Access to Telecommunications Technology

Bridging the Digital Divide in the United States

The "digital divide" is a term used to describe a perceived gap between "information haves and have-nots," or in other words, between those Americans who use or have access to telecommunications and information technologies and those who do not.

Whether or not individuals or communities fall into the "information haves" category depends on a number of factors, ranging from the presence of computers in the home, to training and education, to the availability of affordable Internet access.

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

■ Status of Broadband Deployment in the United States

Prior to the late 1990s, American homes accessed the Internet at maximum speeds of 56 kilobits per second (kbps) by dialing up an Internet Service Provider (such as AOL) over the same copper telephone line used for traditional voice service. A relatively small number of businesses and institutions used broadband or high speed connections through the installation of special "dedicated lines" typically provided by their local telephone company. Starting in the late 1990s, cable television companies began offering cable modem broadband service to homes and businesses. This was accompanied by telephone companies beginning to offer DSL service (broadband over existing copper telephone wireline). Growth has been steep, rising from 2.8 million high-speed lines reported as of December 1999, to 206 million lines as of June 30, 2011. Of the 168 million high-speed lines reported by the FCC, 140 million serve residential users.

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

According to the Federal Communications Commission (FCC), high-speed connections over 200 kbps are reported in 67 percent of households nationwide, while connections of at least 3 Mbps (megabits per second) (download) and 768 kbps (upload) are reported in 38 percent of households nationwide.

According to the FCC's National Broadband Plan, 290 million Americans — 95 percent of the U.S. population — currently live in housing units with access to terrestrial, fixed broadband infrastructure capable of supporting actual download speeds of at least 4 Mbps. This leaves a "gap" of 14 million people in the United States living in 7 million housing units that do not have access to terrestrial broadband infrastructure capable of this speed.

Meanwhile, the National Broadband Map, which is composed of State broadband data and compiled by the National Telecommunications and Information Administration (NTIA), provides data on where broadband is and is not available. The latest update of these data indicate that 99.6 percent of the U.S. population has minimum advertised broadband speeds available (at least 768 kbps download/200 kbps upload), while 96.7 percent have available advertised speeds of at least 3 Mbps (download) and 768 kbps (upload).

The FCC's *Eighth Broadband Progress Report*, released on August 21, 2012, used National Broadband Map data to estimate that 19 million Americans living in 7 million households lack access to fixed broadband at speeds of 4 Mbps (download)/1 Mbps (upload) or greater.

From the Library of Congress, Congressional Research Service report Broadband Internet Access and the Digital Divide: Federal Assistance Programs*, September 7, 2012. See http://www.fas.org/sgp/crs/misc/RL30719.pdf.*

In contrast to broadband availability, which refers to whether or not broadband service is offered, broadband adoption refers to the extent to which American households actually subscribe to and use broadband. The U.S. Department of Commerce report, *Exploring the Digital Nation: Computer and Internet Use at Home* (based on October 2010 U.S. Census Bureau survey data) found that 68 percent of U.S. households have adopted broadband.

Similarly, the FCC's *Eighth Broadband Progress Report* found that 64 percent of American households with broadband available to them adopt broadband service offering speeds faster than 768 kbps/200 kbps, while 40 percent adopt speeds faster than the FCC benchmark of 4 Mbps/ 1Mbps. The FCC found that the "broadband adoption rates for American households are lower, on average, in the counties with the lowest median household income, in areas outside of urban areas, on Tribal lands, and in U.S. Territories."

An FCC consumer survey, conducted in October and November 2009, found that 35 percent, or 80 million American adults, do not use broadband at home, falling into three categories: those who do not use the Internet at all (22 percent); those who use the Internet but do not have Internet access at home (6 percent); and those who use dial-up to access the Internet (6 percent). The survey identified three primary reasons why non-adopting Americans do not have broadband: cost, lack of digital literacy, and the perceived insufficient relevance of broadband.

Similarly, according to the Department of Commerce report, the two most common reasons cited for not having broadband at home are that it is perceived as not needed or too expensive. Lack of a home computer can also be a major factor.

The Department of Commerce report, the FCC's National Broadband Plan, and a survey conducted by the Pew Internet and American Life Projec,t also found disparities in broadband adoption among demographic groups. Populations continuing to lag behind in broadband adoption include people with low incomes, seniors, minorities, the less-educated, non-family households, and the non-employed.

■ Broadband in Rural Areas

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

- According to the FCC's *Eighth Broadband Progress Report*, of the 19 million Americans who live where fixed broadband is unavailable, 14.5 million live in rural areas.

- The Department of Commerce report, *Exploring the Digital Nation*, found that while the digital divide between urban and rural areas has lessened since 2007, it still persists, with 70 percent of urban households adopting broadband service in 2010, compared to 57 percent of rural households.

- Data from the Pew Internet & American Life Project indicate that while broadband adoption is growing in rural areas, broadband users make up larger percentages of non-rural users than rural users. Pew found that the percentage of all U.S. adults with broadband at home is 70 percent for non-rural areas and 50 percent for rural areas.

- According to December 2011 data from the National Broadband Map, 99.7 percent of the population in urban areas have access to available broadband speeds of at least 3 Mbps (download)/768 kbps (upload), as opposed to 84.0 percent of the population in rural areas.

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

Some policymakers believe that disparities in broadband access across American society could have adverse consequences on those left behind, and that advanced telecommunications applications critical for businesses and consumers to engage in e-commerce are increasingly dependent on high-speed broadband connections to the Internet. Thus, some say, communities and individuals without access to broadband could be at risk to the extent that connectivity becomes a critical factor in determining future economic development and prosperity.

A February 2006 study done by the Massachusetts Institute of Technology for the Economic Development

Administration of the Department of Commerce marked the first attempt to quantitatively measure the impact of broadband on economic growth. The study found that "between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in employment, the number of businesses overall, and businesses in IT-intensive sectors, relative to comparable communities without broadband at that time."

A June 2007 report from the Brookings Institution found that for every 1 percentage point increase in broadband penetration in a State, employment is projected to increase by 0.2 percent to 0.3 percent per year. For the entire U.S. private non-farm economy, the study projected an increase of about 300,000 jobs.

Subsequently, a July 2009 study commissioned by the Internet Innovation Alliance found net consumer benefits of home broadband on the order of $32 billion per year, up from an estimated $20 billion in consumer benefits from home broadband in 2005.

Some also argue that broadband is an important contributor to U.S. future economic strength with respect to the rest of the world. Data from the Organization for Economic Cooperation and Development (OECD) found the United States ranking fifteenth among Organization for Economic Cooperation and Development nations in broadband access per 100 inhabitants as of December 2011. By contrast, in 2001 an OECD study found the United States ranking fourth in broadband subscribership per 100 inhabitants (after Korea, Sweden, and Canada).

While many argue that declining U.S. performance in international broadband rankings is a cause for concern, others maintain that the OECD data undercount U.S. broadband deployment and that cross-country broadband deployment comparisons are not necessarily meaningful and are inherently problematic.

Finally, an issue related to international broadband rankings is the extent to which broadband speeds and prices differ between the United States and the rest of the world.

■ Broadband and the Federal Role

The Telecommunications Act of 1996 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."

Since 1999, the FCC has adopted and released seven reports pursuant to Section 706. The first five reports formally concluded that the deployment of advanced telecommunications capability to all Americans is reasonable and timely. Unlike the first five 706 reports, the sixth, seventh, and eighth reports concluded that broadband is not being deployed to all Americans in a reasonable and timely fashion. According to the *Eighth Broadband Deployment Report*:

> Our analysis shows that the Nation's broadband deployment gap remains significant and is particularly pronounced for Americans living in rural areas and on Tribal lands. We find that as of June 30, 2011, approximately 19 million Americans did not have access to fixed broadband. Significantly, approximately 76 percent of these Americans reside in rural areas. Our analysis further shows that Americans residing on Tribal lands disproportionately lack access to fixed broadband. And the available international broadband data, though not perfectly comparable to U.S. data, suggest that the availability and deployment of broadband in the United States may lag behind a number of other developed countries in certain respects, although we also compare favorably to some developed countries in other respects. Moreover, as many as 80 percent of E-rate recipients say that their broadband connections do not fully meet their needs, and 78 percent of recipients say that they need additional bandwidth. These data combined with our findings concerning availability above provide further indication that broadband is not yet being reasonably and timely deployed to all Americans

FCC Commissioner Robert McDowell issued a dissenting statement, maintaining that there is insufficient justification for the 706 report conclusion that broadband is not being deployed in a reasonable and timely fashion. For example, the dissents argued that the report did not sufficiently account for the dramatic growth in the availability and deployment of mobile broadband, and that gaps in broadband adoption should not be used to determine whether or not broadband is being sufficiently deployed.

■ The National Broadband Plan (NBP)

As mandated by the American Recovery and Reinvestmen Act (ARRA), on March 16, 2010, the FCC publically released its report, *Connecting America: The National Broad-*

band Plan. NBP seeks to "create a high-performance America," which the FCC defines as "a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications." In order to achieve this mission, the NBP recommends that the country set six goals for 2020:

- **Goal No. 1:** At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.

- **Goal No. 2:** The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

- **Goal No. 3:** Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.

- **Goal No. 4:** Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.

- **Goal No. 5:** To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

- **Goal No. 6:** To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

The National Broadband Plan is categorized into three parts:

Part I: Innovation and Investment — which "discusses recommendations to maximize innovation, investment and consumer welfare, primarily through competition. It then recommends more efficient allocation and management of assets, government controls, or influences." The recommendations address a number of issues, including spectrum policy, improved broadband data collection, broadband performance standards and disclosure, special access rates, interconnection, privacy and cybersecurity, child online safety, poles and rights-of-way, research and experimentation (R&E) tax credits, and research and development funding.

Part II: Inclusion — which "makes recommendations to promote inclusion — to ensure that all Americans have access to the opportunities broadband can provide." Issues include reforming the Universal Service Fund, intercarrier compensation, Federal assistance for broadband in Tribal lands, expanding existing broadband grant and loan programs at the Rural Utilities Service, enabling greater broadband connectivity in anchor institutions, and improved broadband adoption and utilization, especially among disadvantaged and vulnerable populations.

Part III: National Purposes — which "makes recommendations to maximize the use of broadband to address national priorities. This includes reforming laws, policies, and incentives to maximize the benefits of broadband in areas where government plays a significant role."

National purposes include health care, education, energy and the environment, government performance, civic engagement, and public safety. Issues include telehealth and health IT, online learning and modernizing educational broadband infrastructure, digital literacy and job training, smart grid and smart buildings, Federal support for broadband in small businesses, telework within the Federal Government, cybersecurity and protection of critical broadband infrastructure, copyright of public digital media, interoperable public safety communications, next generation 911 networks, and emergency alert systems.

The release of the National Broadband Plan is seen by many as a precursor towards the development of a national broadband policy — whether comprehensive or piecemeal — that will likely be shaped and developed by Congress, the FCC, and the Administration. Upon release of the NBP, President Obama issued the following statement:

> My Administration will build upon our efforts over the past year to make America's nationwide broadband infrastructure the world's most powerful platform for economic growth and prosperity, including improving access to mobile broadband, maximizing technology innovation, and supporting a nationwide, interoperable public safety wireless broadband network.

Meanwhile, Congress will play a major role in implementing the National Broadband Plan, both by considering legislation to implement NBP recommendations, and by overseeing broadband activities conducted by the FCC and Executive Branch agencies. ■