Congressional Research Service
Informing the legislative debate since 1914

Broadband Internet Access and the Digital Divide: Federal Assistance Programs

name redacted
Specialist in Science and Technology Policy

name redacted
Specialist in Telecommunications Policy

July 25, 2017

Congressional Research Service
7-....
www.crs.gov
RL30719

CRS REPORT
Prepared for Members and
Committees of Congress

Summary

The "digital divide" is a term that has been used to characterize a gap between "information haves and have-nots," or in other words, between those Americans who use or have access to telecommunications and information technologies and those who do not. One important subset of the digital divide debate concerns high-speed Internet access and advanced telecommunications services, also known as broadband. Broadband is provided by a series of technologies (e.g., cable, telephone wire, fiber, satellite, mobile and fixed wireless) that give users the ability to send and receive data at volumes and speeds necessary to support a number of applications including entertainment, telemedicine, distance education, telework, ecommerce, public safety, and energy conservation.

Broadband technologies are currently being deployed primarily by the private sector throughout the United States. While the numbers of new broadband subscribers continue to grow, studies and data suggest that the rate of broadband deployment in urban/suburban and high-income areas is outpacing deployment in rural and low-income areas. Some policymakers, believing that disparities in broadband access across American society could have adverse economic and social consequences on those left behind, assert that the federal government should play a more active role to avoid a "digital divide" in broadband access.

With the conclusion of the grant and loan awards established by the American Recovery and Reinvestment Act of 2009 (P.L. 111-5), there remain two ongoing federal vehicles which direct federal money to fund broadband infrastructure: the broadband and telecommunications programs at the Rural Utilities Service (RUS) of the U.S. Department of Agriculture and the Universal Service Fund (USF) programs under the Federal Communications Commission (FCC). The USF High Cost Fund is undergoing a major transition to the Connect America Fund, which is targeted to the deployment, adoption, and utilization of both fixed and mobile broadband. Similarly, the USF Lifeline Program is transitioning from one that traditionally subsidized voice telephone service to now support mobile and fixed broadband Internet access services on a stand-alone basis, or with a bundled voice service. Additionally, subsidies provided by USF's Schools and Libraries Program and Rural Health Care Program are used for a variety of telecommunications services, including broadband access.

To the extent that Congress may consider various options for further encouraging broadband deployment and adoption, a key issue is how to strike a balance between providing federal assistance for unserved and underserved areas where the private sector may not be providing acceptable levels of broadband service, while at the same time minimizing any deleterious effects that government intervention in the marketplace may have on competition and private sector investment.

Contents

Tables

Appendixes

Contacts

Introduction

The "digital divide" is a term used to describe a perceived gap between "information haves and have-nots," or in other words, between those Americans who use or have access to telecommunications and information technologies and those who do not.[1] Whether or not individuals or communities fall into the "information haves" category depends on a number of factors, ranging from the presence of computers in the home, to training and education, to the availability of affordable Internet access.

Broadband technologies are currently being deployed primarily by the private sector throughout the United States. While the numbers of new broadband subscribers continue to grow, studies and data suggest that the rate of broadband deployment in urban/suburban and high-income areas is outpacing deployment in rural and low-income areas.

Status of Broadband in the United States

Prior to the late 1990s, American homes accessed the Internet at maximum speeds of 56 kilobits per second by dialing up an Internet Service Provider (such as AOL) over the same copper telephone line used for traditional voice service. A relatively small number of businesses and institutions used broadband or high-speed connections through the installation of special "dedicated lines" typically provided by their local telephone company. Starting in the late 1990s, cable television companies began offering cable modem broadband service to homes and businesses. This was accompanied by telephone companies beginning to offer DSL service (broadband over existing copper telephone wireline). Growth in broadband service has been steep, rising from 2.8 million high-speed lines reported as of December 1999, to 369 million connections as of June 30, 2016.[2] Of the 355 million high-speed connections reported by the FCC, 316 million serve residential users.[3]

Table 1 depicts the relative deployment of different types of broadband technologies. A distinction is often made between "current generation" and "next generation" broadband (commonly referred to as next generation networks or NGN). "Current generation" typically refers to initially deployed cable, DSL, and many wireless systems, while "next generation" refers to dramatically faster download and upload speeds offered by fiber technologies and also by successive generations of cable, DSL, and wireless technologies. In general, the greater the download and upload speeds offered by a broadband connection, the more sophisticated (and potentially valuable) the application that is enabled.

[1] The term "digital divide" can also refer to international disparities in access to communications and information technology. This report focuses on domestic issues only.

[2] FCC, *Internet Access Services: Status as of June 30, 2016*, released April 2017, p. 16, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db1130/DOC-342358A1.pdf.

[3] Ibid, p. 17.

Table 1. Percentage of Broadband Technologies by Types of Connection

	Connections over 200 kbps in at least one direction	Residential connections over 200 kbps in at least one direction	Fixed Connections at least 10 Mbps downstream and 1 Mbps upstream	Residential fixed connections at least 10 Mbps downstream and 1 Mbps upstream	Fixed Connections at least 25 Mbps downstream and 3 Mbps upstream	Residential fixed connections at least 25 Mbps downstream and 3 Mbps upstream
Cable modem	16.6%	18.1%	72%	72.5%	82.8%	83.5%
DSL	7.4%	7.7%	12.9%	12.7%	2.1%	2.1%
Mobile wireless	71.8%	70%	—	—	—	—
Fiber	3.0%	3.2%	12.6%	12.3%	14.6%	14.2%
All other	1.1%	0.9%	2.5%	2.4%	0.4%	0.2%

Source: FCC, *Internet Access Services: Status as of June 30, 2016*, pp. 16-22.

Broadband Availability

The FCC is required by Section 706 of the Telecommunications Act of 1996 (P.L. 104-104) to periodically assess whether broadband is being deployed in a reasonable and timely fashion. Measurements of broadband availability depend on how broadband service is defined in terms of what download and upload speeds it offers. As broadband technology—and the applications that depend on that technology—become more mature and sophisticated, the FCC has raised its broadband speed benchmark. In 2015 the FCC, citing changing broadband usage patterns and multiple devices using broadband within single households, raised its minimum broadband benchmark speed from 4 megabits per second (download)/1 Mbps (upload) to 25 Mbps/3 Mbps. Critics have asserted that the FCC excessively raised broadband benchmark speeds to produce a negative finding and to justify the FCC's pursuit of policies addressing such regulatory issues as Universal Service Fund reform and net neutrality.[4]

The FCC's *2016 Broadband Progress Report*, adopted on January 28, 2016, contains broadband availability data for fixed broadband (e.g., wireline technologies such as cable modem or fiber optic). According to the *2016 Broadband Progress Report*, as of December 31, 2014, approximately 10% of Americans (34 million) lack access to fixed 25 Mbps/3 Mbps broadband. Additionally, 6% of Americans lack access at 10 Mbps/1 Mbps, and 5% lack access at 4 Mbps/1 Mbps.[5] **Table 2** shows the percentage of Americans lacking access at 25 Mbps/3Mbps over the past three years. The FCC has not yet set a mobile speed benchmark, so deployment of mobile broadband is not reflected in these data.

[4] For more information on net neutrality, see: CRS Report R40616, *The Net Neutrality Debate: Access to Broadband Networks*, by (name redacted) .

[5] Federal Communications Commission, *2016 Broadband Progress Report*, FCC 16-6, released January 29, 2016, p. 33, available at https://www.fcc.gov/document/fcc-releases-2016-broadband-progress-report.

Table 2. Percentage of Americans Lacking Access to Fixed Broadband

(at 25 Mbps download/3 Mbps upload)

	2014	2013	2012
United States	10%	17%	20%
Rural Areas	39%	53%	55%
Urban Areas	4%	8%	11%
Tribal Lands	41%	63%	68%
Rural Areas	68%	85%	89%
Urban Areas	14%	41%	47%
U.S. Territories	66%	63%	100%

Source: FCC, *2016 Broadband Progress Report*, p. 39.

Table 3 shows the percentage of Americans without access to fixed broadband by state and U.S. territory.

Table 3. Americans Without Access to Fixed Broadband by State and U.S. Territory

(access to speeds of at least 25 Mbps download/3 Mbps upload)

	% of population without access, all areas	% of population without access, urban areas	% of population without access, rural areas
United States	**10%**	**4%**	**39%**
Alabama	20	6	41
Alaska	26	5	67
Arizona	13	8	63
Arkansas	25	7	48
California	5	2	61
Colorado	10	4	53
Connecticut	1	1	1
Delaware	3	2	10
District of Columbia	2	2	—
Florida	7	4	29
Georgia	9	4	25
Hawaii	2	0	22
Idaho	18	4	55
Illinois	9	4	56
Indiana	17	5	52
Iowa	15	4	37
Kansas	15	5	49
Kentucky	16	3	34

	% of population without access, all areas	% of population without access, urban areas	% of population without access, rural areas
Louisiana	19	8	50
Maine	12	4	17
Maryland	4	3	13
Massachusetts	3	2	10
Michigan	12	3	37
Minnesota	12	1	43
Mississippi	34	9	60
Missouri	20	5	61
Montana	31	9	61
Nebraska	16	6	51
Nevada	8	5	65
New Hampshire	7	3	15
New Jersey	3	2	21
New Mexico	20	9	61
New York	2	0	17
North Carolina	7	1	20
North Dakota	14	2	37
Ohio	8	2	31
Oklahoma	27	9	61
Oregon	10	5	37
Pennsylvania	6	3	20
Rhode Island	2	2	2
South Carolina	18	8	38
South Dakota	11	2	26
Tennessee	13	2	34
Texas	11	5	46
Utah	6	3	39
Vermont	17	2	27
Virginia	11	3	38
Washington	3	1	14
West Virginia	30	10	48
Wisconsin	13	1	43
Wyoming	23	3	63
U.S. Territories	**66**	**54**	**98**
American Samoa	100	100	100
Guam	99	99	100

	% of population without access, all areas	% of population without access, urban areas	% of population without access, rural areas
Northern Marianas	100	100	100
Puerto Rico	62	50	98
U.S. Virgin Islands	100	100	100

Source: FCC, *2016 Broadband Progress Report*, Appendix D. pp. 66-67.

Another important broadband availability issue is the number of providers available. Typically, more available providers lead to greater competition and more consumer choice. **Table 4** indicates the percentage of Americans with fixed broadband available from more than one provider.

Table 4. Estimated Percentage of Americans with Multiple Options for Fixed Broadband

	No Provider	One Provider	More than One Provider
United States	10%	51%	38%
Rural Areas	39%	48%	13%
Urban Areas	4%	52%	44%

Source: FCC, *2016 Broadband Progress Report*, p. 48.

Broadband Adoption

In contrast to broadband *availability*, which refers to whether or not broadband service is offered, broadband *adoption* refers to the extent to which American households actually subscribe to and use broadband. According to Census data released by the Department of Commerce, *Computer and Internet Use in the United States: 2013*, 73.4% of American households have a paid broadband subscription.[6] Census data from July 2015 show that 68% of Americans use the Internet at home.[7] The Census data also show that Americans increasingly are connecting to the Internet through other devices in addition to desktop computers: 52% of Americans used two or more devices to connect, including tablets, laptops, mobile phones, and TV connected boxes (gaming consoles and streaming video players).[8]

The FCC's *2016 Broadband Progress Report* found that 73% of households have a subscription to fixed broadband service of at least 200 kbps in at least one direction. For the benchmark speed of 25 Mbps/3 Mbps, the FCC reported an overall adoption rate of 37%.[9] Adoption rates are lower

[6] Thom File and Camille Ryan, U.S. Census Bureau, Economics and Statistics Administration, Department of Commerce, Computer and Internet use in the United States: 2013, American Community Survey Reports, November 2014, p. 3, available at https://www.census.gov/library/publications/2014/acs/acs-28.html.

[7] For other metrics, see NTIA's Digital Nation Data Explorer tool at https://www.ntia.doc.gov/data/digital-nation-data-explorer#sel=internetUser&disp=map.

[8] Guila McHenry, NTIA, "Majority of Americans Use Multiple Internet-Connected Devices, Data Shows," December 7, 2015, available at https://www.ntia.doc.gov/blog/2015/majority-americans-use-multiple-internet-connected-devices-data-shows.

[9] *2016 Broadband Progress Report*, pp. 45-46.

in counties with the lowest median household income, in areas outside of urban areas, on tribal lands, and in U.S. territories.[10]

The Pew Research Center's *Home Broadband 2015* found that 67% of Americans had broadband at home in 2015, down from 70% in 2013.[11] According to Pew, the modest decline in broadband adoption is accompanied by an increase in smartphone adoption, including 13% of adults who rely on their smartphone for online access at home.[12] Pew also found that cost (monthly subscription costs and/or cost of a computer) is the major reason why people do not subscribe to broadband,[13] and that disparities in broadband adoption persist among demographic groups such as people with low incomes, seniors, minorities, and the less-educated (see **Table 5**).

Table 5. Broadband Adoption

(percentage of U.S. adults who are home broadband users)

	2016
All	73%
White	78%
African American	65%
Hispanic	58%
18-29	77%
30-49	81%
50-64	75%
65+	51%
Less than $30K	53%
$30K-$50K	71%
$50K-$75K	83%
$75K-$100K	90%
$100K-$150K	94%
Less than high school	34%
High school diploma	62%
Some college	80%
College degree +	91%
Rural	63%
Urban	73%
Suburban	76%

Source: Pew Research Center, *Digital Divides—Feeding America*, February 9, 2017, available at http://www.pewinternet.org/2017/02/09/digital-divides-feeding-america/.

[10] Ibid, pp. 46-47.

[11] John B. Horrigan and Maeve Duggan, Pew Research Center, *Home Broadband 2015*, December 21, 2015, p. 8, available at http://www.pewinternet.org/files/2015/12/Broadband-adoption-full.pdf.

[12] Ibid, p. 9.

[13] Ibid, p. 15.

Finally, GAO released a report in June 2015 (*Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear*) which found that affordability, lack of perceived relevance, and lack of computer skills are the principal barriers to broadband adoption.[14] GAO examined adoption efforts by NTIA and the FCC, and identified three key approaches used to address broadband adoption barriers: discounts on computer equipment and broadband subscriptions; outreach efforts to promote broadband availability and benefits; and training to help people develop skills in using computers and broadband.[15]

Broadband in Rural Areas[16]

While the number of new broadband subscribers continues to grow, the rate of broadband deployment in urban areas appears to be outpacing deployment in rural areas. While there are many examples of rural communities with state of the art telecommunications facilities,[17] recent surveys and studies have indicated that, in general, rural areas tend to lag behind urban and suburban areas in broadband deployment.

For example:

- According to the FCC's *2016 Broadband Progress Report*, there is a "significant disparity between rural and urban areas, with more than 39% of Americans living in rural areas lacking access to 25 Mbps/3 Mbps advanced telecommunications capability, as compared to 4% of Americans living in urban areas."[18]
- According to 2016 survey data from the Pew Research Center, 63% of adults in rural areas said they have a high-speed broadband connection at home, as opposed to 73% of adults in urban areas and 76% of adults in suburban areas.[19]
- The National Telecommunications and Information Administration (NTIA) Computer and Internet Use Supplement to the Census Bureau's Current Population Survey found that a rural/urban gap remained in 2015, with 69% of rural residents reporting using the Internet, versus 75% of urban residents. According to NTIA, the data "indicates a fairly constant 6-9 percentage point gap between rural and urban communities' internet use over time."[20]

[14] Government Accountability Office, *Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear*, GAO-15-473, June 2, 2015, p. 11, available at http://www.gao.gov/assets/680/670588.pdf.

[15] Ibid, p. 17.

[16] For more information on rural broadband and broadband programs at the Rural Utilities Service, see CRS Report RL33816, *Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, by (name redacted) .

[17] See for example: National Exchange Carrier Association (NECA), *Trends: A Report on Rural Telecom Technology*, December 2015, available at https://www.neca.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=12331&libID=12351.

[18] *2016 Broadband Progress Report*, pp. 33-34.

[19] Pew Research Center, *Digital Gap Between Rural and Nonrural America Persists*, May 19, 2017, available at http://www.pewresearch.org/fact-tank/2017/05/19/digital-gap-between-rural-and-nonrural-america-persists/.

[20] U.S. Department of Commerce, National Telecommunications and Information Administration, "The State of the Urban/Rural Digital Divide," August 10, 2016, available at https://www.ntia.doc.gov/blog/2016/state-urbanrural-digital-divide.

The comparatively lower population density of rural areas is likely the major reason why broadband is less deployed than in more highly populated suburban and urban areas. Particularly for wireline broadband technologies—such as cable modem and fiber—the greater the geographical distances among customers, the larger the cost to serve those customers. Thus, there is often less incentive for companies to invest in broadband in rural areas than, for example, in an urban area where there is more demand (more customers with perhaps higher incomes) and less cost to wire the market area.

The terrain of rural areas can also be a hindrance, in that it is more expensive, for example, to deploy broadband technologies in a mountainous or heavily forested area. An additional added cost factor for remote areas can be the expense of "backhaul" (e.g., the "middle mile"), which refers to the installation of a dedicated line which transmits a signal to and from an Internet backbone, which is typically located in or near an urban area.

Some policymakers believe that disparities in broadband access across American society could have adverse consequences on those left behind, and that advanced telecommunications applications critical for businesses and consumers to engage in ecommerce are increasingly dependent on high-speed broadband connections to the Internet. Thus, some say, communities and individuals without access to broadband could be at risk to the extent that connectivity becomes a critical factor in determining future economic development and prosperity. A February 2006 study done by the Massachusetts Institute of Technology for the Economic Development Administration of the Department of Commerce marked the first attempt to quantitatively measure the impact of broadband on economic growth. The study found that "between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in employment, the number of businesses overall, and businesses in IT-intensive sectors, relative to comparable communities without broadband at that time."[21]

Subsequently, other studies have attempted to assess the economic impact of broadband deployment. For example:

- A June 2007 report from the Brookings Institution found that for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2% to 0.3% per year. For the entire U.S. private nonfarm economy, the study projected an increase of about 300,000 jobs.[22]
- A July 2009 study commissioned by the Internet Innovation Alliance found net consumer benefits of home broadband on the order of $32 billion per year, up from an estimated $20 billion in consumer benefits from home broadband in 2005.[23]

[21] Gillett, Sharon E., Massachusetts Institute of Technology, *Measuring Broadband's Economic Impact*, report prepared for the Economic Development Administration, U.S. Department of Commerce, February 28, 2006, p. 4, available at http://cfp.mit.edu/publications/CFP_Papers/Measuring_bb_econ_impact-final.pdf.

[22] Crandall, Robert, William Lehr, and Robert Litan, *The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data*, June 2007, 20 pp., available at https://www.brookings.edu/research/the-effects-of-broadband-deployment-on-output-and-employment-a-cross-sectional-analysis-of-u-s-data/.

[23] Mark Dutz, Jonathan Orszag, and Robert Willig, *The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households*, Internet Innovation Alliance, July 2009, p. 4, available at http://internetinnovation.org/files/special-reports/CONSUMER_BENEFITS_OF_BROADBAND.pdf.

- A January 2009 study conducted by the Information Technology and Innovation Foundation (ITIF) shows that investing an additional $10 billion in one year on broadband networks will create or retain 498,000 U.S. jobs for that year.[24]
- A study (first published in 2013)[25] funded by the national Agricultural and Rural Development Policy Center found that nonmetro counties that had high levels of broadband adoption (greater than 60%) in 2010 had significantly higher growth in median household income—23.4% versus just over 22%—between 2001 and 2010 when compared to counties that had similar characteristics in the 1990s but were not as successful at adopting broadband.
- A 2016 study from the Hudson Institute found that rural broadband providers directly and indirectly added $24.1 billion to the U.S. economy in 2015. The rural broadband industry supported 69,595 jobs in 2015, both through its own employment and the employment that its purchases of goods and services generated.[26]

Broadband and the Federal Role

Section 706 of the Telecommunications Act of 1996

The Telecommunications Act of 1996 (P.L. 104-104) addressed, among other issues, the issue of whether the federal government should intervene to prevent a "digital divide" in broadband access. Section 706 requires the FCC to determine whether "advanced telecommunications capability [i.e., broadband or high-speed access] is being deployed to all Americans in a reasonable and timely fashion."

Since 1999, the FCC has adopted and released 10 reports pursuant to Section 706. The first five reports formally concluded that the deployment of advanced telecommunications capability to all Americans is reasonable and timely. Unlike the first five 706 reports, the sixth, seventh, eighth, tenth, and eleventh reports concluded that broadband is not being deployed to all Americans in a reasonable and timely fashion.[27]

A key factor in determining whether broadband is being deployed in a reasonable and timely fashion is how broadband service is defined with respect to download and upload speeds. In 2015 the FCC, in its tenth 706 report, raised the broadband threshold speed from 4 Mbps/1 Mbps to 25 Mbps/3 Mbps. This benchmark speed upgrade was controversial. The FCC argued that 25 Mbps/3

[24] Robert D. Atkinson, Daniel Castro and Stephen Ezell, Information Technology and Innovation Foundation, *The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America*, January 2009, 22 p, available at https://www.itif.org/files/roadtorecovery.pdf.

[25] Brian Whitacre, Roberto Gallardo, and Sharon Strover, "Broadband's Contribution to Economic Health in Rural Areas," *Research & Policy Brief Series*, Community and Regional Development Institute, Cornell University, February 2015, available at https://cardi.cals.cornell.edu/sites/cardi.cals.cornell.edu/files/shared/documents/ResearchPolicyBriefs/Policy-Brief-Feb15-draft03.pdf.

[26] Hanns Kuttner, Hudson Institute, *The Economic Impact of Rural Broadband*, April 2016, available at https://s3.amazonaws.com/media.hudson.org/files/publications/20160419KuttnerTheEconomicImpactofRuralBroadband.pdf.

[27] An archive of notices of inquiry and released broadband progress reports are available at https://www.fcc.gov/general/archive-released-broadband-progress-notices-inquiry. The ninth notice of inquiry was concluded without releasing a report.

Mbps is reflective of advanced telecommunications capability, while many providers asserted that the new benchmark is too high, excessive, or aspirational.[28]

The FCC's *2016 Broadband Progress Report* was adopted on January 28, 2016. According to the report:

> We find that advanced telecommunications capability is not being deployed to all Americans in a reasonable and timely fashion.... [W]hile our efforts have helped increase deployment, many Americans still lack access to advanced telecommunications capability, especially in rural areas and on Tribal lands. The disparity between advanced telecommunications capabilities available to rural and urban Americans persists. We also find that many schools, particularly those in rural areas, continue to lack access to advanced telecommunications capabilities, necessary to meet the shorter and long term goals we established for the E-rate program (more formally known as the Schools and Libraries universal service support program).... We find today that the availability of advanced telecommunications capability requires access to both fixed and mobile services.[29]

FCC Commissioner Michael O'Reilly issued a dissenting statement, maintaining that there is insufficient justification for the conclusion that broadband is not being deployed in a reasonable and timely fashion. According to the dissent, the data show "steady progress in connecting unserved Americans," with "the number of unserved Americans [dropping] from approximately 55 million (17 percent of the population) to approximately 34 million Americans (10 percent of the population) in just one year."[30] Then-Commissioner Ajit Pai concurred with the FCC's report, but argued the finding that broadband is not being deployed to all Americans in a reasonable and timely fashion is an indication that "this Administration's policies to encourage and accelerate broadband deployment over the last seven years just haven't worked."[31]

The National Broadband Plan

As mandated by the American Recovery and Reinvestment Act of 2009 (ARRA), on March 16, 2010, the FCC released its report, *Connecting America: The National Broadband Plan*.[32] The National Broadband Plan (NBP) sought to "create a high-performance America," which the FCC defined as "a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications."[33] In order to achieve this mission, the NBP recommended that the country set six goals for 2020:

- Goal No. 1: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.
- Goal No. 2: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

[28] See Federal Communications Commission, *2015 Broadband Progress Report*, FCC 15-10, February 4, 2015, pp. 29-34.

[29] *2016 Broadband Progress Report*, pp. 2-3.

[30] Ibid., p. 85.

[31] Ibid., p. 81.

[32] Available at http://www.broadband.gov/plan/. For more information on the National Broadband Plan, see CRS Report R41324, *The National Broadband Plan*, by (name redacted) et al., available by request to CRS.

[33] Federal Communications Commission, Connecting America: *The National Broadband Plan*, March 17, 2010, p. 9.

- Goal No. 3: Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
- Goal No. 4: Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
- Goal No. 5: To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
- Goal No. 6: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

The National Broadband Plan was categorized into three parts:

- **Part I (Innovation and Investment)**, which "discusses recommendations to maximize innovation, investment and consumer welfare, primarily through competition. It then recommends more efficient allocation and management of assets government controls or influences."[34] The recommendations address a number of issues, including spectrum policy, improved broadband data collection, broadband performance standards and disclosure, special access rates, interconnection, privacy and cybersecurity, child online safety, poles and rights-of-way, research and experimentation (R&E) tax credits, and R&D funding.
- **Part II (Inclusion)**, which "makes recommendations to promote inclusion—to ensure that all Americans have access to the opportunities broadband can provide."[35] Issues include reforming the Universal Service Fund, intercarrier compensation, federal assistance for broadband in tribal lands, expanding existing broadband grant and loan programs at the Rural Utilities Service, enabling greater broadband connectivity in anchor institutions, and improved broadband adoption and utilization especially among disadvantaged and vulnerable populations.
- **Part III (National Purposes)**, which "makes recommendations to maximize the use of broadband to address national priorities. This includes reforming laws, policies and incentives to maximize the benefits of broadband in areas where government plays a significant role."[36] National purposes include health care, education, energy and the environment, government performance, civic engagement, and public safety. Issues include telehealth and health IT, online learning and modernizing educational broadband infrastructure, digital literacy and job training, smart grid and smart buildings, federal support for broadband in small businesses, telework within the federal government, cybersecurity and protection of critical broadband infrastructure, copyright of public digital media, interoperable public safety communications, next generation 911 networks, and emergency alert systems.

The release of the National Broadband Plan was seen by many as a precursor toward the development of a national broadband policy—whether comprehensive or piecemeal—that will

[34] Ibid, p. 11.

[35] Ibid.

[36] Ibid.

likely be shaped and developed by Congress, the FCC, and the Administration.[37] Congress will likely play a major role in implementing the National Broadband Plan, both by considering legislation to implement NBP recommendations, and by overseeing broadband activities conducted by the FCC and executive branch agencies.

Federal Broadband Programs

With the conclusion of grant and loan awards established by the American Recovery and Reinvestment Act of 2009 (P.L. 111-5),[38] there remain two ongoing major federal vehicles which direct federal money to fund broadband: the Universal Service Fund (USF) programs under the Federal Communications Commission (FCC), and the broadband and telecommunications programs at the Rural Utilities Service (RUS) of the U.S. Department of Agriculture.

In June 2017, the National Telecommunications and Information Administration released an updated comprehensive *Guide to Federal Funding of Broadband Projects*.[39] The guide provides a summary and contact information for a variety of federal programs that may fund projects involving broadband infrastructure, adoption, access, planning, or research. The guide is available at https://www2.ntia.doc.gov/files/ntia_guidetofedfunding_062317.pdf.

The Universal Service Concept and the FCC[40]

Since its creation in 1934 the Federal Communications Commission (FCC) has been tasked with "mak[ing] available, so far as possible, to all the people of the United States ... a rapid, efficient, Nation-wide, and world-wide wire and radio communications service with adequate facilities at reasonable charges."[41] This mandate led to the development of what has come to be known as the universal service concept.

The universal service concept, as originally designed, called for the establishment of policies to ensure that telecommunications services are available to all Americans, including those in rural, insular, and high cost areas, by ensuring that rates remain affordable. Over the years this concept has evolved and expanded, fostering the development of various FCC policies and programs that target both providers of and subscribers to telecommunications and, more recently, broadband services. Passage of the Telecommunications Act of 1996 (P.L. 104-104) codified the long-standing commitment by U.S. policymakers to ensure universal service in the provision of telecommunications services, and the FCC established, in 1997, a federal Universal Service Fund (USF) to meet the expanded objectives and principles contained in the act. The USF is administered by the Universal Service Administrative Company (USAC), an independent not-for-profit organization, under the direction of the FCC. The USF is being transformed in stages, over a multiyear period, from a mechanism to support voice telecommunications services to one that

[37] See for example, Office of Science and Technology Policy and National Economic Council, The White House, *Four Years of Broadband Growth*, June 2013, available at https://obamawhitehouse.archives.gov/sites/default/files/broadband_report_final.pdf.

[38] See CRS Report R40436, *Broadband Infrastructure Programs in the American Recovery and Reinvestment Act*, by (name redacted) .

[39] U.S. Department of Commerce, National Telecommunications and Information Administration, *BroadbandUSA: Guide to Federal Funding of Broadband Projects*, June 2017, 44 pp.

[40] The section on universal service was prepared by Angele Gilroy, Specialist in Telecommunications, Resources, Science and Industry Division.

[41] Communications Act of 1934, As Amended, Title I §1 (47 U.S.C. 151).

supports the deployment, adoption, and utilization of both fixed and mobile broadband. The USF currently administers four programs: the High Cost/Connect America Fund Program, the Schools and Libraries Program, the Rural Health Care Program, and the Low Income Program. The USF disbursed $8.8 billion in 2016 with all 50 states, the District of Columbia, and all territories receiving some benefit.[42]

Universal Service and Broadband

One of the major policy debates surrounding universal service in the last decade was whether access to advanced telecommunications services (i.e., broadband) should be incorporated into universal service objectives. The 1996 Telecommunications Act tasked the federal-state Joint Board with defining the services which should be included in the definition of services to be eligible for universal service support. The Joint Board's recommendation, which was adopted by the FCC in May 1997, largely limited the definition to voice telecommunications services. Some policymakers expressed concern that the FCC-adopted definition was too limited and did not take into account the importance and growing acceptance of advanced services such as broadband and Internet access. They pointed to a number of provisions contained in the universal service principles of the 1996 act to support their claim. Universal service principles contained in Section 254(b)(2) state that "Access to advanced telecommunications services should be provided to all regions of the Nation." The subsequent principle (b)(3) calls for consumers in all regions of the nation, including "low-income" and those in "rural, insular, and high cost areas," to have access to telecommunications and information services including "advanced services" at a comparable level and a comparable rate charged for similar services in urban areas. Such provisions, they state, dictate that the FCC expand its universal service definition.

The 1996 act does take into consideration the changing nature of the telecommunications sector and allows, if future conditions warrant, for the modification of the universal service definition. Section 254(c) of the act states that "universal service is an evolving level of telecommunications services" and that the FCC is tasked with "periodically" reevaluating this definition "taking into account advances in telecommunications and information technologies and services." Furthermore, the Joint Board is given specific authority to recommend "from time to time" to the FCC modification in the definition of the services to be included for federal universal service support. The Joint Board, on November 19, 2007, concluded such an inquiry and recommended that the FCC change the mix of services eligible for universal support. The Joint Board recommended, among other things, that "the universal availability of broadband Internet services" be included in the nation's communications goals and hence be supported by federal universal service funds.[43]

This debate was put to rest when provisions contained in the American Recovery and Reinvestment Act of 2009 (ARRA) called for the FCC to develop, and submit to Congress, a national broadband plan to ensure that every American has "access to broadband capability."[44] The FCC in its national broadband plan*, Connecting America: the National Broadband Plan*,

[42] *2016 Annual Report, Universal Service Administrative Company*, p. 62. Total funding approved for disbursement for the months of January-December 2016, available at http://www.usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-interactive-2016.pdf.

[43] The Joint Board recommended that the definition of those services that qualify for universal service support be expanded and that the nation's communications goals include the universal availability of: mobility services (i.e., wireless); broadband Internet services; and voice services at affordable and comparable rates for all rural and nonrural areas. For a copy of this recommendation see http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07j-4A1.pdf.

[44] American Recovery and Reinvestment Act of 2009, P.L. 111-5, Section 6001 (k)(2)(D).

recommended that access to and adoption of broadband be a national goal. Furthermore the national broadband plan proposed that the Universal Service Fund be restructured to become a vehicle to help reach this goal. The FCC, in an October 2011 decision, adopted an Order that calls for the USF to be transformed, in stages, over a multiyear period, from a mechanism to support voice telephone service to one that supports the deployment, adoption, and utilization of both fixed and mobile broadband. This transformation includes the phaseout of the USF's legacy High Cost Program and the creation of a new fund, the Connect America Fund, to replace it as well as an expansion and modification of the Schools and Libraries, Rural Health Care, and Low Income programs.[45]

The High Cost/Connect America Fund Program

Historically the High Cost Program provided support for eligible telecommunications carriers to help offset the higher-than-average costs of providing voice telephone service in rural, insular, or other high cost areas. This mechanism has been the largest USF program based on disbursements and has been particularly important to rural areas due to the lack of subscriber density often combined with higher costs. The High Cost Program is undergoing a transition from one that primarily supports voice communications to one that supports a broadband platform that enables multiple applications, including voice. The High Cost program is being phased out in stages and is being replaced by the Connect America Fund (CAF), which will support the provision of affordable voice and broadband services, both fixed and mobile, in high cost areas. The CAF will eventually replace all of the existing support mechanisms in the High Cost Program and contains a Mobility Fund and a Remote Areas Fund to meet these needs. According to data released by program administrators, from 1998 to 2016 a total of approximately $68.7 billion in funding has been approved for disbursement.[46]

The Schools and Libraries, and Rural Health Care Programs

Congress, through the 1996 act, not only codified, but also expanded the concept of universal service to include, among other principles, that elementary and secondary schools and classrooms, libraries, and rural health care providers have access to telecommunications services for specific purposes at discounted rates. (See §§254(b)(6) and 254(h) of the 1996 Telecommunications Act, 47 U.S.C. 254.)

1. The Schools and Libraries (E-Rate) Program. Under universal service provisions contained in the 1996 act, elementary and secondary schools and classrooms and libraries are designated as beneficiaries of universal service discounts. Universal service principles detailed in Section 254(b)(6) state that "Elementary and secondary schools and classrooms ... and libraries should have access to advanced telecommunications services." The act further requires in Section 254(h)(1)(B) that services within the definition of universal service be provided to elementary and secondary schools and libraries for education purposes at discounts, that is at "rates less than the amounts charged for similar services to other parties."

[45] For a detailed discussion of this Order and USF transition see *In the Matter of the Connect America Fund, et. al.*, WC Docket No. 10-90 et. al., Report and Order and Further Notice of Proposed Rulemaking, FCC 11-161, adopted October 27, 2011, and released November 18, 2011, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-161A1.pdf.

[46] For additional information and data on this program see *2016 Annual Report, Universal Service Administrative Company*, p. 54, available at http://www.usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-interactive-2016.pdf.

The FCC established the Schools and Libraries Division within USAC to administer the schools and libraries or "E (education)-rate" program to comply with these provisions. Under this program, eligible schools and libraries receive discounts ranging from 20% to 90% for telecommunications services depending on the poverty level of the school's (or school district's) population and its location in a high cost (i.e., rural) telecommunications area. Two categories of services are eligible for discounts: category one services (telecommunications, telecommunications services, and Internet access), and category two services that deliver Internet access within schools and libraries (internal connections, basic maintenance of internal connections, and managed internal broadband services). The funding cap for funding year 2017 (July 1, 2017 to June 30, 2018) is $3.99 billion. According to data released by program administrators, from 1998 to 2016 a total of approximately $44.4 billion in funding has been approved for disbursement.[47]

2. The Rural Health Care Program. Section 254(h) of the 1996 act requires that public and nonprofit rural health care providers have access to telecommunications services necessary for the provision of health care services at rates comparable to those paid for similar services in urban areas. Subsection 254(h)(1) further specifies that "to the extent technically feasible and economically reasonable" health care providers should have access to advanced telecommunications and information services. The FCC established the Rural Health Care Division (RHCD) within USAC to administer the universal support program to comply with these provisions. The Rural Health Care Program provides funding through three programs: the Telecommunications Program, the Healthcare Connect Fund, and the rural Health Care Pilot Program. The goal of these programs is to improve the quality of health care for those living in rural areas by ensuring access to broadband and telecommunications services. Under FCC established rules only public or nonprofit health care providers are eligible to receive funding.

The Telecommunications Program, established in 1997, provides discounts for telecommunications services to ensure that eligible rural health care providers pay no more than urban providers for telecommunications services. The primary use of the funding is to provide reduced rates for telecommunications and information services necessary for the provision of health care.[48]

The Rural Health Care Pilot Program was established in 2006, to help public and nonprofit health care providers build state and region-wide broadband networks dedicated to the provision of health care services. The program provides funding up to 85% of eligible costs. No new funding is available under this program and current participants that need additional support will transfer to the most recently created program, the Healthcare Connect Fund.

The FCC in December 2012 created the Healthcare Connect Fund,[49] a program to expand health care provider access to broadband, particularly in rural areas, and replace the Rural Health Care Pilot Program with a permanent program. The Healthcare Connect Fund program supports high-capacity broadband connectivity and encourages the development of state and regional networks. This program provides a 65% discount on eligible expenses related to broadband connectivity and

[47] For additional information and data on this program see *2016 Annual Report, Universal Service Administrative Company*, p. 60, available at http://www.usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-interactive-2016.pdf.

[48] For additional information on this program see the RHCD website: http://www.universalservice.org/rhc/.

[49] Title II (the Rural Healthcare Connectivity Act of 2016) of P.L. 114-182 includes skilled nursing facilities to the list of health care providers eligible to receive RHC program support. This change became effective June 21, 2017.

is available to individual rural health care providers and consortia. Consortia can include nonrural providers but at least 50% of providers must be located in a rural area.

The total annual funding cap for all of the above mentioned USF rural health care programs is $400 million.[50] According to data released by program administrators, from 1998 to 2016 a total of approximately $1.9 billion in funding has been approved for disbursement.[51]

The Low Income Program

As initially designed the Low Income Program provided a discount for voice telephony service for eligible low-income consumers. The major program has two subprograms, Lifeline and Link Up,[52] with the Lifeline Program providing the vast majority of support. In March 2016 the FCC adopted an Order to expand the Lifeline Program to support mobile and fixed broadband Internet access services on a stand-alone basis, or with a bundled voice service.[53] Households must meet a needs-based criteria for eligibility. The Lifeline Program provides assistance to only one line per eligible household either wired or wireless, in the form of a monthly subsidy of, in most cases, $9.25.[54] Support is not given directly to the subscriber but to the designated service provider. According to data released by program administrators, from 1998 to 2016 a total of approximately $20.2 billion in funding has been approved for disbursement.[55]

Rural Utilities Service Programs

RUS implements three programs specifically targeted at providing assistance for broadband infrastructure deployment in rural areas: the Rural Broadband Access Loan and Loan Guarantee Program (also referred to as the Farm Bill Broadband Loans), the Telecommunications Infrastructure Loans and Loan Guarantees (previously the rural telephone loan program dating back to 1949), and the Community Connect Grant Program.[56] The 113th Congress reauthorized and reformed the Rural Broadband Access Loan and Loan Guarantee program as part of the 2014 farm bill (P.L. 113-79 Agricultural Act of 2014). Additionally, RUS houses the Distance Learning and Telemedicine Grant Program, which supports broadband-based applications.

[50] For more details on the USF rural health care support mechanism and the Healthcare Connect Fund see *In the Matter of Rural Health Care Support Mechanism*, WC Docket No. 02-60, Federal Communications Commission, adopted December 12, 2012, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-150A1.pdf.

[51] For additional information and data on this program see *2016 Annual Report, Universal Service Administrative Company*, p. 58, available at http://www.usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-interactive-2016.pdf.

[52] The Link Up program assists eligible low-income subscribers to pay the costs associated with the initiation of service and is no longer available except for on Tribal Lands.

[53] For additional information on the Lifeline Program see CRS Report R44487, *Federal Lifeline Program: Frequently Asked Questions*, by (name redacted) .

[54] Tribal Lands Lifeline provides an additional discount of up to $25 for eligible low-income consumers living on Tribal Lands for a total discount of up to $34.25.

[55] For additional information and data on this program see *2016 Annual Report, Universal Service Administrative Company*, p. 56, available at http://www.usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-interactive-2016.pdf.

[56] For more information on these programs, see CRS Report RL33816, *Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, by (name redacted) .

P.L. 111-5: The American Recovery and Reinvestment Act of 2009

On February 17, 2009, President Obama signed P.L. 111-5, the American Recovery and Reinvestment Act (ARRA). Broadband provisions of the ARRA provided a total of $7.2 billion, for broadband grants, loans, and loan/grant combinations. The total consisted of $4.7 billion to NTIA/DOC for a newly established Broadband Technology Opportunities Program (grants) and $2.5 billion to the RUS/USDA Broadband Initiatives Program (grants, loans, and grant/loan combinations).

Regarding the $2.5 billion to RUS/USDA broadband programs, the ARRA specified that at least 75% of the area to be served by a project receiving funds shall be in a rural area without sufficient access to high-speed broadband service to facilitate economic development, as determined by the Secretary of Agriculture. Priority was given to projects that provide service to the most rural residents that do not have access to broadband services. Priority was also given to borrowers and former borrowers of rural telephone loans.

Of the $4.7 billion appropriated to NTIA:

- $4.35 billion was directed to a competitive broadband grant program, of which not less than $200 million shall be available for competitive grants for expanding public computer center capacity (including at community colleges and public libraries); not less than $250 million to encourage sustainable adoption of broadband service; and $10 million transferred to the Department of Commerce Office of Inspector General for audits and oversight; and
- $350 million was directed for funding the Broadband Data Improvement Act (P.L. 110-385) and for the purpose of developing and maintaining a broadband inventory map, which shall be made accessible to the public no later than two years after enactment. Funds deemed necessary and appropriate by the Secretary of Commerce may be transferred to the FCC for the purposes of developing a national broadband plan, which shall be completed one year after enactment.

Final BTOP and BIP program awards were announced by September 30, 2010. With a few exceptions, all ARRA broadband projects were concluded as of September 30, 2015. For more information on implementation of the broadband provisions of the ARRA, see CRS Report R40436, *Broadband Infrastructure Programs in the American Recovery and Reinvestment Act*, by (name redacted) . For information on the distribution and oversight of ARRA broadband grants and loans, see CRS Report R41775, *Background and Issues for Congressional Oversight of ARRA Broadband Awards*, by (name redacted) .

Infrastructure Initiative and Broadband

On June 21, 2017, President Trump announced that the Administration's $1 trillion infrastructure proposal will "promote and foster enhanced broadband access for rural America."[57] To date, no details on the Administration's infrastructure package have been released. Meanwhile, Democrats in Congress have released infrastructure proposals that include broadband.[58]

[57] The White House, "Remarks by President Trump on Agricultural Innovation," Cedar Rapids, IA, June 21, 2017, available at https://www.whitehouse.gov/the-press-office/2017/06/22/remarks-president-trump-agricultural-innovation-cedar-rapids-ia.

[58] See for example: the Lift America Act which would provide $40 billion over five years to deploy broadband (https://democrats-energycommerce.house.gov/newsroom/press-releases/ec-democrats-unveil-comprehensive-(continued...)

On July 19, 2017, the President released an Executive Order establishing a Presidential Advisory Council on Infrastructure.[59] The 15-member council, drawn from different sectors including communications and technology, will make findings and recommendations to the President regarding federal funding, support, and delivery of infrastructure projects in a number of sectors, including broadband. The council will terminate on December 31, 2018, unless extended by the President.

Other Federal Programs and Initiatives

Broadband Development Advisory Committee

Aside from funding, another way the federal government can facilitate broadband deployment is by taking steps to lower or remove regulatory barriers to broadband deployment facing private sector providers. On January 31, 2017, FCC Chairman Ajit Pai announced the formation of a new federal advisory committee, the Broadband Deployment Advisory Committee (BDAC), which will provide advice and recommendations for the FCC on how to accelerate the deployment of broadband by reducing and/or removing regulatory barriers to infrastructure investment.[60] The BDAC is composed of stakeholders, appointed by the FCC chairman, representing industry, states, localities, tribes, academia, and others. Five working groups have been formed; these are: Model Code for Municipalities, Model Code for States, Competitive Access to Broadband Infrastructure, Removing State and Local Regulatory Barriers, and Streamlining Federal Siting.[61]

The FCC has also initiated proceedings addressing the issue of reducing regulatory barriers for the deployment of wireless and wireline broadband:

- On April 20, 2017, the FCC adopted a Notice of Proposed Rulemaking and Notice of Inquiry to identify and address unnecessary regulatory barriers to wireless infrastructure deployment. The proceeding will examine how state and local processes affect the speed and cost of infrastructure deployment, and asked for comment on improving state and local infrastructure reviews, and whether siting applications that are not acted on by state or local governments within a reasonable period of time should be "deemed granted" by FCC rules.[62]
- Also on April 20, 2017, the FCC adopted a Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment on ways to accelerate next-generation networks by removing regulatory barriers to wireline broadband infrastructure development. The NPRM sought comment on pole attachment

(...continued)

infrastructure-package); and the 21st Century New Deal for Jobs Act, which would provide $100 billion for broadband over ten years (https://cpc-grijalva.house.gov/21st-century-new-deal-for-jobs/).

[59] The White House, Office of the Press Secretary, "Presidential Executive Order Establishing a Presidential Advisory Council on Infrastructure," July 19, 2017, available at https://www.whitehouse.gov/the-press-office/2017/07/19/presidential-executive-order-establishing-presidential-advisory-council.

[60] See https://www.fcc.gov/broadband-deployment-advisory-committee.

[61] FCC, *Public Notice*, "FCC Announced Membership and First Meeting of the Broadband Development Advisory Committee," GN Docket No. 17-83, April 6, 2017, available at https://apps.fcc.gov/edocs_public/attachmatch/DA-17-328A1.pdf.

[62] FCC, *Notice of Proposed Rulemaking and Notice of Inquiry*, "In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment," WT Docket No. 17-79, FCC 17-38, adopted April 20, 2017, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-17-38A1.pdf.

reforms, expediting copper network retirement, using the FCC's preemption authority to prospectively prohibit the enforcement of state and local laws that pose barriers to broadband deployment, and input on when carriers must obtain FCC permission to alter or discontinue a service.[63]

Broadband Opportunity Council

On March 23, 2015, President Obama signed a Presidential Memorandum, "Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training."[64] The memorandum established an interagency Broadband Opportunity Council (BOC) chaired by the Department of Commerce (DOC) and the USDA, and consisting of 25 other member agencies. The council's objectives were to engage with industry and other stakeholders to understand ways the government can better support the needs of communities seeking to expand broadband access and adoption; identify regulatory barriers unduly impeding broadband deployment, adoption, or competition; survey and report back on existing programs that currently support or could be modified to support broadband competition, deployment, or adoption; and take all necessary actions to remove these barriers and realign existing programs to increase broadband competition, deployment, and adoption. On April 29, 2015, DOC and USDA put out a notice and request for public comment in the *Federal Register*.[65]

On September 21, 2015, the Obama Administration released the *Broadband Opportunity Council Report and Recommendations*.[66] In its report, the Council issued nine recommendations encompassing 36 immediate actions that federal agencies committed to undertake. The Council recommendations emphasized actions that federal agencies can take under existing authority, and without additional appropriated funding. This encompasses such measures as making broadband projects eligible for funding from other existing federal grant and loan programs; modifying agency rules and regulations in order to maximize broadband-related uses of federal assets such as highways and federal lands; upgrading public dissemination of broadband information, data, and best practices; and researching new broadband technologies and applications.

In January 2017, NTIA released the *Broadband Opportunity Council Agency's Progress Report*. According to NTIA, 15 of the 36 original agency action items were deemed completed, with the rest in progress.[67] NTIA is maintaining a points-of-contact list of Broadband Interagency Working Group (BIWG) Members to answer questions about their respective agencies' participation in the

[63] FCC, *Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment*, "In the Matter of Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment," WC Docket No. 17-84, FCC 17-37, adopted April 20, 2017, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-17-37A1.pdf.

[64] Available at https://www.whitehouse.gov/the-press-office/2015/03/23/presidential-memorandum-expanding-broadband-deployment-and-adoption-addr.

[65] Department of Commerce and Department of Agriculture, "Broadband Opportunity Council Notice and Request for Comment," *Federal Register*, Vol. 80, No. 82, April 29, 2015, pp. 23785-23787, available at http://www.ntia.doc.gov/files/ntia/publications/fr_boc_notice_and_rfc_4-29-15.pdf.

[66] Department of Commerce and Department of Agriculture, *Broadband Opportunity Council Report and Recommendations*, August 20, 2015, available at https://www.ntia.doc.gov/files/ntia/publications/broadband_opportunity_council_report_final.pdf. For a summary of the BOC report, see CRS Insight IN10367, *Broadband Opportunity Council Report and Recommendations*, by (name redacted), available by request to CRS.

[67] Department of Commerce and Department of Agriculture, *Broadband Opportunity Council Agency's Progress Report*, January 2017, p. 8, available at https://www.ntia.doc.gov/files/ntia/publications/broadband_opportunity_council_agencies_progress_report_jan2017.pdf.

BIWG and the status of their activities in meeting the Broadband Opportunity Council recommendations and action items.[68]

BroadbandUSA

BroadbandUSA is housed at the Department of Commerce's National Telecommunications and Information Administration (NTIA). Using the expertise gained during administration of the ARRA Broadband Technology Opportunities Program (BTOP), BroadbandUSA program offers one-to-one technical assistance to communities seeking to plan and implement broadband initiatives. BroadbandUSA will leverage knowledge of federal funding and its network of contacts to help communities identify and leverage funding opportunities; provide support to communities seeking public-private partnerships; review, analyze, and provide recommendations and guidance associated with community-level reports, studies, and procurements; and provide background information and training to organizations that need assistance navigating the broadband landscape.[69] BroadbandUSA also organizes regional events and workshops bringing together broadband stakeholders and publishes guides and tools[70] that can serve as resources for communities seeking to launch broadband initiatives.

Appalachian Regional Commission

Section 1436 of the Fixing America's Surface Transportation Act (FAST Act, P.L. 114-94) authorized a high-speed broadband deployment initiative for the 13-state Appalachian region consisting of $10 million in available broadband grants annually through FY2020. In August 2016, ARC published a *Broadband Planning Primer and Toolkit*.[71]

HUD ConnectHome

On July 15, 2015, the White House announced a new Department of Housing and Urban Development (HUD) initiative with communities called ConnectHome. An initial pilot program was launched in 27 cities and one tribal nation where regional and local partnerships will be built whereby Internet Service Providers, nonprofits, and the private sector will offer broadband access, technical training, digital literacy, programs, and devices for residents in assisted housing units.[72]

Additionally, as part of ConnectHome, HUD is pursuing regulatory changes and modifications that promote broadband availability and adoption in public and assisted housing, including beginning a rulemaking process that requires HUD-funded new residential construction and substantial rehabilitation projects to support broadband Internet connectivity.[73] On May 18, 2016, HUD published in the *Federal Register* a proposed rule entitled, "Narrowing the Digital Divide Through Installation of Broadband Infrastructure in HUD-Funded New Construction and

[68] NTIA, *Broadband Interagency Working Group (BIWG) Members*, May 2017, available at https://www.ntia.doc.gov/files/ntia/publications/biwg_public_pocs_05_04_2017.pdf.

[69] For more information on the types of technical assistance BroadbandUSA offers, see http://www2.ntia.doc.gov/technical_assistance.

[70] See http://www2.ntia.doc.gov/publications.

[71] Available at https://www.arc.gov/images/programs/telecom/ARCBroadbandPlanningPrimerToolkit.pdf.

[72] The White House, *Fact Sheet*, "Connect Home: Coming Together to Ensure Digital Opportunity for All Americans," July 15, 2015, available at https://www.whitehouse.gov/the-press-office/2015/07/15/fact-sheet-connecthome-coming-together-ensure-digital-opportunity-all.

[73] Ibid.

Substantial Rehabilitation of Multifamily Rental Housing."[74] Also on May 18, 2016, HUD published in the *Federal Register* a proposed rule entitled, "Modernizing HUD's Consolidated Planning Process To Narrow the Digital Divide and Increase Resilience to Natural Hazards."[75]

Digital Literacy Initiative

Using the experience gained running the BTOP program, NTIA created the web portal DigitalLiteracy.gov in cooperation with the Department of Education and other federal agencies. The website is intended to serve as a resource to practitioners who are delivering digital literacy training and services in their communities. The portal "organizes content conveniently, enables valuable discussion and collaboration among users and elevates best practices to improve the quality of digital literacy offerings."[76]

Concluding Observations

To the extent that Congress may consider various options for encouraging broadband deployment and adoption, a key issue is how to strike a balance between providing federal assistance for unserved and underserved areas where the private sector may not be providing acceptable levels of broadband service, while at the same time minimizing any deleterious effects that government intervention in the marketplace may have on competition and private sector investment.

In addition to loans, loan guarantees, and grants for broadband infrastructure deployment, a wide array of policy instruments are available to policymakers, including universal service reform, tax incentives to encourage private sector deployment, broadband bonds, demand-side incentives (such as assistance to low-income families for purchasing computers), reducing regulatory barriers to broadband deployment, and spectrum policy to spur rollout of wireless broadband services. In assessing federal incentives for broadband deployment, Congress may consider the appropriate mix of broadband deployment incentives to create jobs in the short and long term, the extent to which incentives should target next-generation broadband technologies, and the extent to which "underserved" areas with existing broadband providers should receive federal assistance.

[74] Available at https://www.regulations.gov/document?D=HUD-2016-0050-0001.

[75] Available at https://www.regulations.gov/#!documentDetail;D=HUD-2016-0049-0001.

[76] See http://www.digitalliteracy.gov/about.

Appendix. Broadband Legislation in the 115th Congress

The following is a selected listing of introduced broadband legislation related to the issue of federal assistance for broadband deployment in unserved and underserved areas.

H.R. 547 (DeLauro), introduced on January 13, 2017, would facilitate efficient investments and financing of infrastructure projects (including broadband projects) through the establishment of a National Infrastructure Development Bank. Referred to multiple committees.

H.R. 800 (Huffman), introduced on February 1, 2017, as the New Deal Rural Broadband Act of 2017, would establish an Office of Rural Broadband within USDA; authorize a "Breaking Ground on Rural Broadband Program" to make grants, loans, or loan guarantees to eligible entities for serving rural and underserved areas ($20 billion to remain available until September 30, 2022); establish a Tribal Broadband Assistance Program ($25 million for each of fiscal years 2017 through 2022); establish a broadband grant program to accompany the Rural Broadband Loan program; modify the Telecommunications Infrastructure Loan program by raising the threshold for an eligible rural area from 5,000 to 20,000 population and by permitting RUS to give preference to loan applications that support regional telecommunications development; and direct USDA to establish and maintain an inventory of any real property that is owned, leased, or otherwise managed by the federal government on which a broadband facility could be constructed, as determined by the Under Secretary for Rural Broadband Initiatives. Referred to the Committee on Agriculture, and in addition to the Committees on Natural Resources and Energy and Commerce.

H.R. 1084 (Kelly of Illinois), introduced on February 15, 2017, as the Today's American Dream Act, would direct GAO to submit to Congress a report on the efficiency and effectiveness of efforts by federal agencies to expand access to broadband service, including the RUS telecommunications and broadband programs. Referred to the Committee on Ways and Means, and in addition to the Committees on Education and the Workforce, Agriculture, Financial Services, Small Business, Energy and Commerce, the Judiciary, and Oversight and Government Reform.

H.R. 1139 (Cramer), introduced February 16, 2017, as the Preserving State Commission Oversight Act of 2017, would amend the Communications Act of 1934 to protect low-income Lifeline subscribers by mandating a continued role for states in designating eligible telecommunications carriers for participation in the Universal Service Program, and for other purposes. Referred to the House Committee on Energy and Commerce and to the Subcommittee on Communications and Technology.

H.R. 1546 (Loebsack), introduced on March 15, 2017, as the Rural Wireless Access Act of 2017, would direct the FCC to establish a methodology for the collection by the Commission of mobile service coverage data. Referred to Committee on Energy and Commerce.

H.R. 1581 (Ruiz), introduced on March 16, 2017, as the Tribal Digital Access Act of 2017, would amend the Communications Act of 1934 to add access to telecommunications and information services in Indian country and areas with high populations of Indian people to the universal service principle relating to access to such services in rural, insular, and high cost areas. Referred to the Committee on Energy and Commerce.

H.R. 1591 (Welch), introduced on March 16, 2017, would direct the FCC to adopt rules and conduct outreach to offer recipients of assistance under the Lifeline Assistance Program mobile

devices that are capable of receiving a WiFi signal and are capable of tethering with other WiFi compatible hardware or devices. Referred to Committee on Energy and Commerce.

H.R. 1814 (Kinzinger), introduced on March 30, 2017, would encourage spectrum licensees to make unused spectrum available for use by rural and smaller carriers in order to expand wireless coverage. Referred to Committee on Energy and Commerce.

H.R. 2425 (Huffman), introduced on May 17, 2017, as the Public Lands Telecommunications Act, would support the establishment and improvement of communications sites on or adjacent to federal lands under the jurisdiction of the Secretary of the Interior or the Secretary of Agriculture through the retention and use of rental fees associated with such sites. Referred to the Committee on Natural Resources and in addition to the Committee on Agriculture. Ordered to be reported (amended) by the Committee on Natural Resources on June 27, 2017.

H.R. 2479 (Pallone), introduced on May 17, 2017, as the LIFT America Act, would provide $40 billion over five years to deploy secure and resilient broadband to expand access for communities nationwide while promoting security by design. Three quarters of this funding will be used to deploy broadband in unserved areas of the country through a national reverse auction. The remaining funds will be given to states to distribute through separate statewide reverse auctions. If there are no unserved areas in a state, the state may use the funding to deploy broadband in underserved areas, to deploy broadband or connective technology to schools and libraries, or to fund the deployment of Next Generation 9-1-1. Requires that grant recipients offer a service tier of 25 Mbps (download)/3Mbps (upload) at $60 per month. Referred to multiple committees.

H.R. 2870 (Collins), introduced on June 12, 2017, as the Gigabit Opportunity Act, would provide tax incentives for low-income communities in states that adopt Uniform Model Broadband Deployment laws developed by FCC and that have been designated by state as gigabit opportunity zones. Referred to Committees on Energy and Commerce and Ways and Means.

H.R. 2903 (McKinley), introduced on June 15, 2017, as the Rural Reasonable and Comparable Wireless Access Act of 2017, would direct the FCC to promulgate regulations that establish a national standard for determining whether mobile and broadband services available in rural areas are reasonably comparable to those services provided in urban areas. Referred to Committee on Energy and Commerce.

H.R. 3268 (Aderholt), introduced on July 17, 2017, as the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2018, would provide $4.5 million to subsidize a loan level of $27 million for the broadband loan program, and $122.7 million for the new Rural Economic Infrastructure Account, which would include both Community Connect and Distance Learning and Telemedicine grants, along with Community Facilities grants and Home Repair grants. The bill included language requiring at least 15% of the account resources ($18 million) be allocated to each program area. Reported by Committee on Appropriations, July 17, 2017 (H.Rept. 115-232); placed on Union Calendar.

S. 19 (Thune), introduced on June 3, 2017, as the MOBILE Now Act, would make more spectrum available for wireless broadband, facilitate broadband infrastructure deployment on federal lands, establish a national broadband facilities asset database, and encourage consultation between telecommunications providers and state highway authorities receiving federal highway money. Reported (S.Rept. 115-4) by Senate Committee on Commerce, Science and Transportation on March 21, 2017.

S. 277 (Manchin), introduced on February 2, 2017, as the Rural Telecommunications and Broadband Service Act of 2017, would establish a Rural Telecommunications and Broadband

Advisory Committee within the Federal Communications Commission. Referred to the Committee on Commerce, Science, and Transportation.

S. 421 (Fischer), introduced February 16, 2017, as the Preserving State Commission Oversight Act of 2017, would amend the Communications Act of 1934 to protect low-income Lifeline subscribers by mandating a continued role for States in designating eligible telecommunications carriers for participation in the Universal service program, and for other purposes. Referred to the Committee on Commerce, Science, and Transportation.

S. 604 (Hatch), introduced on March 9, 2017, as the Highway Rights-of-Way Permitting Efficiency Act of 2017, would allow certain state permitting authority to encourage expansion of broadband service to rural communities. Referred to the Committee on Environment and Public Works.

S. 645 (Klobuchar), introduced on March 15, 2017, as the Measuring the Economic Impact of Broadband Act of 2017, would require the Secretary of Commerce to conduct an assessment and analysis of the effects of broadband deployment and adoption on the economy of the United States. In conducting the assessment, the Secretary shall consider matters relating to employment, including job creation, business headcount, online commerce, income, education and distance learning, telehealth, telework, agriculture, population growth, population density, broadband speed, and geography. Referred to the Committee on Commerce, Science, and Transportation.

S. 742 (Booker), introduced on March 28, 2017, as the Community Broadband Act of 2017, would remove state barriers for constructing municipal broadband networks and encourage public-private partnerships. Referred to the Committee on Commerce, Science, and Transportation.

S. 875 (Sullivan), introduced April 6, 2017, would require the Comptroller General of the United States to conduct a study and submit a report on filing requirements under the Universal Service Fund programs. Referred to the Committee on Commerce, Science, and Transportation and ordered to be reported with an amendment in the nature of a substitute favorably.

S. 1013 (Moore), introduced on May 3, 2017, as the Gigabit Opportunity Act, would provide tax incentives for low income communities in states that adopt Uniform Model Broadband Deployment laws developed by FCC and that have been designated by state as gigabit opportunity zones. Referred to the Committee on Finance.

S. 1104 (Manchin), introduced on May 11, 2017, as the Rural Wireless Access Act of 2017, would require the FCC to establish a methodology for the collection by the Commission of information about commercial mobile service and commercial mobile data service. Referred to the Committee on Commerce, Science, and Transportation.

S. 1363 (Heller), introduced on June 15, 2017, as the Rural Broadband Deployment Streamlining Act, would streamline the process for broadband facility location applications on Department of Interior and Forest Service land. Referred to the Committee on Energy and Natural Resources.

S. 1377 (Wicker), introduced on June 19, 2017, as the Reaching Underserved Rural Areas to Lead Telehealth Act, would remove the limitation on certain amounts for which large nonrural hospitals may be reimbursed under the Healthcare Connect Fund of the Federal Communications Commission, and for other purposes. Referred to the Committee on Commerce, Science, and Transportation.

S. 1603 (Hoeven), introduced on July 20, 2017, as the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2018, would provide $4.5 million to subsidize a loan level of $27 million for the broadband loan program, and $30 million

for the Community Connect grants. Reported by Committee on Appropriations, July 20, 2017 (S.Rept. 115-131); placed on Senate Legislative Calendar.

Author Contact Information

(name redacted)
Specialist in Science and Technology Policy
[redacted]@crs.loc.gov, ...

(name redacted)
Specialist in Telecommunications Policy
[redacted]@crs.loc.gov, ...