bring experience in building, running, securing, and upgrading networks.

APPENDIX 1

FAILED, STRUGGLING & UNDERPERFORMING GOVERNMENT-OWNED BROADBAND NETWORKS[3]

GON Location	Outcome
Braintree, MA (*pop. ~39,000*)	Failed – Municipal electric utility sold its broadband system to a private ISP after years of customer losses. The GON couldn't compete with its private counterparts.
Bristol, VA (*pop. ~17,000*)	Failed – Corruption in the parent municipal utility led to the downfall of this GON, which was sold at a staggering $80M loss.
Burlington, VT (*pop. ~44,000*)	Failed – GON was unable to financially self-sustain, forcing the city to prop it up and resulting in credit downgrades. The GON was sold at a loss.
Dunnellon, FL (*pop. ~2,000*)	Failed – Tepid customer demand resulted in almost immediate financial instability. The city sold the GON at a $7M loss.
Groton, CT (*pop. ~9,500*)	Failed – Tepid customer demand resulted in almost immediate financial instability. The city sold the GON at a $30M loss.
KentuckyWired (*pop. ~4,500,000*)	Underperforming – Massive statewide middle-mile project was delayed and overbudget, requiring additional state funds on several occasions. To date, it has yet to partner with ISPs for the delivery of promised last-mile service.
Lake County, MN (*pop. ~11,000*)	Failed – This GON faced numerous financial issues, resulting in a sale at a $40M loss.
MassBroadband123 (*pop. ~7,000,000*)	Underperforming – The initial goal for this state-owned middle-mile network was to support GONs. That proved unworkable, so the state shifted its focus to partnerships with established private ISPs to expand networks into unserved areas.
Mooresville & Davidson, NC (*pop. ~65,000*)	Failed – This multi-city GON was unable to attract enough subscribers to make the financials work. It was sold at a $10M+ loss.
Monticello, MN (*pop. ~14,500*)	Struggling – Once cited as a success, this GON has struggled to gain market share, leading it to miss debt payments. The city has leased the network to a private entity.
Opelika, AL (*pop. ~31,000*)	Failed – This city utility-led GON failed to generate enough revenues to self-sustain, forcing its sale to a private entity at a $29M loss.
Pitcairn, PA (*pop. ~3,200*)	Failed – This municipal cable system failed to keep pace with offerings by nimbler and more innovative private counterparts. The city elected to shut down the system.
Provo, UT (*pop. ~115,000*)	Failed – This once-touted GON failed to generate much consumer interest, resulting in financial troubles. The city sold the assets to Google for $1, representing a $40M loss.
Quincy, FL (*pop. ~8,000*)	Failed – The city deployed this GON to "take charge of its future." Instead, the GON failed to attract enough subscribers, which led the city to shut it down.
Russell, MA (*pop. ~1,800*)	Failed – This municipal cable system was sold to a private ISP because the city could not keep pace with the investments needed to upgrade the network.
Salisbury, NC (*pop. ~35,500*)	Struggling – This GON never achieved the subscribership necessary to self-sustain, necessitating cash infusions from the city. The GON is now operated by a private ISP.
UTOPIA, UT (*pop. ~525,000*)	Underperforming – This multi-city open access GON has struggled for decades to complete its initial buildout commitments, leaving some household unserved 20 years after being initially promised service.

NOTES

[1] *See, e.g.,* Community Networks, Map, https://muninetworks.org/communitymap.

[2] *See, e.g.*, Sam Sabin, *About Half the Public Thinks Local Governments Should Be Able to Pursue Their Own Broadband Network Build-Outs*, April 26, 2021, Morning Consult, https://morningconsult.com/2021/04/26/municipal-broadband-private-isps-poll/.

[3] Source data for each example is on file with the ACLP.

KEY TAKEAWAYS

- Deliberate, data-driven, and inclusive broadband planning is critical to guiding the wise and efficient investment of government resources.
- Optimal planning processes are collaborative and transparent, ensuring that all voices are heard and that all potential partnerships are explored.
- Cities and states must be cautious when engaging third-parties to assist in broadband planning and should thoroughly vet potential partners.

5.3.1 WHY IS THE BROADBAND PLANNING PROCESS IMPORTANT?

Broadband projects of any size are complex and expensive undertakings that implicate a host of technical, financial, legal, and consumer issues. Successful outcomes hinge on careful planning to ensure that every aspect of a project is addressed and that, in the event a disruption occurs, there is a plan in place to address it.

State and local policymakers regularly spearhead broadband planning inquiries. These take many forms, including hearings, working groups, or formal commissions chartered to develop recommendations and plans for addressing specific connectivity issues. These can also include informal discussions with ISPs, businesses, community groups, and others to gather anecdotal data about the state of connectivity.

Over the last few years, planning activity has increased at the local level as cities and counties evaluate whether and how to use Coronavirus Recovery Funds made available by the American Rescue Plan Act.[1] Some localities have invested available funding to hire consultants to guide their planning processes, an approach that could yield suboptimal outcomes if essential precautions are not taken (see below for further discussion). Others have leveraged existing city or county bodies – *e.g.,* City Council committees – to identify priorities and the most efficient ways of addressing them (for examples, see **Section 5.5**).

State broadband planning efforts will ramp up considerably as funding for the Broadband Equity, Access & Deployment (BEAD) Program, overseen by the National Telecommunications & Information Administration (NTIA), rolls out over the next few years (for an overview of BEAD, see **Section 2.3**). States will have to develop plans and related materials for submission to NTIA before they can receive and disburse grant funds for broadband deployment.[2]

In general, state planning in the context of BEAD will be focused primarily on detailing how funding will be used to facilitate broadband deployment to unserved areas.[3] These efforts generally align with much of the ongoing broadband planning efforts at the local level, although some localities are unwisely electing to spend funds on overbuilding duplicative infrastructure (see **Section 5.2**).

This section articulates best practices and guiding principles for state and local policymakers seeking to engage in an inclusive and robust planning process. Doing so will ensure that the planning process identifies real broadband challenges and deploys feasible solutions.

5.3.2 WHAT FACTORS CONTRIBUTE TO SUCCESSFUL BROADBAND PLANNING?

A high-level Framework for effective broadband planning is included in **Appendix 1**. The Framework reflects several core best practices that should inform and shape any broadband planning process. These best practices encourage state and local broadband planning processes to be:

- **Inclusive**. Planning processes should be a vehicle for bringing all stakeholders – incumbent ISPs, potential new ISPs, businesses, community groups, etc. – together for solution-focused dialogues. Too often, planning is an insular undertaking that pits parties against each other from the start. A better approach is to be inclusive from the outset so that every perspective is heard and weighed equally in the outcome.
- **Transparent**. Planning should happen in the sunshine to the maximum extent possible. Planning should not occur behind closed doors. Being transparent throughout the entire planning process – from pre-planning, through its formal launch and during the drafting of a plan or recommendations – will ensure that the public is apprised of what will likely be a substantial project that will impact them. Healthy, public, data-driven debates will enhance outcomes.
- **Collaborative**. The third major step is collaboration – *i.e.,* actively working with stakeholders to forge partnerships and other joint efforts aimed at bolstering broadband availability. Proceeding with a collaborative mindset from the outset will help to steer planning efforts towards recommendations and projects that include PPPs, which, as discussed in **Sections 5.4 and 5.5**, are the optimal approach to addressing many connectivity issues. Conversely, beginning a planning process with an outcome already in mind – or hiring a consultant with a history of recommending a single "solution" to broadband challenges – makes collaboration difficult.
- **Data-Driven.** Gathering insight and as much relevant data as possible from stakeholders during the planning process is essential to precisely identifying which parts of a city or state remain without robust broadband availability or where broadband adoption is lagging. These data should be supplemented with as much additional information as possible – information ideally gathered from trusted sources (for an overview of these sources, see **Section 4.3**).
- **Cautious**. Broadband planning can attract a wide range of firms interested in working with a state or local government in the pursuit of better broadband connectivity. Some of these firms are established entities, like incumbent ISPs or local chambers of commerce, which might bring valuable ideas and data to the table. A range of other firms, though, might only be interested in potential paid opportunities (*e.g.*, generating a feasibility study) and not in working with a city or state to improve its long-term wellbeing. States and cities should proceed cautiously when engaging with firms that might be pursuing one-off opportunities.

5.3.3 HOW CAN DECISIONMAKERS THOROUGHLY VET THIRD PARTIES SEEKING TO DO BUSINESS WITH A CITY OR STATE AS PART OF ITS BROADBAND PLANNING?

Many cities and states hire third-parties to assist with broadband planning. Such entities typically include:

- **Consultants,** which are tasked with spearheading development of a broadband master plan or a GON feasibility study;

- **Survey firms,** which might assist a consultant in gathering public input regarding the state of broadband connectivity in an area; and
- **Engineering firms,** which might help a city or state inventory key assets for use in bolstering broadband availability.

Many of these firms specialize in broadband planning, and some have developed reputations for delivering the same or similar recommendations and work-product across very different markets (*e.g.,* firms that always recommend a GON or a particular model for facilitating new market entry). In addition, some firms seek to profit from an engagement with a city or state in multiple ways – *e.g.,* by securing a contract to develop a study that eventually recommends a GON, and then bidding on the contract to design and/or build the system that the firm itself recommended. This dynamic does little to help develop plans reflecting the myriad nuances in connectivity likely evident in a city or state. Accordingly, *it is critically important that state and local policymakers proactively vet the entities they are engaging to help in the planning process.*

To assist in this vetting, questions that might be posed to these entities – either as part of the bidding process (*e.g.,* as a questionnaire included in an RFP) or as a requirement to be completed during the contracting stage (*i.e.,* after the RFP process but before formally locking in a contract) – are included in **Appendix 2**. Additional considerations that might inform the RFP process are detailed in **Section 5.7**. These questions are designed to elicit important information regarding the track-record and motives of a firm under consideration.

5.3.4 WHAT IS THE SIGNIFICANCE OF CYBERSECURITY ISSUES IN BROADBAND PLANNING?

The questions in **Appendix 2** also touch on an emerging issue of critical importance: *cybersecurity.* There have been numerous recent examples of city and state government websites being hacked by bad actors. Some critical systems, like hospital networks, have been forced offline for weeks. The generally poor track record of public IT systems is highly relevant in the context of discussions regarding a possible government-owned broadband network or other government-led broadband project.

As such, it is critical that state and local policymakers ensure that whatever entity may be assisting them in the development of their broadband plans has an operational understanding – *and visible track record* – regarding the many legal, technical, financial, and operational issues implicated by rising and ever-evolving cybersecurity threats facing governments across the country.

It should also be noted that NTIA included a range of cybersecurity-related requirements in its BEAD program, reiterating the importance of this issue.[4] However, NTIA set a low threshold for vetting firms on these key parameters. NTIA allows states to allocate grants to firms with little or no experience with cybersecurity issues so long as those firms have a cybersecurity plan that is "ready to be operationalized upon providing service."[5] When designing their BEAD grant programs, states should strive to exceed NTIA's minimum threshold and prioritize applicants that have a demonstrated track-record of success vis-à-vis deploying cybersecurity plans and successfully thwarting cyber-attacks.

APPENDIX 1

FRAMEWORK FOR EFFECTIVE BROADBAND PLANNING

Identifying Broadband Challenges

1. **Collaboration is Key**. Has the city sought to engage all stakeholders, including ISPs, to gather input regarding where broadband connectivity challenges might exist?
2. **Data is Essential**. Has the city gathered sufficient information to pinpoint where broadband might be unavailable?
3. **Partnerships Can Be Impactful**. Has the city explored potential partnerships with ISPs to address lingering connectivity issues in unserved areas?
4. **Precision Will Yield Optimal Outcomes**. Have broadband plans, RFPs, and related documents been tailored to address the specific needs identified by this process?

Carefully Vetting Vendors

5. **Know Your Consultant.** To the extent a consultant is needed, has the city endeavored to learn as much as possible about its potential partner (for an in-depth set of questions that might be posed to consultants, see **Appendix 2**, below)?
6. **Understanding Broadband.** Does the city understand the many different broadband deployment models, technologies, and techniques currently in use? If not, has it developed a plan for educating itself and the public about these issues?
7. **Protecting the City's Interests.** Has the city developed robust contractual language for engaging third-parties?

Successfully Developing & Executing a Plan

8. **Deploy a Public Process for Finalizing a Plan of Action.** Have residents, businesses, ISPs, anchor institutions, and other stakeholders had an opportunity to offer feedback on the plan throughout its development and finalization?
9. **Submit Plans for Independent Review.** Has the city developed a process for having broadband plans, engineering designs, financial pro forma, etc. reviewed for accuracy by an independent third-party?
10. **Assuring Adequate Accountability.** Has the city explored requiring partners to indemnify it against losses stemming from a proposed joint broadband project? Has the city explored similar accountability mechanisms for other vendors?

APPENDIX 2

QUESTIONS TO ASK OF FIRMS SEEKING TO ASSIST IN BROADBAND PLANNING

1. **How many cities has your firm worked with on broadband issues?**
    a. How many cities has your firm sought to work with on broadband issues?
    b. How many cities have turned down your firm's overtures? Why did those cities elect not to work with your firm?
    c. Of the markets in which your firm recommended action be taken, what proportion followed through with those recommendations?
2. **How many of your firm's recommended broadband projects/networks have:**
    a. Lasted more than 10 years?
    b. Failed?
    c. Operated at a loss? Have any required cash infusions from a city or other source to balance their books?
3. **How often do your networks experience an outage?**
    a. How long does it typically take to get your networks back up and running?
    b. What are some of the best practices that your firm deploys to ensure that your networks are as resilient and reliable as possible?
    c. Do you have uptime data available for your networks?
    d. To the extent business service is provided, do your networks guarantee a level of uptime?
4. **What is your firm's experience in deploying advanced cybersecurity measures?**
    a. Have any of your networks performed a cybersecurity audit?
    b. How do you regularly assure compliance with cybersecurity standards?
    c. Have any of your networks or IT systems experienced a cybersecurity breach?
5. **What is your track-record vis-à-vis achieving:**
    a. Projected take-rates for a government-owned broadband network?
    b. Projected revenue goals for a GON?
    c. On-time completion of GON buildouts?
    d. On-budget completion of GON buildouts?
6. **How does your firm develop financial pro forma?**
    a. Does your firm subject its pro forma to outside review?
    b. Does your firm's pro forma consider sensitivity to variables such as operating expenses, take-rates, likely competitive response by incumbent ISPs?

c. Has your firm compared, on aggregate, the accuracy of its pro forma against actual performance of deployed networks?

7. How does your firm estimate take-rates?

a. If your firm relies on surveys, what level of experience does your firm have in designing these surveys? Or does your firm contract out their design? How does your firm assure statistical rigor and representative sampling? Are surveys subject to peer-review prior to putting them out in the field?

b. If your firm uses other methods, can you describe what those are and the extent to which they produce robust, reliable, and representative results?

c. On aggregate, how accurate have your firm's take-rate projections been for deployed networks?

8. Does your firm work/contract/consult with third-parties or other vendors when conducting feasibility studies, developing a business plan, designing a network, and/or building a network? If so, do these relationships involve payments among the firms?

9. Are any of your firm's principals materially involved in other broadband-related businesses, such as construction services, equipment vendors, ISPs, etc.?

a. If so, how does your consultancy prevent conflicts-of-interest?

10. How often does your firm bid on multiple aspects of a project – *e.g.*, to develop a feasibility study and then to design or build the network recommended in the study?

a. If your firm regularly bids on multiple aspects of a project, what measures, if any, do you take to assure objectivity in each phase?

11. Other than risk to your reputation, how is your firm vested in the long-term success of network projects?

a. Does your firm track the long-term performance of networks for which they provided consulting services?

b. Does your firm provide any form of guarantee or recourse mechanism should networks encounter financial, technical, or operational issues? Does your firm require some type of hold-harmless agreement before it provides consulting services?

c. Would you be willing to indemnify a city should a network proposed by your firm fail, struggle, or otherwise fail to meet its projected targets/goals?

NOTES

[1] For an overview, *see* Coronavirus State and Local Fiscal Recovery Funds, U.S. Dept. of Treasury, https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-funds.

[2] For an overview of this process, *see An Overview of the Infrastructure Investment & Jobs Act's BEAD Program,* ACLP at New York Law School (Dec. 2021), https://digitalcommons.nyls.edu/cgi/viewcontent.cgi?article=1000&context=reports_resources.

[3] States that request and receive funding to assist in these planning efforts must develop a 5-Year Action Plan, the requirements of which are set forth in Section 60102(e)(1)(D) ARPA. To receive the first tranche of funding for broadband deployment, states must then submit an Initial Proposal, the requirements of which are set forth in Section 60102(e)(3)(A) of ARPA. To receive the remaining funds for broadband deployment, states must submit a Final Proposal, the requirements of which are set forth in Section 60102(e)(4)(A) of ARPA. For additional information, *see generally BEAD NOFO.*

[4] *BEAD NOFO* at p. 70.

[5] *BEAD NOFO* at p. 70.

KEY TAKEAWAYS

- Public-private partnerships (PPPs) leverage public resources and private expertise to address specific challenges.
- PPPs involving established ISPs are the most effective means to address most broadband connectivity challenges.

5.4.1 WHAT IS A PUBLIC-PRIVATE PARTNERSHIP (PPP) AND HOW ARE PPPs USED TO BOLSTER BROADBAND CONNECTIVITY?

A public-private partnership (PPP) is an arrangement where government resources (*e.g.,* funding; right-of-way (ROW) access) are used as the basis for engaging a private-sector entity to accomplish a shared objective.

PPPs are common in the U.S. and are regularly used to pursue a range of infrastructure initiatives. The flexibility of PPPs allows partners to craft unique agreements that address very specific needs. As such, and because of the benefits that accrue to public and private partners (discussed below), PPPs have become ideal vehicles for addressing a range of broadband connectivity issues.

Public-private partnerships are being pursued by state and local government to, among other things:

- **Expand Existing Broadband Infrastructure.** Cities and states work with incumbent ISPs to identify ways for extending networks into unserved areas.
- **Facilitate the Deployment of New Broadband Infrastructure.** Cities and states make available resources needed to encourage new network deployment in certain areas (*e.g.*, funding; ROW access; poles; etc.).
- **Pursue Smart City Services**. Cities engage ISPs and other vendors to deliver smart city applications over private networks built atop public ROW.
- **Enhance Broadband Adoption and Digital Literacy**. Cities and states leverage the expertise of ISPs, nonprofits, and others in the delivery of affordable connectivity options and supplemental training services (demand-side issues are addressed in **Section 6**).

The array of broadband PPPs is discussed below. Illustrative examples of successful and unsuccessful PPPs are offered in **Section 5.5**.

5.4.2 HOW EFFECTIVE ARE PPPs AT IMPROVING BROADBAND CONNECTIVITY?

PPPs offer a highly effective approach to enhancing broadband connectivity because they leverage the unique strengths of both public and private partners. This combination fosters a collaborative environment that maximizes the likelihood of PPP projects delivering significant gains to consumers.

For the public partner, benefits of a PPP include:

- **Reduced Risk**. PPPs reduce a city or state's risk exposure. Electing to address broadband connectivity issues directly via government intervention (*e.g.*, in the form of a GON) entails significant risk – in the form of debt, developing and successfully implementing a viable business

model, keeping up with long-term operating expenses, out-competing nimbler private-sector counterparts, etc. A PPP, on the other hand, allows a city or state to offload much of the financial and operational risk to a private partner. Private partners have significant experience shouldering and managing such risks.

- **Optimized Investment**. PPPs help ensure that finite public resources are put to their best uses. Oftentimes, PPPs require less capital to achieve connectivity goals than building a GON or pursuing a similarly ambitious project. Indeed, many broadband PPPs entail the use of both public and private funds, which means that a city or a state can free up funding for other, more pressing needs (*e.g.*, modernizing public infrastructure like roads, bridges, and dams; improving schools; bolstering public safety; shoring up pension funds; etc.).

- **Timely Achievement of Connectivity Goals.** PPPs can be narrowly tailored to target specific areas for broadband enhancement. These agreements can steer needed resources (*e.g.*, funding) to support network expansion or the deployment of new infrastructure. Such precision in the deployment of resources helps to achieve connectivity goals more quickly. In contrast, electing to build a GON from scratch takes many years, and there is no guarantee that a public network will succeed given the rocky history of municipal broadband in the U.S. (see **Section 5.2** for additional information).

  Since the onset of the COVID-19 pandemic, two factors – supply-chain disruptions and workforce issues – have delayed broadband deployment in some instances. As a result, ISPs without adequate resources to work around these issues have had difficulty sourcing the materials (*e.g.*, fiber cabling; network equipment) that undergird networks and hiring enough skilled workers to build systems.[1] Notwithstanding these challenges, established ISPs have generally been able to continue building and upgrading their networks, further underscoring their value as lead partners in broadband-focused PPPs. As part of the NTIA BEAD program, states will be able to give greater weight to applications involving entities that have robust plans in place to address supply chain and workforce-related issues.[2] States should seek to prioritize applications from established ISPs so that broadband deployments supported by BEAD funds are not unduly delayed.

- **Enhanced Relationships with ISPs**. PPPs are a means of forging more constructive relationships between government and ISPs. Both public and private stakeholders have deep roots in the communities they serve. ISPs have a significant interest in forging productive, solution-oriented relationships with localities and states.

- **Government as Convener**. An optimal role for both state and local governments in the broadband context is as a convener of stakeholders. Bringing parties together enhances planning and strategy development and ensures that whatever solutions are ultimately deployed have buy-in from all involved (see **Section 5.3**).

For the private partner, benefits of a PPP include:

- **Enhanced Relationships with Cities and States.** Working together via a PPP can enhance the relationship between ISPs and their government partners. Indeed, these partnerships can be a valuable vehicle for ISPs to demonstrate to a city or a state their commitment to helping achieve shared goals for broadband connectivity. This can be helpful in reframing how officials view and engage with ISPs. Forging a collaborative working dynamic can facilitate modernized regulatory frameworks, streamlined administrative processes, and related reforms that can

unlock additional investment, lower deployment costs, and deliver better, more affordable service to consumers.

- **Accessing Resources to Make Deployment More Economic.** PPPs can help ISPs extend networks into areas that would otherwise be uneconomic to serve (see **Section 1.3** for a discussion of the economics of broadband deployment). This is a "win" for all involved: cities and states can leverage a relatively small amount of funding, supplemented by ISP investment, to bridge availability gaps; ISPs use the funds to offset its costs and speed buildout; and, most importantly, consumers are able to access quality, affordable connections.
- **Expanded Footprint**. PPPs focused on enhancing availability result in the expansion of an ISP's service footprint, which helps to generate additional revenues that can be reinvested across the network. This positive feedback cycle ultimately benefits all customers of an ISP.
- **Set a Positive Precedent for Future Collaborations.** Successful PPPs can eventually translate into additional partnership opportunities between the partners. For example, cities and ISPs could leverage these enhanced relationships to facilitate smart city projects, serve anchor institutions, develop low-cost broadband programs, and launch collaborative digital literacy training efforts.

5.4.3 HOW CAN CITIES AND STATES ENSURE THAT THEY SELECT THE RIGHT PARTNER?

As noted in **Section 5.3**, broadband projects can attract a range of respected and fledgling firms seeking to tap into public funding. Cities and states should deploy the resources in this Tool Kit to thoroughly vet potential partners.

As an overview, the following factors should be considered by state and local officials when selecting PPP partners:

- **Expertise**. Is the prospective partner truly an expert in broadband network buildout? Is there evidence that the ISP has the technical, operational, and financial expertise to help the city/state achieve its goals? NTIA has identified these as key factors for states to take into account when allocating BEAD grants.[3]
- **Track Record.** Does the prospective partner have an established track record of successfully building, maintaining, operating, and upgrading a network? Of providing reliable service to customers? Of providing helpful customer service? NTIA has identified these as key factors for states to take into account when allocating BEAD grants.[4]
- **Scale.** Is the prospective partner ISP sufficiently established to achieve economies of scale in the delivery of its services? Such can greatly reduce the amount of capital needed to expand networks and lower prices for consumers.
- **Security & Resilience**. Is the prospective partner able to secure the network it is looking to build with the city/state? Does the ISP have experience in deploying cybersecurity solutions? Protecting users' data and privacy? Hardening its assets against storms and other natural disasters? Addressing outages in a timely manner? NTIA has identified these as key factors for states to consider when allocating BEAD grants.[5]

- **Community Roots.** Is the ISP a known quantity in the community? If not, what are the ISP's bona fides in the markets where it currently provides service?
- **Commitment to Competing on a Level Playing Field**. Is the ISP willing to offer its services on a level playing field with other competitors? Or is it seeking special concessions and other advantages to facilitate its entry into the market?

5.4.4 WHAT ARE THE PPP MODELS THAT MIGHT BE EXPLORED BY A CITY OR STATE INTERESTED IN FACILITATING BROADBAND DEPLOYMENT?

The following chart (1) describes seven major categories of PPP models that cities and states might explore vis-à-vis bolstering broadband availability; (2) details the roles of cities/states and partner ISPs; and (3) identifies potential pros and cons.

OPPORTUNITY	CITY/STATE ROLE	ISP ROLE	PROS & CONS
Request for Proposals (RFP) (See **Section 5.7** for additional information)	- Issuer of RFP, which details a city/state's goals for broadband connectivity - Apply scoring criteria to identify winning bid - Develop contract that will guide partnership	- Engagement could help shape an RFP that precisely targets discrete connectivity challenges - Respondent to RFP, proposing parameters of a potential partnership	*Pros:* RFPs are a widely used tool for establishing PPPs, so there is broad familiarity with what is expected of potential partners *Cons:* once responses are submitted, RFP processes are rarely transparent
Smart City	- Facilitator of smart city deployment – *e.g.,* providing ROW access; making funding available; sharing revenues derived from certain offerings; etc. - Anchor tenant/user of smart city systems	- Lead partner in building the network that will enable smart city services - Direct provider of certain services; facilitator of others	*Pros:* a PPP in the smart city context is best because leveraging existing broadband infrastructure is most efficient, and can lead to additional deployment (*e.g.,* by extending existing networks into unserved areas to assure smart city apps are universally available) *Cons:* partnering with an inexperienced firm could raise cybersecurity and privacy concerns

OPPORTUNITY	CITY/STATE ROLE	ISP ROLE	PROS & CONS
State Grant Program	- States leverage BEAD funding to bolster broadband deployment to unserved areas (some states have also allocated general revenues and federal funds via ARPA to launch grant programs; BEAD funds will supplement those) - States set program criteria; for BEAD, criteria is vetted and approved by NTIA, setting forth terms and conditions for using funds to build networks, etc.	- ISPs apply for grant funding - Awardee of grant funding, subject to the requirements and commitments attached to the public dollars by the state and/or NTIA - Provider of data to the state to track progress - Provider of broadband services in new markets, bringing the unconnected online	*Pros:* grant programs are now the primary means of facilitating broadband expansion, which means many programs have become efficient and impactful on this front *Cons:* some states have attempted to use these programs as a means of achieving broad policy goals (*e.g.,* enhancing competition), which, in practice, can result in inefficient outcomes (*e.g.,* wasteful overbuild)
Network Expansion	- Locality leverages funding (*e.g.,* CARES, ARPA) to support network expansion in unserved and underserved areas (see **Section 2.2** for a funding overview) - Locality develops the terms and conditions governing how these funds can be used	- ISPs work with local officials to develop a PPP that allows for the expansion of an existing network on mutually beneficial terms and conditions - ISPs educate officials about the importance of working with an established firm, especially vis-à-vis security, resilience, and long-term viability	*Pros:* localities and partner ISPs are well positioned to collaborate in the identification of where broadband remains unavailable *Cons:* some localities are using available funding to pursue GONs, eschewing the proven PPP model in favor of riskier, unproven, and oftentimes unnecessary market interventions
Dark Fiber/Conduit Lease	- Locality invests funding (*e.g.,* tax revenue; debt; federal funding) to build a dark fiber or dark conduit network in an effort to introduce competition in the market - Locality seeks partner ISPs to leverage those resources to serve residents and/or businesses	- Potential anchor tenant/lessee of these publicly-owned assets	*Pros:* puts underused assets to productive use; potential revenue generator for a city *Cons:* oftentimes these assets are deployed in served markets, resulting in wasteful overbuild. In addition, there is little evidence that this approach to broadband expansion is viable over the long term

OPPORTUNITY	CITY/STATE ROLE	ISP ROLE	PROS & CONS
New Market Entry	- Locality expresses interest in facilitating market entry by offering concessions and other special considerations to ISPs - Provides ISP with low cost or free access to ROW and otherwise facilitates unique offerings to potential new entrants (*e.g.,* single point of contact; free office space; streamlined permitting)	- Party to special agreements with cities to enter a market on terms and conditions that are different from those of incumbent ISPs - Investor in new network infrastructure	*Pros:* a new ISP enters a market, providing consumers with additional choices *Cons:* failure to extend special concessions to all ISPs unnecessarily tilts the playing field in favor of the new entrant and undermines the incentives of incumbent ISPs to continue investing, all of which negatively impacts consumers
Regulatory Reform	- City/state indicates that it is open to addressing legal/regulatory barriers that impede investment and network expansion	- ISPs are critical partners in identifying rules and regulations that need to be modernized (*e.g.,* pole-related issues; ROW access) and describing how reforms will impact investment levels (for additional discussion, see **Section 5.6**)	*Pros:* updating rules to reflect modern market dynamics can unlock significant new investments and potentially invite new entrants, all of which benefits consumers immensely *Cons:* none, so long as the reforms maintain a level playing field by being generally applicable to all ISPs

NOTES

[1] *See, e.g.,* Deborah Kish, *The Vicious Cycle of Supply Chain in Fiber Broadband – Is an End in Sight?*, Broadband Communities (Nov./Dec. 2021), https://www.bbcmag.com/community-broadband/the-vicious-cycle-of-the-supply-chain-in-fiber-broadband-is-an-end-in-sight; Diana Goovaerts, *Broadband Providers Have a People Problem on Their Hands,* May 26, 2022, Fierce Telecom, https://www.fiercetelecom.com/telecom/broadband-providers-have-people-problem-their-hands.

[2] *See, e.g., BEAD NOFO* at p. 70-71.

[3] *See, e.g., BEAD NOFO* at p. 71.

[4] *See, e.g., BEAD NOFO* at p. 71.

[5] *See, e.g., BEAD NOFO* at p. 71.

KEY TAKEAWAYS

- In general, PPPs offer the most effective way to address broadband connectivity challenges. However, not all PPPs are created equal.
- A substantial number of broadband-related PPPs have been launched in the U.S. over the last decade. Policymakers should learn from successful and failed PPPs and integrate lessons learned into new partnerships going forward.

5.5.1 WHAT IS THE TRACK RECORD OF PPPS IN BOLSTERING BROADBAND AVAILABILITY?

In general, PPPs have demonstrated significant viability in addressing supply-side broadband issues across the country. One measure of their broad acceptance as one of the most impactful tools on this front is the number of state grant programs that steer funding to such partnerships. By the end of 2021, some 44 states had established such grant programs; by the end of 2022, it is likely that every state will have a grant program of some kind since such programs will play key roles in the disbursement of BEAD funding.[1] (For additional discussion of state broadband programs, see **Section 3**.)

Another measure of the popularity of PPPs in this space is the number of partnerships being forged by localities allocating ARPA funding in support of them. Dozens of such projects involving expert ISPs were launched in 2021 and 2022. Examples of these and other recent PPPs are provided below.

Do all PPPs succeed? Not every PPP succeeds. Indeed, there have been many examples of PPPs that have failed or struggled to achieve their stated goals. Illustrative examples of successes and failures are provided below.

5.5.2 WHAT FACTORS IMPACT A PPP'S LIKELIHOOD OF SUCCESS?

The success or failure of a PPP hinges on:

- **The Scope of the PPP**. Successful PPPs address specific broadband challenges (*e.g.*, extending networks into an unserved area); unsuccessful PPPs attempt to do too much, oftentimes resulting in wasteful overbuild (*e.g.*, duplicative middle-mile networks).
- **The Partners Involved.** Successful PPPs leverage the expertise of experienced ISPs; unsuccessful PPPs often involve untested or inexperienced ISPs.
- **Enforcement of Accountability Measures.** Successful PPPs are typically governed by carefully developed contracts that include robust monitoring provisions to assure accountability; unsuccessful PPPs usually have similar provisions in place but oversight entities (*e.g.*, a government agency) might not be aggressive enough in enforcing those protections.

5.5.3 WHAT ARE SOME EXAMPLES OF PPPS THAT HAVE SUCCESSFULLY BOLSTERED BROADBAND CONNECTIVITY?

The following provides illustrative examples of several successful PPPs that have been pursued in recent years (for more information on each model, see **section 5.4**).

5.5.3.1 Bringing Service to Underserved Areas

In Vanderburgh County, Indiana, officials collaborated with AT&T to forge a PPP that will bring fiber broadband service to 20,000 previously underserved households.[2] The PPP revolves primarily around funding: AT&T will fund 75% of the $40 million buildout; the county will use nearly $10 million in ARPA funds to cover the remaining 25%.[3] The County spearheaded the PPP by initially issuing an RFP, to which AT&T responded and was eventually selected as the winner.[4] The contract governing the PPP identifies numerous additional areas where the parties will collaborate and leverage their core competencies to facilitate deployment – *e.g.,* the County promises to assist in securing permits and ROW access as needed.[5]

5.5.3.2 Extending Networks into Unserved Areas

In Florence County, South Carolina, officials forged a partnership with Charter Communications to extend broadband infrastructure into unserved parts of the county.[6] The county is using $4.5 million in ARPA funding to seed this partnership; Charter has committed to investing an additional $9.3 million.[7] The goal is to bring broadband service to 3,320 unserved households in the county.[8] The contract governing this PPP includes reporting mechanisms and commitments by the county to assist in securing necessary permits and other permissions related to building the infrastructure.[9]

5.5.3.3 Enhancing Access Opportunities for Low-Income Students

To ensure that low-income schoolchildren in Oakland, California, had robust access to broadband during the pandemic, T-Mobile partnered with the city to deliver wireless hotspots to some 35,000 students across the city.[10] T-Mobile has replicated this model in numerous cities across the country, helping to connect more than three million students to the internet over the last few years.[11]

5.5.3.4 Smart City PPP

Cox has partnered with a handful of cities to deploy smart city offerings. For example, it has worked with Las Vegas on several projects. Initially, the two partnered to "trial its smart curbside management solution…aimed at reducing automobile traffic congestion."[12] More recently, the two have built on the initial partnership to launch a new pilot program that will leverage a private wireless network deployed and managed by Cox to enable "video cameras and radar sensors" to "gather data related to usage, parking lot activity and other real-time feedback" stemming from a major local park.[13]

5.5.4 WHAT ARE SOME EXAMPLES OF PPPs THAT HAVE FAILED TO BOLSTER BROADBAND CONNECTIVITY OR OTHERWISE NEGATIVELY IMPACTED THE BROADBAND SPACE?

The following provides illustrative examples of several unsuccessfully deployed PPP models (for more information on each model, see **section 5.4**).

5.5.4.1 Duplicative Network Deployment

There have been numerous examples of states and localities electing to use public funding to support the deployment of redundant broadband infrastructure. As noted in **Section 5.2**, such overbuilding is wasteful because the duplicative networks built in this manner often struggle or fail when in direct competition with more experienced private ISPs. In addition, funds invested in the overbuilding of networks leaves less money for projects in unserved areas.

Many examples of failed PPPs on this front involve middle-mile broadband projects (see **Section 1.2** for an overview of the middle-mile and the role it plays in broadband delivery). These projects involved the use of public funds by a government entity to build a fiber-optic middle-mile network that would be offered for lease to private ISPs for use in delivering last-mile service. These projects struggle to attract partner ISPs because middle-mile infrastructure tends to already be available, thereby limiting demand among established ISPs.

Prominent examples of middle-mile projects that have struggled or failed because the infrastructure represented unnecessary overbuilding include:

- **KentuckyWired,** a $1.5 billion statewide middle-mile project that was launched to facilitate last-mile broadband service in unserved and underserved rural areas.[14] The project has gone significantly over-budget and was delayed for many years.[15] It is now mostly complete, but it has yet to forge meaningful partnerships with ISPs for the delivery of last-mile service.
- In 2009, a consortium of entities in Colorado successfully secured federal grant funding to build **EAGLE-Net,** a statewide middle-mile fiber network aimed at connecting every school district in the state and providing connectivity to various anchor institutions.[16] This $135 million project struggled from the start. Indeed, as the network was being built, it quickly became clear that, in many places, the infrastructure would be placed near existing middle-mile assets. Rather than "identify[] and adapt[] to these market changes, EAGLE-Net plowed forward," overbuilding private infrastructure and eventually triggering a federal investigation.[17] The investigation concluded that the project was engaging in inefficient overbuild, which contributed materially to the network's financial struggles.[18] Eventually, a private entity was engaged to "take[] over the responsibility of managing Colorado's beleaguered EAGLE-Net."[19]
- In 2009, 14 North Florida county governments and eight municipalities came together to build a "1,200-mile fixed wireless broadband network" that would connect "more than 300 community anchor institutions at speeds of 10 Mbps to 1 Gbps," all in an effort to "enhance economic development, education, and public services throughout the region."[20] The **North Florida Broadband Authority (NFBA)** received $30 million in federal grant funding to begin the project; the remaining $9 million was to come from members of the consortium.[21] Almost immediately, the NFBA project became financially unsustainable, due in large part to project mismanagement.[22] In response, the federal government froze its funding in September 2011 and opened an investigation.[23] Shortly thereafter, the project was described as stable and almost complete.[24] However, by 2013, a private entity was tapped to take over due to a "shortage of customers."[25] That entity "pulled out within a year after sourcing on the prospects of making a profit."[26] As a result, the network quickly became defunct – equipment was not maintained, making the system "unreliable" and forcing "some customers [to move] on to other sources for internet service."[27]

5.5.4.2 Concession-Based Entry

Another way that localities can attract new broadband investment is by making available certain concessions that help a new or established ISP deploy new networks more efficiently. These concessions might include discounts on access to certain ROW; fast-tracked permitting processes; and dedicating city staff and office space to support the ISP.

Google Fiber was the pioneer of this approach. When it launched in 2009, Google Fiber drew significant interest from cities looking to partner with this high-profile though untested ISP in an effort to facilitate

its entry into served markets. Early partner cities extended to it a range of concessions that, together, helped to dramatically reduce the costs of deployment.[28] Initially, some partner cities sought to extend these concessions only to Google Fiber, giving it a substantial leg-up on other ISPs. As noted above, these kinds of regulatory asymmetries in markets can dampen incentives to continue investing and innovating in networks by those ISPs that are unable to avail themselves of the concessions. Eventually, these cities agreed to extend concessions to all ISPs to preserve a level playing field, which, as discussed in **Section 5.6**, is essential to fostering a sustainable competitive environment.[29]

Google Fiber sought additional concessions from its partner cities, including contractual mechanisms that would allow it to walk away from unsuccessful projects. Ultimately, Google Fiber wished to operate outside the normal contractual strictures that govern traditional franchise agreements between ISPs and cities, which, among other things, required ISPs to deploy services universally in exchange for accessing the city's ROW.[30]

The downsides of catering to a new entrant in this manner were demonstrated in Louisville, Kentucky, when Google Fiber abandoned its fledgling fiber network with almost no notice. The ISP was using Louisville as a testing ground for an experimental fiber deployment strategy.[31] That technique, though, did not work, causing numerous service disruptions. Rather than invest more to address the problems, Google Fiber elected to pull out of Louisville entirely, something that was possible only because of the contract that the ISP negotiated with the city.

5.5.4.3 Worrisome Smart City Partnerships

As more and more cities explore becoming "smart cities," there is growing experimentation in the contractual parameters governing these PPPs (an overview of the typical smart city PPP arrangement is provided in **Section 5.4**).

Among other things, localities are exploring whether and how to allow private partners to tap into and potentially monetize the torrent of data that will be generated by new smart city systems. For example, in its RFP for smart city services, which was issued in April 2021, New Orleans encouraged respondents to detail how they might monetize certain kinds of user data generated by the city's smart city network.[32] Such proposals have raised numerous privacy concerns.[33]

The New Orleans smart city project is a useful case study that ties together many of the points made above. The city's mayor, who led the project, deployed a subpar vetting process, which resulted in the selection of a coalition of private firms that lacked a track record in building smart city networks.[34] After the city council raised objections and called for an investigation, the original awardees pulled out of the project.[35] The investigation eventually identified numerous conflicts of interest involving city staff.[36] New Orleans was thus left without a partner a year after issuing its RFP.

NOTES

[1] Kathryn de Wit and Anna Read, *Issue Brief: How State Grants Support Broadband Deployment*, Dec. 23, 2021, Pew, https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2021/12/how-state-grants-support-broadband-deployment.

[2] *See* Brady Williams and Jill Lyman, *Vanderburgh Commissioners Approve Expanded Broadband Project*, Sept. 28, 2021, 14News.com, https://www.14news.com/2021/09/28/vanderburgh-commissioners-vote-expanded-broadband-project/.

[3] *Id.*

[4] *See Fiber Construction Contract Between AT&T Indiana and Vanderburgh County, Indiana,* https://evansville.granicus.com/MetaViewer.php?view_id=2&clip_id=4612&meta_id=243586.

[5] *Id.*

[6] *See* Matthew Christian, *Florence County and Charter Communications Partnering...,* Sept. 23, 2021, SCNow.com https://scnow.com/news/local/florence-county-and-charter-communications-partnering-to-bring-broadband-to-whole-county/article_0fb433d8-1c8f-11ec-b84c-77b26668133d.html.

[7] *Id.*

[8] *Id.*

[9] *Broadband Infrastructure Grant Agreement*, Florence County, SC, https://s3.us-east-1.amazonaws.com/files.florenceco.org/public/CountyCouncil/Agendas/2021/Agendas/09/04/Agenda-September162021Revised(full).pdf#page=198.

[10] *A Big Step Across the Digital Divide: T-Mobile's Project 10Million Connects 35,000 Oakland Students,* Oct. 13, 2021, T-Mobile, https://www.t-mobile.com/news/community/p10m-hhm2021.

[11] *Id.*

[12] *Las Vegas, Cox Partner to Pilot Smart City...,* March 4, 2021, BTR.com, https://www.broadbandtechreport.com/business-services/article/14198762/las-vegas-cox-partner-to-pilot-smart-city-curbside-management.

[13] Skip Descant, *Las Vegas Uses Smart Network to Monitor Park Activity,* Oct. 11, 2021, Government Technology, https://www.govtech.com/fs/las-vegas-uses-smart-network-to-monitor-park-activity.

[14] *See, e.g.,* Alfred Miller, *Auditor: Kentucky Taxpayers Ripped Off as Price of Beshear Project Leaps*, Sept. 27, 2018, Courier Journal, https://www.courier-journal.com/story/news/politics/2018/09/27/kentuckywired-broadband-cost-taxpayers-1-5-billion/1436691002/.

[15] *Id.*

[16] EAGLE-Net Project Overview, BTOP, U.S. Dept. of Commerce, https://www2.ntia.doc.gov/sites/default/files/grantees/cboces.pdf.

[17] Kellen O'Brien, *EAGLE-Net's Never-Ending Odyssey: Addressing Colorado's Unique Broadband Infrastructure Challenges,* 12 J. on Telecomm. & High Tech. L 222, 240 (2014), http://www.jthtl.org/content/articles/V12I1/JTHTLv12i1_O%27Brien.PDF.

[18] *See generally Letter from Todd J. Zinser, Inspector General, U.S. Department of Commerce, to the Honorable Greg Walden, et al.,* Jan. 23, 2014, https://www.oig.doc.gov/OIGPublications/OIG-14-011-M.pdf.

[19] Sean Buckley, *Zayo Takes Over Management of Colorado's Trouble EAGLE-Net Alliance,* July 20, 2015, Fierce Telecom, https://www.fiercetelecom.com/telecom/zayo-takes-over-management-colorado-s-troubled-eagle-net-alliance.

[20] *Project Fact Sheet: North Florida Broadband Authority,* NTIA, U.S. Dept. of Commerce, https://www2.ntia.doc.gov/sites/default/files/grantees/fl_nofloridabbauth_final.pdf.

[21] *Id.*

[22] *See, e.g., Testimony of the Hon. Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce, Before the House Subcommittee on Communications and Technology,* at p. 11, Feb. 27, 2013, https://www.govinfo.gov/content/pkg/CHRG-113hhrg80019/pdf/CHRG-113hhrg80019.pdf#page=28 ("*Strickling Testimony*").

[23] *Id.*

[24] *Id.*

[25] Anthony Clark, *Rural Counties Struggle Getting 'Last-Mile' of Fast Internet,* Nov. 28, 2015, Gainesville Sun, https://www.gainesville.com/article/LK/20151128/News/604137522/GS.

[26] *Id.*

[27] *Id.*

[28] *See, e.g., Understanding the Debate over Government-Owned Broadband Networks*, at p. 121-124, ACLP at NYLS (June 2014), http://comms.nyls.edu/ACLP/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf ("*Understanding the Debate*").

[29] *See, e.g.,* Dante D'Orazio, *AT&T Tries to Beat Google to Austin, Launches Fiber Internet in December*, Oct. 1, 2013, The Verge, https://www.theverge.com/2013/10/1/4790718/att-u-verse-gigapower-broadband-austin-launch-in-december.

[30] *Understanding the Debate* at p. 122.

[31] *See, e.g.,* Alfred Miller, *Google Fiber Made 'Tough Decision' to Pull Service from Louisville,* Feb. 8, 2019, Courier Journal, https://www.courier-journal.com/story/news/2019/02/07/google-fiber-louisville-internet-service-leaving-city/2802763002/.

[32] *RFP for Advanced Broadband and Smart City System*, at p. 35, New Orleans, LA (April 2021), https://tinyurl.com/t53jrfx7.

[33] *See, e.g.,* Skip Descant, *Will Data Privacy Issues Affect New Orleans' Broadband Push?* May 19, 2021, Government Technology, https://www.govtech.com/fs/will-data-privacy-issues-affect-new-orleans-broadband-push.

[34] *See, e.g.,* Michael Isaac Stein, *'Smart Cities' Contractors Drop Out of Project as Investigation Intensifies,* April 25, 2022, The Lens, https://thelensnola.org/2022/04/25/smart-cities-contractors-drop-out-of-project-as-investigation-intensifies/.

[35] *Id.*

[36] *See, e.g.,* Michael Isaac Stein, *Potential Conflicts Found in Another City Tech Deal After Collapse of 'Smart Cities' Project*, May 25, 2022, The Lens, https://thelensnola.org/2022/05/25/potential-conflicts-found-in-another-city-tech-deal-after-collapse-of-smart-cities-project/.

KEY TAKEAWAYS

- To ensure that broadband deployment gains are made in a timely and sustainable manner, state and local policymakers should explore updating relevant legal and regulatory frameworks impacting broadband deployment. Such can cut costs, unlock additional investment, and speed deployment.
- Reforms could focus on, among other things, streamlining access to key rights-of-way (ROW); updating the rules governing how utility poles are leveraged for broadband deployment; and modernizing relevant tax policies.

5.6.1 WHAT ROLE CAN REGULATORY LAW AND POLICY REFORMS PLAY IN SUPPORTING AND FURTHERING BROADBAND PPPS?

Public-private partnerships (PPPs) are poised to play a major role in bringing broadband to the country's remaining unserved areas (see **Sections 5.2, 5.3, and 5.4** for additional discussion). The historic amount of funding that will be made available for these purposes promises to close the digital divide once and for all (see **Section 2** for an overview of these funds). To ensure that these gains are made in a timely and sustainable manner, state and local policymakers should explore updating relevant legal and regulatory frameworks impacting broadband deployment.

Revisiting and revising the array of rules and regulations that impact the buildout of broadband networks will help:

- **Cut Costs**. Effective reforms target the array of fees and costs associated with permitting, ROW access, pole attachments, and related administrative aspects of broadband deployment. In particular, fees related to utility pole access often discourage investment by ISPs in rural areas (see below for additional discussion).
- **Speed Deployment**. Streamlining administrative processes – *e.g.*, the time it takes to review and approve a permit – greatly enhances the speed with which broadband networks are built. A major advantage of PPPs is how quickly new networks can be built in unserved areas. Accordingly, updating relevant rules to assure swift deployment is critical.
- **Unlock Additional Investment**. Modernized regulatory frameworks can unlock additional investment in two ways. First, incumbent ISPs that can save time and money because of updated legal and regulatory requirements are able to reinvest those resources in its network, helping to increase overall investment across its footprint. Second, other ISPs might be attracted to a particular market if the city or state has demonstrated a willingness to continue adjusting its rules to help facilitate network deployment, bringing new investment dollars with them.
- **Sustain Gains Over the Long Term**. Broadband networks are complex and ever-evolving, requiring ongoing investment and innovation across every aspect of the infrastructure (middle-mile, last-mile, etc.). Indeed, network technology, equipment, and standards change frequently, requiring ISPs to engage in ongoing maintenance and upgrades (there is no such thing as "future proof" broadband infrastructure). At times, new network architectures require new deployment techniques (*e.g.*, the use of small cells for 5G mobile broadband networks vis-à-vis the more traditional cell tower-and-antennae approach of 3G and 4G networks). In short,

broadband networks built now will likely change over the course of decades. As such, ongoing regulatory reform is necessary to encourage and sustain innovation across broadband infrastructure.

5.6.2 WHAT GUIDING PRINCIPLES SHOULD INFORM THESE REFORMS?

As policymakers contemplate modernizing legislative and regulatory frameworks impacting broadband, the following principles should inform their efforts:

5.6.2.1 Maintain a Level Playing Field

With a sizable infusion of funding available to support broadband deployment to unserved areas and a growing array of ISPs capable of offering service – traditional providers like cable, telecom, mobile, and fixed wireless; emerging providers like low-earth-orbiting satellite firms; and non-traditional providers like municipalities and electric utilities – policymakers must ensure that these myriad entities compete on similar terms and conditions. Failure to address the inherent advantages of certain providers could undermine the incentives of all ISPs to invest and compete for customers.

5.6.2.2 Promote Technology Neutrality

Technology neutrality encompasses an all-of-the-above mindset to bringing broadband to unserved and underserved areas. While some argue that new broadband networks should use only fiber, such a perspective artificially narrows the solutions available to address broadband challenges. Fixed wireless, for example, has played and will continue to play a key role in plugging availability gaps and enhancing competitive choice in states across the country.[1] In addition, 5G mobile broadband is quickly emerging as a competitor of wireline networks. A new generation of satellite services could very well deliver service on par with wireline networks in the not-too-distant future.[2] And cable, the most popular wireline service in the country, continues to increase download and upload speeds to reflect actual customer demand and usage patterns. In short, policy should support *all* platforms capable of delivering broadband speeds.

5.6.2.3 Regularly Revisiting Policies Impacting Broadband Deployment

Reform efforts tend to be ad hoc in nature. Indeed, many are typically undertaken only after policymakers are apprised of a lingering issue by ISPs or other stakeholders. A more impactful approach – from the perspective of encouraging greater investment by new and incumbent ISPs – would be to commit a legislative or regulatory body to revisiting certain laws and rules on a regular basis. For example, policymakers could include sunset clauses in a law or regulation that requires a body to affirmatively renew, repeal, or amend it. Such would send a powerful signal to ISPs that a locality or state is committed to supporting continued broadband investment and innovation.

5.6.3 WHAT ARE EXAMPLES OF POLICY REFORMS STATE POLICYMAKERS MIGHT SPEARHEAD?

State policymakers can enact legislation and adopt regulations that set the parameters of broadband policy in a state. Effective policy reforms can roll back outdated rules; update fees and related costs to better reflect modern network architectures and deployment strategies; and assure a more consistent regulatory environment across the entire state.

Examples of specific actions that might be taken are discussed below.

5.6.3.1 Level Playing Field Legislation

Proactive state reforms can help ensure that neither policy, nor the inherent advantages of certain ISPs, unnecessarily tilt the playing field in one direction.

How can policy tilt the playing field? Failure to adhere to a technology neutral approach, for example, could prioritize one kind of broadband platform (*e.g.,* fiber) over others when it comes to grant funding. This could occur if policymakers define broadband too narrowly or otherwise set policies that favor wireline deployments over wireless deployments.

What kinds of inherent advantages could tilt the playing field? The inherent advantages of both GONs and electric utilities are illustrative. *Foremost among these is the ability to cross-subsidize broadband networks by tapping guaranteed revenue streams from captive customer bases.* A local government can do this by propping up a struggling GON with infusions from a general fund, which is comprised of tax receipts from residents and businesses. This is a common occurrence with GONs (see **Section 5.2** for additional discussion).[3]

A utility can do this by allocating fiber-related costs to its electric business (*e.g.,* for smart grid purposes), which can be recouped in rates charged to captive electric customers.[4] Local governments and electric utilities also oftentimes own ROW and other assets that are critical to broadband deployment. When they decide to build a network, a local government or utility can grant itself free, priority access to those assets while charging other ISPs fees and putting their permit applications through the standard review process.

In recognition of these kinds of advantages, state legislatures across the country are beginning to adjust legal and regulatory frameworks to assure a level playing field among all ISPs. Example of these actions include:

- Explicit bans of cross-subsidization by utilities offering broadband service.[5]
- Focusing utility broadband efforts on unserved areas.[6]
- Requiring local governments and utilities to develop feasibility studies and financial plans for their broadband projects to ensure that they are sustainable and won't require subsidies to keep afloat.[7]
- Regular audits and financial reporting to enhance accountability, protect against cross-subsidization, and guard against corruption.[8]

5.6.3.2 Utility Pole Policy Reform

Utility poles are essential components of broadband infrastructure. These structures are pivotal in the aerial deployment of wireline networks, especially in rural areas, where poles are already in place and ready to be leveraged (fixed and mobile wireless networks also use poles to support antennae and related equipment). There are few cost-effective alternatives for wireline and wireless deployment in these areas. The costs associated with burying broadband lines tends to be prohibitive, especially in rural areas.

Unfortunately, ISPs seeking to use poles to extend networks into unserved rural areas have run into numerous issues accessing these structures. Pole owners oftentimes charge high fees for renting space on the pole and completing the "make ready" work that is required to make room for an ISP's equipment. In addition, some pole owners have attempted to charge ISPs the full cost of replacing a pole as a

condition of granting access to them. Taken together, it is estimated that these practices can comprise some 25 percent of an ISP's costs to build networks in rural areas.[9]

Pole owners have sought to justify these practices as essential to maintaining the integrity of their infrastructure and keeping electric rates low by shifting the costs for maintaining and upgrading their poles to those seeking to use them for broadband purposes.[10] The practical impact of these practices, however, is the unnecessary delay of broadband deployment to unserved areas. It has been estimated that the delays stemming from disputes over pole costs in states across the country is holding back upwards of $314 billion in "new economic gains."[11]

In response, a growing number of states have begun to update their legal and regulatory rules for poles. In some states (*e.g.,* Ohio), regulatory commissions have sought to align their rules with those maintained by the Federal Communications Commission, which establish a consistent and relatively streamlined approach to resolving many, but not all, relevant issues.[12] Other state PUCs (*e.g.,* Kentucky) have sought to (1) provide clearer guidance regarding cost-sharing between the pole owner and ISPs seeking to attach equipment to the pole and (2) enhance dispute resolution processes for when disagreements arise.[13] Several other states (*e.g.,* New York) are currently undertaking similar reviews.[14]

In other states, legislatures have acted to update antiquated pole rules. For example, in 2022 Florida enacted legislation that creates a program to "reimburse [ISPs] for their costs incurred for the removal and replacement of existing utility poles in areas [of the state] that are unserved by broadband."[15] Specifically, the program will limit reimbursements to "50 percent of the [ISP's] eligible pole replacement costs or $5,000, whichever is less, in addition to the [ISP's] administrative costs related to the preparation and submission of the application for reimbursement."[16] In Kentucky, legislators created a similar fund to reimburse a portion of eligible pole replacement costs.[17]

The importance of rational pole attachment and replacement policies also continues to be echoed at the federal level, where policymakers can establish rules and procedures that serve as both a model and baseline for state level regulations. To these ends, the FCC is considering new rules to assist in resolving disputes between ISPs and pole owners regarding the proper allocation of pole replacement costs.[18] Once adopted, these rules can be deployed in the many remaining states that have yet to update their pole policies. In addition, NTIA, as part of its BEAD NOFO, requires states to describe in their applications the steps they will take to "promote…cost-effective access to poles, conduits, easements, and rights of way, including the imposition of reasonable access requirements."[19]

These myriad reform efforts at the state and federal levels underscore the importance of modernizing the policies and practices around pole attachments and replacements. These follow similar state and federal reforms impacting pole utilization by wireless carriers, which were adopted in the late 2010s as 5G deployment began in earnest. Once the legislative and regulatory frameworks impacting wireline access to poles are modernized in a similar manner, then ISPs of all ilk will be able leverage a key infrastructure input on similar terms and conditions, which will speed deployment and lower costs – benefits that will inure to all consumers.

5.6.3.3 Streamlining ROW Access

Public rights-of-way are of foundational importance to network construction as ISPs seek to thread broadband wiring across utility poles, streetlamps, ducts, and other such structures. Too often, though, the terms and conditions for accessing these resources are onerous, leading to delays in network

deployment and higher costs, which are inevitably passed onto consumers. Failure to streamline ROW access could lengthen the time it will take to deploy grant-funded networks to unserved areas.

State policymakers could spearhead reforms on several fronts, including the implementation of a statewide framework for ROW access to assure uniformity and consistency in the granting of such access at the local level. More than 30 states adopted such frameworks to facilitate 5G deployment.[20] Similar legislative action could spark further investment and deployment by wireline ISPs. In addition, the FCC has issued rules on several occasions over the last few years to assure consistency in ROW access across the country.[21] Additional action by state policymakers could help to further hasten new network deployment.

5.6.3.4 Update Relevant Tax Policies

Tax policy is another tool that state policymakers can use to unlock additional broadband investment. There is a well-documented relationship between taxes and broadband investment.[22] Even though many major broadband tax incentives are federal in nature, states have important roles to play in furthering positive tax policies and rolling back counterproductive ones.

For example, state policymakers could evaluate whether and to what extent their tax code penalizes or supports ISP investments in network equipment. Indeed, as of 2019 some 34 states collected sales tax on cable network equipment purchases.[23] It has been estimated that removing these taxes could unlock an additional $4 billion in broadband investment.[24]

In addition, state policymakers could review the extent to which permitting fees and related costs levied on ISPs operate as a tax on certain aspects of network deployment. For example, some states require ISPs to pay fees to state Departments of Transportation to access ROW along state highways.[25]

Engaging in holistic reviews of these fees and tax policy generally could greatly supplement broadband investment and further the gains in broadband availability that are likely to be made via PPPs that states will be forging with ISPs over the next few years.

5.6.4 WHAT ARE EXAMPLES OF POLICY REFORMS LOCAL POLICYMAKERS MIGHT SPEARHEAD?

As noted in **Sections 5.4 and 5.5**, localities generally possess significant authority to manage and leverage their ROW for broadband deployment. State laws and rules can prohibit certain actions or set limits on fees, for example, but, in general, localities can still set many of the terms and conditions for accessing ROW. As such, policy reforms aimed at modernizing and streamlining the processes by which ISPs can gain access to and leverage these assets are critical to supporting sustainable investments and deployments.

Not all reforms and modified approaches, however, are created equal. Indeed, offering too many concessions to one category of ISPs (*e.g.,* new entrants) can be counterproductive (see **Section 5.5**). Those reforms aimed at modernizing how ROW is made available to all potential ISPs tend to have the biggest impacts on broadband deployment.

Collaboration between ISPs and localities in support of 5G deployment offer examples of how reforms to the "usual" way of leveraging ROW can hasten new network deployment. Indeed, cities like San Jose, CA, worked closely with mobile carriers to determine mutually-beneficial arrangements for deploying the small cells that comprise 5G networks.[26] Similar solution-focused discussions between ISPs and localities could bolster wireline and wireless broadband network expansion moving forward.

NOTES

[1] *See, e.g.,* Joan Engebretson, *RDOF Will Put Gigabit Fixed Wireless to the Test,* Dec. 18, 2020, Telecompetitor, https://www.telecompetitor.com/rdof-will-put-gigabit-fixed-wireless-to-the-test/.

[2] *See, e.g.,* Michael Kan, *Starlink: Here are the Download Speeds You Can Expect Across North America,* May 5, 2021, PCMag, https://www.pcmag.com/news/starlink-here-are-the-download-speeds-you-can-expect-across-north-america.

[3] For additional examples, *see, e.g.,* Charles M. Davidson & Michael J. Santorelli, *Understanding the Debate over Government-Owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers*, ACLP at New York Law School (June 2014), http://comms.nyls.edu/ACLP/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf.

[4] *See, e.g.,* George S. Ford, *Electricity Rates and the Funding of Municipal Broadband Networks: An Empirical Analysis*, 102 Energy Economics (Oct. 2021), https://www.sciencedirect.com/science/article/pii/S0140988321003613?dgcid=author.

[5] *See, e.g.,* AR Code § 23-18-806; GA Code § 46-3-200.2; KY Rev. Stat § 278.2201.

[6] *See, e.g.,* MN Stat. § 429.021; VA Stat. § 56-585.1:9.

[7] *See, e.g.,* MS Code § 77-17-5.8; WV Stat. § 24-2-1P(f); FL. Stat. § 350.81(2)(c).

[8] *See, e.g.,* IN Code § 32-30-16-17(c); MS Code Ann. § 77-17-15; SC Code § 33-49-150(b).

[9] *See, e.g.,* Kristian Stout and Ben Sperry, *Issue Brief: Pole Attachments and Broadband Build-Out,* at p. 3, ICLE (July 2021), https://laweconcenter.org/wp-content/uploads/2021/07/Pole-Attachment-Issue-Brief.pdf.

[10] *See, e.g., Fact Sheet – Rural Broadband and Pole Attachment Fees,* NRECA (March 2021), https://www.cooperative.com/topics/telecommunications-broadband/documents/pole_attachment_fact_sheet_final.pdf.

[11] Edward J. Lopez and Patricia D. Kravtin, *Advancing Pole Attachment Policies to Accelerate National Broadband Buildout,* at p. 3, Connect the Future (Dec. 2021), https://connectthefuture.com/wp-content/uploads/2021/11/Advancing-Pole-Attachment-Policies-To-Accelerate-National-Broadband-Buildout-National-Report.pdf.

[12] *See, e.g., State Broadband Profile: Ohio*, at p. 3, ACLP at New York Law School (Feb. 2022), https://digitalcommons.nyls.edu/cgi/viewcontent.cgi?article=1002&context=reports_resources.

[13] *See, e.g., Kentucky PSC Adopts New Pole Attachment Rules*, Oct. 26, 2021, Connect the Future, https://connectthefuture.com/kentucky-psc-adopts-new-pole-attachment-rules/.

[14] *See, e.g., Notice Seeking Comment,* Case 22-M-0101, NY PSC (March 1, 2022), https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C07D0EEF-823F-4EDC-AC53-08EBDD38B6AD}.

[15] *Bill Analysis and Fiscal Impact Statement – SB 1800*, https://www.flsenate.gov/Session/Bill/2022/1800/Analyses/2022s01800-pcs711618.ap.PDF.

[16] *Id.*

[17] HB 315 (2022), https://apps.legislature.ky.gov/law/acts/22RS/documents/0202.pdf.

[18] *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment,* Second Further Notice of Proposed Rulemaking, WC Docket No. 17-84 (March 16, 2022), https://docs.fcc.gov/public/attachments/FCC-22-20A1.pdf.

[19] *BEAD NOFO* at p. 32.

[20] For an overview, *see* Mobile 5G and Small Cell 2021 Legislation (as of Aug. 26, 2021), National Conference of State Legislatures, https://www.ncsl.org/research/telecommunications-and-information-technology/mobile-5g-and-small-cell-2021-legislation.aspx.

[21] *See, e.g., Declaratory Ruling and Third Report and Order,* Accelerating Wireless Deployment by Removing Barriers to Broadband Deployment, WT Docket No. 17-79 (Sept. 27, 2018), https://docs.fcc.gov/public/attachments/FCC-18-133A1.pdf.

[22] *See, e.g., The Impacts of Tax Policy on Broadband Connectivity: The Good, The Bad & The Ugly,* ACLP at New York Law School (Sept. 2015), http://comms.nyls.edu/ACLP/ACLP-Policy-Briefing-Tax-Policy-BB-Connectivity-September-2015.pdf.

[23] *Assessment of the Economic Impact of Taxation on Communications Investments in the United States,* at p. 6, Broadband Tax Institute (Nov. 2019). https://broadbandtax.org/downloads/Katz%20Study%20-%20Broadband_Tax_Institute_2019_Report_v.Final_9.pdf.

[24] *Id.*

[25] *See, e.g.,* Jamie DeLine, *New York State Senators Call for an End of Fiber Optic Tax on Broadband Expansion,* Feb. 15, 2022, News10.com. https://www.news10.com/news/new-york-state-senators-call-for-an-end-of-fiber-optic-tax-for-broadband-expansion/.

[26] *See, e.g.,* Martha DeGrasse, *San Jose Plans Smart City Infrastructure with Verizon and AT&T*, June 15, 2018, Fierce Wireless, https://www.fiercewireless.com/wireless/san-jose-plans-smart-city-infrastructure-verizon-and-at-t.

KEY TAKEAWAYS

- States and localities regularly use Requests for Proposals and related solicitations to gather information on many aspects related to broadband planning and deployment. In the context of identifying entities with which to forge PPPs for broadband deployment, RFPs can be powerful tools in making sure a state or locality identifies the most reliable and expert firm.
- Developing impactful solicitations should be a collaborative and transparent exercise that seeks to precisely identify real challenges and tailors the RFP to address those issues.

5.7.1 WHAT KINDS OF SOLICITATIONS ARE USED BY STATES & LOCALITIES WHEN SEEKING POTENTIAL PARTNERS AND VENDORS?

Requests for proposals and related solicitations issued by states and localities signal an intent to formally pursue a specific avenue for bolstering broadband connectivity. There are several different kinds of requests that government entities issue when exploring broadband projects. These include:

5.7.1.1 Request for Information (RFI)

An RFI is a vehicle for collecting information regarding a specific issue. In the broadband context, RFIs are typically issued before an RFP in an effort to identify whether there is interest among potential vendors in responding to a subsequent RFP. RFI submissions are not binding on respondents.

5.7.1.2 Request for Qualifications (RFQ)

An RFQ is a means of pre-qualifying potential bidders/respondents to a formal RFP. Like RFIs, RFQs are used to gauge whether there is sufficient interest in partnering with a government entity on a particular project. RFQ submissions are not binding on respondents.

5.7.1.3 Request for Proposal (RFP)

An RFP is a formal means of engaging a vendor to complete a specific task (*e.g.,* developing a broadband plan; building a network). Proposals should be evaluated based on criteria set forth in the RFP.

Government entities issue RFPs to engage consultants in developing broadband plans; to assess local broadband markets; and to offer recommendations for specific projects (*e.g.,* smart city services). RFPs are also used to engage engineering firms to plan and build networks; develop maps; and partner with ISPs in bolstering existing offerings and/or extending networks into unserved/underserved areas (several other kinds of solicitations are discussed below).

Local and/or state procurement rules usually apply, ensuring that the issuing entity solicits a range of bids and settles on a vendor that best satisfies the criteria set for in the request.

5.7.2 WHAT BEST PRACTICES HELP YIELD OPTIMAL OUTCOMES?

The following best practices are offered to policymakers as they develop RFPs and related solicitations for use in bolstering broadband availability.

5.7.2.1 Proceed One Step at a Time

The various solicitations mentioned above provide government entities with an array of ways to gather information and data regarding current levels of broadband connectivity.

An RFI can be used to aggregate such information; an RFP can then be drafted to reflect that information.

5.7.2.2 Be Inclusive

The information-gathering process that will inform an RFP should include outreach to all relevant stakeholders, including existing ISPs. This will help to ensure that the RFP or other solicitation precisely targets at a real challenge and tees up actionable solutions.

5.7.2.3 Avoid Pursuit of a Predetermined Outcome

When seeking vendors to assist in broadband planning, policymakers should be wary of consultants and other firms that consistently offer the same recommendations and analyses regardless of the context. Hiring firms that tout a particular broadband model or product or a track-record of success with a particular approach (*e.g.,* municipal broadband) could preclude development of the kind of objective analysis that will benefit a state or locality the most. (For additional discussion, see **Sections 5.2 and 5.3**.)

5.7.2.4 Assure Adequate Vetting of Potential Partners and Vendors

All respondents to an RFP should be required to submit substantial evidence of success in successfully undertaking the kind of activities identified in the solicitation.

5.7.2.5 Include Mechanisms for Independent Review of Work Product

RFPs for work-product that entails proposals for substantial government intervention into the broadband market (*e.g.,* in the form of a GON) should include mechanisms that subject those materials to independent review. Some firms that specialize in the development of broadband master plans and feasibility studies tend to offer similar recommendations, financial pro forma, and related analyses across their various engagements with client-cities. In some cases, this is driven by self-interest since some of these entities will seek to design and/or build the municipal network that they are recommending. To protect the financial interests of a city or state, RFPs and related solicitations should include provisions requiring that studies and analyses produced by a consultant be subject to rigorous review by a third-party.

5.7.2.6 Develop Objective Scoring Criteria

Many RFP submissions are scored using a rubric that allocates points based on the extent to which a respondent meets a city or state's ideal criteria. These criteria should be carefully developed to ensure that all respondents have the same opportunity to win the contract. For example, scoring criteria should not be weighted in favor of one technology (*e.g.,* fiber) over another (*e.g.,* cable or 5G). Doing so would artificially narrow the field of potential partners and undermine critical notions of technology neutrality.

5.7.2.7 Assure Maximum Transparency

RFP processes should strive to be as transparent as possible. This depends, in part, on prevailing state and local laws. Indeed, depending on the relevant rules, an RFP could preclude discussions from occurring outside of the formal channels established by the request. For example, a broadband-related

RFP might foreclose an ISP from discussing certain issues with a city during the pendency of the solicitation. Such could lead a city or state to miss out on a partnership opportunity that might address a broadband issue more efficiently and quickly than what has been described in an RFP. As appropriate, state and local officials should revisit transparency rules related to RFPs to bolster, rather than limit, the amount of communication and information-sharing allowed during these processes.

5.7.2.8 Integrate Robust Accountability Requirements

Although robust protections might already be in place via existing procurement policies and related rules, state and local policymakers should supplement these with additional accountability requirements in their RFPs. For example, solicitations could require vendors and partners to participate in regular check-ins (*e.g.,* during monthly City Council meetings) and provide status updates and briefings. Vendors might also be required to engage in regular meetings as requested by policymakers, staff, and other stakeholders (*e.g.,* ISPs).

KEY TAKEAWAYS

- Broadband planning is a complex and multifaceted process that entails numerous overlapping inquiries. To guide these efforts, the following checklist is offered to state and local policymakers as they consider how best to use available funding to support broadband deployment.

How to Use the Checklist. The Broadband Planning Checklist below offers a step-by-step process that state and local policymakers can follow when evaluating options for addressing broadband connectivity challenges. It is recommended that policymakers complete the entire checklist prior to formalizing any plan for bolstering broadband availability in an area.

The checklist encompasses the following core areas of planning and decision-making:

- **Assessing the Local Broadband Market**. The checklist identifies the range of actions that policymakers should take to gauge the current level of broadband connectivity from both the supply-side and demand-side.
- **Evaluating Other Priorities**. The checklist provides a process by which policymakers can undertake a holistic assessment of infrastructure needs and other areas where investment might be needed. It is critical that policymakers determine that a potential allocation of funds in support of a broadband project is truly a priority in light of other needs. This is particularly critical post-pandemic as cities and states address the financial and operational toll that COVID has had.
- **Evaluating Options for Addressing Broadband Challenges**. The checklist highlights the importance of precisely identifying areas of need; collaborating with stakeholders to develop RFPs that seek to address those specific issues; and pursuing PPPs whenever possible to address real broadband needs.
- **Evaluating Proposals for a GON**. The checklist provides a detailed framework that state and local policymakers can use when determining whether a GON is appropriate.
- **Post-Deployment Activities to Assure Accountability**. The checklist concludes with considerations around enhancing accountability and transparency throughout the planning and project deployment phases.

Successful completion of the checklist will require significant information-gathering and collaboration with stakeholders, including ISPs. It is recommended that policymakers seek to integrate the best practices articulated throughout **Section 5** regarding effective and inclusive broadband planning when endeavoring to address the checklist's various sections.

ASSESSING THE LOCAL BROADBAND MARKET	
▪ Have local officials comprehensively examined the local broadband market? Such examinations should encompass both the supply-side and the demand-side.	☐
On the Supply-Side: ▪ What is the nature of local broadband competition? How many total broadband options – wireline, wireless, satellite, etc. – do consumers have access to? ▪ Are there state and/or local barriers to further deployment by incumbent Internet Service Providers (ISPs)? By new entrants? ▪ Has the governing entity analyzed how it could leverage its resources to facilitate additional network deployment by private ISPs? Examples include reevaluating existing rights-of-way administration, tower siting approvals, antiquated zoning laws, pole attachment rules, and franchising processes. ▪ Has the governing entity engaged ISPs in dialogues around meeting clear goals on the supply-side?	☐
On the Demand-Side: ▪ Are there data available on the nature of broadband demand and use in the relevant area? ▪ Has the governing entity engaged experts in the private and nonprofit sectors to identify barriers to more robust adoption and utilization? Has the governing entity begun work to remove those barriers? ▪ Has the governing entity inventoried and examined existing resources on the demand-side – *e.g.*, training programs, anchor institutions, digital literacy initiatives, subsidy programs, low-cost offerings by ISPs? ▪ Has the governing entity attempted to work with and through local social infrastructures to address real demand-side needs? ▪ In unserved and underserved areas, have partners in the public, private, and nonprofit sectors engaged in sufficient demand aggregation activities to create favorable environments for new network deployment?	☐
EVALUATING OTHER PRIORITIES	
▪ Has the governing entity evaluated basic infrastructure needs and weighed them against actual broadband needs? These include developing plans for allocating sufficient funding to maintain roads, bridges, dams, electric grid components, water system elements, ports, and other basic public infrastructure for which state and local governments are responsible.	☐
▪ Does the municipality have a balanced budget? A surplus? A deficit? Is it financially solvent? Are there competing priorities for funding? Is the municipality assuming additional debt (e.g., under-funded pensions)?	☐

Post-COVID Financial Analysis ▪ Has the governing entity adequately accounted for any lingering costs of the pandemic once available federal funding is spent? ▪ To what extent, if any, will the governing entity have to cut its budget as a result of the pandemic? How will it apportion those cuts? ▪ To what extent will the governing entity invest resources to shore up its public health infrastructure and other hard-hit departments/agencies? ▪ Does the governing entity expect any changes to its credit status? Will the availability/cost of financing change due to the pandemic? ▪ Has the governing entity made arrangements for creating/replenishing rainy day funds? ▪ Has the governing entity accounted for rising inflation and related economic issues in its long-term planning? ▪ Given the myriad competing priorities facing policymakers, to what extent will the governing entity be able to invest in non-mission critical projects?	☐
EVALUATING OPTIONS FOR ADDRESSING BROADBAND CHALLENGES	
Identifying Broadband Availability Issues ▪ Has the governing entity gathered data to identify where broadband is and is not available? ▪ Has the governing entity consulted FCC broadband maps to confirm the availability or unavailability of broadband in a given area? ▪ Has the governing entity sought data from ISPs to ensure that areas identified as unserved or underserved are actually without sufficient broadband options? ▪ Using the data gathered from these various sources, is the governing entity able to precisely identify specific locations where broadband remains unavailable?	☐
Developing and Releasing Solicitations to Identify Viable Partners & Vendors ▪ Has the governing entity sought information and input from ISPs and other stakeholders as it considers options for addressing availability challenges? ▪ Has the governing entity clearly articulated its supply-side goals for broadband via RFPs/RFIs and/or other such means of public communication? ▪ Has the governing entity followed the best practices identified in **Section 5.7** of the Broadband Planning Tool Kit when developing its solicitations? ▪ Has the governing entity built in sufficient accountability and transparency provisions into its solicitation?	☐

Forging Public-Private Partnerships to Address Availability Issues ▪ Has the governing entity engaged expert ISPs to identify whether there are opportunities to partner to address broadband availability issues? ▪ Has the governing entity identified funding (*e.g.,* via a state grant program) to seed a PPP with an expert ISP? ▪ When evaluating a potential partner, has the governing entity determined that the firm is an expert in broadband network buildout? Is there evidence that the ISP has the technical, operational, and financial expertise to help the city/state achieve its goals? ▪ Does the prospective partner have an established track record of successfully building, maintaining, operating, and upgrading a network? Of providing reliable service to customers? Of providing helpful customer service? ▪ Is the prospective partner ISP able to leverage economies of scale in the delivery of its services? Such can greatly reduce the amount of capital needed to expand networks and lower prices for consumers. ▪ Is the prospective partner able to properly secure and safeguard the proposed network? Does the ISP have experience in deploying cybersecurity solutions? Protecting users' data and privacy? Hardening its assets? Addressing outages in a timely manner? ▪ Is the ISP a known quantity in the community? If not, what are the ISP's bona fides in the markets where it currently provides service? ▪ Is the ISP willing to offer its services on a level playing field with other competitors? Or is it seeking special concessions and other advantages to facilitate its entry into the market?	☐
EVALUATING PROPOSALS FOR A GOVERNMENT-OWNED BROADBAND NETWORK	
▪ Have policymakers exhausted all other options for bolstering broadband availability before contemplating a GON?	☐
▪ Have policymakers identified the driving consideration(s) for a GON? Are there actual problems or issues that policymakers are seeking to address with a municipal network? Are policymakers looking to generate income? Spur the local economy? Make the local broadband market more competitive? Are they responding to unsolicited proposals?	☐
▪ Have policymakers and planners consulted and involved constituents in the process? Have policymakers created opportunities and a process for informative dialogue amongst citizens and stakeholders during review and planning stages?	☐

Prior to Engaging a Consultant to Assist in Exploring a GON: ▪ Has the governing entity been approached by a firm pitching a particular "solution" or product that it claims will address broadband challenges? If so, has the governing entity evaluated the financial incentives underlying the firm's proposal? ▪ If the governing entity seeks to engage a consulting firm via an RFP, does the solicitation include robust vetting provisions? ▪ Has the governing entity properly vetted the consulting firm? Has the governing entity used the questionnaire included in **Appendix 2** of **Section 5.3** to ensure that the firm is sufficiently credible? ▪ Will the governing entity submit consultant work-product to an independent third-party for rigorous review? ▪ Has the governing entity evaluated whether to require consulting firms to indemnify the state or city in the event that a proposed GON fails or struggles to meet estimated revenue and take-rate projections?	☐
When Reviewing Specific GON Proposals: ▪ Does the feasibility study consider and address the range of possible negative outcomes – *e.g.*, low consumer uptake, inability to compete on price, and other key elements of a sensitivity analysis? ▪ Are performance and outcome expectations – among policymakers, the public, etc. – for the network grounded in solid data and analysis? Are assumptions and predictions about costs, take rates, and competitive impacts supported? ▪ Have policymakers and planners addressed the challenges associated with network construction and maintenance? Factors include population density, geographic considerations, and recurring network costs. ▪ Does the network plan have one or more "end games" or exit strategies? ▪ Does the plan adequately consider (and contain strategies regarding) the market strengths and possible responses of private sector providers? ▪ Does the plan create competitive or regulatory advantages for the proposed municipal provider compared to non-municipal providers? If so, has the governing entity considered how to maintain a level playing field should the GON move forward?	☐
When Reviewing the Proposed Costs of a GON: ▪ What is the estimated cost of the GON? Does this estimate encompass all aspects of long-term expenses related to maintenance, operation, security, and technology upgrades? ▪ What is the expected cost and availability of experienced management and expert staff – necessary inputs for operating a network in a competitive market? ▪ What is the expected cost for marketing and consumer outreach? Have these and other related costs been factored into cost projections? ▪ What are the projected impacts of cost overruns on project feasibility? How tolerant are the network's financials of higher-than-estimated buildout costs or unexpected increases in ongoing expenses? ▪ Have policymakers contemplated the costs of unwinding the network in the event of failure?	☐

When evaluating the proposed GON business plan: ▪ Is the proposed business plan reasonable when measured against actual consumer demand for broadband services and when measured in light of competitive conditions in the relevant market? ▪ To what extent does the business model hinge on cross-subsidies (*e.g.*, by a parent electric utility)? Are these cross-subsidies legal? Sustainable? Do they provide the GON with a competitive advantage over other ISPs? ▪ Does the proposed business plan clearly delineate break-even levels of customer uptake, including how quickly the network must grow its customer base to remain solvent? Are these expectations realistic? ▪ Does the proposed business plan include contingency planning to address under-adoption, pricing adjustments by competitors, and/or outright failure? ▪ Does the business model allocate any potential profits to the local government (*e.g.*, payments in lieu of taxes)? ▪ To what extent does the business plan include supplemental borrowing or allocation of additional funds/resources by the governing entity?	☐
POST-DEPLOYMENT ACTIVITIES TO ASSURE ACCOUNTABILITY	
▪ Has the governing entity established processes to ensure that the project launched to address broadband availability challenges – a PPP, GON, etc. – is on-time and on-budget? These could include regular status briefings, filing requirements, City Council or State Legislative hearings, etc.	☐
▪ Are there filing requirements associated with the broadband project (*e.g.,* status reports required by a state grant program and/or NTIA as part of the BEAD program)? If so, has the governing entity established processes by which the broadband project will satisfy these requirements?	☐
▪ Has the governing entity explored how to maximize transparency throughout the entirety of the broadband project?	☐

Section 6

How to Best Deploy Funds for Bolstering Broadband Adoption & Digital Literacy

KEY TAKEAWAYS

- For too long, broadband demand-side issues have been overlooked. Now, with broadband on its way to being universally available, and with significant federal funding allocated to support digital equity initiatives, it is appropriate for state and local policymakers to shift their focus to enhancing broadband adoption.
- This Section provides policymakers with essential resources to help bring as many people online as possible and to equip them with the skills needed to harness the transformative power of broadband.

6.1.1 WHY SHOULD POLICYMAKERS FOCUS ON BROADBAND ADOPTION AND DIGITAL LITERACY ISSUES?

Until recently, the primary, if not exclusive, focus of policymakers at every level vis-à-vis broadband has been on supply-side issues – *i.e.*, making sure that a high-speed internet connection of some kind is available in every corner of the country. Such a focus long made sense because broadband remained unavailable in many rural parts of the country. With broadband now almost universally available, and with a historic amount of funding being made available to bring service to remaining unserved areas, the focus must now broaden to encompass demand-side issues like broadband adoption and digital literacy skill development.

Broadband is only useful if it is adopted and used in a meaningful way, and making broadband available does not guarantee that it will be adopted. Indeed, in served areas, broadband adoption appears to have plateaued in recent years (see **Section 1.5** for data and discussion). The reasons for non-adoption are myriad and are explored at length in this Section. Bringing more people online and equipping them with the requisite skills is resource intensive and not amenable to the kind of short-term "wins" that are possible when building out broadband networks. Fortunately, billions of dollars in federal aid will soon be made available to support states and localities in closing the adoption gap.

This Section provides policymakers with an introduction to broadband adoption dynamics and offers strategies, frameworks, and other ways of approaching this complex and multifaceted set of issues.

6.1.2 OVERVIEW OF POLICYMAKER RESOURCES PROVIDED IN SECTION 6

Section 6.2 defines key terms associated with broadband demand-side issues. These terms include broadband adoption, digital equity, digital inclusion, and digital literacy.

Section 6.3 focuses on empowering state and local officials with an overview of broadband adoption dynamics. Understanding why certain households choose not to adopt an otherwise readily available broadband connection will help to inform the tailored education and outreach strategies that are needed to increase take-rates across the board.

Section 6.4 identifies the growing number of resources available to consumers to offset the monthly cost of a broadband subscription and to assist with the purchase of a computing device. These resources range from monthly subsidies available from the federal government to low-cost broadband plans offered by most major ISPs. In many cases, eligible consumers can avail themselves of free high-speed internet connections by combining available subsidies with a low-cost plan.

Section 6.5 identifies the roles that state and local policymakers can and should play when it comes to bolstering broadband adoption and enhancing digital literacy skill development. In particular, this section identifies a range of best practices that policymakers can look to when developing strategies for increasing broadband adoption rates and promoting digital literacy skill development.

Section 6.6 sets forth a framework that can be used to guide digital equity planning by state and local policymakers. Using this framework from the outset can help to jumpstart the planning process by focusing attention on the aspects of equity planning that matter the most. Such will be critical as state and local policymakers seek to access funding specifically earmarked for promoting digital equity in communities across the country.

KEY TAKEAWAYS

- Discussions regarding broadband demand-side issues typically revolve around key terms like broadband adoption, digital equity, digital inclusion, and digital literacy.
- Understanding how these terms are defined, what they encompass, and how they work together is critical to developing effective demand-side strategies and deploying impactful programs aimed at increasing the number of skilled broadband users.

6.2.1 WHAT TERMS ARE RELEVANT TO DISCUSSIONS REGARDING BROADBAND DEMAND-SIDE ISSUES?

The terminology used in discussions regarding broadband demand-side issues has evolved over the last few decades to become more descriptive and precise vis-à-vis the challenges facing consumers who remain offline.

For many years, the policy focus was on the "digital divide" writ large, a dynamic first observed in the mid-1990s when the commercial internet was being used more and more by households of all kinds. In one of the first reports analyzing the digital divide, NTIA observed a glaring gap between the digital "haves" and "have nots" in urban and rural America.[1] Subsequent reports issued by NTIA in the late-1990s and early 2000s further refined the contours of the nation's digital divide, highlighting the disparities in internet usage across different socioeconomic and demographic groups.[2]

Since then, the notion of a persistent "digital divide" has remained because gaps in internet utilization are still evident across many of these same groups (for data on the current state of broadband adoption in the U.S., see **Section 1.5**). As policymakers, academics, and others have focused more on understanding the myriad complexities associated with the digital divide, there has been a refinement in how different aspects of the divide are labelled and discussed.

Now, discussions regarding the digital divide encompass terms like broadband adoption, digital equity, digital inclusion, and digital literacy. Formal definitions for each term are provided below, along with a discussion of how these terms work together. Ultimately, these terms provide a clearer view of the many facets and policy considerations implicated by efforts to address demand-side broadband issues.

6.2.2 WHAT DOES BROADBAND ADOPTION MEAN?

In general, broadband adoption describes a decision by a consumer to use high-speed internet access on a consistent basis. Oftentimes, survey firms like Pew frame formal adoption of broadband as the purchase of a monthly subscription for wireline internet access for use in one's home. However, as discussed elsewhere in this Tool Kit, the intermodal nature of broadband, coupled with rapidly shifting consumer needs for greater mobility, have made the notion of broadband adoption more multifaceted in nature (see **Section 1** for additional discussion).

The Infrastructure Investment & Jobs Act (IIJA) included the Digital Equity Act, which makes available billions of dollars for supporting broadband adoption-related efforts (see **Section 2.2** for an overview of the digital equity grant programs created by the IIJA; as noted above, states can also use leftover BEAD funding for digital equity purposes). The IIJA defines broadband adoption as follows:

> "[T]he process by which an individual obtains daily access to the internet –
>
> (A) At a speed, quality, and capacity –
>
> (i) That is necessary for the individual to accomplish common tasks; and
>
> (ii) Such that the access qualifies as an advanced telecommunications capability [*i.e.*, broadband];
>
> (B) With the digital skills that are necessary for the individual to participate online; and
>
> (C) On a –
>
> (i) Personal device; and
>
> (ii) Secure and convenient network."[3]

This more expansive definition of broadband adoption captures the full range of issues and considerations that are usually implicated in efforts to connect the unconnected. As such, the IIJA's definition of broadband adoption will likely be the standard going forward.

6.2.3 WHAT DOES DIGITAL EQUITY MEAN?

The term "digital equity" is relatively new, but the notions that it encompasses – of ensuring that every person, regardless of demography, geography, or socioeconomic status, has the same opportunity to access and benefit from broadband services – are decades old. Indeed, equitable broadband access has long been a guiding light for policymakers, ISPs, and other stakeholders.

The IIJA definition of "Digital Equity" boils down these concepts to their essence:

> "The term 'digital equity' means the condition in which individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States."[4]

Unlike its definition of broadband adoption, the IIJA definition of digital equity is very broad. Implicit in it and in the definitions of the term offered by other groups, however, is the critical notion of equal opportunity to benefit from the transformative power of broadband.[5]

6.2.4 WHAT DOES DIGITAL INCLUSION ENCOMPASS?

The term "digital inclusion" can be thought of as a means of realizing digital equity. Both terms revolve around notions of equality of opportunity and equitable access to technology. But whereas "digital equity" describes the "condition" or ideal outcome of equitable broadband strategies, "digital inclusion" encompasses the nuts-and-bolts of realizing that outcome.

The IIJA definition of "digital inclusion," which reflects the work of advocacy groups like the National Digital Inclusion Alliance (NDIA),[6] provides more detail:

> "The term 'digital inclusion' –
>
> (A) Means the activities that are necessary to ensure that all individuals in the United States have access to, and the use of, affordable information and communications technologies, such as –
>
> (i) Reliable fixed and wireless broadband internet service;

(ii) Internet-enabled devices that meet the needs of users; and

(iii) Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration; and

(B) Includes –

(i) Obtaining access to digital literacy training;

(ii) The provision of quality technical support; and

(iii) Obtaining basic awareness of measures to ensure online privacy and cybersecurity."[7]

In short, "digital inclusion" encompasses the full range of supply- and demand-side issues impacting broadband adoption in the U.S. Successfully implementing comprehensive digital inclusion strategies can help a state or community realize digital equity goals.

6.2.5 WHAT SKILLS ARE ASSOCIATED WITH DIGITAL LITERACY?

"Digital literacy" encompasses the full skillset needed to put a broadband connection to meaningful and impactful uses. The IIJA definition adapts a widely-used definition developed by the American Library Association:

> "The term 'digital literacy' means the skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information."[8]

Digital literacy skills can range from the very basic – *e.g.,* learning how to navigate a computer with a mouse and how to log into email – to more complex tasks associated with leveraging broadband-enabled technologies for employment, healthcare, and/or educational purposes. IIJA's definition appears to be open-ended on purpose so stakeholders can adapt programming and related outreach and training initiatives to the specific needs of those lacking these skills.

6.2.6 HOW DO THESE TERMS AND NOTIONS WORK TOGETHER?

At bottom, a core focus of many demand-side policy interventions in the broadband space (*e.g.,* IIJA's digital equity programs) is to help increase broadband adoption rates among certain user groups. As noted in **Section 1**, broadband adoption rates have plateaued in recent years, driven in large part by stagnating adoption rates among low-income households, senior citizens, and other demographic groups. Programs and funding opportunities are being made available to drive adoption and to deliver needed digital literacy training. Stakeholders are being encouraged to do so in a digitally inclusive and equitable manner.

In sum, digital inclusion and digital equity are the overarching principles and goals to which supply- and demand-side programs should aspire. As discussed above, digital inclusion strategies are a means of achieving digital equity in communities and the nation as a whole. Successfully implemented, digitally inclusive and equitable strategies will naturally yield increased broadband adoption rates and enhanced digital literacy skills among historically under-adopting and unskilled populations.

NOTES

[1] *Falling Through the Net: A Survey of "Have Nots in Rural and Urban America,"* NTIA (July 1995), https://www.ntia.doc.gov/ntiahome/fallingthru.html.

[2] *See, e.g., Falling Through the Net II: New Data on the Digital Divide,* NTIA (July 1998), https://www.ntia.doc.gov/ntiahome/net2; *Falling Through the Net: Defining the Digital Divide,* NTIA (July 1999), https://www.ntia.doc.gov/report/1999/falling-through-net-defining-digital-divide.

[3] IIJA § 60302 (1).

[4] IIJA § 60302 (10).

[5] *See, e.g.,* Diana Fingal, *6 Things Every Educator Should Know About Digital Equity,* Oct. 4, 2021, International Society for Technology in Education, https://www.iste.org/explore/Lead-the-way/5-things-every-educator-should-know-about-digital-equity.

[6] *See, e.g.,* NDIA, Definitions, https://www.digitalinclusion.org/definitions/ ("*NDIA Definitions*").

[7] IIJA § 60302 (11).

[8] IIJA § 60302 (12). *See also NDIA Definitions.*

KEY TAKEAWAYS

- Broadband adoption rates continue to lag in certain communities and demographic groups. Oftentimes, the reasons for non-adoption vary from group to group and from household to household.
- It is incumbent upon state and local policymakers to understand the complex and multifaceted nature of the broadband adoption dynamics in their communities. Understanding why certain households choose not to adopt an otherwise readily available broadband connection will help to inform the tailored education and outreach strategies that are needed to increase take-rates across the board.

6.3.1 WHY IS IT CRITICAL FOR POLICYMAKERS TO UNDERSTAND THE DYNAMICS ASSOCIATED WITH BROADBAND ADOPTION?

For many, the notion of "broadband adoption" likely hinges on whether or not a person chooses to go online. Though technically accurate, this perspective oversimplifies the multifaceted decision-making process that each consumer goes through before going online. Appreciating that there is a "process" involved is essential to understanding the complexities of broadband adoption.

As discussed below, numerous factors and barriers influence, shape, and impede the broadband adoption decision-making process. These variables vary from community to community and user-group to user-group. For policymakers, knowing that these variations exist is a key first step toward developing impactful strategies and solutions to addressing them and making the decision-making process easier.

Ultimately, broadband adoption decisions are personal. Not every person in the U.S. will adopt or use broadband, even if a connection is free. The focus of policymakers should thus be on creating an environment in which broadband adoption is easy, affordable, and sustainable for those who wish to go online and learn how to use their internet connection in a meaningful way.

6.3.2 WHAT FACTORS IMPACT BROADBAND ADOPTION DECISIONS?

The following explores a range of factors that impact and influence broadband adoption decisions.

- **Awareness of Broadband and its Availability.** Broadband adoption requires consumers to know what broadband is, what it can do, and that it is available to them for purchase. The COVID-19 pandemic certainly raised the profile of broadband and its many uses in enabling both convenient (*e.g.*, video-conferencing) and critical (*e.g.*, telemedicine, virtual schooling) services. Indeed, there is data suggesting a small but meaningful bump in broadband adoption in certain areas during the pandemic.[1] In addition, surveys taken during the pandemic indicate greater awareness of the essential nature of broadband.[2] Policymakers can build on this momentum by continuing to promote the benefits of broadband and underscoring that it remains a critical tool post-pandemic.
- **Appreciating that Broadband is Relevant to One's Life.** Broadband adoption requires more than just an awareness of an available connection. Consumers must also view broadband as relevant to their life and therefore a valuable investment of resources. "Relevance" has long been part of the digital divide conversation. Survey data consistently highlights that many non-

adopters do not perceive broadband as relevant or useful.[3] Such an outlook directly impacts whether they view the cost of a broadband subscription as affordable.[4] As discussed in **Section 6.5**, properly designed outreach and education initiatives can help to reframe broadband as relevant for many non-adopters.

- **Ability to Afford Broadband.** For some, the cost of a subscription is a major barrier to broadband adoption. In general, broadband adoption has long been correlated with income: those with higher annual incomes tend to have much higher rates of broadband adoption than lower-income households (see **Section 1.5** for additional discussion).[5] For many years, there were limited resources available to non-adopters who were unable to afford a broadband connection. Until recently, government subsidies distributed by the FCC through its Lifeline program focused only on voice services. Fortunately, a spate of new programs has been launched in recent years to help address the affordability of broadband. As discussed in more detail in **Section 6.4**, eligible consumers can use these subsidies in combination with low-cost broadband offerings from ISPs to access the internet for free.

- **Ability to Access Broadband on a Computing Device.** Another impediment to broadband adoption is lack of a computing device to harness a broadband connection. Purchasing such a device only adds to the overall cost of adopting broadband, further compounding the affordability concerns of many non-adopters. Until recently, one of the only means of overcoming this barrier was via a nonprofit that refurbished old computers. Now, device subsidies are being rolled out as part of a broader focus on steering funds directly to consumers to address broadband affordability issues (these are discussed in **Section 6.4**).

- **Privacy and Security Concerns.** A range of additional barriers impact broadband adoption decisions and how adopters use the internet. These include security and privacy concerns – *e.g.*, that being online increases the likelihood of having one's personal or financial information stolen. These concerns are common across both adopting and non-adopting households. Indeed, even avid internet users tend to avoid certain online activities because of safety and privacy concerns.[6] Among non-adopters, these concerns are especially prevalent among older adults.[7]

- **Accessibility-Related Barriers.** Accessibility barriers also remain for many people with disabilities. The broadband adoption rates among people with disabilities is somewhat lower than the rate for those without disabilities: 72% vs. 78%.[8] This may be because the quality of the user experience is reduced in many cases for people with disabilities as a significant number of websites and online services lack even basic accessibility features.[9]

- **Possessing the Skills Needed to Use an Internet Connection.** Many non-adopters and fledgling broadband adopters lack the skills needed to use broadband effectively, significantly decreasing the perceived usefulness of an internet connection. Promoting the notion of "digital readiness," of being ready, willing, and able to harness the transformative power of broadband, is essential to state and local efforts aimed at bringing more people online.[10]

6.3.3 TO WHAT EXTENT CAN POLICYMAKERS ADDRESS THESE FACETS OF BROADBAND ADOPTION?

Each of the factors and barriers described above is amenable to intervention by policymakers and other stakeholders. As discussed in subsequent parts of this Section, the most impactful interventions tend to

be those that are tailored to address the needs of a specific under-adopting group. For example, education and outreach initiatives targeting non-adopting senior citizens will likely vary in many ways from those targeting low-income households with school-age children. Some components of these efforts might be the same – *e.g.,* making subsidies available to offset the price of a broadband subscription – but the manner in which broadband is framed as relevant and useful will likely be much different. This is what makes broadband adoption such a challenging issue to address. As such, policymakers should seek to collaborate with and leverage as many partners as possible when addressing adoption-related issues in their community.

NOTES

[1] *See, e.g.,* Catherine Isley and Sarah A. Low, *Broadband Adoption and Availability: Impacts on Rural Employment During COVID-19,* Telecommunications Policy 46 (2022), https://www.sciencedirect.com/science/article/pii/S0308596122000143.

[2] *See, e.g.,* Colleen McLain et al., *The Internet and the Pandemic,* Sept. 1, 2021, Pew Research Center, https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/.

[3] *See, e.g.,* Rafi Goldberg, *Unplugged: NTIA Survey Finds Some Americans Still Avoid Home Internet Use,* April 15, 2019, NTIA, https://www.ntia.gov/blog/2019/unplugged-ntia-survey-finds-some-americans-still-avoid-home-internet-use.

[4] *See, e.g.,* Charles M. Davidson, Michael J. Santorelli & Thomas Kamber, *Broadband Adoption: Why it Matters & How it Works*, 19 Media L. & Policy (2009), http://comms.nyls.edu/ACLP/Davidson_Santorelli_Kamber-BB-Adoption-Article-MLP-19.1.pdf.

[5] *See, e.g.,* Rafi Goldberg, *New NTIA Data Show Enduring Barriers to Closing the Digital Divide, Achieving Digital Equity,* May 11, 2022, NTIA, https://www.ntia.doc.gov/blog/2022/new-ntia-data-show-enduring-barriers-closing-digital-divide-achieving-digital-equity.

[6] *See, e.g.,* Andrew Perrin, *Half of Americans Have Decided Not to Use a Product or Service Because of Privacy Concerns,* April 14, 2020, Pew Research Center, https://www.pewresearch.org/fact-tank/2020/04/14/half-of-americans-have-decided-not-to-use-a-product-or-service-because-of-privacy-concerns/.

[7] *See, e.g.,* Ed Baig, *Older Adults Wary about their Online Privacy,* April 23, 2021, AARP, https://www.aarp.org/home-family/personal-technology/info-2021/companies-address-online-privacy-concerns.html.

[8] *See* Andrew Perrin and Sara Atske, *Americans with Disabilities Less Likely Than Those Without to Own Some Digital Devices,* Sept. 10, 2021, Pew Research Center, https://www.pewresearch.org/fact-tank/2021/09/10/americans-with-disabilities-less-likely-than-those-without-to-own-some-digital-devices/.

[9] *See, e.g.,* Sarah Katz, *The Inaccessible Internet,* May 22, 2020, Slate, https://slate.com/technology/2020/05/disabled-digital-accessibility-pandemic.html.

[10] *See, e.g.,* John B. Horrigan, *Digital Readiness Gaps,* Pew Research Center (Sept. 2016), https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2016/09/PI_2016.09.20_Digital-Readiness-Gaps_FINAL.pdf.

KEY TAKEAWAYS

- In recognition of the affordability challenges experienced by millions of Americans vis-à-vis subscribing to broadband – challenges that were laid bare during the pandemic – a range of programs and plans were created to help lower the cost of internet service.
- These efforts include a new federal subsidy program that makes available $30/month to offset broadband subscription costs. Most major ISPs also provide low-cost broadband plans. Taken together, these offerings are helping to substantially lower the cost of broadband – and in many cases reduce it to zero – thereby making broadband adoption a reality for millions.

6.4.1 ARE RESOURCES AVAILABLE FROM THE FEDERAL GOVERNMENT TO OFFSET THE COST OF BROADBAND AND/OR COMPUTING DEVICES?

The FCC's Affordable Connectivity Program (ACP), launched in early 2022, makes available $30/month to eligible households, and $75/month to eligible households on qualifying Tribal lands, to offset the cost of a broadband subscription.[1] The program also offers one-time device subsidies of up to $100.[2]

Program eligibility is broad and covers households with an income at or below 200% of the Federal Poverty Guidelines. It also covers households with a member that either:

- Received a Pell grant during the current award year;
- Meets the eligibility criteria for a participating ISP's existing low-income program (see below for details);
- Participates in SNAP, Medicaid, federal public housing assistance, SSI, WIC, Veterans Pension (or survivor benefits), or Lifeline; or
- Participates in related programs while living on a qualifying Tribal land.[3]

As of September 2022, nearly 14 million households were participating in the ACP.[4] This represents an increase of over 4 million households since the ACP succeeded the prior subsidy program, the Emergency Broadband Benefit (EBB) Program, on Dec. 31, 2021.[5] Most subscribing households – about 60% as of September 2022 – choose to apply the subsidy to a mobile broadband connection, reflecting increased consumer demand for wireless connectivity.[6]

The ACP, and before it the EBB, have succeeded in helping to keep millions of Americans connected to broadband and lowering the affordability barrier for non-adopters. However, the ACP remains vastly undersubscribed. Data suggests that less than one-third of all eligible households have enrolled in the ACP almost a year after the original EBB program was launched.[7] Policymakers at every level should focus on promoting the availability of this significant monthly subsidy.

Subsidies via the federal Lifeline program also remain available. The Lifeline subsidy, though, is only $9.25/month for qualifying households and $34.25/month for qualifying Tribal households.[8] As of January 2022, approximately 6.5 million households continued to receive the Lifeline subsidy, representing a 19% enrollment rate.[9] Current Lifeline enrollees must opt into the ACP program; automatic enrollment is not possible at this time.[10]

6.4.2 HAVE ISPs MADE AVAILABLE LOW-COST INTERNET PLANS TO ADDRESS AFFORDABILITY ISSUES FOR NON-ADOPTERS?

Every major ISP has launched a program or plan that makes available low-cost broadband service. Many of these offerings predate the ACP and were available to consumers during the pandemic, providing critical support to those seeking to remain online or connect for the first time during a period when connectivity was essential.

The following provides an overview of some of these low-cost offerings (as of September 2022):

- **AT&T Access**. AT&T's Access offers eligible customers broadband service of up to 100 Mbps for $30/month or less.[11] Eligible households are those that participate in the ACP and/or receive SNAP, National School Lunch, or have a household income below 200% of the federal poverty guidelines.[12] Qualifying customers can use the ACP subsidy to pay the reduced cost of service offered via Access, providing them with free connectivity.[13]
- **Charter Spectrum Internet Assist**. This program offers eligible households 30 Mbps broadband service for $15/month.[14] To be eligible, a member of the households must be enrolled in the National School Lunch Program (NSLP), the Community Eligibility Provision of the NSLP, or Supplemental Security Income for those over the age of 65.[15] Charter also maintains a Spectrum Internet 100 program, through which customers who enroll in the ACP can receive 100 Mbps internet service at no monthly cost.[16]
- **Comcast Internet Essentials**. Comcast's Internet Essentials is the oldest ISP-led low-cost broadband program. It was established in 2011 and succeeded in connecting over 10 million people to the internet in its first decade.[17] Internet Essentials currently offers eligible households a 50/10 Mbps connection for $9.95/month.[18] An Internet Essential Plus package is also available – it provides 100 Mbps service for $29.95/month, or for free if enrollees also sign up for the ACP.[19]
- **Cox Connect2Compete**. This program offers eligible households a 100 Mbps connection for $9.95/month.[20] Eligibility revolves around whether a household receives any form of government assistance for children in K-12.
- **Verizon Fios Forward**. Verizon launched this program in April 2020. It offers eligible households a 300 Mbps broadband connection for $39.99/month.[21] Those who enroll in the ACP will receive service for free.[22]

6.4.3 ARE ADDITIONAL EFFORTS UNDERWAY OR ON THE HORIZON TO EXPAND THE AVAILABILITY OF LOW-COST BROADBAND SERVICE?

A number of related efforts are underway or about to launch, promising to greatly expand the number of affordable options available to both existing broadband users and non-adopters looking to go online.

Per the IIJA, any entity that receives grant funding via the BEAD program to build a broadband network in unserved or underserved areas must make available a low-cost broadband service option.[23] The parameters of the low-cost offering will be set by states and approved by NTIA. States must consult with ISPs and other potential grantees when developing their proposed low-cost options, so in theory, the parameters of these low-cost offerings could reflect those currently on offer by ISPs.[24] Indeed, NTIA's NOFO included a possible definition for low-cost broadband that mirrors many ISPs' low-cost plans

discussed above.[25] Electing to adopt a low-cost broadband approach that reflects current plans could assure greater consistency in the offerings, enhance predictability among consumers (and reduce confusion), and streamline their administration.

The digital equity components of the IIJA will also likely help to promote the availability of the myriad affordable broadband options described above. For example, via the State Digital Equity Capacity Grant Program, states will be required to develop digital equity plans that, among other things, identify objectives – and the means of achieving those objectives – related to the affordability of broadband service and access devices.[26] This could encompass education and outreach initiatives that leverage the relationships and reach of organizations like anchor institutions, educational agencies, nonprofits, and organizations that work with older adults, people with disabilities, veterans and other similar groups.[27]

Concurrent with these emerging efforts at the state level is a growing focus on promoting broadband adoption and digital literacy at the local level. As discussed in **Sections 6.5 and 6.6**, meaningful progress towards increasing adoption levels and enhancing digital literacy skills will be made at the hyperlocal levels. In recognition of this fundamental dynamic, cities are deploying a range of resources to support proven efforts aimed at bolstering broadband connectivity. Some cities, like San Jose, CA, have established digital equity funds to enable the broader provision of outreach and training services.[28] Other cities, like Philadelphia, PA, have developed and released comprehensive digital equity plans that articulate a multifaceted strategy for closing digital divides.[29]

Regardless of the path taken, a greater focus on promoting broadband adoption and improving digital literacy by cities will likely translate into higher take-rates.

NOTES

[1] FCC, Affordable Connectivity Program, https://www.fcc.gov/acp.

[2] *Id*.

[3] *Id*.

[4] USAC, ACP Enrollment and Claims Tracker (as of Sep. 19, 2022), https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/ ("*ACP Enrollment Data*").

[5] USAC, Emergency Broadband Benefit Program Enrollments and Claims Tracker (as of Dec. 30, 2021), https://www.usac.org/about/emergency-broadband-benefit-program/emergency-broadband-benefit-program-enrollments-and-claims-tracker/.

[6] USAC, Additional ACP Data, https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/additional-acp-data/.

[7] Based on a comparison of ACP enrollment data as of April 2022, *ACP Enrollment Data,* with the total number of households eligible for Lifeline, a program with similar eligibility criteria to the ACP. *See* USAC, Lifeline – Program Data, https://www.usac.org/lifeline/resources/program-data/. The ACP's eligibility criteria is broader than Lifeline's, so the enrollment rate for the ACP is likely much lower than one-third.

[8] FCC, Lifeline – Consumer Guide, https://www.fcc.gov/sites/default/files/lifeline_support_for_affordable_communications.pdf.

[9] *Id*.

[10] FCC, Affordable Connectivity Program Consumer FAQ, https://www.fcc.gov/affordable-connectivity-program-consumer-faq.

[11] AT&T, Access, https://www.att.com/internet/access/.

[12] *Id.*

[13] *Id.*

[14] Charter, Spectrum Internet Assist, https://www.spectrum.com/internet/spectrum-internet-assist.

[15] *Id.*

[16] *Charter is Advancing Access to Affordable, Reliable High-Speed Internet Service,* April 28, 2022, Charter Communications, https://policy.charter.com/advancing-access-to-affordable-reliable-internet.

[17] *10 Years of Internet Essentials,* Comcast (March 2021), https://update.comcast.com/wp-content/uploads/sites/33/dlm_uploads/2021/03/IE-ProgressReport_FINAL.pdf.

[18] Comcast, Internet Essentials, https://internetessentials.com/.

[19] *Id.*

[20] Cox, Connect2Compete, https://www.cox.com/residential/internet/connect2compete.html.

[21] Verizon, Fios Forward, https://www.verizon.com/home/fios-forward/.

[22] *Id.*

[23] IIJA § 60102(h)(5).

[24] IIJA § 60102(h)(5)(B)(ii).

[25] *BEAD NOFO* at p. 67-68.

[26] IIJA § 60304(c)(1)(B)(i) & (v).

[27] IIJA § 60304(c)(1)(D).

[28] *See, e.g.,* San Jose Digital Inclusion Fund, About, https://www.sjdigitalinclusion.org/about.

[29] *See, e.g., A Digital Equity Plan for the City of Philadelphia,* Office of Innovation & Technology, City of Philadelphia (Jan. 2022), https://www.phila.gov/media/20220215130307/Digital-Equity-Plan.pdf.

KEY TAKEAWAYS

- State and local policymakers have many roles to play when it comes to bolstering broadband adoption and enhancing digital literacy. The most impactful of these roles are as supporters and enablers of the efforts of expert entities with a demonstrated track-record in bringing people online and equipping them with a core set of skills.
- This Section identifies best practices that state and local policymakers can look to when developing strategies for increasing broadband adoption rates and promoting digital literacy skill development.

6.5.1 WHAT BEST PRACTICES CAN POLICYMAKERS AT THE STATE AND LOCAL LEVELS LOOK TO WHEN DEVELOPING STRATEGIES FOR INCREASING BROADBAND ADOPTION RATES?

The following details best practices that state and local policymakers might use to inform strategies aimed at bolstering broadband adoption rates in their communities.

- **Seek to Understand Broadband Adoption Dynamics.** As a first step, state and local policymakers should endeavor to understand the complexities associated with the broadband adoption decision-making process. A high-level overview is provided in **Section 6.3**. Once policymakers learn about the many different variables that influence adoption decisions, it will become clear that embracing the following best practices is the optimal way to improve adoption rates.
- **Understand that the Best Role for Policymakers is as a Supporter and Enabler of the Efforts of Others.** When it comes to increasing broadband adoption rates, the most impactful role for policymakers at the state and local levels is as a facilitator and promoter of the efforts of those working on the ground to connect the unconnected. This is not to say that state and local governments have no role to play. To the contrary, these entities can and should play lead roles in planning, identifying goals/objectives for maximizing adoption rates, securing available grant funding to support adoption-oriented initiatives, and making sure expert entities have the resources needed to expand their efforts.
- **Appreciate the Hyperlocal & Community-Specific Nature of Broadband Adoption.** A core aspect of broadband adoption is that it is highly community-specific.[1] The barriers impacting older adults, for example, often differ in subtle but important ways from those impeding adoption among low-income households.[2] In addition, the challenges facing non-adopting households in rural areas usually differ in significant ways from those facing non-adopting households in urban areas. A key takeaway for policymakers is that the most effective adoption-related strategies reflect this essential dynamic and prioritize hyperlocal efforts aimed at bringing more people online.[3]
- **Harness the Local Social Infrastructure.** To effectively address adoption-related barriers at the hyperlocal level, it is necessary for policymakers to tap into local social infrastructures. These networks of expert programs and institutions are key inputs to any adoption- and skills-focused program. As such, it is essential to understand the characteristics of these local networks, including the capacities and limitations of component organizations. Developing this

knowledge base is critical to effective programmatic responses. In the context of forthcoming digital equity grant programs established by the IIJA and to be overseen by NTIA, such an approach is specifically contemplated, underscoring the importance of policymakers seeking to understand the nuances of their local social infrastructures sooner rather than later.[4]

- **Empower Experts.** Over the last decade, a range of nonprofits and other organizations have established themselves as experts in helping to connect the unconnected. Policymakers should seek to collaborate with these groups in order to support and expand their offerings. Many of these programs focus on specific under-adopting user groups and tailor their offerings accordingly. For example, Older Adults Technology Services (OATS) is the preeminent organization for helping to raise the broadband adoption rate among senior citizens.[5] Other efforts focus on addressing specific needs in under-adopting neighborhoods. For example, a recently launched partnership in Chattanooga, TN, pairs adoption-oriented outreach services with a focus on promoting telehealth to improve health outcomes in a high poverty part of the city.[6] Ultimately, it is up to policymakers to know who the broadband adoption experts are in their communities and proactively engage them to determine how a state or city can best support their work.

- **Make Funding Available.** A major need of expert entities working on broadband adoption issues is funding. Effective education and outreach initiatives tend to be very resource-intensive. Training programs are usually multi-week courses that are offered for free in community centers, libraries, and other community institutions.[7] As such, many programs can only scale their efforts incrementally after receiving adequate funding to support establishing programs in a new area. State and local policymakers are well positioned to help steer more resources to support continued expansion of proven programs. Funding from the IIJA's digital equity programs and BEAD (once supply-side issues have been adequately addressed) will certainly help to jumpstart such expansion, but additional funding from states, localities, philanthropies, and other sources will be needed for further growth and to sustain these efforts over the long-term.

- **Leverage the "Bully Pulpit" to Raise Awareness of the Benefits of and Opportunities for Broadband Adoption.** State and local policymakers should seize every opportunity to promote the importance of and opportunities for broadband adoption. Hearing from officials on these issues can be powerful motivators, especially if an official identifies concrete steps that can be taken to get online. In New York, for example, Governor Kathy Hochul specifically highlighted the availability of monthly subsidies via the Affordable Connectivity Program (ACP) as part of a push focused on enhancing connectivity across the state. This helped to increase enrollment in the ACP by 100,000 households in just a few months.[8] Similar efforts deployed across every state and locality could dramatically increase take-rates.

6.5.2 WHAT BEST PRACTICES CAN POLICYMAKERS AT THE STATE AND LOCAL LEVELS LOOK TO WHEN DEVELOPING STRATEGIES FOR PROMOTING DIGITAL LITERACY SKILL DEVELOPMENT?

State and local policymakers are also well positioned to support and further efforts focused on promoting digital literacy skill development. As discussed throughout **Section 6**, digital literacy skills are essential to helping wary non-adopters and fledgling new adopters embrace broadband and equipping them with the tools needed to put their connections to meaningful uses.

The following identifies best practices that state and local policymakers might use to inform strategies aimed at enhancing digital literacy skill development in their communities.

- **Leverage the "Bully Pulpit" to Raise Awareness of the Benefits of and Opportunities for Digital Literacy Skill Development.** Like with promoting broadband adoption, state and local policymakers should seize every opportunity to highlight the importance of developing digital literacy skills and identify opportunities for doing so. Such opportunities will likely increase in number as federal digital equity grant programs are rolled out over the next few years. In the meantime, state and local officials should be sure to build a robust focus on digital literacy skill development into their broadband connectivity planning. To that end, NTIA encouraged states to engage concurrently in BEAD and digital equity planning so that they could develop a unified vision for bolstering broadband connectivity from both the supply-side and demand-side.[9]

- **Integrate Digital Literacy Skill Development into Educational Curricula.** In addition to promoting the importance of digital literacy skill development, state and local policymakers can begin the process of integrating those opportunities into school curricula. This can help to ensure that the next generation of broadband users are prepared to leverage their connections in a responsible and impactful way. Such was attempted on a national scale via the Common Core initiative that was launched in 2010.[10] Implementation, though, has not been consistent, with some states refusing to adopt the core standards outright and with others failing to develop comprehensive digital literacy requirements. Related efforts have been deployed at a more local level since then. In New York City, for example, a consortium of technology companies, nonprofits, philanthropies, and others launched CS4All, which focused on making available coding and related offerings in schools across the city.[11] That effort has since spread across the nation, helping equip teachers with the skills needed to teach students about responsible computer use.[12] State and local policymakers can advance these and similar efforts by formally integrating digital literacy standards and requirements into school curricula.

- **Link Broadband Adoption and Digital Literacy with Workforce Development Programs.** One way to raise awareness of the relevance of broadband and highlight how digital tools can be used to generate income is to link broadband adoption and digital literacy skills to workforce development programs. Creating pathways or pipelines that connect a digital literacy program to a job placement initiative make explicit the practical importance of connectivity in today's digital economy. A number of such programs have already been developed by the private and nonprofits sectors. Many involve coding academies or bootcamps that are sponsored by tech companies, which then consider graduates for full-time employment.[13] Even for non-adopters, this approach has proven to work. OATS, for example, offers a range of workforce-related offerings to older adults, many of whom are interested in continuing to work or pursuing a second career.[14] This often translates into more sustainable broadband adoption. Increasingly, cities and states are seeking to coordinate these myriad offerings as part of overall digital inclusion and workforce development planning.[15] By continuing to serve as convenors and facilitators, state and local policymakers can greatly enhance the impact of these programs vis-à-vis broadband adoption and digital literacy skill development.

NOTES

[1] *See, e.g.,* Charles M. Davidson, Michael J. Santorelli & Thomas Kamber, *Broadband Adoption: Why it Matters & How it Works*, 19 Media L. & Policy (2009), http://comms.nyls.edu/ACLP/Davidson_Santorelli_Kamber-BB-Adoption-Article-MLP-19.1.pdf.

[2] *See, e.g., Barriers to Broadband Adoption: A Report to the FCC*, ACLP at New York Law School (Dec. 2009), http://comms.nyls.edu/ACLP/ACLP-Report-to-the-FCC-Barriers-to-BB-Adoption.pdf.

[3] *See, e.g.,* Charles M. Davidson, Michael J. Santorelli & Thomas Kamber, *Toward an Inclusive Measure of Broadband Adoption*, 6 International Journal of Communication 2555 (2012), http://comms.nyls.edu/ACLP/Davidson-Santorelli-Kamber-Toward-an-Inclusive-Measure-of-Broadband-Adoption-IJOC-2012.pdf.

[4] IIJA § 60304(c)(1)(D)(i)-(xi).

[5] For more information, *see* https://oats.org/.

[6] *See, e.g.,* Michelle Hindmon, *Expanding Access to Create Connected Communities in Orchard Knob,* March 3, 2022, Chattanooga Pulse, http://www.chattanoogapulse.com/citylife/science-technology/expanding-access-to-create-connected-communities-in-orchard-/.

[7] *See, e.g., Connecting Rural Older Americans with Technology: Lessons From Senior Planet,* OATS (May 2020), https://oats.org/wp-content/uploads/2020/05/noco-lessons-from-senior-planet-1.pdf.

[8] *See Governor Hochul Announced 100,000 Families Have Joined Federal Broadband Affordability Program,* March 16, 2022, Office of the Governor of the State of New York, https://www.governor.ny.gov/news/governor-hochul-announces-100000-families-have-joined-federal-broadband-affordability-program.

[9] *BEAD NOFO* at p. 10.

[10] *See, e.g.,* Monica Burns, *The Common Core and Digital Skills Development,* July 1, 2015, Edutopia, https://www.edutopia.org/blog/common-core-digital-skills-development-monica-burns.

[11] *See* CS4All, About, https://www.csforall.org/about/csnyc/.

[12] *Id.*

[13] *See, e.g.,* Jessica Stillman, *This is How Coding Bootcamp Will Impact Your Career*, Inc, https://www.inc.com/jessica-stillman/this-is-how-that-coding-bootcamp-will-impact-your-career.html.

[14] *See, e.g.,* Paula J. Gardner, *Older Adults and OATS Computer Training Courses – A Social Impacts Analysis,* N.Y. Academy of Medicine (April 2010), https://cdn-std.droplr.net/files/acc_695959/txMwZF?download&response-content-disposition=attachment%3B%20filename%3DNew-York-Academy-of-Medicine-study.pdf.

[15] *See, e.g.,* Sydney Diavua, *Building Opportunities and Skills for a Growing Digital Workforce,* Federal Reserve Bank of Philadelphia (Winter 2016), https://www.philadelphiafed.org/community-development/workforce-and-economic-development/building-opportunities-and-skills-for-a-growing-digital-workforce.

KEY TAKEAWAYS

- Over the next few years, state and local policymakers will have to grapple with digital equity issues if they wish to leverage federal funding that has been earmarked for addressing supply-side and demand-side broadband issues.
- This Section sets forth a framework that can be used to guide equity-related planning by state and local policymakers. Using this framework from the outset can help to jumpstart the planning process by focusing attention on the aspects of equity planning that matter the most.

6.6.1 HOW CAN POLICYMAKERS AT THE STATE AND LOCAL LEVELS ENHANCE DIGITAL EQUITY IN THEIR COMMUNITIES?

Digital equity has become a major focus and driver of broadband-related efforts in recent years. As noted in **Section 6.2**, digital equity encompasses core notions related to ensuring that every person, regardless of demography, geography, or socioeconomic status, has the same opportunity to access and benefit from broadband services. Over the next few years, state and local policymakers will have to grapple with these issues if they wish to leverage federal funding that has been earmarked for addressing digital equity from both the supply-side and demand-side.

To access federal broadband funding, state policymakers will have to collaborate with their counterparts at the local level, as well as stakeholders across the private and nonprofit sectors, to develop and deploy plans that detail how resources will be used to enhance digital equity and promote more robust broadband connectivity. Indeed, the IIJA positions equity as a primary consideration that must inform how BEAD funding is allocated – the statute requires states to ensure that whatever funding is distributed in support of broadband expansion is done in an "equitable and non-discriminatory manner."[1] Similarly, securing digital equity grant funding via the IIJA will require states to work with local counterparts to develop digital equity plans that cover the full range of broadband connectivity issues – *i.e.,* those on both the supply-side and demand-side.[2]

This Section sets forth a framework to help guide equity-related planning by state and local policymakers. Using this framework from the outset can help to jumpstart the planning process by focusing attention on the aspects of equity planning that matter the most.

6.6.2 WHAT ARE THE KEY ELEMENTS THAT SHOULD BE INCLUDED IN A DIGITAL EQUITY FRAMEWORK?

The Digital Equity Framework includes the following elements:

- **Availability Assessment**. As a threshold matter, officials should undertake a comprehensive inventory of broadband availability in the city/county/region. This should encompass all forms of broadband regardless of technology and catalog available speeds, price points, and service offerings. If the area is served – *i.e.*, if residents can readily subscribe to a broadband connection of some kind – then officials should continue forward with the framework. If the area is deemed unserved, then different remedies are appropriate (see **Section 5** for resources related to bolstering broadband availability).

- **Adoption Assessment.** In served areas, the next step is to evaluate broadband adoption in the community. What are the adoption rates across relevant demographic and socioeconomic groups? What kinds of services and speeds are consumers using? Who isn't online?
- **Barriers Assessment**. For those who aren't online, understanding specifically why they have not adopted broadband is essential. What are the major barriers impeding their adoption? Is it the cost of a broadband connection? The lack of a computing device? A hesitance or fear of going online? A lack of appreciation for how broadband can positively impact one's life? General disinterest? A granular understanding of these issues within each under-adopting user group will increase the chances that policy responses are impactful (see **Section 6.5** for further discussion).
- **Partnership Assessment**. Once the nuanced landscape of broadband connectivity is fully understood, the next step is to identify potential partners for bringing more people online. ISPs are natural partners given their presence in the locality (see **Sections 5.3 and 5.4**). Partnerships with them could yield greater promotion of existing low-cost offerings, the availability of ACP subsidies, additional Wi-Fi deployments, or other appropriate responses to connectivity challenges facing certain communities. Currently, there appears to be a significant gap in awareness of the availability of low-cost broadband programs and subsidies among users who might qualify (see **Section 6.4**). Closing that gap should be a priority for policymakers and other stakeholders. On the demand-side, partners might include anchor institutions, nonprofits, foundations, healthcare associations, community groups, senior centers, and other stakeholders in the local social infrastructure that have established roots in the community and have demonstrated bona fides vis-à-vis bringing people online and delivering targeted digital literacy training.
- **Strategy Development**. After the data has been gathered and assessed; the issues identified; and resources marshaled, local officials will then be in a better position to begin aligning these myriad assets to address the challenges at hand. An inclusive process that brings all stakeholders to the table for collaborative, solution-focused discussions will be best vis-à-vis generating workable strategies.
- **Solution Deployment**. Once strategies have been developed, officials, in tandem with the network of partners convened to assist, can focus on the tactical deployment of actual solutions, including the securing and allocating of available grant funding. Priority should be assigned to those communities where broadband adoption rates are lowest.

6.6.3 WHAT ARE THE BENEFITS OF USING A DIGITAL EQUITY FRAMEWORK TO INFORM PLANNING AND PROGRAMMATIC RESPONSES?

The benefits of the framework proposed above are myriad. The framework is:

- **Realistic.** Deploying the framework ensures that responses to broadband challenges are reflective of actual supply and demand needs. Moreover, the framework intentionally avoids starting from the perspective that a certain kind of technology or speed or price point is optimal. Rather, the framework embraces what is already available and works from there.

- **Data Driven**. The framework revolves around accurate and fresh data collected from the communities where challenges are evident. Wielding data in this manner helps to ensure that the identification of connectivity issues is as precise as possible.
- **Holistic**. This ground-up assessment will help to assure a more comprehensive understanding of any nuances in local broadband availability and adoption. It also serves as means of bringing all stakeholders together for collaborative, solution-focused conversations.
- **Hyperlocal.** The most impactful broadband equity strategies tend to be those that tap into partners, institutions, and other resources that are already available in communities (see **Section 6.5**).
- **Technology Neutral**. The framework does not value one kind of broadband technology over another. Rather, it embraces any platform that can provide reliable high-speed access to the internet (see **Section 5.3**).
- **Flexible**. Deploying the framework avoids having to shoehorn communities into one-size-fits-all "solutions." Instead, communities are empowered to develop strategies that reflect the unique characteristics of their local broadband market.
- **Amenable to Public-Private Solutions**. The framework orients government intervention around leveraging private and nonprofit partners whenever possible to address both supply-side (*e.g.*, identifying issues like rights-of-way access for regulatory reform in an effort to facilitate greater investment and hasten buildout) and demand-side issues (*e.g.*, working together to promote low-cost offerings). This allows public officials to serve as conveners and coordinators, which are their optimal roles in the broadband space.

NOTES

[1] IIJA § 60102(g)(2)(B).

[2] IIJA § 60304(c)(1).

State and Local Policymakers' Broadband Planning Tool Kit

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