INSIGHT on the Issues

A Connection for All Ages: Enabling the Benefits of High-Speed Internet Access for Older Adults

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In an increasingly digital world, where a new generation of Internet-based services promises vast opportunities and benefits, many older adults do not have affordable, high-speed Internet connectivity at home. The Federal Communications Commission (FCC) highlighted the need to increase the use of high-speed Internet technologies among older Americans as part of the 2010 National Broadband Plan. Three years later, a review of the National Broadband Plan suggests slow and uncertain progress to address key barriers to broadband adoption and use among older adults.

High-speed Internet Connectivity Enables a New Generation of Services and Benefits

The experience of Internet connectivity has changed substantially since the mid-1990s. For many Internet users, what was once predominantly a medium for sending email and reading Web pages has become a more powerful and common platform for accessing and sharing all types of interactive multimedia services. Much of this change is the result of technologies that have increased the capacity of users to transmit audio, video, and data across the Internet.

The capacity or bandwidth of an Internet connection, frequently referred to as "speed," is a measure of how much information can move from one point to another in a given amount of time. In general, users with slow Internet connections are limited to basic applications. Higher-speed Internet service supports a greater flow of content, an easier and faster way to access information, and a better user experience. More important, high-speed connectivity enables a new generation of applications and services that have the potential to address a broad array of societal and individual needs.

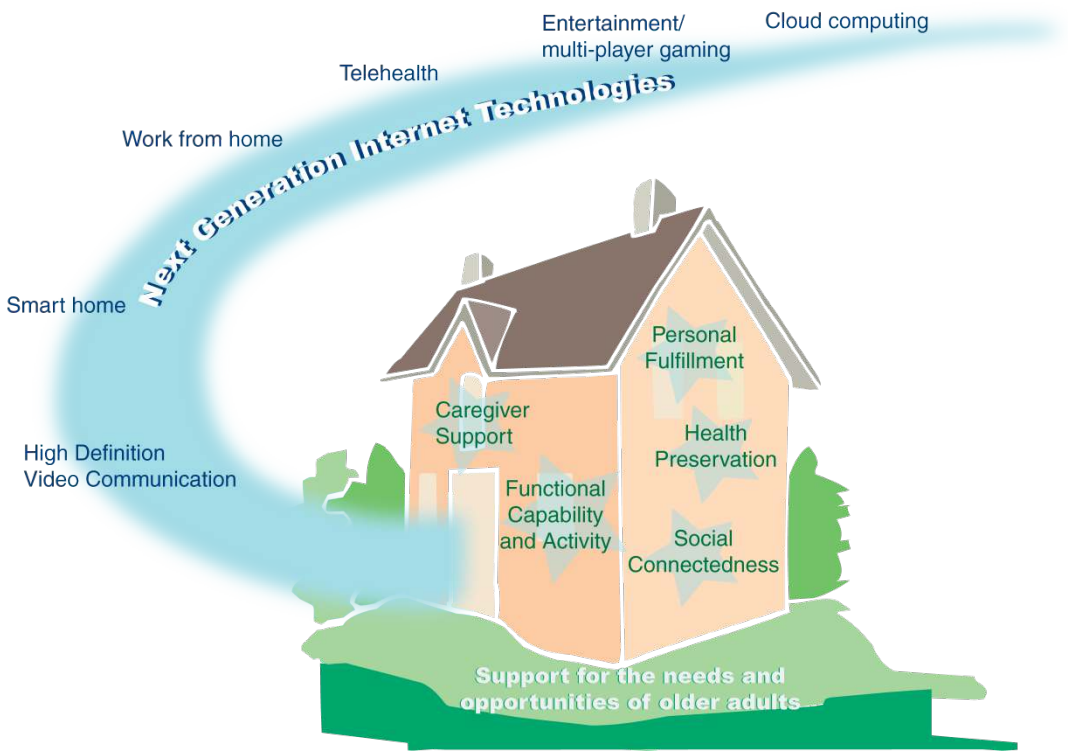
Emerging Internet Technologies Promise to Empower Older Adults in Key Areas of Life

A variety of emerging Internet-based technologies have the potential to empower older adults to live more productive, independent, and satisfying lives. In fact, research suggests that technology can help support the needs and ambitions of older adults in five broad, interrelated impact areas: personal fulfillment, health preservation, social connectedness, functional capability and activity, and caregiver support (Figure 1).[1]

Personal Fulfillment

A range of technologies and applications are available or emerging that can make it easier and more convenient for older adults to engage in meaningful and personally fulfilling activities. The impact of these

Figure 1
High-speed Internet-enabled Technologies in Support of Key Needs and Opportunities for Older Adults



technologies can be particularly powerful in support of paid work, continuing education, and volunteering, as these activities enable older adults to make important contributions to society and enhance their own well-being.[2] For example, the option of working from home can be particularly valuable to older adults who face growing demands to manage complex health, retirement, and care arrangements. In this regard, Internet-enabled videoconferencing and real-time document sharing can increase effectiveness and productivity when employees work from home or entrepreneurs operate a home-based business. Similar technologies can facilitate distance-learning opportunities and volunteer activities at convenient times and places, especially for individuals who have jobs, disabilities, or family responsibilities that make it difficult to travel to a classroom.

Health Preservation

Internet-enabled technologies create opportunities to help older adults take advantage of preventive health services, participate in physical activity, and self-manage chronic diseases that can help prevent or postpone functional decline. For example, the use of increasingly sophisticated home-based "smart medical services" supports the long-term treatment of chronic diseases.[3] Online multiplayer gaming and virtual reality systems such as Nintendo Wii or Sony PlayStation can help promote physical activity and exercise among older adults.[4]

The use of video conferencing and telepresence technology to connect patients to health professionals and services can help expand access to primary and preventive care and improve patient outcomes. In fact, a

recently released large-scale study of patients receiving mental health services showed that providing these services through remote high-speed video conferencing can dramatically reduce hospital admissions and total hospitalized days.[5]

Social Connectedness

The challenges to independence and quality of life that often accompany aging can make staying connected difficult. The death of a spouse, accumulating losses of family members or friends, retirement, disabilities, or poor health may heighten the risk of chronic loneliness. Evidence suggests that feelings of social isolation, or loneliness, are prevalent among older adults and indicate major risks of decline in physical, mental, and emotional well-being.[6]

A number of emerging Internet-based products and services show significant potential to increase well-being and social inclusion for older adults.[7] Applications that take advantage of the dynamic nature of video communication promote a sense of "closeness" that can be especially effective in fostering and encouraging social interactions.[8] For example, video calling with programs such as Skype may offer particular value for grandparents seeking to stay connected with their grandchildren.[9]

Functional Capability and Activity

Internet technologies have vast potential to help individuals overcome various functional limitations—from minor inconveniences to severe disabilities—so they can participate more actively and independently in daily life. High-speed network connectivity is a key enabler of many supportive technologies. Examples range from commercially available video relay services that allow people who use sign language to make and receive telephone calls, to network-connected robots that assist older adults with daily activities that can become more challenging with age.

Caregiver Support

Providing quality care for older adults with chronic conditions and functional limitations is a major commitment, and can be complex and highly stressful work. It often requires a team of health care professionals and significant support from family or other unpaid caregivers.

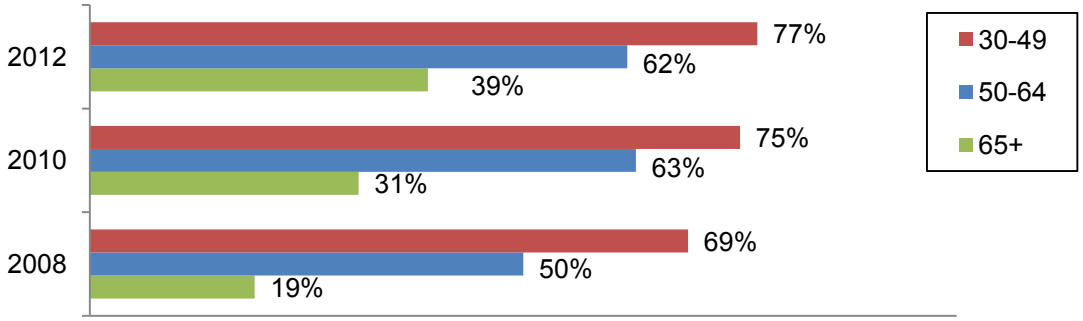
High-speed Internet connectivity supports numerous services and applications that can assist caregivers. For example, high-definition video conferencing can offer fast access to health care providers and support groups, and enables family meetings when people live at a distance from each other.

Several emerging "smart home" applications can also help reduce the burden of multiple tasks in the caregiver's hectic daily life. Useful features of a smart home allow residents or their caregivers to manage and control home security, appliances, lighting, and digital thermostats regardless of whether they are at home or at some distant location.[10]

Older Adults Lag in High-speed Internet Adoption and Use

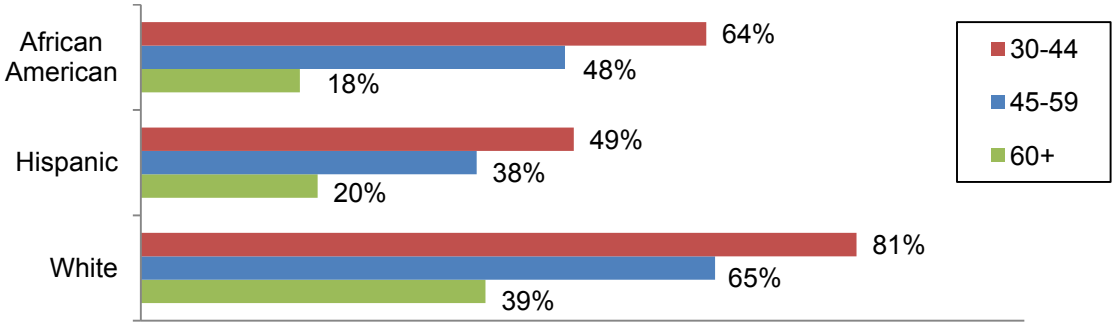
Despite the need to stay connected and the many benefits of Internet connectivity, older adults adopt home high-speed Internet access at a much lower rate than the national average (see Figure 2). Moreover, older Hispanics and African Americans are less likely than older whites to have a high-speed Internet connection at home (Figure 3). Although more than 6 in 10 adults go online wirelessly with a cell phone or laptop, only about 1 in 5 older adults are mobile Internet users.[11] In addition, most

Figure 2
High-speed Internet Connection at Home by Age, April 2008, 2010, and 2012



Source: Pew Internet & American Life Project Surveys, April 2008, April 2010, and April 2012.

Figure 3
High-speed Internet Connection at Home by Age and Race, 2010



Source: Pew Hispanic Center (2011), Latinos and digital technology, 2010.

mobile wireless connections do not qualify as broadband.[12]

This lack of access is a problem, as the chairman of the FCC has noted, because "broadband has gone from being a luxury to being a necessity for full participation in our economy and society."[13]

As the value and reach of broadband-enabled content and services continue to grow, the costs of not having a broadband connection are likely to increase exponentially. Indeed, as more people connect to a network, the individual cost of exclusion increases faster than any rise in value for those who are included.[14] As one scholar explains, "having access to broadband … is simply treading water or keeping up. Not having it means sinking."[15]

The National Broadband Plan Calls for a Long-term Commitment to Create a High-performance America

In early 2009, Congress directed the FCC to adopt a plan to "ensure that all people of the United States have access to broadband capability."[16] The instructions from Congress also required a detailed strategy for achieving affordability and maximizing use of broadband to advance consumer welfare and other national purposes such as health care delivery, energy efficiency, and education.[17]

In March 2010, the FCC released the National Broadband Plan (NBP) with the mission of creating "a high-performance America—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."[18] This multipronged strategy included more than 200 recommendations for the FCC, Congress, and other agencies to implement over the course of a decade.

Modest Recommendations and Uncertain Implementation Strategy Hamper NBP Vision of Digital Inclusion for All

The United States has long aspired to full digital inclusion for all Americans,[19] and the NBP presents a particularly eloquent and convincing case for why achieving this vision is so critical. However, the FCC makes clear that the NBP's real value is in connecting aspirations to actions because "[a]ctions and their results matter most to capturing the opportunities broadband presents."[20]

The NBP makes a series of recommendations to address major barriers that large segments of the population—including many older adults—face in adopting broadband.[21] These recommendations are based on the results of a large, nationwide FCC study. The study found that cost, digital literacy, and relevance are three primary obstacles that keep 35 percent of adult Americans from getting home broadband.[22]

Tracking the implementation progress of these recommendations is a difficult task for several reasons. Although the FCC worked diligently in the first year following the introduction of the NBP to communicate with the public on the progress made in implementing the various recommendations,[23] it has not sustained that effort.[24] In addition, the executive branch has yet to act on an NBP recommendation to create a broadband strategy council to coordinate the implementation of NBP recommendations. This is a particularly important function, given that only about half of the NBP recommendations focus on the FCC.[25]

Since the release of the NBP almost three years ago, the federal government has initiated action on many of the recommendations to promote broadband adoption and utilization. However, the impact of these actions in facilitating broadband use among older adults is unclear. Most older adults will be ineligible for two of the more prominent initiatives (Connect2Compete and the low-income broadband pilot program).

The FCC has yet to announce what, if any, actions it has taken on the one recommendation in the NBP that specifically targets older adults. Below is a more detailed status update of the actions taken on these and other NBP recommendations to address the factors that contribute to lower broadband adoption and utilization levels: cost, digital literacy, and relevance (see Appendix A for a summary of these actions).

Cost

To help overcome the cost barriers to broadband adoption, the NBP recommends expanding the Lifeline telephone assistance program to provide support for broadband service.[26]

Lifeline is an undersubscribed yet valuable program that provides low-income households with a monthly discount on local telephone service.[27] Since the mid-1980s, the program has made phone service affordable for tens of millions of economically disadvantaged citizens, enabling an essential connection to jobs, family, and emergency services. The recommendation encourages the FCC to allow program recipients to apply their discounts to any service package that includes broadband, as long as the package also includes basic voice service.[28]

In January 2012, the FCC approved major changes to its Lifeline program, including the addition of a new program goal: ensuring the availability of broadband for all low-income Americans.[29] As part of this reform, the FCC announced that it would conduct a pilot program to identify effective approaches to increase broadband adoption among low-income consumers. The Commission selected 14 projects: five wireless projects, seven wireline projects, and two that use both wireline and wireless technologies.[30] The FCC authorized $13.8 million to fund monthly discounts on broadband service for up to 74,000 low-income consumers over a 12-month period.[31]

Two details about the pilot program are particularly noteworthy. First, only 8 of the 14 pilot projects offer connection speeds at or above the FCC's current definition of broadband—4 Megabits per second (Mbps) downstream and 1 Mbps upstream—in all or portions of their study areas.[32] Second, although two of the projects will partner with organizations that offer digital literacy training targeted toward older adults, various unresolved funding issues raise questions about their potential value.[33]

To further address the cost barriers to broadband adoption, the NBP recommends the deployment of a nationwide free or low-cost wireless broadband network. Under this proposal, the FCC would auction one or more spectrum bands with the requirement that the license winners provide a free or low-cost broadband service.[34]

The FCC decided against moving forward with the NBP recommendation for a free or low-cost wireless Internet access network.[35] Although a variety of technical and nontechnical issues, including substandard Internet access connections, may have contributed to this decision, the FCC did not explain its rationale for dropping the concept.[36]

Digital Literacy

As defined by the NBP, digital literacy refers to the technical and cognitive "skills associated with using information and communications technology to find, evaluate, create and communicate information."[37] To help more consumers develop these basic skills, the NBP calls on the federal government to launch a National Digital Literacy Program consisting of three parts.

Digital Literacy Portal – The first recommendation was to create an online digital literacy portal to serve as a central location for sharing resources that impart digital skills. A federal interagency working group, led by the U.S. Department of Commerce, undertook this initiative and launched the National Digital Literacy Portal (digitalliteracy.gov) on May 13, 2011.[38]

Greater Library Capacity – The second recommendation was to increase the capacity of libraries and other community-based organizations to improve their Internet connectivity, train personnel, and enhance computer hardware. The NBP specifically identified the Institute of Museum and Library Services (IMLS), an independent agency that serves as the main source of federal support for libraries and museums in the United States, as a key leader on this initiative.

In response, the IMLS consulted with many experts and community members to identify action steps and a framework for digital communities, culminating in the release of *Building Digital Communities: A Framework for Action* on March 21, 2012.[39]

National Digital Literacy Corps – The third recommendation was to establish a

National Digital Literacy Corps of trained volunteers, modeled after AmeriCorps, to teach digital skills and help people in their community become more comfortable with technology.

On October 12, 2011, the FCC announced its intention to initiate a proceeding to explore opportunities to expand access to digital literacy training at more public libraries and schools across the country, and possibly form a National Digital Literacy Corps.[40] However, as word of this potential initiative spread, librarians and others began expressing concern that the Digital Literacy Corps would undermine their authority and the public's perception of them.[41] The FCC has yet to initiate a proceeding on this issue.

Relevance

Some nonadopters question the relevance of broadband to their daily lives. According to FCC survey data, 52 percent of nonadopters cite one or more of the following as a reason why they do not have broadband:

- The Internet is a waste of time.
- There is nothing online worth seeing.
- They are content with their current service.[42]

The NBP offers several recommendations to address relevance barriers to broadband adoption, including one recommendation that solely targets older adults. That recommendation calls on public and private partners to engage in efforts that increase the relevance of broadband for older adults and includes several action steps (see Box 1).

The most notable action step proposes that the FCC and the National Institute on Aging work together to conduct a survey of older adults that identifies barriers to their adoption of broadband technology. It emphasizes that the survey should particularly focus on relevance and skills, but also notes "that cost and lack of comfort with technology are almost certainly impediments to older Americans adopting broadband." The FCC and National Institute on Aging have yet to initiate formal action on this recommendation.

Another relevant recommendation calls on the private and nonprofit sectors to join together to direct a national outreach and awareness campaign that helps communicate why broadband matters. This recommendation encourages the campaign to target key segments of nonadopters such as the elderly, low-income Americans, ethnic and racial minorities, and rural Americans.

In response to this NBP proposal, the FCC has facilitated the creation of Connect2Compete, a public-private partnership that aims to "improve the lives of Americans—regardless of their age, race, geography, income, or education level" by providing $10 per month high-speed Internet connections, low-cost computers, and free digital literacy training to qualifying households.[43] Although the FCC characterizes this initiative as an unprecedented effort to reduce barriers to broadband adoption, the actual impact may fall well short of expectations. Unfortunately, the "high-speed" Internet access service promoted by Connect2Compete does not meet the minimum speed threshold that the FCC uses to define basic broadband.[44] In addition, the program limits eligibility to households with children who qualify for free lunches through the National School Lunch Program, a criterion that essentially excludes older adults.[45]

The two remaining recommendations in this section lack clear direction in implementation strategy and any real means to measure progress or enforce

BOX 1

Action Steps from National Broadband Plan Recommendation 9.5: Public and Private Partners Should Prioritize Efforts to Increase the Relevance of Broadband for Older Americans*

The FCC should work with the National Institute on Aging to conduct a survey of older Americans to more clearly identify barriers to their adoption of broadband technology. The survey should particularly focus on relevance and skills.

Service providers, federal agencies, and nonprofit groups can work together to develop government initiatives, broadband service offerings, and online tools and content that give people a reason to be online, a low-cost way to do it, and an easy way to do the things they need to do.

The FCC and National Institute on Aging should identify how to best target adoption programs to older Americans.

- These programs should address the social infrastructure that supports adoption, including family members, other caregivers, and organizations that serve as trusted sources of information.
- This work should focus on incorporating the needs of older Americans into the implementation of other recommendations in this section, such as the National Digital Literacy Program, the Best Practices Clearinghouse, and any programs to improve broadband affordability for low-income populations.

The private sector, in collaboration with nonprofits that serve older Americans, could launch a competition to invite development of applications that enhance the social benefits of broadband for older Americans.

* For the full text of recommendation 9.5, see Federal Communications Commission, National Broadband Plan: Connecting America (Washington, DC, March 2010), Recommendation 9.5, pp.179–180, http://www.broadband.gov/plan/9-adoption-and-utilization/#r9-5.

compliance. The first calls on the FCC to conduct an in-depth study of consumer mobile use with a particular focus on communities with low broadband adoption rates. Without much more direction than that, the FCC might reasonably suggest that the release of its 15th annual Mobile Wireless Competition Report on June 27, 2011, would be sufficient to meet this recommendation and that no further action would be necessary.[46]

The second is for the National Telecommunications and Information Administration (NTIA) to consider opportunities for other federal agencies to engage with public-private partnerships to improve broadband adoption. A search of the NTIA website suggests that the agency has yet to act on the NBP's recommendation to improve broadband adoption by organizing public-private partnerships to work with federal agencies already serving nonadopting communities.

Beyond Digital Literacy: Focusing on the Quality of Internet Connectivity to Help Bridge the Digital Divide

The full impact and value of maximizing broadband adoption and utilization depends in part on the quality of the broadband connections.

Differences in the quality of Internet connectivity, especially as they relate to the speed of the connection and the affordability of service, can influence what types of services are available and what users can do with their network connection. This point has been overshadowed in the transition from dial-up Internet access as policymakers and analysts generally have focused on "universal broadband availability" or "broadband connectivity everywhere" as the end goal.[47] For consumers, however, broadband is not an end in itself. It is a means to deliver the services, applications, and content that individuals, communities, businesses, and government want and increasingly need to ensure a globally competitive future and a high quality of life.

Need for Speed

"Speed" refers to the rate, commonly expressed in Mbps, at which data travels from one point to another in a given amount of time. In general, higher-speed Internet connectivity enables a greater flow of content, access to a wider range of services, and a better user experience (Table 1 provides an example of how higher-speed Internet access can improve user experience).

Among the many factors that affect what users can do with a broadband connection,[48] speed is generally regarded as "the single most important technical metric … and is often positively correlated with other indices of service quality."[49]

Research suggests that higher-speed connections spur economic growth and productivity.[50] At least one international ranking of cities includes broadband speed as an indicator of a vibrant economy and a strong quality of life.[51] Many countries and states recognize connection speed as a source of competitive advantage and a specific measure of broadband leadership.[52]

Many European and Asian countries have significantly faster Internet speeds than the United States. One recent study shows that the United States trails 18 other industrialized countries in terms of average advertised download speeds.[53]

In 2010, the FCC updated its definition of broadband Internet service to a minimum data transmission speed of 4 Mbps for downloads (i.e., to the user) and 1 Mbps for uploads (i.e., from the user).[54] At the same time, the FCC also

Table 1
Estimated Time to Download a Two-Hour High-Definition Movie at Various Internet Connection Speeds

Speed	Time	Notes on Speed
56 Kbps	8.5 days	Maximum speed for a dial-up connection
4 Mbps	2.8 hours	Minimum speed to qualify as broadband as defined by the FCC
10 Mbps	68 minutes	Minnesota law: All state residents have access to 10–20 Mbps by 2015
50 Mbps	14 minutes	National Broadband Plan Goal for 2015: 100 million households have broadband with actual download speeds of 50 Mbps
100 Mbps	7 minutes	National Broadband Plan Goal for 2020: 100 million households have broadband with actual download speeds of 100 Mbps
1 Gbps	Seconds	South Korea: 1 Gbps broadband for all by 2012

* Kbps = Kilobits per second; Mbps = Megabits per second; Gbps = Gigabits per second.

Prepared by AARP Public Policy Institute using the download time calculator (http://download.stormloader.com/) and based on the assumption that a two-hour high-definition movie requires 5 gigabytes of disk space.

noted that these minimum speed requirements would need to increase in the future as consumer applications and services emerge that demand the download and upload of more data.[55]

In fact, the demand for advanced applications and higher-quality Internet connections continues to grow. A 2012 FCC report suggests that more consumers are moving to higher-speed Internet connections,[56] albeit at a slower rate than some other countries. Moreover, industry analysts predict that Internet traffic worldwide will quadruple between 2011 and 2016, driven significantly by explosive growth in the consumption of video content and the rapid proliferation of laptops, tablets, and mobile devices.[57]

These and other related trends exert varying degrees of upward pressure on the demand for higher-quality Internet connections (see Box 2). Their convergence facilitates a range of emerging applications and services that promise to help consumers manage nearly every aspect of daily living more efficiently and effectively.

Promoting policies that make the United States a world leader in the use of these applications and services is a basic NBP objective. A key long-term goal of the NBP is to ensure that 100 million homes have affordable access to download speeds of at least 100 Mbps and upload speeds of at least 50 Mbps by 2020.[58] Meeting this goal is critical to building a high-performance America.

However, 100 million homes will account for only about 75 percent of all U.S. households in 2020. For the remaining 25 percent, the NBP's goal (identified by the FCC as "a universalization target") is affordable access to download speeds of 4 Mbps and upload speeds of 1 Mbps by 2020.[59] The substantial difference in speeds between these two goals means that the United States could achieve the NBP's broadband availability targets and still end up with a large digital divide. Millions of households would lack access to the full range of economic and social opportunities and benefits enjoyed by many other consumers.

Affordability and Value

Affordability is another key indicator of broadband quality. Higher-priced service may prevent broadband adoption or lead to the use of a connection that lacks sufficient capacity to access the full range of opportunities that the digital world offers. It also may mean that households spend an excessive amount of their finances on broadband, limiting their ability to purchase other essential goods.

Available data on broadband prices suggests that Americans pay more for high-speed Internet connectivity than citizens in many other nations. Indeed, the cheapest available broadband plan, as measured in dollars per megabit of speed, is more expensive in the United States than in all but 5 of the 34 Organization for Economic Cooperation and Development member countries.[60]

Among the 31 countries that have network connections supporting download speeds of 30 Mbps and above, the United States has the highest monthly price.[61] The general impact of this pricing trend is clear, according to Harvard's Berkman Center for Internet and Society: "… as long as U.S. prices are middling to high relative to a set of countries, we should not expect U.S. consumers' adoption to be better than middling by comparison to adoption elsewhere in the countries that have lower prices."[62]

High or unpredictable broadband costs present a particular burden for older adults, many of whom live on fixed incomes and do not have the resources

BOX 2

Key Trends Driving the Need for High-capacity Broadband

Several related trends are contributing to Internet traffic growth and exerting varying degrees of upward pressure on the demand for higher capacity broadband.

Explosive Growth in Video Traffic

Demand for online video, the most bandwidth-intensive form of data, is exploding. Forecasts suggest that by 2016, 1.2 million minutes of video—or the equivalent of more than two years' worth of viewing time—will cross the Internet every second.*

Simultaneous Use of Multiple Services and Applications

As broadband access networks function as the primary platform for a growing number of essential technologies and services, many households increasingly find themselves accessing multiple broadband applications simultaneously, a trend that pushes demand for higher-speed connections even further. Indeed, higher-capacity broadband enables the concurrent use of many different applications in much the same way that the electric grid powers all the appliances in the home.**

Cloud Computing

Cloud computing allows users to store their software applications and digital content (documents, videos, music, etc.) on a provider's remote computer servers rather than on a local hard drive. This change enables users to access their digital resources anywhere, anytime, on any device as long as they have an Internet connection of sufficient capacity to transfer their data.

Internet of Things

The Internet of Things generally refers to how the Internet will expand as all types of objects get connected online and actively communicate with each other and their users. More than just mobile phones, tablets, and desktop computers, these objects include an increasing number of everyday things—from household appliances, clothing, and furniture to video cameras, thermostats, and medicine cabinets. These objects are equipped with various sensors and mechanical devices and connected to the Internet to create, share, and respond to data about their locations and make processes more efficient.***

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* Cisco Systems Inc., Cisco Visual Networking Index: Forecast and Methodology, 2011–2016, White Paper, May 30, 2012. Available online at: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf.

** Institute for a Broadband-Enabled Society, *Institute for a Broadband-Enabled Society response to the House of Representatives Standing Committee on Infrastructure and Communications Inquiry into the National Broadband Network*, February 2011. Available online at: http://broadband.unimelb.edu.au/engage/pubs/sub/IBES-HoR-NBN-2011.pdf.

*** Steve Lohr, "The Internet Gets Physical," The New York Times, December 18, 2011, p. SR1, Available online at: http://www.nytimes.com/2011/12/18/sunday-review/the-internet-gets-physical.html.

or flexibility to withstand significant changes in their expenses. One study finds that more than half (52 percent) of retirees aged 65 and older who live alone or with a spouse do not have sufficient income to cover expenses for basic necessities such as food, medical care, and transportation.[63]

Older adults and all consumers need accurate data to make meaningful price comparisons of their specific Internet service options. Unfortunately, such data are largely unavailable to the public. The FCC's most recent broadband progress report notes that the Commission "… does not currently have data sufficient to analyze the

prices that consumers in fact pay for broadband."[64] The National Broadband Map is an interactive website designed in part to help inform consumers about available high-speed Internet services. The map is the largest dataset of its kind, but it does not include essential price information. The omission is critical. As one analyst noted, the map is "ineffective as a meaningful resource for U.S. residents."[65]

In addition, Internet service providers often market broadband connectivity as part of a bundle of services and under a variety of multipart pricing schemes and long-term contracts. They may set monthly limits on the amount of data a subscriber can use over their Internet connection and impose fees when they exceed this allowance.[66] As a result of these practices, consumers face myriad features, and uncertain costs make it difficult to gauge the value of different service offers. These complex pricing schemes almost certainly have implications for consumer use and adoption of broadband. One study finds that unanticipated costs associated with broadband are often cited as reasons for discontinuing service.[67]

Although many factors influence the quality of Internet connectivity in a region, competition and public policies to increase competition and consumer choices are essential. Not that long ago, when slow dial-up service was the primary means of Internet access in the United States, consumers could choose from among thousands of independent Internet service providers.[68] Federal telecommunications policy helped foster this vigorous competition in part by requiring local telephone companies to open their networks and rent access to their competitors. Although the FCC later abandoned these rules, similar policies in Europe and Asia continue to provide important consumer benefits, such as greater consumer choice, lower prices, and higher connection speeds.[69]

Today's consumers have very few options for truly high-speed Internet service at home. Most households have only two choices: cable modem service from the cable company and digital subscriber line service from the telephone company. This lack of serious competition helps explain why Americans often pay higher prices for slower service than residents of other countries. In fact, in another study reporting that consumers in the United States pay higher prices and have slower connection speeds, the New America Foundation also finds that prices are lower and speeds are higher in markets where consumers may choose from at least three competitive Internet service providers.[70] Without this competitive pressure, the dominant service providers have few incentives to upgrade networks or reduce prices.

Policy Options

Truly high-speed Internet access can make the world more accessible for older Americans, providing convenient pathways to the resources, activities, and services that empower them to live healthy, independent, and meaningful lives. This section outlines a few basic policy principles to help promote full digital inclusion for older adults.

Make Universal, Truly High-Quality Broadband a Priority

- Federal, state, and local policymakers should promote consumer choice and pursue all meaningful opportunities to maximize the adoption and utilization of affordable, high-quality broadband-enabled services. Rather than just waiting for private companies to act, policymakers should take a proactive, leadership

role to ensure full digital inclusion for all, regardless of gender, income, age, or geographic location.

- Policymakers should make the NBP's 2020 goal to bring 100 Mbps broadband to 100 million homes their own priority. Their objective should be to ensure that *every* home in their jurisdiction has affordable access to 100 Mbps connection as soon as possible, but before 2020.

Include Older Adults in Broadband Adoption Efforts

- As recommended in the NBP, the FCC and the National Institute on Aging should move expeditiously to conduct a survey of older adults to more clearly identify and understand the barriers to their adoption and utilization of broadband technology.
- The FCC should fund and promote large-scale pilot projects that provide truly high-quality connectivity to underserved populations, including those who face financial or physical impediments, such as older adults and individuals with disabilities.

Measure Progress and Emphasize Transparency

- Policymakers should take steps to improve the quality of the National Broadband Map, ensuring the collection and public reporting of timely and standardized information. In particular, this information should provide a full and accurate measure of broadband adoption throughout the United States and address key elements of quality such as price and speed.
- The FCC should return to using Broadband.gov as a tool for measuring progress and keeping stakeholders and the public informed on the status of each of the recommendations in the NBP. The FCC should also create a Broadband Performance Dashboard, as recommended in the NBP, to clearly communicate the extent of progress and effectiveness in meeting the plan's long-term goals.

Ensure Coordination

The foundation of an effective multiyear broadband strategy to extend affordable, high-performance connectivity to all Americans requires strong leadership and great collaboration across the federal government. The executive branch should create a high-profile broadband strategy council, as proposed in the NBP, to coordinate the implementation of NBP recommendations.

Appendix A

Status Summary of National Broadband Plan (NBP) Recommendations to Address Key Barriers to Broadband Adoption and Utilization

Recommendation	Status	Summary of Action
Recommendation 9.1 (NBP, p. 172) – The FCC should expand Lifeline Assistance (Lifeline) and Link-Up America (Link-Up) to make broadband more affordable for low-income households.	In progress	The FCC authorized a $13.8 million pilot program to fund monthly discounts on broadband service for low-income consumers. Only 8 of the 14 pilot projects will offer connection speeds at or above the FCC's current definition of broadband.
Recommendation 9.2 (NBP, p. 173) – The FCC should consider free or very-low-cost wireless broadband as a means to address the affordability barrier to adoption.	Denied	FCC decided not to move forward with this recommendation.
Recommendation 9.3 (NBP, p. 174) – The federal government should launch a National Digital Literacy Program that creates a Digital Literacy Corps, increases the capacity of digital literacy partners, and creates an Online Digital Literacy Portal.	In progress	The Department of Commerce launched digitalliteracy.gov and the IMLS released a report on building digitally inclusive communities.
Recommendation 9.4 (NBP, p. 178) – NTIA should explore the potential for public-private partnerships to improve broadband adoption by working with other federal agencies.	?	No action reported on this recommendation.
Recommendation 9.5 (NBP, p. 179) – Public and private partners should prioritize efforts to increase the relevance of broadband for older Americans.	?	No action reported on this recommendation.
Recommendation 9.6 (NBP, p. 180) – The federal government should explore the potential of mobile broadband access as a gateway to inclusion.	?	No action reported on this recommendation.
Recommendation 9.7 (NBP, p. 180) – The private sector and nonprofit community should partner to conduct a national outreach and awareness campaign.	In progress	Connect2Compete, a nonprofit championed by the FCC, initiated pilot programs to provide reduced-cost Internet service to families who qualify for free and reduced lunches at school.

Endnotes

[1] These five impact areas were adapted from several sources, including J. F. Coughlin and J. Lau, "Cathedral Builders Wanted: Constructing a New Vision of Technology for Old Age," *Public Policy and Aging Report*, Vol. 16, No. 1 (2006), 4–8; R. M. Baecker, K. Moffatt, and M. Massimi, "Technologies for Aging Gracefully," *interactions*, Vol. 19, No. 3 (2012), 32–36; and H. Bouma, J. L. Fozard, and J. V. Bronswijk, "Gerontechnology as a Field of Endeavour," *Gerontechnology*, Vol. 8, No. 2, (2009), 68–75.

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