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Broadband Internet Access and the Digital Divide: Federal Assistance Programs

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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, also known as *broadband*. 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.

Broadband technologies are currently being deployed 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 into the 109th Congress (H.R. 144, H.R. 146, S. 14) seeks to provide federal financial assistance for broadband deployment in the form of grants, loans, subsidies, and tax credits. In assessing this legislation, several policy issues arise. For example, is the current status of broadband deployment data an adequate basis on which to base policy decisions? Given the early stages of broadband deployment, 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.

Contents

Background 1
Broadband in Rural and Underserved Areas 2
Federal Role 5
State and Local Broadband Activities 8
Federal Telecommunications Development Programs 9
The Universal Service Concept and the FCC 9
Universal Service and the Telecommunications Act of 1996 . . . 10
Universal Service and Broadband 11
Rural Utilities Service 12
Rural Broadband Access Loan and Loan Guarantee Program . . . 13
Community Connect Broadband Grants 14
Department of Commerce 15
Legislation in the 108th Congress 15
Legislation in the 109th Congress 18
Policy Issues 19
Is Broadband Deployment Data Adequate? 19
Is Federal Assistance for Broadband Deployment Premature or Inappropriate? 19
Which Approach is Best? 20
Appendix – Catalog of Selected State and Local Broadband Activities . . . 27

List of Tables

Table 1. Selected Federal Domestic Assistance Programs Related to Telecommunications Development 21

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, is the sixth Department of Commerce report examining the use of computers, the Internet, and other information technology. For the first time, the DOC report focuses 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 December 22, 2004), as of June 30, 2004 there were 32.5 million high speed lines connecting homes and businesses to the Internet in the United States, a growth rate of 15% during the first half of 2004. Of the 32.5 million high speed lines reported by the FCC, 30.1 million serve homes and small businesses.[8] While the broadband *adoption* rate stands at 20-30% of U.S. households, broadband *availability* is much higher. As of June 30, 2004, the FCC found at least one high-speed subscriber in 94% 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.[9]

Broadband in Rural and Underserved Areas. 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 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

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[6] For further information on different types of broadband technologies, including their respective strengths and limitations, see CRS Issue Brief IB10045, *Broadband Internet Access: Background and Issues*.

[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, 2004,* December 22, 2004. Available at [http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd1204.pdf]

[9] 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]

250,000, and broadband over the telephone network has been deployed in 56% of all cities with populations over 100,000.[10]

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.[11]

A study released in February 2004 by the Pew Internet & American Life Project found 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. Between 2000 and 2003, the study found that while the number of home broadband users grew from 8% to 36% of the online population in urban communities, and from 7% to 32% in suburban communities, the number of home broadband users in rural communities grew from 3% to 19%.[12]

According to the latest FCC data on the deployment of high-speed Internet connections (released December 22, 2004), high-speed subscribers were reported in 99% of the most densely populated zip codes, as opposed to 73% 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 81% of the bottom one-tenth of zip codes.[13]

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 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

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[10] 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]

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

[12] Pew Internet &American Life Project, *Rural Areas and the Internet*, p. 14. Available at [http://www.pewinternet.org/pdfs/PIP_Rural_Report.pdf]

[13] FCC, *High-Speed Services for Internet Access: Status as of June 30, 2004,* December 22, 2004, p. 4-5. Available at [http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd1204.pdf]

progress in closing the gaps in access that these groups traditionally have experienced.[14]

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."[15] The report also found that broadband penetration rates are higher in the West and Northeast than in the South and Midwest.[16] 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.[17]

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.[18]

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 13th worldwide in broadband penetration (subscriptions per 100 inhabitants as of January 2004).[19] Similarly, data from the Organization for Economic Cooperation and Development (OECD) found the U.S. ranking 10th among OECD nations in broadband access per

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

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

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

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

[18] 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]

[19] International Telecommunications Union, *ITU Strategy and Policy Unit Newslog*, September 15, 2004. Available at [http://www.itu.int/osg/spu/newslog/categories/broadband/2004/09/15.html#a720]

100 inhabitants as of December 2003.[20] By contrast, in 2001 an OECD study found the U.S. ranking 4th in broadband subscribership per 100 inhabitants (after Korea, Sweden, and Canada).[21]

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."[22] 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 continues, and extensive investment is pouring into this segment of the economy.[23]

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[20] OECD, *Broadband Access in OECD Countries per 100 inhabitants*, December 2003, Released June 22, 2004, available at [http://www.oecd.org/document/4/0,2340,en_2649_34225_32248324_1_1_1_1,00.html]

[21] 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 pages.

[22] 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]

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

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."[24] 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.[25]

On September 9, 2004, the FCC adopted and released its *Fourth Report* pursuant to Section 706. Like the previous three reports, the FCC concludes 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."[26] The FCC notes 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 notes 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.[27]

Two FCC Commissioners (Michael Copps and Jonathan Adelstein) dissent from the *Fourth Report* conclusion that broadband deployment is reasonable and timely. They argue 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.[28]

While the FCC is currently implementing or actively considering some regulatory activities related to broadband,[29] no major regulatory intervention pursuant

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

[25] *Ibid*., p. 5-6.

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

[27] *Ibid*., p. 9.

[28] *Ibid*., p. 5, 7.

[29] See Appendix C of the *Fourth Report*, "List of Broadband-Related Proceedings at the (continued...)

to Section 706 of the Telecommunications Act of 1996 has been deemed necessary by the FCC at this time. Meanwhile, the National Telecommunications and Information Administration (NTIA) at the Department of Commerce (DOC) was tasked with developing the Bush Administration's broadband policy.[30] Statements from Administration officials indicated that much of the policy would focus on removing regulatory roadblocks to investment in broadband deployment.[31] 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, President Bush endorsed the goal of universal broadband access by 2007.[32] 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.[33]

The Bush Administration has also emphasized the importance of encouraging demand for broadband services. On September 23, 2002, the DOC's Office of Technology Policy released a report, *Understanding Broadband Demand: A Review of Critical Issues*,[34] 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

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[29] (...continued)
Commission," pp. 54-56.

[30] 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]

[31] 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]

[32] Allen, Mike, "Bush Sets Internet Access Goal," *Washington Post*, March 27, 2004.

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

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

security); promoting telework, distance learning, and telemedicine; pursuing broadband-friendly spectrum policies, and ensuring access to public rights of way for broadband infrastructure.[35] Meanwhile, "high-tech" organizations such as TechNet,[36] the Computer Systems Policy Project (CSPP)[37], and the Semiconductor Industry Association (SIA)[38] 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. Numerous bills were introduced into the 108th 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,[39] Technet,[40] and the Alliance for Public Technology[41] have explored state and local broadband programs.

The Appendix of this report provides a state-by-state catalog of selected state and local broadband programs and activities. This information was compiled by the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin as part of a Policy Research Project (PRP) conducted under contract to the Congressional Research Service.

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[35] 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]

[36] 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/newsreleases/2002-01-15.64.pdf]

[37] 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/reports/networkedworld.pdf]

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

[39] American Electronics Association, *Broadband in the States 2003: A State-by-State Overview of Broadband Deployment*, May 22, 2003. [http://www.aeanet.org/publications/idet_broadbandstates03.asp]

[40] TechNet, *The State Broadband Index: An Assessment of State Policies Impacting Broadband Deployment and Demand*, July 17, 2003, 48 p. Available at [http://www.technet.org/resources/State_Broadband_Index.pdf]

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

Federal Telecommunications Development Programs

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.

The Universal Service Concept and the FCC.[42] 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...."[43] 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.[44]

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.[45] 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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[42] The section on universal service was prepared by Angele Gilroy, Specialist in Telecommunications Policy, Resources, Science and Industry Division.

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

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

[45] 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 USC 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, $12.9 billion in funding has been committed over the first six years of the program with funding released to all states, the District of Columbia and all territories. Funding commitments for funding Year 2004, the seventh and current year of the program, totaled $1.1 billion as of December 3, 2004.[46]

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

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[46] For information on the status, funding and implementation of the program see CRS Issue Brief IB98040, *Telecommunications Discounts for Schools and Libraries: The "E-Rate" Program and Controversies,* by Angele A. Gilroy.

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.[47] 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 returned to a $400 million cap for the three most recent years. As of December 31,2004, covering the first seven years of the program, a total of $89.7 million has been committed to 2,327 rural health care providers. The primary use of the funding is to provide reduced rates for telecommunications services necessary for the provision of health care.[48]

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 ranging from $375,000 to $1 million per investment.[49] 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. As of March 11, 2004, the TDF had $50 million under management of which approximately $13-15million is committed to thirteen portfolio companies.[50]

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

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[47] Any health care provider that does not have toll-free access to the Internet can receive the lesser of $180 in toll charges per month or the toll charges incurred for 30 hours of access to the Internet per month. To obtain this support the health care provider does not have to be located in a rural area, but must show that it lacks toll-free Internet access and that it is an eligible health care provider.

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

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

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

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 services 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, 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). The RTB is described as a public-private partnership intended to provide additional sources of capital that will supplement loans made directly by RUS. Another program, the Distance Learning and Telemedicine Program, specifically addresses the needs engendered by passage

of the Telecommunications Act of 1996 (P.L. 104-104). Its passage has contributed to an increase in demand for telecommunications loans. Currently, the 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.

Rural Broadband Access Loan and Loan Guarantee Program. The Farm Security and Rural Investment Act of 2002 (P.L. 107-171) authorized a loan and loan guarantee program to eligible entities for facilities and equipment providing broadband service in rural communities. Section 6103 makes available, from the funds of the Commodity Credit Corporation (CCC), a total of $100 million through FY2007 ($20 million for each of fiscal years 2002 through 2005, and $10 million for each of fiscal years 2006 and 2007). P.L. 107-171 also authorizes any other funds appropriated for the broadband loan program. On January 30, 2003, the RUS published in the *Federal Register* amended regulations establishing the Rural Broadband Access Loan and Loan Guarantee Program, as authorized by P.L. 107-171.[51] For FY2003, loans totaling $1.455 billion were made available. Of this total, $1.295 billion was for direct cost-of-money loans, $80 million for direct 4-percent loans, and $80 million for loan guarantees.[52] For FY2003, the RUS received over 80 applications requesting loans totaling $1 billion.

In its FY2004 budget request, the Administration proposed cancelling the mandatory $20 million from the Commodity Credit Corporation (as provided in P.L. 107-171), while providing $9.1 million in discretionary funding through the FY2004 appropriations process. The $9.1 million in discretionary budget authority would support almost $200 million in loans during FY2004. In addition, the Administration proposed $2 million for broadband grants in FY2004. The FY2004 House Agriculture Appropriations bill, passed by the House on July 14, 2003 (H.R. 2673; H.Rept. 108-193) also cancels the mandatory $20 million from the Commodity Credit Corporation, while providing $9.1 million in loan subsidies and $8 million for broadband grants. The Senate Agriculture Appropriations bill, as passed by the Senate on November 6, 2003, while also blocking the $20 million from the Commodity Credit Corporation, provides $15.1 million in loan subsidies and $10 million in broadband grants. The Conference Agreement on the FY2004 Consolidated Appropriations Act (H.R. 2673; H.Rept. 108-401) provides $13.1 million in loan subsidies (which will support a loan level of $602 million) and $9 million for broadband grants. The FY2004 Consolidated Appropriations Act was signed into law on January 23, 2004 (P.L. 108-199).

For FY2004, $38.8 million (mandatory budget authority) is carried over from prior years and is available to support a direct and guaranteed loan level of $1.6 billion. Additionally, the $13.1 million of discretionary budget authority (appropriated for FY2004) supports a loan level of $600 million. Therefore, the total loan level available for FY2004 is about $2.2 billion. On March 29, 2004, RUS

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[51] Rural Utilities Service, USDA, "Rural Broadband Access Loans and Loan Guarantees," *Federal Register*, Vol. 68, No. 20, January 30, 2003, pp. 4684-4692.

[52] Rural Utilities Service, USDA, "Rural Broadband Access Loans and Loan Guarantees Program," *Federal Register*, Vol. 68, No. 20, January 30, 2003, pp. 4753-4755.

announced the availability of $2.211 billion, consisting of $2.051 billion in direct cost-of-money loans, $80 million for direct 4 percent loans, and $80 billion for loan guarantees.[53]

The Administration's FY2005 budget proposal requested $9.9 million in discretionary authority, which would support about $331 million in loan levels (includes direct treasury rate loans, direct 4% loans, and guaranteed loans). The mandatory funding provided by the Farm Bill for 2004 and 2005, a total of $40 million, would be rescinded. The FY2005 House Agriculture Appropriations bill, passed by the House on July 13, 2004 (H.R. 4766; H.Rept. 108-584), provides $9.9 million (representing approximately $464 million in lending authority) for the cost of broadband treasury rate loans. The FY2005 Senate Agriculture Appropriations bill (S. 2803; S.Rept. 108-340) approved by the Senate Appropriations Committee on September 14, 2004, provides $12.78 million for the cost of broadband treasury rate loans (representing $600 million in lending authority). The FY2005 Consolidated Appropriations Act (P.L. 108-447) provides $11.715 million for the cost of broadband loans, representing $550 million in lending authority.

Community Connect Broadband Grants. Complementing the broadband loan program, the RUS has established a broadband pilot grant program which issues grants to applicants proposing to provide broadband service on a "community-oriented connectivity" basis to rural communities of under 20,000 inhabitants. The program targets rural, economically-challenged communities by providing support for broadband service to schools, libraries, education centers, health care providers, law enforcement agencies, public safety organizations, residents and businesses. In the program's initial year, FY2002, $20 million was made available; RUS received more than 300 applications requesting a total of $185 million. On May 15, 2003, RUS announced 40 awards totaling $20 million for the FY2002 program. On July 18, 2003, RUS announced the availability of $10 million for the FY2003 program; 34 FY2003 grant awards totaling $11.3 million were announced on September 24, 2003.

The FY2004 Consolidated Appropriations Act (P.L. 108-199) provides $9 million for broadband grants in FY2004. On July 28, 2004, the Secretary of Agriculture announced the availability of FY2004 funds for broadband grants. The application period closed on September 13, 2004. Awards were announced on October 29, 2004.

The Administration's FY2005 budget proposal requests no funding for broadband grants. The FY2005 House Agriculture Appropriations bill, passed by the House on July 13, 2004 (H.R. 4766; H.Rept. 108-584), provides $9 million for broadband grants. The FY2005 Senate Agriculture Appropriations bill (S. 2803; S.Rept. 108-340) also provides $9 million for broadband grants. The FY2005 Consolidated Appropriations Act (P.L. 108-447) provides $9 million for broadband grants.

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[53] Rural Utilities Service, USDA, "Rural Broadband Access Loans and Loan Guarantees Program," *Federal Register*, Vol. 69, No.60, March 29, 2004, pp. 16231-16232.

Department of Commerce. The Technology Opportunities Program (TOP), formerly the Telecommunications and Information Infrastructure Assistance Program (TIAPP), is administered by the National Telecommunications and Information Administration (NTIA) at the Department of Commerce. TOP gives grants for model projects demonstrating innovative uses of advanced telecommunications technologies, especially in rural and underserved communities. Matching grants are awarded to state, local and tribal governments, health care providers, schools, libraries, police departments, and community-based non-profit organizations. Applications include distance learning, telemedicine, and economic development.

Since 1994, TOP has awarded 610 grants, totaling $233.6 million and leveraging $314 million in local matching funds. As broadband technologies become increasingly developed and deployed, it is likely that an increasing number of TOP grants will be related to broadband deployment.

In its FY2003 budget submission, the Administration proposed to terminate the TOP program. The FY2003 Omnibus Appropriations (P.L. 108-7) provides $15.5 million for TOP. In its FY2004 budget submission, the Administration again proposed to terminate the TOP program. The FY2004 Consolidated Appropriations Act (P.L. 108-199) provides $15 million for TOP in FY2004.

The Administration's FY2005 budget again proposes the termination of TOP. The House FY2005 Commerce, Justice, State appropriations bill (H.R. 4754; H.Rept. 108-576), passed on July 8, 2004, also provides no funding for TOP. The Senate FY2005 Commerce, Justice, State appropriations bill (S. 2809; S.Rept. 108-344), approved by the Senate Appropriations Committee on September 15, 2004, provides $14.82 million for TOP. The FY2005 Consolidated Appropriations Act (P.L. 108-447) adopts the House proposal, providing no new funding for TOP in FY2005.

Legislation in the 108th Congress

In the 108th 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. The FY2005 Consolidated Appropriations Act (P.L. 108-447) provides continued funding in FY2005 for the Rural Broadband Access Loan and Loan Guarantee Program and the Community Connect Broadband Grants in the Rural Utilities Service (RUS) of the U.S. Department of Agriculture. Also passed in the 108th Congress was the Commercial Spectrum Enhancement Act (Title II of P.L. 108-494, signed by the President on December 23, 2004), which seeks to make more spectrum available for wireless broadband and other services by facilitating the reallocation of spectrum from government to commercial users.

In the Jobs and Growth Tax Relief Reconciliation Act of 2003 (H.R. 2/P.L. 108-27), the Senate inserted a provision allowing the expensing of broadband Internet access expenditures. This provision was not retained during the House/Senate Conference. The broadband expensing provision was subsequently attached to S. 1637, the Jumpstart Our Business Strength (JOBS) Act, which was passed by the Senate on May 11, 2004 as a substitute amendment to H.R. 4520. However, the broadband expensing provision was not retained in the final version of H.R. 4520,

which subsequently became public law. The following is a complete listing of bills.

H.R. 138 (McHugh)

Rural America Digital Accessibility Act. Provides for grants, loans, research, and tax credits to promote broadband deployment in underserved rural areas. Introduced January 7, 2003; referred to Committee on Energy and Commerce, Committee on Ways and Means, and Committee on Science.

H.R. 340 (Issa)

Jumpstart Broadband Act. Requires the FCC to allocate additional spectrum for unlicensed use by wireless broadband devices. Introduced January 27, 2003; referred to Committee on Energy and Commerce.

H.R. 363 (Honda)

Jumpstart Broadband Act. Requires the FCC to allocate additional spectrum for unlicensed use by wireless broadband devices. Introduced January 27, 2003; referred to Committee on Energy and Commerce.

H.R. 768 (English)

Amends the Internal Revenue Code of 1986 to provide a broadband Internet access tax credit. Provides tax credits for five years to companies investing in broadband equipment. Provides a 10% tax credit for "current generation" broadband service (defined as download speeds of at least 1 million bits per second) for rural and low-income areas (both residential and business subscribers), and a 20% tax credit for "next generation" broadband service (defined as download speeds of at least 22 million bits per second) for all residential subscribers and business subscribers in rural and underserved areas. Introduced February 13, 2003; referred to Committee on Ways and Means.

H.R. 769 (English)

Amends the Internal Revenue Code of 1986 to allow the expensing of broadband Internet access expenditures. Introduced February 13, 2003; referred to Committee on Ways and Means.

H.R. 1396 (Markey)

Spectrum Commons and Digital Dividends Act of 2003. Uses proceeds of spectrum auctions to establish a Public Broadband Infrastructure Investments Program at the National Telecommunications and Information Administration. Introduced March 20, 2003; referred to Committee on Energy and Commerce.

H.R. 3089 (Andrews)

Greater Access to E-Governance Act. Establishes grant program at the Department of Commerce to provide funds to State and local governments to enable them to deploy broadband computer networks for the conduct of electronic governance transactions by citizens in local schools and libraries. Introduced September 16, 2003; referred to Committee on Energy and Commerce.

H.R. 4699 (McHugh)

Establishes a grant program to support broadband-based economic development efforts. Introduced June 24, 2004; referred to Committee on Transportation and Infrastructure and to Committee on Financial Services.

H.R. 5419 (Upton)

Commercial Spectrum Enhancement Act. Facilitates the relocation of spectrum from governmental to commercial users. Introduced November 20, 2004; referred to Committee on Energy and Commerce. Passed House November 20, 2004. Passed Senate December 8, 2004. P.L. 108-494 signed by President December 23, 2004.

S. 159 (Boxer)

Jumpstart Broadband Act. Requires the FCC to allocate additional spectrum for unlicensed use by wireless broadband devices. Introduced January 14, 2003; referred to Committee on Commerce, Science and Transportation.

S. 160 (Burns)

Amends the Internal Revenue Code of 1986 to allow the expensing of broadband Internet access expenditures. Introduced January 14, 2002; referred to Committee on Finance.

S. 305 (Kerry)

Amends the Internal Revenue Code of 1986 to include in the criteria for selecting any project for the low-income housing credit whether such project has high-speed Internet infrastructure. Introduced February 5, 2003; referred to Committee on Finance.

S. 414 (Daschle)

Economic Recovery Act of 2003. Provides a 10% tax credit for "current generation" broadband service (defined as download speeds of at least 1.0 million bits per second) for rural and low-income areas, and a 20% tax credit for "next generation" broadband service (defined as download speeds of at least 22 million bits per second). Introduced February 14, 2003; placed on Senate Legislative Calendar.

S. 905 (Rockefeller)

Provides tax credits for five years to companies investing in broadband equipment. Provides a 10% tax credit for "current generation" broadband service (defined as download speeds of at least 1.0 million bits per second) for rural and low-income areas, and a 20% tax credit for "next generation" broadband service (defined as download speeds of at least 22 million bits per second). Introduced April 11, 2003; referred to Committee on Finance.

S. 1637 (Frist)

Jumpstart Our Business Strength Act. Allows the expensing of broadband Internet access expenditures. Introduced September 18, 2003; referred to Committee on Finance. Reported by Committee on Finance (S.Rept. 108-192) on November 7, 2003; placed on Senate Legislative Calendar. Passed by the Senate, May 11, 2004, as a substitute amendment to H.R. 4520. Senate Conferees appointed July 15, 2004.

S. 1796 (Coleman)

Rural Renaissance Act. Establishes a Rural Renaissance Corporation which would fund a variety of types of rural revitalization projects, including a project to expand broadband technology. Introduced October 29, 2003; referred to Committee on Finance.

S. 2577 (Clinton)

Broadband Rural Research Investment Act of 2004. Authorizes $25 million for the National Science Foundation to fund research on broadband services in rural and other remote areas. Introduced June 24, 2004; referred to Committee on Commerce, Science, and Transportation.

S. 2578 (Clinton)

Broadband Expansion Grant Initiative of 2004. Authorizes $100 million in grants and loan guarantees from the Department of Commerce for deployment by the private sector of broadband telecommunications networks and capabilities to underserved rural areas. Introduced June 24, 2004; referred to Committee on Commerce, Science, and Transportation.

S. 2580 (Clinton)

Technology Bond Initiative of 2004. Provides an income tax credit to holders of bonds financing the deployment of broadband technologies. Introduced June 24, 2004; referred to Committee on Finance.

S. 2582 (Clinton)

Establishes a grant program to support broadband-based economic development efforts. Introduced June 24, 2004; referred to Committee on Environment and Public Works.

Legislation in the 109th Congress

Many of the legislative proposals related to providing financial assistance for broadband deployment are being reintroduced into the 109th Congress. A complete listing of bills is provided below.

H.R. 144 (McHugh)

Rural America Digital Accessibility Act. Provides for grants, loans, research, and tax credits to promote broadband deployment in underserved rural areas. Introduced January 4, 2005; referred to Committee on Energy and Commerce and the Committee on Ways and Means.

H.R. 146 (McHugh)

Establishes a grant program to support broadband-based economic development efforts. Introduced January 4, 2005; referred to Committee on Transportation and Infrastructure and to Committee on Financial Services.

S. 14 (Stabenow)

Fair Wage, Competition, and Investment Act of 2005. Allows the expensing of broadband Internet access expenditures. Introduced January 24, 2005; referred to Committee on Finance.

Policy Issues

Legislation introduced into the 109th Congress seeks 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.[54] 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 is extended for five years beyond its March 2005 expiration date.[55]

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

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[54] 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.

[55] 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]

question whether federal tax dollars should support a technology that has not yet matured, and whose societal benefits have not yet been demonstrated.[56]

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.[57]

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 and low-income areas. How might the impact of federal assistance compare with the effects of regulatory or deregulatory actions?[58] And finally, how might any federal assistance programs best compliment existing "digital divide" initiatives by the states, localities, and private sector?

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[56] 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].

[57] 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]

[58] See CRS Issue Brief IB10045 for a detailed discussion of regulatory issues.

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

Program	Agency	Description	FY2004 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
Technology Opportunities Program	National Telecommunications and Information Administration, Dept. of Commerce	Provides grants for model projects demonstrating innovative uses of advanced telecommunications technologies, especially in rural and underserved communities	$12.9 million	[http://www.ntia.doc.gov/otiahome/top/index.html]
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	$23.5 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	$198.3 million	[http://www.doc.gov/eda/]

Program	Agency	Description	FY2004 (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); $250 million (cost of money loans); $120 million (FFB Treasury loans)	[http://www.usda.gov/rus/telecom/index.htm]
Rural Telephone Bank Loans	Rural Utilities Service, U.S. Dept. of Agriculture	Provides supplemental financing to extend and improve telecommunications services in rural areas	$174 million	[http://www.usda.gov/rus/telecom/rtb/index_rtb.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	$39 million	[http://www.usda.gov/rus/telecom/dlt/dlt.htm]

Program	Agency	Description	FY2004 (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	$602 million	[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/initiatives/index_initiatives.htm#broadband]
Community Technology Centers Program	Office of Vocational and Adult Education Dept. of Education	Provides access to computers and technology, particularly educational technology, to adults and children in low-income communities in both urban and rural areas who otherwise would lack that access	$9.9 million	[http://www.ed.gov/fund/grant/apply/AdultEd/CTC/index.html]
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	$692 million	[http://www.ed.gov/Technology/TLCF/index.html]
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	$20.4 million	[http://www.ed.gov/programs/starschools/index.html]

Program	Agency	Description	FY2004 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
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.	$14.3 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	$39.1 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.	$5 million	[http://telehealth.hrsa.gov/grants.htm]
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	$66.3 million	[http://www.nlm.nih.gov/ep/extramural.html]

Program	Agency	Description	FY2004 (obligations)	Web Links for More Information [http://12.46.245.173/cfda/cfda.html]: Go to "All Programs Listed Numerically" and search by program
Interoperable Communications Equipment	Dept. of Homeland Security	Provide funding to jurisdictions across the nation for demonstration projects that will explore uses of equipment and technologies to increase interoperability among the fire service, law enforcement, and emergency medical service communities.	$79.7 million	[http://www.ojp.usdoj.gov/odp/library/bulletins.htm#grants]
Homeland Security Information Technology and Evaluation Program	Dept. of Homeland Security	To foster and identify novel uses of existing "state-of-the-market" information technology that will remove barriers and improve information sharing and integration of State and local public safety interoperability communications.	$9 million	[http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0454.xml]
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	$157.6 million	[http://www.imls.gov/grants/library/lib_gsla.asp#po]

Program	Agency	Description	FY2004 (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	$3.21 million	[http://www.imls.gov/grants/library/lib_nat.asp]
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	$55 million	[http://www.denali.gov]

Prepared by CRS based on information from the Catalog of Federal Domestic Assistance, updated November 2004.

Appendix – Catalog of Selected State and Local Broadband Activities[59]

ALABAMA

Alabama Research and Education Network

The Alabama Education and Research Network (AREN) provides high-speed Internet access for many public entities in Alabama including state government, universities, community colleges, K-12 schools, and libraries. Many colleges and K-12 schools receive free Internet access through AREN via funding from the Alabama Education Trust Fund. Some new education customers have to pay partial rates; however, private schools, commercial customers and 'general fund' state agencies must pay standard prices for Internet access through AREN. The Alabama Supercomputer Authority (ASA) is a state-funded corporation that runs AREN and the Alabama Supercomputer Center.

Facts about AREN. Available: [http://www.asc.edu/network/index.shtml]. Accessed: April 4, 2004.

ALASKA

GCI: Total network strategy

General Communications Inc. is a large telecommunications provider in Alaska. GCI has a commitment to the whole state of Alaska, not just the high-profit urban areas. By serving the smaller areas, the larger areas benefit by being able to be in contact with the remote villages. They feel that even if this means that GCI loses money in one village, the overall benefit of including them in the network outweighs that loss. Large consumers such as Wells Fargo are able to reach nearly all Alaskans because of this philosophy. Almost 70 percent of long distance in the state is provided by GCI mostly due to GCI's network investment and closing the network gap. GCI moved aggressively into the universal service arena and now USF pays for the bulk of the access in rural areas. The value of being able to deliver things and information virtually, rather than physically, is greater in Alaska than in other states due to the geographic challenges. GCI is involved in many rural areas' education and telehealth programs.

Duncan, Ron. President, GCI, Anchorage, Alaska. Personal interview, January 14, 2004.

USDA Rural Broadband Grant

The Regulatory Commission of Alaska is in charge of administering a $15 million grant from the U.S. Department of Agriculture (USDA) Rural Utility Services fund for increasing broadband access to rural areas in Alaska. The $15 million is technically two $7.5 million appropriations authorized in the Consolidated Farm and Rural Development Act. An Evaluation Grant Committee made up of several different people from different types of agencies including the Denali Commission

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[59] This information was compiled by the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin as part of a Policy Research Project (PRP) conducted under contract to the Congressional Research Service. The PRP was entitled, "Exploring the Digital Divide: Regional Differences in Patterns of Internet Use in the United States." The project involved 14 graduate students from the Master of Public Affairs program under the direction and supervision of Professor Kenneth S. Flamm.

help to review the applications and choose awardees. However, the complete list of the board's members and the recipients of the grant are not public yet as the application appeal process is still open. The main goals for the grant include serving communities with specific income and poverty levels and no local dial-up access. The intent is for the grant funding to provide hardware and technology.
Gazaway, Rich. Common Carrier Specialist, Regulatory Commission of Alaska, Anchorage, Alaska. Personal interview, January 14, 2004.
Government Technology. Available: [http://www.govtech.net/news/news.phtml ?docid=2002.08.14-3030000000018960]. Accessed: November 1, 2003.

ARIZONA

Community Telecommunications Assessment Program

The Government Information Technology Association runs the Community Telecommunications Assessment Program as a means of evaluating the availability of rural broadband service providers. If the CEA finds a gap in broadband availability, then the program will investigate the possibility of using grants, loans, or other public policy initiatives to encourage the deployment of broadband in the area..
Government Information Technology Agency E-Bits. Available: [http://gita.state.az.us/ebits/ebits/Winter%202003%20E-bits.htm]. Accessed: April 10, 2004.

Arizona's Rural Telecommunication Development Initiatives

From 2001 to 2006, Arizona will spend at least $100 million on the Telecommunications Open Partnerships of Arizona (TOPAZ). TOPAZ is a statewide network that is designed to bring broadband access to rural communities. Specifically, TOPAZ will provide broadband capabilities to 100 government offices in 167 rural communities in Arizona. In addition, GETA, the Department of Education and the School Facilities Board are working together to provide broadband to 545 rural schools. TOPAZ is the state's effort to build one large public network by contracting with nine telecommunication companies. Through TOPAZ, eligible organizations such as government offices, schools, libraries, colleges, and non-profit health providers, will be able to buy broadband services at competitive prices.
Government Information Technology Agency. Available: [http://gita.state.az.us/telecom/news/topazpr.htm].
Accessed: Jan 31, 2004.
Digital Divide Network. Available: [http://www.digitaldividenetwork.org /content/stories/index.cfm?key=134]. Accessed: Jan 31, 2004.

ARKANSAS

Arkansas State Video Network

The Office of Information Technology runs the Arkansas State Video Network which connects over 200 sites in the state to provide interactive video conferencing. The network is designed to support distance learning, telemedicine, and teleconferencing.
Video Network Project. Available: [http://www.oit.state.ar.us/AgPlan /Colloborative_Projects/video.htm]. Accessed: April 14, 2004.

Broadband Investment by AIR2LAN

The Enterprise Corporation of the Delta has invested $250,000 in the local ISP AIR2LAN to help subsidize broadband deployment to underserved areas that do not

already have other broadband options. See press release in reference citation for full story.
Enterprise Corporation of the Delta, Broadband Investment by AIR2LAN. Available: [http://www.ecd.org/news/news_files/ECD%20Invests%20in%20AIR2LAN.pdf]. Accessed: January 25, 2004.

CALIFORNIA

California Research and Education Network

The California Research and Education Network is a "multitiered advanced network-services fabric to serve all research and education in California." The network has three tiers: CalRen-XD (an experimental and development network), CalRen-HPR (a high performance–research network), and CalRen-DC (provides Internet to K-20 schools and staff).
CalREN. Available: [http://www.cenic.org/calren/index.html]. Accessed: April 14, 2004.

California Teleconnect Fund

The California Public Utilities Commission runs a program similar to e-rate called the California Teleconnect Fund (CTF). The CTF was founded in 1994 and began to provide discounts in 1997. Participating institutions include schools and libraries, hospitals, and community-based organizations (CBOs). Schools and libraries qualify for a 50 percent discount on switched 56 lines, ISDN, T-1, DS-3 and OC-192 services. Eligible schools include all public K-12 schools and private K-12 schools with endowments less than $50 million. Municipal and County owned and operated hospitals are eligible for a 20 percent discount on switched 56 lines, ISDN, T-1, and DS-3. CBOs qualify for a 25 percent discount on switched 56 lines (two), or ISDN lines (two), or one switched 56 line and one ISDN line, or one T1 line. Participation is very high among schools and libraries with over 6000 entities that participate in the program, however, CBOs and hospitals have not reached participation goals, with only 68 and 21, respectively.
CA Teleconnect Fund. Available: [http://www.cpuc.ca.gov/static/industry/telco/public+programs/ctf_faq.htm]. Accessed: April 10, 2004.
Final Report to the Legislature on the California Teleconnect Fund. Available: [http://www.cpuc.ca.gov/PUBLISHED/REPORT/33549.htm#P442_30054]. Accessed: April 10, 2004.

Center for Health and Technology

The University of California, Davis Health System created the Center for Health and Technology's Telemedicine Program in 1996 to bring telemedicine to nearly 80 facilities in California in predominantly rural settings. Some of their applications include mental health care, endocrinology and prenatal care. Through the Center, a number of telemedicine research projects have been initiated. The Telemedicine Learning Center was begun in 2003 with a grant from the California Telemedicine and e-Health Center to better educate and train medical providers in the uses of telemedicine. The Center began a research project in the uses of pediatric care in especially underserved communities. The project is focusing on how telemedicine consultations can increase the standard and quality of care for abused and injured children in these rural areas. In conjunction with the Center and the Medical Investigation of Neurodevelopmental Disorders (M.I.N.D.) Institute, a project was begun in 2002 to investigate 63 telemedicine uses in caring for children with autism

in rural communities. This project was supported by a grant from the National Institute of Mental Health.
Telemedicine Information Exchange. Available: [http://tie.telemed.org/programs /showprogram.asp?item=2728]. Accessed: April18, 2004.

Broadband Report (Response to Senate Bill 1712)
As directed by Senate Bill 1712, the Public Utilities Commission considered the proposal that universal service should be expanded to include broadband by requiring all carriers to provide broadband in their "basic service" package. In the Final Broadband Report, the Commission finds that broadband should not be required in the "basic service" package. The reason for this is as follows, (1) the public does not wish to subsidize broadband by telephone surcharges,(2) requiring broadband would quadruple the price of all customers' basic service packages, (3) only a limited number of Californians chose to subscribe to broadband where it is available, about 17 percent of those that have access subscribe to broadband, and (4) the Commission does not believe that broadband is an "essential service."
Broadband Report. Available: [http://www.cpuc.ca.gov/static/industry/telco/reports /020814_broadband_report.htm].
Accessed: April 8, 2004.

COLORADO
Colorado Multi-Use Network
The state of Colorado implemented the Multi-Use Network (MNT) to connect rural and urban communities in the state as a means to bridge the digital divide. MNT was originally conceived of in the 1998 "Strategic Plan for Statewide Telecommunications Infrastructure." The development of MNT began in 2000 when the state contracted with Qwest Communications to build the fiber optic network. The state has allocated $37 million to MNT over ten years, while Qwest has contributed $60 million dollars for construction. Qwest owns and maintains the network, which has a backbone infrastructure that consists of 70 Aggregated Network Access Points. The state plans to consolidate approximately 200 networks for state agencies and education into the MNT. In order to offset the costs of the network, the state added a 33 percent surcharge on telecommunications, and the funds are placed in the Colorado Digital Divide Elimination Fund.
The Colorado Department of Personnel and Administration Division of Information Technologies. Available: [http://www.colorado.gov/dpa/doit/mnt/]. Accessed: April 4, 2004.

Beanpole Initiative
The Beanpole Initiative, the sister project to the Multi-Use Network (MNT), handles "last mile" access so that rural entities can connect to the MNT. The Beanpole Bill was approved in 1999 and $4.7 million was allocated to distribute as grants to help rural communities connect to the MNT.
The Colorado Department of Personnel and Administration Division of Information Technologies. Available: [http://www.colorado.gov/dpa/doit/mnt/]. Accessed: April 4, 2004.

CONNECTICUT

Connecticut Education Network

In July 2000, the Department of Information Technology began planning for the Connecticut Education Network (CEN), an optical network that when complete will connect all public schools, libraries, and colleges in Connecticut to free high-speed Internet access. Deployment of the CEN has already begun with over 200 sites connected statewide. When the CEN is complete (scheduled for 2005), Connecticut will be the first state to have an all optical backbone that connects all public schools, which will allow the state to implement new state-wide learning opportunities.
Connecticut Education Network. Available: [http://www.ct.gov/cen/site/default.asp]. Accessed: February 11, 2004.

DELAWARE

Entrepreneurs Offer Broadband Services

Entrepreneurs and small business owners are taking action to increase broadband services in their areas by purchasing the equipment to offer wireless broadband access in some of Delaware's not-so-hot spots.
Delaware Online. Available:
[http://www.delawareonline.com/newsjournal/business/2003/05/18broadbandreache.html]
Accessed: November 25, 2003.

FLORIDA

Tele-Competition Innovation and Infrastructure Enhancement Act

In May 2003, under Senate Bill 654, the Tele-Competition Innovation and Infrastructure Enhancement Act was created to reduce network access rates and to protect broadband services from local government regulation, with the exception of right-of-ways. This act increases competition in the telephone industry and prohibits the regulation of Voice Over Internet Protocol.
Frequently Asked Questions about Telecommunications Legislation. Available:
[http://www.psc.state.fl.us/faq/telecom_legislation.cfm]. Accessed: April 15, 2004.

GEORGIA

Telecom Tax Credit

The state of Georgia offers telecommunication companies a state tax credit for existing telecom infrastructure. Tax credits are one percent, three percent, or five percent depending on location.
Telecommunications Industry Association. Available:
[http://www.tiaonline.org/policy/states.cfm]. Accessed: April 12, 2004.

Georgia Electronic Design Center – Yamacraw Initiative

The Yamacraw Initiative began in 1999. It is administered by the Georgia Centers for Advanced Telecommunications Technology. The state has set up the $5 million Yamacraw Seed Capital Fund, which is available to private companies that are improving infrastructure and developing new technologies. The funds that are received must be matched 3:1 by the private company.
GEDC. Available: [http://www.yamacraw.org/index.html]. Accessed: April 4, 2004.

HAWAII

Technology Infrastructure Renovation Tax Credit

Hawaii offers a tax credit for renovation of "technology-enabled infrastructure," such as broadband networks. The tax credit is four percent of the renovation costs.
Hawaii Statutes. Available: [http://www.capitol.hawaii.gov/hrscurrent /vol04_ch0201-0257/hrs0235/hrs_0235-0110_0051.htm]. Accessed: April 15, 2004.

Next Generation Network

Hawaii's Information and Communication Systems Division is currently overseeing the construction of the Next Generation Network, a fiber optic network that will connect all state buildings on all the islands. Verizon-Hawaii and Cisco systems have partnered with the state to build the network.
ICSD – Selective List of ISCD Projects. Available: [http://www.hawaii.gov /icsd/projects/]. Accessed: April 14, 2004.

IDAHO

IDANET

State of Idaho Internet (IDANET) is Idaho's broadband digital telecommunications initiative. To bring broadband to rural areas, IDANET serves as the State's attempt to leverage its telecommunications buying power by aggregating existing dollars spent by State agencies and Higher Education. By serving as anchor tenant, the State hopes to encourage commercial providers to deploy broadband telecommunications services in rural and urban Idaho to serve State government and others. The network should be completed in 2004. Recently, the State has entered into agreements with Electric Lightwave, Inc. (ELI), Qwest Corporation, and Syringa Networks, acquiring telecommunications services for IDANET.
IDAnet. Available: [http://www2.state.id.us/idanet/]. Accessed: January 18, 2004.

Idaho Rural Initiative

The Idaho Rural Initiative was adopted by the state legislature in 2001. Section 63-3029I of the Idaho Code enacts a three percent investment tax credit for companies investing in broadband equipment in Idaho. This tax credit lasts from January 1, 2001 to December 31, 2005.
Idaho Legislature. Available: [http://www3.state.id.us/oasis/2001/H0275.html]. Accessed: January 18, 2004.

Broadband Investment in Rural Idaho

As part of the Idaho Rural Initiative, Syringa Networks, LLC, a consortium of 12 Idaho local telecommunications companies, is investing $40 million in fiber optic cable and other digital equipment so that rural communities in southern and eastern Idaho will have broadband access. The 1,350 mile network runs from Council in the northwest to Soda Springs in the southeast. Syringa considers itself a middle-mile provider, connecting small and large towns. Recently, Syringa became one of the telecommunications companies that provides service to the state-operated IDANET.
Association for Telecommunications and Technology Professionals Serving State Government, Networks: 2003- 2004 NASTD State Reports, (Lexington, KY: 2003), p. 40.

ILLINOIS

Community Technology Grant Program

Under the Eliminate the Digital Divide Law, the Department of Commerce and Community Affairs is authorized to administer the Community Technology Grant Program with funding from the Digital Divide Elimination Fund. The fund was created by the State Treasury to subsidize the construction of high-speed Internet service or advanced telecommunications infrastructure, and related training for populations living in rural areas or low-income communities of the state. It provides grants to expand the Community Technology Centers. This fund was established in July 2003.

Illinois Department of Commerce and Economic Opportunity. Available: [http://www.illinoisbiz.biz/tech/tech_eliminate.html]. docid=2003.07.30-62042. Accessed: Jan 31, 2004.

INDIANA

Intelenet Grant Programs

The Intelenet Commission provides the Intelenet Basic Grant to K-12 schools to assist them in connecting to the Internet and to the Indiana Telecommunications Network (ITN). The grant provides schools with $10,000 per year to help them connect to the ITN. The Commission also offers the Video Distance Learning Grant, of which there were nearly 40 recipients in 2003. The Video Distance Learning Grants provide funding for custom video equipment packages.

Intelenet – School Grants. Available: [http://www.in.gov/intel/schoolgrants/]. Accessed: April 4, 2004.

Broadband Project

Broadband Project is a state-wide survey on current Internet use, especially broadband use in Indiana. This project focuses on small communities, and examines various areas such as basic infrastructure, e-Gov services, Internet access and use, attitude, etc.

State of Indiana. Available: [http://www.in.gov/doc/businesses/images /PowerPoint/Broadband.ppt#43]. Accessed: February 2, 2004.

State of Indiana. Available: [http://www.in.gov/doc/businesses/eBroadband.htm]. Accessed: February 2, 2004.

Indiana Telecommunications Network

The Indiana Telecommunications Network (ITN) was created to efficiently serve the public sector's telecommunications needs by consolidation into one state-wide network. Members of the ITN include K-12 schools, public libraries, government offices, and higher education institutions. ITN was established through cooperation between the Intelenet Commission of the state of Indiana and the Indiana Higher Education Telecommunication System. ITN members purchase Internet connections ranging from a DS-3 service to primary T-1 line to a 56k line; prices range from $7,000 to $400 a month. The network is projected to save the state over $34 million in telecommunications services over its first ten years.

Indiana Telecommunications Network. Available: [http://www.in.gov/itn/about/]. Accessed: February 2, 2004.

IOWA

Iowa Rural Development Council

The Iowa Rural Development Council (IRDC) is "a cooperative partnership of individuals and organizations that have a common interest in securing a high quality of life for all Iowans, with a special focus on those who reside in rural Iowa communities." The Council focuses on various fields, including technology and telecommunications as well as other life issues such as agriculture, business development, child care, cultural and recreational opportunities, educational and social programs, healthcare, and workforce development. The Council was designed to help improve the operations of those programs and services that already exist, especially those using federal and state funds. The IRDC supports business and home access to broadband and encourage Iowans to learn more about the benefits of advanced telecommunications services in their life.

Iowa Rural Development Council. Available: [http://www.iowarural.org/about.html]. Accessed: February 24, 2004.

Iowa Communications Network

Construction for the Iowa Communications Network (ICN), a state-wide fiber optic network, began in 1991. Phase I and II of the project installed 104 network endpoints, including one in each of the 99 counties in Iowa. In 1995, phase III installed full-motion video conference sites in public and private school districts, education agencies, and libraries across the state. The ICN provides users with Internet access, phone services, and video conferencing. ICN allows for new online services including, telemedicine, improved e-government services, and distance learning.

Users of the ICN include hospitals, state and federal government, libraries, schools, and institutions of higher education. The ICN, through distance learning programs, has given students the opportunity to communicate with the International Space Station and to work with other students in Europe.

Iowa Communications Network. Available: [http://www.icn.state.ia.us]. Accessed: February 2, 2004.

KANSAS

Research and Education Network

The network provides a backbone across the state that connects to the Great Plain Network gigaPOP with hubs in Kansas City, Lawrence, Manhattan, Wichita and Hayes. In addition, the consortium provides training, offers consulting services, designs internal networks, and maintains servers for its members.

Kansas Research and Education Network. Available: [http://www.kanren.net]. Accessed: March 22, 2004.

KAN-ED

The State of Kansas and the Kansas Telecommunications Industry have partnered to form KAN-ED, a broadband network "designed to connect all K-12 schools, higher education institutions, public libraries, and hospitals" in the state. The KAN-ED Act passed in 2001 and presented a comprehensive technical plan to the 2002 legislature. The Kansas Board of Regents is responsible for governance. The project is attempting to unite the 48 service providers in Kansas to the KAN-ED network, so that every citizen in Kansas has access to high-speed Internet service for the same price. Part of the funding for this project is provided by e-Rate.

KAN-ED. Where Kansans Access the Information Age. Available: [http://www.kan-ed.org]. Accessed: February 4, 2004.
KAN-ED. Reaching all of Kansas Equally.
KAN-ED. Where Kansans Access the Information Age.

KENTUCKY

Kentucky Housing Corporation Broadband Initiative

In 2003, the Kentucky Housing Corporation (KHC) became the first state to require that all new low income housing be equipped with broadband wiring if the developer receives at least 50 percent of its funding from KHC. The KHC is also looking at ways to provide low income families with computers and subsidized Internet access.
Wired News: A Broadband Hookup in Every Home. Available: [http://www.wired.com/news/politics/0,1283,57249,00.html]. Accessed: April 14, 2004.

Kentucky Information Highway (KIH)

The Kentucky Information Highway (KIH) is a statewide network that was created in 1995 through a contract with Qwest, BellSouth, and other local telephone companies as a means of making broadband available to all 120 counties. There are over 3,000 sites connected to KIH, including 1,200 schools from all 176 school districts in the state. Access is limited to public entities such as local government agencies, higher education institutions and school districts, and rates for access vary depending on the type of connection.
KIH Online. Available: [http://ky.gov/got/kih/]. Accessed: February 17, 2004.
KIH Online. Available: [http://ky.gov/got/kih/kih.ppt]. Accessed: April 15, 2004.

Broadband for Everyone, Inc.

Broadband for Everyone, Inc. is a private ISP working to provide high-speed Internet access nationwide. Based in Georgetown, KY, BFE was created in 2002 and focuses on wireless broadband, especially in rural but also some urban regions.
Broadband for Everyone. Available: [http://www.mybfe.com/]. Accessed: February 17, 2004.

LOUISIANA

Louisiana Broadband Council

The 2004 legislature has proposed HB 1265, which would create the Louisiana Broadband Council. The council would be created within the Governor's Council for Rural Development and would serve as a central broadband planning agency to eliminate the digital divide throughout the state. The bill is currently assigned to the House Commerce Committee.
Bayou Buzz. Available: [http://www.bayoubuzz.com/articles.aspx?aid=1368]. Accessed: April 12, 2004.

Louisiana State-wide Backbone

LaNet is Louisiana's statewide network that provides a telecommunications connection between schools, government, and community groups. This network is the result of collaborative work between the Office of Telecommunications Management, several state agencies and higher education facilities. It provides medium to high-speed Internet access to its subscribers and is paid for by monthly fees from each subscriber.

Alliance for Public Technology. A Nation of Laboratories: Broadband Policy Experiments. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 12, 2004.

MAINE

Maine Science and Technology Foundation

Legislation (L.D. 1632) created a working group to identify the challenges and opportunities for deployment of broadband technology infrastructure to all parts of Maine. Specifically the legislation directed the Maine Science and Technology Foundation to determine the physical condition of the information technology infrastructure, particularly in rural areas, and to report its recommendations, together with any necessary implementing legislation, to the Legislature.

Rural Broadband Initiative

The Rural Broadband Initiative is conducting a research survey on broadband deployment and demand in several areas of Maine. RBI is a nonprofit organization out of Wilton, Maine that addresses broadband issues in rural areas in Maine as well as around the country.

Rural Broadband Initiative. Available: [http://www.ruralbroadbandinitiative.org /about/]. Accessed: April 14, 2004.

MARYLAND

Western Maryland Broadband Study

The Tri-County Council for Western Maryland and the Maryland Technology Development Corporation created the Western Maryland Broadband Deployment Strategy in November 2003. This project hopes to identify and help eliminate the areas without service and determine best practices for this region.

Western Maryland Broadband Deployment Strategy. Available: [http://www.tccwmd.org/W%20Md%20Executivev1.pdf]. Accessed: April 14, 2004.

Maryland Interactive Video Distance Learning Network

Installed by Verizon, the Maryland Interactive Video Distance Learning Network (MIDLN) offers a "full motion, two-way interactive video system provided over a digital fiber optic network." The network is available in almost 125 sites across the state, including secondary schools, community colleges, and universities. MIDLN offers students distance learning opportunities, and it also allows for increased collaboration and resource sharing between schools.

Maryland Interactive Video Distance Learning Network. Available: [http://www.aacc.cc.md.us/distancelearning/interactive.cfm]. Accessed: February 9, 2004.

Net.Work.Maryland Plan

The General Assembly passed legislation in 1998 that formed the Task Force on High Speed Network Development. The legislature, based on recommendations from the task force, allocated $6 million to begin the development of the high-speed network. In order to receive funding and support for Net.Work.Maryland the plan is being implemented with three initial pilot projects.

Maryland Department of Budget and Management, Net.Work.Maryland Plan.

Task Force for Underserved Rural Areas
The General Assembly passed a bill in April 2003 to create a Task Force on Broadband Communications Deployment in underserved rural areas. The Task Force is to present a final report before June, 2005.
Maryland Department of Budget and Management, Net.Work.Maryland Plan.

MASSACHUSETTS
MassBroadband Initiative
This joint effort between the Massachusetts Technology Collaborative and the Massachusetts Software & Internet Council attempts to define and encourage the continuation of the deployment of broadband services throughout Massachusetts. This report outlines the roadmap recommended by the MTC and summarizes the broadband situation in Massachusetts.
MassBroadband Initiative. Available: [http://www.mtpc.org/NewsandReports /reports_other/reports.htm]. Accessed: April 14, 2004.

MICHIGAN
Michigan Broadband Development Authority Act
This act (Public Act 49 of 2002) provides a method to assure that economic, technological, and logistical integrated broadband services are provided throughout Michigan on a non-discriminatory basis. It declared the need for Michigan's government to assist in the financing of both the private and public sectors to offer affordable broadband services to underserved areas throughout the state. The Michigan Broadband Development Authority was enacted in March 2002 as a result of Public Act 49 and was the first U.S. independent state agency with a focus on broadband. This act provides incentives for the development of broadband services and was created to improve the deployment in underserved areas of the state, particularly rural Michigan. A major part of MBDA's role is to provide low-cost financing in the form of tax-exempt bonds and other loans to private broadband providers, thereby increasing highspeed Internet service and use in rural areas.
Michigan Legislature.

Metropolitan Extension Telecommunication Right-of-Way Oversight Act
The METRO Act came into effect in 2002 and helps to standardize the right-of-way access by creating a legal authority that can evaluate and administer fees paid to the municipality. The act (Public Act 48) requires that service providers include route maps indicating their location and other information in their application for a right-of-way permit. “Providers are required to pay a one time $500.00 administrative fee to the Authority and are charged $.05 per linear foot annually as a maintenance fee.”
Telecommunications - The Metro Act. Available: [http://www.mml.org/legal/metro _act.htm]. Accessed: December 12, 2003.

LinkMichigan
In May 2001, the LinkMichigan program began as an effort to provide broadband Internet service to rural areas of northeastern Michigan. LinkMichigan's goals include “aggregating statewide telecommunication purchases to create a high-speed backbone, implementing taxing and permitting fairness, increasing access to information about the telecommunication infrastructure that exists in Michigan, and providing funds for regional telecommunication planning of last mile solutions.” With eight counties affected, this program offered the region as many as 100

Michigan State University telecommunications students and professors as free consultants to help plan and build telephone and broadband service throughout the region, forming the first rural co-op in the nation.

MINNESOTA

Minnesota Broadband Internet Initiative

This initiative under the Minnesota Department of Administration is set up to help communities develop information technology plans to be able to participate in the new, technology-based economy. The Broadband Internet Initiative collected survey data based on community access to broadband technologies. This initiative will maintain a database and develop plans to help communities gain affordable access to high-speed Internet services.

Minnesota Broadband Internet Initiative.

Non-profit Broadband Initiative

This broadband program intends to help non-profit organizations in Minnesota with advanced technology so that the non-profit sector has equal access. This program informs the non-profit sector of technologies that will help them improve their performance and add to their services.

Minnesota Council of Nonprofits Broadband Initiative. Available: [http://www.mncn.org/broadband.htm]. Accessed: April 16, 2004.

Connecting Minnesota

Connecting Minnesota was a large project created by the Department of Transportation and Administration in order to extend a network across the state that would reach 80 percent of the population, including rural areas. The projected cost was initially about $195 million, but in February 2003 the project was shut down due to lack of funding. A crucial deadline was not met and the project was cancelled at a 10 percent completion stage.

Connecting Minnesota.

Broadband Account

H.F. 3301 "creates a broadband access availability account for use for broadband infrastructure deployment grants to schools, community projects and underserved areas. Funding for this program will come from surcharges collected by communications providers in the state."

Telecommunications Industry Association. Available: [http://www.tiaonline.org /policy/states.cfm]. Accessed: April 12, 2004.

MISSISSIPPI

Mississippi Broadband Technology Development Act

The Mississippi Broadband Technology Development Act, also known as Senate Bill 2979, provides tax credits and sales tax exemptions to companies investing in rural broadband deployment.

Alliance for Public Technology. A Nation of Laboratories: Broadband Policy Experiments. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 12, 2004.

Broadband Grant for North Mississippi
The Appalachian Regional Commission awarded a $2.2 million grant to build a high-speed fiber optic network in north Mississippi. This grant is part of a $5.64 million Mississippi Economic Growth and Point of Presence project. The fiber optic backbone forms a ring connecting Memphis, Nashville, Birmingham and Meridian and should be completed by mid-2004.
"$2.2M Federal Grant Goes to North Mississippi Broadband Project." The Associated Press State & Local Wire (September 25, 2003). Online. Lexis-Nexis Academic Universe. Accessed: January 18, 2004.

MISSOURI
MORENet
MOREnet (Missouri Research and Education Network provides connectivity for Internet access to Missouri's public sectors, including schools, libraries, health care organizations and local governments. This backbone has access to Internet2 and also provides training and videoconferencing services.
Cenic Policy Issues. Available: [http://www.cenic.org/gb/pubs/taskforce /policyissues.htm]. Accessed: April 16, 2004.

MONTANA
Tax Credit for Broadband Investments
The 1999 S.B. 172 created 20 percent tax credits for telephone companies that increased broadband infrastructure deployment in Montana. The act also created a competitive broadband grant program. However, the tax credit was eliminated for FY2002 and 2003, but may become available again in 2004 based on budget issues.
Telecommunications Industry Association. Available: [http://www.tiaonline.org /policy/states.cfm]. Accessed: April 12, 2004.

Summiteer II
Summiteer II is the strategic plan for a state and university integrated network. Once installed, it will fully merge voice, video and data network services for over 530 state offices and university campuses.
Hinman, Audrey. Chief of Architecture and Internet Services Bureau, Helena, Montana. Telephone interview, January 14, 2004.

Summiteer
Summiteer is the multi-protocol network for state agencies, local government, and universities providing voice, video and data networks. Summiteer is "cost-rate recovered," meaning there is a user fee ($74.50 per month in 2004) for desktop services, which includes support, software, and Internet access. The Montana State Legislature appropriates funds for these services as part of an agency's overall budget.
Beginning in the 1970s, Montana utilized a SNA multipoint network. In 1991, the state built a frame relay network linking the state agencies and universities. Then in 2000, the state awarded a $10 million five-year contract to Qwest for the deployment of asynchronous transfer mode technology (ATM) and frame relay services. To connect state offices outside of the Qwest service area, the state is working with independent telephone companies, such as Vision Net.
Hinman, Audrey. Chief of Architecture and Internet Services Bureau, Helena, Montana. Telephone interview, January 14, 2004.

Hotvedt, Carl. Bureau Chief Network Technology Services, Helena, Montana. Telephone interview, January 29, 2004.

NEBRASKA

Nebraska Internet Enhancement Fund (NIEF)

The Nebraska legislature passed L.B. 827 in 2001, creating the Nebraska Internet Enhancement Fund (NIEF) to help provide counties and cities with financial help to deploy broadband infrastructure, especially in rural and underserved regions. The Alliance for Public Technology predicted that once the NIEF was fully functional, 181 schools would be connected. However, the Nebraska Surpreme Court declared the NIEF unlawful in 2003.

Telecommunications Industry Association. Available: [http://www.tiaonline.org /policy/states.cfm]. Accessed: April 12, 2004.

[http://www.appanet.org/legislativeregulatory/broadband/broadbandbarriers.cfm]. Accessed: April, 20, 2004.

Public Service Commission Broadband Access Report

A study conducted in 2002 by the Public Service Commission of Nebraska states that 85 percent of Nebraska communities now have access to broadband technology, but the rate for subscribing to these services still remains low.

Technologies Across Nebraska Newsletter, Public Service Commission Broadband Access Report. Available: [http://extension.unl.edu/tangents/tangents_broadband8-03.htm]. Accessed: January 28, 2004.

Rural Internet Access Plan

According to Brenda Decker, the Director of the Division of Communications for the state, the Nebraska State Government is not focusing solely on rural telecommunications development. The state is focusing on providing access to the local and state government offices, K-12 education facilities, telehealth organizations and other public entities with high-speed access, which will allow them to perform their functions regardless of location. The state's plan is focusing on the "state" as the anchor tenant in the majority of towns throughout Nebraska. The plan is to benefit all citizens by attracting the telecommunications providers to serve public entities. The State of Nebraska has not taken the position of being the implementer of broadband telecommunications in the state, but has taken the stance of being the "driver" of those services by working with telecommunications providers to deliver services to public entities.

Decker, Brenda. Director, Division of Communications, Lincoln, Nebraska. Telephone interview, November 26, 2003.

NEVADA

NevadaNet

NevadaNet is the statewide backbone network that supports the University and Community College System of Nevada (UCCSN), the K-12 educational community, and participating state and federal agencies. Nearly 120 predominantly rural Nevada locations, including Native American communities and hospitals, receive data and compressed video services from Nevada Net.

SCS oversees NevadaNet. System Computing Services, Nevada Net. Available: [http://www.scs.nevada.edu/nevadanet/]. Accessed: January 31, 2004.

NEW HAMPSHIRE

Regional Broadband Initiatives

Two telecommunications projects were allotted funding of $250,000 from the state in 2001. The North Country Connect project looks for vendors who can provide broadband connectivity at an affordable rate. The NCC task force oversees the implementation and negotiates solutions to problems that arise. The Monadnock Broadband Initiative is a collaboration between public and private entities to help aggregate demand for broadband technologies in the Monadnock region. Members receive T1 access for 50 percent less than market rates. The National Guard Broadband Project in New Hampshire invests in providing broadband access to the 22 National Guard locations across the states. Private businesses that qualify, state, federal and local government agencies, schools and other programs have access to the network.

Alliance for Public Technology. A Nation of Laboratories: Broadband Policy Experiments. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 12, 2004.

NEW JERSEY

NJEDge.Net

Established by a non-profit corporation of the New Jersey President's Council, NJEDge.Net is a statewide broadband network designed to enhance New Jersey colleges and universities.

NJEDge.Net. Available: [http://www.njedge.net/]

Garden State Network (GSN) Upgrade

The Garden State Network (GSN), the telecommunications backbone for New Jersey's government agencies, has undergone a $2.4 million upgrade which will improve the state's Internet connectivity, provide for the support of digital government initiatives, as well as allow for network monitoring and the building of a shared server infrastructure.

NASCIO Connections, June 2001. New Jersey Telecommunications Network Upgraded. Available: [https://www.nascio.org/publications/Newsletters/0601statetrends.cfm]

NEW MEXICO

State-wide Wireless Tribal Broadband Network

The state-wide Wireless Tribal Broadband Network is a test bed network being developed by the Albuquerque High Performance Computing Center of the University of New Mexico, the Pueblo Tribal Nations of New Mexico and the Bands of Mission Indians in California.

Analysis.com. Available: [http://www.analysys.com/default_acl.asp?Mode=article&iLeftArticle=1071&m=&n=].

Accessed: April 16, 2004.

Internet Exchange
On January 31, 2003, a co-op comprised of New Mexico businesses turned on "Internet exchange" that "allows multiple ISPs to plug into each other via an existing fiber optics networks." The new servers will allow for in-state data transmission, which will save time in transmitting data and help to eliminate some of the mileage charges for ISPs.
New Mexico Business Weekly, "Local 'Internet Exchange' will aggregate need" (January 31, 2003). Available:
[http://albuquerque.bizjournals.com/albuquerque/stories/2003/02/03/story4.html]. Accessed: February 20, 2004.

Statewide Broadband Inventory
The Strategic Telecommunications Alliance and Resource Team (START) created an inventory of New Mexico's broadband infrastructure and a database of communications service providers. In May 2003, START surveyed 796 communities and found that 157 have DSL access. According to the research, although the "infrastructure spreads statewide, the problem lies in the so-called 'last-mile' -- the connection from a central office to business and homes." Residents can search the online database for service providers by city, telephone prefix or type of service.
Strategic Telecommunications Alliance and Resource Team. Available:
[http://www.nmstart.org]. Accessed: September 4, 2003.
New Mexico Business Weekly, "Group unveils plan to patch state's broadband holes" (May 29, 2003). Available: [http://www.albuquerque.bizjournals.com/albuquerque/stories/2003/05/26/daily10.html]. Accessed: September 4, 2003.

NEW YORK
NYC Broadband Initiative
In May 2003, the New York City Council published a report including 14 recommendations for a broadband initiative for the New York City region. These recommendations include switching to competitive bids for servicing the local government. The report also recommends wireless technologies as well as using the subway tunnels to deploy affordable broadband citywide. The full report is available online.
World TelePort. Available: [http://www.worldteleport.org/iCommunity/Fall03/focus5.html]. Accessed: April 16, 2004.

Bell Atlantic Broadband Investment
As part of a 1995 regulatory agreement, "Bell Atlantic set aside $50 million for [the development of] advanced telecommunications in economically disadvantaged areas. To date, 12 projects have been implemented and funded with help from the Fund." One collaborative project between Bell Atlantic and a variety of partner organizations focuses on the construction of a high-speed network for Brooklyn, the Bronx, Queens, and Manhattan.
Alliance for Public Technology. A Nation of Laboratories: Broadband Policy Experiments. Available:[http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 12, 2004.

NYeNet
NYeNet is the New York State government electronic communications network. The NYeNet integrates various individual networks into one common system. The

NYeNet increases the speed and capacity of the individual networks, and it allows for improved communications between agencies and government entities in all parts of the state. The NYeNet also expands the agencies' capacities to offer online government services for citizens. The plan for NYeNet emerged in 1996, but the network is not yet complete. The New York State Office for Technology manages the NYeNet.

New York State Office for Technology, Welcome to the NYeNet. Available: [http://www.oft.state.ny.us/nyt/nyt.htm]. Accessed: February 5, 2004.

New York State Office for Technology, NYeNet Overview. Available: [http://www.oft.state.ny.us/nyt/overview.htm]. Accessed: February 5, 2004.

NORTH CAROLINA

Utility Account

House Bill 1734 "creates a Utility Account to provide funds for construction of or improvements to existing public utilities, including telecommunications and high speed broadband lines throughout the state."

Telecommunications Industry Association. Available: [http://www.tiaonline.org /policy/states.cfm]. Accessed: April 12, 2004.

North Carolina Information Highway

The North Carolina Information Highway (NCIH) has its roots in Governor Hunt's 1993 North Carolina Information Highway initiative. The NCIH is the state's telecommunications network, and it connects government agencies, schools, and libraries around the state. The network was designed to integrate state telecommunications technology and to improve communication between state agencies through video network services. The network's video conferencing capabilities allows for telemedicine and distance learning programs. A 1996 report evaluated the success of the NCIH.

A Trip Along the NC Information Highway - Where We Are Coming From. Available: [http://www.ncih.net/infohiwa/comefrom.htm]. Accessed: February 18, 2004.

North Carolina Information Highway. Available: [http://www.ncih.net/]. Accessed: February 18, 2004.

Broadband Subsidies

Several bills have been initiated in both the House and the Senate offering taxpayers credits for expanding broadband Internet access infrastructure in rural and underserved areas. These bills were initiated in the 2001-2002 Session, and the House tried again in the 2003-2004 Session, but both bills were referred to the Committee on Finance and never passed.

North Carolina House of Representatives, Broadband Deployment Act, House Bill 914, 2003-2004 Session. Available: [http://www.ncga.state.nc.us/gascripts /BillLookUp/BillLookUp.pl?Session=2003&BillID=h914]. Accessed: February 2, 2004.

E-NC Authority

The e-NC Authority began in January 2004 and was established in a reauthorization bill as a continuation of three years of similar work done by the Rural Internet Access Authority (The RIAA was formed in January 2001 as the result of General Assembly legislation). The E-NC Authority promotes Internet access and usage among North

Carolinians, especially in rural areas, by deploying a number of programs in rural areas and offering grants to be used for e-communities planning, infrastructure, public access, and training. It is successfully meeting its initial goals of offering local dial-up Internet access from all North Carolina telephone exchanges and increasing highspeed access and usage around the state. Seventy-two percent of all rural households now have access to the highspeed Internet if they wish to purchase it. The e-NC Authority receives private funding and prides itself on being a grassroots initiative. From the e-NC Authority homepage, North Carolinians can retrieve a list of public access sites in their area as well as interact with a GIS based website view of telecommunications services deployed in North Carolina.
North Carolina's e-NC Authority, What is e-NC? Available: [http://www.e-nc.org /Webpage.asp?page=10]. Accessed: January 4, 2004.
Email from Jane Smith Patterson, Executive Director, Rural Internet Access Authority (and current e-NC Authority Executive Director), "NC Profile," March 2, 2004.
Telephone interview with Jane Smith Patterson, Executive Director, Rural Internet Access Authority (and current e-NC Authority Executive Director), October 31, 2003.

NORTH DAKOTA

STAGEnet

Created in 1999 by the state legislature, North Dakota Statewide Technology Access for Government and Education network (STAGEnet) is a computer network that provides high-speed, broadband connections to all North Dakota state agencies, local governments and schools. The North Dakota State Chief Information Officer, Curtis Wolfe, has the ultimate decision making authority regarding the network.
North Dakota STAGEnet. Available: [http://www.stagenet.nd.gov/]. Accessed: January 19, 2004.

OHIO

Ohio Broadband Initiative

In September, 2002, Governor Bob Taft announced the Ohio Broadband Initiative as part of the Third Frontier Project, a $1.6 billion (trimmed to $1.1 billion in November 2003 when Ohioans voted not to fund the final $500 million) overarching plan to make Ohio businesses more competitive and bring jobs to the state. At the time, Governor Taft stated the Broadband Initiative would “ensure statewide access to high-speed data lines.” Among other things the effort planned to pool businesses’ purchasing power to lower rates on broadband services, directly link all colleges and research facilities via a dedicated network, and educate and train small businesses on the advantages of broadband connections.
Available: [http://www.thirdfrontier.com/PressReleases/092602broadband.asp]. Accessed: April 4, 2004.

Ohio's Synchronous Optical Network (SONET)

Ohio's Synchronous Optical Network (SONET) is a “multi-agency communications system” and comprehensive network. It is called Ohio's "fiber backbone" for state services. Ohio SONET allows state government to effectively bring more services into every library and classroom in the state. Ohio SONET connects 4,500 schools, 100 colleges and universities, 100 state offices, 250 public libraries and 40 public television and radio stations in Ohio, thus minimizing the operational cost. The cost

of a T-1 line on the state contract is approximately 75 percent less than the cost of a commercially-purchased line. This project is administered by The Ohio Department of Administrative Services (DAS).
Ohio SONET.

Ohio Community Computing Center Network
The Ohio Community Computing Center Network (OCCCN) was established in 1995 as an oversight and evaluation organization for Community Technology Centers(CTC) in Ohio. As of March 2004, OCCCN consists of 18 community technology centers, which provide basic computer training and support to low income people who lack opportunities to learn about or use computer technology. The centers are located in libraries, community centers, schools, churches, social service agencies, and residential housing complexes.
Ohio Community Computing Center Network. Available: [http://www.occcn.org/]. Accessed: January 26, 2004.

OKLAHOMA
OneNet
Oklahoma has a state-wide broadband network, called OneNet, which provides access for government agencies, schools, universities, and hospitals. In the last few years, the state has been upgrading the network to create a new communication pipeline for voice, data and video. The network is managed by the regents of higher education, and has been funded by allocations from the regents, bond issues and user fees. For example, the National Guard pays a fee for using the state network.
Fleckinger, Joe. Director of Information Services Division, Oklahoma City, Oklahoma. Telephone interview, January 14, 2004.

Oklahoma Municipal Services Corporation (OMSC)
Approximately 400 cities in Oklahoma joined together to create the Oklahoma Municipal Services Corporation (OMSC) in order to develop broadband service in the area. The first of three wireless projects began in Durant, Oklahoma in the spring of 2001. However by 2003, Purcell, Oklahoma, one of the early adopters, canceled its contract with OMSC because the service was unreliable.
The Purcell Register. Available: [http://www.purcellregister.com/article-display.asp?idnum=591]. Accessed: April 4, 2004.
AgriFood Innovations. Available: [http://www.agribiz.net /offerings.cfm?categoryId=103]. Accessed: April 4, 2004.

Rural Broadband Task Force
The state does not provide public access via OneNet. In response to questions regarding consumer Internet access, the state legislature created a rural broadband task force in 2003. The task force was supposed to study rural broadband access and ways to make it financially viable for telecom companies to expand their coverage areas. However, as of January 2004, the task force had not met.
Fleckinger, Joe. Director of Information Services Division, Oklahoma City, Oklahoma. Telephone interview, January 14, 2004.

OREGON

Broadband Tax Credit

In 2001, Oregon passed a 20 percent non-refundable tax credit for investment in high-speed, dedicated or switched broadband telecommunications infrastructure. The credit can be used against the Personal Income Tax and the Corporation Income Tax for 20 percent of the costs or waiver of installation charges for schools, rural health clinics and libraries. (Or. Rev. Stat. § 315.511(1) 2001.) The Economic and Community Development Commission certifiesthe facilities that meet the law's requirements.

Oregon Legislature.

Public Communications Network

The Public Communications Network was created in 1985 by the Metropolitan Area Communications Commission as a partnership between AT&T, MACC and agencies in the Tualatin Valley. The PCN works to provide cable broadband services to the public. Those institutions using the PCN for all communications (voice, data and video) include schools and libraries, local government agencies and emergency services.

Public Communications Network. Available: [http://www.maccor.org/ PCNpages /pcn.htm]. Accessed: February 17, 2004.

Telecommunications Infrastructure Account

The Telecommunications Infrastructure Account provides funds to Oregon communities for route diversity, and broadband services. As of 2003, there were five SONET (Synchronous Optical Network) rings and nine projects approved by the Oregon Economic and Community Development Commission. These accounts were created through SB 622 and carriers.

Telecommunications Infrastructure Account. Available: [http://www.econ.state.or.us /telecom/projdesc.htm]. Accessed: February 4, 2004

Rural Infrastructure

Qwest committed $70 million to rural broadband infrastructure in 2000. According to the company's estimates in 2002, roughly 50 percent of the infrastructure was in place.

Oregon Rural Infrastructure. PowerPoint Report at Rural Telecommunications Congress. Available: [http://www.ruraltelecon.org/admin/library/uploads/15]. Accessed: September 30, 2003.

PENNSYLVANIA

The Ben Franklin Technology Development Authority (BFTDA)

The Ben Franklin Technology Development Authority (BFTDA) is a government technology development organization which provides funding for regionally-designed grassroots strategies that extend technological capabilities to all Pennsylvania communities. It has provided over $50 million in funding to community-based projects. While the organization funds a variety of local business and community initiatives, it has specifically supported broadband network projects such as Keystone Community Network, Inc., Key-Net Alliance, I-99 Corridor Project (Altoona Blair County Development Corporation) and the Broadband Rural Area Information Network (BRAIN) in recent years.

A Nation of Laboratories: Broadband Experimentation in the States. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 4, 2004.

RHODE ISLAND

Rhode Island Network for Educational Technology (RINET)

Established in 1994, Rhode Island Network for Educational Technology (RINET) provides connectivity, services and training to "over 95 percent of the state's K-12 public school districts, parochial and independent private schools, municipal buildings, and non-profits."

Rhode Island Network for Educational Technology (RINET). Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 16, 2004.

SOUTH CAROLINA

South Carolina Information Network (SCINet)

The South Carolina Information Network (SCINET) provides statewide connectivity for state and local government, K-12 and higher education. The network services over 5,000 locations with the public school connections at T-1 levels or higher and the state connections at an OC-12 to Internet 2 level.

SREB Educational Technology Cooperative. Available: [http://www.sreb.org /programs/EdTech/survey/selectNetwork.asp?state=43&submit=Go]. Accessed: April 6, 2004.

South Carolina Rural Infrastructure Fund

The Rural Infrastructure Fund provides financial support to qualified counties in building the infrastructure necessary for economic growth and development. This includes improving public and private telecommunication systems. Created by Bill 4706, "funding originates from unclaimed Job Development Credits."

South Carolina Department of Commerce. Available: [http://www.callsouthcarolina.com/callsc.cfm?page=grants&document=home]. Accessed: April 6, 2004.

A Nation of Laboratories: Broadband Experimentation in the States. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 6, 2004.

SOUTH DAKOTA

Rural Broadband

Studies of high-speed Internet access based on ZIP codes don't accurately reflect the state of South Dakota, because a large ranch often has its own ZIP code. Instead, the state government uses population data to analyze Internet access penetration. According to the state's analysis in 2003, 67 percent of the population has broadband access (DSL or cable). There are currently no government initiatives for increasing consumer access to the Internet because they "don't think that it is necessary," said Jim Edman, wide-area network manager. "Realistically, only satellite access is feasible in most rural areas," said Edman.

Edman, James. Wide Area Network Manager, Pierre, South Dakota. Telephone interview, January 14, 2004.

Rural Subsidies

As the number of state agencies has grown, the state has required telecommunications companies to build lines to provide business level services to meet government needs. Once the infrastructure is in place, the company can offer

services to the local public. This anchor-tenant relationship has provided government subsidy of telecom development in rural areas.
Edman, James. Wide Area Network Manager, Pierre, South Dakota. Telephone interview, January 14, 2004.

Statewide Broadband Network
South Dakota has an extensive broadband network, the Digital Dakota Network, which is available to all of the state agencies, K-12 schools, higher education institutions, libraries, municipal governments, and state hospitals. There are 286 video conferencing sites on this network, which supports on average 125-150 online distance learning classes per day, according to Jim Edman, wide area network manager. The Department of Education funded the development of the infrastructure within the schools, however the schools do not pay for access. The higher education campuses, counties, and municipalities pay a fee for the network service.
Edman, James. Wide Area Network Manager, Pierre, South Dakota. Telephone interview, January 14, 2004.

TENNESSEE
Tennessee State-Wide Area Network
The network provides connectivity for all state agencies and 150 of the 1,800 K-12 schools in Tennessee.
SREB Educational Technology Cooperative. Available: [http://www.sreb.org /programs/EdTech/survey/selectNetwork.asp?state=45&submit=Go]. Accessed: April 6, 2004.

Tennessee Rural Internet Access Authority
In 2002, the state legislature established the Tennessee Rural Internet Access Authority to oversee, manage, and monitor efforts to provide rural counties with broadband access. (H.B. 2322/S.B. 2594).
TIA Assessment of State Broadband Initiatives. Available:
[http://www.tiaonline.org/policy/states.cfm]. Accessed: April 15, 2004.
Tennessee General Assembly Archives. Available:
[http://www.legislature.state.tn.us/info/Leg_Archives/102GA/bills /BillStatus/HB2322.htm]. Accessed: April 18, 2004.

ConnectTEN Internet Project
In 1996, Tennessee's ConnectTEN initiative equipped all of Tennessee' s elementary and secondary public schools with access to direct, high-speed Internet. Currently, ConnectTEN connects over 214,000 computers across the state's 1,800 K-12 public schools. One of the program's goals is to increase bandwidth in order to lower the student–to-computer ratio from 5:1 to 2:1 within five years. “All network facilities and services are outsourced to the contracted vendor.” The annual budget is $18 million with the state providing approximately 30 percent of the funds and E-Rate the remaining 70 percent.
ConnectTEN. Available: [http://www.connect-tn.org/about_connecTEN.htm]. Accessed: April 6, 2004.
The Journal. Available: [http://www.thejournal.com/magazine/vault/A1592.cfm]. Accessed: April 5, 2004.

Tennessee Information Infrastructure (TNII)
According to the State Report, TNII is the state's project to consolidate executive branch and higher education network infrastructures in order to create a single statewide network serving the respective operations group for each government entity. The project covers several issues regarding telecommunications services in the private sector and the facilitation of advanced applications for the state's agencies.
E-government Resource Centre. Available:
[http://www.egov.vic.gov.au/International/TheAmericas/UnitedStates/StateGovtWebsites/USStateGovt.htm]. Accessed: October 15, 2003.

TEXAS
PUC Substantive Rules
Chapter 26, Subchapter G is the section of the PUC Substantive Rules that refers to advanced services in Texas telecommunications. The subchapter addresses the need and the methods for telecommunications service providers to provide, when requested, rural telecommunications services at comparable costs and conditions to urban services.
Public Utility Commission of Texas, Advanced Services in Rural Areas. Available: [http://www.puc.state.tx.us/telecomm/advserv/index.cfm]. Accessed: January 30, 2004.

Broadband Deployment Bill
An amendment to the Public Utility Regulatory Act of 1995, House Bill 2128 began the Telecommunications Infrastructure Fund (TIF), and offered discounted telecommunications rates to public schools and libraries. The act also took steps to deregulate the telecommunications market in Texas by making it easier for local service providers to compete with larger telecommunications companies.
Texas State Library and Archives Commission, Appendix B Laws Affecting Texas Libraries. Available: [http://www.tsl.state.tx.us/ld/pubs/plant/appenb.html]. Accessed: January 30, 2004.
Dana Williams, "Texas Telecommunications Deregulation: Its Effects and Its Future." Available: [http://www.utexas.edu/lbj/21cp/dana_williams.htm]. Accessed: January 30, 2004.

Telecommunications Infrastructure Fund
Created by the State Legislature in 1995, the Telecommunications Infrastructure Fund was a state grant program designed to increase Internet access and usage throughout the state, especially in rural and underserved areas. TIF grants were funded by a special tax paid by telecommunications vendors and customers in Texas, and they offered public schools, libraries, universities, and health care facilities the opportunity to develop community technology initiatives, including public access stations, technology training programs, community networks, and infrastructure acquisitions and upgrades. The legislature authorized TIF to fund $1.5 billion in grants over 10 years, yet because of state budget difficulties, TIF was disbanded in 2003. Many public schools and libraries relied on TIF funding for technology integration projects, and without TIF funding, program sustainability becomes a serious concern.
Texas Library Association, TIF: Background and Review of Legislative Activity. Available: [http://www.txla.org/html/legis/tif/tiflegis.html]. Accessed: January 30, 2004.

Texas Agency Network: TEX-AN 2000 Network

Used by all state agencies except for universities and the state legislature, TEX-AN 2000 is the state's central telecommunications system. Owned completely by telecommunications vendors, it offers voice, data, and video services to all users, including some local governments and other public entities, and it allows users to receive contract services at prearranged prices. Using AT&T and Southwestern Bell as its primary vendors, the TEX-AN 2000 network was establish to minimize state infrastructure and telecommunications services costs and to unite state agencies under one telecommunications system.

State of Texas Department of Information Resources, TEX-AN 2000: A Network and a Family of Contracts.

Available: [http://www.dir.state.tx.us/tex-an/index.htm]. Accessed: January 29, 2004.

State of Texas Department of Information Resources, TEX-AN 2000: Telecommunications for a Connected Texas.

UTAH

UTOPIA

UTOPIA is an initiative to build fiber optic cable to every home within the 18 communities it represents. Modeling it after the city wide network built by Provo, Utah, the consortium will own the network, backed by bonds, and lease the dark fiber to commercial service providers. The system is expected to cost $450 million to build and should service over 723,000 residents, 248,000 households and 34,500 businesses. The planners predict that high-speed Internet connectivity will cost users around $28 per month and provide 100 megabits per second access (well in excess of the 3 megabits per second).

Oveson, Val. Chief Information Officer, Utah Governor's Office, Salt Lake City, Utah. Telephone interview, February 2, 2004.

American Public Power Association. Available: [http://www.appanet.org/newsroom/magazine/2004/WashFocus-JF04.cfm]. Accessed: February 2, 2004.

VERMONT

Vermont Telecommunications Service Availability Project

The Economic Development Department of Vermont sponsored a study in 2000, to identify what telecommunication resources are available in each county. The study was updated in October 2001. By maintaining a list of Internet service providers, specifically broadband providers, Vermont is hoping to attract and also maintain businesses in their state.

Vermont Department of Economic Development. Available:
[http://www.thinkvermont.com] Accessed: February 2, 2004.

GovNet

GovNet is a state-wide network infrastructure that has a backbone consisting of 15 T-1 lines that are further supplemented by 50 56-Kbps lines. GovNet connects all government agencies around the state in an attempt to create better efficiency and additional information sharing. The need for GovNet was identified by the Vermont Information Strategy Plan (now known as Information Resource Management Advisory Council). GovNet later led to the creation of K-12 Net.

GovNet. Available: [http://www.govnet.state.vt.us/]. Accessed: February 2, 2004.

K-12 Net
In 1995, Vermont expanded their GovNet program to implement K-12 Net, which would develop an infrastructure to interconnect all public schools and libraries in the state. Nearly 300 of the 400 schools in Vermont are connected to K-12 Net. Schools and libraries may purchase annual Internet access through K-12 Net with prices ranging from $250 to $4,300 to $18,000 a year depending on the type of connection. Nearly 25 percent of schools use a highspeed connection through the K-12 network, while the remaining schools utilize dial-up connections. In addition, more than 100 public libraries use K-12 Net.
GovNet. Available: [http://www.govnet.state.vt.us/k12net.htp]. Accessed: September 22, 2003.

VIRGINIA
Net.Work.Virginia
Net.Work.Virginia, which started as a project led by Virginia Tech, Old Dominion and the Virginia Community College system, "is an advanced, broadband network delivering Internet and Intranet services statewide." The goal of the project was to provide access to competitive advanced services to all of Virginia. Previously only open to schools, public libraries and government agencies, the network can now be accessed by commercial customers. Currently, customer service charges provide complete funding for the network which is contracted to service providers and coordinated by Virginia Tech. "Net.Work.Virginia provides access for more than 1.3 million Virginians through educational institutions alone."
Net.Work.Virginia. Available: [http://www.networkvirginia.net/]. Accessed: April 6, 2004.
SREB Educational Technology Cooperative. Available: [http://www.sreb.org /programs/EdTech/survey/selectNetwork.asp?state=45&submit=Go]. Accessed: April 6, 2004.

Virginia Community Improvement Grants
The Virginia Department of Housing and Community Development offers grant funding through its Community Development Block Grant to assess current broadband availability and usage, and to implement projects that target the "last mile"of broadband.
Community Improvement Grants Home page. Available: [http://www.dhcd.virginia.gov/CD/CDBG/Community%20Improvement %20Grants.htm]. Accessed: January 26, 2004.

Broadband Rural Project
The Center for Innovative Technology and the Secretary of Technology were tasked with recommending plans for rural broadband access. In a report submitted to the Governor and General Assembly in November 2002, findings and recommendations were made to assist rural communities in broadband access.
Center for Innovative Technology and the Secretary of Technology. Advancing affordable, high bandwidth electronic networks in rural Virginia. (Richmond 2002)

WASHINGTON
Strategic Plan for Rural High-Speed Internet
According to a January 19, 2004 news story, "Twenty families in a rural Indian community [Darrington, WA] will receive new, high-powered computers within the

month. ... Today's announcement comes as part of the Affiliated Tribes of the Northwest Indians Economic Development Corporation (ATNI-EDC) and Verizon Avenue's (VZA) strategic plan to bring high-speed Internet service and wireless network to communities with limited financial resources and infrastructure."
Internet Technology Comes to Rural Washington Community.

BPA Public Benefits Fiber Program
The Bonneville Power Administration and the Washington Public Utility Districts Association signed an agreement in October 1999 to make fiber optic cables available to public and private entities and the communities that these entities serve. The program is known as the Bonneville Power Administration's (BPA) Public Benefits Fiber Program.
BPA, PUDs Agree to Use Fiber Optics for Public Utility, Community Purposes. Available: [http://www.bpa.gov/corporate/BPAnews/archive/1999/nr100499.pdf]. Accessed: April 8, 2004.

WEST VIRGINIA
The West Virginia Network (WVNET)
The West Virginia Network (WVNET) provides connectivity to the state's institutions of higher education. As part of Operational Direct 9801 issued in 1998 by the Governor's Office of Technology, the WVNET is leading an initiative to develop a statewide network which will include state government, K-12 institutions, public libraries, and county government.
The West Virginia Network (WVNET). Available: [http://www.wvnet.edu /aboutwvnet/aboutus.html]. Accessed: April 6, 2004.

West Virginia Education Information System (WVEIS) World School
The West Virginia Education Information System (WVEIS)/World School Network, a closed network, provides connectivity for all public K-12 schools in the state. Local school districts funded about 51 percent of the network costs. The remaining funding came from the state (35 percent) and Verizon (14 percent) grants. Connection speeds vary greatly, ranging from 56Kb to 1.544Mb (T1).
SREB Educational Technology Cooperative. Available: [http://www.sreb.org/programs/EdTech/survey/selectNetwork.asp ?state=52&submit=Go]. Accessed: April 6, 2004.

Rural Telecom Subsidies & Investment
According to the IT Strategic Plan, "West Virginia is the one of the most rural states in the nation, making digital divide issues a very real concern." The state's strategy is to encourage assistance and partnering with private firms.
West Virginia IT Strategic Plan. Available: [http://www.state.wv.us/got /webITreport.pdf]. Accessed: February 16, 2004. Page 11 of 20.

WISCONSIN
Broadband Deployment Bill
In March 2004, the Wisconsin State Assembly passed the Broadband Deployment Bill (SB 272) to "encourage free market competition and foster broadband deployment." In other words, the bill attempts to prevent local government from forcing "tax payers to subsidize the building of telecommunication infrastructure." While the bill does not prevent communities without a high-speed Internet provider

from building a broadband utility, it does restrict "communities that wish to compete with the private sector." Under the bill, these communities would have to "conduct a three-year cost-benefit business plan of the proposed broadband utility, give the public 30 days to review the proposal before conducting a public hearing, and refrain from using taxpayer subsidies to fund the service."
Representative Phil Montgomery. Press Release. March 5, 2004.

Education Telecommunications Access Program
Education Telecommunications Access Program "provides subsidized access to new data lines for direct Internet access" for K-12 public schools, libraries and colleges. Members are charged a capped monthly rate "based on the speed of their line" while the program pays for costs that exceed the maximum rate.
A Nation of Laboratories: Broadband Experimentation in the States. Available: [http://apt.org/publica/broadbandreport_final.pdf]. Accessed: April 6, 2004.

WYOMING
WTC Broadband Initiative
According to a draft plan of the WTC Broadband Initiative, released on April 16, 2004, "The Wyoming Legislature has allocated up to $250,000 of the Wyoming Business Council's Business Ready Communities Program budget to fund the Wyoming Telecommunications Council (WTC) Broadband Initiative. Under the budget, the overall objective of the broadband initiative remains the same: identifying those areas of the state most in need of broadband infrastructure upgrades for purposes of developing and implementing a plan to achieve ubiquitous broadband access for Wyoming businesses and citizens." The next public work session will be held on April 23, 2004.
The Plan of the Wyoming Telecommunications Council To Upgrade Broadband Infrastructure in Wyoming.
SweetNet
The cities of Rock Springs and Green Water in Sweetwater County are teaming up to build the Southwestern Wyoming Enhanced & Expanded Telecommunications Network (SweetNet). Expected to cost over $31 million and have a 50-70 percent customer penetration rate, the SweetNet will be funded by revenue bonds (75 percent) and contributions from private partners (25 percent).
Southwestern Wyoming Enhanced & Expanded Telecommunications Network (SweetNet). Available: [http://www.sweetnet.us]. Accessed: April 18, 2004.