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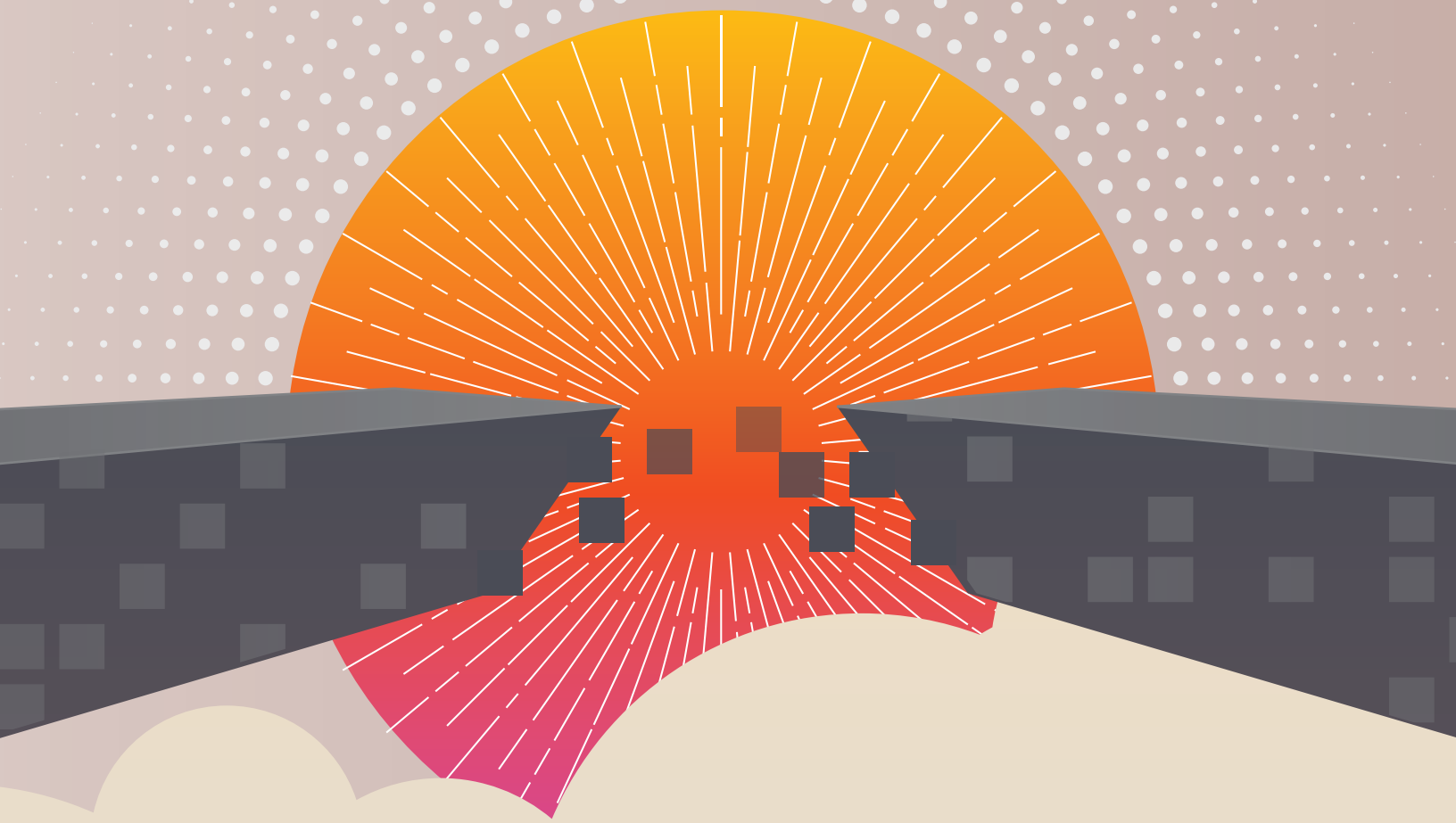

Closing the digital divide

How states can expand broadband access

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Introduction

STATES HAVE BEEN seeking to expand broadband for years, with mixed results. The Federal Communications Commission (FCC) estimates that nearly 14 million Americans still lack broadband, while others put the number at almost three times that.[1] Most people think of broadband access as a problem of rural America, but it affects urban areas as well. Roughly 18% of New York City residents lack broadband access, according to the Mayor's Office of the Chief Technology Officer.[2]

During the pandemic, reliable internet access became essential for many everyday tasks. Activities such as taking classes, attending doctors' appointments, accessing government services, and working from home often required a broadband connection. Unfortunately, too many individuals were forced to park outside a library or fast-food restaurant to get a usable connection.[3]

Yes, access to high-speed internet is all but mandatory these days. But it's *available* only to people who can afford the data charges—and have the digital literacy needed to use internet applications.

The digital divide tends to cut across the national landscape along racial and economic lines.[4] We sometimes conflate the digital divide with the lack of an internet service provider (ISP) in a given location, equating broadband *access* with broadband *availability*. Yes, access to high-speed internet is all but mandatory these days. But it's *available* only to people who can afford the data charges—and have the digital literacy needed to use internet applications.

The time is now for state governments to execute broadband strategies that recognize a key broadband "equation"—**broadband access = availability + affordability + adoption**. Closing the digital divide requires:

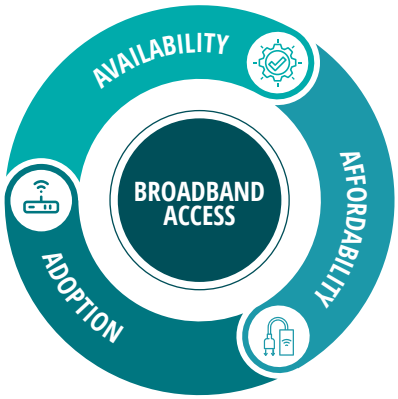
- **Availability**—Ensuring high-speed internet in a given location
- **Affordability**—Helping people and organizations afford the cost of connectivity and devices[5]
- **Adoption**—Overcoming knowledge barriers, including a lack of digital literacy or educational limitations, which prevent people from using the internet

Until recently, states' focus has been on the infrastructure needed to expand availability with limited funding resources. In the decade between 2010 and 2020, the federal government spent more than US$100 billion expanding broadband access, with a bulk of it going to infrastructure expansion.[6] Most of these funds flowed to ISPs, and significant progress has been made toward expanding broadband availability. Going forward, however, a more balanced approach that also considers affordability and adoption will be critical to expanding broadband access.

New resources are on the way. The Infrastructure Investment and Jobs Act passed in November of 2021 provides a total of US $65 billion for broadband expansion, much of which will go through states.

FIGURE 1

Broadband access is a function of availability, affordability, and adoption



Source: Deloitte analysis.

DEFINING BROADBAND

The FCC, in the January 2021 edition of its annual broadband deployment report, maintained its definition of broadband as a fixed service speed of 25 megabits per second (Mbps) for downloads and 3 Mbps for upload speed—often called "25/3 Mbps" for short.[8]

In the bill, US$42.45 billion goes to the Broadband Equity, Access, and Deployment Program (BEAD), a formula-based grant program to states, territories, and D.C. for broadband deployment to underserved communities. Each state would receive a minimum of US$100 million, with the remainder of the funds allocated by formula. States may use grant funds for a variety of purposes.

Moreover, the bill targets many aspects of broadband expansion, including:

- **Equity**: US$1.44 billion authorized and fully appropriated for grants to States to support the implementation of State Digital Equity Plans and digital inclusion activities.

- **Rural broadband**: US$2 billion has been allocated for the USDA's Rural Utilities Service Distance Learning, Telemedicine, and Broadband Program and another US$2 billion assigned for the National Telecommunications and Information Administration's (NTIA) Broadband Connectivity Fund for the Tribal Broadband Connectivity Program.

- **Middle mile infrastructure**: US$1 billion for the NTIA to establish and carry out a "Middle Mile" grant program.

- **Affordability**: The bill provides US$14.2 billion for the FCC's Emergency Broadband Benefit program, renamed the Affordable Connectivity Program, to make the benefit permanent and expand eligibility to reach additional low-income households.

From planning to mapping, from reaching underserved areas to connecting community anchor institutions, this bill represents an opportunity to significantly increase broadband connectivity efforts.[7]

But what *should* states be doing? What steps can they take to maximize the impact of broadband investments and close the digital divide?

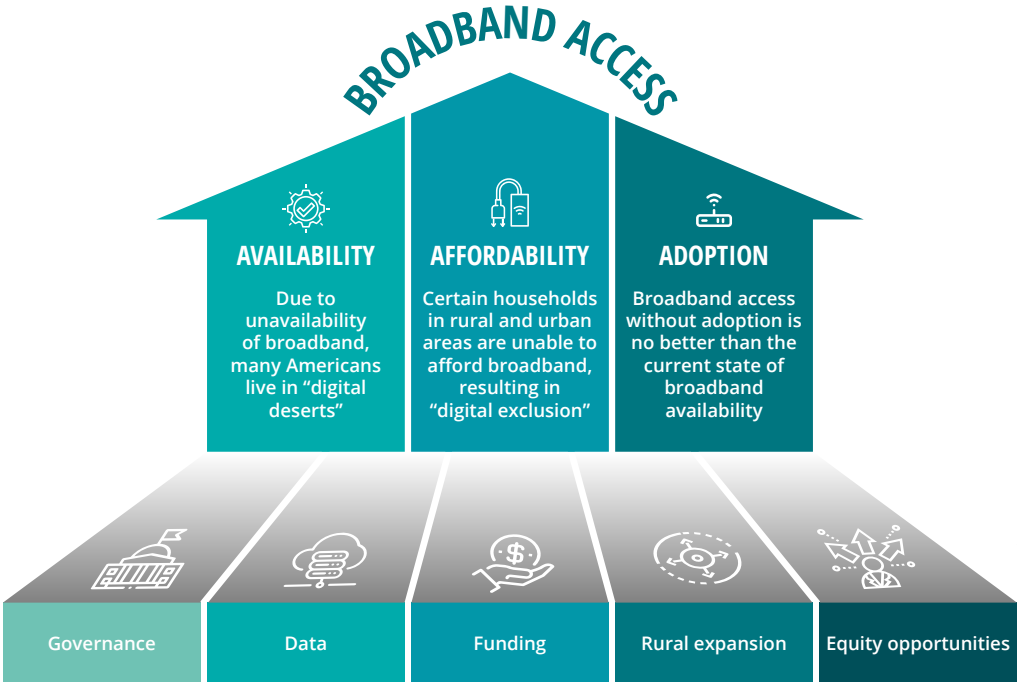
The state's role in broadband expansion

STATES PLAY A critical role in shaping the future of broadband access. States should focus on five key areas as new federal funds begin to arrive (figure 2):

- Governance
- Data
- Funding
- Rural expansion
- Equity opportunities

FIGURE 2

The path to deploying universal broadband



Source: Deloitte analysis.

Executing a state broadband strategy: Lessons from the field

1. Governance: State leadership for broadband expansion

The broadband expansion mission doesn't fit neatly under any single state secretariat. It's entwined with many functions of state government, including information technology, public health, education, transportation, and economic development. It's also a highly technical undertaking, meaning that a state chief information officer (CIO) or chief technology officer (CTO) should play a meaningful role. Expansion also requires collaboration with federal funding partners, local governments, and private players such as ISPs. How can states execute a strategy that involves so many important partners?

States have taken a variety of routes in establishing leadership for broadband development. No matter what structure is chosen, however, states should craft a governance structure that provides sufficient funding and authority to execute the plan.

Some approaches include:

A dedicated broadband office: California has a dedicated broadband office within its Department of Technology.[9] Minnesota's is housed under the Department of Employment and Economic Development.[10]

States should craft a governance structure that provides sufficient funding and authority to execute the plan.

An additional responsibility within an existing agency: Iowa, for instance, asked the state CIO to drive broadband expansion; in Alabama, this authority was given to the Department of Economic and Community Affairs.[11]

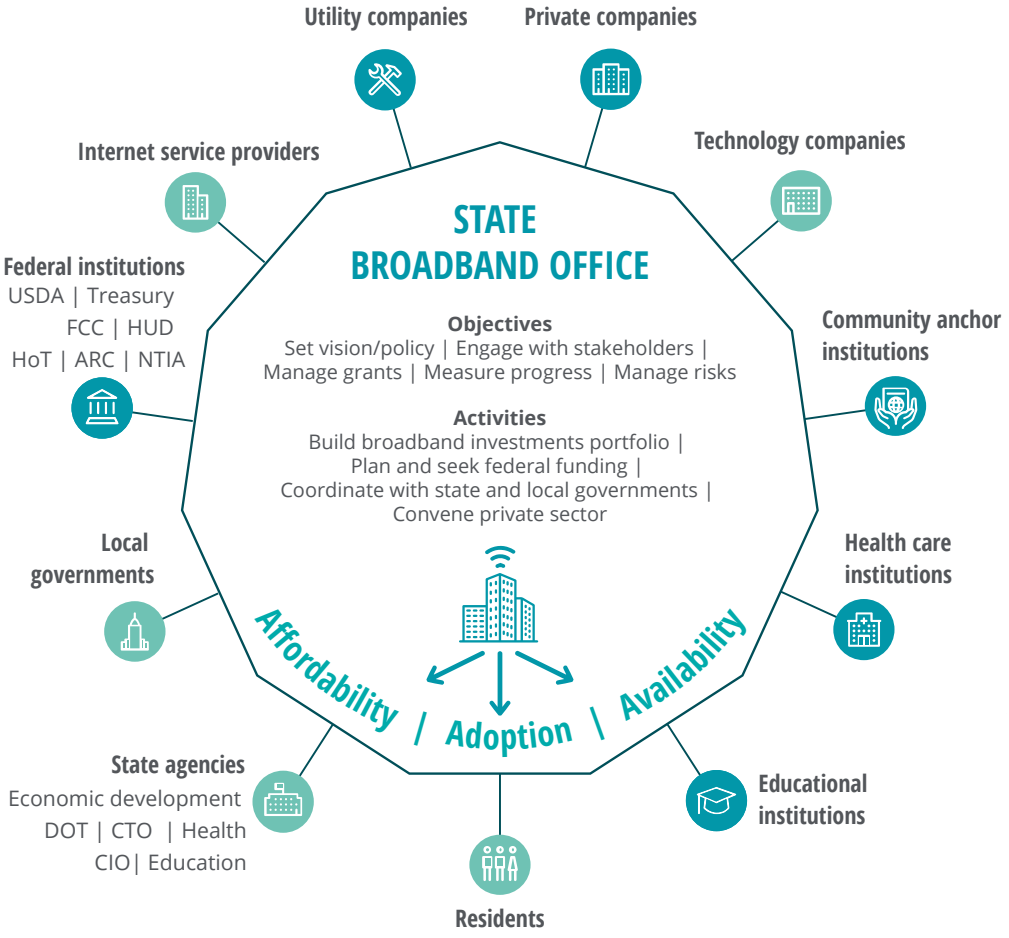
Shared responsibility between multiple agencies: In Georgia, for example, the Department of Community Affairs and the Georgia Technology Authority are coordinating a multiagency effort to expand broadband.[12]

Task forces and broadband councils: Some states have created specialized task forces or broadband councils to facilitate coordination.[13]

There's no one correct approach. But it's important to create a *formal governance structure* to engage with stakeholders, manage state-level accessibility data, and coordinate with federal agencies (figure 3).

FIGURE 3

The path to deploying universal broadband



Source: Deloitte analysis.

HOW UTAH COLLABORATES TO EXPAND BROADBAND

Utah's Broadband Advisory Council, within the Governor's Office of Economic Development, comprises representatives from multiple state agencies including the Utah Education and Telehealth Network, the Utah Department of Transportation, and the public-private alliance Utah Communities Connect. It also includes many community stakeholders and representatives from ISPs.[14]

One of the council's primary goals is guiding collaboration among an ecosystem of stakeholders. For instance, it works with the state's Automated Geographic Reference Center to update Utah's broadband maps every two years. These maps provide critical information about both commercial and residential broadband access.

The Broadband Advisory Council tackles both rural and urban connectivity. In Salt Lake City, the council has assembled community stakeholders,

including educational institutions, nonprofits, local governments, and the private sector to drive initiatives in digital equity and digital literacy.[15]

2. Data: Reliable metrics to measure broadband reach

While the FCC's 25/3 Mbps broadband definition is clear, reliable data regarding broadband accessibility is harder to come by.

The FCC's broadband access data, based on reports from individual ISPs, is commonly cited and yet has important limitations. First, the FCC's figures are released well after submission, meaning they don't necessarily reflect current conditions. Furthermore, the data tends to *overstate* broadband availability. If an ISP reports broadband services to even one household in a census block, the FCC counts the *entire block* as covered by the provider.[16]

The FCC has acknowledged the shortcomings in its data collection and is taking steps to improve them. In February 2021, the commission established a task force to supplement data provided by ISPs with additional data from states, local governments, and consumers.[17] In March, the FCC's acting chair noted that the commission "will create—for the first time—a publicly accessible, data-based nationwide map of locations where broadband is truly available throughout the United States."[18] In line with this, the FCC recently released a Request for Information (RFI) and awarded a contract to develop a broadband data system.[19]

In the meantime, states need accurate data to execute broadband deployment. Many have developed initiatives to tackle the data issue. Some have passed legislation, begun working closely with ISPs to obtain more accurate data, leveraged new tools and technology to improve data collection, and tapped into private sector expertise.

Georgia's 2018 Achieving Connectivity Everywhere Act, for instance, is specifically intended to improve the state's broadband accessibility data.[20] After passing this legislation, Georgia quickly moved ahead with plans to develop new broadband maps for the state.

First, it tweaked the FCC's definitions to require 80% of addresses within a census block to have broadband to be considered "served." Based on this methodology, the state found that nearly 10% of its homes and businesses lacked broadband—significantly more than the 6.2% implied by FCC maps.[21] The state also began working with a commercial real estate data company to accurately identify locations without broadband access.

Finally, Georgia's initiative is seeking more granular data from the state's ISPs. ISPs feared that sharing customer data could hurt their competitiveness; the 2018 broadband legislation allayed these fears by requiring the state to keep the data confidential. Georgia was ultimately able to identify more than a quarter of a million addresses that *weren't* considered unserved by the FCC.[22]

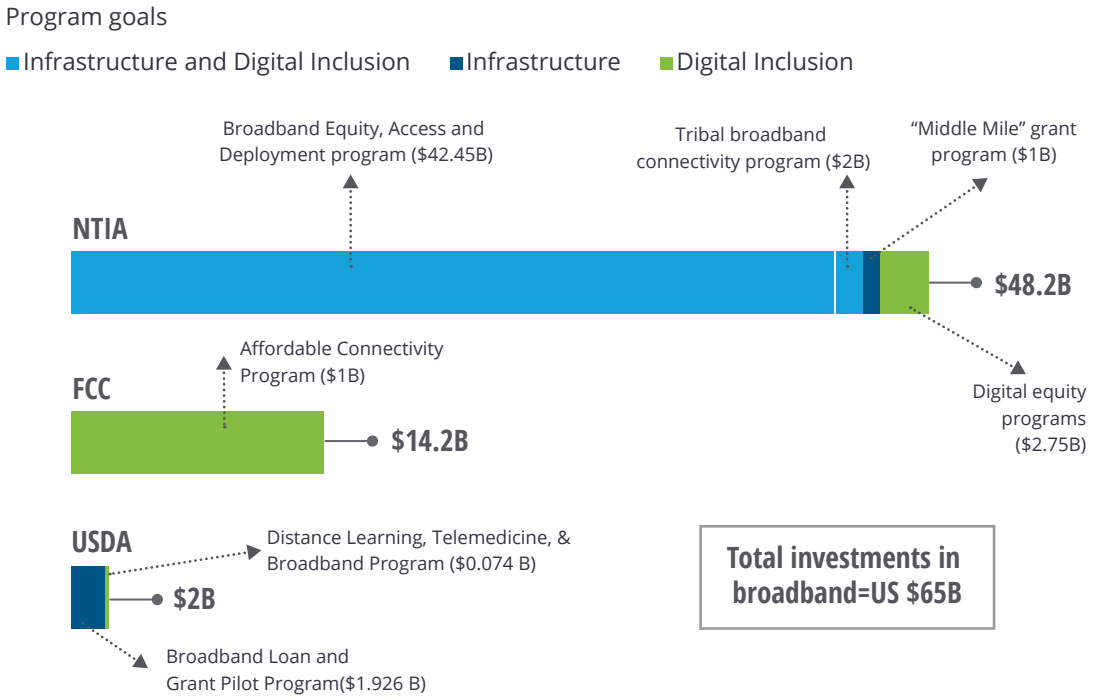
3. Funding: Navigating the federal maze

As noted above, federal agencies provided more than US$100 billion for broadband expansion between 2010 and 2020, the bulk of it from the FCC's Universal Service Fund (USF).[23]

As of 2021, with the passage of the new Infrastructure Investment and Jobs Act, the federal government has committed to dramatically increase broadband funding (figure 4). At the start of the year, more than US$25 billion in additional funding was earmarked for broadband development, including the FCC's Emergency Broadband Benefit program, which subsidizes monthly internet bills for eligible households.[24]

FIGURE 4

Dramatic increase in federal spending on broadband with the passage of the infrastructure investment and jobs act



Source: Deloitte analysis of the Infrastructure Investment and Jobs act.

The increase in federal funding creates a happy challenge for states. States could see greater discretion in how they spend these funds and should be poised to quickly identify the right investment choices. They can use some federal funds for grant programs to extend internet infrastructure, including **middle- and last-mile** infrastructure. Increased federal funding from a variety of agencies will require states to manage a portfolio of spending initiatives and track results in accord with federal requirements.

Many states have used funding from the Coronavirus Aid, Relief and Economic Security (CARES) Act and American Rescue Plan Act to drive broadband expansion, and more federal funding is coming. Virginia, for instance, plans to use US$700 million in American Rescue Plan funding to connect unserved areas and move toward universal internet access in the state by 2024.[25]

In May 2021, North Carolina passed a bill that will expand its own broadband investments by US$750 million, with a clear focus on plugging "broadband gaps" in areas not covered by previous legislation or the FCC's Rural Digital Opportunity Fund.[26]

4. Rural expansion: New options for states

The challenge of rural broadband availability is obvious. Rural areas often don't have enough potential subscribers to encourage ISPs to make the investments needed to serve them and may feature challenging terrain and weather conditions as well.

Yet broadband is increasingly critical to rural America. Precision agriculture, for example, relies on networks of sensors to detect soil moisture and data analytics for soil management.[27]

States have commonly used grant programs to encourage infrastructure expansion. But while these can help, they're likely to need more innovative efforts to expand availability.

HELPING SMALL TOWNS HELP THEMSELVES

Rural governments' capabilities are often limited, with part-time mayors and volunteer fire departments. Such communities generally lack the technical sophistication needed to deal with federal agencies or negotiate with service providers. States can help bring the right partners to the table, knowing that rural connectivity can have spillover effects in manufacturing, health, education, and agriculture—if the incentives are aligned properly.

For instance, the USDA has been an early pioneer in advancing rural broadband, particularly through the ReConnect program, which is designed to drive collaboration between state, local, and federal governments. The program provides loans and grants to help build broadband infrastructure and install modern equipment. The program has invested more than US$1.5 billion in high-speed broadband infrastructure in rural areas through two funding rounds.[28] States should be playing a pivotal role in coordinating with rural communities and helping them tap into these federal funds.

State broadband offices, for instance, can:

- Provide assistance in applying for federal programs
- Connect small communities with potential partners such as public colleges and private businesses to explore deployment opportunities
- Assist communities in exploring innovative connectivity technologies

PARTNERSHIPS TO ACHIEVE INFRASTRUCTURE BUILD-OUT

Private industry has an interest in infrastructure build-out, and this can set up a win-win scenario for broadband expansion, with local communities gaining benefits from private sector initiatives.

States can work with technology firms expanding their connectivity infrastructure. In West Virginia, Indiana, Ohio, Iowa, and Nebraska, for example, Facebook subsidiary Middle Mile Infrastructure is laying hundreds of miles of fiber optic to connect the company's data centers. The company plans to lay approximately 275 miles of fiber optic cable through West Virginia's western border, and another 160 miles of fiber infrastructure in Indiana along the I-70 corridor.[29] These build-outs have been possible through continual efforts and coordination between state agencies, state legislature, federal agencies, and Facebook.[30] While Facebook will use the infrastructure to connect its data centers, its excess capacity can be used by local and regional broadband providers to improve access in previously unserved areas.

States can accelerate broadband deployment by partnering with industry. In 2020, for example, the New Mexico Department of Information Technology created a US$5 million public-private partnership with ExxonMobil and a regional ISP to build a 107-mile fiber infrastructure connecting ExxonMobil's fields. As with the Facebook build-out, this new infrastructure will help Exxon

improve its operations while providing high-speed internet to local businesses, governments, and residents.[31]

CONNECTING COMMUNITIES WITH NEW INTERNET TECHNOLOGIES

States aren't looking at just fiber-optic connectivity; some are exploring innovative technologies for connectivity.

Low-earth-orbit (LEO) satellites, for instance, are creating new ways to connect. In March 2021, more than 5,000 satellites were in LEO, and that number is expected to rise exponentially in the coming years.[32] Satellites and 5G can make high-speed connectivity in rural and mountainous regions feasible in the near future.[33]

"What a difference high-speed internet can make! Our children can participate in remote learning, residents can access #healthcare. We felt like we'd been paddling up-river with a spoon on this. @SpaceX Starlink made it happen overnight. Thanks @WAStateCommerce for introduction."

NORTH DAKOTA'S UNIQUE JOURNEY IN EXPANDING RURAL BROADBAND

North Dakota is the nation's fourth-most sparsely populated state, with just 10 residents per square mile. It has lots of wide-open spaces—and surprisingly good broadband access. North Dakota's rural residents are more likely to have access to high-speed fiber-optic internet than American city dwellers in general.[36]

How does a big state with a tiny population—North Dakota has fewer residents than Charlotte, North Carolina—manage to provide high-speed, low-cost broadband to its residents? North Dakota's success has been made possible by years of effort on the ground to form homegrown coalitions, the effective use of federal funds, and developing an effective public-private model.

It began a quarter-century ago, in 1996, when 15 telephone co-ops and independent companies formed a coalition called the Dakota Carrier Network (DCN) to acquire rural telephone infrastructure for North Dakota. The acquisition paved the way for the future of high-speed connectivity in the state.[37] In 2009, the state used American Recovery and Reinvestment Act (ARRA) funds to expand the state's broadband infrastructure and lay hundreds of miles of high-speed fiber cable.[38]

North Dakota also uses an "anchor tenant" model to drive broadband infrastructure development. Just as a shopping-mall developer seeks a large tenant to serve as an anchor store, North Dakota sought to partner with key tenants, such as colleges, hospitals, and state office buildings, to help justify the investment in fiber-optic deployment.[39] Through its partnership with the DCN, the state has leveraged this model to improve broadband infrastructure in the state.

The North Dakota experience shows that it's possible to expand broadband despite low population density.

Until recently, for instance, the Hoh Tribe of Western Washington lacked adequate internet.[34] The tribe reached out to the state, which connected them with SpaceX's Starlink team to discuss accessing its new LEO-based internet service. The timing was perfect, since Starlink was planning beta trials for that region, and so the company provided early access to the Hoh Tribe.[35] This tweet from the Hoh Tribe says it all:

5. Equity opportunities: Building equitable and inclusive broadband infrastructure

President Biden has made equity an important cornerstone of his administration's policy priorities.[40] (Read more in *Government's equity imperative*.)

The new infrastructure legislation reinforces this commitment by authorizing two NTIA formula-based and competitive grant programs to support digital inclusion and equity in communities that are currently unable to take advantage of broadband connections.[41]

To promote affordability, the federal infrastructure legislation also extends emergency broadband subsidies introduced during the pandemic. To improve broadband adoption and provide more transparency to consumers, the FCC is developing a broadband "nutritional label." As with food labels in the grocery store, these nutritional labels will include information on broadband prices, hidden fees, overheads, monthly data allowances, available speed, and other performance metrics.[42]

States also are stepping up to close the digital divide. California, for example, recently passed a massive US$6 billion broadband plan as a part of its 2021–22 budget. The plan sets aside US$3.25 billion to build the **middle-mile** infrastructure and US$2 billion for **last-mile** lines to connect underserved and unserved areas. It also allocates US$750 million for a local community loan program that can help finance broadband services and reduce dependency on private ISPs.[43]

At the local level, there's a growing focus on digital *inclusion*, not just availability. The city of Philadelphia, for example, knew that roughly a fourth of its population lacked adequate access to the internet. When the pandemic struck, families had to transition to work from home and remote learning for their children. Many had challenges with poor connectivity or simply didn't own computers or smartphones.

To address this need, the city launched a partnership called PHLDonateTech, which collected unwanted computers from city residents and businesses and had them refurbished locally. They collected more than 600 computers in less than two months and donated them to citizens in need. A related initiative, PHLConnectED, tackled the same issue with a focus on K-12 students. In partnership with area ISPs, the city raised enough funding to connect students with poor or no connections to mobile hotspots. These hotspots proved particularly important in providing internet service to housing-insecure families.[44]

Looking ahead: From strategy to execution

THE PANDEMIC PUT a tight focus on expanding broadband access. The federal funding for broadband in the next few years will create many opportunities for state governments and their local partners to greatly expand broadband.

Here are some steps that can help state governments execute their broadband strategies.

A holistic approach: Access requires availability, affordability, and adoption

By analogy, it's not enough to cover a developing nation with highways—you *also* need a population that can afford cars and knows how to drive. It's the same with broadband connectivity: You can't get there just by laying fiber, which in itself is a monumental task. The digital divide is eliminated only when a rural farmer can operate his or her tractor remotely and sell products online; when elderly patients can visit their doctors from their living rooms; when children in isolated areas can take online class work without broadband connection issues.

State governments need a holistic approach toward broadband access, focusing on all three As—availability, affordability, and adoption. The federal and state governments are focused on improving availability, but as availability improves, they need to start pivoting toward affordability and adoption. It's generally the last house or the last neighborhood that's the most difficult to get. Digital inclusion initiatives, affordable connectivity options, and better service in underserved and unserved communities must be part of the broadband expansion plan.

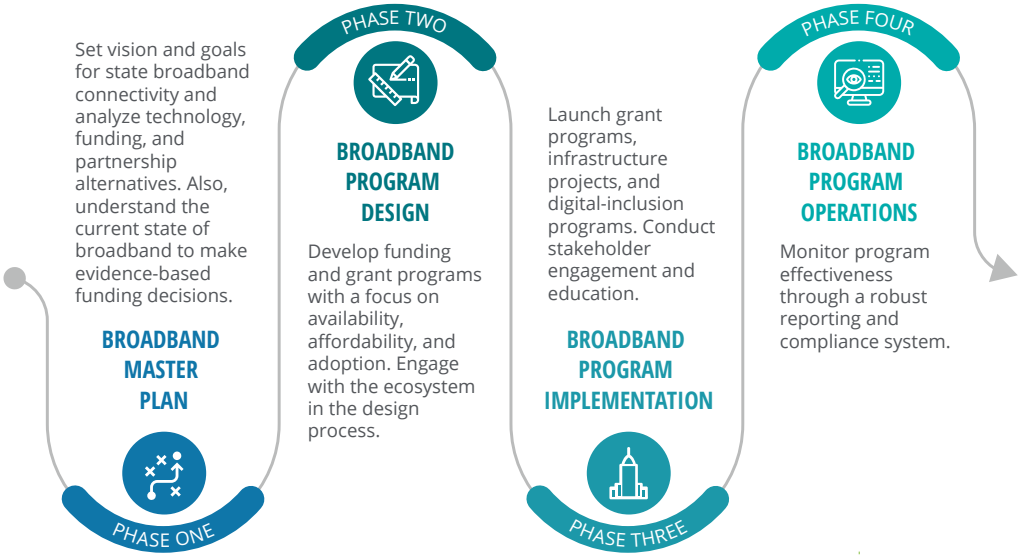
Get the governance right: Build authority and accountability in state broadband leadership

As we saw earlier, different states have built different governance structures to drive their broadband strategies. Wherever they're situated, broadband offices should have sufficient authority and funding to execute the state strategy effectively. Beyond governance, states should be taking a phased approach to broadband deployment (figure 5).

The broadband office should play the role of convener in the broader ecosystem, including state agencies, local governments, ISPs, utilities, the private sector, social enterprises, and community organizations. California's broadband legislation, for instance, calls for a broadband "czar" within the Department of Technology and an advisory committee with representatives from state agencies and the legislature.[45] Similarly, in February 2021, Louisiana governor appointed the state's first executive director of broadband development and connectivity.

FIGURE 5

Phased approach to executing broadband strategy



Source: Deloitte analysis.

Getting the broadband governance and leadership in place will be critical as state and local governments get ready for large federal funding from multiple federal agencies including the FCC, USDA, and NTIA.

The broadband office should play the role of convener in the broader ecosystem, including state agencies, local governments, ISPs, utilities, the private sector, social enterprises, and community organizations.

Partner for success: Build partnerships and tap into ecosystem expertise

State governments should reimagine their roles in the broadband ecosystem to determine when they need to take the lead and when they should simply coordinate market solutions. For rural broadband, state governments should build a patchwork of partnerships with educational institutions, agricultural manufacturing, and other supply chain partners, local and regional ISPs and utility companies, and local governments. Similarly, states should work with emerging technology companies and major national wireless internet providers to improve internet penetration in hard-to-reach areas.

Explore other technologies: The key is connectivity, not the underlying technology

State governments should be exploring the role of new wireless technologies such 5G and LEOs for semiurban and rural settings. While fiber-based internet seems to be the primary connectivity technology explored in multiple states, advances in technology will make high-speed wireless internet connections technically and economically viable across many areas in the near future. This will require states to be "technology-agnostic" in the future to tap into advanced connectivity technologies beyond wired broadband.

Plan for the future: Future-proof next-generation connectivity needs

The need for higher speed, ubiquitous connectivity, and capacity is bound to increase in both urban and rural areas. For instance, the largely rural agricultural landscape will need higher bandwidth as the use of sensors and autonomous agricultural equipment increases. The hyperconnected future in urban areas—with autonomous transport, millions of infrastructure sensors, smart homes, telehealth, and online education—will put increasing pressure on existing bandwidth. State broadband and technology leaders should consider a portfolio of connectivity solutions to meet ever-increasing demand.

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