

# THE BROADBAND ADOPTION SUMMIT



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## All Aboard? Tackling Broadband Adoption

*By Rick Schadelbauer*

# **All Aboard? Tackling Broadband Adoption**

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**National Telecommunications Cooperative Association**

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## I. Introduction

*“We need to tackle the challenge of connecting 93 million Americans to our broadband future. In the 21<sup>st</sup> century, a digital divide is an opportunity divide. To bolster American competitiveness abroad and create the jobs of the future here at home, we need to make sure that all Americans have the skills and means to fully participate in the digital economy.”*

*—FCC Chairman Julius Genachowski, February 2010*

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The national broadband plan, released in March 2010, established a laudable goal for the nation: all U.S. citizens, regardless of where they live, should have access to robust broadband Internet service within 10 years.

However, the initial ability to obtain access to broadband service is but one part of the solution to unlocking the myriad benefits of broadband Internet service. Broadband must both *get* to a location and *stay* at that location, *and* it must remain affordable. The consumer must also recognize—and continue to recognize each day and month—the value of broadband. Unless consumers actually *subscribe* to broadband services at home, they will be left behind in today’s online world even if broadband service has been made available to them.

This white paper examines the issue of broadband Internet adoption from several angles. First, it looks at the scope of the issue. In closely examining the results of three recent studies of broadband adoption, it looks for consensus on the size of the problem. Next, the paper looks at the underlying barriers that prevent nonadopters from subscribing to at-home broadband service. The paper then looks more closely at the potential benefits that could accrue to the overall macroeconomy and individual citizens as a result of more widespread broadband adoption. Finally, the paper proposes some high-level next steps for beginning to achieve the goal of bringing the 93 million Americans referenced by FCC Chairman Genachowski into the fold of at-home broadband users.

The task of substantially increasing broadband adoption rates will, in many ways, be as difficult as the challenge of making sure that broadband service becomes and remains ubiquitously available and affordable. But unless it can be accomplished, the full range of economic and social benefits made possible by widespread broadband deployment will go largely unrealized.

## II. Broadband Adoption Estimates

Three recent comprehensive surveys have examined the issue of at-home broadband Internet adoption in America:

- The FCC Omnibus Broadband Initiative (OBI) Working Series Paper No. 1, “Broadband Adoption and Use in America,” published in February 2010, presented the results of a fall 2009 FCC survey designed to “explore the broadband experience of American consumers.”<sup>1</sup>
- In August 2010, Pew Internet & American Life Project released “Home Broadband 2010,” a study of home broadband Internet adoption based on telephone interviews with 2,252 adults age 18 and older.
- The U.S. Department of Commerce’s Economics and Statistics Administration and National Telecommunications and Information Administration released “Exploring the Digital Nation: Home Broadband Adoption in the United States” in November 2010. The report draws on the Census Bureau’s Current Population Survey Internet Use Supplement, which surveyed 54,000 households in October 2009.

This section of the white paper will look at the results of these three surveys, and will seek out a consensus as to the extent of broadband adoption in the United States.

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The FCC Omnibus Broadband Initiative (OBI) Working Series Paper No. 1, “Broadband Adoption and Use in America,” published in February 2010, presented the results of a fall 2009 FCC survey of more than 5,000 Americans. Among the results:

- 78% of adults are Internet users, either broadband or dial-up, from home or elsewhere.
- 74% of adults have Internet access from their home.
- 67% of U.S. households include a broadband user who accesses the service from home.
- 65% of adults are broadband adopters.
- 6% of Americans use dial-up connections from their homes.
- 6% use the Internet somewhere outside of their home.

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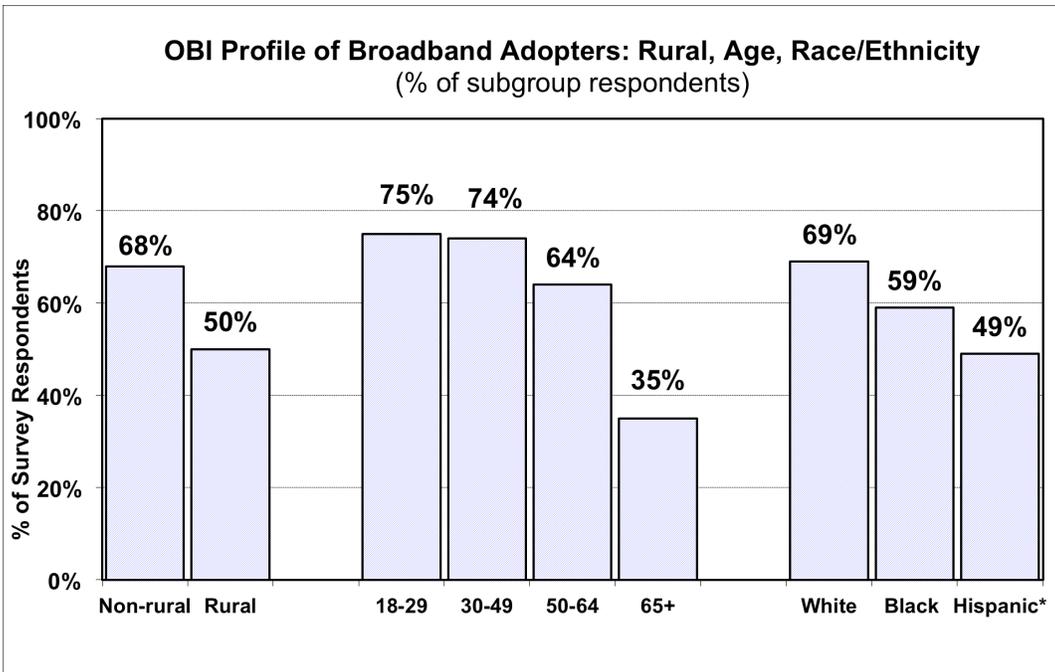
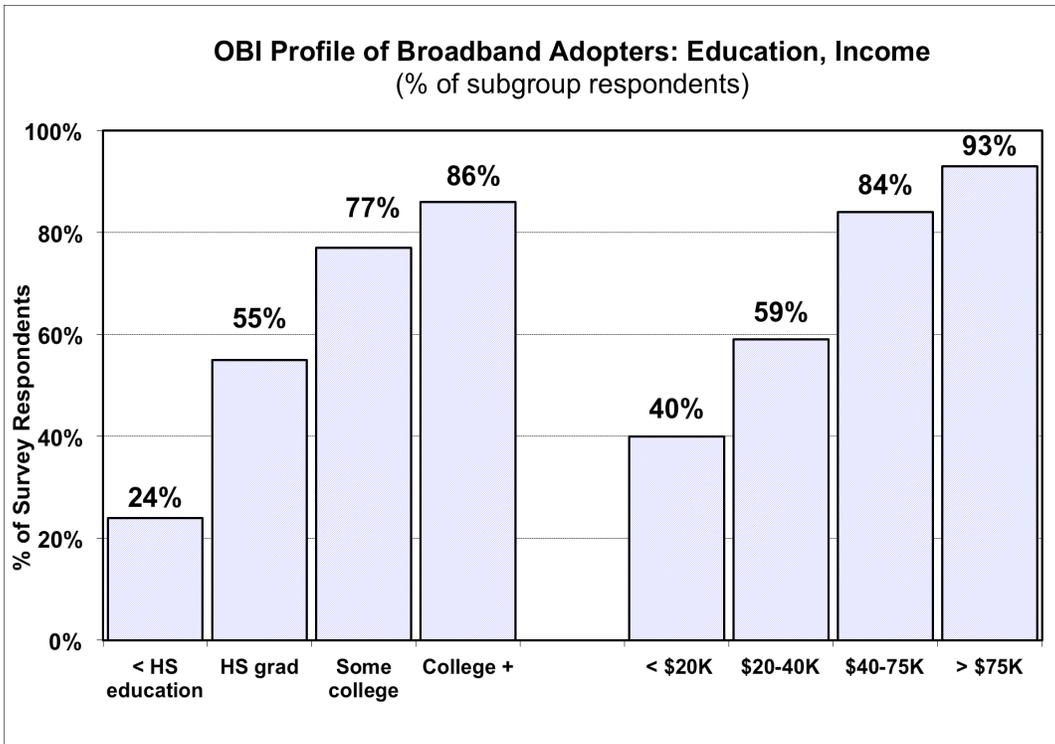
<sup>1</sup> Broadband Adoption and Used in America, OBI Working Paper Series No. 1, p. 11, (“OBI Working Paper No. 1”).

The survey also examined broadband adoption along the following demographic lines:

- Education: 55% of adults whose highest level of education is a high school diploma are broadband users at home, compared with 86% of those who have graduated from college.
- Income: 52% of Americans with annual incomes of \$50,000 or below have broadband at home, versus 87% of those with annual incomes above that level.
- Race and Ethnicity: 59% of African-Americans have broadband at home, compared with 49% of Hispanics (English and Spanish speaking.) For Hispanics taking the survey in Spanish, broadband adoption is 20%; for those Hispanics taking the survey in English, broadband adoption is 65%.
- Age: Senior citizens (over the age of 65) have the lowest broadband adoption rate of any age group with a 35% at-home broadband adoption rate. Forty-eight percent of senior citizens are Internet users, either broadband or dial-up.
- Rural Americans: While only 50% of rural Americans subscribe to broadband, this reflects a number of convergent factors, including: a higher percentage of older citizens than in nonrural areas, an overall lower average income and lack of infrastructure. Among those rural residents who can receive broadband, however, the survey finds that they “are as active as their urban and suburban counterparts in using the Internet for shopping and taking classes online, suggesting that they use broadband as a way to virtually access the benefits associated with urban or suburban living.”<sup>2</sup>

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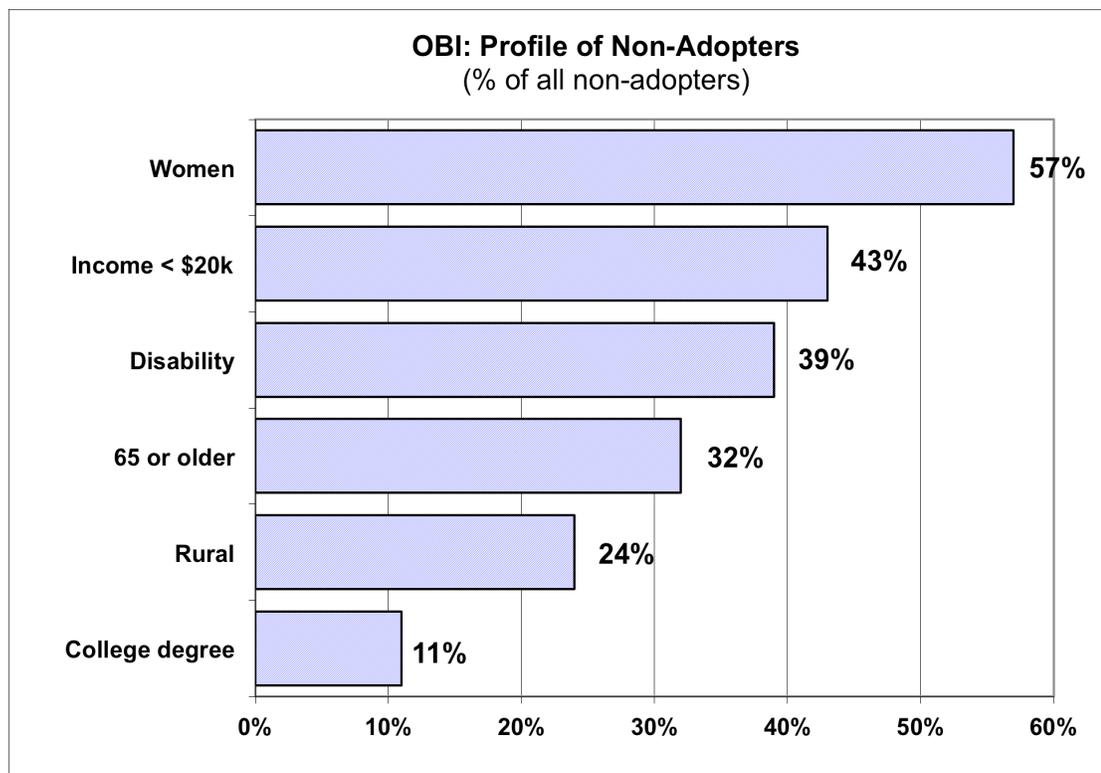
<sup>2</sup> *Ibid.*, p. 7.



The OBI report finds that 35% of Americans do not access broadband at home. This represents 93 million Americans—80 million adults and 13 million children over the age of 5.

Removing the estimated 4% that say that broadband service is not available where they live leaves 31% who could receive broadband in their home but choose not to. The report identifies the demographics of nonadopters:

- 57% of home nonadopters are women.
- 43% have an average annual household income of \$20,000 or less.
- 39% have a disability.
- 32% are age 65 or older (and 65% of senior citizen nonadopters are women).
- 24% live in rural areas.
- 11% have a college degree.



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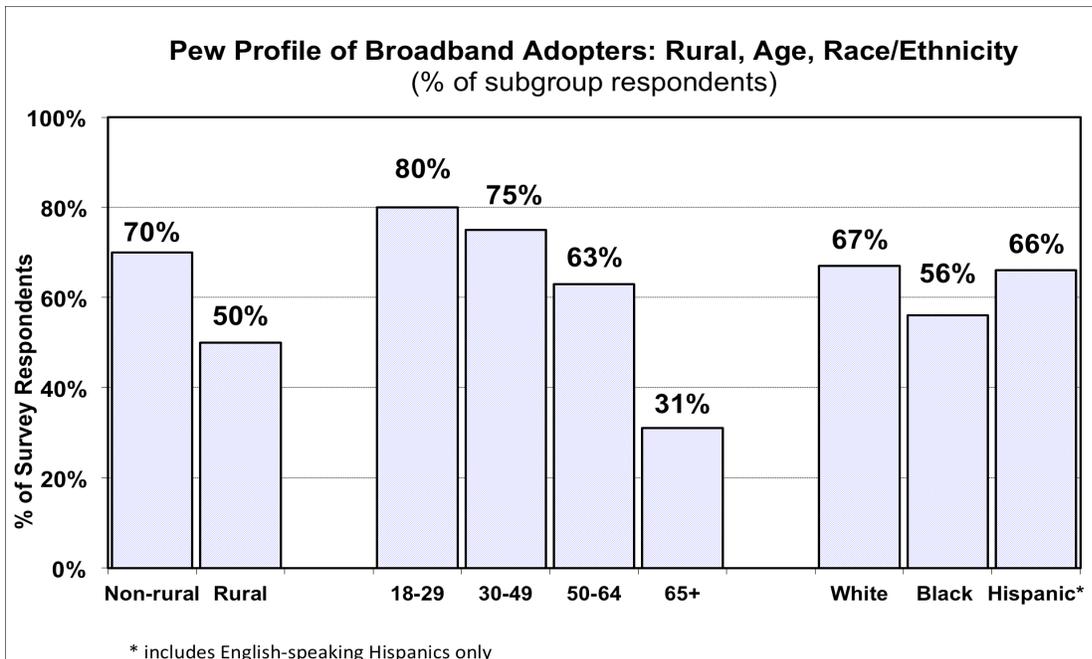
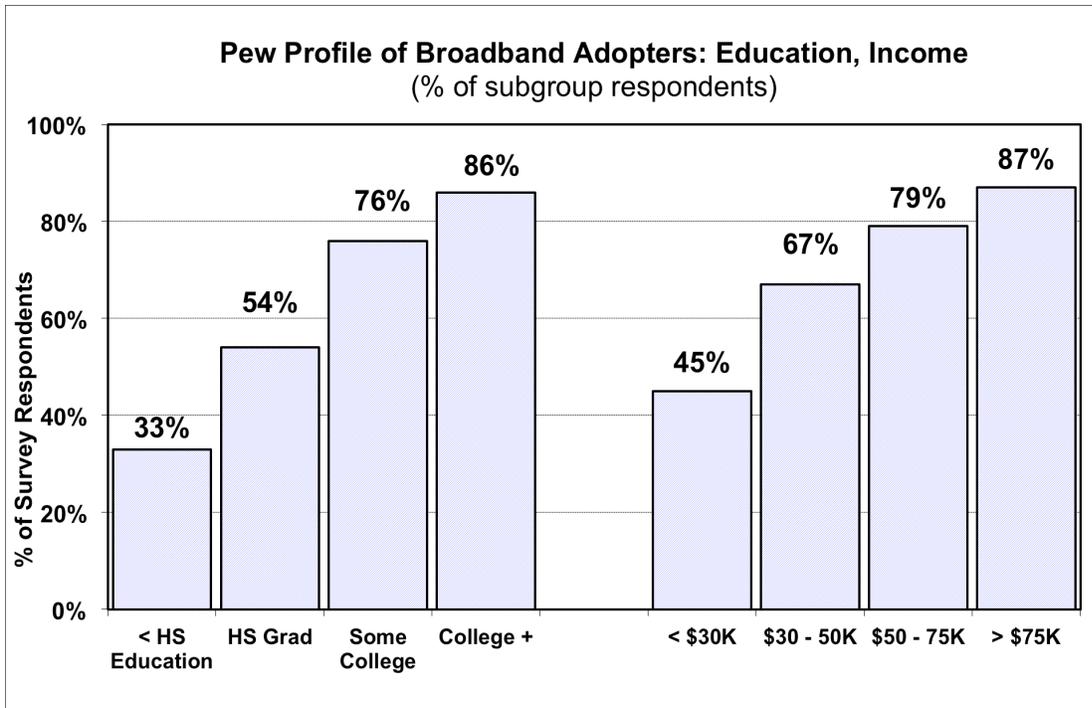
In August 2010, Pew Internet & American Life Project released a study of home broadband Internet adoption based on telephone interviews with 2,252 adults age 18 and older. Entitled "Home Broadband 2010," the report estimates that 66% of American adults currently use a high-speed Internet connection from home. (This finding is largely unchanged from the 63% that were found to be using broadband at home in Pew's 2009 survey.) Of the

34% who are not currently using broadband at home, 5% use a dial-up connection and 3% are unsure of what kind of connection they have at home. Among the report's other key findings:

- 21% of Americans do not use the Internet. Of these, 34% have been online at some point or have a family member who connects to the Internet from their household; the remaining 66% (14% of all Americans) have no tie to online life and little or no apparent interest in going online.
- Fifty-one percent of home broadband users subscribe to their provider's basic level of service, while 36% take premium service and 13% don't know.

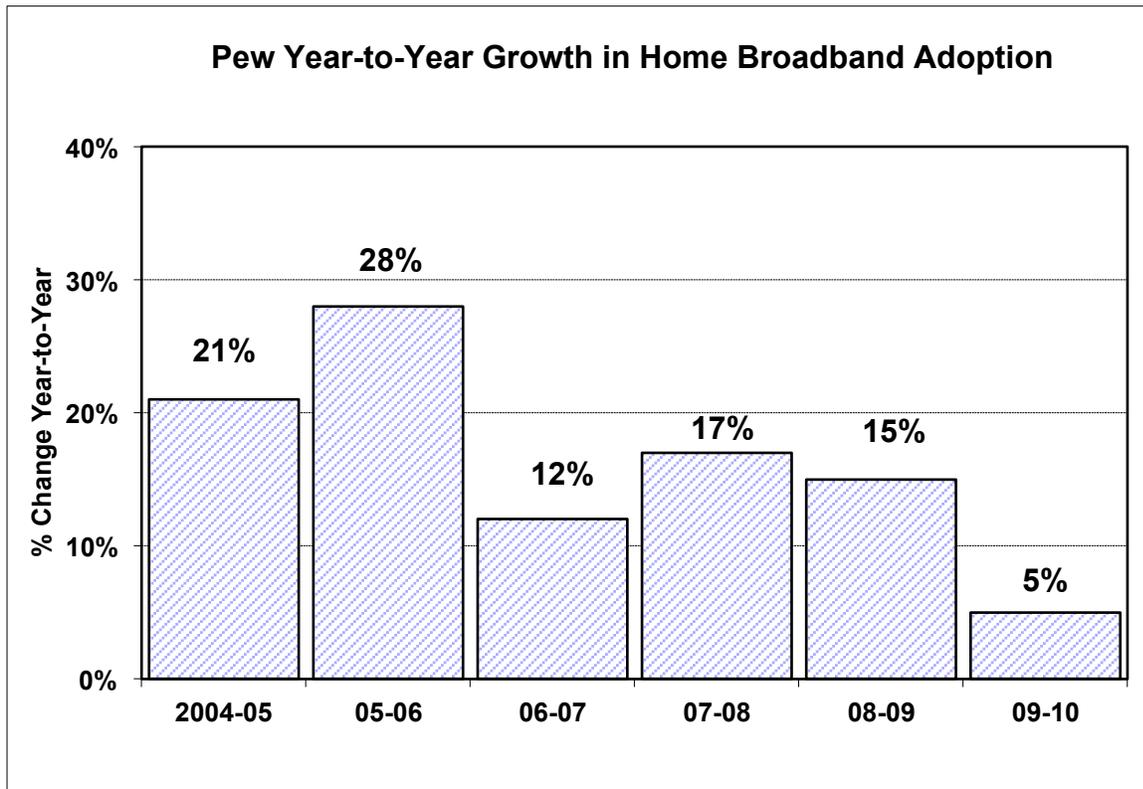
The Pew survey also looked at demographics:

- Education. Pew found that 33% of those adults with less than a high school education had access to broadband at home, compared with 54% of those with a high school diploma, 76% with some college education and 86% of college graduates.
- Income. 45% of those with annual household incomes below \$30,000 have broadband at home, as do 67% of those earning between \$30,000 and \$49,999, 79% of those earning between \$50,000 and \$74,999, and 87% of those earning more than \$75,000.
- Race and Ethnicity. 67% of white (non-Hispanic) survey respondents have a broadband connection at home, as do 56% of black (non-Hispanic) respondents and 66% of Hispanic (English-speaking) respondents.
- Age. Pew found broadband Internet adoption in the home to be inversely proportional to age: 80% of those 18 to 29 had a broadband connection in their home, versus 75% of those 30–49, 63% of those 50–64, and 31% of those age 65 or older.
- Rural Americans. Pew also reported a rural/urban digital divide, stating that 50% of rural Americans subscribed to broadband in their homes compared with 70% of nonrural Americans.



As Pew has been conducting its survey for several years, it is possible to compare annual broadband adoption growth rates over time. As illustrated in the following chart, between 2004 and 2009 annual year-to-year growth has ranged from 12% to 28%. Between 2009 and 2010,

however, growth was only 5%. Whether this is merely a one-time occurrence or an indicator of the relative size of future growth absent active intervention remains to be seen.



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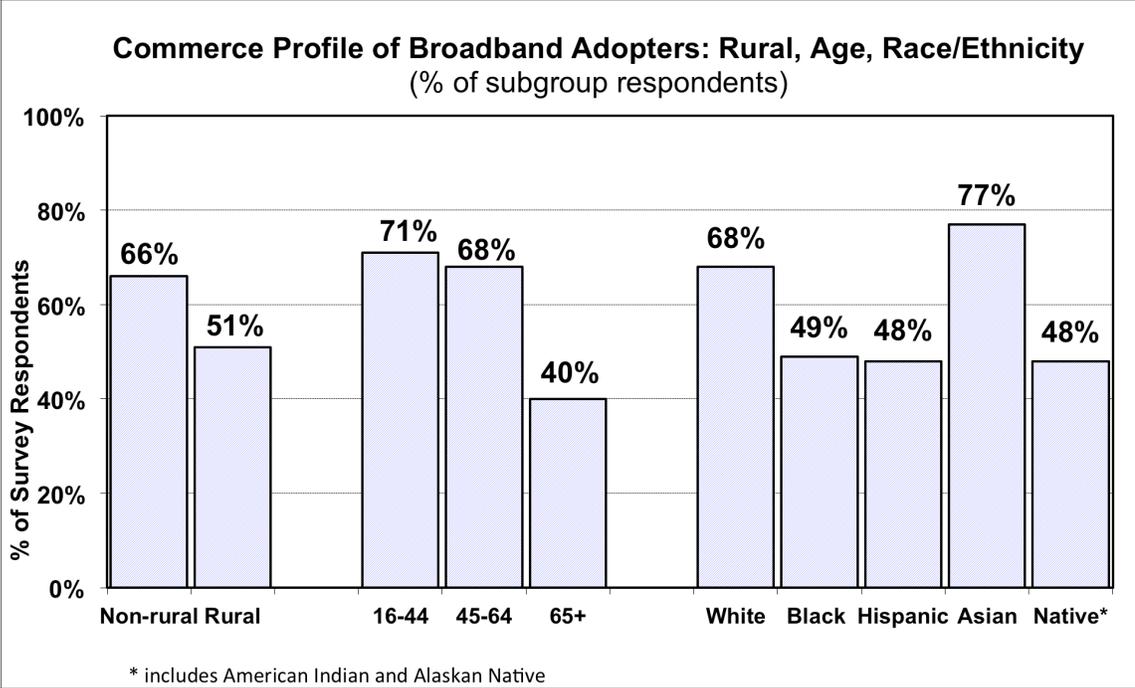
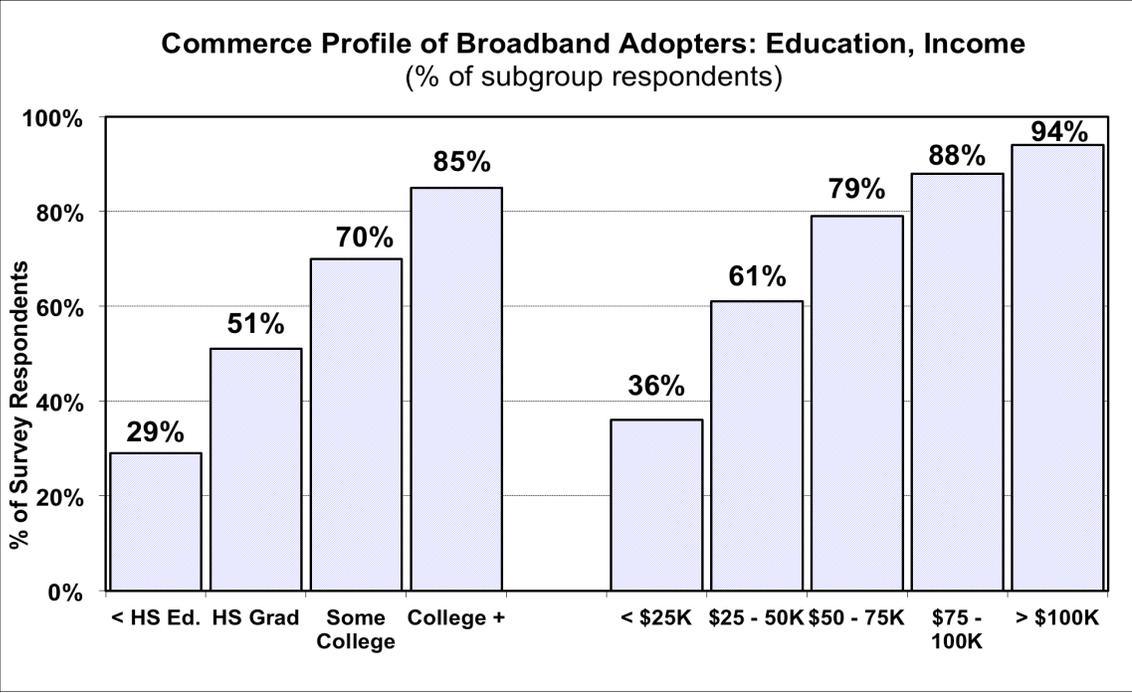
The U.S. Department of Commerce’s Economics and Statistics Administration and National Telecommunications and Information Administration released “Exploring the Digital Nation: Home Broadband Adoption in the United States” in November 2010. The report draws on the Census Bureau’s Current Population Survey Internet Use Supplement, which surveyed 54,000 households in October 2009. Among the key findings:

- In 2009, 64% of Americans were using broadband Internet at home. Five percent were using dial-up at home, 8% were using the Internet, but not at home, and 23% did not use the Internet. This represents substantial growth from 2007, when 51% were using broadband at home, 11% were using dial-up at home, 9% used the Internet someplace other than home and 29% were not using the Internet.

- Since 2001, household broadband Internet use has grown from 9% to 64%, an increase of more than 600%.

In terms of demographics:

- Education: The Commerce Department report found that 29% of those Americans with less than a high school diploma use broadband at home, versus 51% of high school graduates, 70% of those with some college, and 85% of college graduates.
- Income. 36% of those with annual household incomes below \$25,000 used broadband from home, as did 61% of those with incomes between \$25,000 and \$50,000, 79% of those with incomes between \$50,000 and \$75,000, 88% of those with incomes between \$75,000 and \$100,000, and 94% of those with incomes above \$100,000.
- Race and Ethnicity. 68% of white (non-Hispanic) survey respondents use broadband at home, as do 49% of black (non-Hispanic) respondents, 48% of Hispanic respondents, 77% of Asian (non-Hispanic) respondents, and 48% of American Indian or Alaskan Native (non-Hispanic) respondents.
- Age. Seventy-one percent of those Americans age 16–44 years have broadband Internet in their homes, compared with 68% of those age 45–64, and 40% of those 65 and over.
- Rural Americans. Sixty-six percent of urban (metropolitan) Americans subscribe to broadband at home, as compared with 51% of rural (nonmetropolitan) Americans. By population, 63% of those living in core-based statistical areas (CBSAs) of less than 1 million have broadband at home, compared with 66% of those in CBSAs between 1 million and 2.5 million, 71% of those in CBSAs between 2.5 million and 5 million, and 67% of those in CBSAs greater than 5 million in population.



The Commerce Department went one step further in its analysis, estimating the adoption gap between different demographic groups after controlling for household

characteristics, such as differences in income, education, race, ethnicity, age, household size, etc. The result presents the difference in broadband adoption among two groups not attributable to the preceding factors.

- The gap between non-Hispanic white and non-Hispanic black respondents fell from 19% to 10% after controlling for household characteristics.
- The gap between non-Hispanic white and Hispanic fell from 20% to 14%.
- The gap between urban and rural fell from 15% to 7%.
- The gap between urban (with population less than 1 million) and rural fell from 12% to 6%.
- The gap between urban (with population between 1 million and 2.5 million) and rural fell from 15% to 7%.
- The gap between urban (with population between 2.5 million and 5 million) and rural fell from 20% to 9%.
- The gap between urban (with population more than 5 million) and rural fell from 16% to 9%.

These numbers allow a better idea of how much the difference between two different categories is inherent to those categories, and strip away much of the differences due to other factors.

### Consensus

While there is some variation in the findings of the three reports, a relatively clear picture of broadband adoption in the United States nonetheless emerges. Among the areas of agreement:

- Between two-thirds and three-quarters of Americans currently utilize broadband at home.
- Broadband adoption rates vary directly with income and education level.
- Broadband adoption rates vary inversely with age.
- Adoption rates for several ethnic groups lag that of the overall population.
- Rural adoption lags that of nonrural areas.

Armed with knowledge of *who* is not currently subscribing to broadband at home, the next step is to identify the variety of reasons behind *why* they are not adopters.

### III. Reasons Behind Broadband Nonadoption

The literature identifies four main reasons impeding broadband nonadopters:

- Lack of demand – people who don't identify a need for broadband in their lives.
- Lack of access – broadband service is not available in their area.
- Lack of resources – broadband service is too expensive for them to afford, or they do not own a computer.
- Lack of knowledge/experience – potential end-users do not know how to go about accessing the Internet, or perceive the Internet to be a dangerous place.

#### Lack of Demand

The OBI report broke down at home broadband nonusers into subgroups: those who do not use the Internet from home at all, those who only use dial-up from home, and those who use broadband outside of their home. The survey found:

- Among those who do not use the Internet from home at all, 7% believe the Internet is “a waste of time”; 7% indicated that there is nothing on the Internet that interests them; and 1% responded that they can “access the Internet all they want from work.”
- Among those who only use dial-up at home, 18% “don't use the Internet that much”; and 4% “do not need the additional speed [broadband] would offer.”
- Among those who use broadband outside of their home only, 11% “can access the Internet all [they] want from work”; 4% believe that “the Internet is just a waste of time”; and 2% feel that “there is nothing on the Internet [they] want to see or use.”

The Pew survey found that 21% of Americans do not use the Internet at all. Of these Americans, 34% have or have had some exposure to the Internet, either because they live in a household with an Internet user, or because they at one time in their lives used the Internet but no longer do so. Of those not currently using the Internet, 31% indicated that they are just not interested; 7% think it's a waste of time; 6% are too busy or don't have the time; and 4% don't need or want it. Pew also found that only 10% of current Internet nonusers indicated that they would like to start using the Internet or email in the future—the remainder are, apparently, content to remain nonusers.

The Commerce Department finds that 38% of all survey respondents without broadband in the home feel they don't need broadband at home or are not interested in broadband. The report also breaks down broadband nonusers into those who don't use the Internet at all, those who use the Internet outside of their home, and those who have dial-up access at home:

- Among those who don't use the Internet at all, 47% don't need broadband service or are not interested.
- Among those who use the Internet outside of their home only, 17% don't need broadband service or are not interested.
- Among those with dial-up service in their home, 27% don't need broadband service or are not interested.

### Lack of Access

According to the national broadband plan, 14 million Americans, or approximately 4.5% of the country's total population, do not have access to broadband service that "can support today's and tomorrow's applications."<sup>3</sup> For these Americans, there is no decision to be made about broadband adoption.

The OBI report estimates that 5% of nonadopters indicated that their inability to get service where they live is the main reason why they do not have broadband. Among dial-up users—who make up only 6% of the adult population—21% say that broadband is not available where they live. Pew reports that 6% of those not currently using the Internet cited not having access as the primary reason.

According to the Commerce Department report, 0.7% of all survey respondents cited the lack of Internet availability as the primary reason they do not use the Internet at home. Broken down by metropolitan status, 0.5% of urban residents and 1.1% of rural residents cited lack of broadband availability as the primary reason. Amongst those using broadband Internet outside of their home, 2.7% cited lack of broadband availability as the primary reason (2.1% of urban residents, and 5.0% of rural residents.) Of those currently using a dial-up connection from home, 19.9% said that the primary reason was the lack of broadband availability (14.7% of urban residents, and 36.1% of rural residents.)

The variation of the data presented here—as well as the controversy surrounding the first version of the recently released national broadband map—highlights the challenges inherent to pinpointing the precise extent of broadband availability nationwide. Regardless of the data source used, however, it is evident that gaps in availability do exist.

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<sup>3</sup> Federal Communications Commission, "Connecting America: The National Broadband Plan," March 2010, p. 19.

## Lack of Resources

Lack of resources includes both lacking the necessary funds to afford a subscription to broadband Internet service, as well as the inability to purchase a computer with capabilities sufficient to access broadband Internet service.

According to the OBI report, nearly half (47%) of all nonusers cited cost as a reason for not being online, and 11% singled out cost of broadband service as the primary reason. An additional 14% said that they cannot afford a computer, and 5% said that the activation and installation fee to get service is too much. Among dial-up users, 50% cited cost as one of the reasons they were not using broadband; for 19%, it was the main reason. For those using broadband outside of the home, 57% cited cost as one reason and 27% selected cost as the primary reason for not having at-home broadband service.

As part of the survey detailed in the OBI report, nonadopters were asked what price they would be willing to pay for broadband service. The average response was \$25 per month—though some would be willing to pay more, some less, and some indicated they would not be willing to pay for at-home broadband service under any circumstances whatsoever.

In the Pew survey, 22% of nonadopters indicated that cost was the primary reason they were not receiving broadband service at home. Twelve percent of nonadopters indicated they do not own a computer, and 10% feel that at-home broadband service is too expensive.

The Commerce Department report found that 44% of nonadopters of home broadband Internet cited cost as the main reason, with 26% saying that service was too expensive and 18% indicating that had no computer or an inadequate computer. Among those with no at-home Internet access, 22% cited no computer or an inadequate computer, and 19% said that the service was too expensive. (As expected, this varied greatly by income level, with 22% of those with average annual incomes below \$25,000 saying the service was too expensive, versus 7% of those with incomes between \$75,000 and \$100,000 annually.) Among those using the Internet outside of the home, 40% do so because at-home broadband service is too expensive, and 17% cited no computer or an inadequate computer. Of those respondents with dial-up access at home, 41% indicated broadband service was too expensive and 1% said they had no computer or their computer was inadequate.

## Lack of Knowledge/Experience

Lack of knowledge/experience includes both the basic knowledge necessary to get online, as well as the perception that the online world is a dangerous and risky place, without knowing the basic steps one can take to avoid online hazards.

Forty-six percent of the respondents to the survey cited in the OBI report said that not being comfortable using a computer is one reason they are not online, and 45% said that they are worried about all the “bad things” that can happen while using the Internet. When asked to select one main reason, 16% cited not being comfortable using a computer (the most popular choice) and 12% selected worries about online dangers. Among dial-up users, who are already familiar with the online world, neither of these choices emerged. Among those who use the Internet somewhere other than home, 9% said they worry about bad things that could happen is their primary reason for not using broadband service at home, and 5% cited not being comfortable using a computer.

The Pew survey found that 18% of respondents cited a “usability” issue as the primary reason for being a nonadopter. Breaking down the usability issues further, 9% believe that the Internet is too difficult or too frustrating for them, 4% believe they are too old to use the Internet, 2% do not know how, 2% are physically unable to use the Internet, and 1% are worried about viruses, spam and/or spyware. Asked if they know enough about computers and technology to go online on their own, 21% of nonadopters said they do, while 61% said they would need assistance and 4% were not sure. Fourteen percent said that they do not want to start using the Internet.

Four percent of Internet nonusers responding to the Commerce Department’s survey selected lack of confidence or skill as the primary reason they are not online, while 0.3% noted privacy and security concerns and 0.1% cited concerns for their children’s access. Among those currently using the Internet outside of their home, 0.4% cited a lack of confidence or skill, 0.4% concern for their children’s access, and 0.3% privacy and security concerns as the primary reason for not using broadband in their home. Among those users with dial-up access at home, 0.8% cited a lack of confidence or skill, 0.3% privacy or security concerns, and 0.1% concern for their children’s access.

## Consensus

Based on the information presented above, it is possible to rank the reasons for broadband nonadoption for each of the reports as follows:

|           |                              |     |
|-----------|------------------------------|-----|
| OBI:      | Lack of Resources            | 36% |
|           | Lack of Knowledge/Experience | 22% |
|           | Lack of Demand               | 19% |
|           | Lack of Access               | 5%  |
| Pew:      | Lack of Demand               | 48% |
|           | Lack of Resources            | 21% |
|           | Lack of Knowledge/Experience | 18% |
|           | Lack of Access               | 6%  |
| Commerce: | Lack of Resources            | 44% |
|           | Lack of Demand               | 42% |
|           | Lack of Access               | 4%  |
|           | Lack of Knowledge/Experience | 3%  |

It must be noted, however, that specific reasons for nonadoption varies according to different demographic subgroups. Nonetheless, the aggregated numbers presented above give an important indication as to the general significance of each of the specific factors contributing to nonadoption.

#### IV. What Is at Stake?

The stakes of increased broadband availability and adoption for the macroeconomy are potentially quite high:

- According to a February 2009 report titled “Estimating the Economic Impact of the Broadband Stimulus Plan,” written by Raul Katz, Ph.D., of the Columbia Business School and Stephan Suter, Ph.D., of Polynomics AG, the \$7.2 billion broadband stimulus program will result in the addition of approximately 128,000 construction jobs over four years, as well as up to 270,000 jobs created due to “network externalities,” i.e., the presence of robust broadband where it hadn’t previously existed.<sup>4</sup>
- A Brookings Institute working paper titled “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data” concludes that, on the basis of their multivariate regression analysis, every one percentage point increase in broadband penetration in a state increases overall employment by 0.2% to 0.3% a year.<sup>5</sup>
- A January 2010 Public Policy Institute of California report estimated that during the years 1999 through 2006, an area moving from no broadband providers to one to three providers would achieve overall employment growth of 6.4% and growth in the working age population of 2.4%.<sup>6</sup>
- A 2008 Connected Nation study indicates that a 7% increase in U.S. broadband adoption could create up to 2.4 million jobs and add \$134 billion to the overall economy.<sup>7</sup>

In addition to these substantial macro benefits, broadband adoption can hold significant advantages for the individual end-user. Respondents to the Pew survey offered the following benefits of broadband access:

- *Job opportunities and career skills:* 43% see the lack of broadband access as a “major disadvantage” in identifying job opportunities and gaining job skills, 23% see it as a “minor disadvantage” and 28% “not a disadvantage.”
- *Health information:* 34% seek the lack of broadband access to be a “major disadvantage” in obtaining health information, 28% a “minor disadvantage” and 35% “not a disadvantage.”

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<sup>4</sup> <http://www.ntia.doc.gov/broadbandgrants/comments/1EA7.pdf>

<sup>5</sup> [http://www.brookings.edu/~media/Files/rc/papers/2007/06labor\\_crandall/06labor\\_crandall.pdf](http://www.brookings.edu/~media/Files/rc/papers/2007/06labor_crandall/06labor_crandall.pdf)

<sup>6</sup> [http://www.ppic.org/content/pubs/report/R\\_110JKR.pdf](http://www.ppic.org/content/pubs/report/R_110JKR.pdf)

<sup>7</sup> [http://connectednation.org/documents/Connected\\_Nation\\_EIS\\_Study\\_Full\\_Report\\_02212008.pdf](http://connectednation.org/documents/Connected_Nation_EIS_Study_Full_Report_02212008.pdf)

- *Learning new things to improve and enrich life:* 31% believe that the lack of broadband is a “major disadvantage” in learning new things to improve and enrich life, 31% a “minor disadvantage” and 32% “not a disadvantage.”
- *Government services:* 29% see lack of broadband as a “major disadvantage” in using government services, 27% a “minor disadvantage” and 37% “not a disadvantage.”
- *Keeping up with news and information:* 23% see the lack of broadband as a “major disadvantage” in keeping up with news and information, 27% a “minor disadvantage” and 47% “not a disadvantage.”
- *Keeping up with what is happening in their communities:* 19% think that the lack of broadband is a “major disadvantage” to keeping up with what is happening in their communities, 32% a “minor disadvantage” and 45% “not a disadvantage.”

## V. Next Steps

In order to obtain the greatest possible impact, efforts to boost broadband adoption should be primarily aimed at those demographic groups that have been most hesitant to take broadband Internet service at home. As detailed in Section II of this paper, that would include senior citizens, lower income Americans, the less educated, and those with disabilities.

### Lack of Demand

Broadband Internet access may be the ultimate “show me” technology, one which is difficult to accurately describe in words and must be experienced to be truly appreciated. It is also a “sticky” technology, in that it is extremely difficult to return to the world of dial-up after being exposed to the capabilities of high-speed Internet access. Providing potential broadband users with the ability to experience broadband firsthand will make them aware of the differences between broadband and dial up. Kiosks with computers linked to the Internet, set up in public places, such as shopping malls, government buildings, community centers, senior citizen centers, and telecom providers’ business offices will allow nonadopters the opportunity to experience high-speed broadband firsthand.

Many nonadopters are unaware of the benefits that broadband can make in their lives, in terms of health care, education, participation in local/state/federal government, obtaining the latest news and information, etc. A focused education campaign could go a long way toward making nonadopters aware of the potential improvements that broadband could make in their day-to-day lives. This campaign could include, but not be limited to, bill inserts, ads in local newspapers, and television and radio spots. Ideally, this campaign would be targeted specifically to those demographic groups that are nonadopters.

There is a direct role for government in this arena, as well. The National Broadband Plan cites the importance of creating “public-private partnerships of hardware manufacturers, software companies, broadband service providers, and digital literacy training partners to improve broadband adoption and utilization by working with federal agencies already serving nonadopting communities.”<sup>8</sup> Implemented properly, such civic engagement could prove a tremendously cost-effective means of boosting broadband adoption, particularly in remote areas.

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<sup>8</sup> National Broadband Plan, p. 178.

### Lack of Access

Not surprisingly, the vast majority of unserved Americans live in the nation's most difficult and expensive to serve regions. Reaching them with high quality broadband service, at a reasonable cost, will not be easily accomplished, and will require the cooperation of all aspects of the industry. The process is already well underway, and the stakes are high. The bottom line, however, is that without access to broadband service, the decision whether or not to become an adopter is moot.

### Lack of Resources

Utilizing broadband from the home requires a certain level of financial resources. Potential at-home broadband users need both a computer with the ability to access the Internet, and the ability to afford the monthly cost of broadband service. As deployment becomes more widespread, it is very likely that per-customer costs will fall. However, as a relatively large portion of nonadopters are those in the lower income tiers in this country, more assistance will likely be needed. The national broadband plan proposes extending the Lifeline and Link-Up programs to support broadband,<sup>9</sup> and steps have already been taken to begin to implement that proposal.

The problem of the prohibitive expense of a computer could be at least partly addressed through the development of programs that would refurbish computers no longer needed by industry and government. Many of the older machines that are replaced may still be perfectly adequate for home Internet use. (Such a program would also have a side benefit of reducing the number of computers that would need to be disposed of in an environmentally safe manner.) Older machines could be refurbished and made available to lower income citizens at a minimal cost. There would still, however, undoubtedly be some cost associated with such a program.

It is important to keep in mind that the adoption decision is not a one-time act of a customer choosing to purchase broadband Internet access, but rather an ongoing choice to keep using broadband month after month. It is therefore imperative that any support programs designed to make broadband affordable to those of limited means living in areas where the cost to serve is particularly high be both ongoing and sustainable.

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<sup>9</sup> National Broadband Plan, p. 26.

## Lack of Knowledge/Experience

The Internet in general and broadband in particular can be intimidating for newcomers, regardless of their age. The Internet experience requires some familiarity with concepts, terminology and procedures which, although not intrinsically complicated, need to be learned before a successful connection may be made.

Net literacy education for younger Americans could take place in the schools. Not only is this segment of society easily reached, they are also typically quickest to adopt new technology. A greater challenge will be to educate older Americans, particularly senior citizens. This education could be provided in senior citizen centers, community centers, libraries, houses of worship, and other places where it would be easily accessible to as many people as possible. (Perhaps enthusiastic young people, possessing highly polished technical skills and gregarious personalities, could be enlisted as trainers.) Initial training will also need to be followed up with some type of "hot line" service, where trainees could quickly receive answers to questions that might arise as they are actually using broadband from their home.

In addition to training nonadopters how to physically use the Internet, it will be equally important to assuage their concerns about Internet safety. Training in avoiding Internet scams, reducing the possibility of identity theft, and avoiding viruses, malware and spyware will ultimately make the online experience much more enjoyable. Parents could also be taught how to keep their children safe from inappropriate online content, online predators, and cyber bullying.

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As the literature indicates, there are typically several barriers that prevent users from accessing broadband service at home. Bringing today's nonparticipants into the online world will require addressing not just one of these intertwined barriers, but rather all of them. Like any goal worth pursuing, it will be challenging, but it will be a challenge that can be conquered through the hard work and cooperation of numerous relevant parties.

## Resources

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