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The Persistent Digital Divide: Selected Broadband Deployment Issues and Policy Considerations

April 18, 2023

Congressional Research Service

<https://crsreports.congress.gov>

R47506



R47506

April 18, 2023

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The Persistent Digital Divide: Selected Broadband Deployment Issues and Policy Considerations

Access to high-speed internet—known as broadband—has become a topic of increasing significance over the past few decades, with extra urgency in recent years due to the Coronavirus Disease 2019 (COVID-19) pandemic. Deployment of broadband is not uniform across the United States. Some areas lack broadband entirely—creating a so-called digital divide between those who have access to broadband service and those who do not.

Although some public entities (e.g., municipalities) provide broadband service, broadband is primarily deployed by the private sector. Private sector providers typically make their deployment decisions based on economic criteria, such as whether an area will provide a sufficient return on investment. They may therefore choose not to serve communities that have a lower population density (i.e., rural or remote areas) if they conclude that the cost to provide service would outweigh the returns. The terrain in some rural or remote areas may also make some technologies—such as fiber optic cable—more expensive to deploy. In such cases, it may not make economic sense for providers to deploy broadband in the absence of some type of subsidy to offset their costs.

Federal support for broadband deployment comes primarily from three agencies—the Federal Communications Commission (FCC), the U.S. Department of Agriculture, and the National Telecommunications and Information Administration (an agency in the Department of Commerce). Other federal agencies have programs that fund broadband deployment as one among many possible activities, but in most cases broadband is not the primary eligible funding activity. The federal government has been providing support for broadband deployment for decades; progress has been made, but the digital divide persists. To deploy federal resources effectively, an accurate national picture of where broadband is and is not available is key. The FCC has responsibility for mapping broadband availability, but ensuring the accuracy of the data has been challenging, and the federal government does not know precisely where broadband has and has not been deployed. Another issue is that broadband takes time to deploy, especially if there are supply chain problems, labor shortages, or delays in administration of federal funding.

The digital divide puzzle is complex and has many pieces. Additional funding for broadband deployment may not alone be enough to close it. The 118th Congress may also assess whether regulatory policies are helping or hindering broadband deployment and weigh how changes in regulatory policies could help. Possible considerations include

- the sufficiency of federal broadband funding and whether more is needed,
- the numerous federal agencies and programs involved in promoting broadband deployment, which could lead to coordination issues or duplication of effort,
- the FCC’s minimum broadband speed benchmark and whether raising the speed benchmark could inadvertently create a new digital divide,
- the potential for prioritization of unserved areas to ensure ubiquitous broadband availability, and
- the potential application of rural electrification strategies to rural broadband deployment.

Policy options proposed in bills currently under consideration by the 118th Congress include, for example, prioritizing the processing of applications for rural broadband projects located in areas with the shortest construction seasons (H.R. 43), amending the Internal Revenue Code of 1986 to exclude certain broadband grants from gross income (H.R. 889/S. 341), determining whether the lack of network equipment significantly impacted the deployment of broadband (S. 690), and ensuring that broadband maps are accurate before funds are allocated under the Broadband Equity, Access, and Deployment Program (S. 1162).

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Introduction to Broadband and the Digital Divide

Broadband is high-speed internet service that is faster than traditional dial-up internet service and offers an “always on” connection. It can be delivered through various technologies, such as

- digital subscriber line (DSL), which uses copper telephone wires to transmit data;
- cable modem, which uses the same coaxial cables used for cable television;
- fiber optic cable, which uses pulses of light shot by lasers through thin strands of glass;
- wireless, which uses a radio connection between a user’s device, such as a laptop or phone, and a service provider’s terrestrial antenna; and
- satellite, which uses a radio connection between a user’s device and a service provider’s space-based antenna.¹

The Federal Communications Commission (FCC)—an independent agency over which Congress has oversight—has set a minimum speed benchmark as its definition of broadband. The benchmark, adopted in 2015, is 25 megabits per second (Mbps) to download data and 3 Mbps to upload data. This benchmark is referred to as “25/3.”²

Broadband has become increasingly important as aspects of everyday life continue to move online. This trend became especially apparent during the Coronavirus Disease 2019 (COVID-19) pandemic, with activities such as school and work moving from in-person to online. However, not everyone in the United States has equal access to broadband. The gap between those who have access to broadband and those who do not is referred to as the digital divide. The term originated at the National Telecommunications and Information Administration (NTIA) in the mid-1990s “to express the gap between ‘haves’ and ‘have-nots’ in terms of access to computers.”³ The term has evolved to include other aspects of technology access, especially broadband availability. Despite billions of federal dollars directed toward broadband deployment, discrepancies in access to broadband remain. The continuing lack of broadband access in some areas can be attributed to several factors, including terrain, population density, demography, and market characteristics. Rural and tribal areas are most affected, but urban areas can also be.

This report provides an overview of the digital divide in broadband deployment and issues that contribute to its persistence. The report includes a discussion of policy issues facing Congress. An **Appendix** lists related legislation in the 118th Congress.⁴

¹ Federal Communications Commission, “Types of Broadband Connections,” June 23, 2014, available at <https://www.fcc.gov/general/types-broadband-connections>.

² 25/3 Mbps was an increase from the previous benchmark (4/1 Mbps), which was adopted in 2010. Tyler Cooper, *The FCC Definition of Broadband: Analysis and History*, BroadbandNow, November 2, 2021, available at <https://broadbandnow.com/report/fcc-broadband-definition/>.

³ Advay Chandra, *What Is Digital Divide and Why Must We Understand That Term?*, Learning Spaces, May 10, 2021, available at <https://learningspacesglobal.org/what-is-digital-divide/>.

⁴ This report focuses on the digital divide as it pertains to broadband deployment. Broadband adoption and affordability issues, which are another aspect of the digital divide, are outside the scope of this report. For more information on broadband adoption and affordability, see CRS Report R46108, *Demand for Broadband in Rural Areas: Implications for Universal Access*, by Brian E. Humphreys.

Why Is the Digital Divide Persistent?

Since 1999, the FCC has issued 16 reports that provide a snapshot and assessment of broadband deployment.⁵ **Table 1** shows percentages of Americans in urban, rural, and tribal areas with access to fixed⁶ broadband at speeds of 25 Mbps/3Mbps, since the adoption of the minimum speed benchmark in 2015, as presented in the FCC’s *Fourteenth Broadband Deployment Report*.⁷ Although the percentage of Americans that lack access to broadband has been shrinking, 100% access to broadband for all Americans in urban, rural, and tribal areas across the United States is still elusive, as certain factors may contribute to areas perpetually remaining unserved with broadband.

Table 1. Percentage of Americans with Access to Fixed Broadband at the Minimum Speed Benchmark of 25/3 Mbps

	2015	2016	2017	2018	2019
All U.S.	89.9%	91.9%	93.5%	94.4%	95.6%
Urban	96.7%	97.7%	98.3%	98.5%	98.8%
Rural	61.5%	67.8%	73.6%	77.7%	82.7%
Tribal	57.8%	63.1%	67.9%	72.3%	79.1%

Source: Federal Communications Commission, *Fourteenth Broadband Deployment Report*, January 19, 2021, p. 20, available at <https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf>.

Notes: The FCC’s *Fourteenth Broadband Deployment Report* with data as of December 31, 2019, is the most recent report.

Some challenges that may contribute to the persistence of the digital divide include:

- the federal government does not know precisely who has broadband access and who does not;
- broadband can be difficult and costly to deploy;⁸
- broadband takes time to deploy, and
- supply chain problems, labor shortages, or delays in the administration of federal funding can exacerbate broadband deployment issues.⁹

The following sections address each of these challenges.

⁵ Of the 16 reports, 14 have a national focus, while two have a rural focus. An archive of these reports is available at Federal Communications Commission, *Broadband Progress Reports*, available at <https://www.fcc.gov/reports-research/reports/broadband-progress-reports>.

⁶ Fixed broadband includes DSL, fiber, cable, fixed wireless, and fixed satellite, but not mobile wireless or satellite.

⁷ Federal Communications Commission, *Fourteenth Broadband Deployment Report*, January 19, 2021, p. 20, available at <https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf>.

⁸ Christopher Ali, *Everything You Wanted To Know About Broadband (But Were Afraid to Ask)*, Benton Institute for Broadband & Society, August 31, 2020, available at <https://www.benton.org/blog/everything-you-wanted-know-about-broadband-were-afraid-ask>.

⁹ NBC5, “Lots of Broadband Money, but US Expansion Finds Speed Bumps,” April 16, 2022, available at <https://www.mynbc5.com/article/lots-of-broadband-money-but-us-expansion-finds-speed-bumps/39741440>.

Broadband Availability Data and Mapping Challenges

Pinpointing where broadband is and is not deployed across the United States has been challenging. Estimates of how many Americans lack access to broadband vary—ranging, for example, from the FCC’s estimate of 14.5 million¹⁰ to an estimate by BroadbandNow of 42 million¹¹ to Microsoft’s estimate of 157.3 million.¹² Without an accurate figure, it is difficult for policymakers to know how much funding would potentially help close the divide—and where to direct it. FCC Chairwoman Jessica Rosenworcel stated in a June 30, 2022, blog post:

For as long as people have been talking about the digital divide, there have been complaints that we lack detailed maps to tell us exactly where broadband is—and is not—available. This has been a constant source of frustration for policymakers trying to deploy resources to build broadband in more places as well as consumers, who knew with greater accuracy than Washington about their what broadband service was available where they lived or worked.¹³

The FCC has had primary responsibility for developing a comprehensive map of broadband access in the United States since 2018,¹⁴ but the data and methodology used to compose the map may have overstated availability. For example, an entire census block¹⁵ was considered as served if at least one home or business in that census block had broadband access. This policy could have consequences for efforts to address the digital divide, as the FCC’s map is frequently consulted to identify areas that are completely unserved with broadband, and thus, to determine where to invest federal resources through programs such as the Rural Digital Opportunity Fund (RDOF) and the Broadband Equity, Access, and Deployment (BEAD) program.¹⁶ Many Members of Congress have acknowledged the potential implications of inaccurate broadband data and mapping. For example, some Members have written letters on the topic to the FCC Chair.¹⁷

¹⁰ Federal Communications Commission, *Fourteenth Broadband Deployment Report*, January 19, 2021, available at <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/fourteenth-broadband-deployment-report>.

¹¹ John Busby, Tyler Cooper, and Julia Tanberk, “BroadbandNow Estimates Availability for All 50 States; Confirms That More Than 42 Million Americans Do Not Have Access to Broadband,” BroadbandNow, October 13, 2022, available at <https://broadbandnow.com/research/fcc-broadband-overreporting-by-state>.

¹² Charlotte Edmond, “Airband: The Initiative to Bring the Internet to Everyone,” Microsoft, September 1, 2020, available at <https://news.microsoft.com/on-the-issues/2020/09/01/airband-initiative-rural-broadband-digital-divide/>.

¹³ Chairwoman Jessica Rosenworcel, *Status Update: Mapping Where Broadband Is—and Is Not—Available in the U.S.*, Federal Communications Commission, June 30, 2022, available at <https://www.fcc.gov/news-events/notes/2022/06/30/status-update-mapping-where-broadband-and-not-available-us>.

¹⁴ For more background and information about broadband data and mapping, see CRS Report R45962, *Broadband Data and Mapping: Background and Issues for the 117th Congress*, by Colby Leigh Rachfal.

¹⁵ According to the FCC, “Census blocks are the smallest unit of geography defined by the Census Bureau ... but are diverse in size. While the largest block is over 8,500 square miles (it’s in Alaska), half the blocks are smaller than a tenth of a square mile (6.4 acres).” See Federal Communications Commission, *More About Census Blocks*, October 27, 2020, available at https://transition.fcc.gov/form477/Geo/more_about_census_blocks.pdf. Population does not delineate census blocks; many census blocks have no population. See U. S. Census Bureau, “What Are Census Blocks?,” July 2011, available at <https://www.census.gov/newsroom/blogs/random-samplings/2011/07/what-are-census-blocks.html>. Census blocks are grouped into block groups, which are “generally defined to contain between 600 and 3,000 people.” See U. S. Census Bureau, “Glossary,” April 11, 2022, available at <https://www.census.gov/programs-surveys/geography/about/glossary.html>.

¹⁶ For more information, see CRS Report R46501, *Rural Digital Opportunity Fund: Requirements and Selected Policy Issues*, by Colby Leigh Rachfal.

¹⁷ For example, see Wyden, *Barrasso and 12 Bipartisan Senators Urge FCC to Ensure Rural, Tribal Communities Receive Fair Share of Federal Broadband Grants*, March 22, 2023, available at <https://www.wyden.senate.gov/news/press-releases/wyden-barrasso-and-12-bipartisan-senators-urge-fcc-to-ensure-rural-tribal-communities-receive-fair>

In March 2020, Congress enacted the Broadband Deployment Accuracy and Technological Availability Act (Broadband DATA Act; P.L. 116-130). This law required the FCC to change how broadband data is collected, verified, and reported. For example, the law requires specific location-level information about broadband services available throughout the country and implementation of a public challenge process in which consumers, state, local, and tribal governments, and other stakeholders (e.g., internet service providers) can submit challenges to the FCC if they believe the map required under the act—referred to as the National Broadband Map—contains inaccurate data (e.g., overstated availability of broadband service).

The pre-production version of the National Broadband Map debuted on November 18, 2022, to mixed reviews. Some stakeholders acknowledge that, although some issues persist, the map is an improvement from the previous version, and they have applauded the FCC for its efforts.¹⁸ Some Members of Congress have expressed concerns. For example, on December 21, 2022, multiple Senators wrote a letter to Chairwoman Rosenworcel, stating,

We have heard from constituents, state and local governments, and service providers alike of continuing concerns about the accuracy of the map, ranging from persistent issues with missing or incorrect serviceable locations to potentially overstated claims of coverage by providers.¹⁹

Additionally, news outlets have reported that some providers may have submitted false broadband availability data to the FCC.²⁰ The digital divide will be difficult to close unless areas unserved with broadband are accurately identified. Congress may consider additional legislative actions, such as enhancing accountability protocols for data submitted by providers, penalizing providers that provide false or inaccurate data, or increasing the frequency of updates to the National Broadband Map.²¹

To assist with improving the accuracy of the map, state and local governments have been encouraging residents to check their address on the National Broadband Map and challenge incorrect information.²² The map is to be updated at least twice a year with the resolution of consumer challenges, along with updated service provider data on availability.²³ Although the

share-of-federal-broadband-grants, and *Rep. Allen Leads Bipartisan Georgia Delegation Letter to FCC on Broadband Map*, July 12, 2021, available at <https://allen.house.gov/news/documentsingle.aspx?DocumentID=4762>.

¹⁸ Kristi Eaton, “New FCC Broadband Map of the U.S. Is ‘A Step in the Right Direction,’” *The Daily Yonder*, December 12, 2022, available at <https://dailyyonder.com/new-fcc-broadband-map-of-the-u-s-is-a-step-in-the-right-direction/2022/12/12/>.

¹⁹ Letter from Senators Shelley Moore Capito, Jacky Rosen, Roger Wicker, John Thune, Tammy Baldwin, John Barrasso, Michael F. Bennet, Sherrod Brown, Benjamin L. Cardin, Catherine Cortez Masto, Mike Crapo, Tammy Duckworth, Dick Durbin, Joni Ernst, Dianne Feinstein, Chuck Grassley, Cynthia Lummis, Roger Marshall, Jerry Moran, Kyrsten Sinema, Dan Sullivan, Joe Manchin, Robert Menendez, Deb Fischer, Jon Tester, and Todd Young to the Honorable Jessica Rosenworcel, Federal Communications Commission Chairwoman, December 21, 2022, available at https://www.feinstein.senate.gov/public/_cache/files/7/3/739aa0e3-bfa9-4601-a7c8-f3dc3f08dcbe/177487E8F5C7D6FF8794BB957E97B483.12-21-2022-final-signed-capito-rosen-broadband-accuracy-and-accountability-letter1.pdf.

²⁰ Jon Brodtkin, “Starlink, Verizon, and T-Mobile Made Shaky Claims on FCC Coverage Map,” *arsTechnica*, February 13, 2023, available at <https://arstechnica.com/tech-policy/2023/02/starlink-verizon-and-t-mobile-made-shaky-claims-on-fcc-coverage-map/>.

²¹ For more information, see CRS In Focus IF12298, *FCC’s National Broadband Map: Implications for the Broadband Equity, Access, and Deployment (BEAD) Program*, coordinated by Colby Leigh Rachfal.

²² Guy McCarthy, “Tuolumne County Urges Residents to Provide Input on FCC National Broadband Map,” *The Union Democrat*, December 8, 2022, available at https://www.uniondemocrat.com/news/article_782e921a-767e-11ed-be09-23496a9e614a.html.

²³ According to a March 23, 2023, Notes from the FCC post by Chairwoman Jessica Rosenworcel, “In the past four

challenge process may result in more accurate data, it remains to be seen whether national mapping of where broadband is and is not available will continue to pose a challenge. This issue has been a particular focus of congressional interest in light of the \$42.45 billion BEAD program, which is required by law to use the National Broadband Map to determine how much BEAD funding a state is to receive based on the state's share of unserved locations.

State Variability and Cost to Deploy

Areas of the United States vary dramatically in terms of landform, climate, and settlement patterns. There are mountains in the West, semi-arid grasslands in the Great Plains, and wilderness in Alaska. Such variations can present challenges in deploying broadband. Climatic variations, for example, may allow the deployment of buried cables all year in some places (e.g., some parts of California), while others may have ground that is frozen for long periods (e.g., Michigan) and may therefore have to pause deployment efforts at certain times of year. In the 118th Congress, the Rural Broadband Window of Opportunity Act (H.R. 43) would require the FCC to prioritize the processing of applications for certain rural broadband expansion projects that are located in areas with the shortest construction seasons (generally areas with long winters and heavy snowfall).

Of the technologies used to deliver broadband, fiber is typically preferred by both consumers and providers due to its reliability (fiber cables are typically buried underground) and scalability (i.e., flexibility to accommodate higher speeds in the future).²⁴ Additionally, fiber can provide symmetrical speeds of up to 1,000 Mbps and lower latency (i.e., lag time) than other technologies.²⁵ However, geography can make laying fiber challenging as, in many cases, deploying fiber requires subsurface digging to bury conduit and physically connecting each household.

Returns on investment typically drive broadband deployment decisions. Areas in which it is difficult and expensive to deploy broadband (e.g., mountains) often make little economic sense for providers.²⁶ According to Pew Charitable Trusts, “cost is one obstacle to extending broadband internet to everyone who wants it. The companies providing the services need adequate returns to justify their investment in the necessary fiber, towers, and cables.”²⁷

months, our mapping team has processed challenges to availability data for over 4 million locations. In other words, on average, we are addressing availability challenges to tens of thousands of locations every single day. Every two weeks, our public map is updated to reflect all availability challenges that have been resolved.” See Chairwoman Jessica Rosenworcel, *The National Broadband Map—Getting Better All the Time*, Federal Communications Commission, March 23, 2023, available at <https://www.fcc.gov/news-events/notes/2023/03/23/national-broadband-map-getting-better-all-time>.

²⁴ Fiber Broadband Association, *Fiber Broadband Association Releases Broadband Experience Index*, October 21, 2019, available at <https://www.fiberbroadband.org/blog/fiber-broadband-association-releases-broadband-experience-index>.

²⁵ Tyler Cooper, “DSL vs. Cable vs. Fiber: Which Internet Option Is the Best?,” *BroadbandNow*, May 6, 2022, available at <https://broadbandnow.com/guides/dsl-vs-cable-vs-fiber>. Broadband speed is symmetrical if upload speed and download speed are the same.

²⁶ Anna Read, *How Can the United States Address Broadband Affordability?*, The Pew Charitable Trusts, April 29, 2022, available at <https://www.pewtrusts.org/en/research-and-analysis/articles/2022/04/29/how-can-the-united-states-address-broadband-affordability>.

²⁷ Joyce Winslow, *America's Digital Divide*, Pew Charitable Trusts, July 26, 2019, available at <https://www.pewtrusts.org/en/trust/archive/summer-2019/americas-digital-divide>.

Cost estimates of fiber deployment can range from less than \$20,000 per mile to more than \$300,000 per mile, depending on location.²⁸ To deploy fiber, technicians lay conduit underground or between poles, splice and join conduit, and connect conduit to network equipment such as routers and end-use modems. According to Forbes, “about every 40 to 60 miles, the [fiber] connection must be re-amplified²⁹ at an in-line amplification (ILA) shelter.... ILAs can be costly to build and maintain. This issue is one of the reasons why fiber is not available everywhere.”³⁰

Fiber also requires middle mile infrastructure, which “is the physical mid-section of the infrastructure required to enable [last mile] internet connectivity for homes, businesses, and community institutions.”³¹ In rural or remote areas, it can be “more difficult for providers to deploy service, increasing capital expenditure costs (e.g., construction equipment, labor) and the likelihood of needing to build longer middle mile infrastructure to reach the internet core [network].”³²

Figure 1 depicts the role of middle mile infrastructure in enabling last mile connectivity.

²⁸ Vantage Point Solutions, *Cost of Bringing Broadband to All*, August 1, 2022, p. 7, available at <https://www.fcc.gov/ecfs/document/108012327916993/2>.

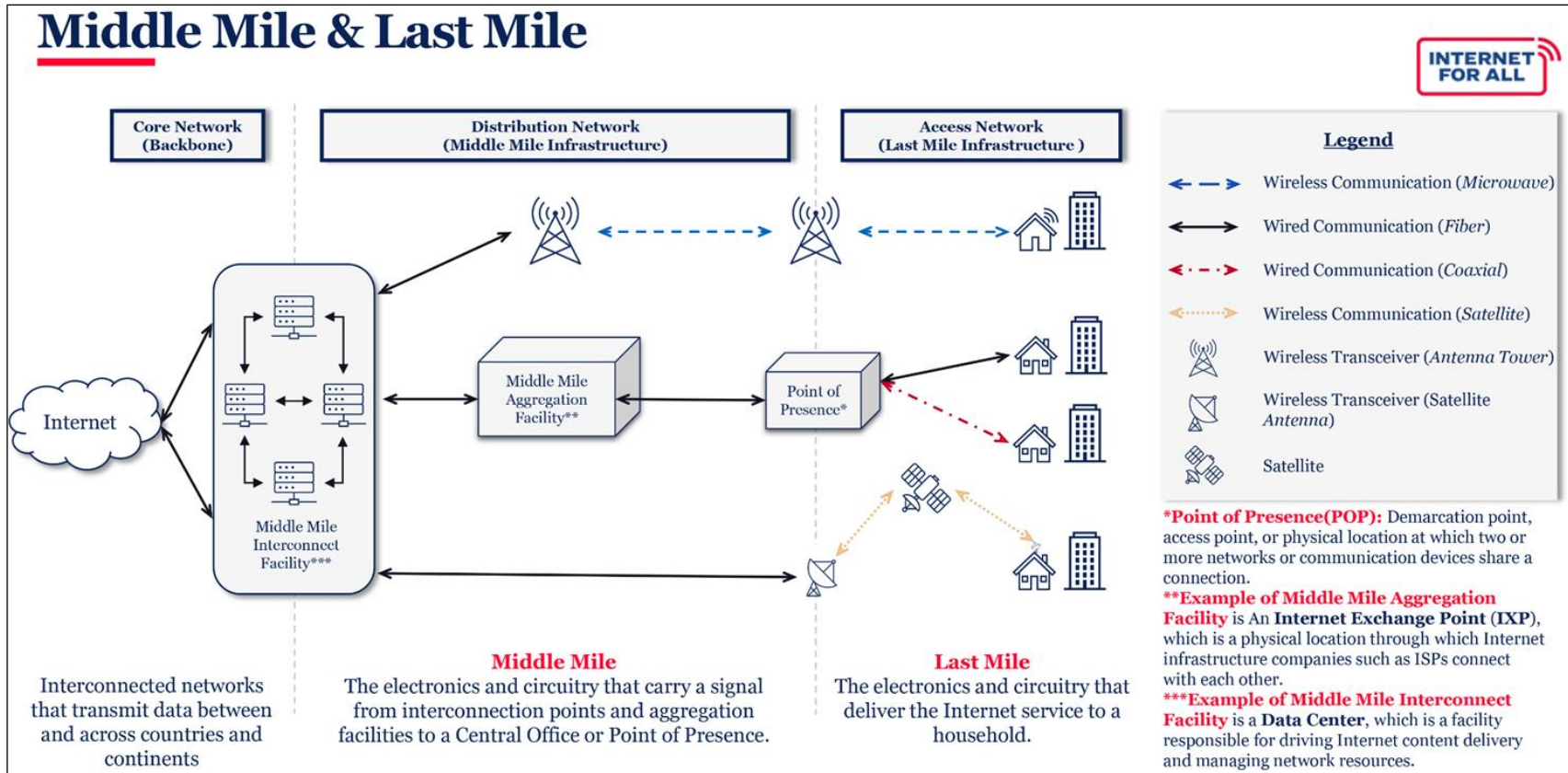
²⁹ “Amplification boosts the signal in the optical fiber ... (i.e. it increases the distance over which the data between two sites can be transmitted).” See Smartoptics, *Managing Amplification and Dispersion in the Optical Network*, available at <https://www.smartoptics.com/article/managing-amplification-dispersion-network/>.

³⁰ Raymond Nelson, “The Future of Fiber,” *Forbes*, April 18, 2018, available at <https://www.forbes.com/sites/forbestechcouncil/2018/04/18/the-future-of-fiber/?sh=201e5ffb2bc9>.

³¹ California Department of Technology, *Middle-Mile Broadband Initiative FAQ*, available at <https://cdt.ca.gov/middle-mile-advisory-committee/middle-mile-faq/>.

³² National Telecommunications and Information Administration, *Economics of Broadband Networks*, available at <https://broadbandusa.ntia.doc.gov/sites/default/files/2022-03/Economics%20of%20Broadband%20Networks%20PDF.pdf>.

Figure 1. Core Network, Middle Mile, and Last Mile Infrastructure



Source: National Telecommunications and Information Administration, *Introduction to Broadband and High Speed Internet*, Fall 2022, p. 17, available at https://broadbandusa.ntia.doc.gov/sites/default/files/2022-12/Introduction_to_Broadband_and_High_Speed_Internet_FINAL_0.pdf.

Notes: This figure is included for illustrative purposes.

According to Fierce Telecom, “middle mile access is a huge issue that drives up the cost of rural fiber deployments.”³³ Further, much of the middle mile infrastructure needed across the United States for last mile connectivity does not currently exist. According to Matthew Rantanen, technology and telecommunications co-chairman of the National Congress of American Indians,

The middle-mile fiber is missing. We did the math, got maps from carriers and tribes, worked with the GIS [geographic information system] folks and anchor institutions—there’s about 8,000 missing miles in the Lower 48 states, 1,800 just in California. That’s a billion-dollar problem on its own just in the Lower 48.³⁴

A consideration for Congress is whether the government might consider funding middle mile infrastructure that would be too costly for private providers without subsidies. While Congress provided \$1 billion in funding for middle mile infrastructure in the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58)—which is being administered by the National Telecommunications and Information Administration (NTIA)³⁵—whether that funding resolves the lack of middle mile infrastructure, or whether additional funding might be needed remains to be seen.

Fiber is not the only broadband technology that may be costly to deploy. Many providers, including winners from the FCC’s Rural Digital Opportunity Fund (RDOF) auctions, are using a technology called fixed wireless access (FWA), which “is a way of providing wireless connectivity through radio links between two fixed points.”³⁶ According to Fierce Telecom, “while FWA deployments are generally cheaper than fiber ... in a place like Alaska, even getting a tower built is going to be much more expensive given the rural nature of the roads, lack of rural electricity at a tower site, and mountain topography.”³⁷

In places where fiber or FWA may not be feasible to deploy—due to cost or geography—other technologies may be able to step in and help fill the gap. For example, broadband provided by satellites in low Earth orbit (LEO) may hold promise, especially in remote or rural areas. LEO satellites, which are positioned at a much lower altitude than geostationary (GEO) satellites, have the potential to deliver broadband speeds closer to those that can be achieved with fiber, as well as lower lag times or latency. However, there are many unknowns—for example, whether LEO satellites can consistently provide the anticipated lower latency and higher speeds.³⁸ Although fiber may be the preferred technology by consumers and providers, other technologies may be best suited for particular areas (e.g., LEO satellites in remote areas) and each community has different challenges a particular technology might be able to address. An additional consideration for Congress could be whether some states (e.g., ones that have challenging terrain) may require uniquely tailored plans to close the digital divide.

³³ Diana Goovaerts, “FBA CEO Says ‘No One Too Expensive to Reach’ with Fiber,” Fierce Telecom, September 28, 2022, available at <https://www.fiercetelecom.com/broadband/fba-ceo-says-no-one-too-expensive-reach-fiber>.

³⁴ Robert Chaney, “Broadband Funding for Native Communities Could Finally Connect Some of America’s Most Isolated Places,” *MIT Technology Review*, September 21, 2022, available at <https://www.technologyreview.com/2022/09/21/1059682/pandemic-broadband-funding-native-communities-blackfeet-internet-access/>.

³⁵ National Telecommunications and Information Administration, *Enabling Middle Mile Broadband Infrastructure Program*, available at <https://broadbandusa.ntia.doc.gov/enabling-middle-mile-broadband-infrastructure-program>.

³⁶ everythingRF, “What Is Fixed Wireless Access?,” May 28, 2020, available at <https://www.everythingrf.com/community/what-is-fixed-wireless-access>.

³⁷ Diana Goovaerts, “The Cost of Running Fiber in Rural America: \$200,000 per Passing,” Fierce Telecom, September 27, 2022, available at <https://www.fiercetelecom.com/broadband/cost-running-fiber-rural-america-200000-passing>.

³⁸ For more information see CRS Report R46896, *Low Earth Orbit Satellites: Potential to Address the Broadband Digital Divide*, by Colby Leigh Rachfal.

Network Construction Time and Other Potential Delays

Many policymakers see closing the digital divide as urgent, but the time it takes to deploy broadband infrastructure may pose a challenge in providing an immediate solution. According to Dgtl Infra Real Estate 2.0,

As a general rule, fiber construction takes 6 to 10 months for a network to become operational, after the beginning of a build-out. However, the construction timeline for a new fiber optic network varies depending upon the number of route miles to be constructed, the number of homes or premises targeted for connection to the network, and the general deployment of the network.³⁹

Broadband can take even longer to deploy if an entity is receiving federal funding to construct a network. For example, the FCC’s RDOF was announced in January 2020, with a reverse auction⁴⁰ held in December 2020. Following the auction, the FCC began reviewing long-form applications⁴¹ from winning bidders. It did not begin approving disbursement of support until July 2021. Approvals are still ongoing as of the publication of this report. Similarly, a January 24, 2023, Government Accountability Office (GAO) report found that announcement of awards for NTIA’s Broadband Infrastructure and Tribal Broadband Connectivity Programs took longer than anticipated. For example, award announcements for the Tribal Broadband Connectivity Program were expected in November 2021, but as of September 2022, awards were still being announced on a rolling basis.⁴² Further, because of construction milestones—typically measured in years—communities may have to wait years after an award is announced before they actually receive broadband service. For example, funding recipients under RDOF have eight years to serve all locations (i.e., homes and businesses).⁴³

Factors other than construction and administrative delays can also slow deployment. For example, workforce challenges—such as labor shortages—may contribute to the length of time to construct a network. Stakeholders have differing perspectives on whether broadband workforce shortages will pose a challenge to closing the digital divide. A December 15, 2022, GAO report “found that thousands more skilled workers will be needed to deploy broadband and 5G funded by recent federal programs.... We found mixed evidence on whether there’s a shortage of these workers.”⁴⁴ Congress may consider whether to direct federal agencies to collect additional data on the broadband workforce to help determine whether a workforce shortage exists, and, if so, how that might negatively affect efforts to close the digital divide. Additionally, Congress could consider directing the FCC, NTIA, and the U.S. Department of Agriculture (USDA) to collect information from grant recipients on any difficulties experienced in securing skilled technicians for

³⁹ Jonathan Kim, *Fiber Optic Network Construction: Process and Build Costs*, Dgtl Infra, July 28, 2022, available at <https://dgtlinfra.com/fiber-optic-network-construction-process-costs/>.

⁴⁰ In a reverse auction, the lowest bidder wins.

⁴¹ According to the FCC, “winning bidders must provide in their long-form applications additional information about qualifications, funding, and the network that they intend to use to meet their obligations.” See Federal Communications Commission, *Auction 904: Rural Digital Opportunity Fund*, available at <https://www.fcc.gov/auction/904/factsheet>.

⁴² Government Accountability Office, *Broadband Funding: Stronger Management of Performance and Fraud Risk Needed for Tribal and Public-Private Partnership Grants*, January 24, 2023, available at <https://www.gao.gov/products/gao-23-105426>.

⁴³ Federal Communications Commission, *Auction 904: Rural Digital Opportunity Fund*, available at <https://www.fcc.gov/auction/904/factsheet>.

⁴⁴ Government Accountability Office, *Telecommunications Workforce: Additional Workers Will Be Needed to Deploy Broadband, but Concerns Exist About Availability*, December 15, 2022, available at <https://www.gao.gov/products/gao-23-105626>.

deployment projects as part of reporting requirements.⁴⁵ If Congress determines there is a workforce shortage, potential options to address the issue may include federal funding for training programs to produce more workers with the needed broadband skills or incentivizing companies to provide higher pay to attract the needed workers (for example, prioritizing federal funding applications for companies that meet or exceed a certain pay threshold). Initiatives such as these may take years to develop, which can make it challenging to address workforce shortages in a timely manner (e.g., if it takes time to set up a training program and train a useful number of workers, the shortage may have resolved itself by the time the training is completed).

Broadband providers may continue to face shortages in the supply chain (e.g., fiber optic cable, electronic equipment) which can add time to deployment.⁴⁶ For example, in 2021, AT&T stated that it had planned to build fiber to 3 million homes, but would only actually build to around 2.5 million, mainly due to supply chain issues.⁴⁷ Supply chain issues could delay Vermont’s plan to bring fiber optic service to every home on the electric grid within five years, as wait times for some materials are now one year.⁴⁸ Supply chain issues can be attributed to multiple factors. For example, the COVID-19 pandemic increased demand for broadband with the shift to telework and distance learning activities. At the same time, production was stalled “as factories were forced to limit shifts or close.”⁴⁹ Further, with the influx of federal funding for broadband—particularly in the IJA—many providers are competing for materials at the same time.⁵⁰ Some Members of Congress introduced legislation in the 117th Congress seeking to address supply chain issues. For example, the Network Equipment Transparency Act (S. 3692) would have required the FCC to determine (every two years) whether the lack of network equipment significantly impacted the deployment of broadband. That legislation has been reintroduced as S. 690 in the 118th Congress.

Policy Issues for Congress

In addition to the oversight issues already discussed, Congress may seek to address a number of other topics:

- the adequacy of funding provided to date, and potential needs for additional funds;

⁴⁵ For more information see CRS In Focus IF12111, *Bridging the Digital Divide: Broadband Workforce Considerations for the 118th Congress*, by Colby Leigh Rachfal.

⁴⁶ Cathy Cash, “Down to the Wire: A Perfect Storm of Shortages Threatens to Douse Rural Broadband Progress,” *Rural Electric Magazine*, August 1, 2021, available at <https://www.cooperative.com/remagazine/articles/pages/kinks-in-the-chain-a-perfect-storm-of-shortages-threatens-to-douse-rural-broadband-progress.aspx>.

⁴⁷ Deborah Kish, “The Vicious Cycle of the Supply Chain in Fiber Broadband—Is an End in Sight?,” *Broadband Communities Magazine*, November 2021, available at <https://www.bbcmag.com/community-broadband/the-vicious-cycle-of-the-supply-chain-in-fiber-broadband-is-an-end-in-sight>.

⁴⁸ Fred Thys, “Supply Issues Drive Vermont Broadband Timeline,” *Valley News*, April 24, 2022, available at <https://www.vnews.com/broadband-rollout-may-take-longer-than-helped-46069936>.

⁴⁹ Cathy Cash, “Down to the Wire: A Perfect Storm of Shortages Threatens to Douse Rural Broadband Progress,” *Rural Electric Magazine*, August 1, 2021, available at <https://www.ervative.com/remagazine/articles/pages/kinks-in-the-chain-a-perfect-storm-of-shortages-threatens-to-douse-rural-broadband-progress.aspx>.

⁵⁰ Alex Goldman, *Supply Chain Will Challenge US Fiber, Fixed Wireless Rural Broadband Rollouts*, Fiber Broadband Association, December 10, 2021, available at <https://optics.fiberbroadband.org/Full-Article/supply-chain-will-challenge-us-fiber-fixed-wireless-rural-broadband-rollouts-1>.

- the numerous federal entities and programs involved in the broadband landscape and whether to reduce or combine programs, or move programs under a single federal agency;
- the FCC’s minimum broadband speed benchmark—and determining whether raising the benchmark could create a “new” digital divide, including the dilemma of whether to prioritize federal funding solely for unserved areas; and
- the potential application of rural electrification efforts to rural broadband connectivity and limitations on cooperatives and municipalities.

Each of these issues is discussed in greater detail below.

Potential Funding

Congress has provided billions of dollars to close the digital divide—most recently, the \$65 billion broadband investment in the IJA (P.L. 117-58). However, it remains to be seen whether the funding allocated in the IJA for broadband will close the digital divide. In 2017, the FCC’s Office of Strategic Planning and Policy Analysis estimated that it would cost approximately \$80 billion to connect every U.S. household to fiber—with the cost to connect the last 2% of households (mostly in remote areas) estimated at approximately \$40 billion.⁵¹

Some critics do not believe the \$65 billion allocated by the IJA will be enough to close the digital divide. Estimates vary with respect to how much additional funding would be needed. According to a Tufts University study, “at least \$240 billion is needed to close the digital divide—\$175 billion more than the \$65 billion allocated.”⁵² A study conducted by America’s Communications Association Connects (ACA Connects) estimates that it could take between \$20 billion and \$198 billion to connect all homes and businesses to broadband service—with higher broadband speeds involving higher costs.⁵³ Another study by Vantage Point Solutions (VPS) found the cost could exceed \$400 billion.⁵⁴

An article by Techdirt states, “an analysis of broadband deployment by the [Wall Street] Journal found, unsurprisingly, that funding has been thrown numerous times at the same regions that are still ... somehow waiting for modern-era broadband to arrive.”⁵⁵ Mapping broadband availability may help; however, according to the VPS report, “even if the number of locations that need upgrades to receive broadband were known precisely, it remains a difficult task to determine the cost to construct broadband networks throughout the United States.”⁵⁶ The report further states, “underground fiber construction may cost less than \$20,000 per mile in some areas, but be more

⁵¹ Paul de Sa, *Improving the Nation’s Digital Infrastructure*, Federal Communications Commission, January 17, 2017, p. 2, available at <https://docs.fcc.gov/public/attachments/DOC-343135A1.pdf>.

⁵² Bhaskar Chakravorti, “How to Close the Digital Divide in the U.S.,” *Harvard Business Review*, July 20, 2021, available at <https://hbr.org/2021/07/how-to-close-the-digital-divide-in-the-u-s>.

⁵³ Cartesian, *Addressing Gaps in Broadband Infrastructure Availability and Service Adoption*, June 2021, p. 11, available at <https://acaconnects.org/index.php?checkfileaccess=/wp-content/uploads/2021/06/Addressing-Gaps-in-Broadband-Infrastructure-Availability-and-Service-Adoption-ACA-Connects-and-Cartesian-June2021.pdf>.

⁵⁴ Vantage Point Solutions, *Cost of Bringing Broadband to All*, August 1, 2022, p. 3, available at <https://www.fcc.gov/ecfs/document/108012327916993/2>.

⁵⁵ Karl Bode, “We Just Keep Throwing Billions at Telecom Monopolies in Exchange for Half-Completed, Shitty Broadband Networks,” Techdirt, June 17, 2022, available at <https://www.techdirt.com/2022/06/17/we-just-keep-throwing-billions-at-telecom-monopolies-in-exchange-for-half-completed-shitty-broadband-networks/>.

⁵⁶ Vantage Point Solutions, *Cost of Bringing Broadband to All*, August 1, 2022, p. 7, available at <https://www.fcc.gov/ecfs/document/108012327916993/2>.

than \$300,000 per mile in other areas. Not only do these factors make estimating construction costs in a given region difficult, but they also change over time.”⁵⁷ Determining how much funding might be needed to close the digital divide is a dynamic issue and may be a continuing debate for the 118th Congress.

Federal Agencies and Programs

The primary agencies providing federal support for broadband deployment are the FCC, NTIA, and USDA. Other federal agencies may also provide funding for broadband deployment. For example, the U.S. Department of the Treasury Capital Projects Fund allows the use of its funding for broadband infrastructure projects, among many other eligible uses. The number of federal entities involved in broadband deployment efforts has been an issue of concern among some Members of Congress.⁵⁸ A May 2022 GAO report found that “federal broadband efforts are fragmented and overlapping, with more than 100 programs administered by 15 agencies.”⁵⁹ According to NTIA’s BroadbandUSA federal funding site, 63 of these programs are for broadband deployment purposes.⁶⁰

The number of these programs may make coordinating among agencies challenging. For example, although NTIA, FCC, and USDA have an interagency agreement to coordinate broadband deployment federal funding, there is no coordinated map or effort to track where the funding from all possible agencies and programs is going to build out broadband.⁶¹ This could lead to a potentially unclear picture of where the digital divide is being addressed—and by what federal programs—and where it is not. A result could be duplication of efforts—leaving some areas well served with broadband, while others remain unserved or underserved. Congress might consider requiring broadband service providers to include data on broadband buildout using federal funding as part of FCC reporting requirements for incorporation as a layer into the National Broadband Map. Congress could also require entities to report this information to the FCC for incorporation into the National Broadband Map as part of conditions of accepting a broadband grant.

The telecommunications industry has weighed in on the multitude of programs that fund broadband infrastructure (and other broadband activities). According to a January 6, 2023, industry association response to a December 6, 2022, letter from Senator John Thune,

part of the reason that so many broadband programs exist is precisely because Congress has far too often in the past sought to create new programs from whole cloth rather than examining which programs have worked best in the past and seeking to leverage and build upon those initiatives instead.⁶²

⁵⁷ Ibid., p. 7.

⁵⁸ Template letter from Senator John Thune, December 6, 2022, available at https://www.thune.senate.gov/public/_cache/files/0d7fef2d-7031-4224-be1f-d92ff4bc26a7/5A4B462A12E9BA0612544839342F2BF1.12.6.22-broadband-oversight-letter.pdf.

⁵⁹ Government Accountability Office, *Broadband: National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide*, May 31, 2022, available at <https://www.gao.gov/products/gao-22-104611>.

⁶⁰ National Telecommunications and Information Administration, *Federal Funding*, available at <https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding>.

⁶¹ U.S. Department of Agriculture, *USDA, FCC, and NTIA Announce Interagency Agreement to Coordinate Broadband Funding Deployment*, June 25, 2021, available at <https://www.usda.gov/media/press-releases/2021/06/25/usda-fcc-and-ntia-announce-interagency-agreement-coordinate>.

⁶² Shirley Bloomfield, *Letter to Senator John Thune*, NTCA—The Rural Broadband Association, June 6, 2023, available at <https://www.ntca.org/sites/default/files/documents/2023-01/ThuneReply.pdf>.

A consideration for Congress might be whether to assess the success of federal broadband programs—for example, maintaining programs that have been successful and potentially eliminating or consolidating programs that have been less successful. One approach could be to establish criteria for program success, e.g., a minimum percentage of unserved locations a program must connect to broadband service to be considered successful. Another option could be combining existing programs that may fund similar purposes. This idea had been proposed in the 117th Congress for two programs at the USDA—the Broadband Internet Connections for Rural America Act (H.R. 4374) and the Broadband for Rural America Act (H.R. 3369). Both bills would have combined the ReConnect Program and the Rural Broadband Access Program into one program called the ReConnect Rural Broadband Program. Consolidating programs across agencies may also present challenges. According to a May 2022 GAO report,

Programmatic differences, whether from changes over time or the development of new programs, have limited agencies' ability to align programs to address broadband needs in a complementary way, according to agency officials. Programs have their own definitions, eligibility criteria, and other requirements—which may be established in statute or through agency administrative processes.⁶³

Further, the report states that, “The federal government has used a variety of mechanisms for coordination, but no current national strategy exists to provide clear roles, goals, objectives, and accountability to agencies or synchronize the numerous interagency coordination efforts.”⁶⁴ To reduce the number of federal agencies involved, Congress may weigh whether all programs that provide funding for broadband could be consolidated under a single federal agency—for example the FCC, NTIA, or USDA. This would potentially eliminate the need for federal agency coordination and reduce the possibility of duplicative efforts. Consolidating broadband efforts under a single agency might also provide an avenue for a single national strategy in closing the digital divide. On the other hand, consolidation could be challenging because different agencies have different missions and priorities and may fall under different authorizing committees and appropriations subcommittees.

A potential counterpoint to consolidation is that a single agency may not have the staff or resources to handle the already-existing large number of broadband initiatives and Congress may need to provide the selected agency with additional appropriations for this purpose. This also may require Congress to make legislative changes to aid in aligning broadband efforts under a single agency, for example, codifying a single definition for “rural” or “unserved” for usage across all programs. This could also aid in the creation of a common application process for entities applying to broadband programs, which may streamline the application process across programs and encourage more entities to apply for funding. According to GAO,

We’ve also noticed that many potential recipients of broadband funding in underserved areas struggle to identify which of the many federal programs meets their needs, and have difficulty navigating the programs’ complex application processes. These issues may all be hampering the federal government’s ability to increase broadband access in these areas.⁶⁵

Congress could also choose to leave federal broadband programs in place within their current agencies.

⁶³ Government Accountability Office, *National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide*, May 2022, p. 21, available at <https://www.gao.gov/assets/gao-22-104611.pdf>.

⁶⁴ *Ibid.*, p. 31.

⁶⁵ Government Accountability Office, *Closing the Digital Divide for the Millions of Americans Without Broadband*, February 1, 2023, available at <https://www.gao.gov/blog/closing-digital-divide-millions-americans-without-broadband>.

FCC Minimum Broadband Speed Benchmark and Prioritization of Unserved Versus Served Areas

Section 706(a) of the Telecommunications Act of 1996 (P.L. 104-104) directs the FCC to determine whether broadband is deployed to all Americans on a reasonable and timely basis. As part of this effort, the FCC sets a minimum broadband speed benchmark to define what it considers broadband service. In 2015, the FCC set that benchmark speed to 25 Mbps/3 Mbps, which remains in place today.

The definition of what constitutes broadband service can have implications for federal policies targeted toward closing the digital divide. For example, on July 15, 2022, Chairwoman Rosenworcel proposed increasing the minimum broadband benchmark speed to 100 Mbps/20 Mbps.⁶⁶ According to the FCC's Fourteenth Broadband Deployment Report, approximately 14.5 million Americans do not have access to broadband at speeds of 25/3 Mbps—meaning these areas are considered as unserved.⁶⁷ If the FCC were to raise the broadband speed benchmark, any areas that have 25/3 Mbps, but are not served with the new minimum speed benchmark, would be considered unserved with broadband. This could exacerbate the digital divide, as federal funds intended to provide service to areas without 25/3 Mbps service might be redirected to upgrade speeds in areas that already have 25/3 Mbps service but do not meet the new faster benchmark. On the other hand, raising the FCC's minimum speed benchmark might make it more likely that the FCC would find that broadband deployment is not occurring in a reasonable and timely fashion. This could cause the FCC to take further action in the form of new broadband programs or initiatives to speed deployment, or regulatory action—such as streamlining infrastructure deployment rules.⁶⁸

In many cases, federal broadband programs outside the FCC have set other speed thresholds for networks built using federal funds. For example, while the Treasury Department uses a 100/100 Mbps standard for capital projects funded through the American Rescue Plan Act of 2021 (P.L. 117-2),⁶⁹ the NTIA's BEAD program requires grant recipients to build to a minimum of 100/20 Mbps.⁷⁰ Different agencies setting varying speed thresholds may cause inconsistencies in closing the digital divide. Congress might consider specifying a single benchmark as the standard for all federal agencies administering broadband programs, or directing all agencies to use the FCC benchmark.

Some policymakers believe that those who currently lack broadband entirely should be prioritized to prevent duplication in areas that already have some level of broadband access. For example, on February 4, 2022, some Members of Congress wrote to NTIA, urging the agency to prioritize

⁶⁶ Federal Communications Commission, *Chairwoman Rosenworcel Proposes to Increase Minimum Broadband Speeds*, July 15, 2022, available at <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-increase-minimum-broadband-speeds>.

⁶⁷ Federal Communications Commission, *Fourteenth Broadband Deployment Report*, January 19, 2021, p. 2, available at <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/fourteenth-broadband-deployment-report>.

⁶⁸ For more information see CRS In Focus IF11875, *Raising the Minimum Fixed Broadband Speed Benchmark: Background and Selected Issues*, by Colby Leigh Rachfal.

⁶⁹ U.S. Department of Treasury, *Guidance for the Coronavirus Capital Projects Fund for States, Territories & Freely Associated States*, September 2021, p. 3, available at <https://home.treasury.gov/system/files/136/Capital-Projects-Fund-Guidance-States-Territories-and-Freely-Associated-States.pdf>.

⁷⁰ National Telecommunications and Information Administration, *Broadband Equity, Access, and Deployment Program*, Notice of Funding Opportunity, pp. 64-65, available at <https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf>.

projects targeted at unserved areas.⁷¹ In response to the proposed RDOF, in 2019, the Pennsylvania Public Utility Commission urged the FCC to prioritize unserved areas.⁷² A provision to connect areas unserved by broadband was proposed in the 117th Congress in the Connect Unserved Americans Act of 2022 (S. 3587/H.R. 7060). Among other things, the bill would have increased the percentage (from 50% to 80%) of rural households that a project must serve to receive a grant or loan through the Rural Utilities Service’s Distance Learning, Telemedicine, and Broadband program.

Congress may weigh which aspect/definition of the digital divide it wishes to prioritize—whether to prioritize funding for areas without 25/3 Mbps broadband ahead of funding upgrades of existing 25/3 Mbps networks to faster speeds. Congress may also take population density and number of connections into account—for example, should Congress prioritize federal funds that might connect thousands of households in an area versus hundreds of households in an area.

Applying Tools from Rural Electrification and Limitations on Cooperatives and Municipalities

How to connect rural areas to services has faced the United States in the past in the context of electricity. According to the USDA, “in 1936, nearly 90% of farms lacked electric power because the costs to get electricity to rural areas were prohibitive.”⁷³ Similar to broadband deployment, “running wires into the countryside where there might be only a few people per square mile seemed uneconomical for either investors or taxpayers.”⁷⁴ In response, the Rural Electrification Act of 1936 (REA; P.L. 74-605) was enacted, which allowed the federal government to make low-cost loans to non-profit cooperatives.⁷⁵ The REA helped bring electricity to rural areas, as by 1950, nearly 80% of U.S. farms had electric service.⁷⁶

Some policymakers have drawn parallels between rural electrification and rural broadband deployment, arguing “that something similar [to rural electrification] needs to happen to create widespread changes to the issue of rural internet availability.”⁷⁷ For example, according to a 2018 statement by FCC Chairwoman (then Commissioner) Rosenworcel, “We were able to get

⁷¹ Letter from Senators Steve Daines, Charles E. Grassley, Thom Tillis, John Barrasso, Marco Rubio, Mike Braun, James Lankford, Cynthia M. Lummis, James E. Risch, Lindsey O. Graham, Tommy Tuberville, John Kennedy, Mike Crapo, Ted Cruz, John Boozman, Richard Burr, John Cornyn, James M. Inhofe, and Roger Marshall to Assistant Secretary Alan Davidson, February 4, 2022, available at https://www.grassley.senate.gov/imo/media/doc/grassley_et_al.tontibroadbandfunding.pdf.

⁷² Pennsylvania Business Report, *PUC Urges Federal Communications Commission to Prioritize Unserved Areas in Broadband Access Expansion Efforts*, October 16, 2019, available at <https://pennbizreport.com/news/14442-puc-urges-federal-communications-commission-to-prioritize-unserved-areas-in-broadband-access-expansion-efforts/>.

⁷³ Brandon McBride, *Celebrating the 80th Anniversary of the Rural Electrification Administration*, U.S. Department of Agriculture, February 21, 2017, available at <https://www.usda.gov/media/blog/2016/05/20/celebrating-80th-anniversary-rural-electrification-administration>.

⁷⁴ Harold D. Wallace Jr., *Power from the People: Rural Electrification Brought More Than Lights*, National Museum of American History, February 12, 2016, available at <https://americanhistory.si.edu/blog/rural-electrification>.

⁷⁵ National Park Service, *Rural Electrification Act*, August 8, 2021, available at <https://www.nps.gov/home/learn/historyculture/ruralelect.htm>.

⁷⁶ Brandon McBride, *Celebrating the 80th Anniversary of the Rural Electrification Administration*, U.S. Department of Agriculture, February 21, 2017, available at <https://www.usda.gov/media/blog/2016/05/20/celebrating-80th-anniversary-rural-electrification-administration>.

⁷⁷ Sky Lebron, “Rural Broadband Remains Scarce Across North Central Florida. Here’s What That Means for People Without It,” WUFT, January 5, 2022, available at <https://www.wuft.org/news/2022/01/05/rural-broadband-remains-scarce-across-north-central-florida-heres-what-that-means-for-people-without-it/>.

electrification to happen in rural, hard-to-reach parts of this nation ... we need to be able to do the same with broadband.”⁷⁸ A July 2021 White House fact sheet stated, “broadband internet is the new electricity. It is necessary for Americans to do their jobs, to accelerate precision agriculture, to participate equally in school learning and health care, and to stay connected.”⁷⁹

Cooperatives⁸⁰ played the main role in rural electrification. Similar to broadband, “power companies thought rural America too spacious and sparsely populated to provide the necessary returns on investment.”⁸¹ Similarly, “there has been a growing trend among electric cooperatives, which electrified these same rural parts of the country in the 1930s and 1940s, to do it again for broadband.”⁸² According to Pew Charitable Trusts, “A key challenge for electric cooperatives seeking to provide broadband services is securing funding or financing for deployment. Because they do not have as much capital as traditional internet service providers, cooperatives often turn to state and federal programs for additional funding for these projects.”⁸³

Cooperatives may have difficulties in accessing federal funding for broadband. According to NTIA’s BroadbandUSA federal funding site, out of over 90 programs, cooperatives may potentially be eligible for 15 funding opportunities. Among these is the USDA’s ReConnect program, which offers loans, grants, and loan-grant combinations for broadband deployment in rural areas.⁸⁴ A consideration for Congress may be whether to expand eligibility criteria for cooperatives for other federal broadband programs or whether to create a new broadband program that prioritizes cooperatives as eligible recipients.

Municipal broadband is another avenue Congress could potentially look to in filling rural broadband gaps. Some public entities, such as municipal governments, have stepped in to provide broadband services to areas unserved by private sector providers. A patchwork of state laws on municipal broadband exist, with 28 states allowing municipalities to deploy broadband and 22 states either explicitly prohibiting it or having regulations that could make establishing municipal broadband networks challenging. As one of many various options, Congress could weigh granting the FCC explicit authority to preempt state laws to remove potential barriers to municipal

⁷⁸ Marguerite Reardon, “FCC Leaders Say We Need a ‘National Mission’ to Fix Rural Broadband,” CNET, October 24, 2018, available at <https://www.cnet.com/tech/services-and-software/fcc-leaders-say-we-need-a-national-mission-to-fix-rural-broadband/>.

⁷⁹ The White House, *FACT SHEET: Bipartisan Infrastructure Framework Creates Economic Opportunities for Rural America*, July 8, 2021, available at <https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/08/fact-sheet-bipartisan-infrastructure-framework-creates-economic-opportunities-for-rural-america/>.

⁸⁰ According to The Pew Charitable Trusts, “Electrical cooperatives are private, nonprofit organizations that provide electricity to customers in their service areas. They are customer-owned and operate on a cost-of-service basis, returning extra profits as dividends to members or to be invested in infrastructure.” See Lily Gong and Anna Read, *States Considering Range of Options to Bring Broadband to Rural America*, The Pew Charitable Trusts, March 29, 2022, available at <https://www.pewtrusts.org/en/research-and-analysis/articles/2022/03/29/states-considering-range-of-options-to-bring-broadband-to-rural-america>.

⁸¹ Christopher Ali, *The Legacy of the Rural Electrification Act and the Promise of Rural Broadband*, LPE Project, July 12, 2021, available at <https://lpeproject.org/blog/the-legacy-of-the-rural-electrification-act-and-the-promise-of-rural-broadband/>.

⁸² Marguerite Reardon, “Electric Cooperatives Could Be the Key to Solving the Rural Digital Divide,” CNET, February 9, 2020, available at <https://www.cnet.com/tech/mobile/electric-cooperatives-could-be-the-key-to-solving-the-rural-digital-divide/>.

⁸³ Lily Gong and Anna Read, *States Considering Range of Options to Bring Broadband to Rural America*, The Pew Charitable Trusts, March 29, 2022, available at <https://www.pewtrusts.org/en/research-and-analysis/articles/2022/03/29/states-considering-range-of-options-to-bring-broadband-to-rural-america>.

⁸⁴ U.S. Department of Agriculture, *Program Overview*, available at <https://www.usda.gov/reconnect/program-overview>.

broadband investment in unserved areas.⁸⁵ Additionally, legislation has been introduced in the 118th Congress (H.R. 2252) that would amend the Telecommunications Act of 1996 (P.L. 104-104) to allow State and local governments, public-private partnerships, and cooperatives to provide broadband services.

Arguments can be made both for and against broadband provided by cooperatives (and municipal networks, discussed further below). According to an analyst at the Rockefeller Institute of Government of the State University of New York:

Though municipal broadband and cooperatives have been growing in popularity, they have also been a topic of heated debate. Proponents argue that these models are more democratically accountable and will lead to increased competition as well as higher-quality, more affordable, and wider-reaching service than that provided by their private-sector counterparts. Conversely, detractors say these models may not be financially sustainable and could potentially crowd out private investment. Additionally, some argue that lack of expertise makes governments ill-suited to take on the tasks of operating and maintaining commercial broadband networks and that failure comes at the expense of taxpayers.⁸⁶

Both federal and state efforts have tried to replicate aspects of—or expand on—the REA for rural broadband efforts. For example, the New Deal Rural Broadband Act of 2017 (H.R. 800, 115th Congress) would have amended the REA to establish a rural broadband office within the USDA and also authorize new grants and loans for developing broadband in rural, underserved, and tribal areas. On the state level, in 2021, the Vermont legislature passed H. 360, which has been referred to as Vermont’s “rural electrification project” for broadband.⁸⁷ H. 360 focuses on “bringing regional, community-minded solutions to address a problem where the marketplace has failed” and “requiring connectivity solutions to serve all, not just the most profitable neighborhoods.”⁸⁸ This effort includes Vermont’s communications union districts—“a type of municipality where multiple towns could partner together to develop coordinated, regional solutions for broadband connectivity.”⁸⁹

Concluding Observations

The primary means the United States has for encouraging broadband deployment by broadband service providers is subsidizing them to serve areas that they would otherwise find uneconomical to serve. Funding is a key factor in the digital divide and debates continue about how much funding would potentially help close it. In addition, providing additional funding on top of what has already been allocated may not alone close the divide, as it encompasses additional complex

⁸⁵ For more information see CRS Report R47225, *Expanding Broadband: Potential Role of Municipal Networks to Address the Digital Divide*, by Colby Leigh Rachfal.

⁸⁶ By Kevin Schwartzbach, *Should States Fund Municipal Broadband and Cooperatives?*, Rockefeller Institute of Government, March 24, 2022, available at <https://rockinst.org/blog/should-states-fund-municipal-broadband-and-cooperatives/>.

⁸⁷ Tim Briglin and Laura Sibilia, *Briglin & Sibilia: Vermont’s Rural Electrification Project for Broadband*, VTDigger, April 4, 2021, available at <https://vtdigger.org/2021/04/04/briglin-sibilia-vermonts-rural-electrification-project-for-broadband/>.

⁸⁸ *Ibid.*

⁸⁹ *Ibid.*

policy issues. In this regard, Congress may investigate whether existing regulatory policies are helping or hindering broadband deployment in unserved areas.⁹⁰

In addition to funding, Congress may weigh other proposals intended to address the persistence of the digital divide, such as whether to reduce or combine any of the multitude of federal entities and programs involved in the broadband landscape, or to move programs under a single federal entity. Additionally, Congress could examine whether prioritizing federal funding solely for areas completely unserved with broadband might close the existing gap more quickly than devoting some funds to upgrades in areas that already have some service. Congress also may examine whether raising the FCC's minimum broadband speed benchmark could exacerbate the existing digital divide by increasing the number of households that are considered unserved. Congress could also consider whether the application of some aspects of past rural electrification efforts, such as encouraging deployment cooperatives or municipalities in rural areas, could be applicable to rural broadband connectivity.

If the 118th Congress chooses to consider solutions to the persistence of the digital divide, it has a variety of potential options to weigh. Examples of proposals related to broadband deployment in legislation currently before Congress include

- prioritizing the processing of applications for certain rural broadband expansion projects that are located in areas with the shortest construction seasons;
- amending the Internal Revenue Code of 1986 to exclude certain broadband grants from gross income; and
- amending the REA (P.L. 74-605) to provide requirements on the use of assistance for broadband deployment.

The **Appendix** contains a summary of legislation introduced in the 118th Congress.

⁹⁰ U.S. House of Representatives, 118th Congress, *Authorization and Oversight Plan of the Committee on Energy and Commerce*, February 2023, p. 11, available at https://d1dth6e84htgma.cloudfront.net/E_and_C_Authorization_and_Oversight_Plan_118_FINAL_e858cde3ea.pdf.

Appendix. Legislation in the 118th Congress

At the time of publication, 16 bills have been introduced in the 118th Congress that relate to the deployment of broadband in some capacity, with 10 originating in the House and 6 in the Senate.⁹¹

Introduced in the House

H.R. 43. As introduced on January 9, 2023, the Rural Broadband Window of Opportunity Act would require the Federal Communications Commission to prioritize the processing of applications for certain rural broadband expansion projects that are located in areas with the shortest construction seasons (e.g., areas with long winters and heavy snowfall). Referred to the House Energy and Commerce Committee.

H.R. 827. As introduced on February 2, 2023, the Home Internet Accessibility Act, among other things, would require the Comptroller General to submit to Congress a report on the capacity of federally assisted housing to support broadband service.

H.R. 889. As introduced on February 9, 2023, the Broadband Grant Tax Treatment Act would amend the Internal Revenue Code of 1986 to exclude certain broadband grants from gross income. Referred to the House Ways and Means Committee. Companion bill to S. 341.

H.R. 922. As introduced on February 9, 2023, the RURAL Broadband Act of 2023, among other things, would amend the Rural Electrification Act of 1936 to provide requirements on the use of assistance for broadband deployment. Referred to the House Agriculture Committee and the House Energy and Commerce Committee.

H.R. 1178. As introduced on February 24, 2023, the Broadband Stock Acquisition in Local Exchanges Act, among other things, would allow an investment tax credit for 30% of expenditures to purchase, maintain, or improve property to provide voice telephone service or broadband internet access in rural empowerment zones.

H.R. 1241. As introduced on February 28, 2023, the Broadband Incentives for Communities Act would establish a competitive grant program at the National Telecommunications and Information Administration to assist local governments in providing efficient review and approval of zoning and permitting applications that facilitate the deployment of broadband infrastructure. Referred to the House Energy and Commerce Committee.

H.R. 1752. As introduced on March 23, 2023, the E-BRIDGE Act would amend the Public Works and Economic Development Act of 1965 to provide for a high-speed broadband deployment initiative.

H.R. 1812. As introduced on March 27, 2023, the Reforming Broadband Connectivity Act of 2023, among other things, would require the Federal Communications Commission to complete a rulemaking to reform the contribution system of the Universal Service Fund, including by expanding the contribution base of the Universal Service Fund. Companion bill to S. 975.

H.R. 2285. As introduced on March 29, 2023, the bill would provide for a limitation on availability of funds for U.S. Department of Agriculture, Rural Utilities Service, Distance Learning, Telemedicine, and Broadband Program for fiscal year 2024.

⁹¹ On April 13, 2023, CRS conducted a search of legislation in the Congress.gov database to identify legislation introduced in the 118th Congress that relates to deployment of broadband. CRS used search term “broadband,” selected the 118th Congress (2023-2024), and selected bills (H.R. or S.).

H.R. 2252. As introduced on April 10, 2023, the bill would amend the Telecommunications Act of 1996 to preserve and protect the ability of state and local governments, public-private partnerships, and cooperatives to provide broadband services.

Introduced in the Senate

S. 275. As introduced on February 7, 2023, the Rural Broadband Protection Act of 2023 would require the Federal Communications Commission to establish a process to vet applicants seeking funding under the high-cost universal service programs. Applicants would be required to provide a proposal for deploying a broadband network, containing enough detail and documentation for the Federal Communications Commission to ascertain whether the applicant has the technical capabilities to deploy the proposed network and deliver services. Referred to the Senate Commerce, Science, and Transportation Committee.

S. 341. As introduced on February 9, 2023, the Broadband Grant Tax Treatment Act would amend the Internal Revenue Code of 1986 to exclude certain broadband grants from gross income. Referred to the Senate Finance Committee. Companion bill to H.R. 889.

S. 690. As introduced on March 7, 2023, the Network Equipment Transparency Act would require the Federal Communications Commission to determine (subject to available data) whether the lack of network equipment significantly impacted the deployment of broadband and other advanced telecommunications capability. The bill would also require the FCC to include this determination in its biennial report on the state of the communications marketplace.

S. 856. As introduced on March 16, 2023, the Funding Affordable Internet with Reliable Contributions Act would require the Federal Communications Commission to study and report on the feasibility of funding the Universal Service Fund through contributions from edge providers (i.e., providers of online content or services, such as search engines).

S. 975. As introduced on March 27, 2023, the Reforming Broadband Connectivity Act of 2023, among other things, would require the Federal Communications Commission to complete a rulemaking to reform the contribution system of the Universal Service Fund, including by expanding the contribution base of the Universal Service Fund. Companion bill to H.R. 1812.

S. 1162. As introduced on March 30, 2023, the bill would ensure that broadband maps are accurate before funds are allocated under the Broadband Equity, Access, and Deployment Program based on those maps.

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