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Broadband Internet Access and the Digital Divide: Federal Assistance Programs

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Broadband Internet Access and the Digital Divide: Federal Assistance Programs

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, 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 current "dial-up" Internet access over traditional 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 conducted by the Federal Communications Commission (FCC), the Department of Commerce (DOC), and the Department of Agriculture (USDA) suggest that the rate of broadband deployment in urban and high income areas may be 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 underserved areas. Others, however, believe that federal assistance for broadband deployment is not appropriate. Some opponents question the reality of the "digital divide," and argue that federal intervention in the broadband marketplace would be premature and, in some cases, counterproductive.

Legislation introduced in the 110th Congress seeks to provide federal financial assistance for broadband deployment in the form of grants, loans, subsidies, and tax credits. Of particular note is the possible reauthorization of the Rural Utilities Service (RUS) broadband program, which is being considered as part of the 2007 farm bill. Legislation to reform universal service — which could impact the amount of financial assistance available for broadband deployment in rural and underserved areas — has been introduced (H.R. 42, H.R. 2054, H.R. 3428, S. 101, S. 711), as well as other broadband legislation (H.R. 1818, H.R. 2035, H.R. 2174, H.R. 2274, H.R. 2419, H.R. 2569, H.R. 2720, H.R. 2953, H.R. 3281, S. 541, S. 761, S. 1032, S. 1190, S. 1264, S. 1439, S. 1492).

In assessing such legislation, several policy issues arise. For example, is the current status of broadband deployment data an adequate basis on which to base policy decisions? Is federal assistance premature, or do the risks of delaying assistance to underserved areas outweigh the benefits of avoiding federal intervention in the marketplace? And finally, if one assumes that governmental action is necessary to spur broadband deployment in underserved areas, which specific approaches, either separately or in combination, are likely to be most effective?

This report will be updated as events warrant.

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Broadband Internet Access and the Digital Divide: Federal Assistance Programs

Background

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. A series of reports issued by the Department of Commerce[2] (DOC) during the Clinton Administration argued that a "digital divide" exists, with many rural citizens, certain minority groups, and low-income Americans tending to have less access to telecommunications technology than other Americans.[3]

In February 2002, the Bush Administration's Department of Commerce released its first survey report on Internet use, entitled *A Nation Online: How Americans Are Expanding Their Use of the Internet*.[4] While acknowledging a disparity in usage between "information haves and have nots," the report focused on the increasing rates of Internet usage among traditionally underserved groups:

> In every income bracket, at every level of education, in every age group, for people of every race and among people of Hispanic origin, among both men and women, many more people use computers and the Internet now than did so in the recent past. Some people are still more likely to be Internet users than others. Individuals living in low-income households or having little education, still trail the national average. However, broad measures of Internet use in the United States suggest that over time Internet use has become more equitable.[5]

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

[2] See U.S. Department of Commerce, *Falling Through the Net: Toward Digital Inclusion*, released October 2000.

[3] Not all observers agree that a "digital divide" exists. See, for example: Thierer, Adam D., *Divided Over the Digital Divide*, Heritage Foundation, March 1, 2000. [http://www.heritage.org/Press/Commentary/ED030100.cfm]

[4] Department of Commerce, *A Nation Online: How Americans Are Expanding Their Use of the Internet*, February 2002. Based on a September 2001 Census Bureau survey of 57,000 households. See [http://www.ntia.doc.gov/ntiahome/dn/index.html]

[5] *A Nation Online*, pp. 10-11.

A Nation Online: Entering the Broadband Age, published in September 2004, was the sixth Department of Commerce report examining the use of computers, the Internet, and other information technology. For the first time, the DOC report focused on broadband, also known as high-speed Internet access. Broadband is provided by a series of technologies (e.g., cable, telephone wire, satellite, wireless) that give users the ability to send and receive data at volumes and speeds far greater than current "dial-up" Internet access over traditional telephone lines.[6] The DOC report found that the proportion of U.S. households with broadband connections grew from 9.1% in September 2001 to 19.9% in October 2003.[7]

According to the latest FCC data on the deployment of high-speed Internet connections (released January 2007), as of June 30, 2006 there were 64.6 million high speed lines connecting homes and businesses to the Internet in the United States, a growth rate of 26% during the first half of 2006. Of the 64.6 million high speed lines reported by the FCC, 50.3 million serve residential users.[8] While the broadband *adoption* rate stands at roughly 45% of U.S. households,[9] broadband *availability* is much higher. As of June 30, 2006, the FCC found at least one high-speed subscriber in 99% of all zip codes in the United States. The FCC estimates that "roughly 20 percent of consumers with access to advanced telecommunications capability do subscribe to such services." 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.[10]

Broadband in Rural and Underserved Areas.[11] 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. In response to a request by ten Senators, the Departments of Commerce and Agriculture released a report on April 26, 2000, concluding that rural areas lag behind urban areas in access to broadband technology. The report found

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[6] For further information on different types of broadband technologies, including their respective strengths and limitations, see CRS Report RL33542, *Broadband Internet Access: Background and Issues*, by Angele A. Gilroy and Lennard G. Kruger.

[7] U.S. Department of Commerce, Economics and Statistics Administration, National Telecommunications and Information Administration, *A Nation Online: Entering the Broadband Age*, September 2004, p. 1.

[8] FCC, *High-Speed Services for Internet Access: Status as of June 30, 2006,* January 2007. Available at [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-270128A1.pdf]

[9] Percentage assumes one high speed line per household, 50 million residential high speed lines (per June 30, 2006 FCC data) and 110 million households in the U.S. (Census data).

[10] 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]

[11] 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.

that less than 5% of towns of 10,000 or less have access to broadband, while broadband over cable has been deployed in more than 65% of all cities with populations over 250,000, and broadband over the telephone network has been deployed in 56% of all cities with populations over 100,000.[12]

Similarly, the February 2002 report from the Department of Commerce, *A Nation Online: How Americans Are Expanding Their Use of the Internet*, found that 12.2% of Internet users in rural areas had high-speed connections, as opposed to 21.2% of Internet users in urban areas. The report's survey also found, not surprisingly, that individuals in high-income households have higher broadband subscribership rates than individuals in lower income households.[13]

December 2005 data 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 suburban users than rural users. Pew found that the percentage of all U.S. adults with broadband at home is 38% for urban areas, 40% for suburban areas, and 24% for rural areas.[14]

Similarly, a May 2006 report released by the Government Accountability Office (GAO) found that 17% of rural households subscribe to broadband, as opposed to 28% of suburban and 29% of urban households.[15]

According to the latest FCC data on the deployment of high-speed Internet connections (released January 2007), high-speed subscribers were reported in 99% of the most densely populated zip codes, as opposed to 89% of zip codes with the lowest population densities. Similarly, 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 91% of the bottom one-tenth of zip codes.[16]

On the other hand, the FCC's *Fourth Report*, while acknowledging that disparities in broadband deployment exist, asserts that the gap between the broadband "haves and have-nots" is narrowing:

> [T]he *Fourth Report* also documents the continuation of a positive trend that first emerged in our last report: namely, the increasing availability of advanced telecommunications capability to certain groups of consumers — those in rural

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[12] See U.S. Depts. of Commerce and Agriculture, *Advanced Telecommunications in Rural America: The Challenge of Bringing Broadband Service to All Americans*, April 2000, 80 pages. Available at [http://www.ntia.doc.gov/reports/ruralbb42600.pdf]

[13] *A Nation Online*, pp. 40-41.

[14] Horrigan, John B., Pew Internet & American Life Project, *Rural Broadband Internet Use,* February 2006, Available at [http://www.pewinternet.org/pdfs/PIP_Rural_Broadband.pdf]

[15] 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. 12.

[16] FCC, *High-Speed Services for Internet Access: Status as of June 30, 2006,* January 2007, p. 4. Available at [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-270128A1.pdf]

> areas, those with low incomes, and those with disabilities — who stand in particular need of advanced services. Consumers in these groups are of special concern to the Commission in that they are most in need of access to advanced telecommunications capability to overcome economic, educational, and other limitations, they are also the most likely to lack access precisely *because* of these limitations. The *Fourth Report* demonstrates that we are making substantial progress in closing the gaps in access that these groups traditionally have experienced.[17]

The September 2004 Department of Commerce report, *A Nation Online: Entering the Broadband Age*, found that a lower percentage of Internet households have broadband in rural areas (24.7%) than in urban areas (40.4%), and that "while broadband usage has grown significantly in all areas since the previous survey, the rural-urban differential continues."[18] The report also found that broadband penetration rates are higher in the West and Northeast than in the South and Midwest.[19] Race and ethnicity were also found to be significant determinants of broadband use, with 25.7% of White Americans living in broadband households, as opposed to 14.2% of Black and 12.6% of Hispanic Americans.[20]

Some policymakers believe that disparities in broadband access across American society could have adverse consequences on those left behind. While a minority of American homes today subscribe to broadband, many believe that advanced Internet applications of the future — voice over the Internet protocol (VoIP) or high quality video, for example — and the resulting ability for businesses and consumers to engage in e-commerce, may increasingly depend 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 2003 study conducted by Criterion Economics found that ubiquitous adoption of current generation broadband technologies would result in a cumulative increase in gross domestic product of $179.7 billion, while sustaining an additional 61,000 jobs per year over the next nineteen years. The study projected that 1.2 million jobs could be created if next generation broadband technology is rapidly and ubiquitously deployed.[21] A February 2006 study done by the Massachusetts Institute of Technology for the Economic Development Administration/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

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[17] *Fourth Report*, p. 8-9.

[18] *A Nation Online: Entering the Broadband Age*, pp. 12-13.

[19] *Ibid*., p. 12.

[20] *Ibid*., p. A-1.

[21] Crandall, Robert W. et al, *The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy*, Conducted by Criterion Economics, L.L.C. for the New Millennium Research Council, September 2003. Available at [http://www .newmillenniumresearch.org/archive/bbstudyreport_091703.pdf]

businesses in IT-intensive sectors, relative to comparable communities without broadband at that time."[22]

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, assuming the economy is not already at full employment.[23]

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 U.S. ranks 16th worldwide in broadband penetration (subscriptions per 100 inhabitants as of December 2005).[24] Similarly, 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 December 2006.[25] By contrast, in 2001 an OECD study found the U.S. ranking 4th in broadband subscribership per 100 inhabitants (after Korea, Sweden, and Canada).[26] While many argue that the U.S. declining performance in international broadband rankings is a cause for concern,[27] others — including the Administration — maintain that the OECD data undercounts U.S. broadband deployment,[28] and that cross-country broadband deployment comparisons are not

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[22] 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.

[23] 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].

[24] International Telecommunications Union, *Economies by broadband penetration, 2005.* Available at [http://www.itu.int/ITU-D/ict/statistics/at_glance/top20_broad_2005.html].

[25] OECD, *OECD Broadband Statistics, December 2006*. Available at [http://www.oecd.org/sti/ict/broadband].

[26] OECD, Directorate for Science, Technology and Industry, *The Development of Broadband Access in OECD Countries*, October 29, 2001, 63 pages. 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 p.

[27] 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/docs/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 p., available at [http://www.freepress.net/docs/shooting_the_messenger.pdf].

[28] National Telecommunications and Information Administration, *Fact Sheet: United States Maintains Information and Communication Technology (ICT) Leadership and Economic Strength*, available at [http://www.ntia.doc.gov/ntiahome/press/2007/ICTleader _042407.html].

necessarily meaningful and inherently problematic.[29] 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.[30]

Federal Role. The Telecommunications Act of 1996 (P.L. 104-104) addresses 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."

On January 28, 1999, the FCC adopted its first report (FCC 99-5) pursuant to Section 706. The report concluded that "the consumer broadband market is in the early stages of development, and that, while it is too early to reach definitive conclusions, aggregate data suggests that broadband is being deployed in a reasonable and timely fashion."[31] The FCC announced that it would continue to monitor closely the deployment of broadband capability in annual reports and that, where necessary, it would "not hesitate to reduce barriers to competition and infrastructure investment to ensure that market conditions are conducive to investment, innovation, and meeting the needs of all consumers."

The FCC's second Section 706 report was adopted on August 3, 2000. Based on more extensive data than the first report, the FCC similarly concluded that notwithstanding risks faced by some vulnerable populations, broadband is being deployed in a reasonable and timely fashion overall:

> Recognizing that the development of advanced services infrastructure remains in its early stages, we conclude that, overall, deployment of advanced telecommunications capability is proceeding in a reasonable and timely fashion. Specifically, competition is emerging, rapid build-out of necessary infrastructure

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[29] See Wallsten, Scott, Progress and Freedom Foundation, *Towards Effective U.S. Broadband Policies*, May 2007, 19 pages. Available at [http://www.pff.org/issues-pubs/pops/pop14.7usbroadbandpolicy.pdf]. Also see Ford, George, Phoenix Center, *The Broadband Performance Index: A Policy-Relevant Method of Comparing Broadband Adoption Among Countries*, Phoenix Center Policy Paper Number 29, July 2007, 32 pp. Available at [http://www.phoenix-center.org/pcpp/PCPP29Final.pdf].

[30] See 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 pages, available at [http://www.analysys.com/pdfs/BroadbandPerformanceSurvey.pdf]; and Correa, Daniel K., The International Technology and Innovation Foundation, *Assessing Broadband in America: OECD and ITIF Broadband Rankings*, April 2007, 10 pages, available at [http://www.itif.org/files/BroadbandRankings.pdf].

[31] FCC News Release, "FCC Issues Report on the Deployment of Advanced Telecommunications Capability to All Americans," January 28, 1999. [http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9004.html]

> continues, and extensive investment is pouring into this segment of the economy.[32]

The FCC's third Section 706 report was adopted on February 6, 2002. Again, the FCC concluded that "the deployment of advanced telecommunications capability to all Americans is reasonable and timely."[33] The FCC added:

> We are encouraged by the expansion of advanced services to many regions of the nation, and growing number of subscribers. We also conclude that investment in infrastructure for most advanced services markets remains strong, even though the pace of investment trends has generally slowed. This may be due in part to the general economic slowdown in the nation. In addition, we find that emerging technologies continue to stimulate competition and create new alternatives and choices for consumers.[34]

On September 9, 2004, the FCC adopted and released its *Fourth Report* pursuant to Section 706. Like the previous three reports, the FCC concluded that "the overall goal of Section 706 is being met, and that advanced telecommunications capability is indeed being deployed on a reasonable and timely basis to all Americans."[35] The FCC noted the emergence of new services such as VoIP, and the significant development of new broadband access technologies such as unlicensed wireless (WiFi)and broadband over power lines. The FCC noted the future promise of emerging multiple advanced broadband networks which can complement one another:

> For example, in urban and suburban areas, wireless broadband services may "fill in the gaps" in wireline broadband coverage, while wireless and satellite services may bring high-speed broadband to remote areas where wireline deployment may be costly. Having multiple advanced networks will also promote competition in price, features, and quality-of-service among broadband-access providers.[36]

Two FCC Commissioners (Michael Copps and Jonathan Adelstein) dissented from the *Fourth Report* conclusion that broadband deployment is reasonable and timely. They argued that the relatively poor world ranking of United States broadband penetration indicates that deployment is insufficient, that the FCC's continuing definition of broadband as 200 kilobits per second is outdated and is not comparable to the much higher speeds available to consumers in other countries, and that the use of zip code data (measuring the presence of at least one broadband subscriber within a zip code area) does not sufficiently characterize the availability of broadband across geographic areas.[37]

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[32] *Deployment of Advanced Telecommunications Capability: Second Report*, p. 6.

[33] *Third Report*, p. 5.

[34] Ibid., pp. 5-6.

[35] *Fourth Report*, p. 8.

[36] Ibid., p. 9.

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

While the FCC is currently implementing or actively considering some regulatory activities related to broadband,[38] no major regulatory intervention pursuant to Section 706 of the Telecommunications Act of 1996 has been deemed necessary by the FCC at this time.

On April 16, 2007, the FCC announced a Notice of Inquiry beginning its fifth inquiry under Section706 of the Telecommunications Act of 1996. Under this inquiry, the FCC will collect information on various market, investment, and technological trends relevant to the question of whether advanced telecommunications services is being made available to all Americans.[39]

Meanwhile, the National Telecommunications and Information Administration (NTIA) at the Department of Commerce (DOC) was tasked with developing the Bush Administration's broadband policy.[40] Statements from Administration officials indicated that much of the policy would focus on removing regulatory roadblocks to investment in broadband deployment.[41] On June 13, 2002, in a speech at the 21st Century High Tech Forum, President Bush declared that the nation must be aggressive about the expansion of broadband, and cited ongoing activities at the FCC as important in eliminating hurdles and barriers to get broadband implemented. President Bush made similar remarks citing the economic importance of broadband deployment at the August 13, 2002 economic forum in Waco, Texas.

Subsequently, a more formal Administration broadband policy was unveiled in March and April of 2004. On March 26, 2004, President Bush endorsed the goal of universal broadband access by 2007. Then on April 26, 2004, President Bush announced a broadband initiative which includes 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.[42]

The Bush Administration has also emphasized the importance of encouraging demand for broadband services. On September 23, 2002, the DOC's Office of

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[38] See Appendix C of the *Fourth Report*, "List of Broadband-Related Proceedings at the Commission," pp. 54-56.

[39] 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," GN Docket No. 07-45, FCC 07-21, released April 17, 2007, 21 p.

[40] See speech by Nancy Victory, Assistant Secretary for Communications and Information, before the National Summit on Broadband Deployment, October 25, 2001, [http://www.ntia.doc.gov/ntiahome/speeches/2001/broadband_102501.htm].

[41] Address by Nancy Victory, NTIA Administrator, before the Alliance for Public Technology Broadband Symposium, February 8, 2002, [http://www.ntia.doc.gov /ntiahome/speeches/2002/apt_020802.htm].

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

Technology Policy released a report, *Understanding Broadband Demand: A Review of Critical Issues*,[43] which argues that national governments can accelerate broadband demand by taking a number of steps, including protecting intellectual property, supporting business investment, developing e-government applications, promoting efficient radio spectrum management, and others. Similarly, the President's Council of Advisers on Science & Technology (PCAST) was tasked with studying "demand-side" broadband issues and suggesting policies to stimulate broadband deployment and economic recovery. The PCAST report, *Building Out Broadband*, released in December 2002, concludes that while government should not intervene in the telecommunications marketplace, it should apply existing policies and work with the private sector to promote broadband applications and usage. Specific initiatives include increasing e-government broadband applications (including homeland security); promoting telework, distance learning, and telemedicine; pursuing broadband-friendly spectrum policies, and ensuring access to public rights of way for broadband infrastructure.[44] Meanwhile, "high-tech" organizations such as TechNet,[45] the Computer Systems Policy Project (CSPP),[46] and the Semiconductor Industry Association (SIA)[47] have called on the federal government to adopt policies toward a goal of 100 Mbs to 100 million homes by the end of the decade.

Some policymakers in Congress assert that the federal government should play a more active role to avoid a "digital divide" in broadband access, and that legislation is necessary to ensure fair competition and timely broadband deployment. Bills have been introduced into past Congresses (and have been introduced or are expected in the 110th Congress) seeking to provide federal financial assistance for broadband deployment in the form of grants, loans, subsidies, and/or tax credits.

State and Local Broadband Activities. In addition to federal support for broadband deployment, there are programs and activities ongoing at the state and local level. Surveys, assessments, and reports from the American Electronics Association,[48] Technet,[49] the Alliance for Public Technology,[50] the California Public

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[43] Available at [http://www.technology.gov/reports/TechPolicy/Broadband_020921.pdf].

[44] President's Council of Advisors on Science and Technology, Office of Science and Technology Policy, *Building Out Broadband*, December 2002, 14 p. Available at [http://www.ostp.gov/PCAST/FINAL%20Broadband%20Report%20With%20Letters.pdf].

[45] TechNet represents over 300 senior executives from companies in the fields of information technology, biotechnology, venture capital, investment banking, and law. TechNet's policy document, "A National Imperative: Universal Availability of Broadband by 2010," is available at [http://www.technet.org/news/release/?postId=6265&pageTitle=TechNet+CEOs+Call+for+National+Broadband+Policy].

[46] CSPP is composed of nine CEOs from computer hardware and information technology companies. See "A Vision for 21st Century Wired & Wireless Broadband: Building the Foundation of the Networked World," [http://www.cspp.org/documents/networkedworld.pdf]

[47] See Semiconductor Industry Association, "Removing Barriers to Broadband Deployment," [http://www.sia-online.org/downloads/Broadband_Combined.pdf].

[48] American Electronics Association, *Broadband in the States 2003: A State-by-State* (continued...)

Utilities Commission,[51] the AEI-Brookings Joint Center,[52] and the National Conference of State Legislatures[53] have explored state and local broadband programs. A related issue is the emergence of municipal broadband networks (primarily wireless and fiber based) and the debate over whether such networks constitute unfair competition with the private sector (for more information on municipal broadband, see CRS Report RS20993, *Wireless Technology and Spectrum Demand: Advanced Wireless Services*, by Linda K. Moore).

Federal Programs Supporting Broadband

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.

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.

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[48] (...continued)
Overview of Broadband Deployment, May 22, 2003. [http://www.aeanet.org/publications/idet_broadbandstates03.asp]

[49] TechNet, *The State Broadband Index: An Assessment of State Policies Impacting Broadband Deployment and Demand*, July 17, 2003, 48 p. Available at [http://www.michigan.gov/documents/State_Broadband_Index_71282_7.pdf].

[50] Alliance for Public Technology, *A Nation of Laboratories: Broadband Policy Experiments in the States*, March 5, 2004, 48 p. Available at [http://www.apt.org/publications/reports-studies/broadbandreport_final.pdf].

[51] California Public Utilities Commission, *Broadband Deployment in California*, May 5, 2005, 83 p. Available at [http://www.cpuc.ca.gov/static/telco/reports/broadbandreport.htm].

[52] Wallsten, Scott, AEI-Brookings Joint Center for Regulatory Studies, *Broadband Penetration: An Empirical Analysis of State and Federal Policies*, Working Paper 05-12, June 2005, 29 p. Available at[http://aei-brookings.org/admin/authorpdfs/page.php?id=1161].

[53] For a summary of selected state broadband bills, see [http://www.ncsl.org/programs/telecom/broadband0906.htm].

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.

The Universal Service Concept and the FCC.[54] 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...."[55] 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 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.[56]

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.[57] 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.

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[54] 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.

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

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

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

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."

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, $17 billion in funding has been committed over the first eight years of the program with funding released to all states, the District of Columbia and all territories. Funding commitments for funding Year 2006 (July 1, 2006 - June 30, 2007), the ninth and current year of the program, totaled $1.9 billion as of July 18, 2007.[58]

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-

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

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 13, 2007, covering the first nine years of the program, a total of $183.9 million has been committed to 3,517 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.[59]

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 overseen by a seven-member board of directors and fund management. The purpose of the TDF is threefold: to promote access to capital for small businesses in order to enhance competition in the telecommunications industry; to stimulate new technology development and promote employment and training; and to support universal service and enhance the delivery of telecommunications services to rural and underserved areas. The TDF is authorized to provide financing to eligible small businesses in the telecommunications industry through loans and investment capital. At this time the TDF is focusing on providing financing in the form of equity investments and has two funds with 5 companies in each portfolio.[60] Initial funding for the program is derived from the interest earned from the upfront payments bidders submit to participate in FCC auctions. The availability of funds for future investments is dependent on earning a successful return on the Fund's portfolio. The TDF had $50 million under management and makes preferred equity investments of $500K-$2.5 million.[61]

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

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

[60] The TDF also provides management and technical assistance to the companies in which it invests.

[61] For additional information on this program see the TDF website at [http://www .tdfund.com]

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, in July 2002, concluded such an inquiry and recommended that at this time no changes be made in the current list of services eligible for universal service support. The FCC, in a July 10, 2003 order (FCC 03-170) adopted the Joint Board's recommendation thereby leaving unchanged the list of services supported by Federal universal service.

Rural Utilities Service. 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 current

authorization for the Rural Broadband Access Loan and Loan Guarantee Program expires on September 30, 2007. It is expected that the 110th Congress will consider reauthorization of the program as part of the 2007 farm bill. 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.

Legislation in the 109th Congress

In the 109th Congress, legislation was introduced to provide financial assistance to encourage broadband deployment (including loans, grants, and tax incentives), and to allocate additional spectrum for use by wireless broadband applications. Of particular note was enactment of the Deficit Reduction Act of 2005 (P.L. 109-171), which set a hard deadline for the digital television transition, thereby reclaiming analog television spectrum to be auctioned for commercial applications such as wireless broadband.

Legislation in the 110th Congress

In the 110th Congress, legislation has been introduced that would provide financial assistance for broadband deployment. Of particular note is the reauthorization of the Rural Utilities Service (RUS) broadband program, which is being considered as part of the 2007 farm bill (H.R. 2419). Legislation to reform universal service (H.R. 2054, S. 101, S. 711) — which could have a significant impact on the amount of financial assistance available for broadband deployment in rural and underserved areas — has also been introduced. Additionally, Congress is considering broadband data bills (S. 1492 in the Senate Commerce, Science, and Transportation Committee, an unnumbered draft bill in the House Energy and Commerce Committee).

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 complete listing of bills in the 110th Congress.

H.R. 42 (Velazquez)
Serving Everyone with Reliable, Vital Internet, Communications and Education Act of 2007. Directs the FCC to expand assistance provided by the Lifeline Assistance Program and the Link Up Program to include broadband service. Introduced January 4, 2007; referred to Committee on Energy and Commerce.

H.R. 1818 (Matsui)
Broadband Deployment Acceleration Act of 2007. Amends the Internal Revenue Code of 1986 to provide for the expensing of broadband Internet access

expenditures. Introduced March 29, 2007; referred to Committee on Ways and Means.

H.R. 2035 (Herseth Sandlin)

Rural Broadband Improvement Act. Amends the Rural Electrification Act of 1936 to modify the broadband loan program at the Rural Utilities Service by narrowing the definition of "eligible rural community" and by limiting loans awarded to applicants proposing to serve areas that already have a broadband provider. Introduced April 25, 2007; referred to Committee on Agriculture and to Committee on Energy and Commerce.

H.R. 2054 (Boucher)

Universal Reform Act of 2007. Targets universal service support specifically to eligible telecommunications carriers in high-cost geographic areas to ensure that communications services and high-speed broadband services are made available throughout all of the States of the United States in a fair and equitable manner. Introduced April 26, 2007; referred to Committee on Energy and Commerce.

H.R. 2174 (Salazar)

Rural Broadband Initiative Act of 2007. Establishes an Office of Rural Broadband Initiatives within the Department of Agriculture which will administer all rural broadband grant and loan programs previously administered by the Rural Utilities Service. Also establishes a National Rural Broadband Innovation Fund which would fund experimental and pilot rural broadband projects and applications. Introduced May 3, 2007; referred to Committee on Agriculture and to Committee on Energy and Commerce.

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

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.

H.R. 2419 (Peterson)

Farm Bill Extension Act of 2007. Reauthorizes broadband program at the Rural Utilities Service through FY2012. 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.

H.R. 2569 (Graves)

Rural Broadband Deployment Act. Codifies certain changes proposed by USDA to the rules governing eligibility for the rural broadband access program. Specifically, would relax market survey requirements and eliminate the credit support requirement, including the cash-on-hand requirement. Introduced June 5, 2007;

referred to Committee on Agriculture, and in addition to the Committee on Energy and Commerce.

H.R. 2720 (Kind)

FARM 21 Act of 2007. Amends the Farm Security and Rural Investment Act of 2002 to direct that the Secretary of USDA shall make available funds of the Commodity Credit Corporation to the rural broadband loan program as follows: $10 million for each of fiscal years 2008 through 2012. Also specifies criteria to be applied by USDA in considering applications for all rural development projects. Introduced June 14, 2007; referred to Committee on Agriculture, and in addition to the Committees on Education and Labor, Foreign Affairs, and Ways and Means.

H.R. 2953 (Space)

Rural Broadband Access Enhancement Act. Seeks to redefine "eligible rural community, streamline application process and lowers equity requirements, restricts loans to communities with existing broadband providers, eliminates limitation on eligibility based on number of subscriber lines, sets 35-year maximum on term of loan repayment, and directs USDA/RUS to meet specific reporting requirements. Introduced July 10, 2007; referred to Committee on Agriculture and Committee on Energy and Commerce.

H.R. 3161 (DeLauro)

Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations, 2008. Provides $6.45 million to support a loan level of $300 million for the broadband loan program, and $17.82 million for broadband community connect grants. Introduced July 24, 2007; referred to Committee on Appropriations. Reported by Committee on Appropriations, July 24, 2007 (H.Rept. 110-258; placed on Union Calendar. Passed House, August 2, 2007.

H.R. 3281 (Boucher)

Community Broadband Act of 2007. Sets forth that no state regulation or requirement shall prevent a public provider from offering broadband services, and prohibits a municipality from discriminating against competing private providers. Introduced August 1, 2007; referred to Committee on Energy and Commerce.

H.R. 3428 (McHugh)

Rural America Digital Accessibility Act. Provides for grants, loan guarantees, research, and tax credits to promote broadband deployment in underserved rural areas. Introduced August 3, 2007; referred to Committee on Energy and Commerce and in addition to the Committee on Ways and Means and the Committee on Science and Technology.

S. 101 (Stevens)

Universal Service for Americans Act ("USA Act"). Directs the FCC to establish Broadband for Unserved Area Areas Program to be funded by the Universal Service Fund. Requires communications carriers to submit detailed broadband deployment data to the FCC. Introduced January 4, 2007; referred to Committee on Commerce, Science, and Transportation.

S. 541 (Feingold)

Rural Opportunities Act of 2007. Directs the FCC to collect more detailed broadband deployment data and to periodically revise its definition of broadband above 200 kbps. Directs the Secretary of Agriculture to report on the adoption or planned adoption of the recommendations contained in the September 2005 audit report by the Inspector General of the United States Department of Agriculture. Introduced February 8, 2007; referred to Committee on Agriculture, Nutrition and Forestry.

S. 711 (Smith)

Universal Service for the 21st Century Act. Expands the contribution base for universal service and establishes a separate account within the universal service fund to support the deployment of broadband service in unserved areas. Introduced February 28, 2007; referred to Committee on Commerce, Science, and Transportation.

S. 761 (Reid)

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 March 5, 2007; placed on Senate Legislative Calendar, March 6, 2007. Passed Senate April 25, 2007. Senate incorporated this measure in H.R. 2272 as an amendment July 19, 2007.

S. 1032 (Clinton)

Rural Broadband Initiative Act of 2007. Establishes an Office of Rural Broadband Initiatives within the Department of Agriculture which will administer all rural broadband grant and loan programs previously administered by the Rural Utilities Service. Also establishes a National Rural Broadband Innovation Fund which would fund experimental and pilot rural broadband projects and applications. Introduced March 29, 2007; referred to Committee on Agriculture, Nutrition, and Forestry.

S. 1190 (Durbin)

Connect the Nation Act. Establishes a State Broadband Data and Development Grant Program within the Department of Commerce to help states develop and implement statewide initiatives to identify and track the availability and adoption of broadband services within each state. Authorizes $40 million for each of fiscal years 2008 through 2012. Introduced April 24, 2007; referred to Committee on Commerce, Science, and Transportation.

S.Res. 191 (Rockefeller)

Establishing a national goal for the universal deployment of next-generation broadband networks by 2015, and calling upon Congress and the President to develop a strategy, enact legislation, and adopt policies to accomplish this objective. Introduced May 8, 2007; referred to Committee on Commerce, Science, and Transportation.

S. 1264 (Coleman)

Rural Renaissance Act. Creates a Rural Renaissance Corporation which would fund qualified projects including projects to expand broadband technology in rural areas. Introduced May 2, 2007; referred to Committee on Finance.

S. 1439 (Roberts)

Rural Broadband Improvement Act of 2007. Reauthorizes the broadband and broadband loan guarantee program under Title VI of the Rural Electrification Act of 1936. Introduced May 21, 2007; referred to Committee on Agriculture, Nutrition, and Forestry.

S. 1492 (Inouye)

Broadband Data Improvement Act. Seeks to improve the quality of federal broadband data collection and encourage state initiatives that promote broadband deployment. Directs the FCC to reevaluate its current 200 kbps broadband standard and to develop a new metric for "second generation broadband" capable of transmitting high definition video content. Directs broadband providers to report to the FCC connections within either census tracts, nine digit (zip+4) postal zip code areas, or five digit postal zip code areas. Directs the FCC to conduct its Section 706 inquiry into the status of broadband deployment on an annual basis. Directs the Census Bureau to collect residential broadband data. Directs GAO to develop broadband metrics involving connection cost and capability information that could be used to improve the process of comparing U.S. broadband deployment with other countries. Directs the Small Business Administration to conduct a study evaluating the impact of broadband speed and cost on small businesses. Authorizes $40 million for each of fiscal years 2008 through 2012 to establish a State Broadband Data and Development Grant Program within the Department of Commerce to help states develop and implement statewide initiatives to identify and track the availability and adoption of broadband services within each state. Introduced May 24, 2007; referred to Committee on Commerce, Science, and Transportation. Ordered to be reported July 19, 2007.

S. 1745 (Mikulski)

Departments of Commerce and Justice, Science, and Related Agencies Appropriations Act, 2008. Provides $10 million to the Technology Opportunities Program (TOP) at the National Telecommunications and Information Administration, Department of Commerce, for grants to rural projects promoting broadband deployment in support of educational, cultural, healthcare, or other social services. Introduced June 29, 2007; referred to Committee on Appropriations. Reported to Senate, June 29, 2007 (S.Rept. 110-124); placed on Senate Legislative Calendar.

S. 1853 (Lautenberg)

Community Broadband Act of 2007. Sets forth that no state regulation or requirement shall prevent a public provider from offering broadband services, and prohibits a municipality from discriminating against competing private providers. Introduced July 23, 2007; referred to Committee on Commerce, Science, and Transportation.

S. 1859 (Kohl)

Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations, 2008. Provides $10.643 million to support a loan level of $495 million for the broadband loan program, and $8.9 million for broadband grants. Introduced July 24, 2007; referred to Committee on Appropriations. Reported to Senate (S.Rept. 110-134) July 24, 2007; placed on Senate Legislative Calendar.

Policy Issues

Legislation in the 110th Congress will likely seek to provide federal financial assistance for broadband deployment in rural and underserved areas. In assessing this legislation, several policy issues arise.

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) four broadband deployment reports.

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.[62] 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.[63]

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

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[62] 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.

[63] 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].

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.[64]

On April 16, 2007, the FCC announced a Notice of Proposed Rulemaking which seeks 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.[65]

State initiatives to collect broadband deployment data in order to promote broadband in underserved areas are being viewed by Congress as a possible model for governmental efforts to encourage broadband. In particular, an initiative in the Commonwealth of Kentucky — 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.[66] Other states are pursuing or considering similar approaches.

On the federal level, Congress is exploring ways to support or implement the types of broadband mapping and data collection efforts demonstrated by ConnectKentucky. In the House, draft legislation entitled the Broadband Census of America Act of 2007 was discussed in a hearing held by the House Subcommittee on Telecommunications and the Internet on May 17, 2007. The draft legislation would provide grants to states and local communities for broadband mapping, and would require NTIA to develop an interactive map of broadband deployment nationwide. The draft legislation also would provide grants to support state level public-private partnerships to identify and develop local broadband deployment and demand. Additionally, the draft legislation would direct the FCC to report on all available broadband speeds, and to report on broadband deployment either by five or nine digit zip code level, by census tract, or by a functional equivalent.

In the Senate, S. 1492, the Broadband Data Improvement Act introduced by Senator Inouye on May 24, 2007, and reported by the Senate Committee on

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[64] 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.

[65] 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 p.

[66] 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].

Commerce, Science, and Transportation on July 19, 2007, seeks to improve the quality of federal broadband data collection and encourage state initiatives that promote broadband deployment. Specifically, S. 1492 would: 1) direct the FCC to reevaluate its current 200 kbps broadband standard and to develop a new metric for "second generation broadband" capable of transmitting high definition video content; 2) direct broadband providers to report to the FCC connections within either census tracts, nine digit (zip+4) postal zip code areas, or five digit postal zip code areas; 3) direct the FCC to conduct its Section 706 inquiry into the status of broadband deployment on an annual basis; 4) direct the Census Bureau to collect residential broadband data; direct GAO to develop broadband metrics involving connection cost and capability information that could be used to improve the process of comparing U.S. broadband deployment with other countries; 5) direct the Small Business Administration to conduct a study evaluating the impact of broadband speed and cost on small businesses; and 6) authorize $40 million for each of fiscal years 2008 through 2012 to establish a State Broadband Data and Development Grant Program within the Department of Commerce to help states develop and implement statewide initiatives to identify and track the availability and adoption of broadband services within each state. The provision establishing state broadband data grants matches language in the Connect the Nation Act (S. 1190), previously introduced by Senator Durbin on April 24, 2007.

Is Federal Assistance for Broadband Deployment Premature or Inappropriate? Related to the data issue is the argument that government intervention in the broadband marketplace would be premature or inappropriate. Some argue that financial assistance for broadband deployment could distort private sector investment decisions in a dynamic and rapidly evolving marketplace, and question whether federal tax dollars should support a technology that has not yet matured, and whose societal benefits have not yet been demonstrated.[67]

On the other hand, proponents of financial assistance counter that the available data show, in general, that the private sector will invest in areas where it expects the greatest return — areas of high population density and income. Without some governmental assistance in underserved areas, they argue, it is reasonable to conclude that broadband deployment will lag behind in many rural and low income areas.[68]

Which Approach is Best? If one assumes that governmental action is appropriate to spur broadband deployment in underserved areas, which specific approaches, either separately or in combination, would likely be most effective? Targeted grants and loans from several existing federal programs have been proposed, as well as tax credits for companies deploying broadband systems in rural

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[67] See Leighton, Wayne A., *Broadband Deployment and the Digital Divide: A Primer*, a Cato Institute Policy Analysis, No. 410, August 7, 2001, 34 pp. Available at [http://www.cato.org/pubs/pas/pa410.pdf]. Also see Thierer, Adam, *Broadband Tax Credits, the High-Tech Pork Barrel Begins*, Cato Institute, July 13, 2001, available at [http://www.cato.org/tech/tk/010713-tk.html].

[68] See for example: Cooper, Mark, Consumer Federation of America and Consumers Union, *Expanding the Digital Divide & Falling Behind on Broadband*, October 2004, 33 pages. Available at [http://www.consumersunion.org/pub/ddnewbook.pdf]

and low-income areas. How might the impact of federal assistance compare with the effects of regulatory or deregulatory actions?[69] And finally, how might any federal assistance programs best compliment existing "digital divide" initiatives by the states, localities, and private sector?

[69] See CRS Report RL33542, *Broadband Internet Access: Background and Issues*, by Angele A. Gilroy and Lennard G. Kruger, for a discussion of regulatory issues.

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

Program	Agency	Description	FY2006 (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	$19.7 million	[http://www.ntia.doc.gov/otiahome/ptfp/index.html]
Grants 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	$158.1 million	[http://www.eda.gov/]

Program	Agency	Description	FY2006 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
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); $420 million (cost of money loans); $175 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	$54.4 million (grants) $25 million (loans)	[http://www.usda.gov/rus/telecom/dlt/dlt.htm]

Program	Agency	Description	FY2006 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
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	$2032 million (cost of money loan) $46 million (4% loan) $79 million (loan guarantee)	[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.	$9 million	[http://www.usda.gov/rus/telecom/index.htm]
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	$272 million	[http://www.ed.gov/Technology/TLCF/index.html]

Program	Agency	Description	FY2006 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
Star Schools	Office of Assistant Secretary for Educational Research and Improvement, Dept. of Education	Grants to telecommunication partnerships for telecommunications facilities and equipment, educational and instructional programming	$14.8 million	[http://www.ed.gov/programs/starschools/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.	$10.9 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	$38.4 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.	$3.4 million	[http://www.hrsa.gov/telehealth/]

Program	Agency	Description	FY2006 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
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	$65.2 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	$163.7 million	[http://www.imls.gov/grants/library/lib_gsla.asp#po]

Program	Agency	Description	FY2006 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
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	$3.6 million	[http://www.imls.gov/grants/library/lib_nat.asp]
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.	$62 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	$139 million	[http://www.denali.gov/]

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

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, the 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.

Program	Comments
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.
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.

Program	Comments
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 Star Schools, 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.

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