

Broadband Internet Access and the Digital Divide: Federal Assistance Programs

Lennard G. Kruger

Specialist in Science and Technology Policy

Angele A. Gilroy

Specialist in Telecommunications Policy

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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 technologies (e.g., telephones, computers, the Internet) 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, wireless) that give users the ability to send and receive data at volumes and speeds far greater than traditional "dial-up" Internet access over telephone lines.

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 and high income areas are 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. One approach is for the federal government to provide financial assistance to support broadband deployment in unserved and underserved areas.

Economic stimulus legislation enacted by the 111th Congress includes provisions that provides federal financial assistance for broadband deployment. On February 17, 2009, President Obama signed P.L. 111-5, the American Recovery and Reinvestment Act (ARRA). The ARRA provides a total of **$7.2 billion** for broadband, consisting of $4.7 billion to NTIA/DOC for a newly established Broadband Technology Opportunities Program and $2.5 billion to existing RUS/USDA broadband programs.

Meanwhile, it is expected that the Obama Administration will ultimately develop a national broadband policy or strategy that will seek to reduce or eliminate the "digital divide" with respect to broadband. It is likely that elements of a national broadband policy, in tandem with broadband investment measures in the American Recovery and Reinvestment Act, will significantly shape and expand federal policies and programs to promote 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.

This report will be updated as events warrant.

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Introduction

The "digital divide" is a term used to describe a perceived gap between perceived "information haves and have-nots," or in other words, between those Americans who use or have access to telecommunications technologies (e.g., telephones, computers, the Internet) 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 and high income areas are 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. One approach—adopted in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)—is for the federal government to provide financial assistance, primarily grants, to support broadband deployment in unserved and underserved areas.

Status of Broadband Deployment 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 has been steep, rising from 2.8 million high speed lines reported as of December 1999, to 121.2 million lines as of December 31, 2007. Of the 121.2 million high speed lines reported by the FCC, 74.0 million serve residential users.[2] Since the deployment of residential broadband in the United States, the primary residential broadband technologies deployed continue to be cable modem and DSL. 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 currently deployed cable, DSL, and many wireless systems, while "next generation" refers to dramatically faster download and upload speeds offered by fiber technologies and also potentially by future generations of cable, DSL, and wireless technologies.[3] In general, the greater the download and

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

[2] FCC, *High-Speed Services for Internet Access: Status as of December 31, 2007,* January 2009. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-287962A1.pdf.

[3] Initially, and for many years following, the FCC defined broadband (or more specifically "high-speed lines") as over 200 kilobits per second (kbps) in at least one direction, which was roughly four times the speed of conventional dialup Internet access. In recent years, the 200 kbps threshold was considered too low, and on March 19, 2008, the FCC (continued...)

upload speeds offered by a broadband connection, the more sophisticated (and potentially valuable) the application that is enabled.

December 2008 survey data from the Pew Internet and American Life Project found that 57% of Americans have broadband at home.[4] It is estimated that less than 10% of U.S. households have no access to any broadband provider whatsoever (not including satellite).[5] While the broadband *adoption* or *penetration* rate stands at close to 60% of U.S. households, broadband *availability* is much higher, at more than 90% of households. Thus, approximately 30% of households have access to some type of terrestrial (non-satellite) broadband service, but do not choose to subscribe. According to the FCC, possible reasons for the gap between broadband availability and subscribership include the lack of computers in some homes, price of broadband service, lack of content, and the availability of broadband at work.[6] According to Pew, non-broadband users tend to be older, have lower incomes, have trouble using technology, and may not see the relevance of using the Internet to their lives. Between 2007 and 2008, low income Americans (under $20,000 annual income) and African Americans showed no significant growth in home broadband adoption after strong growth in previous years.[7] Pew also found that about one-third of adults without broadband cite price and availability as the reasons why they don't have broadband in their homes, while two-thirds cite reasons such as usability and relevance.[8]

Broadband in Rural and Underserved Areas[9]

While the number of new broadband subscribers continues to grow, the rate of broadband deployment in urban and high income areas appears to be outpacing deployment in rural and low-income areas. While there are many examples of rural communities with state of the art telecommunications facilities,[10] recent surveys and studies have indicated that, in general, rural areas tend to lag behind urban and suburban areas in broadband deployment. Data (2008) from the Pew Internet & American Life Project indicate that while broadband adoption is growing in urban, suburban, and rural areas, broadband users make up larger percentages of urban and

(...continued)

adopted a report and order (FCC 08-89) establishing new categories of broadband speed tiers for data collection purposes. Specifically, 200 kbps to 768 kbps will be considered "first generation," 768 kbps to 1.5 Mbps as "basic broadband tier 1," and increasingly higher speed tiers as broadband tiers 2 through 7 (tier seven is greater than or equal to 100 Mbps in any one direction). Tiers can change as technology advances.

[4] Horrigan, John, Pew Internet & American Life Project, "Barriers to Broadband Adoption—The User Perspective," December 19, 2008, available at http://otrans.3cdn.net/fe2b6b302960dbe0d7_bqm6ib242.pdf.

[5] S. Derek Turner, Free Press, *Down Payment on Our Digital Future*, December 2008, p. 8.

[6] Federal Communications Commission, *Fourth Report to Congress*, "Availability of Advanced Telecommunications Capability in the United States," GN Docket No. 04-54, FCC 04-208, September 9, 2004, p. 38. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-208A1.pdf.

[7] "Barriers to Broadband Adoption—The User Perspective," p. 1.

[8] Horrigan, John, Pew Internet & American Life Project, "Obama's Online Opportunities II: If You Build It Will They Log On?" January 21, 2009, available at http://www.pewinternet.org/pdfs/PIP_Broadband%20Barriers.pdf.

[9] 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 Lennard G. Kruger.

[10] See for example: National Exchange Carrier Association (NECA), Trends 2006: Making Progress With Broadband, 2006, 26 p. Available at http://www.neca.org/media/trends_brochure_website.pdf.

suburban users than rural users. Pew found that the percentage of all U.S. adults with broadband at home is 60% for suburban areas, 57% for urban areas, and 38% for rural areas.[11]

Similarly, according to the latest FCC data on the deployment of high-speed Internet connections (released January 2009), high-speed subscribers were reported in 99% of the most densely populated zip codes, as opposed to 90% of zip codes with the lowest population densities. For zip codes ranked by median family income, high-speed subscribers were reported present in 99% of the top one-tenth of zip codes, as compared to 92% of the bottom one-tenth of zip codes.[12]

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 DSL—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.[13]

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 e-commerce 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 e-commerce 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."[14]

Subsequently, 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 non-farm economy, the study projected an increase of about 300,000 jobs.[15]

Some also argue that broadband is an important contributor to U.S. future economic strength with respect to the rest of the world. According to the International Telecommunications Union, the

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[11] Horrigan, John B., Pew Internet & American Life Project, *Home Broadband Adoption 2008,* July 2008, p. 3. Available at http://www.pewinternet.org/pdfs/PIP_Broadband_2008.pdf.

[12] FCC, *High-Speed Services for Internet Access: Status as of December 31, 2007,* p. 4.

[13] The terrain of rural areas can also be a hindrance to broadband deployment because it is more expensive 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.

[14] 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.

[15] 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 http://www3.brookings.edu/views/papers/crandall/200706litan.pdf.

U.S. ranks 24th worldwide in broadband penetration (subscriptions per 100 inhabitants in 2007).[16] Data from the Organization for Economic Cooperation and Development (OECD) found the U.S. ranking 15th among OECD nations in broadband access per 100 inhabitants as of June 2008.[17] By contrast, in 2001 an OECD study found the U.S. ranking 4th in broadband subscribership per 100 inhabitants (after Korea, Sweden, and Canada).[18] While many argue that the U.S. declining performance in international broadband rankings is a cause for concern,[19] others maintain that the OECD and ITU data undercount U.S. broadband deployment,[20] and that cross-country broadband deployment comparisons are not necessarily meaningful and inherently problematic.[21] Finally, an issue related to international broadband rankings is the extent to which broadband speeds and prices differ between the U.S. and the rest of the world.[22]

Is Broadband Deployment Data Adequate?

Obtaining an accurate snapshot of the status of broadband deployment is problematic. Anecdotes abound of rural and low-income areas which do not have adequate Internet access, as well as those which are receiving access to high-speed, state-of-the-art connections. Rapidly evolving technologies, the constant flux of the telecommunications industry, the uncertainty of consumer wants and needs, and the sheer diversity and size of the nation's economy and geography make the status of broadband deployment very difficult to characterize. The FCC periodically collects broadband deployment data from the private sector via "FCC Form 477"—a standardized information gathering survey. Statistics derived from the Form 477 survey are published every six months. Additionally, data from Form 477 are used as the basis of the FCC's (to date) five broadband deployment reports.

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[16] International Telecommunications Union, *Economies by broadband penetration, 2007.* Available at http://www.itu.int/ITU-D/ict/statistics/at_glance/top20_broad_2007.html.

[17] OECD, *OECD Broadband Statistics, June 2008*. Available at http://www.oecd.org/sti/ict/broadband.

[18] OECD, Directorate for Science, Technology and Industry, *The Development of Broadband Access in OECD Countries*, October 29, 2001, 63 pp. For a comparison of government broadband policies, also see OECD, Directorate for Science, Technology and Industry, *Broadband Infrastructure Deployment: The Role of Government Assistance*, May 22, 2002, 42 pp.

[19] See Turner, Derek S., Free Press, *Broadband Reality Check II: The Truth Behind America's Digital Divide*, August 2006, pp 8-11. Available at http://www.freepress.net/files/bbrc2-final.pdf; and Turner, Derek S., Free Press, *'Shooting the Messenger' Myth vs. Reality: U.S. Broadband Policy and International Broadband Rankings*, July 2007, 25 pp., available at http://www.freepress.net/files/shooting_the_messenger.pdf.

[20] National Telecommunications and Information Administration, *Fact Sheet: United States Maintains Information and Communication Technology (ICT) Leadership and Economic Strength*, at http://www.ntia.doc.gov/ntiahome/press/2007/ICTleader_042407.html.

[21] See Wallsten, Scott, Progress and Freedom Foundation, *Towards Effective U.S. Broadband Policies*, May 2007, 19 pp. Available at http://www.pff.org/issues-pubs/pops/pop14.7usbroadbandpolicy.pdf. Also see Ford, George, Phoenix Center, *The Broadband Performance Index: What Really Drives Broadband Adoption Across the OECD?*, Phoenix Center Policy Paper Number 33, May 2008, 27 pp; available at http://www.phoenix-center.org/pcpp/PCPP33Final.pdf.

[22] See price and services and speed data on OECD Broadband Portal, available at http://www.oecd.org/sti/ict/broadband; Turner, Derek S., Free Press, *Broadband Reality Check II: The Truth Behind America's Digital Divide*, August 2006, pp 5-9; Kende, Michael, Analysis Consulting Limited, *Survey of International Broadband Offerings*, October 4, 2006, 12 p, available at http://www.analysys.com/pdfs/BroadbandPerformanceSurvey.pdf; and Atkinson, Robert D., The International Technology and Innovation Foundation, *Explaining International Broadband Leadership*, May 2008, 108 p, available at http://www.itif.org/files/ExplainingBBLeadership.pdf.

The FCC is working to refine the data used in future Reports in order to provide an increasingly accurate portrayal. In its March 17, 2004 Notice of Inquiry for the *Fourth Report*, the FCC sought comments on specific proposals to improve the FCC Form 477 data gathering program.[23] On November 9, 2004, the FCC voted to expand its data collection program by requiring reports from all facilities based carriers regardless of size in order to better track rural and underserved markets, by requiring broadband providers to provide more information on the speed and nature of their service, and by establishing broadband-over-power line as a separate category in order to track its development and deployment. The FCC Form 477 data gathering program was extended for five years beyond its March 2005 expiration date.[24]

The Government Accountability Office (GAO) has cited concerns about the FCC's zip-code level data. Of particular concern is that the FCC will report broadband service in a zip code even if a company reports service to only one subscriber, which in turn can lead to some observers overstating broadband deployment. According to GAO, "the data may not provide a highly accurate depiction of local deployment of broadband infrastructures for residential service, especially in rural areas." The FCC has acknowledged the limitations in its zip code level data.[25]

On April 16, 2007, the FCC announced a Notice of Proposed Rulemaking which sought comment on a number of broadband data collection issues, including how to develop a more accurate picture of broadband deployment; gathering information on price, other factors determining consumer uptake of broadband, and international comparisons; how to improve data on wireless broadband; how to collect information on subscribership to voice over Internet Protocol service (VoIP); and whether to modify collection of speed tier information.[26]

On March 19, 2008, the FCC adopted an Order that substantially expands its broadband data collection capability. Specifically, the Order expands the number of broadband reporting speed tiers to capture more information about upload and download speeds offered in the marketplace, requires broadband providers to report numbers of broadband subscribers by census tract, and improves the accuracy of information collected on mobile wireless broadband deployment. Additionally, in a Further Notice of Proposed Rulemaking, the FCC sought comment on broadband service pricing and availability.[27]

During the 110th Congress, state initiatives to collect broadband deployment data in order to promote broadband in underserved areas were viewed as a possible model for governmental efforts to encourage broadband. In particular, an initiative in the Commonwealth of Kentucky—

[23] Federal Communications Commission, *Notice of Inquiry*, "Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996," FCC 04-55, March 17, 2004, p. 6.

[24] FCC News Release, *FCC Improves Data Collection to Monitor Nationwide Broadband Rollout*, November 9, 2004. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-254115A1.pdf.

[25] U.S. Government Accountability Office, *Broadband Deployment is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas*, GAO-06-426, May 2006, p. 3.

[26] Federal Communications Commission, *Notice Proposed Rulemaking*, "Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice Over Internet Protocol (VoIP) Subscribership," WC Docket No. 07-38, FCC 07-17, released April 16, 2007, 56 pp.

[27] FCC, News Release, "FCC Expands, Improves Broadband Data Collection," March 19, 2008. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-280909A1.pdf.

called ConnectKentucky—has developed detailed broadband inventory mapping which identifies local communities that lack adequate broadband service. Kentucky is using this data to promote public-private partnerships in order to reach a goal of universal broadband coverage in the state.[28] Other states are pursuing or considering similar approaches.

The 110th Congress explored ways to support or implement the types of broadband mapping and data collection efforts demonstrated by ConnectKentucky. The Broadband Data Improvement Act was enacted by the 110th Congress and became P.L. 110-385 on October 10, 2008. The law requires the FCC to collect demographic information on unserved areas, data comparing broadband service with 75 communities in at least 25 nations abroad, and data on consumer use of broadband. The act also directs the Census Bureau to collect broadband data, the Government Accountability Office to study broadband data metrics and standards, and the Department of Commerce to provide grants supporting state broadband initiatives.

P.L. 111-5, the American Recovery and Reinvestment Act, provides NTIA with an appropriation of $350 million to implement the Broadband Data Improvement Act and to develop and maintain a national broadband inventory map, which shall be made accessible to the public no later than two years after enactment.

Broadband and the Federal Role

The Telecommunications Act of 1996 (P.L. 104-104) addressed 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." If this is not the case, the act directs the FCC to "take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."

Since 1999, the FCC has issued and adopted five reports pursuant to Section 706. All five reports formally concluded that the deployment of advanced telecommunications capability to all Americans is reasonable and timely. The fifth and most recent 706 report was adopted on March 19, 2008, and released on June 12, 2008.[29] Two FCC Commissioners (Michael Copps and Jonathan Adelstein) have repeatedly dissented from the reports' conclusions that broadband deployment is reasonable and timely, arguing that the relatively poor world ranking of United States broadband penetration indicates that deployment is insufficient, that the FCC's definition of broadband was outdated and not comparable to the much higher speeds available to consumers in other countries, that the use of zip code data (measuring the presence of at least one broadband subscriber within a zip code area) did not sufficiently characterize the availability of broadband

[28] Testimony of Brian Mefford, President and CEO, Connected Nation, Inc., before the Senate Committee on Commerce, Science and Transportation, April 24, 2007. Available at http://commerce.senate.gov/public/_files/DC_Committeetestimony_04_23_07.pdf.

[29] Federal Communications Commission, *Fifth Report*, "In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996," GN Docket No. 07-45, FCC 08-88, Adopted March 19, 2008, Released June 12, 2008. 76 pp. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-88A1.pdf.

across geographic areas, and that broadband deployment is impeded by the lack of a comprehensive national broadband policy.[30]

Bush Administration

The Bush Administration pursued a broadband policy that emphasized deregulation, non-intervention by government in the marketplace, and general tax policies intended to foster overall economic growth. On March 26, 2004, President Bush endorsed a goal of "universal broadband access by 2007," and on April 26, 2004, announced a broadband initiative which included promoting legislation which would permanently prohibit all broadband taxes, making spectrum available for wireless broadband and creating technical standards for broadband over power lines, and simplifying rights-of-way processes on federal lands for broadband providers.[31] Subsequently, on January 31, 2008, NTIA released a report, entitled, *Networked Nation: Broadband in America, 2007* which characterized the Bush Administration's broadband initiative as follows:

> From its first days, the Administration has implemented a comprehensive and integrated package of technology, regulatory, and fiscal policies designed to lower barriers and create an environment in which broadband innovation and competition can flourish.[32]

The Bush Administration broadband policy embraced the view that a minimum of government intervention would create an economic climate favorable to private sector investment in the broadband market. According to NTIA, the report showed "that the Administration's technology, regulatory, and fiscal policies have stimulated innovation and competition, and encouraged investment in the U.S. broadband market contributing to significantly increased accessibility of broadband services."[33]

During the 110th Congress, some policymakers disagreed with the Bush Administration's assessment and asserted that the federal government should play a more active role to avoid a "digital divide" in broadband access. Bills were introduced seeking to provide federal financial assistance for broadband deployment in the form of grants, loans, subsidies, and/or tax credits.

Obama Administration

It is expected that the Obama Administration will ultimately develop a national broadband policy or strategy that will seek to reduce or eliminate the "digital divide" with respect to broadband. One of the key elements of the Obama transition's technology agenda is to "deploy next-generation broadband," and specifically:

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[30] Ibid., pp. 5, 7.

[31] See White House, A New Generation of American Innovation, April 2004. Available at http://www.whitehouse.gov/infocus/technology/economic_policy200404/innovation.pdf.

[32] U.S. Department of Commerce, National Telecommunications and Information Administration, Networked Nation: Broadband in America 2007, January 2008, p. I. Available at http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf.

[33] NTIA, *Press Release*, "Gutierrez Hails Dramatic U.S. Broadband Growth," January 31, 2008. Available at http://www.ntia.doc.gov/ntiahome/press/2008/NetworkedNation_013108.html.

> Work towards true broadband in every community in America through a combination of reform of the Universal Service Fund, better use of the nation's wireless spectrum, promotion of next-generation facilities, technologies and applications, and new tax and loan incentives. America should lead the world in broadband penetration and Internet access.[34]

The Obama campaign released a policy blueprint for technology and innovation that includes policy proposals intended to result in full broadband penetration and deployment of next-generation broadband. Specifically, policy proposals include:

- redefining broadband at speeds "demanded by 21st century business and communications;"
- reforming universal service to support affordable broadband specifically focusing on unserved communities;
- creating incentives for more efficient use of government spectrum and new standards for commercial spectrum to bring affordable broadband to rural communities;
- ensuring that schools, libraries and hospitals have access to next-generation networks and that adequate training and resources are available to enable these institutions to take full advantage of broadband connectivity; and
- encouraging public/private partnerships at the local level that result in broadband to unserved communities.[35]

It is likely that these and other potential elements of a national broadband policy, in tandem with broadband investment measures and development of a national broadband strategy by the FCC as directed by the American Recovery and Reinvestment Act of 2009, will significantly shape and expand federal policies and programs intended to promote broadband deployment and adoption.

Current Federal Broadband Programs

Aside from the broadband programs newly established by the American Recovery and Reinvestment Act of 2009 (P.L. 111-5),[36] the Rural Broadband Access Loan and Loan Guarantee Program and the Community Connect Broadband Grants, both at the Rural Utilities Service of the U.S. Department of Agriculture, are currently the only federal programs *exclusively* dedicated to deploying broadband infrastructure. However, there exist other federal programs that provide financial assistance for various aspects of telecommunications development. The major vehicle for funding telecommunications development, particularly in rural and low-income areas, is the Universal Service Fund (USF). While the USF's High Cost Program does not *explicitly* fund broadband infrastructure, subsidies are used, in many cases, to upgrade existing telephone networks so that they are capable of delivering high-speed services. 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.

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[34] Office of the President-Elect, *Technology Agenda*, available at http://change.gov/agenda/technology_agenda.

[35] Barack Obama, *Connecting and Empowering All Americans Through Technology and Innovation*, 2008, available at http://obama.3cdn.net/780e0e91ccb6cdbf6e_6udymvin7.pdf.

[36] See CRS Report R40436, *Broadband Infrastructure Programs in the American Recovery and Reinvestment Act*, by Lennard G. Kruger.

Table 1 (at the end of this report) shows selected federal domestic assistance programs throughout the federal government that can be associated with telecommunications development. Many (if not most) of these programs can be related, if not necessarily to the deployment of broadband technologies in particular, then to telecommunications and the "digital divide" issue generally.

Table 2 (also at the end of this report) presents selected federal programs that have provided financial assistance for broadband. These programs are broken down into three categories: first, programs that fund access to telecommunications services in unserved or underserved areas; second, general economic development programs that have funded broadband-related projects; and third, applications-specific programs which will typically fund some aspect of broadband access as a means towards supporting a particular application, such as distance learning or telemedicine.

Rural Utilities Service Programs

The Rural Electrification Administration (REA), subsequently renamed the Rural Utilities Service (RUS), was established by the Roosevelt Administration in 1935. Initially, it was established to provide credit assistance for the development of rural electric systems. In 1949, the mission of REA was expanded to include rural telephone providers. Congress further amended the Rural Electrification Act in 1971 to establish within REA a Rural Telephone Account and the Rural Telephone Bank (RTB). Rural Telephone Loans and Loan Guarantees provide long-term direct and guaranteed loans for telephone lines, facilities, or systems to furnish and improve telecommunications service in rural areas. The RTB—liquidated in FY2006—was a public-private partnership intended to provide additional sources of capital that would supplement loans made directly by RUS. Another program, the Distance Learning and Telemedicine Program, specifically addresses health care and education needs of rural America.

RUS implements two programs specifically targeted at providing assistance for broadband deployment in rural areas: the Rural Broadband Access Loan and Loan Guarantee Program and Community Connect Broadband Grants. The 110th Congress reauthorized and reformed the Rural Broadband Access Loan and Loan Guarantee program as part of the 2008 farm bill (P.L. 110-234). For further information on rural broadband and the RUS broadband programs, see CRS Report RL33816, *Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, by Lennard G. Kruger.

The Universal Service Concept and the FCC [37]

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.... "[38] This mandate led to the development of what has come to be known as the universal service concept.

[37] The section on universal service was prepared by Angele Gilroy, Specialist in Telecommunications, Resources, Science and Industry Division. For more information on universal service, see CRS Report RL33979, *Universal Service Fund: Background and Options for Reform*, by Angele A. Gilroy.

[38] Communications Act of 1934, As Amended, Title I sec.1 [47 U.S.C. 151].

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 fostered the development of various FCC policies and programs to meet this goal. The FCC offers universal service support through a number of direct mechanisms that target both providers of and subscribers to telecommunications services.[39]

The development of the federal universal service high cost fund is an example of provider-targeted support. Under the high cost fund, eligible telecommunications carriers, usually those serving rural, insular and high cost areas, are able to obtain funds to help offset the higher than average costs of providing telephone service.[40] This mechanism has been particularly important to rural America where the lack of subscriber density leads to significant costs. FCC universal service policies have also been expanded to target individual users. Such federal programs include two income-based programs, Link Up and Lifeline, established in the mid-1980s to assist economically needy individuals. The Link Up program assists low-income subscribers pay the costs associated with the initiation of telephone service and the Lifeline program assists low-income subscribers pay the recurring monthly service charges. Funding to assist carriers providing service to individuals with speech and/or hearing disabilities is also provided through the Telecommunications Relay Service Fund. Effective January 1, 1998, schools, libraries, and rural health care providers also qualified for universal service support.

Universal Service and the Telecommunications Act of 1996

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.

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 Sections 254(b)(6) and 254(h)of the 1996 Telecommunications Act, 47 U.S.C. 254.)

1. The Schools and Libraries 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."

[39] Many states participate in or have programs that mirror FCC universal service mechanisms to help promote universal service goals within their states.

[40] Additional FCC policies such as rate averaging and pooling have also been implemented to assist high cost carriers.

The FCC established the Schools and Libraries Division within the Universal Service Administrative Company (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 percent for telecommunications services depending on the poverty level of the school's (or school district's) population and its location in a high cost telecommunications area. Three categories of services are eligible for discounts: internal connections (e.g., wiring, routers and servers); Internet access; and telecommunications and dedicated services, with the third category receiving funding priority. According to data released by program administrators, $21.3 billion in funding has been committed over the first ten years of the program with funding released to all states, the District of Columbia and all territories. Funding commitments for funding Year 2008 (July 1, 2008 - June 30, 2009), the eleventh and current year of the program, totaled $2.2 billion as of March 10, 2009.[41]

2. The Rural Health Care Program. Section 254(h) of the 1996 Act requires that public and non-profit 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 the USAC to administer the universal support program to comply with these provisions. Under FCC established rules only public or non-profit health care providers are eligible to receive funding. Eligible health care providers, with the exception of those requesting only access to the Internet, must also be located in a rural area. The funding ceiling, or cap, for this support was established at $400 million annually. The funding level for Year One of the program (January 1998 - June 30, 1999) was set at $100 million. Due to less than anticipated demand, the FCC established a $12 million funding level for the second year (July 1, 1999 to June 30, 2000) of the program but has since returned to a $400 million yearly cap. As of March 17, 2009, covering the first 11 years of the program, a total of $284.7 million has been committed to 4,167 rural health care providers. The primary use of the funding is to provide reduced rates for telecommunications and information services necessary for the provision of health care.[42]

The Telecommunications Development Fund

Section 714 of the 1996 Act created the Telecommunications Development Fund (TDF). The TDF is a private, non-governmental, venture capital corporation currently overseen by a five-member board of directors and fund management. The TDF focuses on seed, early stage, and select later stage investments in communications and has $90 million under management in two funds. Fund I is no longer making new investments. Fund II remains active and currently has 13 companies in its investment portfolio Funding is largely derived from the interest earned from the upfront payments bidders submit to participate in FCC auctions. The TDF also provides entrepreneur education, training, management and technical assistance in underserved rural and urban communities through the TDF Foundation.[43]

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[41] For additional information on this program, including funding commitments, see the E-rate website: http://www.universalservice.org/sl/.

[42] For additional information on this program, including funding commitments, see the RHCD website: http://www.universalservice.org/rhc/.

[43] For additional information on the TDF fund and TDF Foundation see the TDF website at http://www.tdfund.com.

Universal Service and Broadband

One of the policy debates surrounding universal service is whether access to advanced telecommunications services (i.e. broadband) should be incorporated into universal service objectives. The term universal service, when applied to telecommunications, refers to the ability to make available a basket of telecommunications services to the public, across the nation, at a reasonable price. As directed in the 1996 Telecommunications Act [Section 254(c)] a federal-state Joint Board was tasked with defining the services which should be included in the basket of services to be eligible for federal universal service support; in effect using and defining the term "universal service" for the first time. The Joint Board's recommendation, which was subsequently adopted by the FCC in May 1997, included the following in its universal service package: voice grade access to and some usage of the public switched network; single line service; dual tone signaling; access to directory assistance; emergency service such as 911; operator services; access and interexchange (long distance) service.

Some policy makers expressed concern that the FCC-adopted definition is too limited and does not take into consideration the importance and growing acceptance of advanced services such as broadband and Internet access. They point to a number of provisions contained in the Universal Service section 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.

Others caution that a more modest approach is appropriate given the "universal mandate" associated with this definition and the uncertainty and costs associated with mandating nationwide deployment of such advanced services as a universal service policy goal. Furthermore they state the 1996 Act does take into consideration the changing nature of the telecommunications sector and allows for the universal service definition to be modified if future conditions warrant. Section 254(c)of the act states that "universal service is an evolving level of telecommunications services" and 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 service 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.[44] In response to the Joint Board recommendation, the FCC, on January 29, 2008, released three notices of proposed rulemaking dealing with specific aspects of universal service, including an examination of the scope of the definition. The FCC is still

[44] 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 voice); broadband Internet services; and voice services at affordable and comparable rates for all rural and non-rural areas. For a copy of this recommendation see http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07J-4A1.pdf.

examining proposals for universal service reform, including expanding the program to include broadband, but has not taken action.

Legislation in the 110th Congress

In the 110th Congress, legislation was introduced that would provide financial assistance for broadband deployment. Of particular note is the reauthorization of the Rural Utilities Service (RUS) broadband loan program, which was enacted as part of the 2008 farm bill (P.L. 110-234). In addition to reauthorizing and reforming the RUS broadband loan program, P.L. 110-234 contains provisions establishing a National Center for Rural Telecommunications Assessment and requiring the FCC and RUS to formulate a comprehensive rural broadband strategy.

The Broadband Data Improvement Act (P.L. 110-385) was enacted by the 110th Congress and requires the FCC to collect demographic information on unserved areas, data comparing broadband service with 75 communities in at least 25 nations abroad, and data on consumer use of broadband. The act also directs the Census Bureau to collect broadband data, the Government Accountability Office to study broadband data metrics and standards, and the Department of Commerce to provide grants supporting state broadband initiatives.

Meanwhile, the America COMPETES Act (H.R. 2272) was enacted (P.L. 110-69) and contains a provision authorizing the National Science Foundation (NSF) to provide grants for basic research in advanced information and communications technologies. Areas of research include affordable broadband access, including wireless technologies. P.L. 110-69 also directs NSF to develop a plan that describes the current status of broadband access for scientific research purposes.

The following is a listing of broadband related bills enacted in the 110th Congress.

P.L. 110-69 (H.R. 2272)

America COMPETES Act. Authorizes the National Science Foundation (NSF) to provide grants for basic research in advanced information and communications technologies. Areas of research include affordable broadband access, including wireless technologies. Also directs NSF to develop a plan that describes the current status of broadband access for scientific research purposes. Introduced May 10, 2007; referred to House Committee on Science and Technology. Passed House May 21, 2007. Passed Senate July 19, 2007. Signed into law, August 9, 2007.

P.L. 110-161 (H.R. 2764)

Consolidated Appropriations Act, 2008. For Rural Utilities Service, U.S. Department of Agriculture, provides $6.45 million to support a loan level of $300 million for the broadband loan program, and $13.5 million for broadband community connect grants. Signed by President, December 26, 2007.

P.L. 110-234 (H.R. 2419)

Food, Conservation, and Energy Act of 2008. Reauthorizes broadband program at the Rural Utilities Service through FY2012. Establishes a National Center for Rural Telecommunications Assessment. Directs USDA and the FCC to submit to Congress a comprehensive rural broadband strategy. Introduced May 22, 2007; referred to Committee on Agriculture, and in addition to

Committee on Foreign Affairs. Subcommittee on Specialty Crops, Rural Development, and Foreign Agriculture held markup of Title VII (Rural Development) on June 6, 2007. Reported by House Committee on Agriculture (H.Rept. 110-256) on July 23, 2007. Passed House July 27, 2007. Passed Senate with an amendment, December 14, 2007. Conference report (H.Rept. 110-627) approved by the House May 14, 2008, and by the Senate May 15, 2008. Vetoed by the President, May 21, 2008. House and Senate overrode veto on May 21 and May 22, 2008. Became P.L. 110-234, May 22, 2007.

P.L. 110-329 (H.R. 2638)

Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009. Continuing resolution funds RUS broadband loan and grant program at FY2008 levels through March 6, 2009. Signed by President September 30, 2008.

P.L. 110-385 (S. 1492)

Broadband Data Improvement Act. Seeks to improve the quality of federal broadband data collection and encourage state initiatives that promote broadband deployment. Requires the FCC to collect demographic information on unserved areas, data comparing broadband service with 75 communities in at least 25 nations abroad, and data on consumer use of broadband. Directs the Census Bureau to collect broadband data, the Government Accountability Office to study broadband data metrics and standards, and the Department of Commerce to provide grants supporting state broadband initiatives. Introduced May 24, 2007; referred to Committee on Commerce, Science, and Transportation. Ordered to be reported July 19, 2007; reported by Committee (S.Rept. 110-204) and placed on Senate Legislative Calendar, October 24, 2007. Passed by Senate with an amendment September 26, 2008. Passed by House September 29, 2008. Became P.L. 110-385, October 10, 2008.

Broadband Stimulus Legislation in the 111th Congress

In December 2008, leadership in the House and Senate, as well as the Obama transition team, announced their intention to include a broadband component in the infrastructure portion of the economic stimulus package. At the same time, numerous interested parties, including: broadband equipment manufacturers; large, mid-sized, and small wireline and wireless service providers; satellite operators; telecommunications unions; consumer groups; education groups; public safety organizations; think tanks; and others unveiled a multitude of specific proposals for government support of broadband infrastructure.[45]

House

On January 21, 2009, the House Appropriations Committee approved legislative language for the spending portion of the economic stimulus package (H.R. 1, American Recovery and

[45] See CRS Report R40149, *Infrastructure Programs: What's Different About Broadband?*, by Charles B. Goldfarb and Lennard G. Kruger, p. 21.

Reinvestment Act of 2009). The legislation would provide $6 billion to support deployment of broadband and wireless services in rural, unserved, and underserved areas of the nation. Of the total, $2.825 billion would be provided to the Rural Utilities Service (RUS) of the Department of Agriculture, and $3.175 billion to the National Telecommunications and Information Administration of the Department of Commerce. The House broadband stimulus provisions are included within Title II (under Rural Utilities Service), Title III (under National Telecommunications and Information Administration), and Title VI (Broadband Communications) of H.R. 1. Specifically, the legislation breaks down as follows:

- **$2.825 billion** to the Rural Utilities Service for additional loans, loan guarantees, and grants to finance "open access" broadband infrastructure. Specifies 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 is given to projects that provide service to the most rural residents that do not have access to broadband services. Priority is also given to borrowers and former borrowers of rural telephone loans.
- **$350 million** to the National Telecommunications and Information Administration to establish the State Broadband Data and Development Grant Program, as authorized by the recently enacted Broadband Data Improvement Act (P.L. 110-385). Grants would be used to develop and implement statewide initiatives to identify and track the availability and adoption of broadband within each state. Would also be used to develop and maintain a nationwide broadband inventory map.
- **$1 billion** to NTIA for Wireless Deployment Grants for wireless voice service and advanced wireless broadband service (at least 3 Mbps downstream, 1 Mbps upstream). To the extent possible, 25% of the grants are to be awarded for providing wireless voice service in unserved areas, and 75% for advanced wireless broadband service in underserved areas. Grant recipients are required to operate on an "wireless open access" basis.
- **$1.825 billion** to NTIA for Broadband Deployment Grants for basic broadband service (at least 5 Mbps downstream, 1 Mbps upstream) or advanced broadband service (at least 45 Mbps downstream, 15 Mbps upstream). To the extent possible, 25% of the grants are to be awarded for providing basic broadband in unserved areas, and 75% for advanced broadband service in underserved areas. Grant recipients are required to operate on an "open access" basis.

For the Wireless and Broadband Deployment Grants, the terms "unserved," "underserved," "open access," and "wireless open access" shall be defined by the FCC not later than 45 days after enactment of the legislation. Also for these grants, each state planning to participate is required to submit to NTIA a report detailing which geographic areas within that state are most in need of wireless voice, advanced wireless broadband, basic broadband, and advanced broadband services in both unserved and underserved areas. Unserved and underserved areas identified by a state shall not constitute more than 20% of the population or geographic area of that state.

While the RUS broadband programs and the State Broadband Data and Development Grant Program were previously authorized (the RUS programs have operated for seven years, while the state grants is newly established by P.L. 110-385, the Broadband Data Improvement Act, and not

yet funded), the Broadband Deployment Grants and the Wireless Deployment Grants would be newly authorized.

On January 22, 2009, the House Committee on Energy and Commerce marked up and approved sections 3101 (nationwide broadband inventory map to be developed by NTIA) and 3102 (authorizing wireless and broadband deployment grants at NTIA). An amendment in the nature of a substitute, offered by the Chairman, additionally requires NTIA to issue an annual report assessing the impact and effectiveness of the grants, and expands the list of eligible entities to include satellite companies. Other amendments agreed to by the Committee would:

- include the improvement of interoperable broadband communications systems used for public safety and emergency response among factors to be considered in award decisions;
- direct the FCC to review and revise its definitions of unserved and underserved areas after completion of NTIA's nationwide broadband inventory map;
- direct the FCC to submit to Congress a national broadband plan; and
- direct NTIA to consider whether an eligible entity is a socially and economically disadvantaged small business.

On January 28, 2009, the House passed H.R. 1. An amendment agreed to by the House would make projects funded by the newly established NTIA broadband and wireless grant programs eligible for worker training grant money (under Title IX, Subtitle A of H.R. 1).

Senate

On February 7, 2009, a substitute amendment to H.R. 1 (S.Amdt. 570, the "Collins-Nelson amendment") was submitted in the Senate. S.Amdt. 570 would provide $7 billion to NTIA for establishment of a national broadband service development and expansion program called the Broadband Technology Opportunities Program. This is $2 billion less than what was provided in the Senate Appropriations Committee mark (S. 336, S.Rept. 111-3). The program, as provided in S.Amdt. 570, consists of:

- **$6.650 billion** for competitive broadband grants, 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.
- **$350 million** 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.

Significant language related to Broadband Technology Opportunities Program grants includes the following:

- 50% of the total grant funding shall be used to support projects in rural communities, and funds may be transferred for this purpose to USDA's Rural Utilities Service if deemed appropriate by the Secretary of Commerce and in consultation with the Secretary of Agriculture. In cases where this funding is made available to the RUS broadband loan, loan guarantee, and grant programs, 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 is given to projects that provide service to the highest proportion of rural residents that do not have sufficient access to broadband services.
- Among the purposes of the grant program is to provide broadband to citizens residing in unserved and underserved areas. NTIA may consult with the chief executive officer of any state with respect to identifying unserved and underserved areas within that state, and with respect to the allocation of grant funds within that state.
- NTIA shall, in coordination with the FCC, develop nondiscrimination and network interconnection obligations that shall be contractual conditions of grants awarded.
- The federal share of any project may not exceed 80% unless NTIA determines financial hardship.
- Grant eligibility includes: a state or political subdivision, a nonprofit foundation, corporation, institution or association, Indian tribe, Native Hawaiian organization or other nongovernmental entity in partnership with a state or political subdivision, Indian tribe, or native Hawaiian organization.
- Grants may be used to acquire equipment and technology necessary for broadband infrastructure, to construct and deploy broadband service related infrastructure, to ensure access to broadband by community anchor institutions, to facilitate broadband service by vulnerable populations, to construct and deploy broadband facilities to improve public safety communications.

S.Amdt. 570 also includes an investment tax credit for qualified broadband expenditures. The provision would establish a 10% tax credit for investment in current generation broadband in rural and underserved areas, a 20% tax credit for investment in current generation broadband in unserved areas, and a 20% tax credit for investment in next generation broadband in rural, underserved, and unserved areas. Current generation is defined as at least 5 Mbps download speed and 1 Mbps upload, or for wireless broadband, 3Mbps download and 768 kbps upload. Next generation is defined as at least 100 Mbps download and 20 Mbps upload.

On February 10, 2009, the Senate passed H.R. 1 as amended by S.Amdt. 570.

Comparison of House and Senate Bills

The following are some key similarities and differences between the House-passed and Senate-passed broadband provisions of H.R. 1:

- both the House and Senate bills would rely primarily on grants as a strategy to stimulate broadband deployment – House total funding is $6 billion, Senate total is $7 billion;
- House would provide $3.175 billion to NTIA and $2.825 billion to RUS broadband programs; Senate provides all funding to NTIA, but directs that 50% should finance projects in rural areas, DOC can transfer this funding in part to the RUS broadband loan and grant programs if deemed appropriate;
- both the House and Senate bills would provide $350 million to NTIA for funding the Broadband Data Improvement Act and to develop a national broadband inventory map;
- Senate specifically sets aside not less than $200 million for competitive grants for expanding public computer center capacity (including at community colleges and public libraries) and not less than $250 million to encourage sustainable adoption of broadband service; funding is not specifically set aside for these purposes in the House bill;
- Senate has a 20% matching requirement for grant recipients (which can be waived in case of financial hardship); House doesn't have a matching requirement but cites a 20% match as a positive consideration when assessing grant applications;
- House sets funding allocation percentages for Broadband Technology Opportunity grants based on minimum broadband speed requirements (download and upload) and whether area is unserved or underserved, directs FCC to define "unserved" and "underserved" within 45 days; Senate doesn't prescribe allocations based on minimum download/upload speeds and whether an area is unserved or underserved, instead directs NTIA to consult with each state to identify unserved and underserved areas as well as the appropriate allocation of grant funds within that state;
- House mandates "open access" requirement for grant projects and requires that projects adhere to FCC's net neutrality principles, directs FCC to define "open access" and "wireless open access" within 45 days; Senate directs that NTIA shall, in coordination with the FCC, develop nondiscrimination and network interconnection obligations that shall be contractual conditions of grants awarded;
- House defines entities eligible for grants as essentially any provider of wireless or broadband service, including states or local governments; Senate defines an eligible applicant as a state or political subdivision thereof, a nonprofit foundation, corporation, institution or association, Indian tribe, Native Hawaiian organization or other nongovernmental entity in partnership with a state or political subdivision, Indian tribe, or native Hawaiian organization;
- Senate includes broadband investment tax credits; House does not include broadband tax incentives;
- House directs that 50% of grant funds are to be awarded no later than September 30, 2009; Senate directs all funds to be awarded by the end of FY2010; and
- both the House and Senate bills direct FCC to develop a national broadband plan in one year.

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 provide a total of **$7.2 billion**, primarily for broadband grants. The total consists of $4.7 billion to NTIA/DOC for a newly established Broadband Technology Opportunities Program and $2.5 billion to existing RUS/USDA broadband programs.[46]

Regarding the $2.5 billion to RUS/USDA broadband programs, the ARRA specifies 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 is given to projects that provide service to the most rural residents that do not have access to broadband services. Priority is also given to borrowers and former borrowers of rural telephone loans.

Of the $4.7 billion appropriated to NTIA:

- $4.35 billion is 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 is 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.

The Broadband Technology Opportunities Program within NTIA is authorized by Division B, Title VI of the ARRA. Specific implementation requirements and guidelines for the new NTIA broadband grants are as follows:

- Directs NTIA to consult with each state to identify unserved and underserved areas (with respect to access to broadband service) as well as the appropriate allocation of grant funds within that state. The Conferees (H.Rept. 111-16) "intend that the NTIA has discretion in selecting the grant recipients that will best achieve the broad objectives of the program."
- The substitute does not define "unserved area," "underserved area," and "broadband." The Conferees instructed NTIA to coordinate its understanding of these terms with the FCC, and in defining "broadband service" to take into consideration technical differences between wireless and wireline networks and to consider the actual speeds these networks are able to deliver to consumers under a variety of circumstances.

[46] For information on existing broadband programs at RUS, see: CRS Report RL33816, *Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, by Lennard G. Kruger.

- Directs NTIA, in coordination with the FCC, to publish "non-discrimination and network interconnection obligations" that shall be contractual conditions of awarded grants, and specifies that these obligations should adhere, at a minimum, to the FCC's broadband principles to promote the openness and interconnected nature of the Internet (FCC 05-151, adopted August 5, 2005).
- Directs NTIA, when considering applications for grants, to consider whether the project will provide the greatest broadband speed possible to the greatest population of users in the area. There are no specific speed thresholds that applicants must meet to be eligible for a grant. The Conferees acknowledged that while speed thresholds could have the unintended effect of thwarting broadband deployment in some areas, deploying next-generation speeds would likely result in greater job creation and job preservation. NTIA is instructed to "seek to fund, to the extent practicable, projects that provide the highest possible, next-generation broadband speeds to consumers."
- Defines entities eligible for grants as: a state or political division thereof; the District of Columbia; a territory or possession of the United States; an Indian tribe or native Hawaiian organization; a nonprofit foundation, corporation, institution or association; or any other entity, including a broadband service or infrastructure provider, that NTIA finds by rule to be in the public interest. It was the intent of the Conferees that as many entities as possible be eligible to apply for a grant, including wireless carriers, wireline carriers, backhaul providers, satellite carriers, public-private partnerships, and tower companies.
- Requires NTIA to consider whether a grant applicant is a socially and economically disadvantaged small business as defined under the Small Business Act.
- Directs NTIA to ensure that all awards are made before the end of FY2010. Grantees will be required to substantially complete projects within two years after the grant is awarded.
- Directs that the federal share of any project cannot exceed 80% unless the applicant petitions NTIA and demonstrates financial need.

The Conference Agreement and public law bill did not include the broadband investment tax credit provisions that were contained in the Senate bill. 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 Lennard G. Kruger.

Other Legislation in the 111th Congress

P.L. 111-8 (H.R. 1105). Omnibus Appropriations Act, 2009. Appropriates to RUS/USDA $15.619 million to support a loan level of $400.487 million for the Rural Broadband Access Loan and Loan Guarantee Program, and $13.406 million for the Community Connect Grant Program. To the FCC, designates not less than $3 million to establish and administer a State Broadband Data and Development matching grants program for State-level broadband demand aggregation activities and creation of geographic inventory maps of broadband service to identify gaps in service and provide a baseline assessment of statewide broadband deployment. Passed House February 25, 2009. Passed Senate March 10, 2009. Signed by President, March 12, 2009.

H.R. 691 (Meeks). Broadband Access Equality Act of 2009. Amends the Internal Revenue Code of 1986 to provide credit against income tax for businesses furnishing broadband services to underserved and rural areas. Introduced January 26, 2009; referred to Committee on Ways and Means.

H.R. 760 (Eshoo). Advanced Broadband Infrastructure Bond Initiative of 2009. Amends the Internal Revenue Code of 1986 to provide an income tax credit to holders of bonds financing new advanced broadband infrastructure. Introduced January 28, 2009; referred to Committee on Ways and Means and in addition to Committee on Energy and Commerce.

Concluding Observations

As Congress considers various options for encouraging broadband deployment, 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), regulatory and deregulatory measures, and spectrum policy to spur roll-out of wireless broadband services. In assessing federal incentives for broadband deployment, Congress will likely 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, the extent to which "underserved" areas with existing broadband providers should receive federal assistance, and how broadband stimulus measures of the ARRA might fit into the context of overall goals for a national broadband policy.

Table 1. Selected Federal Domestic Assistance Programs Related to Telecommunications Development

Program	Agency	Description	FY2008 (obligations)	Web Links for More Information http://12.46.245.173/cfda/cfda.html: Go to "All Programs Listed Numerically" and search by program
Public Telecommunications Facilities—Planning and Construction	National Telecommunications and Information Administration, Dept. of Commerce	Assists in planning, acquisition, installation and modernization of public telecommunications facilities	$19.5 million	http://www.ntia.doc.gov/otiahome/ptfp/index.html
Investments for Public Works and Economic Development Facilities	Economic Development Administration, Dept. of Commerce	Provides grants to economically distressed areas for construction of public facilities and infrastructure, including broadband deployment and other types of telecommunications enabling projects	$249 million	http://www.eda.gov/
Rural Telephone Loans and Loan Guarantees	Rural Utilities Service, U.S. Dept. of Agriculture	Provides long-term direct and guaranteed loans to qualified organizations for the purpose of financing the improvement, expansion, construction, acquisition, and operation of telephone lines, facilities, or systems to furnish and improve telecommunications service in rural areas	$145 million (hardship loans); $250 million (cost of money loans); $295 million (FFB Treasury loans)	http://www.usda.gov/rus/telecom/index.htm
Distance Learning and Telemedicine Loans and Grants	Rural Utilities Service, U.S. Dept. of Agriculture	Provides seed money for loans and grants to rural community facilities (e.g., schools, libraries, hospitals) for advanced telecommunications systems that can provide health care and educational benefits to rural areas	$24.7 million (grants) $28 million (loans and loan-grant combinations)	http://www.usda.gov/rus/telecom/dlt/dlt.htm
Rural Broadband Access Loan and Loan Guarantee Program	Rural Utilities Service, U.S. Dept. of Agriculture	Provides loan and loan guarantees for facilities and equipment providing broadband service in rural communities	$300 million (cost of money loans)	http://www.usda.gov/rus/telecom/broadband.htm
Community Connect Broadband Grants	Rural Utilities Service, U.S. Dept. of Agriculture	Provides grants to applicants proposing to provide broadband service on a "community-oriented connectivity" basis to rural communities of under 20,000 inhabitants.	$13.4 million	http://www.usda.gov/rus/telecom/index.htm

Program	Agency	Description	FY2008 (obligations)	Web Links for More Information http://12.46.245.173/cfda/cfda.html: Go to "All Programs Listed Numerically" and search by program
Education Technology State Grants	Office of Elementary and Secondary Education, Dept. of Education	Grants to State Education Agencies for development of information technology to improve teaching and learning in schools	$267 million	http://www.ed.gov/Technology/TLCF/index.html
Ready to Teach	Office of Assistant Secretary for Educational Research and Improvement, Dept. of Education	Grants to carry out a national telecommunication-based program to improve the teaching in core curriculum areas.	$10.7 million	http://www.ed.gov/programs/readyteach/index.html
Special Education—Technology and Media Services for Individuals with Disabilities	Office of Special Education and Rehabilitative Services, Dept. of Education	Supports development and application of technology and education media activities for disabled children and adults	$39.3 million	http://www.ed.gov/about/offices/list/osers/index.html?src=mr/
Telehealth Network Grants	Health Resources and Services Administration, Department of Health and Human Services	Grants to develop sustainable telehealth programs and networks in rural and frontier areas, and in medically unserved areas and populations.	$3.9 million	http://www.hrsa.gov/telehealth/
Medical Library Assistance	National Library of Medicine, National Institutes of Health, Department of Health and Human Services	Provides funds to train professional personnel; strengthen library and information services; facilitate access to and delivery of health science information; plan and develop advanced information networks; support certain kinds of biomedical publications; and conduct research in medical informatics and related sciences	$67.5 million	http://www.nlm.nih.gov/ep/extramural.html
State Library Program	Office of Library Services, Institute of Museum and Library Services, National Foundation on the Arts and the Humanities	Grants to state library administrative agencies for promotion of library services that provide all users access to information through State, regional, and international electronic networks	$171.5 million	http://www.imls.gov/grants/library/lib_gsla.asp#po
Native American and Native Hawaiian Library Services	Office of Library Services, Institute of Museum and Library Services, National Foundation on the Arts and the Humanities	Supports library services including electronically linking libraries to networks	$3.7 million	http://www.imls.gov/grants/library/lib_nat.asp

Program	Agency	Description	FY2008 (obligations)	Web Links for More Information http://12.46.245.173/cfda/cfda.html: Go to "All Programs Listed Numerically" and search by program
Appalachian Area Development	Appalachian Regional Commission	Provides project grants for Appalachian communities to support the physical infrastructure necessary for economic development and improved quality of life.	$73 million	http://www.arc.gov/index.do?nodeId=21
Delta Area Economic Development	Delta Regional Authority	Grants to support self-sustaining economic development of eight states in Mississippi Delta region.	$7.8 million	http://www.dra.gov/programs/information-technology
Denali Commission Program	Denali Commission	Provides grants through a federal and state partnership designed to provide critical infrastructure and utilities throughout Alaska, particularly in distressed communities	$106 million	http://www.denali.gov/

Source: Prepared by CRS based on information from the Catalog of Federal Domestic Assistance.

http://www.crsdocuments.com

Table 2. Selected Federal Programs Funding Broadband Access

Program	Comments
Programs Funding Access to Telecommunications in Underserved Areas	
Rural Broadband Access Loan and Loan Guarantee Program (Rural Utilities Service, U.S. Department of Agriculture)	Provides loan and loan guarantees for facilities and equipment providing broadband service in rural communities.
Community Connect Broadband Grants (Rural Utilities Service, U.S. Department of Agriculture)	Provides grants to applicants proposing to provide broadband service on a "community-oriented connectivity" basis to rural communities of under 20,000 inhabitants.
Rural Telephone Loans and Loan Guarantees (Rural Utilities Service, U.S. Department of Agriculture)	Since 1995, the RUS Rural Telephone Loan and Loan Guarantee program—which has traditionally financed telephone voice service in rural areas under 5,000 inhabitants—has required that all telephone facilities receiving financing must be capable of providing DSL broadband service at a rate of at least 1 megabyte per second.
Universal Service Fund: High Cost Program (Federal Communications Commission)	While the USF's High Cost Program does not *explicitly* fund broadband infrastructure, subsidies are used, in many cases, to upgrade existing telephone networks.
Federal Economic Development Programs Funding Broadband Access	
Community Development Block Grants (Department of Housing and Urban Development)	In Michigan, a Digital Divide Investment Program (DDIP) combined Michigan Broadband Development Authority loans (initially $12 million) and CDBG grant funding ($4 million) to deploy a hybrid fixed wireless and fiber network in two rural counties which would make broadband affordable for low to moderate income residents.
Indian Community Development Block Grants (Department of Housing and Urban Development)	In 2005, HUD awarded the Coquille Indian Tribe a $421,354 grant used to fund the Coquille Broadband Technology Infrastructure Project. The project will allow for improved connectivity for reservation residents, improvements in rural community access, and potentially increased wireless Internet access for the Tribal and surrounding communities.
Grants for Public Works and Economic Development Facilities (Economic Development Administration, Department of Commerce)	Supports the proliferation of broadband networks as a key priority for regional economic growth. Examples: $6 million grant to a company in Virginia for investment in 300 miles of fiber optic cable in nine counties and three cities; $2 million grant to companies in Vermont to help build a 424 mile fiber optic broadband network in rural northern Vermont; and $270 thousand to support a Rhode Island Wireless Innovation Networks project. EDA encourages communities eligible for RUS programs to access that first before applying for EDA investment dollars.
Appalachian Regional Commission	The Appalachian Regional Development Act Amendments of 2002 reauthorized ARC for five years and created specific authority for a Region-wide initiative to bridge the telecommunications and technology gap between the Appalachian Region and the rest of the United States. Supported a telecommunications initiative ($33 million over five year period) which includes projects such as: a regional fiber network across northeast Mississippi; wireless demonstrations in rural New York, Ohio, Pennsylvania, Virginia, West Virginia, and Georgia; and a regionwide effort in Kentucky to compile an inventory of broadband access across the 51 Appalachian counties and work with the private sector to substantially increase broadband coverage. In Maryland, a county-wide high-speed wireless network, funded by ARC over several years, now serves over 4,500 customers.

Program	Comments
Delta Regional Authority	During a strategic planning retreat in February 2005, the DRA board determined that one of the authority's three top policy priorities would be information technology. To support its policy position, the authority devoted $150,000 to create an information technology plan for the region.
Denali Commission	Funded Telecommunications Survey in 2000 which was used to determine the state of broadband deployment in Alaska and used as basis for applying for RUS broadband assistance.
Applications-Based Federal Programs Related to Broadband	
Universal Service Fund: Schools and Libraries or "E-Rate" Program (Federal Communications Commission)	Used to fund broadband access for schools and libraries.
Universal Service Fund: Rural Health Care Program (Federal Communications Commission)	Used to fund broadband access for rural health care centers.
Distance Learning and Telemedicine Program (Rural Utilities Service, U.S. Department of Agriculture)	Provides seed money for loans and grants to rural community facilities (e.g., schools, libraries, hospitals) for advanced telecommunications systems that can provide health care and educational benefits to rural areas.
Public Safety Interoperable Communications Grant Program (National Telecommunications and Information Administration, Department of Commerce)	Provides funding to states and territories to enable and enhance public safety agencies' interoperable communications capabilities.
Telehealth Network Grants (Health Resources and Services Administration, Department of Health and Human Services)	Grants to develop sustainable telehealth programs and networks in rural and frontier areas, and in medically unserved areas and populations.
Public Telecommunications Facilities Program (National Telecommunications and Information Administration, Department of Commerce)	Grants for public television, public radio, and nonbroadcast distance learning projects.
Education technology programs (Department of Education)	Examples include Education Technology State Grants, Ready to Teach.
State Library Grants (Office of Library Services, Institute of Museum and Library Services, National Foundation on the Arts and the Humanities)	Grants to state library administrative agencies for promotion of library services that provide all users access to information through State, regional, and international electronic networks.
Medical Library Assistance (National Library of Medicine, National Institutes of Health, Department of Health and Human Services)	Provides funds to train professional personnel; strengthen library and information services; facilitate access to and delivery of health science information; plan and develop advanced information networks; support certain kinds of biomedical publications; and conduct research in medical informatics and related sciences.

Author Contact Information

Lennard G. Kruger
Specialist in Science and Technology Policy
lkruger@crs.loc.gov, 7-7070

Angele A. Gilroy
Specialist in Telecommunications Policy
agilroy@crs.loc.gov, 7-7778

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