

DIGITAL NATION

21st Century America's Progress Toward Universal Broadband Internet Access

An NTIA Research Preview
February 2010

U.S. Department of Commerce
National Telecommunications and Information Administration



www.ntia.doc.gov



FOREWORD



“President Obama believes that all Americans should have access to broadband and the transformative opportunities it affords. Broadband services allow individuals to access new career and educational opportunities. They help businesses reach new markets and improve efficiency. They support struggling communities that seek to attract new industries. And they enhance the government’s capacity to deliver critical services.”

From: *Recovery Act Investments in Broadband*
National Economic Council, Executive Office of the President
December 2009

The release of this report, *Digital Nation: 21st Century America’s Progress Toward Universal Broadband Internet Access*, by the U.S. Department of Commerce occurs at a critical juncture in the nation’s quest for universal broadband Internet access. The report confirms that at the end of the first decade of the 21st Century, too many Americans still rely on slow, narrowband Internet access or do not use the Internet at all. This fact and others revealed in the report underscore the importance of the Administration’s policy objective to ensure that all Americans have affordable access to broadband Internet services.

The report’s findings are based on data collected in October 2009 through a special Internet Use Supplement, sponsored by NTIA, to the U.S. Census Bureau’s Current Population Survey. With a sample size of approximately 54,000 households and 129,000 citizens, the survey data provides compelling information on the state of Internet use and broadband access across America. In combination with other data collection efforts currently taking place at the Federal Communications Commission, NTIA and other federal, state and private entities, this report will greatly enrich our knowledge across numerous dimensions on the status of Internet connectivity.

The Internet has not only transformed the way we communicate, but also how we live, work, and learn. Although life without high speed Internet service seems unimaginable for many Americans, for too many others, broadband is still unattainable. As the world leader in technology innovation and the place where the Internet was pioneered, we can and must do better. This report will help identify both the gaps in Internet access and the reasons people that have such access are choosing not to use it. We hope that, armed with this new data, policymakers can support our nation’s continued competitiveness in the 21st Century information economy.

Lawrence E. Strickling
Assistant Secretary for Communications and Information
U.S. Department of Commerce

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EXECUTIVE SUMMARY

During the first decade of the 21st Century, U.S. broadband Internet connectivity by households has increased dramatically as its importance to our economy and way of life has grown. Based on a survey of over 50,000 households commissioned by the National Telecommunications and Information Administration (NTIA) and conducted by the United States Census Bureau, virtually all demographic groups have increased their adoption of broadband services at home over time. The data also reveal that demographic disparities among groups have persisted over time. Persons with high incomes, those who are younger, Asians and Whites, the more highly-educated, married couples, and the employed tend to have higher rates of broadband use at home. Conversely, persons with low incomes, seniors, minorities, the less-educated, non-family households, and the non-employed tend to lag behind other groups in home broadband use.

Survey results demonstrate that persons in rural areas are less likely to use the Internet. For example, Blacks and Hispanics in rural areas exhibit a lesser propensity to use broadband than their counterparts in urban areas. A substantial difference in home broadband penetration remains between urban and rural areas. Although the gap has declined since 2007, it still is significant.

Despite the growing importance of the Internet in American life, over 30 percent of households and 35 percent of persons do not use the Internet at home, and 30 percent of all persons do not use the Internet anywhere. Those with no broadband access at home amount to more than 35 percent of all households and approximately 40 percent of all persons, with a larger proportion in rural areas in both categories. Overall, the two most important reasons given by survey respondents for not having broadband access at home are “don’t need” and “too expensive.”¹ Inadequate or no computer is also a major reason given for no home broadband adoption. In rural America, lack of availability is a much more important reason for non-adoption than in urban areas.

The U.S. Department of Commerce will undertake a more detailed analysis later this year when the full data base becomes available, and anticipates sponsoring new collections of Census data and conducting analyses of these data bases. We also will look forward to the findings that the broader research community will provide based on this data.

INTRODUCTION

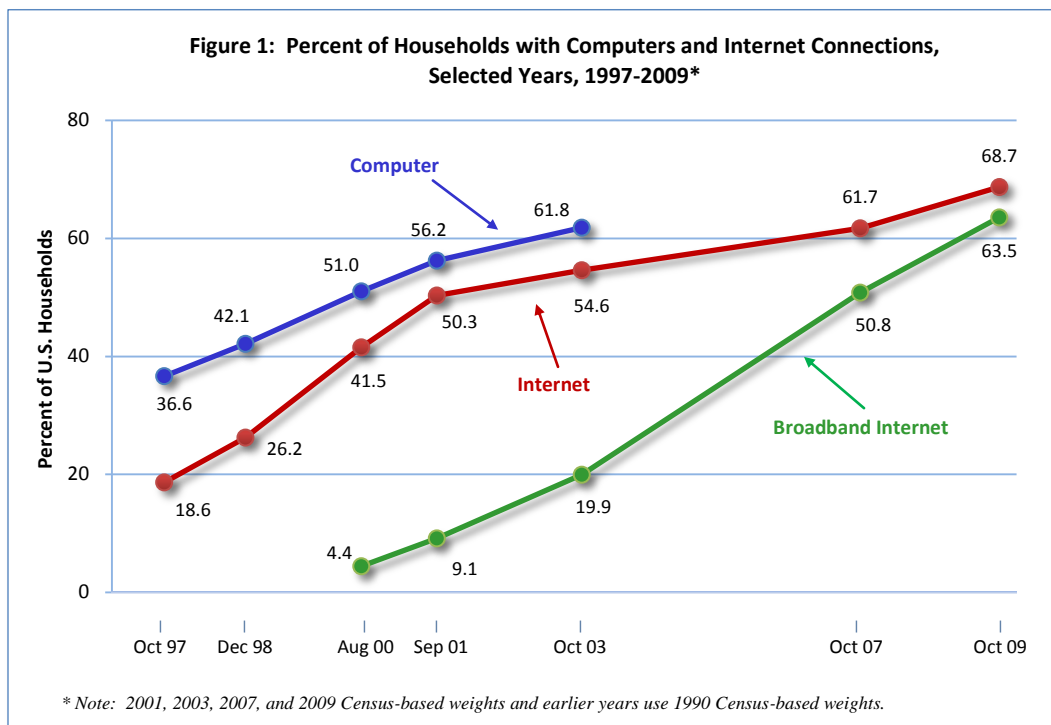
Universal access to and adoption of 21st Century broadband for all citizens is a top priority for the Obama Administration. Widespread access is critical to America’s future as the world’s economic leader because of its impact on increasing our productivity, global competitiveness, and improving Americans’ quality of life – through economic growth and development, job creation, national security, telemedicine, distance learning, public safety, civic engagement, and telework. As the President stated:

One key to strengthening education, entrepreneurship, and innovation in communities... is to harness the full power of the Internet, and that means faster and more widely available broadband.²

In the analysis below, the U.S. Department of Commerce's NTIA probes the data collected by its sister agency, U.S. Bureau of the Census, as part of the Current Population Survey (CPS). This special Internet Use Supplement periodically surveys approximately 54,000 households and gathers information on some 129,000 persons.³ The Census Bureau conducted this survey in October 2009, the eighth such Internet survey sponsored by NTIA since the early 1990s.⁴ Below, the report documents the rapid growth overall of both broadband and the Internet in general, and the disparate increases in adoption experienced by demographic groups and geographic areas.⁵ Finally, we examine the major reasons why some Americans do not access broadband Internet at home.⁶ The raw data on which this report is based are posted at <http://www.ntia.doc.gov/data/index.html> and can be found through dataset pointers at <http://www.data.gov>.⁷

ACCESS AND USE

During the first decade of the 21st Century, U.S. broadband Internet connectivity by households has grown dramatically as its importance to our economy and way of life has grown.⁸

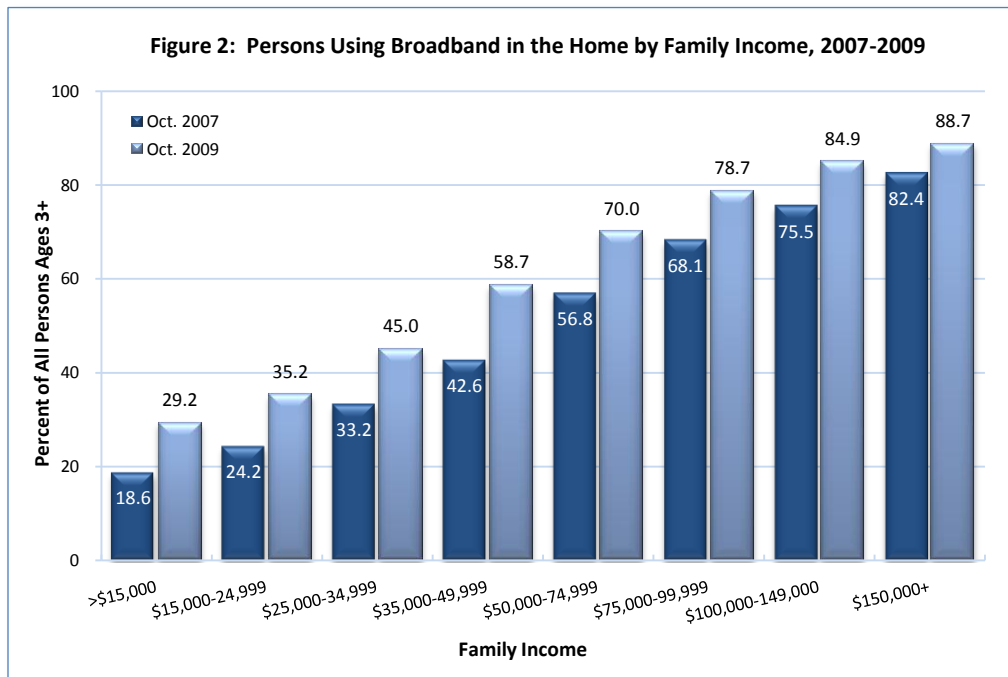


In October 2009, according to the Census Current Population Survey data, 63.5 percent (75.8 million) of U.S. households used a high-speed Internet – “broadband” -- service (*i.e.*, technologies that are faster than dial-up, such as DSL, cable modem, fiber optics, satellite, and wireless). This represented a 25 percent increase from just two years earlier (50.8 percent in October 2007). From the initial CPS study results in August 2000 (4.4 percent), broadband adoption exhibited robust gains each time new data results were developed. (See Figure 1.) During this time, the incidence of dial-up use leveled off, then plummeted. In 2000, dial-up already was a thriving service, with 37.0 percent (39.0 million) of households having such

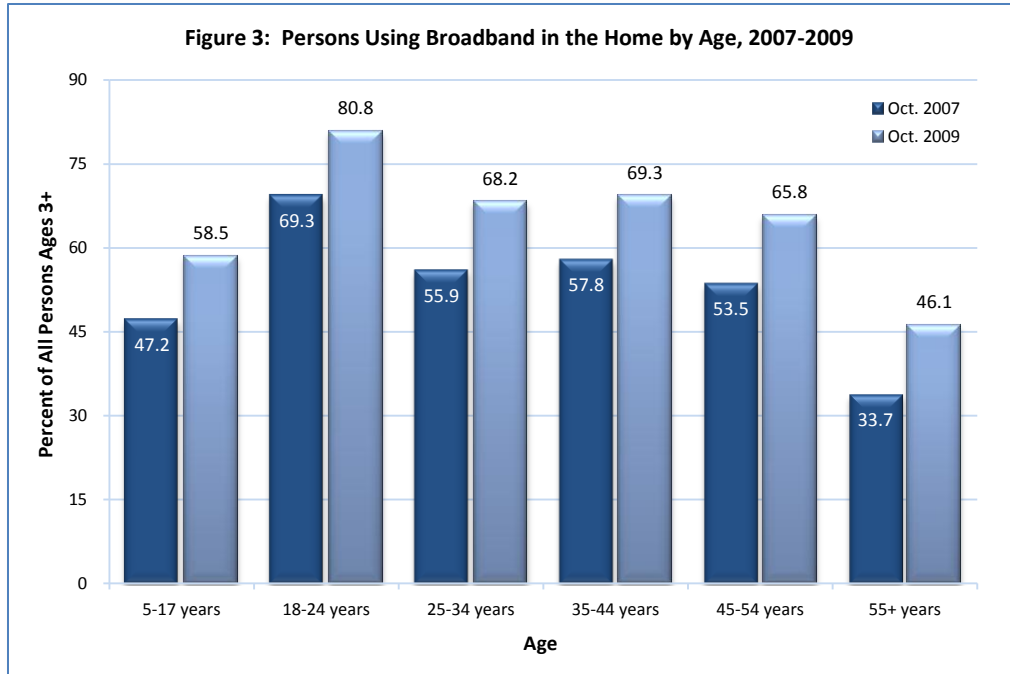
capability by August. In October 2003, the incidence of dial-up use had slipped to 34.3 percent (38.6 million) of all households, only to decline more than sevenfold by October 2009 to 4.7 percent (5.6 million). Virtually all demographic groups have experienced rising broadband use at home over time. Demographic groups categorized by family income levels, age, race, educational attainment, employment status, household types, and gender all have enjoyed a higher incidence of broadband connectivity since 2007. (See Figures 2-7 below.)

The data also have revealed that the basic demographic characteristics of broadband use at home have tended not to change.

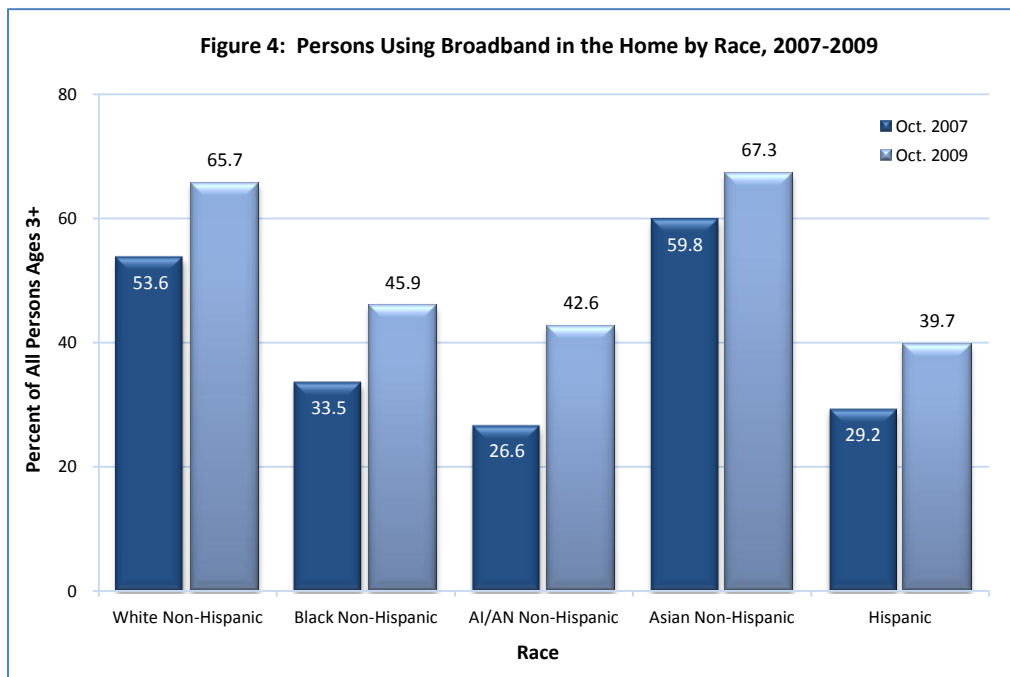
Usage by income. In 2009, when viewed by income, the users of broadband at home ranged from the highest percentages by those persons who are most affluent (with annual family income of \$150,000 or greater) to the lowest percentages by those with \$15,000 annual family income or less. These 2009 results mirror the 2007 survey which also found that the highest broadband use at home was by those who were most affluent and the lowest use was by those persons living in households with \$15,000 annual family income or less.



Usage by age. By age brackets, persons 18-24 years old exhibited the greatest broadband use at home, while seniors (55 years or older) used broadband at home the least. Those 25-54 years old proved to be middle range in adoption as well as in the array of age brackets. This is consistent with our findings in 2007.



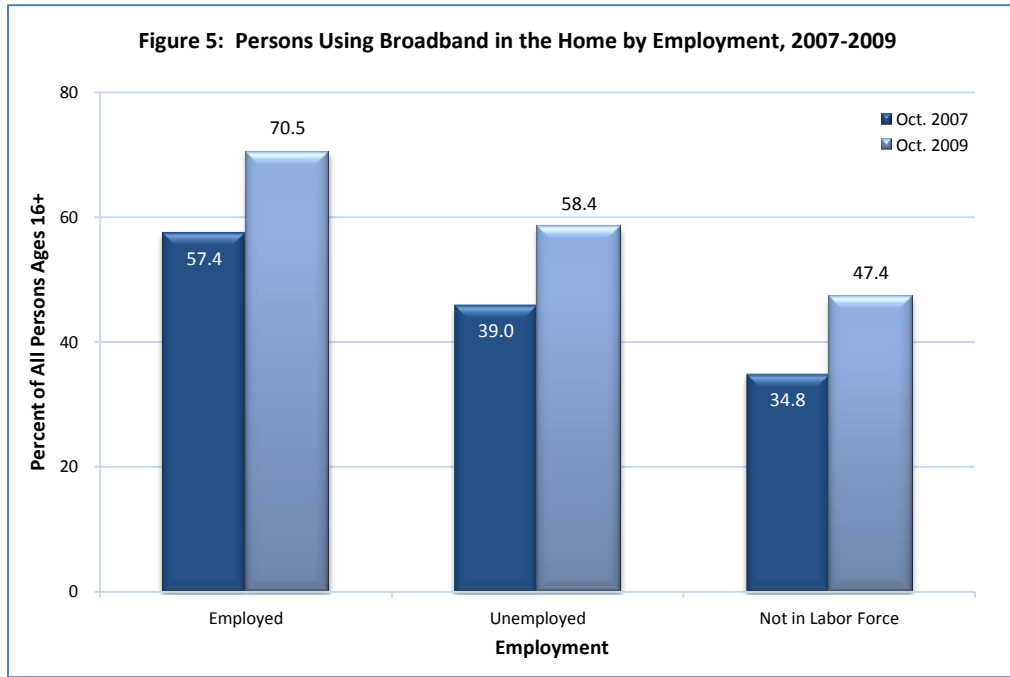
Usage by race and ethnicity. Gauging broadband use at home by race and ethnicity, Asian non-Hispanics led all other groups in 2009, with White non-Hispanics second in usage, followed by a grouping of Black non-Hispanics, Native Americans (American Indians/Alaskan Natives), and Hispanics. In 2007, the pattern was not dissimilar; although Hispanics and Native Americans switched places, the small differential may not be statistically significant.⁹



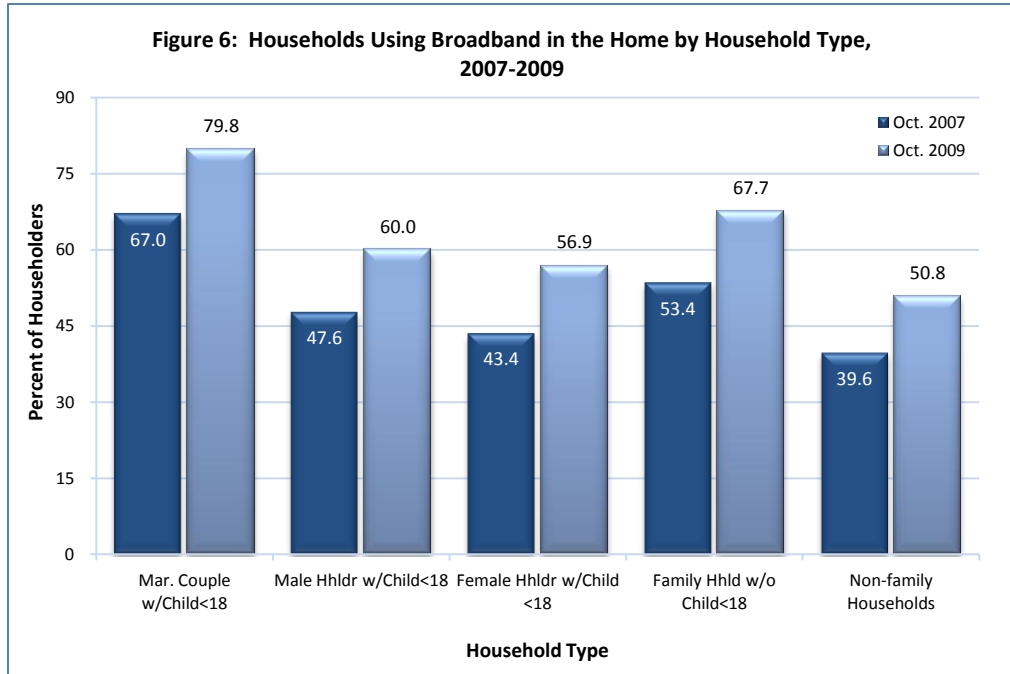
Usage by education level. For households with householders 25 years and older in 2009, 84 percent of those with college degrees had broadband access at home. In contrast, only 28 percent of those householders with less than a high school diploma had such access. The conclusion that

persons with the highest levels of education exhibit the highest broadband use and those with the least education experience the lowest adoption rate is consistent with past survey results on the subject.¹⁰

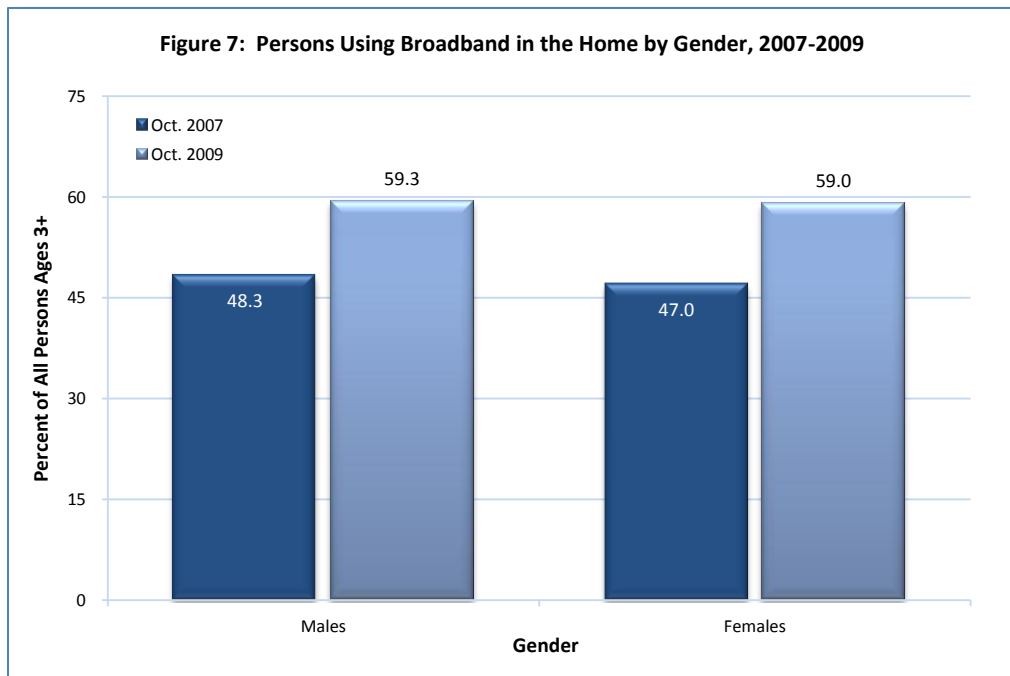
Usage by employment status. Employment status revealed a pattern with broadband use at home that featured the highest percentage use by those persons who were employed, with the unemployed and particularly those persons not in the labor force lagging behind in usage. This is similar to our findings in 2007.



Usage by household type. Classifying by household type, married couples with children younger than 18 years old surpassed all other groups in broadband use at home in 2009 and 2007, followed by family households (i.e., two-parent or single parent) without younger children. Non-family (i.e., where the householder is unrelated to other members of the household) rated lowest in both years, followed by female householders (heads of house) with young children.

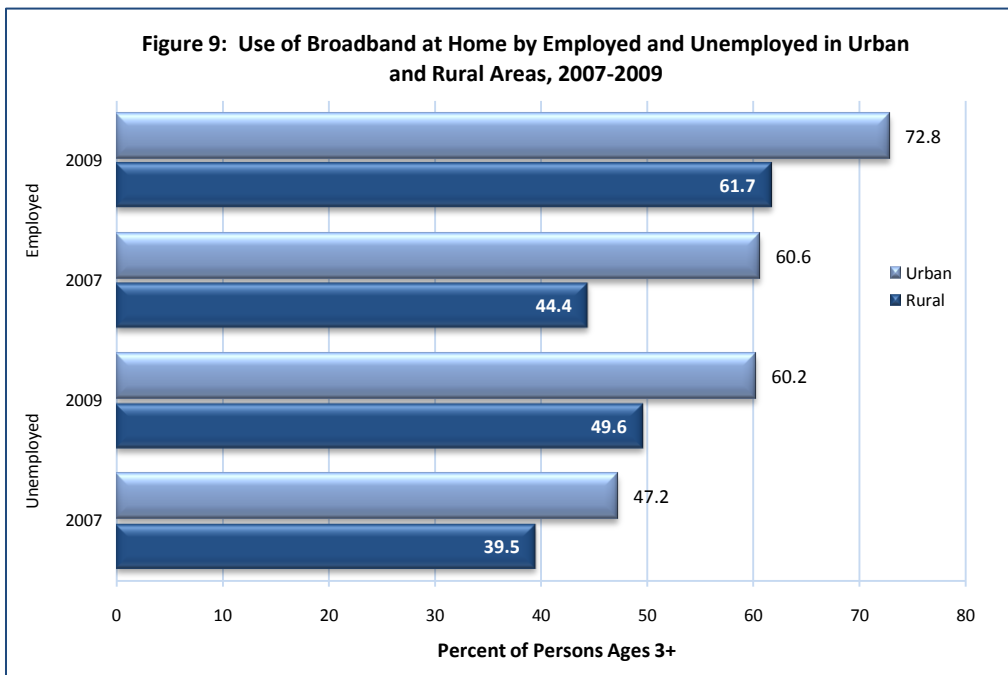
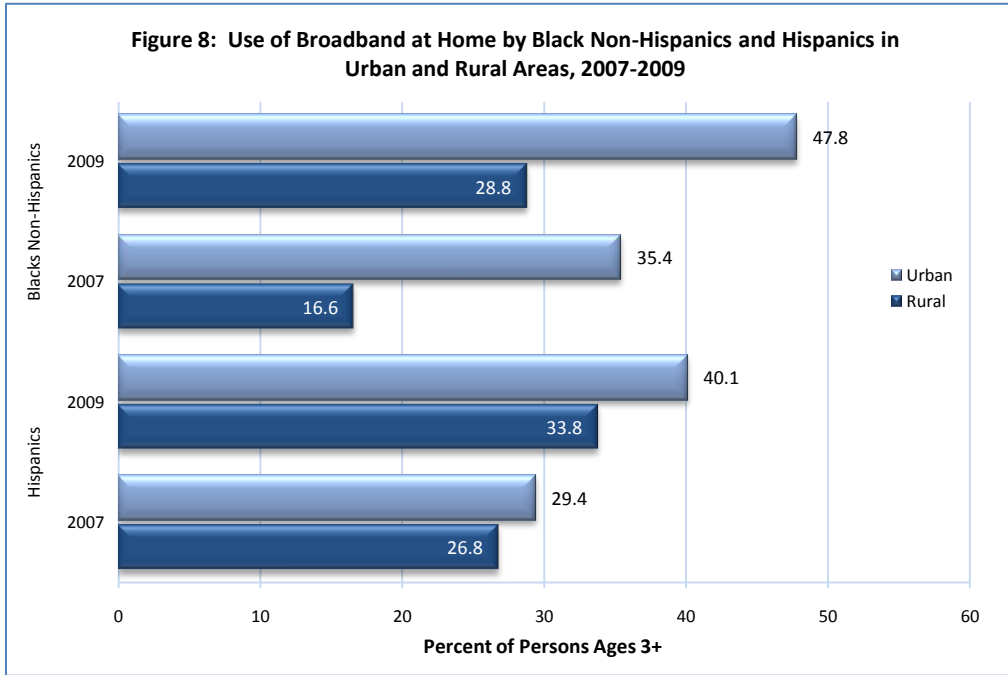


Usage by gender. With respect to gender, males registered only slightly higher broadband use at home than females in 2009 (59.3 percent v. 59.0 percent). This is consistent with our findings in 2007 (48.3 percent v. 47.0 percent).



Usage by location. Americans in rural areas tend to have lower broadband adoption rates than their demographic counterparts in urban areas. For example, in 2009 Blacks (28.8 percent) and Hispanics (33.8 percent) in rural areas exhibited much lower levels of broadband use at home

than their counterparts in urban areas (47.8 percent and 40.1 percent, respectively). Similarly, both employed (61.7 percent) and unemployed persons (49.6 percent) in rural America had significantly lower broadband use at home than their counterparts in urban areas (72.8 percent and 60.2 percent, respectively). This is consistent with our findings in 2007, albeit at lower levels of participation.



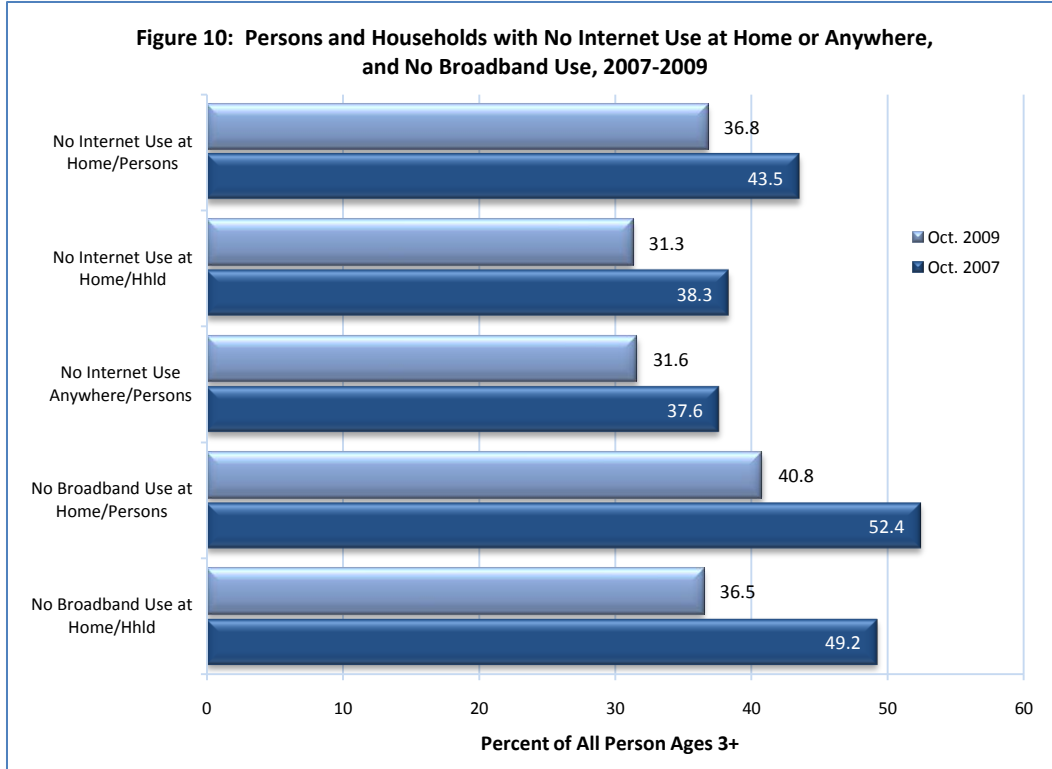
There remains a substantial difference in overall broadband use at home between urban and rural areas. The gap has declined since 2007 but still exists. In 2009, 65.9 percent of urban households and 54.1 percent of rural households accessed broadband service. In contrast, 8.9 percent of rural households and only 3.7 percent of urban households used dial-up. In 2007, 53.8 percent of households in urban areas and 38.8 percent of households in rural America were broadband users. Again, rural homes relied more heavily on dial-up (19.3 percent) than urban did (8.5 percent) that year. Broadband use at home also varies by regions, with the West (68.0 percent of households) and Northeast (67.0 percent) leading, followed by the Midwest (62.2 percent), and the South (60.0 percent) in 2009.

Internet usage anywhere. In 2009, the incidence of Internet use anywhere (i.e., inside or outside the home) by Americans totaled 68.4 percent (197.9 million persons, ages three and older).¹¹ This represents an increase from 62.4 percent (177.9 million) in 2007. Similar to the broadband pattern, all demographic categories with respect to Internet use anywhere experienced rising adoption over time but historical demographic differences in use have continued. Interestingly, the urban-rural gap in Internet use anywhere in 2009 registered only 4.4 percentage points (69.3 v. 64.9 percent), which was decidedly less than the broadband use at home differential. In 2007, however, the urban and rural divide relating to Internet use in all areas equaled only 2.2 percentage points (62.8 v. 60.6 percent).

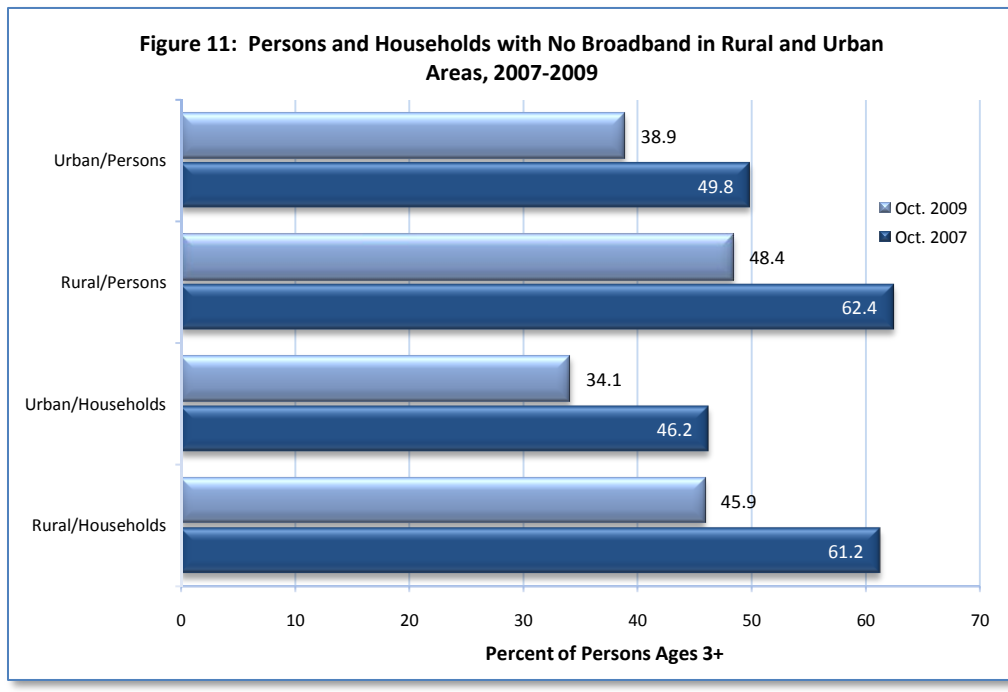
NON-USE

Non-usage at home. Collectively, the proportion of those Americans who do not use the Internet at home declined between 2007 and 2009 but persists at a level higher than 30 percent today. Utilizing a household measurement, the percentage dropped by seven percentage points during the span, registering 31.3 percent in 2009. Measured in persons (three years and older), such non-users numbered 36.8 percent in 2009 and had dropped almost seven percentage points in two years.

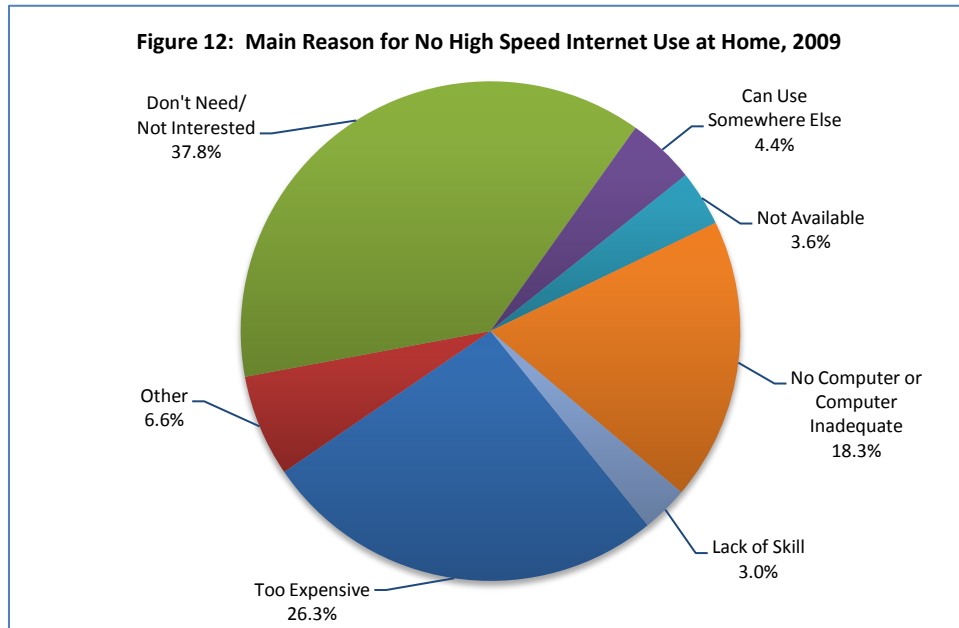
Those persons who do not use broadband at home total more than 35 percent of all households and approximately 40 percent of all persons, with a larger proportion in rural areas. More specifically, 36.5 percent of households and 40.8 percent of persons did not use such high-speed Internet at home in 2009. The urban-rural gap was found to exist, regardless of the unit of measure. In rural areas, 45.9 percent of households and 48.4 percent of persons had no home broadband access, while the corresponding numbers for urban areas are 34.1 percent for households and 38.9 percent for persons. In 2007, the overall figures and those for rural and urban respectively registered more than ten percentage points higher.



Non-usage anywhere. Similarly, the category of not using the Internet inside or outside the home remains at more than 30 percent of all persons. Those persons (ages three and older) who do not use the Internet at all numbered 31.6 percent in 2009 and 37.6 percent in 2007.

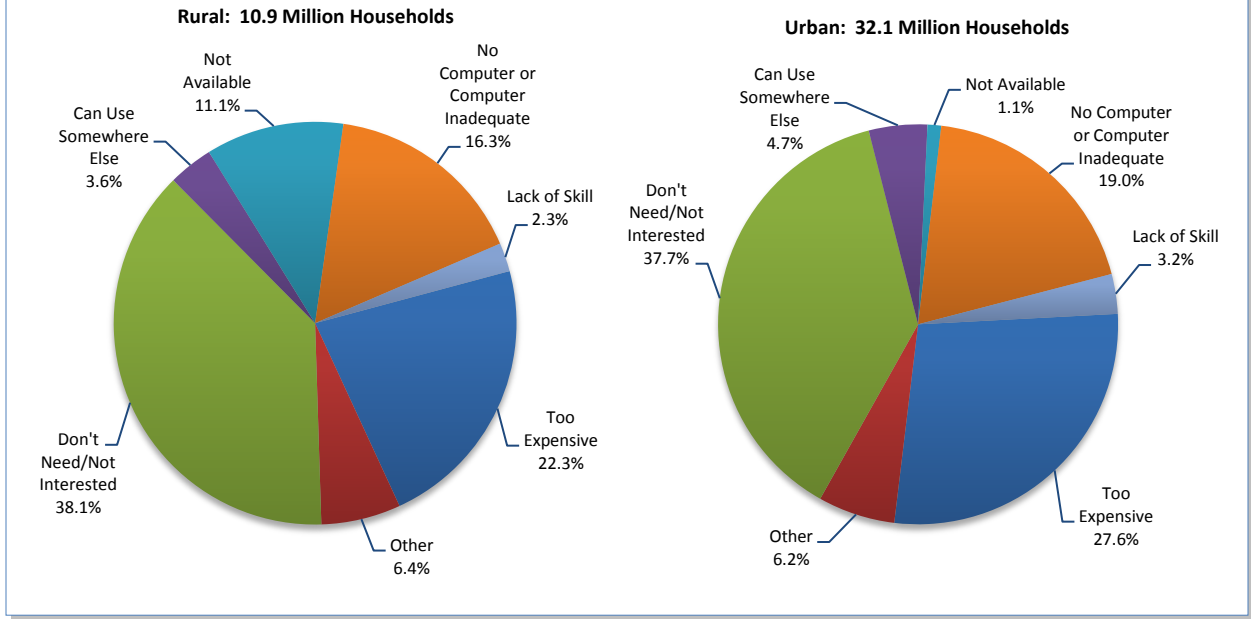


Main reasons for non-use of broadband. Overall, the two most important reasons for no broadband access at home are “don’t need” and “too expensive.” Households without high-speed Internet access at home stated that “don’t need” (a value proposition) is more important than cost (affordability). The next most important reason is “no computer or inadequate computer,” followed by “can use somewhere else,” “not available,” and “lack of skill.”



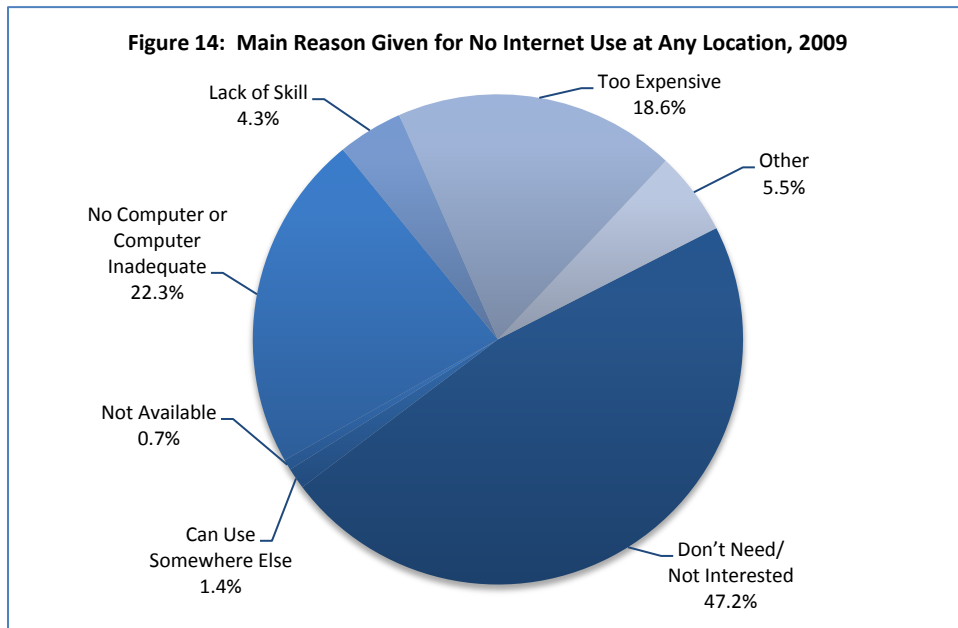
In rural America, “not available” is a much more important reason for non-adoption of home broadband than in urban areas. “Don’t need” and cost ranked highest in both categories, and the “no computer or computer inadequate” issue ranked third. However, “not available” accounts for more than 10 percent of the main reasons for non-use in rural areas but accounts for only about a one percent factor in urban areas.

Figure 13: Main Reason for No High-Speed Internet Use at Home, Rural/Urban, 2009

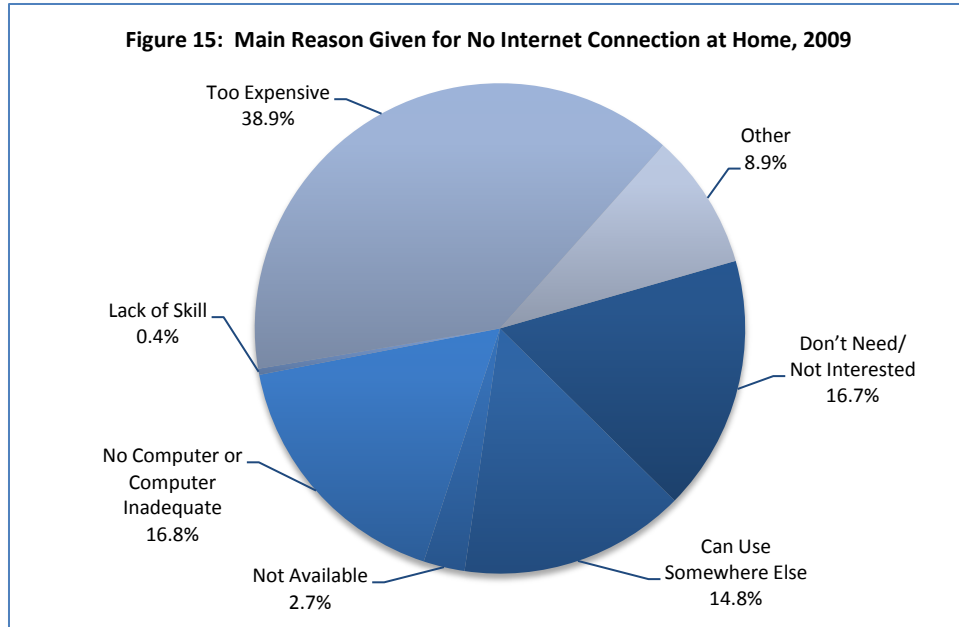


When other types of non-use are examined, however, the rankings can and do change. For example, respondents who do not use the Internet anywhere ranked the value proposition significantly higher than affordability.

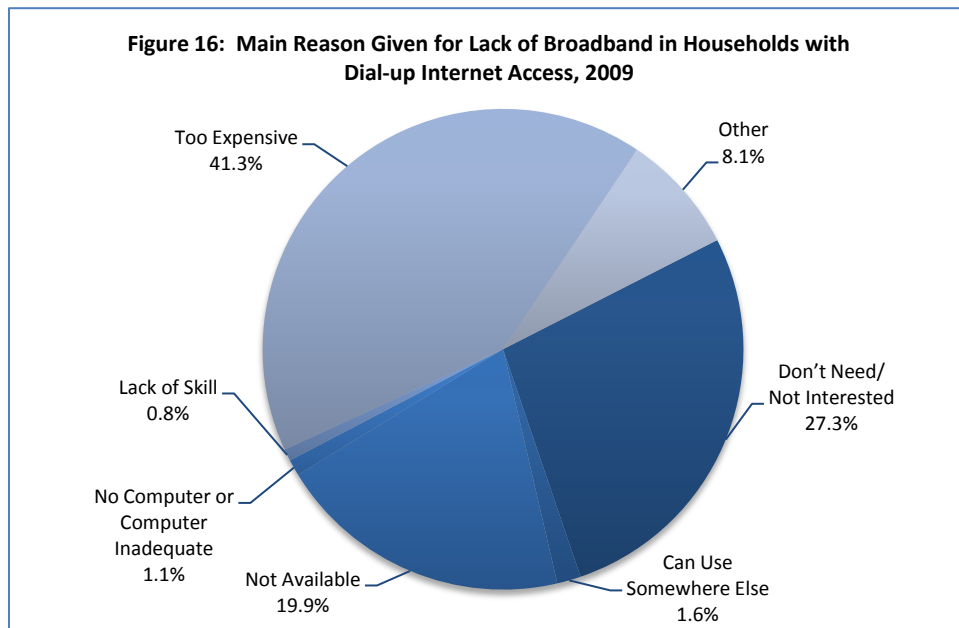
Figure 14: Main Reason Given for No Internet Use at Any Location, 2009



This contrasts with the category of households that do not access the Internet at home, which rated cost as the clear-cut top concern.



Similarly, those in households with dial-up service identified cost as the most important reason for not having broadband connectivity at home.



The answer category “no computer or computer inadequate” is highly ranked by each of the above groups (Figures 13-16) except the dial-up category. The latter cites lack of availability as much more important, especially in rural areas where it is cited as the most important reason (42.6 percent), followed by cost (32.5 percent).

CONCLUSION

The Internet is integral to the U.S. economy and our standard of living. The nation's broadband Internet access adoption rate is at an all-time high, but a number of Americans still do not use the technology. This initial analysis of the 2009 survey results begins the process of developing a factual basis for sound policymaking to expand the adoption of and access to Internet technology, particularly broadband.

This preview report is based on summary Current Population Survey (CPS) data provided to NTIA by the Census Bureau. Later this year, the U.S. Department of Commerce will make the complete data set publicly available, enabling a much more comprehensive analysis of Internet usage patterns around the country. We anticipate that a more detailed examination of the CPS data base would offer additional insights for public policymakers. The Commerce Department's National Telecommunications & Information Administration and Economics and Statistics Administration will undertake such an analysis later this year when the full additional CPS data base becomes available. We will also look forward to the findings that the broader research community will provide based on this data.

While many Americans have come to grasp the importance of broadband as evidenced by increasing use of the technology across virtually all demographic groups and geographic areas, there exist differences in adoption rates across groups and areas that have tended to persist. Non-adoption rates for the Internet and broadband total 30 percent or more. Survey results provide insights as to why this non-use occurs. Lack of perceived value ("don't need") in using the technology ranks number one among the major reasons for non-use with respect to broadband at home and Internet anywhere, and for rural and urban areas. Affordability ("too expensive"), however, rates highest among the major reasons for eschewing broadband at home among those with either no Internet at home or only dial-up service. Lack of an adequate or any computer ranks high generally as a rationale for not having broadband at home, as does lack of availability in rural areas. Further probing finds that the most important reasons that those with dial-up service in rural areas do not subscribe to broadband include the latter's unavailability and affordability.

These findings provide a better understanding of the scope and nature of broadband adoption in our nation. Knowing which demographic groups or geographic areas are either leading or lagging – and why -- in their use of this high-speed Internet can sharpen the focus of public decision-making that can help bridge this technological divide, boost economic growth and create jobs. The Obama Administration's Open Government initiative is pursuing a wide range of programs making government information and services available online. These efforts, along with innovative commercial and non-commercial activities, can bolster demand for broadband Internet access in market segments identified by this report as experiencing weak demand and high access barriers. This Administration's broadband deployment and adoption initiative is a high-priority effort to help ensure that Americans can truly enjoy and participate in the Internet economy.

¹ By “most important,” we mean the most frequently ascribed major reason given by respondents in the survey.

² President Barack Obama, September 21, 2009, in Troy New York. http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Innovation-and-Sustainable-Growth-at-Hudson-Valley-Community-College/

³ For household-level estimates based on the total sample, the error attributable to sampling and other random effects at the 90 percent confidence level is no more than plus or minus 0.35 percentage points based on a standard error (SE) of 0.21 percentage points. For results based on Internet households, the margin of sampling error is no more than plus or minus 0.43 percentage points, based on a SE of 0.26 percentage points.

⁴ More specifically, NTIA wholly or partially funded (with Commerce's Economics and Statistics Administration) and designed survey instruments for CPS Computer and Internet Use Supplements in 1994, 1997, 1998, 2000, 2001, and 2003, and Internet Use Supplements in 2007 and 2009. The data became the basis for the Commerce reports “Falling Through the Net” (1995, 1998, 1999, 2000) and “A Nation Online” (2002, 2004), and provided input into the NTIA report “Networked Nation: Broadband in America 2007.”

⁵ In a subsequent report, NTIA and ESA will examine in more detail the demographic details available in the October 2009 CPS data base.

⁶ In this report, we examine broadband from the demand side based on the Census CPS survey of households. Thus, terms such as “use,” “adopt,” “access,” and “connect” refer to the perspective of a household or person. This is to be distinguished from supply-side (provider) considerations such as “deployment” that, in turn, can result in demand perceptions such as “lack of availability.”

⁷ Data from the October 2009 CPS Internet Use survey can be retrieved at www.ntia.doc.gov/data/index.html. For historical CPS data used in this report, see also “Internet and Computer Use Supplements” at <http://www.bls.census.gov/cps ftp.html#cpssupps>.

⁸ As shown in Figure 1, household adoption of both Internet access overall and computers has been rising significantly since 1997 albeit collection of the latter data by Census ceased in 2003.

⁹ Figure 4 provides percentages for Native Americans in the column, “AI/AN Non-Hispanic,” which is an abbreviation for “American Indians/ Alaskan Natives Non-Hispanic.”

¹⁰ Previous years' data on Internet use have shown consistently that people with higher education levels are more likely to use the Internet. See Jennifer Cheeseman Day, Alex Janus and Jessica Davis “Computer and Internet Use in the United States: 2003” Series P23-208, Washington, DC: U.S. Census Bureau. Using a basis of persons who are 16 years and older in the October 2009 CPS data collection, the direct relationship between educational level and broadband adoption generally holds. This sample would include current high school students as well as adults who never finished high school, thereby introducing distortions into the analysis. The Department of Commerce's more detailed look at educational attainment and broadband use in the future will focus on the more meaningful CPS data set that includes only those persons 25 years of age and above.

¹¹ Because a household measure is less useful than a person basis in gauging Internet or broadband use outside the home, it is not used in this context in the report.