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Broadband Internet Regulation and Access: Background and Issues

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Summary

Broadband or high-speed Internet access is provided by a series of technologies that give users the ability to send and receive data at volumes and speeds far greater than current Internet access over traditional telephone lines. In addition to offering speed, broadband access provides a continuous, "always on" connection and the ability to both receive (download) and transmit (upload) data at high speeds. Broadband access, along with the content and services it might enable, has the potential to transform the Internet: both what it offers and how it is used. It is possible that many of the future applications that will best exploit the technological capabilities of broadband have yet to be developed. There are multiple transmission media or technologies that can be used to provide broadband access. These include cable, an enhanced telephone service called digital subscriber line (DSL), satellite, fixed wireless (including "wi-fi" and "Wi-Max"), broadband over powerlines (BPL), fiber-to-the-home (FTTH), and others. While many (though not all) offices and businesses now have Internet broadband access, a remaining challenge is providing broadband over "the last mile" to consumers in their homes. Currently, a number of competing telecommunications companies are developing, deploying, and marketing specific technologies and services that provide residential broadband access.

From a public policy perspective, the goals are to ensure that broadband deployment is timely and contributes to the nation's economic growth, that industry competes fairly, and that service is provided to all sectors and geographical locations of American society. The federal government — through Congress and the Federal Communications Commission (FCC) — is seeking to ensure fair competition among the players so that broadband will be available and affordable in a timely manner to all Americans who want it.

Some areas of the nation — particularly rural and low-income communities — continue to lack full access to high-speed broadband Internet service. In order to address this problem, the 110th Congress is examining a wide range of issues including the scope and effect of federal broadband financial assistance programs (including universal service and the broadband programs at the U.S. Department of Agriculture's Rural Utilities Service), and the impact of telecommunications regulation and new technologies on broadband deployment. To date, legislative measures to address the reform and expansion of scope of the universal service fund (S. 101, S. 711, H.R. 42, H.R. 278), net neutrality (S. 215), and broadband financial assistance (S. 541, S. 761) have been introduced. One facet of the debate over broadband services focuses on whether present laws and subsequent regulatory policies are needed to ensure the development of competition and its subsequent consumer benefits, or conversely, whether such laws and regulations are overly burdensome and discourage needed investment in and deployment of broadband services.

This report which will be updated as events warrant.

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Broadband Internet Regulation and Access: Background and Issues

Most Recent Developments

The 110th Congress continues to examine a range of telecommunications issues including the scope and effect of federal broadband financial assistance programs (including universal service and the broadband programs at the U.S. Department of Agriculture's Rural Utilities Service), and the impact of telecommunications regulation and new technologies on broadband deployment. The Senate Commerce Committee held a hearing on universal service reform and a wide range of issues were discussed during FCC oversight hearings held by both the Senate Commerce Committee and the House Telecommunications and the Internet Subcommittee. Legislative measures to address the reform and expansion of scope of the universal service fund, net neutrality, and broadband financial assistance have been introduced.

Background and Analysis

Broadband or high-speed Internet access is provided by a series of technologies that give users the ability to send and receive data at volumes and speeds far greater than current Internet access over traditional telephone lines. Currently, a number of telecommunications companies are developing, installing, and marketing specific technologies and services to provide broadband access to the home. Meanwhile, the federal government — through Congress and the Federal Communications Commission (FCC) — is seeking to ensure fair competition among the players so that broadband will be available and affordable in a timely manner to all Americans who want it.

What Is Broadband and Why Is It Important?

Traditionally, Internet users have accessed the Internet through the same telephone line that can be used for traditional voice communication. A personal computer equipped with a modem is used to hook into an Internet dial-up connection provided (for a fee) by an Internet service provider (ISP) of choice. The modem converts analog signals (voice) into digital signals that enable the transmission of "bits" of data.

The faster the data transmission rate, the faster one can download files or hop from Web page to Web page. The highest speed modem used with a traditional telephone line, known as a 56K modem, offers a maximum data transmission rate of about 45,000 bits per second (bps). However, as the content on the World Wide Web

becomes more sophisticated, the limitations of relatively low data transmission rates (called "narrowband") such as 56K become apparent. For example, using a 56K modem connection to download a 10-minute video or a large software file can be a lengthy and frustrating exercise. By using a broadband high-speed Internet connection, with data transmission rates many times faster than a 56K modem, users can view video, make telephone calls, or download software and other data-rich files in a matter of seconds. In addition to offering speed, broadband access provides a continuous "always on" connection (no need to "dial-up") and a "two-way" capability — that is, the ability to both receive (download) and transmit (upload) data at high speeds.

Broadband access, along with the content and services it might enable, has the potential to transform the Internet — both what it offers and how it is used. For example, a two-way high speed connection could be used for interactive applications such as online classrooms, showrooms, or health clinics, where teacher and student (or customer and salesperson, doctor and patient) can see and hear each other through their computers. An "always on" connection could be used to monitor home security, home automation, or even patient health remotely through the Web. The high speed and high volume that broadband offers could also be used for bundled service where, for example, cable television, video on demand, voice, data, and other services are all offered over a single line. In truth, it is possible that many of the applications that will best exploit the technological capabilities of broadband, while also capturing the imagination of consumers, have yet to be developed.

Broadband Technologies

There are multiple transmission media or technologies that can be used to provide broadband access. These include cable modem, an enhanced telephone service called digital subscriber line (DSL), satellite technology, fiber, terrestrial (or fixed) wireless technologies, and others. Cable and DSL are currently the most widely used technologies for providing broadband access. Both require the modification of an existing physical infrastructure that is already connected to the home (i.e., cable television and telephone lines). Each technology has its respective advantages and disadvantages, and competes with each other based on performance, price, quality of service, geography, user friendliness, and other factors. The following sections summarize cable, DSL, and other broadband technologies.

Cable. The same cable network that currently provides television service to consumers is being modified to provide broadband access. Because cable networks are shared by users, access speeds can decrease during peak usage hours, when bandwidth is being shared by many customers at the same time. Network sharing has also led to security concerns and fears that hackers might be able to eavesdrop on a neighbor's Internet connection. The cable industry is developing "next generation" technology which will significantly extend downloading and uploading speeds.

Digital Subscriber Line (DSL). DSL is a modem technology that converts existing copper telephone lines into two-way high speed data conduits. Speeds can depend on the condition of the telephone wire and the distance between the home and the telephone company's central office (i.e., the building that houses telephone switching equipment). Because DSL uses frequencies much higher than those used

for voice communication, both voice and data can be sent over the same telephone line. Thus, customers can talk on their telephone while they are online, and voice service will continue even if the DSL service goes down. Like cable broadband technology, a DSL line is "always on" with no dial-up required. Unlike cable, however, DSL has the advantage of being unshared between the customer and the central office. Thus, data transmission speeds will not necessarily decrease during periods of heavy local Internet use. A disadvantage relative to cable is that DSL deployment is constrained by the distance between the subscriber and the central office. DSL technology over a copper wire only works within 18,000 feet (about three miles) of a central office facility. However, DSL providers are deploying technology to further increase deployment range. One option is to install "remote terminals" which can serve areas farther than three miles from the central office.

Wireless. Terrestrial or fixed wireless systems transmit data over the airwaves from towers or antennas to a receiver. Mobile wireless broadband services (also referred to as third generation or "3G") allow consumers to get broadband access over cell phones, PDAs, or wireless modem cards connected to a laptop.[1] The FCC is planning to auction frequencies currently occupied by broadcast channels 52-69. These and other frequencies in the 700 MHZ band are possible candidates for wireless broadband applications. A number of wireless technologies, corresponding to different parts of the electromagnetic spectrum, also have potential. These include the upperbands (above 24GHz), the lowerbands (multipoint distribution service or MDS, below 3 GHz), broadband personal communications services (PCS), wireless communications service (2.3 GHz), and unlicenced spectrum. Unlicensed spectrum is being increasingly used to provide high-speed short-distance wireless access (popularly called "wi-fi") to local area networks, particularly in urban areas where wired broadband connections already exist. A new and developing wireless broadband technology (called "WiMax") has the capability to transmit signals over much larger areas.

Fiber. Another broadband technology is optical fiber to the home (FTTH). Optical fiber cable, already used by businesses as high speed links for long distance voice and data traffic, has tremendous data capacity, with transmission speeds dramatically higher than what is offered by cable modem or DSL broadband technology. While the high cost of installing optical fiber in or near users' homes has been a major barrier to the deployment of FTTH, both Verizon and AT&T (formerly SBC) are rolling out fiber-based architectures that will offer consumers voice, video, and high-speed data (sometimes referred to as a "triple play"). Some public utilities are also exploring or beginning to offer broadband access via fiber inside their existing conduits. Additionally, some companies are investigating the feasibility of transmitting data over power lines, which are already ubiquitous in people's homes.[2]

Satellite. Satellite broadband Internet service is currently being offered by three providers: Hughes Network Systems (DirecWay), Starband (Spacenet Inc.) and

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[1] For further information, see CRS Report RS20993, *Wireless Technology and Spectrum Demand: Advanced Wireless Services,* by Linda K. Moore.

[2] For further information, see CRS Report RL32421, *Broadband Over Power Lines: Regulatory and Policy Issues,* by Patricia Moloney Figliola.

WildBlue. Like cable, satellite is a shared medium, meaning that privacy may be compromised and performance speeds may vary depending upon the volume of simultaneous use. Another disadvantage of Internet -over-satellite is its susceptibility to disruption in bad weather. On the other hand, the big advantage of satellite is its universal availability. Whereas cable or DSL is not available to some parts of the United States, satellite connections can be accessed by anyone with a satellite dish facing the southern sky. This makes satellite Internet access a possible solution for rural or remote areas not served by other technologies.

Status of Broadband Deployment

Broadband technologies are currently being deployed by the private sector throughout the United States. According to the latest FCC data on the deployment of high-speed Internet connections (released January 2007), as of June 30, 2006 there were 64.6 million high speed lines connecting homes and businesses to the Internet in the United States, a growth rate of 26% during the first half of 2006. Of the 64.6 million high speed lines reported by the FCC, 50.3 million serve residential users.[3] As of June 30, 2006, the FCC found at least one high-speed subscriber in 99% of all zip codes in the United States. While the broadband *adoption* rate stands at 28% of U.S. households[4], broadband *availability* is much higher. 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.[5]

According to the International Telecommunications Union, the U.S. ranks 16th worldwide in broadband penetration (subscriptions per 100 inhabitants as of December 2005).[6] Similarly, data from the Organization for Economic Cooperation and Development (OECD) found the U.S. ranking 12th among OECD nations in broadband access per 100 inhabitants as of June 2006.[7] By contrast, in 2001 an

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

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

[5] 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]

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

[7] OECD, *Broadband Access in OECD Countries per 100 inhabitants*, December 2005. Available at [http://www.oecd.org/document/9/0,2340,en_2825_495656_37529673_1_1_1_1,00.html#Data2005]

OECD study found the U.S. ranking 4th in broadband subscribership per 100 inhabitants (after Korea, Sweden, and Canada).[8]

Access to Broadband and the "Digital Divide"

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. According to the latest FCC data on the deployment of high-speed Internet connections (released January 2007), high-speed subscribers were reported in 99% of the most densely populated zip codes, as opposed to 89% of zip codes with the lowest population densities. Similarly, for zip codes ranked by median family income, high-speed subscribers were reported present in 99% of the top one-tenth of zip codes, as compared to 91% of the bottom one-tenth of zip codes.[9]

Some policymakers assert that disparities in broadband access across American society could have adverse consequences on those left behind. 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.

FCC Activities. The Telecommunications Act of 1996 (P.L. 104-104) addressed the issue of whether the federal government should intervene to prevent a "digital divide" in broadband access. Section 706 requires the FCC to determine whether "advanced telecommunications capability [i.e., broadband or high-speed access] is being deployed to all Americans in a reasonable and timely fashion." If this is not the case, the act directs the FCC to "take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."

On September 9, 2004, the FCC adopted and released its *Fourth Report* pursuant to Section 706. Like the previous three reports, the FCC concluded that "the overall goal of section 706 is being met, and that advanced telecommunications capability is indeed being deployed on a reasonable and timely basis to all Americans."[10] While the FCC is currently implementing or actively considering some

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[8] 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.

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

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

regulatory activities related to broadband,[11] no major regulatory intervention pursuant to Section 706 of the Telecommunications Act of 1996 has been deemed necessary by the FCC at this time.

The FCC noted the future promise of emerging multiple advanced broadband networks which can complement one another:

> For example, in urban and suburban areas, wireless broadband services may "fill in the gaps" in wireline broadband coverage, while wireless and satellite services may bring high-speed broadband to remote areas where wireline deployment may be costly. Having multiple advanced networks will also promote competition in price, features, and quality-of-service among broadband-access providers.[12]

Two FCC Commissioners (Michael Copps and Jonathan Adelstein) dissented from the *Fourth Report* conclusion that broadband deployment is reasonable and timely. They argued that the relatively poor world ranking of United States broadband penetration indicates that deployment is insufficient, that the FCC's continuing definition of broadband as 200 kilobits per second is outdated and is not comparable to the much higher speeds available to consumers in other countries, and that the use of zip code data (measuring the presence of at least one broadband subscriber within a zip code area) does not sufficiently characterize the availability of broadband across geographic areas.[13]

The Government Accountability Office (GAO) has also cited concerns about the FCC's zip code level data. Of particular concern is that the FCC will report broadband service in a zip code even if a company reports service to only one subscriber, which in turn can lead to some observers overstating of broadband deployment. According to GAO, "the data may not provide a highly accurate depiction of local deployment of broadband infrastructures for residential service, especially in rural areas."[14]

Administration Activities. The National Telecommunications and Information Administration (NTIA) at the Department of Commerce (DOC) has been tasked with developing the Bush Administration's broadband policy.[15] Statements from Administration officials indicated that much of the policy would focus on

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

[12] Ibid., p. 9.

[13] Ibid., p. 5, 7.

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

[15] 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].

removing regulatory roadblocks to investment in broadband deployment.[16] On June 13, 2002, in a speech at the 21st Century High Tech Forum, President Bush declared that the nation must be aggressive about the expansion of broadband, and cited ongoing activities at the FCC as important in eliminating hurdles and barriers to get broadband implemented. President Bush made similar remarks citing the economic importance of broadband deployment at the August 13, 2002 economic forum in Waco, Texas. Subsequently, a more formal Administration broadband policy was unveiled in March and April of 2004. On March 26, 2004, President Bush endorsed the goal of universal broadband access by 2007.[17] Then on April 26, 2004, President Bush announced a broadband initiative which advocates permanently prohibiting all broadband taxes, making spectrum available for wireless broadband, creating technical standards for broadband over power lines, and simplifying rights-of-way processes on federal lands for broadband providers.[18]

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*,[19] 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 Advisors on Science & Technology (PCAST) was tasked with studying "demand-side" broadband issues and suggesting policies to stimulate broadband deployment and economic recovery. The PCAST report, *Building Out Broadband*, released in December 2002, concludes that while government should not intervene in the telecommunications marketplace, it should apply existing policies and work with the private sector to promote broadband applications and usage. Specific initiatives include increasing e-government broadband applications (including homeland security); promoting telework, distance learning, and telemedicine; pursuing broadband-friendly spectrum policies; and ensuring access to public rights of way for broadband infrastructure.[20]

Enacted Legislation. Some policymakers in Congress have asserted 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. The Farm Security and Rural Investment Act of 2002 — signed into law on May 13, 2002 as P.L. 107-171 — contained a provision

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[16] 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]

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

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

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

[20] 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]

(Section 6103) authorizing the Secretary of Agriculture to make loans and loan guarantees to eligible entities for facilities and equipment providing broadband service in rural communities. Authorization of the Rural Broadband Access Loan and Loan Guarantee Program runs through FY2007. The 110th Congress will likely consider reauthorization of the RUS broadband program as part of the farm bill.[21]

Congress has also enacted legislation intended to make radiofrequency spectrum available for wireless broadband applications. For example, the 108th Congress enacted The Commercial Spectrum Enhancement Act (Title II of P.L. 108-494), 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 109th Congress, the Title III of the Deficit Reduction Act of 2005 (P.L. 109-171) set a hard deadline for the digital television transition, thereby reclaiming analog television spectrum to be auctioned for commercial applications such as wireless broadband.

Regulation and Broadband: Convergence and the Changing Marketplace

Rapid technological advances and the resulting convergence of telecommunications providers and markets has prompted the reexamination of the existing telecommunications industry regulatory framework. The "Telecommunications Act of 1996," (P.L.104-104) redefined and recast the 1934 Communications Act to address the emergence of competition in what were previously considered to be monopolistic markets. Despite its relatively recent enactment, however, a consensus has been growing that the modifications brought about by the implementation of the 1996 Act are not sufficient to address the Nation's changing telecommunications environment. Technological changes such as the advancement of Internet technology to supply data, voice, and video as well as the growing convergence in the telecommunications sector, have, according to many policymakers, made it necessary to consider another "rewrite" or revision of the laws governing these markets.

The regulatory debate focuses on a number of issues including the extent to which existing regulations should be applied to traditional providers as they enter new markets where they do not hold market power, the extent to which existing regulations should be imposed on new entrants as they compete with traditional providers in the same markets, and the appropriate regulatory framework to be imposed on new and/or converging technologies that are not easily classified under the present framework.[22]

The regulatory treatment of broadband technologies continues to hold a major focus in the policy debate. A major facet of the debate centers on whether present

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[21] For more information on the RUS broadband programs, see CRS Report RL30719, *Broadband Internet Access and the Digital Divide: Federal Assistance Programs,* by Lennard G. Kruger and Angele A. Gilroy.

[22] For further information see CRS Report RL32949, *Communications Act Revisions: Selected Issues for Consideration*, Angele A. Gilroy, coordinator.

laws and regulations are needed to ensure the development of competition and its subsequent consumer benefits, or, conversely, whether such laws and policies are overly burdensome and discourage needed investment and deployment of such services. What if any role regulators should play to ensure the Internet remains open to all, often referred to as "open access" requirements or "net neutrality," is also a major and contentious part of the dialogue.[23] In addition to the debate over economic regulation, concern over how and to what extent "social regulations" such as emergency 911 access, disability access, and law enforcement regulations, should be applied to new and converging technologies continues to be debated. The continued growth and expressed interest in municipal broadband networks has also focused debate on what the appropriate role of the government sector should be and whether it should be competing with the private sector.

How traditional policy goals, such as the advancement of universal service mandates, should be revised to accommodate the changing marketplace has also come under scrutiny. For example, issues such as who should receive and who should contribute to universal service funds and whether the definition of universal service objectives should be expanded to include new technologies such as broadband continue to be debated.

Activities in the 109th Congress

In the 109th Congress, debate over broadband policy primarily centered on H.R. 5252 – the Communications Opportunity, Promotion, and Enhancement Act (COPE) in the House, and the Advanced Telecommunications and Opportunity Reform Act (ATOR) in the Senate. H.R. 5252 addressed a number of issues, including the extent to which legacy regulations should be applied to traditional providers as they enter new markets, the extent to which legacy regulations should be imposed on new entrants as they compete with traditional providers in their markets, the treatment of new and converging technologies, and the emergence of municipal broadband networks and Internet access. H.R. 5252, as amended, passed (321-101) the House, was significantly amended and passed (15-7) by the Senate Commerce Committee, but did not reach the Senate floor for consideration.

In addition to regulatory reform legislation, measures to provide financial assistance to encourage broadband deployment were introduced, but not enacted. Appendix A provides a listing of broadband-related legislation introduced into the 109th Congress.

H.R. 5252 (COPE). House Commerce Committee Chairman Barton, on March 27, 2006, released a draft telecommunications reform proposal that was the subject of a Committee hearing on March 30, 2006. The then unnumbered measure, passed (27-4) the subcommittee, with amendment, on April 5, 2006, and passed (42-12) the full Committee with amendment, on April 26, 2006. The measure, titled "The Communications Opportunity, Promotion, and Enhancement Act of 2006" (COPE), was referred to the House Committee on Energy and Commerce and formally

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[23] For further information on the net neutrality debate, see CRS Report RS22444, *Net Neutrality: Background and Issues*, by Angele A. Gilroy.

introduced as H.R. 5252. A sequential referral request, by House Judiciary Chairman Sensenbrenner, which was subsequently denied, delayed floor consideration. The House passed (321-101) an amended version of H.R. 5252 on June 8, 2006. In addition to a manager's amendment clarifying franchising provisions, five additional amendments were passed. The other amendments: established a complaint process to resolve fee disputes between a local franchise authority and a cable operator; increased the income discrimination penalty for a cable operator from $500,000 to $750,000; allowed a cable franchising authority to issue an order requiring compliance with FCC revised consumer protection rules; preserved FCC authority to require VOIP providers to contribute to the federal universal service fund, when they connect directly or indirectly to the public switched network and compensate network owners for use of their network; and clarified that language in HR5252 giving the FCC the exclusive authority to adjudicate network neutrality does not remove antitrust authority over net neutrality complaints. Two amendments did not pass. The first, an amendment, sponsored by Representative Markey, to strengthen net neutrality provisions failed by a vote of 152-269. The second, to reduce, from 1 percent to 0.5 percent, the fee paid to local franchise authorities relating to PEG/iNet support by women-owned, small business and socially and economically disadvantaged firms was withdrawn.

H.R. 5252, as passed by the House, contained in its 6 titles, provisions that would establish a national cable franchising process; clarify the FCC's authority to enforce its network neutrality principles; address VoIP 911 interconnection and E911 requirements; and bar states from prohibiting municipalities from providing their own broadband networks. More specifically, Title I establishes a national process, through the FCC, for new entrants to offer pay TV services and opens it up to incumbent cable providers, once they face local competition. An operator of a national franchise is prohibited from discriminating in the provision of service to any group of residential subscribers based on the income of that group. National consumer protection rules are established with a local authority/FCC complaint procedure. Additional provisions in Title I preserve the local five percent franchise fee cap, preserve and support PEG channel and I-Nets or Institutional Networks (a one percent gross revenue fee is established to ensure financial support), and preserve rights-of-way requirements. The bill also contains provisions to assist small and rural carriers in the provision of video service by allowing video operators to share a headend transmission facility.

Title II clarifies the FCC's authority to enforce its August 2005 network neutrality principles in complaint proceedings, but prohibits the FCC from engaging in related-rulemaking. Fines up to $500,000 per violation are established and the FCC is required to resolve complaints within 90 days. The FCC is also directed to conduct and submit to the House Energy and Commerce and Senate Commerce Committees, within 180 days of enactment, a study, to evaluate ".... whether the objectives of the (FCC's) broadband policy statement and the principles incorporated therein are being achieved."

The remaining four titles dealt with a wide range of telecommunications issues. Title III of the bill contains provisions to establish 911 and E-911 requirements for VoIP services that connect to the public switched network and represent a replacement telephone service. Additional provisions provide access to the nation's

911 infrastructure and requires the FCC to appoint a 911 number administrator. Title IV contains provisions that bar states from prohibiting municipalities from providing their own broadband networks (that is telecommunications, information, or cable services), but also requires that they do not discriminate in favor of, or bestow any advantages to, such entities as compared with other providers of such services. The FCC is tasked with submitting within one year of enactment, a report to Congress, on the status of the provision of such services by municipalities. Titles V and VI contain provisions that ensue consumers can buy stand-alone broadband service; call for an FCC study to examine the possible interference associated with the deployment of broadband over power lines; and further the development of "seamless mobility."

S. 2686 (HR5252/ATOR). The Senate Commerce Committee held a series of hearings on a wide range of telecommunications issues in preparation for developing comprehensive telecommunications legislation. Senate Commerce Committee Chairman Stevens introduced, on May 1, 2006, a comprehensive (135 page) telecommunications bill, S. 2686. The major provisions of that measure dealt with a wide range of topics, including universal service reform; streamlining of the video franchising process; requiring the FCC to report annually to Congress on the net neutrality issue; interoperability of public safety communications systems; interconnection; and municipal broadband ownership. The bill also contains a number of provisions relating to broadcast issues such as the digital television transition, the reinstating of the FCC's "broadcast flag" rules, access to sports programming, and use of unlicensed "white space." Additional provisions relating to protecting children from child pornography and amending the FCC's "sunshine rules" are also included.

Although Senator Inouye, the ranking minority member of the Committee, signed on as a bill co-sponsor, he stated that S. 2686 needed considerable amendment to gain his support. He circulated a draft proposal containing provisions addressing video franchising, Internet access, broadband deployment, and universal service, for consideration that addressed his concerns. The lack of a strong net neutrality provision was one of the issues he specifically singled out for attention. S. 2686 provisions relating to streamlining the video franchising process, universal service fund reform, and net neutrality were the major focus of Commerce Committee hearing held on May 18, and May 25,2006. The Commerce Committee issued a revised draft of the bill which was the subject of a hearing held on June 13, 2006.

After a lengthy and intense markup the Senate Commerce Committee approved (15-7) on June 28, 2006 the newly titled "Advanced Telecommunications and Opportunity Reform Act," which technically is an amended version in the nature of a substitute for H.R. 5252. In addition to a new bill name and number the three-day markup led to the approval of a significant manager's amendment containing a new title and 70 amendments resulting in the passage of a 200-plus page omnibus telecommunications measure. S. 2686, which was referred to as "the Senate Committee passed version of H.R. 5252," contains 11 titles covering a wide range of telecommunications issues including video franchise reform, net neutrality, universal service reform, municipal broadband, broadcast flag, the digital television transition, interoperability, the illegal transmission of child pornography, and FCC

reform. The issue of net neutrality proved to be major point of contention during the markup. Despite the addition of a new title (Title IX) establishing an "Internet Consumer Bill of Rights" net neutrality advocates continued to press for a net neutrality non-discrimination provision. A nondiscrimination amendment offered during markup was defeated by an 11-11 vote. The lack of a cable franchise build-out provision, federal preemption of state authority over wireless services, as well as provisions added during markup to exempt, for three years, wireless providers from"new and discriminatory" taxes and make permanent the Internet tax moratorium also resulted in concern. While Senator Steven's continued to express confidence that the Senate version of H.R. 5252 would come to the floor for a vote, the 109th Congress ended without full Senate consideration of the measure.

Both the Senate and House Judiciary Committees also examined issues related to telecommunications reform. The House Judiciary's Telecommunications and Antitrust Task Force held a hearing on April 25, 2006, to examine competition issues relating to Internet access and "net neutrality." House Judiciary Committee Chairman Sensenbrenner and Representative Conyers, the ranking minority member, stated, in a letter sent to then House Speaker Hastert, that the Judiciary Committee had oversight over market conditions, consolidations and antitrust protections in the telecommunications sector, and asked for a sequential referral of H.R. 5252. That request was denied. However, Chairman Sensenbrenner, Representative Conyers and others introduced a bipartisan bill (H.R. 5417) focusing on Internet access from an antitrust perspective, that passed (20-13) the Judiciary Committee, with amendment, on May 25, 2006. A request to the House Rules Committee to have the bill considered as an amendment during House floor action on H.R. 5252 was denied. The Senate Judiciary Committee held a June 14, 2006 hearing to examine communications laws in the context of ensuring competition and innovation.

Activities in the 110th Congress

The 110th Congress continues to examine a range of telecommunications issues including the scope and effect of federal broadband financial assistance programs (including universal service and the broadband programs at the U.S. Department of Agriculture's Rural Utilities Service), and the impact of telecommunications regulation and new technologies on broadband deployment. To what degree such issues will become a focal point for legislative activity has yet to be determined. However, the Senate Commerce Committee has held a hearing on universal service reform and a range of issues were discussed in FCC oversight hearings held by both the Senate Commerce Committee and the House Telecommunications and the Internet Subcommittee. Legislative measures to address the reform and expansion of scope of the universal service fund (S. 101, S. 711, H.R. 42, H.R. 278), net neutrality (S. 215) , and broadband financial assistance (S. 541, S. 761) have been introduced.

Appendix A: Broadband-Related Legislation in the 109th Congress

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.

H.R. 214 (Stearns)

Advanced Internet Communications Services Act of 2005. Seeks to promote investment in and deployment of advanced Internet communications services by placing limitations on FCC and state regulation of those services. Introduced January 14, 2005; referred to Committee on Energy and Commerce.

H.R. 1479 (Udall)

Rural Access to Broadband Service Act. Establishes a Rural Broadband Office within the Department of Commerce which would coordinate federal government resources with respect to expansion of broadband services in rural areas. Directs the National Science Foundation to conduct research in enhancing rural broadband. Expresses the Sense of Congress that the broadband loan program in the Rural Utilities Service should be fully funded. Provides for the expensing of broadband Internet access expenditures for rural communities. Introduced April 5, 2005; referred to Committees on Science and on Energy and Commerce.

H.R. 2418 (Gordon)

IP-Enabled Voice Communications and Public Safety Act of 2005. Encourages the rapid deployment of Internet Protocol (IP) enabled voice services for emergency services including 911 and E-911 calls. Introduced May 18, 2005; referred to Committee on Energy and Commerce.

H.R. 2726 (Sessions)

Preserving Innovation in Telecom Act of 2005. Prohibits municipal governments from offering telecommunications, information, or cable services except to remedy market failures by private enterprises to provide such services. Introduced May 26, 2005; referred to Committee on Energy and Commerce.

H.R. 3146 (Blackburn)

Video Choice Act of 2005. Seeks to promote deployment of competitive video services and to eliminate redundant and unnecessary regulation. Introduced June 30, 2005; referred to Committee on Energy and Commerce.

H.R. 3517 (Andrews)
Greater Access to E-Governance Act (GATE Act). Establishes a grant program in 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 July 28, 2005; referred to Committee on Energy and Commerce.

H.R. 3958 (Melancon)
Louisiana Katrina Reconstruction Act. Provides grants for construction of broadband infrastructure necessary for technology and economic development in areas affected by Hurricane Katrina. Introduced September 29, 2005; referred to multiple committees.

H.R. 4297 (Thomas)
Tax Relief Act of 2005. Provides a tax credit to holders of rural renaissance bonds funding qualified projects including expanding broadband technology in rural areas. Passed by House December 8, 2005; passed by Senate February 2, 2006.

H.R. 5072 (Terry)
Universal Reform Act of 2006. Targets universal service support specifically to eligible telecommunications carriers in high-cost geographic areas to ensure that communications services and high-speed broadband services are made available throughout all of the States of the United States in a fair and equitable manner. Introduced March 30, 2006; referred to Committee on Energy and Commerce.

H.R. 5252 (Barton)
Communications Opportunity, Promotion, and Enhancement Act of 2006. A bill to promote the deployment of broadband networks and services. Passed House Committee on Energy and Commerce, April 26, 2006; formally introduced May 1, 2006. Reported by the Committee on Energy and Commerce (H.Rept. 109-470), May 17, 2006. Supplemental report filed (H.Rept. 109-470, Part II), June 6, 2006. Passed (321-101) the House, as amended, June 8, 2006.

H.R. 5273 (Markey)
Network Neutrality Act of 2006. A bill to promote open broadband networks and innovation, foster electronic commerce, and safeguard consumer access to online content and services. Introduced May 2, 2006; referred to Committee on Energy and Commerce.

H.R. 5417 (Sensenbrenner)
Internet Freedom and Nondiscrimination Act of 2006. A bill to amend the Clayton Act to ensure competitive and nondiscriminatory access to the Internet. Introduced May 18, 2006; referred to Committee on the Judiciary. Passed (20-13) the full committee, with amendment, May 25, 2006.

H.R. 5970 (Thomas, William)
Estate Tax and Extension of Tax Relief Act of 2006. Provides a tax credit to holders of rural renaissance bonds funding qualified projects including expanding broadband technology in rural areas. Passed House July 29, 2006.

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.

S. 497 (Salazar)

Broadband Rural Revitalization Act of 2005. Establishes a Rural Broadband Office within the Department of Commerce which would coordinate federal government resources with respect to expansion of broadband services in rural areas. Expresses the Sense of Congress that the broadband loan program in the Rural Utilities Service should be fully funded. Provides for the expensing of broadband Internet access expenditures for rural communities. Introduced March 2, 2005; referred to Committee on Finance.

S. 502 (Coleman)

Rural Renaissance Act. Creates a Rural Renaissance Corporation which would fund qualified projects including projects to expand broadband technology in rural areas. Introduced March 3, 2005; referred to Committee on Finance.

S. 1063 (Nelson)

IP-Enabled Voice Communications and Public Safety Act of 2005. Encourages the rapid deployment of Internet Protocol (IP) enabled voice services for emergency services including 911 and E-911 calls. Introduced May 18, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1147 (Rockefeller)

Amends the Internal Revenue Code of 1986 to provide for the expensing of broadband Internet access expenditures. Introduced May 26, 2005; referred to Committee on Finance.

S. 1294 (Lautenberg)

Community Broadband Act of 2005. Amends the Telecommunications Act of 1996 to preserve and protect the ability of local governments to provide broadband capability and services. Introduced June 23, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1349 (Smith)

Video Choice Act of 2005. Seeks to promote deployment of competitive video services, eliminate redundant and unnecessary regulation, and further the development of next generation broadband networks. Introduced June 30, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1504 (Ensign)

Broadband Investment and Consumer Choice Act. Seeks to establish a market drive telecommunications marketplace, to eliminate government managed competition of existing communication service, and to provide parity between functionally equivalent services. Introduced July 27, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1583 (Smith)

Universal Service for the 21st Century Act. Amends the Communications Act of 1934 to expand the contribution base for universal service and to establish a separate account within the universal service fund to support the deployment of broadband service in unserved areas of the United States. Introduced July 29, 2005; referred to Committee on Commerce, Science and Transportation.

S. 1765 (Landrieu)

Louisiana Katrina Reconstruction Act. Provides grants for construction of broadband infrastructure necessary for technology and economic development in areas affected by Hurricane Katrina. Introduced September 22, 2005; referred to Committee on Finance.

S. 1766 (Vitter)

Louisiana Katrina Reconstruction Act. Provides grants for construction of broadband infrastructure necessary for technology and economic development in areas affected by Hurricane Katrina. Introduced September 22, 2005; referred to Committee on Finance.

S. 1932 (Gregg)

Deficit Reduction Act of 2005. Title III sets a hard deadline for the digital television transition, thereby reclaiming analog television spectrum to be auctioned for commercial applications such as wireless broadband. Section 1401 cancels unobligated funds remaining as of October 1, 2006 for the USDA Rural Utilities Service Rural Broadband Access Loan and Loan Guarantee Program. Passed Senate, November 3, 2005. House agreed to conference report (H.Rept. 109-362), December 19, 2005. Senate agreed to conference report with amendments, December 21, 2005. House agreed to amended conference report, February 1, 2006. **P.L. 109-171** signed by President, February 8, 2006.

S. 2020 (Grassley)

Tax Relief Act of 2005. Provides a tax credit to holders of rural renaissance bonds funding qualified projects including expanding broadband technology in rural areas. Passed by Senate as H.R. 4297, February 2, 2006. Provision not retained in Conference Report.

S. 2113 (De Mint)

Digital Age Communications Act of 2005. Promotes the widespread availability of communications services and the integrity of communications facilities, and to encourage investment in communications networks. Introduced December 15, 2005; referred to Committee on Commerce, Science, and Transportation.

S. 2256 (Burns)

Internet and Universal Service Act of 2006. Amends the Communications Act of 1934 to ensure the availability to all Americans of high-quality, advanced telecommunications and broadband services, technologies, and networks at just, reasonable, and affordable rates, and to establish a permanent mechanism to guarantee specific, sufficient, and predictable support for the preservation and

advancement of universal service. Introduced February 8, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 2332 (Stevens)

American Broadband for Communities Act. Makes unused broadcast television spectrum available for wireless broadband. Introduced February 17, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 2357 (Kennedy)

Right TRACK Act. Directs the President's Council of Advisors on Science and Technology to establish a national broadband policy for improving and expanding broadband access in the United States by 2010. Introduced March 2, 2006; referred to Committee on Finance.

S. 2360 (Wyden)

Internet Non-Discrimination Act of 2006. A bill to ensure and promote a free and open Internet for all Americans. Introduced March 2, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 2686 (Stevens)

Communications, Consumer's Choice, and Broadband Deployment Act of 2006. A bill to amend the Communications Act of 1934 and for other purposes. Introduced May 1, 2006; passed (15-7) as amended, the Committee on Commerce, Science, and Transportation, June 28, 2006.

S. 2917 (Snowe)

Internet Freedom Preservation Act. A bill to amend the Communications Act of 1934 to ensure net neutrality. Introduced May 19, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 2989 (Hutchison)

A bill to reform the franchise procedure relating to cable service and video service, and for other purposes. Introduced May 23, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 3820 (Durbin)

Broadband for Rural America Act of 2006. Establishes a Broadband Access Trust Fund and Office of Broadband Access within the FCC to provide grants to study the lack of affordable broadband in unserved areas. Also reforms FCC's broadband data reporting and USDA's broadband loan and grant programs, provides for spectrum auction for wireless rural broadband, and establishes a public-private Rural Broadband Access Task Force. Introduced August 3, 2006; referred to Committee on Commerce, Science, and Transportation.

S. 3829 (Stabenow)

Tax Relief and Minimum Wage Act of 2006. Provides a tax credit to holders of rural renaissance bonds funding qualified projects including expanding broadband technology in rural areas. Introduced August 3, 2006; referred to Committee on Finance.

S. 3936 (Frist)

National Competitiveness Investment Act. Authorizes the National Science Foundation to provide grants for basic research in advanced information and communications technologies. Areas of research include affordable broadband access, including wireless technologies. Introduced September 26, 2006; placed on Senate Legislative Calendar.

S. 3999 (Clinton)

Rural Broadband Initiative Act of 2006. Establishes an Office of Rural Broadband Initiatives within the Department of Agriculture which will administer all rural broadband grant and loan programs previously administered by the Rural Utilities Service. Also establishes a National Rural Broadband Innovation Fund which would fund experimental and pilot rural broadband projects and applications. Introduced September 29, 2006; placed on Senate Legislative Calendar.

Appendix B: Broadband-Related Legislation in the 110th Congress

H.R. 42 (Velazquez)

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

H.R. 278 (Cubin)

Amends Section 254 of the Communications Act of 1934 to provide that funds received as universal service contributions and the universal service support programs established pursuant to that section are not subject to certain provisions of title 31, United States Code, commonly known as the Antideficiency Act. Introduced January 5, 2007; referred to Committee on Energy and Commerce.

S. 101 (Stevens)

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

S. 215 (Dorgan)

Amend the Communications Act of 1934 to ensure net neutrality. Introduced January 9, 2007; referred to Committee on Commerce, Science, and Transportation.

S. 541 (Feingold)

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

Introduced February 8, 2007; referred to Committee on Agriculture, Nutrition and Forestry.

S. 711 (Smith)

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

S. 761 (Reid)

America COMPETES Act. Authorizes the National Science Foundation (NSF) to provide grants for basic research in advanced information and communications technologies. Areas of research include affordable broadband access, including wireless technologies. Also directs NSF to develop a plan that describes the current status of broadband access for scientific research purposes. Introduced March 5, 2007; placed on Senate Legislative Calendar. crsphpgw

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