

The National Broadband Plan Goals: Where Do We Stand?

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Summary

On March 16, 2010, the Federal Communications Commission (FCC) released *Connecting America: The National Broadband Plan*. The National Broadband Plan (NBP) identified significant gaps in broadband availability and adoption in the United States, and in order to address those gaps and other challenges, the NBP set specific goals to be achieved by the year 2020. Goals were set for next generation broadband service; universal broadband service; mobile wireless broadband innovation and coverage; broadband access of Community Anchor Institutions; a nationwide, wireless, interoperable broadband public safety network; and broadband for tracking energy consumption.

Three years after the rollout of the NBP, available data indicate that there has been progress towards reaching the 2020 goals. The following observations can be made:

- the United States is much closer to reaching broadband availability goals than broadband adoption goals, which remain a major challenge;
- the United States is much closer to achieving broadband download speed goals than upload speed goals;
- while the next generation broadband goal of 100 million households with 100 Mbps speeds seems within reach (at least for download speeds), the price remains high—affordability could improve in the future depending on technological advances and consumer demand for ultra-high speed next generation performance;
- recent rollouts of next generation wireless technologies have led the FCC to state that the United States leads the world in mobile innovation; on the other hand, the latest Organisation for Economic Co-operation and Development (OECD) data indicate that the United States remains in the middle of the pack with respect to wireless broadband subscriptions per 100 of the population;
- while broadband data are incomplete for Community Anchor Institutions, available information indicate that the number of CAIs with 1 gigabit connections remains relatively low; and
- two major initiatives—FirstNet and Smart Grid—are currently underway in order to help reach the goals for a public safety wireless network and for broadband monitoring of energy consumption.

Many of the key telecommunications issues that are currently being considered by the 113th Congress are focused on improving broadband deployment and thus are intended to have a positive impact on the nation's progress towards reaching one (or in many cases, several) of the NBP goals. As the 113th Congress considers contentious telecommunications issues such as universal service reform, wireless technology and spectrum policy, and telecommunications regulatory reform, the ongoing progress towards meeting the NBP goals is likely to be part of that debate.

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Introduction

On March 16, 2010, the Federal Communications Commission (FCC) released *Connecting America: The National Broadband Plan*.[1] Mandated by the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5), the FCC's National Broadband Plan (NBP) is a 360-page document composed of 17 chapters containing over 200 specific recommendations directed to the FCC, the Executive Branch (both to individual agencies and to the Administration as a whole), Congress, and nonfederal and nongovernmental entities.

The ARRA mandated that the NBP should "seek to ensure that all people of the United States have access to broadband capability." Accordingly, the NBP identified significant gaps in broadband availability and adoption in the United States, and in order to address those gaps and other challenges, the NBP set six specific goals to be achieved by the year 2020. These goals are as follows:

- **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.

This report does not address the appropriateness of those goals or the ongoing debate over the best ways to reach those goals.[2] Rather, this report—with three years having passed since release of the NBP—looks at each of these goals and examines available data and activities which might indicate the nation's progress towards meeting them. Currently, the 113th Congress and the FCC are initiating, developing, and/or overseeing a number of telecommunications policies and programs including universal service reform and a number of spectrum and wireless policy initiatives. Given that those policies and programs are intended to help the nation reach many of the goals set by the NBP, the extent to which the NBP goals are met will likely be a part of the ongoing debate over many of these issues.

[1] Federal Communications Commission, *Connecting America: The National Broadband Plan*, March 2010, 360 pp., available at http://download.broadband.gov/plan/national-broadband-plan.pdf.

[2] For more information on the policy debates surrounding the major NBP recommendations, see CRS Report R41324, *The National Broadband Plan*, by Lennard G. Kruger et al.

Goal 1—Next Generation Broadband

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.

Popularly referred to as "100 squared" (100 Mbps in 100 million households), this goal would offer next-generation broadband[3] to about 75% of all U.S. households. Typically, the higher the speeds offered, the more costly the deployment and the higher the prices to consumers. Deployments of 100 Mbps are more likely in densely populated urban and suburban areas than in rural areas. Currently, capabilities in the range of 100 Mbps/50 Mbps are offered by fiber and a next generation cable technology called DOCSIS 3.0.

According to the most recent National Broadband Map data (released February 2013, data current as of June 2012), **63 million households** are in areas with advertised download speeds greater than 100 Mbps.[4] The same data show that **13 million households** have advertised upload speeds greater than 50 Mbps.[5] The goal also calls for "affordable access." According to the New America Foundation, "it costs between $100 and $300 per month to get a connection speed of over 100 Mbps in most U.S. cities—if such high speeds are even available at all."[6] Similarly, the Information Technology & Information Foundation (ITIF) cites FCC international data indicating an average price in the U.S. of $199.99 per month for 100 Mbps or more. According to ITIF, the high price "reflects the fact that the service tier above 100 Mbps is more a curiosity than a meaningful service today."[7]

It is important to note that the goal sets a target for *actual* speed (e.g., the download and upload speeds actually experienced by consumers), whereas the National Broadband Map data reflects *advertised* speed. The FCC has initiated the Measuring Broadband America Program to survey actual performance data of Internet Service Providers serving over 80% of the residential broadband market. The February 2013 Measuring Broadband America Report found that ISPs deliver on average 97% of advertised speeds during peak intervals.[8]

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[3] A distinction is often made between "current generation" and "next generation" broadband. "Current generation" typically refers to traditionally deployed cable, DSL, and wireless broadband systems, while "next generation" refers to dramatically faster download and upload speeds offered by fiber and advanced cable technologies, and also potentially by future generations of DSL and wireless technologies. Because next generation broadband offers significantly higher speeds and capacities, it can enable more sophisticated and diverse applications.

[4] Derived from National Telecommunications and Information Administration, *Broadband Statistics Report*, "Access to Broadband Technology by Speed," June 2012, available at http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf.

[5] National Telecommunications and Information Administration, *Broadband Statistics Report*, "Broadband Availability in Urban vs. Rural Areas," June 2012, available at http://www.broadbandmap.gov/download/Broadband%20Availability%20in%20Rural%20vs%20Urban%20Areas.pdf.

[6] New America Foundation, *The Cost of Connectivity*, July 2012, p. 9, available at http://newamerica.net/sites/newamerica.net/files/policydocs/The_Cost_of_Connectivity.pdf.

[7] Richard Bennett, Luke A. Stewart, and Robert D. Atkinson, Information Technology & Innovation Foundation (ITIF), *The Whole Picture: Where America's Broadband Networks Really Stand*, February 2013, p. 51, available at http://www2.itif.org/2013-whole-picture-america-broadband-networks.pdf.

[8] Federal Communications Commission, *2013 Measuring Broadband America February Report: A Report on Consumer Wireline Broadband Performance in the U.S.*, February 2013, p. 9, available at http://transition.fcc.gov/cgb/measuringbroadbandreport/2013/Measuring-Broadband-America-feb-2013.pdf.

Meanwhile, the National Broadband Plan set—as a milestone—an interim goal of 100 million homes with actual download speeds of 50 Mbps and actual upload speeds of 20 Mbps by 2015. Accordingly, National Broadband Map data show **101 million households** with advertised download speeds over 50 Mbps, and **22 million households** with advertised upload speeds over 25 Mbps (which is the closest speed tier to 20 Mbps). Thus, while the interim goal has been met for download speeds (100 million households with 50 Mbps by 2015), the interim upload speed goal (100 million households with 20 Mbps) is farther from being reached.

Recently, the cable industry has begun rolling out the latest generation of cable modem technology —DOCSIS 3.0—which can offer 100 Mbps download speeds. Thus, the number of households currently having access to 100 Mbps/50 Mbps is likely higher than what is reflected in the National Broadband Map data, which is current through June 2012. With respect to download speeds, the FCC is optimistic that the 100 squared goal will be met. According to the *Measuring Broadband America* report,

> In just the year since we collected data for our last Report, ISPs have improved in both their ability to deliver what they promise to their customers, and in the overall speeds they can and are delivering. This is a success story, and indicates strong progress toward the important goals set forth in the NBP, that by 2015, 100 million homes should have affordable access to actual download speeds of 50 Mbps, and by 2020 the actual download speed should have increased to 100 Mbps. Though we are making progress toward these goals, we have not yet reached them, and to ensure success it is essential that ISPs continue to improve at the impressive pace indicated by this Report.[9]

> Over the next year, we anticipate that providers will continue to innovate and increase their offerings in the higher speed tiers. We know based on industry discussions that the major expansion in high speed service tiers first noted in the July 2012 report was enabled by the deployment by the cable industry of DOCSIS 3.0 technology which permitted service rates of 100 Mbps and above. The cable industry has also announced that it intends in the near future to extend its services to rates beyond 100 Mbps, both to support future service offerings such as ultra-high definition television, and to meet competition created by fiber-based service providers. Verizon fiber is now offering rates up to 300 Mbps in select parts of their market footprint, while Google offers 1 Gbps (1000 Mbps) service in Kansas City, MO.[10]

Similarly, the FCC, in its *Eighth Broadband Progress Report*, notes the acceleration of private sector rollouts of next generation broadband technologies:

> Higher-speed broadband (10 Mbps and above) is increasingly available in many areas of the country. We must keep in mind these developments as we assess the current market and project consumer demand and expectations in the future. For example, cable providers have made much progress on rolling out DOCSIS 3.0, which is capable of 100 Mbps speeds and even higher speeds. And, Americans continue to demand and subscribe to higher services. We will examine in the next Inquiry whether we should identify multiple speed tiers in these reports to assess the country's progress toward our universalization goal, as well as

[9] Federal Communications Commission, *2012 Measuring Broadband America July Report*, July 2012, p. 49, available at http://transition.fcc.gov/cgb/measuringbroadbandreport/2012/Measuring-Broadband-America.pdf.

[10] *2013 Measuring Broadband America February Report*, p. 52.

additional goals—such as affordable access to 100 Mbps/50 Mbps to 100 million homes by 2020.[11]

Goal 2—Mobile Innovation and Wireless Networks

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

National Broadband Map data monitor the availability and extensiveness of wireless broadband networks in the United States. As **Table 1** shows, lower download speeds (up to 3 Mbps, typically provided by 3G wireless technology) are available to 90% or more of U.S. households. The availability percentage for next generation wireless (4G LTE wireless technologies, which can provide over 6 Mbps) is less, at over 78% of U.S. households. These percentages, reflecting June 2012 data, can be expected to rise, given the recent and ongoing buildout and deployment of 4G LTE wireless broadband technologies.[12]

Table 1. Nationwide Availability of Mobile Wireless Broadband

Download Speeds	Percentage of Household Units
>768 kilobits per second	98.51%
>1.5 megabits per second	95.22%
>3 megabits per second	90.49%
>6 megabits per second	78.62%
>10 megabits per second	76.77%
>25 megabits per second	0.0%

Source: Compiled from National Broadband Map, *Broadband Statistics Report*, "Access to Broadband Technology by Speed," data as of June 2012, released January 2013, available at http://www.broadbandmap.gov/download/Technology%20by%20Speed.pdf.

An assessment of whether or not the United States "lead[s] the world in mobile innovation" is a subjective judgment. The FCC notes that since 2010, U.S. wireless providers have aggressively built out the newest commercial technology for mobile broadband, known as 4G LTE, which offers download speeds in the range of 5 to 12 Mbps. According to the FCC, as of the summer of 2010 there was no LTE deployment in the United States; by January 2012, three mobile wireless providers had launched LTE networks which covered an estimated 211 million people.[13]

The FCC's most recent *International Broadband Data Report* asserts that this recent wireless network building is "securing the United States' position as the world leader in LTE adoption."[14]

[11] Federal Communications Commission, *Eighth Broadband Progress Report*, FCC 12-90, released August 21, 2012, p. 44, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db0827/FCC-12-90A1.pdf.

[12] See, for example: AT&T, *News Release*, "AT&T to Invest $14 Billion to Significantly Expand Wireless and Wireline Broadband Networks, Support Future IP Data Growth and New Services," November 7, 2012, available at http://www.att.com/gen/press-room?pid=23506&cdvn=news&newsarticleid=35661&mapcode=corporate|consumer.

[13] *Eighth Broadband Progress Report*, p. 6-7.

[14] Federal Communications Commission, *International Broadband Data Report*, Third Report, DA 12-1334, August 21, 2012, p. 2, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-12-1334A1.pdf.

The FCC notes that according to Deloitte, U.S. investment in 4G networks during 2012-2016 could be $25-$53 billion, that more than 80% of smartphones sold globally run on U.S. operating systems (up from less than 25% three years ago), and that as the first adopters of 4G LTE, the United States is the global test bed for wireless technology and services. In view of this recent progress, the FCC concludes that "the United States has regained its role as a global leader in and around mobile broadband."[15]

On the other hand, another data source, from the Organisation for Economic Co-operation and Development (OECD), provides international comparisons with respect to wireless broadband subscriptions per 100 inhabitants. These data refer to actual subscriptions as opposed to the coverage or extensiveness of wireless networks. The latest OECD data, current as of June 2012, shows the United States ranking 8th behind Korea, Sweden, Australia, Finland, Denmark, Japan, and Norway in wireless broadband subscriptions per 100 inhabitants.[16]

Goal 3—Universal Broadband

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

This goal encompasses two separate but interrelated and measurable aspects of broadband deployment: availability and adoption. The download and upload speeds at which broadband might be considered "robust" is a subjective judgment that depends on what speeds and associated applications are considered required by broadband users. Section 706(d)(1) of the Telecommunications Act of 1996 (P.L. 104-104) defines "advanced telecommunications capability" as "high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology."

The National Broadband Plan recommended a broadband benchmark speed of 4 Mbps download/1 Mbps upload, which could initially serve as a minimum threshold constituting broadband under section 706. According to the *Eighth Broadband Progress Report*:

> In each of the reports the Commission has conducted under section 706, it has relied on a speed benchmark for determining whether a service satisfies this statutory definition. In the *2010 Sixth Broadband Progress Report*, the Commission updated this speed benchmark from 200 kbps in both directions to services that offer actual download (i.e., to the customer) speeds of at least 4 Mbps and actual upload (i.e., from the customer) speeds of at least 1 Mbps (4 Mbps/1 Mbps, or "speed benchmark").
>
> In this report, we continue to rely upon this speed benchmark, which the Commission has used in the two most recent broadband reports. We find that this speed benchmark still reflects the requirements in section 706(d)(1) and generally "enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology." For instance, broadband service offering 4 Mbps/1 Mbps enables users to stream high-definition video and engage in basic video conferencing. Maintaining the speed

[15] Ibid.

[16] OECD Broadband Statistics Update, February 7, 2013, available at http://www.oecd.org/sti/broadband/broadband-statistics-update.htm.

> benchmark from prior years also simplifies the measurement of progress from the prior two years.[17]

Because the consumer demand for bandwidth and services increases over time, the NBP recommended that the 4 Mbps download/1 Mbps upload benchmark be reviewed and possibly reset every four years.

Availability

Broadband availability refers to the presence of broadband service that is offered in a given area. According to the National Broadband Map, **98.2% of the U.S. population** has broadband service available with speeds of at least 3 Mbps download/768 kbps upload. This speed level is the National Broadband Map data measurement tier closest to the FCC's 4 Mbps/1 Mbps benchmark. Therefore, the FCC uses the 3 Mbps/768 kbps data as a surrogate for the broadband benchmark. Under this criterion, broadband availability levels appear to be approaching 100%.

Adoption

Broadband adoption refers to the extent to which Americans actually subscribe to and use broadband. Specifically, the NBP set an adoption goal of "higher than 90%" by 2020.[18]

There are several ways to characterize broadband adoption. The FCC's semiannual report tracking broadband subscribership (also known as the Form 477 report) provides subscribership ratios, which is the number of fixed broadband connections nationwide divided by the number of households. According to the most recent semiannual FCC subscriber data (current as of December 31, 2011, released in February 2013), the subscriber ratio is 40% for fixed residential connections[19] with advertised speeds of at least 3 Mbps down and 768 kbps up. The subscribership ratio for fixed residential connections of at least 200 kbps in any direction (which previously was the FCC's minimum benchmark for broadband) is 68%.[20]

The latest Pew Internet and American Life Project telephone survey (conducted in April 2012) found that 66% of Americans surveyed said they have broadband connections at home. The download and upload speeds of those connections was not specified. The Pew data show that broadband adoption rates have slowed and plateaued in recent years—adoption was at 63% in 2009, as compared to 66% in the 2012 survey.[21]Additionally, the 66% rate in the Pew Survey refers to any speed identified as broadband by the survey respondent. The subscribership rate for the NBP benchmark speed of 4 Mbps/1 Mbps is lower (at 40% for fixed residential connections)

[17] *Eighth Broadband Progress Report*, p. 19-20.

[18] *Connecting America: The National Broadband Plan*, p. 10.

[19] Fixed connections do not include wireless broadband. In the *Eighth Broadband Progress Report*, the FCC explains that it has insufficient information to calculate an adoption rate for mobile services, because many households likely have more than one connected mobile device.

[20] Federal Communications Commission, *Internet Access Services: Status as of December 31, 2011*, February 2013, p. 34-35, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0207/DOC-318810A1.pdf.

[21] Joanna Brenner and Lee Rainie, Pew Research Center, *Pew Internet: Broadband*, May 24, 2012, available at http://www.pewinternet.org/Commentary/2012/May/Pew-Internet-Broadband.aspx.

as reported by the FCC. Thus progress towards meeting the "higher than 90%" goal of the NBP appears to have slowed.[22]

According to the Pew Survey, certain demographic groups tend to have lower broadband adoption rates. These groups include minorities, low income households, the elderly, adults with less educational attainment, and rural populations. Of those surveyed without Internet, almost half said that the main reason they don't go on line is because they don't believe the Internet is relevant to them. In an April 2009 survey, most respondents without broadband said that a drop in price was most likely to get them to switch to broadband.[23] The lack of a computer in the home is also a major reason why households choose not to subscribe to broadband service.[24]

Affordability

Affordability is an important aspect of Goal 3, which calls for "affordable access to robust broadband service." Affordability is also a key factor affecting broadband adoption rates, given that one of the major reasons why people say they choose not to subscribe to a broadband service is its cost.

The question then becomes: at what price should broadband service be considered "affordable?" While measuring affordability is complex, difficult to quantify, and often subjective, one way that broadband service affordability is often assessed is by comparing broadband service prices domestically with rates in other countries. Comparisons of international broadband data can be interpreted in very different ways. Some assert that Americans pay significantly more for broadband than those in other countries, especially for next-generation, very high speed connections.[25] Others assert that broadband prices in the U.S. are reasonable, and that network performance in the U.S. is better than in all but a handful of nations that have densely populated urban areas and have used government subsidies.[26]

The Broadband Data Improvement Act (P.L. 110-385) requires the FCC to prepare international comparisons of broadband service. The third annual *International Broadband Data Report* surveyed broadband plans in 38 countries, including 213 broadband plans (113 fixed, 100 mobile) in the United States. The FCC found that the cheapest plan among those surveyed was $23 per month with 768 kbps download speed and unlimited data. The most expensive standalone broadband plan was a fiber broadband plan at $199 per month with 150 Mbps of download speed, 35 Mbps of upload speed and unlimited data.[27]

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[22] The relatively stalled growth in broadband adoption rates is identified and discussed in: John Horrigan, TechNet, *Broadband Adoption in 2012: Little Movement Since '09 & Stakeholders Can Do More to Spur Adoption*, March 20, 2012, 10 pages; and Richard Bennett, Luke A. Stewart, and Robert D. Atkinson, Information Technology & Innovation Foundation (ITIF), *The Whole Picture: Where America's Broadband Networks Really Stand*, February 2013, 75 pages.

[23] *Pew Internet: Broadband.*

[24] U.S. Department of Commerce, National Telecommunications and Information Administration, *Exploring the Digital Nation: Computer and Internet Use at Home*, November 2011, p. 35, available at http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf.

[25] See New America Foundation, *The Cost of Connectivity: A comparison of high-speed Internet prices in 22 cities worldwide*, July 2012, 54 pp., available at http://newamerica.net/sites/newamerica.net/files/policydocs/The_Cost_of_Connectivity.pdf.

[26] *The Whole Picture: Where America's Broadband Networks Really Stand*, p.4.

[27] Federal Communications Commission, *International Broadband Data Report*, Third Report, DA 12-1334, August (continued...)

Table 2 shows average prices of fixed residential (wireline) broadband plans in the United States surveyed by the FCC. The FCC found that

> From the analysis of the data, we have concluded that the United States is in the midprice range of countries, whether we compare by speed tier or price per gigabyte of data, for fixed residential broadband.[28]

Table 2. Average Fixed Residential Broadband Prices in the United States

	Average Monthly Price $(2011 PPP[a])	Rank Among OECD and other Countries With Developed Broadband Markets[c]
Average monthly net price of a broadband package	$69.75[b]	32nd out of 38
Average monthly net price of a standalone broadband plan, advertised download speed 1-5 Mbps	$34.93	14th out of 24
Average monthly net price of a standalone broadband plan, advertised download speed 5-15 Mbps	$43.71	21st out of 33
Average monthly net price of a standalone broadband plan, advertised download speed 15-25 Mbps	$56.50	26th out of 32

Source: FCC, *Third Annual International Broadband Data Report.*

a. Purchasing power parity (PPP) is a currency conversion rate that converts to a common currency and equalizes the purchasing power of different currencies.

b. This price is a simple average of all the U.S. plans (standalone and bundled broadband) in the dataset.

c. Ranked from lowest to highest average price.

With respect to mobile broadband, the FCC concluded that "particularly for smartphone plans, the United States is one of the ten least expensive countries in terms of price per gigabyte of data."[29]

(...continued)

21, 2012, p. 5, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-12-1334A1.pdf.

[28] Ibid., p. 22.

[29] Ibid.

Goal 4—One Gigabit to Anchor Institutions

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.

Based on currently available data, it is difficult if not impossible to determine how many communities have affordable access to at least 1 gigabit per second broadband service to their anchor institutions. The National Broadband Map includes a dataset which contains nearly 300,000 records of community anchor institutions (CAIs) including schools, colleges and universities, libraries, medical/healthcare facilities, public safety institutions, and community centers (both governmental and nongovernmental).[30] For a large percentage of the CAIs in the dataset (54%) it is unknown whether or not they subscribe to broadband service. However, of the CAIs which have reported whether or not they have broadband service (and which have reported the download speeds they are receiving), 7.8% report download speeds greater than 1 gigabit per second.

The most recent FCC report on the status of broadband deployment—the *Eighth Broadband Progress Report*—concluded that elementary and secondary schools may lack a sufficient level of broadband service, and that "it continues to appear that many schools and classrooms are underserved by broadband today."[31] Specifically, the FCC cites a January 2011 survey of the Schools and Libraries Program (E-rate) funded schools and libraries in which 80% of E-rate recipients said their broadband connections did not fully meet their needs, and 78% of recipients said they need additional bandwidth. Based on National Broadband Map data, the FCC found that "providers offer download speeds of at least 25 Mbps to only 63.7 percent of the nation's schools, suggesting that many schools may not have a sufficient level of broadband service."[32]

Other data are available from the American Library Association's Information Policy and Access Center, which found that 31.2% of libraries have connectivity speeds greater than 10 Mbps, and 55% have speeds between 1.5 and 10 Mbps.[33]

Meanwhile, one of the purposes of the broadband stimulus grants awarded by the National Telecommunications and Information Administration (NTIA) is to provide ultra-high-speed broadband connections to CAIs. Specifically, the Comprehensive Community Infrastructure grant program (under the Broadband Technology Opportunity Program or BTOP) has awarded 117 grants, many of which are due to be complete by the end of FY2013. According to NTIA, 12,000 CAIs have been connected, and over 80% of the 1,500 communities served by the projects will receive speeds greater than a gigabit per second.[34]

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[30] Available at http://www.broadbandmap.gov/data-download.

[31] *Eighth Broadband Progress Report*, p. 59.

[32] Ibid.

[33] Information and Policy Access Center, *Public Libraries & Broadband*, May 31, 2012, available at http://www.plinternetsurvey.org/sites/default/images/Briefs/BroadbandBrief2012May312012-1.pdf.

[34] Testimony of Lawrence Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration, Hearing before the House Committee on Energy and Commerce, Subcommittee on Communications and Technology, "Is the Broadband Stimulus Working?" February 27, 2013, available at http://www.ntia.doc.gov/speechtestimony/2013/testimony-assistant-secretary-strickling-broadband-stimulus-working.

Goal 5—Broadband Public Safety Network

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.

In its 2010 National Broadband Plan report, the FCC stated that "nearly a decade after 9/11, our first responders still lack a nationwide public safety mobile broadband communications network, even though such a network could improve emergency response and homeland security."[35]

Provisions in the Middle Class Tax Relief and Job Creation Act of 2012 (P.L. 112-96) called for developing, constructing, and operating a nationwide network, called FirstNet, designed to meet public safety communications needs.[36]

Goal 6—Broadband and the Smart Grid

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.

According to the FCC, "broadband and advanced communications infrastructure will play an important role in achieving national goals of energy independence and efficiency."[37] In order for this goal to be realized, there must be universal broadband (see Goal 3, above) and, according to the NBP, "the country will need to modernize the electric grid with broadband and advanced communications."[38]

The FCC's central recommendation for reaching this goal involves integrating broadband into the Smart Grid. Currently, the United States "is undertaking a massive communications and information technology buildout to produce the Smart Grid, which the National Institute of Standards and Technology (NIST) defines as the 'two-way flow of electricity and information to create an automated, widely distributed energy delivery network.'"[39]

Title XIII of the Energy Independence and Security Act of 2007 (P.L. 110-140) set forth the policy of the United States "to support the modernization of the nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure." P.L. 110-140 stipulated initiatives for government programs to undertake in Smart Grid investments, including coordinated research, development, demonstration, and information outreach efforts.[40]

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[35] *Connecting America: The National Broadband Plan*, p. XI.

[36] For more information, see CRS Report R42543, *The First Responder Network and Next-Generation Communications for Public Safety: Issues for Congress*, by Linda K. Moore.

[37] *Connecting America: The National Broadband Plan*, p. 265.

[38] Ibid., p. 27.

[39] Ibid., p. 267.

[40] See http://www.smartgrid.gov. Also see Executive Office of the President, National Science and Technology Council, A Policy Framework for the 21st Century Grid: A Progress Report, February 2013, 11 pp., available at http://www.whitehouse.gov/sites/default/files/microsites/ostp/2013_nstc_grid.pdf and CRS Report R41886, *The Smart Grid and Cybersecurity—Regulatory Policy and Issues*, by Richard J. Campbell.

Implementation of NBP Recommendations

The National Broadband Plan contained over 200 specific recommendations intended to help achieve the Plan's goals.[41] The NBP's recommendations were directed to the FCC, to Congress, to the Executive Branch (both to individual agencies and to Administration as a whole), and to nonfederal and nongovernmental entities.

The Benton Foundation maintains a database that tracks the implementation of the NBP recommendations.[42] According to Benton, out of a total 218 recommendations, 17% are completed, 40.4% are in progress, 15.6% are started, and 27.1% are not started.

Many of the key telecommunications issues that are currently being considered by the 113th Congress are focused on improving broadband deployment, and thus are intended to have a positive impact on the nation's progress towards reaching one (or in many cases, several) of the NBP goals. Issues include

- Congressional oversight of the FCC's efforts to establish the Connect America Fund and its Mobility and Remote Areas component funds as part of Universal Service Fund reform;[43]
- Congressional oversight of the FCC's efforts to expand the Lifeline Program by allowing subsidies to low-income Americans to be used for broadband, and to modify the Rural Health Care and Schools and Libraries (E-rate) programs, also part of Universal Service Fund reform;[44]
- Congressional and FCC consideration of spectrum policies intended to make more spectrum available for wireless broadband;[45]
- Congressional oversight of the development, construction, and implementation of FirstNet, a nationwide broadband network designed to meet public safety communications needs;[46]
- Congressional oversight of ARRA broadband grant and loan programs and reauthorization of broadband loan programs in the 2013 farm bill;[47] and

[41] For an outline of NBP recommendations and NBP recommendations to Congress, See Tables 1 and 2 in CRS Report R41324, *The National Broadband Plan*, by Lennard G. Kruger et al.

[42] The Benton Foundation broadband tracker is available at http://benton.org/initiatives/national_broadband_plan.

[43] For more information see CRS Report R42524, *Rural Broadband: The Roles of the Rural Utilities Service and the Universal Service Fund*, by Angele A. Gilroy and Lennard G. Kruger.

[44] For more information see CRS Report R42846, *Lifeline Telephone Program: Frequently Asked Questions*, by Angele A. Gilroy and Mark Gurevitz and CRS Report R42524, *Rural Broadband: The Roles of the Rural Utilities Service and the Universal Service Fund*, by Angele A. Gilroy and Lennard G. Kruger.

[45] For more information see CRS Report R40674, *Spectrum Policy in the Age of Broadband: Issues for Congress*, by Linda K. Moore.

[46]For more information see CRS Report R42543, *The First Responder Network and Next-Generation Communications for Public Safety: Issues for Congress*, by Linda K. Moore.

[47]For more information see CRS Report RL33816, *Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, by Lennard G. Kruger and CRS Report R41775, *Background and Issues for Congressional Oversight of ARRA Broadband Awards*, by Lennard G. Kruger.

- Congressional consideration of possibly revising the current regulatory framework established by the 1996 Telecommunications Act (and its underlying statute, the Communications Act of 1934) in response to the convergence of telecommunications providers and markets and the transition to an Internet Protocol (IP) based network.

Concluding Observations

Three years after the rollout of the National Broadband Plan, available data indicate that there has been progress towards reaching the 2020 goals. The following observations can be made:

- the United States is much closer to reaching broadband availability goals than broadband adoption goals, which remain a major challenge;
- the United States is much closer to achieving broadband download speed goals than upload speed goals;
- while the 100 squared goal seems well within reach (at least for download speeds), its price remains high—affordability could improve in the future depending on technological advances and consumer demand for 100 Mbps plus speeds;
- recent rollouts of next generation wireless technologies (4G LTE) have led the FCC to state that the United States leads the world in mobile innovation; on the other hand, the latest OECD data indicate that the United States remains in the middle of the pack with respect to wireless broadband subscriptions per 100 population;
- while broadband data are incomplete for Community Anchor Institutions, available information indicate that the number of CAIs with 1 gigabit connections remains relatively low; and
- two major initiatives—FirstNet and Smart Grid—are currently underway in order to help reach goals 5 and 6.

In weighing progress towards reaching the goals of the National Broadband Plan, two important considerations should be taken into account. First, the specific broadband goals developed by the FCC are not necessarily universally agreed upon by all stakeholders. For example, the 100 squared goal has been criticized for endorsing an evolution of broadband deployment that could leave rural areas without the next generation broadband service that urban and suburban areas might enjoy. Second, it is impossible to quantify to what extent progress towards reaching these goals is due to the NBP recommendations versus the natural evolution of the broadband market, independent of any impact of the NBP.

Finally, as the 113th Congress considers contentious telecommunications issues such as universal service reform, wireless technology and spectrum policy, and telecommunications regulatory reform, the ongoing progress towards meeting the NBP goals is likely to be part of that debate.

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