

Seizing the Moment: Scaling Up State Broadband Strategies

July 2021

Authored by Jon Wilkins
Published by Quadra Partners, LLC
with support from Schmidt Futures

Acknowledgements

The author wishes to thank the individuals and organizations who supported the development of the white paper by contributing their time, expertise, and perspectives, including:

Tithi Chattopadhyay, Ph.D.
Associate Director
Center for Information Technology Policy
Princeton University

Kathryn de Wit
Project Director
Broadband Access Initiative
The Pew Charitable Trusts

Veneeth Iyengar
Executive Director for Broadband & Connectivity
State of Louisiana

Peter Pratt
Senior Policy Analyst
California Public Utilities Commission

Peggy Schaffer
Executive Director
Connect Maine

Tom Wheeler
Visiting Fellow, The Brookings Institution
Senior Fellow, Harvard Kennedy School

This white paper is the first in a new research series supported by Schmidt Futures, a philanthropic initiative founded by Eric and Wendy Schmidt that bets early on exceptional people making the world better. The series aims to help stakeholders maximize Americans' access to, ability to afford, and adoption of high-speed digital infrastructure.

The views expressed in this white paper are solely those of the author and do not necessarily reflect the views of Schmidt Futures.

Executive Summary

Across the United States, state governments are moving rapidly to expand existing broadband programs to take advantage of the historic wave of new federal support for broadband deployment and adoption. In 2021 alone, 47 states, the District of Columbia, and Puerto Rico introduced legislation addressing broadband. Some states are forming brand new broadband authorities; others are seeking to significantly scale up the work of existing broadband offices.¹ In total, the pace of progress and complexity of the state telecommunications policy environment is at its highest level since the early years following the 1996 Telecommunications Act.

The most important strategic issues now facing states are scale and speed. Over the past decade, many states have developed effective programs and identified a number of best practices, including putting in place a state broadband plan with clear goals and metrics, establishing program evaluation and oversight processes, and ensuring effective intra-governmental coordination between state legislative, executive, and regulatory bodies.

However, in the space of less than 18 months, state broadband efforts have moved from a resourcing environment characterized by relative scarcity to one of prospective abundance. Although state broadband efforts have developed many successful strategies, the current era of federal funding is poised to expand state broadband budgets by an order of magnitude or more in a very short period of time. The key question: will established programs scale, and scale quickly to meet this historic moment of opportunity?

This breakneck pace of recent activity also comes with considerable uncertainty. As the federal government rapidly launches major new broadband programs, states are facing many important choices and a series of tight deadlines, all against the backdrop of uncertainty about the ultimate size and specifics of the potentially largest federal broadband effort of all: the current infrastructure legislation now being debated in Congress.

The objective of this white paper is to help state leaders develop effective plans to scale up their fixed broadband strategies to meet the current moment. This paper will not address the issue of mobile broadband service, and it will not recommend specific front-line policy choices, such as “what broadband speed should define an ‘unserved location’ in a state grant program” or “what types of networks should be supported in what areas.” Instead, this white paper seeks to provide a roadmap for building up state broadband strategies by framing key planning choices, highlighting practical tradeoffs and timing questions, and identifying cross-cutting issues.

One near-certainty is that new federal broadband efforts will reserve significant leeway for state actors. Although no state is alike, this white paper’s overall recommendation does apply to all states: seize the moment to take control of your own destiny.

¹ For a comprehensive current survey, see “Which States Have Dedicated Broadband Offices, Task Forces, Agencies, or Funds?”, Pew Charitable Trusts, (June 28, 2021).

Key Takeaways

Scale-up is not automatic: Even states with strong broadband programs face the challenge of rapidly expanding their efforts to utilize the order-of-magnitude increase in funding suddenly available in order to deliver the transformative results that constituents will demand. Just adding dollars to existing programs will not be enough.

Take control of your own destiny: Concrete guidance from federal agencies may come late or not at all. Be consistent with statutory requirements and delineated goals, but don't expect to be told what to do. Unlike traditional federal programs with highly prescriptive rules, current federal efforts provide significant flexibility to state and local preferences. Waiting for federal direction will likely mean falling behind.

Invest in program capacity: Substantial American Rescue Act funds are already available to state and local entities, and recent Treasury Department guidance allows the use of those funds, in part, for capacity-building investments that are necessary to make the best use of funds. Investing in mapping, new staff for state broadband offices, and technical expertise can be vital for rapidly scaling up state broadband strategies.

Be rigorous about the use of data: State decisions should rest on solid fact-based foundations about where broadband is needed, how much it costs to deploy, the total business case profiles of projects, and the needs of end-users. Fact-based policy making is always important, but today's historic levels of investment in broadband will magnify the benefits of good decisions and the costs of bad ones.

Be strategic and draw on the full policy toolkit: Historically large public funds are available and will likely not be seen again for many years. A range of stakeholders will compete aggressively for them. But the loudest voices may not have the best ideas; take the time to design a strategy that maximizes total investment from all sources to deliver sustained, long term results. Employ a range of policy levers; play chess, not checkers.

Pillars of an Effective Strategy

1. Do your own high-quality broadband map:

- Existing federal broadband maps have known limitations, and improvements remain out on the horizon even as states seek to act now. States are well positioned to collect accurate data about local needs and should do so on a regular basis – both to accurately target current funding and to make future investments more efficient.
- Good mapping includes: an accurate “location fabric” of end-user structures; the type of networks available and performance characteristics; the dynamic ability to be updated with new information over time; and socioeconomic, demographic, adoption, and usage data.

2. Know the economics of broadband in your state:

- Effective investment of public funds requires an accurate economic profile of: 1) the business cases to deploy sustainable new broadband capability to unserved and underserved areas, taking into account the specific local circumstances in different areas of a state; and 2) the affordability gap for populations in both unserved/underserved and well-served areas.
- This economic baseline is the essential foundation for informed state choices. States are not alike. No business would invest substantial funds without a clear economic understanding, and states should not either.
- Focus on the fundamentals: how much total investment would be required to close the state's unserved gap? How much variation exists across the state? What are the financial trade offs of different performance goals? What technology types are best suited to each part of the state?

3. Take an all-of-the-above approach to providers, but do your due diligence:

- Traditional service providers are already implementing many broadband initiatives, including significant new investments in fiber-to-the-home. States should request detailed status updates from implementing entities and factor these into its plans to deploy new funding.
- The nontraditional ISP landscape is dramatically changing and now includes a range of electric utilities, public and nonprofit providers, and other new providers. Some of these entities may already be investing in infrastructure that could provide a major boost to new state efforts.
- Conduct due diligence into operational capabilities, historical track records, and demonstrated real-world technology performance before committing state support to a given provider...
- ...But be wary of attaching so many requirements as to deter participation from the most capable providers; states should aim to support providers who will deploy quickly and offer high performance, not necessarily those with the greatest appetite for engagement with the public sector.

4. Align your plan to tap all federal sources using all available state policy levers:

- A variety of federal agencies will dispense broadband funds, and each has unique requirements and modes of engaging with state-level actors. Wise state planning should be sure to cover all of these federal bases.
- Consider how actions now could foreclose future, potentially larger, federal funding; sequence state actions to maximize share of available funds, including making middle mile investments first. Conduct multiple tranches of funding opportunities; start quickly but incorporate lessons and local input before proceeding to later tranches.
- Look beyond basic grants to consider matching or "stacking" possibilities, with the aim of making the business case for deployment as attractive as possible to providers.

- States with infrastructure banks or similar financing programs could allocate portions of new federal funds to credit support programs or take direct advantage of such programs made available at the federal level.
- Affordability is a barrier, but not the only one; direct subsidies or low-price service tiers may be necessary but not sufficient. States should invest resources in promoting adoption and link those efforts to deployment programs.

5. Tap the potential of the entire state broadband ecosystem:

- Expand the convening, coordinating, and middle mile capacity roles played by research and education networks; school broadband and technology procurement entities; and economic and community development entities, including those in both rural and urban areas. New state coordination bodies or broadband authorities should be considered.
- Cultivate the human capital needed to deliver long-term societal benefits from current era investments; the digital divide will persist even when the access gap is closed, technology expertise in both the public and private sectors will be key.
- Connecting the dots between different federal funding pools and different state and local entities can generate significant synergies both for both deployment and adoption.
- The current surge of available funding creates opportunities to advance broader goals such as increased community usage levels and greater competition, but states should be careful to be realistic about the economic realities of unserved and underserved areas.

Introduction: The Rapid Scale-up Challenge

Even as the debate in Washington over infrastructure legislation continues, the United States is already in the midst of a generational investment in broadband.² Since last year, a range of federal actions made tens of billions of dollars newly available. Current proposals now pending in Congress could add tens of billions more. The size of the funding is unprecedented and the policy opportunity is once-in-a-generation.

However, a critical issue for broadband policy has been somewhat overlooked in all of the attention trained on Washington: the prominent role to be played by states, whether via direct state allocations of federal funds for broadband already authorized, the direct role states could play in the award of additional broadband infrastructure funds, and state policy steps that will impact in-state opportunities to benefit from federally administered broadband

² Over the last number of years, federal programs such as the Federal Communication Commission's Connect American Fund and the United States Department of Agriculture's ReConnect program have made available significant funds for rural broadband deployment. In addition, a wide range of private companies ranging from small, nontraditional players to the nation's largest telecommunications carriers are now in the midst of substantial new investment in fiber-to-the-home networks, reflecting in part the heightened demand for very high performance broadband demonstrated during the 2020-2021 COVID-19 behavioral shifts to work-from-home and remote-learning trends that are expected to remain as long term societal changes.

programs.³ States also are ahead of the curve on implementation. Even as the federal policy debate over infrastructure legislation continues, states from Maine to Louisiana to California are preparing to begin spending substantial funds already available.

Of course, broadband is far from a new policy issue at the state level. Many states have been engaged in broadband deployment and adoption efforts for a decade⁴ or more, in many cases via original work launched by the American Recovery and Reinvestment Act of 2009 (ARRA). Recent research has identified a number of best practices, and various state broadband efforts have made notable progress in recent years.⁵ However, the current moment presents a new critical question to state broadband leaders: how best to achieve rapid scale-up of broadband strategies in order to make the most of the order of magnitude increase in funding that so quickly materialized.

Indeed, for the past decade, state broadband efforts have grappled with the very different problem of how to make the most of highly-limited funding and staffing levels. In 2017, for example, Tennessee estimated that it could cost as much as \$800 million to deploy broadband to the 160,000 unserved homes in the state. Tennessee's grant program was a mere \$25 million over two years with an additional \$30 million in matching private investment. Tennessee's broadband program, in other words, did the best it could to make progress in a constrained funding environment, an experience mirrored by many other states.

Going forward, however, states of Tennessee's size are likely to receive direct and indirect federal funding opportunities for broadband well in excess of \$1 billion.⁶ This raises fundamental questions: should a state stick with existing programs and simply add funding? Should new capacity-building efforts be launched? Should new legislative or regulatory steps be taken? This rapid shift from funding scarcity to funding abundance is at the heart of the challenge for state broadband strategies from coast to coast.

For example, even basic timing and sequencing issues are creating difficult questions for state leaders. Significant initial tranches of federal funds for broadband will be arriving in state capitols this summer. Even more broadband infrastructure funding may be on the way, but timing and amounts are uncertain. Finally, just on the horizon in late 2022 or 2023, the Federal Communications Commission (FCC) will likely run two additional broadband funding efforts using Universal Service Fund dollars totaling approximately \$20 billion.

³ See Appendix A for a summary of currently authorized programs with a direct or indirect state role.

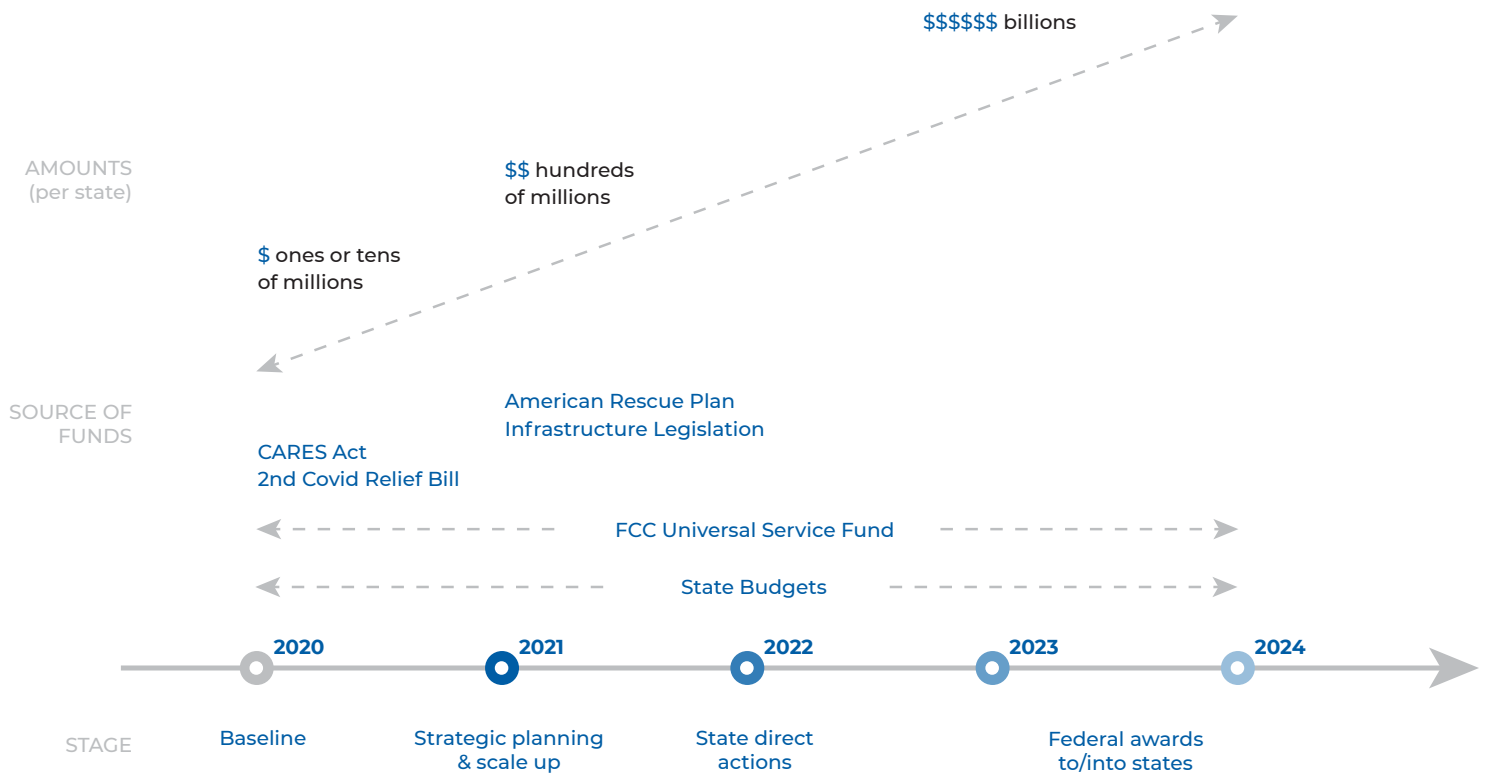
⁴ For example, many states launched broadband efforts as part of the National Telecommunications and Information Administration's State Broadband Initiative (SBI) from 2009-2014.

⁵ Key best practices include creating and regularly updating a state broadband plan based on clear goals and metrics; embedding accountability, oversight, and program evaluation in to all state broadband award processes; and creating ongoing intra-governmental coordination mechanisms between state broadband offices, the legislative and regulatory arms of state government with responsibility for broadband, the state executive branch, and county and municipal stakeholders. See, e.g., How States are Expanding Broadband Access, Pew Charitable Trusts, Feb. 2020. Available at [pewtrusts.org/broadband-research-initiative](https://www.pewtrusts.org/broadband-research-initiative) (Pew Broadband Report); Putting State Broadband Funds to Work: Best Practices in State Rural Broadband Programs, Benton Institute for Broadband & Society, June 2021. Available at <https://www.benton.org/sites/default/files/state-funds-final> (Benton State Grant Programs Report)

⁶ Tennessee is just one of many examples of such an order-of-magnitude increase in available broadband funding leading to a dramatic shift from scarcity to abundance. For example, from 2017-2020, the Virginia Telecommunication Initiative (VATI) totaled \$25 million in grant funds. From 2013-2020, the Wisconsin Broadband Expansion Grant Program totaled \$44 million. Colorado's broadband grant program totaled \$20 million from 2016-2020. Minnesota's "Border-to-Border Broadband" grant program totaled \$85 million from 2014-2020. Between 2006 and 2018, Maine's Connect Maine office totaled \$12 million in grants.

In contrast, this summer every single state in the country will receive as a first step a minimum of \$100 million – and for all but the smallest states considerably more – in funding just from the "Coronavirus Capital Projects Fund" of the American Rescue Plan, which in and of itself represents only \$10 billion out of several hundred billion dollars available in part for broadband. All of which has already become law and is entirely separate from additional broadband funding which could be provided by new infrastructure legislation.

Figure 1: State Broadband Funding Timeline



The core strategic question at the state level is how to make the most of this historic moment to maximize overall investment in broadband from all sources – including from independently available state and local funds; from the state and local portions of new federal funds; from new federal funds awarded to in-state providers; and from private investment – to achieve the highest sustainable levels of broadband deployment and adoption.

In other words, the opportunity for state broadband leaders today is to significantly raise their aspirations by shifting from seeking incremental progress on a limited budget to achieving transformative long-term impact from a generational investment: to not simply narrow the broadband access gap but close it permanently; to establish long-term approaches for managing the overall digital divide, including adoption and utilization; and to generate long-term impacts on economic development and societal health.

As of today, the status of state broadband planning varies tremendously, with some states racing ahead and others at risk of falling behind. Ultimately, each state’s choices must reflect the state’s specific needs and preferences. Given the unprecedented size of the opportunity, what is most imperative is that choices be made based on a fully-developed strategy and not simply as short-term responses to the noisiest stakeholders. The aim of this white paper is to provide state leaders with a roadmap for rapidly scaling up their broadband strategies.

Examples of State-Level Broadband Strategies

Maine: Adding New Muscle to a Strong Foundation

- Newly created Maine Connectivity Authority (MCA) signed into law by Governor Mills June 2021, empowered to use Maine's allocations of new federal funding, including as much as \$150 million of American Rescue Plan funds (10x increase over traditional state funding levels).
- MCA to directly deploy funds to new broadband projects, including loans, equity investments, or direct public ownership of physical assets.
- MCA's focus on direct deployment complements Maine's historically successful ConnectMaine Authority, which retains authority over one of the nation's leading state mapping efforts, performance definitions for unserved and underserved, community planning including pursuit of new direct federal grants, and digital inclusion.

Louisiana: Lightning Fast Scale-up

- Rapid-fire stand-up of multiple new entities driven by Governor Edwards' emphasis on broadband: Broadband for Everyone Commission (2019), Office of Broadband (2020), State Office of Broadband and Connectivity (2021).
- Immediate staffing up of executive leadership and staff, aggressive engagement with local leaders and providers.
- Granting Unserved Municipalities Broadband Opportunities (GUMBO) grant program using \$180 million of Rescue Plan funds enacted by legislature June 2021; initial funding tranches available for last-mile projects beginning September 2021.

California: Going Big in the Golden State

- Governor Newsom released a broadband funding proposal totaling \$7 billion in May 2020. The initiative draws on American Rescue Plan funds and was introduced to the Legislature with 4 categories.
 - \$4 billion for middle-mile investments
 - \$2 billion to the California Advanced Services Fund for deployment grants
 - \$500 million for CPUC awards to high-cost areas
 - \$500 million for financing support programs (loan loss reserve funds)
- Final outcome pending state legislative action.

Mapping Unserved and Underserved Areas and Populations

The need for accurate broadband maps has been a recurring theme over the past decade of federal and state policy. A number of states launched broadband data collection and mapping programs using federal funds available from 2009 to 2014, but some have found it difficult to sustain over time after the end of federal funding support. More recently, the National Telecommunications and Information Administration (NTIA) worked to sustain such efforts via the National Broadband Availability Map (NBAM) and recently released the “Indicators of Broadband Need” visualization tool.

Significant new work also is underway at the FCC via its “Digital Opportunity Data Collection”⁷ (DODC) nationwide broadband availability effort. Nonetheless, although the FCC’s mapping effort will receive considerable attention in the months ahead, one lesson of the last decade is that states are also well positioned, and arguably better informed on some issues to do their own broadband data collection if they have sufficient resources to do the work. Financial resources provided to states by the American Rescue Plan can provide needed funding,⁸ and states should seize the opportunity to strengthen existing mapping programs, or to launch new ones.

Why should states pursue their own mapping efforts rather than wait on the FCC? Simply put, because the maps define where the money goes, the money is about to surge to unprecedented levels, but at present the federal maps and related rules are a huge question mark. Indeed, notwithstanding the current heated debate over what minimum speed defines an “unserved area,” ultimately what will matter just as much in a given state will be what the actual broadband coverage maps – showing real-world locations needing broadband in actual communities seeking new deployment projects – say about where the funds need to be awarded.

Congress has provided the FCC with a mandate and new funding to develop a nationwide answer.⁹ However, the clock is ticking, and it seems likely that the FCC’s DODC mapping effort will stretch into 2022, even as new broadband funding programs at both the federal and state level are already moving forward.¹⁰ In other words, even as Congress allocates tens of billions of new funding for broadband deployment, and many states are moving forward with grant programs this year, there is currently no new broadband map available from the FCC.

Of course, other sources of broadband data exist – although even alternatives such as the NTIA still rely heavily on the legacy FCC “Form 477” data that has been shown to suffer from

⁷ Although commonly referred to as the “new FCC Broadband Map,” in reality what the DODC will produce should be thought of as a “broadband database release”: a dynamic tool with different layers of data, derived from a wide range of sources, updated on a regular basis, and used for a wide range of activities. In short, the DODC will always be a work in progress, and the fundamental question in the time ahead is not “when will the new FCC map be complete” but rather “at what point in development will the data be robust enough to make funding awards or other policy decisions.”

⁸ For example, on June 24, 2021, the Treasury Department provided an updated set of answers to frequently asked questions about the Coronavirus State and Local Fiscal Recovery Funds, stating that “pre-project costs associated with planning and engineering for an eligible broadband infrastructure build-out is considered an eligible use of funds, as well as technical assistance and evaluations that would reasonably be expected to lead to commencement of an eligible project (e.g., broadband mapping for the purposes of finding an eligible area for investment).”

⁹ The Broadband DATA Act requires the FCC to answer this baseline question by updating the national broadband location data set, known as the “Broadband Serviceable Location Fabric” (BSLF).

¹⁰ In addition, under the Broadband DATA Act, the FCC is required to provide for challenge and verification processes – essentially, a procedural opportunity for stakeholders to challenge any initial coverage reports for accuracy – that will likely further extend the timeline. In fact, states themselves are one of the primary entities with a role in the challenge and verification process.

inaccuracies. It also remains uncertain which maps must be relied on under the rules for the various new broadband funding opportunities now being rolled out. The DATA Act provides only one small part of the answer by requiring the FCC to base new funding for its programs on the new FCC map. However, the DATA Act does not similarly require the Department of Treasury, NTIA, United States Department of Agriculture (USDA), or other federal agencies to use the FCC's new map; instead, the DATA Act merely provides that other federal agencies have the ability to "consult" the FCC data. Indeed, rather pointedly, the one federal agency with a clear statutory mandate for what maps to use – the FCC – is also the one federal agency that has not yet been assigned responsibility for any new broadband deployment funding.

Of course, Congress may decide to require other agencies to use certain maps, in particular as the FCC potentially provides a more detailed timeline for the DODC effort. Acting under a new statutory mandate, the FCC, NTIA, and USDA recently entered into an interagency agreement to improve coordination, share information, and consider using a standardized set of coverage data. Similarly, it is possible that Treasury or other federal agencies may put in place firmer mandates for what data states must use when awarding federally provided funds, although guidance to date has emphasized state flexibility.¹¹

On the other hand, it is also possible that no such clear mandates will be made, leaving the question of "which maps?" up to individual agencies or states. Given this uncertainty and the size of the financial stakes, states have both a clear opportunity and a pressing need to strengthen their own broadband mapping efforts.

At minimum, state-level investments in mapping will provide a vital form of insurance against errors and inaccuracies at the federal level by providing states with the independent fact base to verify and challenge federal maps, from the FCC or otherwise. More likely, in the scenario of ongoing flexibility about what maps and data to use, state-level mapping efforts provide significant strategic upside in the planning and implementation of a state's own programs; indeed, many states already employ their own definitions of locations and service availability.¹² State broadband data also will provide a critical source of input and influence with respect to federal agency funding efforts going forward, including how state-level allocations of additional funding could be calculated.¹³

In other words, the best advice for states is to take control of your own destiny by actively pursuing state-level broadband data collection and mapping activities. Accurate data will be critical to direct state funding processes, to ensure states have a full and fair share of federal programs, and to manage overall broadband efforts in the years ahead as huge sums are committed.

As of today, unfortunately, almost half of states have no broadband mapping program of their own.¹⁴

¹¹ Treasury's current approach to date has not been to mandate any particular maps or data sources. In a June 17, 2021, update to its interim rules regarding the use of American Rescue Plan funds for broadband by states and cities, Treasury states that "[w]hen making these assessments, recipients may choose to consider any available data, including but not limited to documentation of existing service performance, federal and/or state-collected broadband data, user speed test results, interviews with residents and business owners, and any other information they deem relevant. In evaluating such data, recipients may take into account a variety of factors..."

¹² Pew Broadband Report at 7.9.

¹³ For example, whatever the final resolution of new broadband infrastructure funding by Congress, the FCC already has existing authority and funding to proceed with the RDOF phase II and 5G Fund auctions – in total an additional \$20 billion in funding for rural fixed and mobile broadband – which alone makes the question of state broadband mapping data high stakes. Second, significant federal broadband funding in 2022 is also likely to flow through federal agencies such as NTIA and the USDA that are more likely to use traditional "merit based" grant approaches (and their own maps). Each of these federal agencies have unique requirements and modes of engaging with state-level actors; wise state broadband data planning should be sure to cover all of these federal bases.

¹⁴ The NTIA website today notes that 23 states do not maintain an active broadband mapping program.

The rest have undertaken at least baseline efforts. Over 30 states participate in the NTIA's NBAM effort, although some struggle with access to data and many simply rely on the FCC's "Form 477" data set of bi-annual provider self-reported information, which many state broadband leaders feel does not reflect true on-the-ground needs in many communities.

Four steps to rapid progress on state broadband maps. How can progress be made quickly, either to bolster an existing state map or launch a new one? The first step is to engage with NTIA's State Broadband Leaders Network and ongoing NBAM effort – by far the best current venue for state broadband mapping practitioners. Second, just as the FCC is currently pursuing commercial contracting solutions to procure commercial data sets,¹⁵ states could consider investing a portion of new federal funds in data acquisition and technical support to bolster their own mapping efforts. Initial funds from the American Rescue Plan dedicated to state governments could provide needed budget support for such state mapping efforts.¹⁶

Indeed, the best current state mapping programs already add additional data layers to significantly improve their maps, bringing in additional information including state regulatory information requests to providers; other sources of state data such as e911 databases; independent verification by local communities or third parties; or acquiring additional data on serviceable locations and broadband economics from commercial providers. Only about 30% of states today take some of these additional steps, including leading broadband mapping states such as Arkansas, California, Colorado, Georgia, Illinois, Maine, Minnesota, New Mexico, and South Carolina.

Whether via internal or external resources, states looking to pursue or expand their own mapping efforts should consider four distinct areas, some of which state and local entities are at least as well, if not better, positioned than federal entities to address.

First, any broadband map must have as a foundation an accurate and complete "location fabric" – i.e., the actual end-user structures that require a broadband connection. Such structures range from houses to businesses to government buildings. Historical federal approaches such as relying on Census addresses are well known to be imprecise at the geolocation level, especially in rural areas where mailing addresses used by the Census may be far removed from the actual physical structures requiring a broadband connection. Although a range of commercial data providers can supply more accurate location information, any one provider may not be able to provide fully accurate data in all areas. Additionally, commercial providers' data sets often come with a rights limitation on public use, creating a barrier to usage in publicly available maps. States and localities, on the other hand, often have access to unique location data sets such as property tax, building permits, zoning surveys, and other government records.

Second, a broadband map requires accurate information about what type of broadband is available, including basic performance characteristics (primarily supported data speeds). Traditional FCC reporting methods from broadband providers have well-documented shortcomings, and improving the quality of availability information is a major focus of the new FCC process. From the state perspective, the goal should be to match service availability

¹⁵ <https://www.fcc.gov/BroadbandData>

¹⁶ See footnote 8; as another example, Treasury Department guidelines for the separate Coronavirus Capital Projects Fund provide for example that funds may be, in part, used for "ancillary costs needed to put the capital assets in use."

information to the individual location level to the extent possible. Although this data is difficult to obtain – especially given some providers’ traditional reluctance to fully share such information – states in some cases have better information than the federal government or at least a more manageable task to conduct on-the-ground validation. Indeed, states enjoy the major advantage of being able to focus more narrowly on only the areas of a given state generally known to suffer from service gaps. If providers are slow or unwilling to share data with state mapping efforts, states also have the option to simply declare certain areas as “unserved-if-unknown” and give providers a time-limited opportunity to challenge.

Third, a broadband map must include the dynamic ability to be updated with new information over time, and in particular to incorporate new information from the local level to include information such as new buildings or incremental coverage expansion by current or new providers, especially as the result of new broadband funding actions. Importantly, new information can include both positive updates (new service available) or negative (challenges to provider reports that service is available).

Fourth, a broadband map should, to the extent possible, include socioeconomic and demographic data as well as information about broadband adoption and usage levels. A widely noted gap in many traditional federal maps is that they reflect only service availability, not the economic conditions of the areas, nor the extent to which residents are subscribed and using broadband, nor the performance levels¹⁷ actually delivered, or prices charged. Although this data may not be easy to find, states could take steps to include this additional level of information within their own maps – for example, by taking advantage of new funding to acquire commercial data, develop proprietary surveys, or harvest crowdsourced data – and create a combined view of access and adoption that would be invaluable for policy development and implementation over time. For states seeking to develop a strong economic fact base to support their broadband strategies, as will be discussed in greater detail below, such data would be particularly valuable.

In summary, efforts over the last decade have shown both the potential and the limitations of federal-level mapping efforts. Although views vary, for many state broadband leaders, experience demonstrates that the country is simply too large and diverse, and federal administrative processes too cumbersome, to rely exclusively on federal efforts to answer state-level broadband questions about who needs assistance with access and adoption. Perhaps most importantly, given that some states have already made significant mapping investments and will likely expand those efforts in the near term, states that simply stand pat or do nothing will be at a growing disadvantage. Such states could end up at the mercy of time-consuming federal efforts that may at best be too late to help states apply for certain funding or, at worst, limit funding in a given state due to inaccuracies.

The bottom line: given the current size of funding and application deadlines beginning as soon as this year, states should not rely on federal authorities to solve the immediate mapping problem. Investing in capacity-building efforts that include data collection and mapping will pay dividends during the critical upcoming window of time with massive funding commitments being made. Over time, states and federal agencies such as the FCC and NTIA can then refine a coordinated, efficient approach.

¹⁷ As one recent example, the newly released NTIA “Indicators of Broadband Need” mapping application helpfully adds layers of socioeconomic data from sources such as the American Community Survey and crowd-sourced broadband performance data to of the FCC’s legacy Form 477 broadband location and availability data.

Engaging Traditional and Non-Traditional Providers: Do Your Due Diligence

Deployment. State leaders are well-acquainted with traditional broadband providers such as telephone and cable companies, ranging from the largest national carriers to small independent providers. One of the most important trends of recent years, however, is new and growing interest in broadband deployment and adoption by a range of non-traditional entities. For instance, recent changes by states to allow electrical co-ops or municipalities to provide broadband have created a more diverse group of ISPs in some states.¹⁸

In order to develop the most effective strategies, state broadband leaders should continue to work to identify, engage with, and cultivate a wide range of potential providers with interest in contributing to closing the digital divide either via new network deployment efforts or via support for increased broadband adoption by under-connected communities.¹⁹ Due diligence will be important: many will seek to benefit from the surge of available funding, and states should take steps to ensure that funds go only to those with the operational, technological, supplier relationships and commitments, and financial ability to deliver.

As an initial matter, large ISPs are pursuing a range of efforts to improve broadband availability and adoption in traditionally underserved communities, although with wide variation by company, state, and type of investment. For example, some large cable operators such as Charter have recently launched significant new rural broadband deployment efforts to unserved areas in certain states including participation in last year's FCC Rural Digital Opportunities Fund (RDOF) auction; other providers offer low-priced service to support customers and recently expanded these programs. Similarly, large traditional telecommunications companies, including two recently out of bankruptcy restructuring, are planning to increase investment in fiber-to-the-home (FTTH) in various markets. Most recently, AT&T has announced a renewed focus on FTTH deployment.

As a starting point, states should take steps – including via outreach and engagement sessions, as well as data collection efforts by state public service commissions or state broadband offices – to clearly delineate the status of current efforts in their states by these traditional providers. Information should be collected with as much granularity as possible – including detailed descriptions of planned investments.²⁰ Some states employ the regulatory authority of public service commissions to collect this data; others work through state broadband offices, although capacity expansion may be necessary in some cases.

Non-traditional providers are also becoming increasingly important. One of the most significant results of the FCC's recent RDOF auction was that over 400 bidding entities representing an even larger number of underlying operating companies pursued support to build out rural broadband. Although traditional broadband providers participated actively, new types of

¹⁸ Pew Broadband Report at 7.

¹⁹ To note just a few of many current examples, North Carolina, Tennessee, California, and Minnesota each maintain aggressive digital equity and inclusion programs.

²⁰ Some state broadband leaders will note that some traditional incumbents have a spotty track record of fulfilling commitments to unserved and underserved communities. Nonetheless, given the significant resources and expertise available to this class of providers, states should engage actively to assess or reassess the extent to which they can play a role in current state strategies.

broadband providers ranging from wireless and satellite firms to electric utilities, competitive fiber startups, and municipal networks were represented in even greater numbers.

Of course, the relative role of nontraditional providers is significantly impacted by state legal and regulatory requirements. In some states, for example, electric utilities are discouraged or outright prohibited from providing telecommunications services; in others, they are not only permitted but actively encouraged to do so. The results are significant, with rural electric cooperatives winning many millions of dollars in RDOF support in some states but barely participating in others, despite the capability of many electric cooperatives to reach unserved rural communities with broadband in part by utilizing their existing infrastructure and operations.

As another example, 17 states currently prohibit municipalities from offering broadband, while another five place significant barriers on municipal broadband providers.²¹ In states that do permit such projects, some have proven successful at the goal of bringing high performance broadband to long-underserved communities. For example, Downeast Broadband is an innovative partnership between three separate townships in rural Maine; its open access fiber network has successfully brought high-performance service to its home markets and is now in talks to expand to neighboring areas. As another example, Utopia Fiber's open access network has expanded service in rural Utah and similarly is in discussions to expand via partnerships including in areas of neighboring states. It is worth noting that each of these examples did not rely on direct subsidies to launch their networks but rather used a combination of municipal loan guarantees and private investment.²²

Another type of nontraditional infrastructure to consider in-state planning is fiber or assets owned by non--last mile entities ranging from private sector communications infrastructure providers to electric utilities to public agencies – none of which are typically providers of direct retail communications services, but all of which can support new deployment via wholesale or other forms of supply input to last-mile broadband providers. One excellent example of such networks are the state research and education networks that provide connectivity between state agencies and educational institutions in a number of states; while typically not providers of direct last-mile service, these networks can be vital contributors of the middle-mile connections to last-mile projects in unserved areas. Indeed, a number of states are actively considering middle mile expansion using portions of American Rescue Plan funds.²³

As another non-traditional example, large investor-owned electric utilities in many states have deployed fiber-optic infrastructure for their internal operations; while such firms typically do not wish to directly offer retail communications services due to regulatory or business strategy reasons, they can significantly improve the business case attractiveness of new broadband projects by selling wholesale or Indefeasible Rights of Use (IRU) fiber for local distribution or middle mile links. States such as Virginia have authorized electric utilities to recover the costs

²¹ Although as recently as last year the count stood at 19 states, Chris Mitchell's Community Networks blog notes "only 17 states retained their municipal barriers." Author Katie Kienbaum writes that her August 2019 count of "19 states" with "barriers" was reduced to 17 by removal of legal barriers in Arkansas and the State of Washington: <https://muninetworks.org/content/preemption-detente-municipal-broadband-networks-face-barriers-19-states>

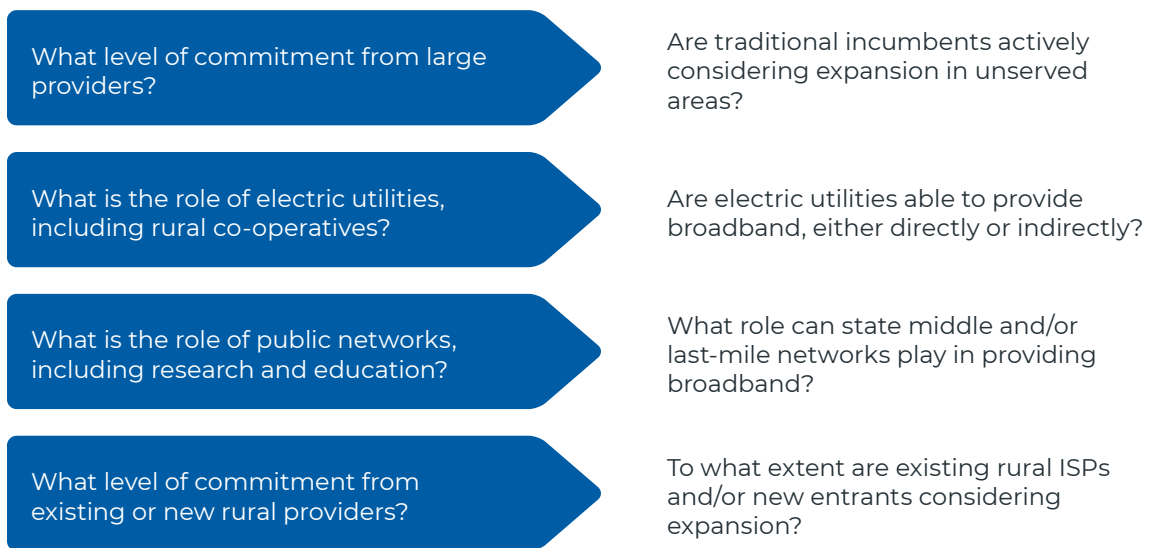
²² Of course, the status of municipal broadband remains under debate in a number of states. It is also worth noting that some pending legislative proposals include favorable funding opportunities for such projects, and other proposed legislation would preempt bans on municipal networks altogether, as will be discussed below.

²³ As just one example, the Governor of California has proposed a \$4 billion middle mile expansion as part of his overall \$7 billion plan to close the digital divide in California.

of these fiber investments in part via their traditional rate bases in exchange for a commitment to support partnerships with last-mile providers in unserved areas. Similarly, a number of states are actively considering efforts to make public-owned infrastructure such as safety communications towers available for use by commercial broadband providers.

Finally, a range of new fixed wireless and low-earth orbit satellite companies are actively pursuing broadband deployment projects, including areas receiving more than one billion dollars of assigned support from the FCC's RDOF auction. The specific capabilities and economics of these providers can vary widely depending on local market conditions (especially local topography and terrain), spectrum availability and propagation characteristics, and other factors. However, in aggregate they represent an additional category of providers for states to consider.

Figure 2: Key Questions To Consider About the Service Provider Landscape



The most important issue for states is to develop a clear, fact-based view of which providers in what specific parts of the state are most qualified and most likely to be able to both effectively manage initial deployment of new networks and then run them efficiently over time. Investing in up-front due diligence is far preferable to a messy, after-the-fact problem-solving for projects that struggle due to insufficient operational or financial capabilities.

Adoption. Just as the types of potential broadband providers have grown in recent years, the range of entities working to promote broadband adoption has also been fueled by new funding sources such as the Emergency Broadband Benefit (EBB) and Emergency Connectivity Fund (ECF), as well as targeted grant programs for digital literacy and community partnerships. One lesson of historical efforts to promote broadband adoption is that providing direct subsidies and/or requiring low-price service tiers is not always enough. Even with lower prices or direct consumer subsidies, sustained success requires ongoing work to advance digital literacy, maintain community levels of engagement, and financial support for connected devices, including ongoing hardware and software maintenance.

As is well known to many state broadband offices, a wide range of entities can provide these services, ranging from the community engagement arms of very large companies to local nonprofits to schools and local governments. As just one example, Louisiana is working with Fortune 100 companies to develop partnerships with the state broadband office and local parishes to support improvements in digital literacy; the long-term economic health of rural areas can be an important business objective for firms who have long standing local ties. Even more than is the case for network deployment, effective broadband adoption efforts must be tailored to local community needs. New federal grants, such as NTIA's Tribal Broadband Connectivity Grants and Connecting Minority Communities Pilot Program will be available directly for community efforts to expand digital literacy and adoption efforts already in place or develop new ones.

In short, the range of available providers to promote both deployment and adoption is likely much larger in 2021 than has been the case in the not-too-distant past. Effective state broadband strategies must start by identifying, cataloging, and engaging with the full panoply of broadband providers and broadband adoption advocates in their states, and then engaging in robust due diligence.²⁴ Many states that followed this strategy are now well positioned.²⁵ Only by understanding the full set of players on the field can state leaders make the best, most informed strategic choices.

Understanding State-level Broadband Economics

Although the current surge of federal funding makes it tempting to sidestep tough prioritization choices, the most effective state broadband strategies will focus resources based on a clear economic understanding of local deployment and adoption. State policy leaders must be careful to balance the opportunity to quickly fund in-hand proposals versus the value of putting in place strategies that will bring a sustained, potentially much greater impact for years to come.

The foundation of an effective long-term state broadband strategy includes an accurate economic profile of state and broadband needs in two areas: the support required to deploy sustainable new broadband capability to unserved and underserved areas and to address the affordability gap for populations in both unserved/underserved and well-served areas.

Deployment support requirements for unserved and underserved areas can be derived from a state broadband mapping effort as discussed above. Once policymakers specify desired performance targets such as broadband speeds and latency, as well as potentially other attributes of infrastructure performance, an accurate state broadband map will identify areas requiring new deployment investment. Accurate, granular mapping of unserved locations -- in combination with other dimensions of mapping including road miles, terrain and topography, and existing network infrastructure -- will generate the needed inputs to develop accurate cost estimates for new deployment required, including capital as well as operating costs.

²⁴ This task will prove more manageable in rural areas with typically limited numbers of providers; an initial focus on the primarily rural access gap is the place to make early progress. Engagement with providers in more urban areas on inclusion, adoption, and utilization challenges will take more time but is equally important.

²⁵ For several best practice examples of stakeholder engagement and outreach at the state level, including in states such as Minnesota and California, see Pew Report at 6-7 and 11-13.

Naturally, broadband deployment costs will vary, potentially significantly, based on a number of factors. Technology type (e.g., fiber-to-the-home, cable, fixed wireless) and associated performance requirements (e.g., minimum speeds, symmetrical requirements, latency, resiliency) create cost variance. Geography, especially as driven by local factors (population density distributions, terrain, topography, and prevailing wage rates) can create wide cost variations even in neighboring jurisdictions. Other drivers of economic differences include state-specific factors such as regulatory requirements, permit processes, and access to infrastructure (e.g., existing state networks, public or private shared infrastructure). Finally, the status of existing and near-term deployment – as driven either by private sector investment or state and federal support programs – will vary from state to state and create differences between a state’s ability to leverage the combination of new and existing financial resources.

Of course, even in costly areas, customers will pay for broadband access. Economic analysis must therefore examine the entire business case for deployment – initial investment, projected revenues and cash flow, and ongoing maintenance needs – to size the actual subsidy that is required to make a given project economically viable.²⁶

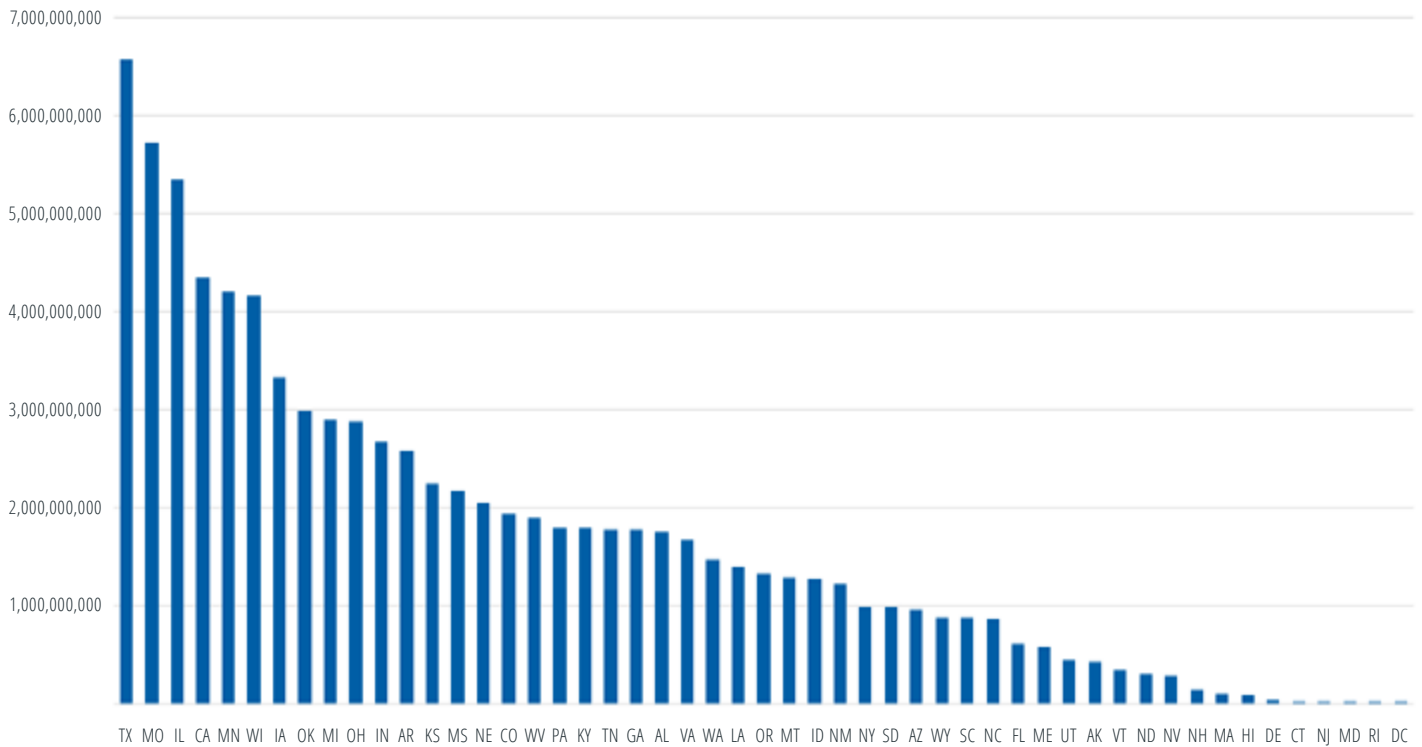
The bottom line is that each state is well-positioned to understand specifically what their residents and businesses need. The nature of broadband demand varies by community-based on patterns of work and commercial activity. Although attempts have been made to estimate the total national need to address the digital divide, many of these efforts rely on broad assumptions and lack deep, state-specific analysis. Even widely-cited national examples such as the 2017 FCC staff white paper estimating an \$80 billion support requirement to deploy fiber to all locations lacking “future-proof” broadband access²⁷ are no more than the sum of the individual states, each of which entails unique requirements that can best be understood at the state level.

Importantly, the needs of states vary far more widely than would be predicted by simple measures such as rural population levels. For example, Quadra Partners and CostQuest Associates recently completed a net present value analysis that largely follows the methodology used by the FCC in 2017 and updates it based on 2020 data for all states. That analysis estimates the total support requirement for greenfield FTTP deployment to all unserved areas at approximately \$84 billion. However, the distribution across the states varies significantly, as shown in Figure 3.

²⁶ By one definition, the proper metric for calculating subsidy need is the amount of current cash required for a given deployment project to have a positive “net present value,” defined as the value of all future cash flows from the project discounted to today using an appropriate financing cost for the deploying entity.

²⁷ de Sa, P. Improving the Nation’s Digital Infrastructure, White Paper, Federal Communications Commission (Jan. 19, 2017). Available at: <https://www.fcc.gov/document/improving-nations-digital-infrastructure>

Figure 3: Estimated Subsidy Needs for FTTP by State



This analysis is premised on a set of assumptions about the definition of unserved and the type of infrastructure built that may not reflect the final version of any enacted legislation or a given state program. The point of this example is simply to illustrate that the needs of individual states vary significantly and may not be fully captured by default federal approaches to allocating funds. Given the magnitude of prospective broadband funding, states would be well served to be proactive rather than reactive in analyzing their own economic needs.

From a practical standpoint, developing a sound economic baseline for broadband subsidy programs at the state level is readily achievable. With an accurate state broadband data set as a baseline, many of the most important economic drivers – such as location linear density, construction costs per mile, and efficiencies from use of pre-existing network assets or other infrastructure – can be straightforwardly incorporated using proven economic modeling approaches. In addition, many real-world data points will be available to validate results.

Also, it is important to keep in mind that the objective of such an effort is simply to provide a fact base to guide to strategic choices. It, therefore, need not be as detailed as, for example, a full underwriting analysis of a given project. Instead, the goal should be to develop a consistent and robust economic profile of key policy questions such as: how much total investment would be required to close the state’s deployment gap under various policy scenarios, such as using different definitions of “unserved areas” or “build-to” performance standards for funded projects? What areas of the state require relatively greater subsidy relative to private investment, and are there areas where strategies such as loan guarantees²⁸ alone may be enough? What are the financial implications and tradeoffs of setting different performance

²⁸ By reducing financing costs, loan guarantees and similar forms of financing support effectively improve the net present value of projects and therefore reduce required direct subsidy needs.

goals? What technology types are best suited to the economic needs of each part of the state?

Only by arraying these different factors against the specific backdrop of a given state's actual unserved and underserved areas can states make the best decisions on these and many other broadband deployment strategy questions.

Affordability and adoption. Even where high-performance broadband infrastructure is fully available, universal adoption remains a sizable challenge in many communities. Indeed, many estimates indicate that there are considerably more people who do not or cannot connect to a broadband network that is available than there are people who do not have access at all.²⁹ As a close companion to the economics of deployment, therefore, states also should develop clear understandings of the adoption challenges on a granular, community-specific level. Importantly, a range of factors including but not limited to strictly economic questions of affordability should be assessed. For example, recent research points to multiple demographic factors which appear to suppress rates of adoption in rural areas even when broadband infrastructure is deployed and available.³⁰

States that have already studied this topic may need to update their assessments based on the wide-scale changes in the need for and use of broadband due to the COVID-19 pandemic. Some states have developed very strong broadband programs over the last decade, but adoption challenges dramatically changed over the past 16 months as many people lost jobs but many new organizations provided assistance with access to broadband.

For starters, states should incorporate available socio-economic and other population demographic information into a baseline view. Actual or estimated data for broadband adoption, including information about type of provider and speed of connection, should be incorporated. States can consider their own approaches to gathering, improving, or updating such adoption data on a regular basis. Perhaps most important, information about out-of-pocket price levels paid should be included to the extent possible. While this data may not be easy to obtain, pricing surveys or other data origination efforts are routinely used by businesses and could be pursued by state broadband offices. In total, an accurate baseline should be able to describe: the residential and small business population in areas of a state with gaps; target or expected broadband adoption; and the profile of provider base and price-performance options in those areas.

Working from this baseline, a state broadband strategy for promoting adoption can be developed or updated. One obvious area of policy development is affordability support; for example, states such as California have long maintained their own state companion subsidy programs to the federal Lifeline program. In addition, non-price barriers such as access to devices, digital literacy, the role of third-party intermediaries such as schools or community groups in connecting households and small businesses with broadband providers, or other local innovations can be tracked, measured, and refined. Although there is no one-size-fits-all solution given the vast range of local circumstances across the country, states are often better positioned than federal agencies to convene, catalogue, and sustain front-line solutions pioneered at the local level.

²⁹ For an overview of this issue, see Eduardo Porter, "A Rural-Urban Divide, But Not the One You Think Of", New York Times, June 1, 2021.

³⁰ See Congressional Research Service, CRS Report R46108, Demand for Broadband in Rural Areas: Implications for Rural Access, by Brian E. Humphreys, December 9, 2019.

Tailoring State Broadband Strategies to Maximize Long-Term Benefits

States want to make directly available funds go as far as possible, and any additional federal-level funding opportunities, by definition, involves inter-state competition for limited (however large in absolute terms) resources. Make no mistake: the large amounts of new federal funding will raise the stakes for states, whose residents will hold them accountable if they fail to convert this potential windfall into meaningful infrastructure. Federal infrastructure support will make billions of dollars available, and the leaders of states with tailored strategies incorporated into clear plans will do far better than those that do not.

The core strategic question is how should a state use available broadband funding – provided via a combination of state-supplied funds and federal awards to in-state projects – to generate the greatest total return in the form of broadband deployment and adoption? Although much of the current discussion centers on the simple question of standing up or scaling up grant programs, states in fact have a much broader range of policy tools to consider.

Indeed, while many states have existing state grant programs of relatively modest size, simple “merit-based” award programs may not easily scale to the much higher funding levels now available. More sophisticated allocation processes such as competitive auctions require expertise to create and administer. Fundamental questions such as deployment obligations, the definition of eligible areas, and how to define performance requirements all must be answered. Simply put, given the significant potential funding levels now on the table, states must ask, “how would we award \$500 million or \$1 billion or more?” and “how confident are we that the desired results will be delivered?”

As an initial approach, some states are planning a staged model, starting with the most “shovel ready” projects and/or areas of clearest need, and then building in time to learn and incorporate lessons before proceeding to later tranches. State broadband leaders in Maine, for example, emphasize the importance of such a staged approach that balances the need for rapid initial progress with the importance of giving local communities time to consider and provide input based on their own needs and preferences. As another example, Louisiana moved extremely rapidly this year to launch an initial \$90 million funding opportunity using American Rescue Plan funds via its new GUMBO state grant program, while strategically keeping a second equally large tranche in reserve for a subsequent round that can incorporate lessons learned and changing conditions.

Another important question is “how will actions we take today at the state level impact how later actions at the federal level play out in our state?” A recent example familiar to many state broadband leaders was the consternation in 2020 related to how a geographic area’s eligibility for the FCC’s RDOF auction was impacted by previous state actions to support broadband in that area. In 2021, if states opt to proceed with their own programs first using initial federal funding pools, state leaders must consider how such state actions now may impact the state’s ability to benefit from later, potentially larger, federal funding.

Indeed, with RDOF long-form applications still pending across the country, and some observers anticipating partial defaults by some participants in light of questionable bidding strategies, state broadband leaders pursuing near-term funding awards must grapple with the question of whether to:

- (a) assume RDOF provisional winning bids³¹ announced in their states will eventually be approved by the FCC and result in successful deployment, and therefore exclude those areas from current state plans to avoid duplication of effort;
- (b) take steps to incentivize or assist RDOF provisional winners with uncertain prospects who bid too low, on the theory that the downside of rewarding irresponsible bidding behavior is offset by the opportunity to ensure networks are actually built, even with the need for extra state assistance; or
- (c) take affirmative steps to support alternative deployment plans in RDOF areas, based on the belief that the FCC will either turn down the long-form application or that the provider will ultimately fail to deploy, even if the FCC approves the long-form application.

State decisions can affect the outcome of these questions. The 1996 Telecommunications Act gives state commissions the authority to designate (or decline to designate) carriers as Eligible Telecommunications Carriers (ETCs),³² and ETC designation is required for provisional winners to receive disbursements from the FCC's Universal Service Fund (USF) program. In addition, FCC rules currently in place do not limit a state's ability to provide additional funding to RDOF areas. While recent interim Treasury Department guidelines take the initial position of discouraging the use of American Rescue Plan funds in areas with legally binding obligations to deploy by the end of 2024, given the lengthy timelines for RDOF deployment (assuming eventual long-form approval by the FCC) states retain significant leeway.

Middle-mile funding is another avenue to invest currently available state funds while preserving opportunities for subsequent last mile awards. Simply put, middle-mile investments do not in and of themselves result in any areas shifting from "unserved" to "served" on a last-mile basis. Instead, new middle mile projects can have the impact of systematically improving the incremental business cases for new last-mile projects by reducing both needed capital investment as well as improving operating costs. Middle-mile projects therefore have a two-fold potential benefit: they both improve the business cases (and reduce needed subsidies) for subsequent last-mile projects, while at the same time preserving more eligible areas for later tranches of last-mile funding. States ranging from Alabama to Michigan to Nevada to California are actively developing middle-mile plans, including a mix of public and private provider participation, in part using American Rescue Plan funds that are approved for such projects.

As another type of an opportunity to consider, recent examples such as the FCC's 2014 modernization of the E-Rate program highlights the potential for states to deploy their own funds on a matching or "stacking" basis, with a strategic aim of making the business case for deployment as attractive as possible to providers. In other words, rather than pursue a simple

³¹ See FCC Public Notice DA 20-1422, Rural Digital Opportunity Fund Phase I Auction (Auction 904) Closes, Winning Bidders Announced, rel. December 7, 2020.

³² See 47 U.S.C. Section 214(e).

first-order strategy of directly allocating funds to one-time deployment projects, a matching strategy aims to amplify the bang for the state buck over time by attracting a higher overall level of funding to the state from sources including direct federal support as well as private investment.³³ This approach can be critical both for maximizing initial investment levels as well as maintaining incentives to sustain and upgrade projects over time.

This concept of “fund stacking” can be extended even further into state strategies that, in effect, take the form of financing support rather than direct grants. States with infrastructure banks, for example, could allocate portions of new federal funds to capitalize loan guarantees or similar credit support programs that, when made available to providers interested in broadband deployment in the state, could enhance the overall effectiveness of those providers to capture additional federal funds as well private investment. For example, the Governor of California recently proposed \$500 million in such financing support as part of an overall \$7 billion plan to expand broadband in the nation’s most populous state. In some cases, public support for financing alone can be enough to attract needed investment without additional direct subsidy, freeing up funds to do more in other areas.

Finally, states can consider accompanying deployment grant awards with requirements that newly funded infrastructure projects, including publicly controlled assets such as rights of way, be made available without undue delay and on reasonable terms to facilitate other forms of broadband deployment, such as new mobile broadband networks.

Of course, individual states must make specific choices for these and related issues, based on policy preferences and existing state law and regulatory policy. The broader point, however, is that given the historic size of the opportunity and stakes for society, states should strive to “play chess, not checkers” by drawing on a broad set of available policy levers – including not only direct grant programs but also middle-mile investments, state stacking and matching funds, financing support, and targeted regulatory and legislative changes – as guided by a fact-based understanding of state-level broadband economics.

Making the Sum Greater than the Parts: Advancing Broader Policy Goals

In addition to unprecedented funding levels, another striking aspect of the current wave of broadband policy activity is that federal policymakers are simultaneously addressing the entire broadband ecosystem. With actions addressing not only network deployment but also direct funding for affordability programs, support for addressing digital literacy and other non-price barriers to adoption, and the broader role of broadband networks as essential inputs into other economic sectors and types of infrastructure projects including transportation and clean energy. Many states are taking a similarly holistic approach to their broadband strategies.

³³ Although Treasury Department guidance remains unclear as of the time of this paper, on June 25, 2021, a bipartisan group of Senators wrote to the Treasury Department requesting that American Rescue Plan funds provided to states and localities be permitted to be used as matching funds for other federal programs that do not expressly bar the use of federally-provided funds for such purposes.

Cross-silo alignment and optimization. First, states can look to expand the convening and coordinating roles played by state-based entities such as research and education networks; school broadband and technology procurement entities; and economic and community development entities, including those in both rural and urban areas. With the rapid launch of a variety of new broadband policy initiatives backed by so much funding, these state and local coordinating groups can play a critical role in making the sum greater than the individual parts. Many states have broadband councils or regional broadband consortia that involve stakeholders from across these groups to provide feedback and improve coordination of efforts.³⁴ Post-secondary educational institutions also have a major role to play in developing future cadres of technical policy expertise that will be critical to sustaining the long-term benefits of the current era’s investments on digital inclusion and equity.³⁵

To highlight just one example, the expansion of E-rate funding to encompass direct-to-home broadband connections creates a major new opportunity to enhance the business cases for new broadband deployment in underserved areas by supporting more rapid rates of subscriber adoption and higher revenues. State and local efforts to facilitate these efforts – while remaining mindful of E-Rate procurement rules – could make a significant impact. The role of local actors such as counties and school boards can be important; for example, even state-level entities may not easily have access to the names and addresses of families eligible for new E-rate based support. An example of a recent initiative to address this information gap is the “K-12 Bridge to Broadband” platform that anonymously matches the names of K-12 families with broadband serviceable address information from local ISPs. The project is led by Education Superhighway, a major educational technology non-profit, in coordination with many local school districts.

There are many other examples of such “connect the dots” opportunities to maximize the value of programs that are developed in silos at the federal level but can be mutually reinforcing and amplifying at the local project level. For instance, NTIA’s new grant programs to expand deployment and adoption in Tribal areas and the Connecting Minority Communities Pilot Program could be considered along with E-rate funding as an opportunity to connect the dots between neighboring communities and multiple constituencies within a geographic area.

Broadband “overbuilding” and facilities-based competition. A second important choice for states is how, if at all, to incorporate the related, but distinct, policy goal of promoting competition into current broadband strategies. There is general agreement on the principle that direct public investment should prioritize areas that are unserved by any reasonable level of broadband. However, to the extent funds are available to do more in a given state, policymakers also must weigh whether providing funding for projects where some level of broadband is already available – often referred to as “overbuilding” – will bring additional public benefits by promoting competition. As with many complex policy topics, the devil is in the details, and states will have considerable say over how this principle plays out in practice in their state programs.

³⁴ Pew Broadband Report at 11-12, 14-16.

³⁵ Indeed, universities will have a critical role in helping answer the broader question of how best to leverage the impact of expanded broadband to promote economic growth in a given community given the diversity of local conditions including the technological expertise of local work forces, the availability of business creation and managerial talent, access to start-up financing support, and major legacy economic sectors in a given area.

As a starting point, the higher the definition of “unserved” that is used, the greater the potential level of overbuilding of legacy networks that could occur. For example, typical estimates³⁶ for the number of unserved locations in the United States vary tremendously based on the definition used:

Unserved Definition (Mbps down/Mbps up)	Estimated Unserved Locations, total U.S.
25 / 3	5-10 million
100 / 20	15-20 million
100 / 100	75-90 million

To be clear, in almost all of these “unserved” (or, arguably, “underserved”) areas, one or more existing providers is in place;³⁷ but the service provided is simply insufficient to meet the performance standard set by policymakers. Therefore, the “overbuilding” question is whether, in addition to the immediate benefit of adding a new, faster service option, opening the door to a new provider would also deliver longer-term benefits to the community from competition.

As of the time of this writing, it remains uncertain whether final federal requirements will retain the current 25 Mbps/3 Mbps definition or increase it. Notwithstanding where the rules for direct federal programs end up, states may retain at least some leeway to set their own interpretations of what constitutes an “unserved area” and therefore can include various locations of a state that are already served by a provider(s) providing some level of broadband.³⁸ The question is under what conditions might this be a beneficial approach.

Advocates of overbuilding claim potential benefits such as lower prices and higher adoption levels, as well as increased investment and innovation in network capabilities. Detractors argue that in 2021, areas that lack fast broadband service are by definition economically challenged, with insufficient population density (and therefore available project revenues) relative to network costs to support even one high performance network without subsidy, let alone competitive investment.

At the core of the debate is a single question: are broadband speeds lacking in a given area because the economics are too challenging even for a single provider, or because that single provider lacks the competitive pressure to invest and do more for customers?

³⁶ See, e.g., New Street Research, “Biden’s Choice: Infrastructure Investment or Lower Prices, Pick One”, May 21, 2021; Deloitte, “Broadband for all: charting a path to economic growth” (April 2021); JP Morgan, “Telecom, Cable, and Satellite: We Estimate Fiber Available in 50m Homes Today” (April 5, 2021).

³⁷ Typical estimates for “entirely unserved” locations – i.e., those without any Internet access option faster than a dial-up modem (excluding satellite, for purposes of analysis) – are approximately 1 million locations.

³⁸ For example, the Treasury Department’s June 24, 2021, update to frequently asked questions explains that “[t]he use of “reliably” in the IFR [(Interim Final Rule)] provides recipients with significant discretion to assess whether the households and businesses in the area to be served by a project have access to wireline broadband service that can actually and consistently meet the specified thresholds of at least 25Mbps/3Mbps – i.e., to consider the actual experience of current wireline broadband customers that subscribe to services at or above the 25 Mbps/3 Mbps threshold. Whether there is a provider serving the area that advertises or otherwise claims to offer speeds that meet the 25 Mbps download and 3 Mbps upload speed thresholds is not dispositive.

At a national level, the evidence of the impact of such “facilities-based” competition – that is, competition between different providers using their own separate networks – is mixed.³⁹

The good news for state policymakers is that their focus can be on the specific economics and realistic outlook for the local market structure in specific areas of their state, rather than in the abstract concepts that tend to dominate national advocacy. As discussed above, a robust economic analysis of a given geographic area in a state can provide a fact-based perspective on the key real-world questions, such as:

- (a) Including state- and federal-provided subsidies, what is the expected return profile of the proposed investment in a new, higher-performance network?
- (b) Is the potential revenue from all sources in the area – including from residential and business customers – high enough to sustain multiple networks, using reasonable market share assumptions for each?
- (c) Including the newly subsidized network, how many different broadband providers will be offering service in the area? In other words, how many choices will exist in the area after the new project is completed?

As a reference point for answering these questions, as of the end of 2019, the FCC estimated that 17% of the U.S. rural population had no terrestrial fixed broadband provider offering 25 Mbps/3 Mbps or better speeds, 40% had access to just one such option, and 30% had two.⁴⁰ In many rural markets, therefore, subsidizing a new entrant will add only a second or in a smaller number of instances a third provider to a market.⁴¹ Will such a change to local market structure result in material changes to competitive behavior in the form of, for example, lower prices or higher investment levels in network improvements? The likely answer is that it is highly dependent on the overall economics of that local market.

For example, if a given area has the economic potential to support multiple viable broadband networks all of which can offer higher broadband speeds, then subsidizing a higher-performance new entrant may be the catalyst to trigger the subsequent additional competitive benefits sought by pro-competition advocates. On the other hand, adding a subsidized second or third network with minimally sustainable financials to an area with already challenging economics may be less likely to result in downstream competitive benefits, as both the incumbent(s) and the new subsidized network will focus mostly on financial survival and not on vigorous competition with each other.

“Collateral overbuilding” and the role of incumbents. Even when the policy goal is to prioritize unserved areas, it is important also to note that some degree of deployment into already served areas may still occur in order to ensure technologically and economically feasible projects. For example, the recent FCC RDOF auction was defined as an “unserved areas” funding process – with eligibility only for areas believed to be fully unserved by 25 Mbps/3 Mbps broadband.

³⁹ For an overview of national data and trends on the prevalence and impact of facilities-based competition, see the FCC’s 2020 Competition Report, 2020 Communications Marketplace Report, December 31, 2020, at 73-93.

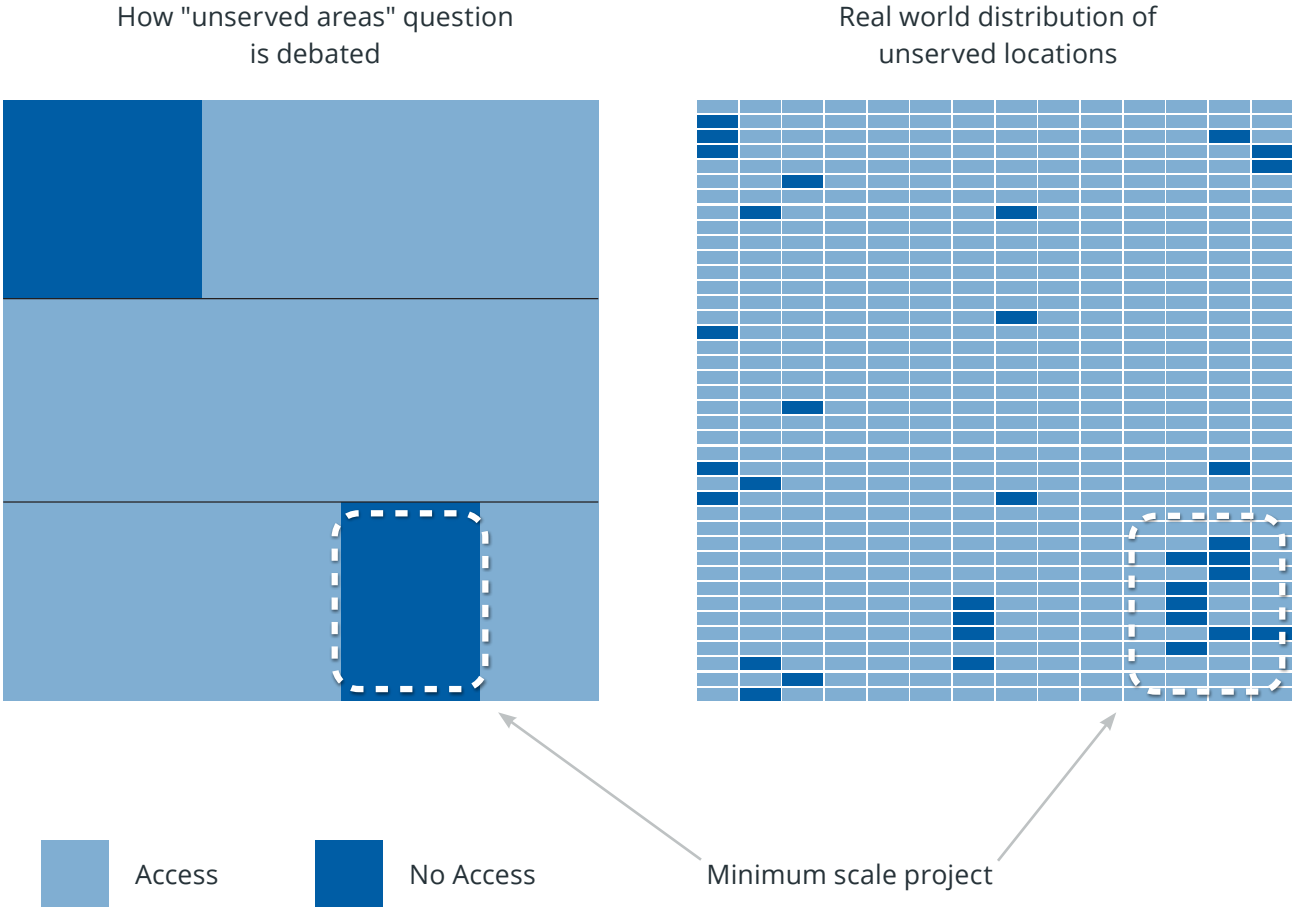
⁴⁰ See FCC 2020 Competition report at 88.

⁴¹ Note that the FCC data discussed in this section is for fixed broadband service only. The question of the extent to which mobile broadband service also serves as a competitive substitute for fixed is beyond the scope of this paper, although in general rural areas tend to lag in mobile speed and coverage just as in fixed.

Indeed, the FCC went to great lengths to explain that, unlike the still-to-be-scheduled RDOF phase II auction, the 2020 RDOF phase I auction provided support only to locations in Census blocks believed to have not even a single location with 25 Mbps/3 Mbps service. Meaning that in some cases, an admittedly unserved location may not have been eligible simply because it was located nearby (that is, in the same Census block), another location that was believed to have access.

However, in reality, the RDOF auction did award funding for some projects that likely will in part lead to some new deployment to previously served locations. Why? Because in the real world, unserved and served locations are often intermingled within the same geographic area that represents reasonable scale for a new broadband deployment project. In other words, while the policy debate seeks to divide the world cleanly into served versus unserved, the real world of deployment sees a much fuzzier picture of partially served and partially unserved areas. Even if not the intended purpose of the funding program, such “collateral overbuilding” plays a role in the overall business cases for many deployment projects aiming to provide new service to unserved locations.

Figure 4: Reality of "Unserved Areas" Is Far More Complex than Terms of Current Debate



This raises a critical question for state grant programs: how to translate a principle of “unserved areas first” into real-world decisions about actual projects that do not fall neatly in “served” versus “unserved” categories. For example, should projects eligible for state funding be limited to ONLY to unserved locations, or to a certain high percentage of unserved locations? Taken to its logical extreme, such an approach has several implications:

- (a) eligible projects (if serving only or almost only unserved locations) will tend to have significantly more negative business cases and will require much higher grant funding to be constructed, and will then require much higher ongoing subsidy over time, making sustainability more uncertain at best and project failure more likely at worst;⁴²
- (b) the most likely providers of such projects will be pre-existing providers, for whom the business case to expand into unserved areas will be based on incremental investment (i.e., extending from the adjacent locations they do serve) and foreclosure value (the competitive benefit of keeping out a new provider) rather than greenfield investment; and
- (c) many such unserved areas will at best end up with a single provider, and at worst will fail to attract any interested providers due to highly unattractive business cases even including available subsidies (in particular, a likely scenario if nearby incumbent operators decline to pursue new funding opportunities).

Of course, with a large enough subsidy, even highly uneconomic, “unserved only” projects could in theory, attract a provider. This could be a workable approach, especially for projects with strong local ties or if paired with generous ongoing operating subsidies.

An important corollary: the question of the extent to which to permit projects to encompass both served and unserved areas will heavily impact the type of broadband technology selected. Given their deployment economics, technologies such as fixed wireless and satellite can much more easily be targeted only to particular small sets of unserved locations, including non-contiguous ones. In contrast, wireline networks such FTTP generally cannot as easily be micro-targeted; when deploying fiber, for example, the fiber must be run down a designated right of way, typically a road or highway, meaning in many cases the network will inevitably “pass” some locations currently deemed as served as the new provider builds out to unserved locations.

A final note: further complicating these policy challenges of the real-world geographic distribution of “served,” “underserved,” and “unserved” definitions and funding eligibility are two additional factors. Federal broadband infrastructure funding programs themselves are inconsistent, as to both speed-based funding eligibility thresholds, and geographic concentrations of “unserved” locations.⁴³ In other words, there is unlikely to be any clear and definitive federal answer to these questions.

⁴² Acknowledging this real-world issue, as an answer to the question “[f]or broadband infrastructure to provide service to ‘unserved or underserved households or businesses,’ must every house or business in the service area be unserved or underserved?” the Treasury Department explained “[n]o. It suffices that an objective of the project is to provide service to unserved or underserved households or businesses. Doing so may involve a holistic approach that provides service to a wider area in order, for example, to make the ongoing service of unserved or underserved households or businesses within the service area economical. Unserved or underserved households or businesses need not be the only households or businesses in the service area receiving funds.”

⁴³ As just one example well-known to many rural broadband providers, the USDA uses different requirements and standards for the ReConnect program versus those used by the FCC’s various Universal Service programs.

Federal preemption, de jure or de facto. Up to this point, interim federal rules covering the use of American Rescue Plan funds from the Treasury Department have provided some degree of flexibility to states and localities with respect to the details of eligible projects and uses. However, a third planning issue that states must consider is the possibility that new federal infrastructure funds may more strictly require states to follow certain federal standards or policy preferences in order to make use of federal funds.

As of the time of this writing, one leading legislative proposal, the BRIDGE Act,⁴⁴ defines “underserved” as 100 Mbps/25 Mbps and establishes a new deployment preference for 100 Mbps/100 Mbps. These changes alone would expand “underserved” eligible areas to include many areas with legacy providers. The BRIDGE Act also proposes to preempt certain state laws, such as those prohibiting municipal broadband networks.

As another proposed example, the LIFT Act similarly adds an expanded definition of “underserved” and includes preferences for public and co-operative owned networks, as well as for open-access networks. While providing significant funding to be provided directly to states for their own programs, the LIFT Act conditions those awards on state processes that follow LIFT Act rules.

Finally, the American Broadband Buildout to Eliminate the Digital Divide Act (ABBEDDA), another leading legislative proposal, takes a different approach of not preempting state prohibitions on municipal networks but also limiting state programs’ flexibility to expand the definition of “unserved” above the current 25 Mbps/3 Mbps standard.

The bottom line is that these issues await final resolution by Congress. However, states should begin to consider that the quid pro quo for additional federal funding could be requirements that certain federal policy preferences are followed. States should identify whether legislative or regulatory steps to align federal requirements and state policies, preferences, and goals are possible if needed.

Adoption and sustainability. Finally, despite the current surge of funding for deployment and affordability, long-term sustainability may not be automatic in all areas even after successful initial deployment efforts. At the time of this writing, federal affordability programs such as EBB and ECF remain temporary mandates, and while permanent the Lifeline program offers too small of a benefit to fill the gap.

In some areas, affirmative support for competition such as via open access network requirements may lead to lower prices; an approach recently adopted in Colorado. Alternatively, in other areas, outright mandates such as low-price tier requirements with minimum performance standards could seek to accomplish a similar end, an approach recently taken in New York and currently the subject of litigation over state regulatory authority. Each state must take a clear-eyed look at the profile of the affordability gap – i.e., the difference between prices and ability to pay, with or without subsidy – across the entire state and how they will address it.

⁴⁴ Broadband Reform and Investment to Drive Growth in the Economy Act.

Similarly, while some new networks, once deployed with subsidy support, will remain sustainable for the long term (which is to say, cash flow positive after operating costs and maintenance investments), others may require longer-term support. For example, in 2017, the FCC calculated that \$80 billion in funding would deliver high-quality broadband to almost all unserved locations; however, even after this full investment in network deployment, the same FCC analysis concluded that a permanent, ongoing subsidy of \$2 billion would be necessary for those areas where available revenues were too small even to cover ongoing operating costs and maintenance.⁴⁵ Note that this issue could come into conflict with the policy objective of affordability; mandating lower prices reduces long-term revenue available for network sustainment over time.

The federal Universal Service Fund (USF) remains, in theory, available as a partial solution to this problem. However, the financial viability of USF has come into question, with various reforms under debate. Moreover, the availability of federal permanent support for any specific project in a given state cannot be assumed. The bottom line is that, as part of their strategies, states should carefully identify based on economic analysis those areas of the state and providers that may require such ongoing support and pursue targeted efforts either to ensure access to existing funding and/or develop specific state sustainability funding programs. In fact, pending greater clarity regarding the long-term outlook for USF or other forms of ongoing federal support for operating expenses, states could consider focusing near-term deployment support on projects that can demonstrate positive long-term cash flow from operations after initial (subsidized) capital investments are completed.

Conclusion

Although final federal infrastructure legislation remains pending as of the date of this white paper, in the months ahead, it is likely that a very large additional federal funding opportunity for broadband will be added to already significant recent public investments. Putting aside the many details remaining to be decided by Congress, one fundamental dynamic is a near certainty: the coming inter-state competition for broadband investments. Whatever the final federal allocation mechanism, broadband funds will be awarded only to a subset of projects that will be proposed across all 50 states. When the dust settles, some states will command higher proportions of funds than others. State strategies should work back from this reality and begin taking steps now to bring their states the greatest success.

⁴⁵ de Sa, P. Improving the Nation's Digital Infrastructure, White Paper, Federal Communications Commission (Jan. 19, 2017). Available at: <https://www.fcc.gov/document/improving-nations-digital-infrastructure>

Appendix A: Funding levels for broadband activities in currently authorized federal actions

Funding Source	Date Enacted	Estimated Date Funds Available	Broadband Activities Funded <i>*funding available directly to states</i>
CARES Act	March 27, 2020	May 5, 2020	<p>\$14 billion higher education emergency relief fund to provide cash grants to college students for costs such as course materials, technology, food, housing, and child care. Colleges to distribute to students.</p> <p>\$200 million in grants over a five-year period for promoting telehealth: eligible health care providers can purchase telecommunications services, information services, and devices necessary to provide critical connected care services</p> <p>Coronavirus Relief Fund (CRF), designating \$150 billion for payments to state, local, and tribal governments navigating the impact of the COVID-19 outbreak. Can be used to cover: Expenses to facilitate distance learning, including technological improvements, in connection with school closings to enable compliance with COVID-19 precautions. Expenses to improve telework capabilities for public employees to enable compliance with COVID-19 public health precautions.</p>
Consolidated Appropriations Act of 2021 (Second Covid Relief Bill)	December 27, 2020	<p>Tribal Broadband Connectivity Grant Application Window opened June 3, 2021 and due before September 1, 2021</p> <p>Broadband Infrastructure Deployment Grant Application Window opened May 19, 2021. Applications due before August 17, 2021.</p> <p>Connecting Minority Communities Pilot Program application window opens Summer 2021</p>	<p>\$249,950,000 addition to the telehealth grant program created by the CARES Act</p> <p>\$1 Billion for Tribal Broadband Connectivity Grants: Grants to expand access to and adoption of: (A) broadband service on Tribal land; or (B) remote learning, telework, or telehealth resources during the COVID19 pandemic.</p> <p>\$288 Million for Broadband Infrastructure Deployment Grants to states partnered with a provider for projects that are designed to:</p> <p>Provide broadband service to the greatest number of households in an eligible service area; Provide broadband service to rural areas; Be most cost-effective in providing broadband service; or Provide broadband service with a download speed of at least 100 Mbps and an upload speed of at least 20 Mbps</p> <p>\$285 million for a new Connecting Minority Communities Pilot Program that will distribute grants to HBCUs, tribal colleges and universities, and other minority serving institutions to expand broadband adoption and device access to their surrounding communities</p> <p>\$1.895 billion to fund the removal, replacement, and disposal of covered communications equipment or services that pose an unacceptable risk to the national security of the United States</p>

Funding Source	Date Enacted	Estimated Date Funds Available	Broadband Activities Funded <i>*funding available directly to states</i>
American Rescue Plan Act of 2021	March 11, 2021	<p>Emergency Connectivity Fund Application Window opens Summer 2021</p> <p>SLRF portal open; Coronavirus Capital Projects Fund Applications will open Summer 2021</p>	<p>\$7.171 billion Emergency Connectivity Fund to provide funding to eligible schools and libraries for the purchase of eligible equipment and/or advanced telecommunications and information services for use by students, school staff, and library patrons at locations other than a school or library.</p> <p>\$350 billion dollars in emergency funding for state, local, territorial, and Tribal governments to address the revenue losses they have experienced as a result of the crisis, it will help them cover the costs incurred due responding to the public health emergency and provide support for a recovery – including through assistance to households, small businesses and nonprofits, aid to impacted industries, and support for essential workers. State, local, and Tribal governments may invest in infrastructure, including water, sewer, and broadband services.</p> <p>\$10 billion for states, territories, and Tribes to cover the costs of capital projects to increase connectivity to those who lack it, including broadband infrastructure. Known as the Coronavirus Capital Projects Fund administered by the Treasury Department</p>
Rural Digital Opportunities Fund Phase II		Not yet scheduled	\$11.2 billion (\$4.4 billion + funds left over from RDOF I, estimated at \$6.8 billion) to provide 10-year support to providers building out broadband and voice service to partially served and unserved areas.
5G Fund		Auction will not be scheduled until after Digital Opportunity Data Collection for 2021 is complete. Current estimations are 2023.	Up to \$9 billion available to bring 5G mobile broadband service to rural areas that would be unlikely to otherwise see deployment of 5G broadband service.

Appendix B: Resources

Broadband Infrastructure Grant Notice of Funding Opportunity: https://broadbandusa.ntia.doc.gov/sites/default/files/2021-05/NTIA%20Broadband%20Infrastructure%20Grant%20Program%20NOFO.Final__0.pdf

NTIA's Grant Program Site: <https://broadbandusa.ntia.doc.gov/resources/grant-programs>

5G Fund Basics: <https://www.fcc.gov/5g-fund>

Treasury Department's Coronavirus Capital Projects Fund: <https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/capital-projects-fund>

Treasury Department's Coronavirus State and Local Fiscal Recovery Funds Frequently Asked Questions: <https://home.treasury.gov/system/files/136/SLFRPFAQ.pdf>



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