



June 2015

# BROADBAND

## Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear

Accessible Version

# GAO Highlights

Highlights of [GAO-15-473](#), a report to congressional requesters

## Why GAO Did This Study

While broadband is available to a majority of Americans, barriers have kept some from subscribing and enjoying its benefits. In 2010, FCC published the National Broadband Plan, which noted that some demographic groups lagged behind others in adopting broadband and called on FCC and NTIA to take action to address these barriers.

GAO was asked to examine progress in addressing broadband adoption barriers. This report examines (1) benefits of home broadband adoption, (2) barriers to adoption and approaches to address them, and (3) the extent to which FCC and NTIA have assessed efforts and set goals to address barriers. GAO reviewed literature on benefits and barriers, documentation on the performance of efforts to address adoption barriers, and interviewed FCC and NTIA officials, 14 of the 42 BTOP grantees, and 21 public and private stakeholders selected based on GAO's prior work and recommendations from other stakeholders.

## What GAO Recommends

GAO recommends that NTIA include an outcome-based goal and measure for its broadband adoption work in its performance plan. NTIA stated that such metrics are not appropriate for its efforts because these efforts are advisory. GAO believes measuring outcomes is key to demonstrating results. GAO also recommends that FCC revise its strategic plan to more clearly state if broadband adoption is a priority, and if so, what outcomes FCC intends to achieve. FCC noted that to the extent its plan is unclear, it will take steps to address the recommendation.

View [GAO-15-473](#). For more information, contact Mark Goldstein at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov).

June 2015

## BROADBAND

### Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear

## What GAO Found

Home broadband adoption can provide a number of social and economic benefits, according to literature from academic, government, and other research sources and interviews GAO held with researchers, consumer and industry organizations, and government officials. For example, broadband provides access to employment opportunities by providing the means to search and apply for jobs and participate in online job training. It also provides access to a number of government benefits, serves as a conduit for civic participation, and provides a means to connect family members, among other benefits.

Affordability, lack of perceived relevance, and lack of computer skills are the principal barriers to broadband adoption identified by literature and stakeholders GAO interviewed. Efforts to address these barriers include projects to increase broadband adoption that were funded by grants from the National Telecommunications and Information Administration's (NTIA) Broadband Technologies Opportunities Program (BTOP) and outreach and other efforts by the Federal Communications Commission (FCC) and NTIA. GAO identified three key approaches used to address adoption barriers:

- **Discounts** on computer equipment and broadband subscriptions.
- **Outreach** efforts to promote broadband availability and benefits.
- **Training** to help people develop skills in using computers and broadband.

NTIA and FCC have limited information about the performance of their broadband adoption efforts and have not established goals articulating the outcomes these efforts should achieve. For example, NTIA compiled and published self-reported information from its BTOP grantees about best practices, but has not assessed the effectiveness of these approaches in addressing adoption barriers. Because BTOP has concluded, NTIA missed an opportunity to evaluate which grantees' approaches were the most effective. NTIA's strategic plan includes a goal to increase broadband use, but the agency's performance plan does not include an outcome-based goal and performance indicator for its ongoing broadband adoption efforts, making it unclear how the agency will show progress toward its strategic goal. NTIA had reported new broadband subscribers as a result of its BTOP efforts, but no longer uses this as a performance metric because BTOP has largely concluded. Although FCC's previous strategic plan included a goal to support broadband adoption, the commission issued a revised plan in 2015 with fewer broader goals, replacing the goal that mentioned broadband adoption with a goal that instead discusses broadband availability. Although lack of availability is a potential barrier, GAO's literature review and stakeholder interviews more frequently mentioned the three barriers cited above and FCC's broadband adoption efforts are aligned with those barriers. Thus, the strategic plan does not clearly reflect FCC's actions and whether broadband adoption is a priority for the commission. FCC officials said that the new plan's broadband goal is meant to encompass adoption efforts, but without including outcome-oriented goals for broadband adoption, it is unclear what, if any, related outcomes may be expected from FCC's broadband adoption efforts.

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## Abbreviations

BTOP	Broadband Technology Opportunities Program
CPS	Current Population Survey
DSL	digital subscriber line
FCC	Federal Communications Commission
GPRA	Government Performance and Results Act
Mbps	megabits per second
NTIA	National Telecommunications and Information Administration
Recovery Act	American Recovery and Reinvestment Act of 2009

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June 2, 2015

The Honorable Frank Pallone, Jr.  
Ranking Member  
Committee on Energy and Commerce  
House of Representatives

The Honorable Anna G. Eshoo  
Ranking Member  
Subcommittee on Communications and Technology  
Committee on Energy and Commerce  
House of Representatives

The Honorable Edward J. Markey  
United States Senate

Internet with speeds at or approaching what is considered high-speed Internet or “broadband” has been deployed to the majority of Americans. According to the Federal Communications Commission (FCC), broadband was available to about 83 percent of U.S. households in 2013, an improvement from about 72 percent in 2011.<sup>1</sup> FCC has also noted, however, that barriers have kept some households from adopting

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<sup>1</sup>FCC, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, FCC 15-10 (rel. Feb. 4, 2015) (2015 Broadband Progress Report). The broadband availability data FCC presented in this report were collected by the National Telecommunications and Information Administration and the states in coordination with FCC. These data apply to types of fixed broadband, which are services that provide high-speed Internet access to a fixed point, such as cable, fiber, and digital subscriber line (DSL). The data exclude mobile and satellite services. FCC defines broadband, referred to in statute as “advanced telecommunications capability,” based on capacity or speed. 47 U.S.C. § 1302(d)(1). The term “broadband” commonly refers to Internet service with speeds generally higher than dial-up connections, and our prior work has found that consumers may not be aware of their Internet speed. See GAO, *Broadband Performance: Additional Actions Could Help FCC Evaluate its Efforts to Inform Consumers*, [GAO-15-363](#) (Washington, D.C.: Apr. 17, 2015). For these reasons, unless we are discussing FCC’s broadband availability data, we are using “broadband” more generically without reference to a specific speed.

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broadband even where it is available, preventing these households from enjoying the social and economic benefits broadband can provide. As required by the American Recovery and Reinvestment Act of 2009 (Recovery Act),<sup>2</sup> FCC released the *National Broadband Plan* in 2010 to improve access to and the services provided by broadband.<sup>3</sup> The plan noted that over one-third of U.S. households lacked broadband and identified affordability, perceived relevance, and lack of computer skills as key barriers to broadband adoption. Additionally, the plan noted that adoption was particularly low among certain demographic segments, including people with low income (less than \$20,000 per year), with no high school diploma, age 65 and older, and with a disability. To address barriers to broadband adoption, the plan recommended actions for FCC and the Department of Commerce's National Telecommunications and Information Administration (NTIA). The Recovery Act also provided funds to NTIA to establish the Broadband Technology Opportunities Program (BTOP). This program awarded about \$251 million in grants to 44 projects to improve broadband adoption.<sup>4</sup>

You asked us to review efforts to address broadband adoption barriers described in the *National Broadband Plan*. This report examines (1) what is known about the benefits of home broadband adoption, (2) identified barriers to broadband adoption and approaches used to address them, and (3) the extent to which FCC and NTIA have assessed their effectiveness and set goals for addressing broadband adoption barriers.

To determine what is known about the benefits of home broadband adoption and broadband adoption barriers, we identified and reviewed academic, government, industry and trade press, and other association or nonprofit literature on these topics published from 2009 through 2014.<sup>5</sup> We also interviewed FCC and NTIA officials and 21 stakeholders—including researchers, consumer groups, industry associations and

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<sup>2</sup>Pub. L. No. 111-5, § 6001(k)(1), 123 Stat. 115, 515-516 (2009).

<sup>3</sup>FCC, *Connecting America: The National Broadband Plan* (Mar. 16, 2010).

<sup>4</sup>In addition to increasing broadband adoption, BTOP also aimed to deploy broadband to underserved areas, expand the capacity of public computer centers, and develop and maintain a map showing the availability of broadband.

<sup>5</sup>We limited the scope of literature to focus on (1) home broadband, as opposed to mobile broadband, (2) experience within the United States, and (3) articles from recent years just before and since the publication of FCC's *National Broadband Plan* in 2010.

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broadband providers, and technology organizations—about broadband benefits and adoption barriers.<sup>6</sup> We identified stakeholders to interview based on our prior telecommunications work and our review of contributors to the *National Broadband Plan* and other broadband adoption literature, as well as based on recommendations from other stakeholders we interviewed. To describe approaches used to address broadband adoption barriers, we identified both federal and nonfederal efforts by reviewing documents from and interviewing FCC and NTIA officials, academic researchers, consumer groups, industry associations, and broadband providers, and by examining 15 of the 44 BTOP projects.<sup>7</sup> We selected these projects because they were the projects that met their goals for new household broadband subscribers as set in their grant applications.<sup>8</sup> For these projects, we reviewed reports submitted to NTIA about project outcomes and, where available, third-party program evaluations that analyzed the effectiveness of approaches to address broadband adoption barriers.<sup>9</sup> We interviewed representatives from the 14 grantees responsible for administering these BTOP projects.<sup>10</sup> To determine the extent to which FCC and NTIA set goals and assessed the agencies' performance to address broadband adoption barriers, we reviewed the agencies' most recent strategic plans and performance plans to identify the agencies' goals and performance measures related to broadband adoption. We reviewed documentation of NTIA's program evaluation of BTOP, including the design and final report. We interviewed FCC and NTIA officials about their efforts to evaluate the effectiveness of

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<sup>6</sup>"Technology organizations" refers to organizations that seek to help consumers get online through partnerships with broadband providers and community organizations.

<sup>7</sup>Our review was not comprehensive of all efforts being taken to address broadband adoption barriers, since our purpose was to identify types of approaches used, not to catalog all efforts. We examined both federal efforts by NTIA and FCC and nonfederal efforts by the private sector and nonprofit organizations.

<sup>8</sup>We selected projects that met their goals because we were interested in identifying the most effective approaches to addressing broadband adoption barriers and reasoned that projects that met their goals were more likely to have been successful at this.

<sup>9</sup>NTIA did not require BTOP projects to have program evaluations; however, some projects elected to do so. We determined which projects had third-party program evaluations and obtained copies of the resulting reports from either NTIA or the project grantees. We reviewed these evaluations to determine which ones specifically examined the effectiveness of projects' approaches for addressing broadband adoption barriers.

<sup>10</sup>One grantee we interviewed administered two of the BTOP projects we examined. Additionally, another grantee we did not interview also administered two projects, resulting in 42 grantees for the 44 projects.



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their broadband adoption efforts and about their strategic goals and performance measures for these efforts. We evaluated their efforts against criteria for evaluating agency performance as established in our prior work on program evaluation and the GPRA Modernization Act of 2010.<sup>11</sup> To provide contextual information about the level of broadband adoption among households overall and within certain demographic groups, we analyzed U.S. Census Bureau data from 2009 through 2013. We determined that these data were sufficiently reliable for showing differences among demographic groups and trends by reviewing information about how Census and NTIA have reported these data and interviewing Census and NTIA officials about these data and their limitations. See appendix I for a more detailed description of our objectives, scope, and methodology.

We conducted this performance audit from August 2014 to June 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### The Recovery Act: FCC and NTIA Broadband Roles

Most of the *National Broadband Plan's* recommendations on broadband adoption were made to either FCC or NTIA, two federal agencies with complementary responsibilities for broadband. FCC regulates wired and wireless forms of communication, including the means of providing broadband service, such as cable, telephone, and satellite technologies. FCC's role includes promoting competition, protecting consumers, and addressing the communications needs of underserved populations. For example, FCC's Lifeline Program provides a subsidy to providers that offer discounted telephone service to low-income households. Through a broadband pilot, FCC has been examining ways to expand the Lifeline

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<sup>11</sup>GAO, *Designing Evaluations: 2012 Revision*, [GAO-12-208G](#) (Washington, D.C.: January 2012). The GPRA Modernization Act of 2010, Pub. L. No. 111-352, 124 Stat. 3866 (2011), amends provisions of the Government Performance and Results Act of 1993 (GPRA), Pub. L. No. 103-62, 107 Stat. 285 (1993).

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program to provide support for broadband service.<sup>12</sup> NTIA is part of the Department of Commerce and advises the President on telecommunications and information-policy issues, including broadband access and adoption. NTIA's activities include administering grant programs that further the deployment and use of broadband and other technologies and developing policy on issues related to the Internet economy, including online privacy, copyright protection, and cybersecurity.

The Recovery Act included provisions aimed at FCC and NTIA to address broadband adoption. The act provided \$4.7 billion to NTIA to establish BTOP, through which NTIA awarded competitive grants to a variety of entities for broadband infrastructure, public computer centers, and to increase broadband access and adoption. Through the broadband adoption component of the program—known as the Sustainable Broadband Adoption grant program—NTIA awarded about \$251 million to fund 44 broadband adoption projects across the country.<sup>13</sup> The purpose of this program was to increase Internet use and broadband subscribership among individuals and businesses. The Recovery Act also authorized NTIA to transfer a portion of its funds to FCC to develop the *National Broadband Plan*, a document to outline ways to ensure that every American had access to broadband service. FCC published the *National Broadband Plan* in 2010.<sup>14</sup> The plan's chapter on broadband adoption provided data on the status of broadband adoption among U.S. households overall and within certain demographics, discussed the

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<sup>12</sup>We did not assess FCC's Lifeline broadband pilot as part of this report. Rather, FCC's Lifeline program, including its broadband pilot, was the subject of our March 2015 report in which we examined the status of FCC's efforts to reform the program, the extent to which households participate in the program and face challenges in accessing and retaining its benefits, and FCC's plans to evaluate the broadband pilot. GAO, *Telecommunications: FCC Should Evaluate the Efficiency and Effectiveness of the Lifeline Program*, [GAO-15-335](#) (Washington, D.C.: Mar. 24, 2015).

<sup>13</sup>Although NTIA initially funded 44 projects, the City of Tallahassee terminated its grant, leaving 43 projects that were completed or ongoing as of November 2014. NTIA reported in June 2012 that the City of Tallahassee had returned its \$1.2 million award.

<sup>14</sup>*National Broadband Plan*.

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barriers to adoption faced by those that lack broadband at home, and recommended actions for FCC and NTIA to address those barriers.<sup>15</sup>

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## Trends in Household Broadband Adoption

According to U.S. Census data, an estimated 73 percent of U.S. households had adopted broadband as of 2013, a statistically significant increase of 9 percentage points from 2009.<sup>16</sup> Estimated broadband adoption levels were significantly higher in 2013 than 2009 for all of the demographic groups we examined; however, some groups had estimated levels of broadband adoption below the level for households overall. For example, the estimated adoption level among households headed by a person age 65 and older increased a statistically significant 14 percentage points from 40 percent to 54 percent from 2009 to 2013.<sup>17</sup> Hispanics also showed a similar increase during this time—an estimated 12 percentage points, from 49 to 61 percent.<sup>18</sup> However, older Americans and Hispanics are an estimated 19 and 12 percentage points, respectively, below the adoption rate for all households. These and other demographic groups, including those with less than a high school education, African Americans, and those with a disability, showed similar increases while still falling behind households overall, as shown in figure 1.

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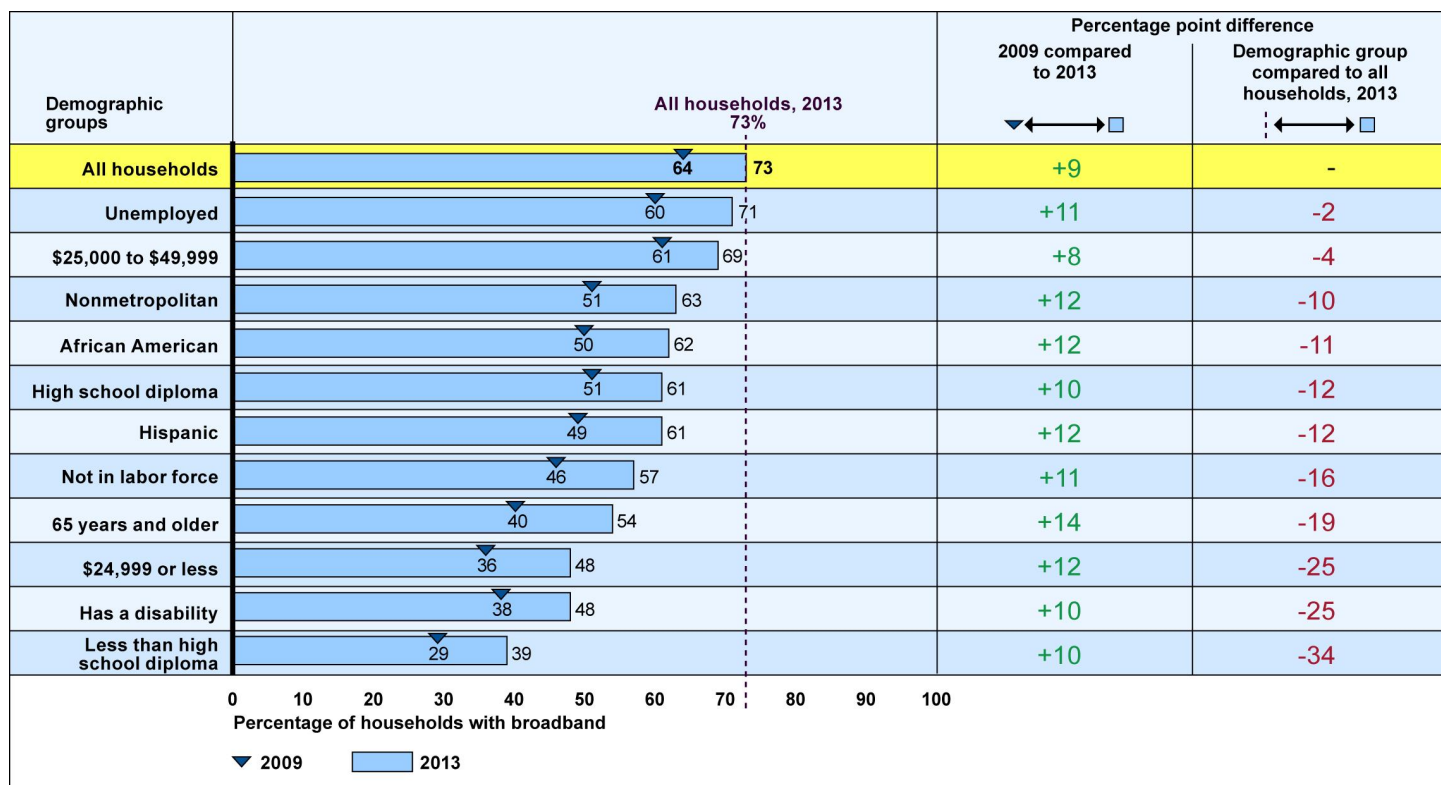
<sup>15</sup>For example, the plan recommended that FCC provide free or low-cost broadband for low-income Americans, that NTIA form partnerships with public and private entities to promote broadband benefits, and that both agencies work together to create a national program to help Americans learn to use computers and the Internet.

<sup>16</sup>The 95 percent confidence interval for the 2013 estimate is 72.7 to 73.7 percent, and the associated 95 percent confidence interval for the 2009 estimate is 63.5 to 64.4 percent. These estimates are from the Computer and Internet Use supplement sponsored by NTIA, a supplement to the Current Population Survey, a national survey administered by the U.S. Census Bureau. For the purposes of the survey, respondents are identified as having broadband if they respond that their Internet service is provided by means other than a dial-up connection, such as cable or fiber. This is in contrast to data from FCC on the availability of advanced telecommunications capability, which are based on upload and download speed data submitted by service providers. The estimates derived from Current Population Survey data that are presented in this section are based upon the responses of the household member who answered the survey.

<sup>17</sup>The 95 percent confidence interval associated with the 2009 estimate is 39.1 to 41.1 percent, and the 95 percent confidence interval associated with the 2013 estimate is 53.2 to 55.4 percent.

<sup>18</sup>The 95 percent confidence interval associated with the 2009 estimate is 47.0 to 50.0 percent, and the 95 percent confidence interval associated with the 2013 estimate is 59.7 to 63.0 percent.

**Figure 1: Household Broadband Adoption among Demographic Groups with Adoption Rates below That of All Households, 2009 and 2013**



Source: U.S. Census Current Population Survey and GAO analysis. | GAO-15-473

Note: The Census Current Population Survey asks the respondent if anyone in the household uses the Internet from home and then asks through which types of service the Internet is accessed. Respondents who say they use dial-up are not counted as having broadband. Respondents who indicate they access the Internet through DSL, cable modem, fiber-optic service, mobile broadband plan, satellite, or some other service are counted as a household with broadband. The household broadband adoption percentages we present are estimates calculated with intervals of 95 percent confidence. They have a sampling error of no larger than plus or minus 2.6 percentage points at the 95 percent level of confidence. Where we have drawn comparisons between groups or years to show differences, those differences are statistically significant and the confidence intervals do not overlap, except in the 2013 comparison between all households (95 percent confidence interval of 72.70 to 73.69 percent) and unemployed (95 percent confidence interval of 68.36 to 73.58 percent). About 1.6 percent of household respondents indicated they were more than one race; we have included these householders under multiple demographic race categories. Starting in 2010, Census changed the methodology for its income variable, including imputing household values that had been missing in prior years to provide values without missing observations.

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There are also some differences in broadband adoption geographically. For example, nonmetropolitan households' 2013 estimated adoption rate of 63 percent is 12 percentage points less than the estimated 75 percent adoption rate of metropolitan areas.<sup>19</sup> Broadband adoption in the states also varies. According to U.S. Census's American Community Survey data, it is estimated that broadband adoption in Alabama, Arkansas, Mississippi, New Mexico, and Puerto Rico was nearly 10 percentage points lower than the national average in 2013.<sup>20</sup> See appendix II for more information on broadband adoption trends.

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## Home Broadband Offers a Variety of Economic and Other Benefits

Adopting broadband at home—as opposed to through mobile devices—can provide a number of benefits, including access to job opportunities, education, and services for economic and social gain.<sup>21</sup> Although mobile devices are becoming more advanced, stakeholders told us that certain benefits are not as easily accessible through mobile devices. For example, it can be difficult, if not impossible, to use a mobile device to develop and submit a resume along with a job application. Additionally, some benefits may also be accessed through broadband connections in public places, such as libraries. However, such access also has limitations, such as time limits. As stated in the *National Broadband Plan*, not adopting broadband limits individuals' ability to fully participate in digital information and services. The literature we reviewed and stakeholders we interviewed identified a variety of benefits:

- *Employment opportunities:* Broadband provides a mechanism to search and apply for jobs. Many employers now require applications to be completed online, including the federal government. In 2011, FCC noted that over 80 percent of Fortune 500 companies require

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<sup>19</sup>The 95 percent confidence interval for the 2013 nonmetropolitan rate is 61.5 to 64.0 percent, and for the 2013 metropolitan rate it is 74.6 to 75.7 percent.

<sup>20</sup>According to the U.S. Census, the state-level adoption rates have margins of error no greater than plus or minus 0.8 percentage points at the 90 percent confidence interval, and the national average has a margin of error of plus or minus 0.1 percentage points at the 90 percent level of confidence.

<sup>21</sup>By “home” broadband, we are referring to broadband service to a home that residents can use with desktop or laptop computers, which is generally provided by wired means such as cable or fiber. This is in contrast to mobile broadband that is accessed by mobile devices (smartphones, tablets) through wireless means. Our scope in discussing broadband benefits is concerned primarily with those related to adoption at home.

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applicants to apply for employment on the Internet.<sup>22</sup> Telecommuting has also allowed many government and private sector employees (e.g., including individuals with disabilities) to use broadband to work at home.

- *Educational enrichment:* Broadband provides an opportunity for web-based learning, for example to complete college requirements or job training and for school-age children to use the Internet for research and classroom assignments. NTIA's BTOP evaluation contractor noted in its study design document that prior research shows using computers and broadband can be a significant factor in boosting math and reading achievement as well as motivating students and enriching school content, ultimately improving students' achievement.<sup>23</sup>
- *Healthcare:* Broadband provides consumers the ability to research health issues, obtain and share their personal health information with third parties, and to communicate with doctors, including specialists who may work in a different city. For example, in 2010, we found that through remote access, telemedicine<sup>24</sup> can allow rural patients to receive medical diagnosis or patient care, including from specialists who are located elsewhere.<sup>25</sup>
- *Social communication and networking:* Broadband provides a mechanism for people to communicate with friends, family members, and organizations. For example, it provides an opportunity for older adults who may be socially isolated to participate in social dialogue about current events and issues.
- *Government services:* Broadband provides an opportunity to obtain information about and apply for most government entitlement benefits, such as social security, and to complete tasks such as tax filing.

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<sup>22</sup>FCC, *FCC and Connect to Compete Tackle Broadband Adoption Challenge*, Oct. 13, 2011.

<sup>23</sup>ASR Analytics, *Study Design Deliverables A-B: Broadband Technology Opportunities Program Evaluation Study* (Potomac, Md.: Revised Jan. 30, 2012).

<sup>24</sup>Telemedicine includes telehealth, which is the use of medical information exchanged from one site to another via electronic communications (such as video or email) to improve a patient's clinical health status. Telehealth can include telemental health, which is the provision of mental health services to patients living in remote locations or otherwise underserved area.

<sup>25</sup>GAO, *Telecommunications: FCC's Performance Management Weaknesses Could Jeopardize Proposed Reforms of the Rural Health Care Program*, [GAO-11-27](#) (Washington, D.C.: Nov. 17, 2010).

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- *Electronic commerce:* Broadband allows online sales transactions. Consumer studies and stakeholders we interviewed reported that the Internet has become an important part of the U.S. economy. This is also reflected in our prior work. In 2014, we found that electronic commerce provides opportunities for local residents to shop online rather than at brick-and-mortar establishments.<sup>26</sup> Shopping online also enables comparing prices and searching for price discounts, thus lowering the price paid for goods and services.
  - *News and civic engagement:* Broadband provides a variety of sources for national and local news. In 2013, Pew Research Center reported that 82 percent of Americans said they accessed news with a desktop or laptop computer.<sup>27</sup> Broadband can also enhance household participation in various government activities that will promote interaction between citizens and their governments.
  - *Entertainment:* Broadband provides the ability to access games, movies, music, books, and other forms of entertainment. For example, movies can be streamed and watched from a computer or television.

Additional benefits may emerge as more information and services become available through broadband. The *National Broadband Plan* noted that many uncertainties will shape the evolution of broadband, including the behavior of consumers, private companies, the economic environment, and technological advances.

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<sup>26</sup>GAO, *Telecommunications: USDA Should Evaluate the Performance of the Rural Broadband Loan Program*, [GAO-14-471](#) (Washington, D.C.: May 22, 2014), and GAO, *U.S. Postal Service: Urgent Action Needed to Achieve Financial Sustainability*, [GAO-13-562T](#) (Washington, D.C.: Apr. 17, 2013).

<sup>27</sup>Pew Research Center, *Key Indicators in Media & News, State of the News Media 2014* (Mar. 26, 2014), accessed April 24, 2015, <http://www.journalism.org/2014/03/26/state-of-the-news-media-2014-key-indicators-in-media-and-news/>.

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## Affordability, Perceived Relevance, and Lack of Computer Skills Are Identified Broadband Adoption Barriers, Which Discounts, Outreach, and Training Have Sought to Address

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### Affordability, Perceived Relevance, and Lack of Computer Skills Are Identified Broadband Adoption Barriers

In 2010, FCC's *National Broadband Plan* identified affordability, perceived relevance, lack of computer skills, and the availability of broadband service as the four principal barriers to broadband adoption.<sup>28</sup> Our more recent literature review and interviews with stakeholders including FCC and NTIA officials, researchers, industry associations and companies, and consumer groups showed that three of these barriers persist:

- *Affordability*: All 21 stakeholders we interviewed identified affordability issues, such as the cost of a subscription for Internet service and computer equipment, as barriers to broadband adoption. While stakeholders told us that it is difficult to find data on broadband subscription costs, affordability was the most frequently identified barrier in the literature and among the stakeholders we interviewed.<sup>29</sup>
- *Perceived relevance*: Almost all of the stakeholders we spoke to told us that the perception that broadband does not provide enough utility,

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<sup>28</sup>*National Broadband Plan*. Additionally, the plan identified accessibility for people with disabilities as a cross-cutting issue.

<sup>29</sup>Some stakeholders told us that broadband subscription cost data are difficult to obtain for reasons such as reluctance from broadband providers to share such information and carriers' bundling practices that make it difficult to separate broadband costs from the costs of other bundled services, such as telephone and video services. In 2011, FCC sought comment on whether it should collect price data from broadband providers, but this issue remains open for consideration. See *In the Matter of Modernizing the FCC Form 477 Data Program*, Report and Order, ¶ 13, 28 FCC Rcd. 9887 (2013).



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relative to its cost, acts as a barrier to broadband adoption. A 2013 NTIA report noted this was the most-cited reason households had not adopted broadband.<sup>30</sup> While some individuals may not benefit from broadband adoption, the literature we reviewed and stakeholders we interviewed told us that many people who have not adopted broadband are not aware of its benefits. Other underlying factors may affect the perception of relevance. For example, NTIA officials and other stakeholders said that some people who say that they do not consider broadband to be relevant may in fact be unable to afford it or lack the computer skills necessary to use it.

- *Lack of computer skills.* A majority of the literature we reviewed and the stakeholders we interviewed told us that lack of computer and Internet skills is a barrier to broadband adoption. Stakeholders we interviewed said that this is a particular problem for certain demographic segments that may lack exposure to or knowledge about computers, such as those of age 65 and older and those with low levels of income and education.

The literature we reviewed and stakeholders we spoke to said that the barrier of availability—the inability to access broadband because it is not offered in a given area by a provider—has been addressed throughout most of the country, but remains an issue primarily for rural areas. Depending on what speed metric is used, FCC's broadband availability data show that broadband was available to all but 4 to 17 percent of the

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<sup>30</sup>NTIA and Economics and Statistics Administration, *Exploring the Digital Nation: America's Emerging Online Experience* (June 2013). Using data from the 2011 U.S. Census Current Population Survey, NTIA reported estimates that 48 percent of households cited "don't need it" or "not interested" as the main reason for not using the Internet at home, followed by 28 percent that said "too expensive" and 13 percent that said they had "no computer" or "no adequate computer."

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population in 2013.<sup>31</sup> These data also show some geographic variation in the availability of broadband, specifically that broadband was unavailable to 20 to 53 percent of the rural population, as well as 17 to 63 percent of Americans living on tribal lands.

Various types of stakeholders we interviewed also identified other barriers to broadband adoption in addition to those identified in the *National Broadband Plan*, although with less frequency:

- *Language*: Six stakeholders told us that language issues—either lack of English fluency among some immigrants or illiteracy among some low-income households—are barriers.
- *Data security concerns*: Three of the 21 stakeholders we spoke with identified data security concerns such as privacy and identity theft as a barrier to broadband adoption.
- *Accessibility for people with disabilities*: NTIA and FCC, as well as 2 of the 21 stakeholders we interviewed identified accessibility as an issue for people with disabilities, such as those who are blind, deaf, or hard of hearing.

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## Approaches to Address Broadband Adoption Barriers Include Discounts, Outreach, and Training

Our review of projects funded by NTIA's BTOP, other FCC and NTIA efforts, efforts by the private sector and nonprofit organizations, and interviews with stakeholders identified three primary approaches that have been used to address broadband adoption barriers:

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<sup>31</sup>See *2015 Broadband Progress Report*, at Table 7. FCC is required by statute to determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion, which is based, in part, on capacity or speed. 47 U.S.C. § 1302(b), (d)(1). In 2015, FCC increased the minimum speed benchmark to download speeds of at least 25 megabits per second (Mbps) and upload speeds of at least 3 Mbps. Prior to this change, the minimum speed benchmark was at least 4 Mbps for downloads and 1 Mbps for uploads (although FCC's data used proxies of 3 Mbps for downloads and 768 kilobits per seconds for uploads). See *2015 Broadband Progress Report* at para. 3. We're presenting a range of numbers to reflect broadband availability at both of these speed benchmarks. As previously stated, consumers are often not aware of their Internet speed. See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 27 FCC Rcd. 10343 (2012) (*Eighth Broadband Progress Report*).

- *Free or discounted equipment and broadband service:* Broadband adoption efforts may provide computer equipment or broadband service at reduced or no cost. This approach addresses the barrier of affordability.
- *Public outreach:* Outreach campaigns seek to promote broadband adoption programs or improve awareness of broadband and its benefits. Outreach efforts may include partnering with community organizations, which representatives of some BTOP projects told us was an effective way to address issues of trust and relevance among lower-income populations that are sometimes suspicious of such outreach. This approach addresses the barrier of relevance.
- *Training (computer or Internet use):* Training may focus on basic computer skills such as operating a computer, using e-mail, and navigating the Internet, or more advanced and specialized skills. This approach addresses the barrier of the lack of computer skills.

Table 1 shows examples of efforts under these three primary approaches.

**Table 1: Examples of Efforts to Address Barriers to Broadband Adoption**

Approach	Example efforts
Free or discounted equipment or broadband service	<ul style="list-style-type: none"> <li>• The Tampa Housing Authority, a Broadband Technology Opportunities Program (BTOP) grantee, provided subsidized computer equipment and broadband service in public-housing units.</li> <li>• Comcast's Internet Essentials and CenturyLink's Internet Basics are programs that offer discounted broadband service and computer equipment to qualified low-income households.</li> </ul>
Public outreach	<ul style="list-style-type: none"> <li>• EveryoneOn and Connected Nation are technology organizations that work to establish partnerships with Internet service providers or state or local governments. Such partnerships promote the benefits of broadband adoption or provide discounted broadband service to low-income families.</li> <li>• Using BTOP funds, the California Emerging Technology Fund conducted a public awareness campaign promoting the benefits of broadband adoption in multiple languages.</li> </ul>
Training (computer or Internet use)	<ul style="list-style-type: none"> <li>• The Mexican Institute of Greater Houston, a BTOP grantee, offered classroom instruction for adults on basic computer literacy in English and Spanish.</li> <li>• The City and County of San Francisco used its BTOP grant to partner with media-focused non-profit organizations to establish computer centers in city schools that offered digital media training to students.</li> </ul>

Source: GAO analysis of BTOP projects and interviews with stakeholders. | GAO-15-473

Note: These are examples of efforts that align with the various approaches; organizations cited may also have other broadband adoption efforts that align with other approaches.

We identified efforts incorporating these approaches that generally targeted specific demographic groups. The majority of federal efforts we examined were projects that received grants through NTIA's BTOP program, which was funded through the Recovery Act, but do not receive

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federal funds on an ongoing basis. Additionally, both NTIA and FCC had some additional efforts. We examined the following efforts:<sup>32</sup>

- *BTOP broadband adoption projects:* As previously discussed, NTIA funded these 44 projects through a grant program established by the Recovery Act. These projects were implemented in various states and targeted multiple demographic groups. Grantees included state and city government agencies, universities, public-private partnerships, schools, libraries, and nonprofit organizations. BTOP grantees frequently used combinations of the three approaches to addressing barriers to broadband adoption described above. For example, Connected Tennessee partnered with a Tennessee state agency to distribute laptop computers to children leaving the foster care system. Connected Tennessee also partnered with a youth services organization to establish computer centers offering training to children. Although most of the BTOP funds have been spent, some projects have continued with other sources of funding.<sup>33</sup> For example, the Mexican Institute of Greater Houston has continued to operate its computer-training classes with funding from Houston-area donors.
- *Digitalliteracy.gov:* NTIA operates a website to provide resources for teaching computer and Internet skills, as well as tools to aid in finding job opportunities and career training services.
- *FCC's Lifeline broadband pilot:* FCC pilot tested ways to provide subsidized broadband service through its Lifeline program, which provides subsidies to telecommunications providers to offer discounted telephone service to low-income households. We examined this program in a recent report.<sup>34</sup>
- *FCC's National Deaf-Blind Equipment Distribution Program:* This program provides \$10 million annually for the local distribution of

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<sup>32</sup>Our review is meant to illustrate these various approaches and is not comprehensive of all efforts to address broadband adoption barriers in the United States.

<sup>33</sup>According to NTIA's November 2014 quarterly report to Congress on BTOP, recipients of BTOP grants—both the Sustainable Broadband Adoption grant and the Public Computing Centers grant—had spent 99 percent of their available grant funding as of June 30, 2014. The report also states that 40 of the 44 broadband adoption grantees had closed out their projects with the remainder nearing completion. NTIA, *Broadband Technology Opportunities Program (BTOP) Quarterly Program Status Report* (November 2014).

<sup>34</sup>[GAO-15-335](#).

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accessible communications equipment for use with broadband services (as well as other telecommunications services) to low-income individuals who are deaf and blind.

- *Other outreach efforts by NTIA and FCC:* These agencies have conducted other outreach efforts, such as using public-private partnerships to promote broadband adoption. They have also held meetings, workshops, and conferences dedicated to promoting broadband adoption. These outreach efforts generally target specific demographic groups. For example, FCC officials told us they have participated in events intended to increase broadband use among older adults, including events hosted by AARP. FCC also noted taking a number of actions to address coordination with Tribal Nations, including creating an Office of Native Affairs and Policy in response to a *National Broadband Plan* recommendation to ensure effective coordination and consultation with tribes on broadband-related issues.<sup>35</sup> According to NTIA officials, upcoming outreach efforts include providing technical assistance to at least 175 communities in implementing or expanding broadband availability and adoption programs.
- *Broadband provider discounts:* Some Internet service providers offer reduced-price broadband service to qualifying lower-income families. For example, the two companies we met with offer monthly service for about \$10 to families with children enrolled in federally subsidized school lunch programs. Such discounts may be supplemented with other approaches to encourage adoption, such as training on how to use the Internet.
- *Technology organizations:* These organizations work to establish partnerships with Internet service providers, state and local government agencies, and other organizations. These partnerships encourage broadband adoption through efforts such as promoting the benefits of broadband and helping low-income households obtain discounted Internet subscriptions. They may also engage in other efforts, such as helping individuals find free computer skills training in their area or providing computer equipment to low-income populations.

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<sup>35</sup>We recently initiated work examining access to telecommunications services, including broadband, on tribal lands; we expect to have the results of this work available in December 2015. Therefore, we did not include broadband issues on tribal lands within the scope of this report.

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NTIA Identified Best Practices for Broadband Adoption, but NTIA and FCC Have Not Fully Assessed the Effectiveness nor Clearly Articulated Intended Outcomes of Their Broadband Adoption Efforts

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NTIA Identified Best Practices of BTOP Projects, but Evaluation of the Effectiveness of NTIA's and FCC's Efforts Is Limited

NTIA has collected and disseminated information about the practices used by the projects funded by its BTOP grant program to address barriers to broadband adoption. NTIA officials told us they intentionally selected a diverse group of 44 projects to receive BTOP funding in order to discover best practices for encouraging broadband adoption. Grantees provided this information on their practices to NTIA as part of their required progress reporting,<sup>36</sup> and NTIA also contracted with a third-party, ASR Analytics, to conduct a program evaluation of the BTOP program as a whole and report its results.<sup>37</sup> NTIA compiled grantee-reported best

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<sup>36</sup>The Recovery Act required BTOP funding recipients to report quarterly on their use of funds and NTIA to make these reports available to the public. See Pub. L. No. 111-5, div. B, tit. VI, § 6001(i)(1) (2009). NTIA also required that funding recipients report quarterly on their broadband equipment purchases and progress made in achieving goals, objectives, and milestones identified in the recipient's application. In addition, BTOP broadband adoption grantees had to report a variety of project-specific information, including the number of new household broadband subscriptions as a result of the program. 74 Fed. Reg. 33104, 33125 (July 9, 2009).

<sup>37</sup>A program evaluation is a systematic study using research methods to collect and analyze data to assess how well a program is working and why. Evaluations answer specific questions about program performance and may focus on assessing program operations or results. Evaluation results may be used to assess a program's effectiveness, identify how to improve performance, or guide resource allocation. See [GAO-12-208G](#).

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practices and published them as a broadband adoption toolkit in 2013.<sup>38</sup> The practices represent a variety of strategies to address broadband adoption barriers that align with the three approaches we described earlier in this report, such as strategies for reaching out to different demographic groups and providing various types of computer and Internet training. NTIA also monitored the projects' progress against their stated goals, including the number of new broadband subscribers as a result of the project and the status of efforts such as outreach and training programs. NTIA's evaluation contractor, ASR Analytics, submitted its evaluation report to NTIA in September 2014, and NTIA later made the report available on its website.<sup>39</sup> The report includes a section on best practices similar to the information in NTIA's toolkit, such as best practices for outreach and communication, instruction, and ways to leverage and sustain community partnerships.

While NTIA's and ASR's reports summarize BTOP project practices, neither evaluated these practices to examine their effectiveness at addressing broadband adoption barriers. NTIA's toolkit links grantees' identified best practices to specific populations and adoption barriers they are meant to address; however, NTIA officials said they did not develop criteria for assessing the success of these practices in getting new broadband subscribers. Additionally, the focus of the ASR evaluation was to identify social and economic outcomes, not which approaches for addressing broadband adoption barriers were the most effective. NTIA officials told us they have not evaluated the effectiveness of their other broadband adoption efforts—the digital literacy website and their ongoing outreach efforts. NTIA officials said that evaluating their efforts to address broadband adoption barriers is challenging and potentially expensive, and therefore the agency has not pursued doing so. They also said that assessing the impact of these projects on broadband adoption is difficult given the external social factors that also affect broadband adoption. Further, the officials told us that the motives for why people do or do not adopt broadband are well understood.

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<sup>38</sup>NTIA, *Broadband Adoption Toolkit* (May 2013), accessed February 10, 2015, [http://www2.ntia.doc.gov/files/toolkit\\_042913.pdf](http://www2.ntia.doc.gov/files/toolkit_042913.pdf).

<sup>39</sup>ASR Analytics, *Final Report: Social and Economic Impacts of the Broadband Technology Opportunities Program* (Potomac, Md.: Submitted Sept. 15, 2014), accessed February 11, 2015, [http://www2.ntia.doc.gov/files/asr\\_final\\_report.pdf](http://www2.ntia.doc.gov/files/asr_final_report.pdf).

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Some BTOP grantees had third-parties evaluate their broadband adoption projects. Specifically, among the 15 projects we examined, 3 were evaluated by third parties seeking to identify the effectiveness of their approaches for addressing adoption barriers.<sup>40</sup> These evaluations took different forms. For example, a team of academics evaluated the effectiveness of the Chicago Smart Communities initiative by comparing broadband adoption data in communities where the project operated to similar communities where it did not. The evaluation found that broadband adoption was significantly higher in neighborhoods where the program was active than in similar neighborhoods where it was not. Researchers suggested that participants' increased experience using the Internet and the introduction of low-cost offerings from a broadband provider were possible explanations for the increase despite the program's not offering discounted service.

FCC plans to evaluate its Lifeline broadband pilot, but FCC officials told us they have not evaluated the effectiveness of the commission's other efforts to address broadband adoption barriers. Our March 2015 report examining the Lifeline program found weaknesses in FCC's ability to effectively evaluate the program. Specifically, we found that the usefulness of information FCC gathered through the broadband pilot program may be limited due to a lack of an evaluation plan and other challenges.<sup>41</sup> Similar to what NTIA officials told us, FCC officials said that evaluating the impact of their efforts to address broadband adoption barriers would be complex and potentially expensive.

Program evaluation is a useful tool for understanding the performance of government programs. It can be used to systematically determine the "value added" by the expenditure of public resources. Specifically, program evaluation can validate which approaches are effective, measure results that are difficult or expensive to assess, and explore why

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<sup>40</sup>Additionally, one project did its own program evaluation. Some of the evaluation work associated with the BTOP projects was focused on outcomes other than broadband adoption, such as improved computer literacy and job prospects.

<sup>41</sup>[GAO-15-335](#). We did not recommend changes to the broadband pilot to address this issue because the pilot's projects were substantially complete. Our report did recommend that FCC conduct a program evaluation to determine the extent to which the Lifeline program is reaching its performance goals. In comments on the report, FCC agreed that it should evaluate the extent to which the Lifeline program is efficiently and effectively reaching its performance goals and said that FCC staff will address GAO's recommendation.



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performance goals are not met.<sup>42</sup> Our prior work has shown that program evaluation can help agencies determine their program performance, assess program effectiveness, and contribute to improving program management.<sup>43</sup> The *National Broadband Plan* discussed the need for program evaluation of broadband adoption programs, stating that such studies are necessary for understanding costs, benefits, and efficiency of different adoption programs, without which the country has a limited understanding of which approaches work.

As we discussed earlier, FCC and NTIA have undertaken a number of initiatives aimed at addressing the barriers to broadband adoption, but since evaluation of these efforts has been limited, the agencies have limited information about which approaches are the most effective. For example, the BTOP project practices NTIA identified may hold promise for addressing broadband adoption barriers, but it is unclear how effective those practices are. Out of the 43 BTOP broadband adoption projects that were completed, more than half did not meet their goals for the number of new household broadband subscribers.<sup>44</sup> Further, among the 24 BTOP broadband adoption grantees NTIA included in its toolkit of promising strategies, 12 did not meet their subscriber goals. While other factors may have contributed to these projects not meeting these goals, without more rigorous evaluation, the ability to determine whether the approaches did or did not work well or if other factors contributed to their not meeting these goals is limited. Furthermore, it is not clear in which areas the agencies should dedicate scarce federal resources to have the greatest impact in addressing barriers to broadband adoption. Because NTIA's major broadband adoption effort—BTOP—is substantially complete, and FCC ended the subsidy for the Lifeline broadband pilot in October 2014,

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<sup>42</sup>[GAO-12-208G](#).

<sup>43</sup>GAO, *Program Evaluation: Studies Helped Agencies Measure or Explain Program Performance*, [GAO/GGD-00-204](#) (Washington, D.C.: Sept. 29, 2000) and *Program Evaluation: Strategies to Facilitate Agencies' Use of Evaluation in Program Management and Policy Making*, [GAO-13-570](#) (Washington, D.C.: June 26, 2013).

<sup>44</sup>BTOP broadband adoption grant applicants stated in their grant applications how many new broadband household or business subscribers they estimated would result from their efforts. NTIA officials told us they consulted with projects that received grants and, in some cases, adjusted these goals. The projects we state did not meet their household subscriber goals are those that met neither their initial nor adjusted goals for households. Of the 43 completed projects, 15 met their adjusted goals, including 5 that reported twice as many or more subscribers than their adjusted goal. Of the 27 projects that did not meet their goals, 8 of the projects met at least 75 percent of their goal.

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the agencies missed opportunities to incorporate program evaluation into the design of their broadband adoption efforts in order to assess the effectiveness of these efforts in addressing barriers to broadband adoption.

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### FCC's Strategic Plan and NTIA's Performance Plan Do Not Clearly Convey Quantifiable Outcomes of the Agencies' Efforts to Address Broadband Adoption Barriers

FCC and NTIA both have ongoing efforts to address broadband adoption barriers, but it is unclear what outcomes they intend to achieve with these efforts because FCC's strategic plan and NTIA's performance plan do not clearly communicate the agencies' desired outcomes for their efforts to address broadband adoption barriers. Communicating what an agency intends to achieve and its progress in doing so are fundamental aims of performance management. Under the GPRA Modernization Act of 2010, an agency is to clearly communicate the intended outcomes of its efforts with a strategic plan and annual performance plans. Specifically, the GPRA Modernization Act of 2010 requires an agency to have:

1. A strategic plan containing outcome-oriented goals for major functions and operations and a description of how goals are to be achieved.
2. An annual performance plan consistent with the strategic plan with quantifiable, measurable performance goals to define the level of performance to be achieved during the year and performance indicators to assess progress toward each performance goal.

The *National Broadband Plan* made recommendations to FCC and NTIA for actions to address broadband adoption barriers. While officials from both agencies told us they have taken steps consistent with recommendations in the plan, they indicated that the plan is not the basis of their ongoing strategies. FCC officials told us that the commission has taken steps to implement actions consistent with a number of the plan's recommendations. However, they also said that the *National Broadband Plan* was intended to be an evolving document and that FCC continues to evaluate the relevance of its recommendations as technologies, markets, and consumer needs and behaviors change. NTIA officials told us that their agency provided input for the *National Broadband Plan* based on activities already underway within the agency. Specifically, NTIA officials told us that the initial steps to implement BTOP were taken in 2009 before publication of the plan in early 2010. Thus, officials told us that NTIA's efforts in this area were guided more by perceived needs than the *National Broadband Plan*. Further, NTIA officials told us that no funding was made available for the agency to implement recommendations in the plan.

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Nonetheless, both agencies remain involved in addressing broadband adoption barriers. Although some of their recent efforts have concluded, a number of FCC and NTIA efforts are ongoing, as we discussed earlier in this report. NTIA's strategic plan makes it clear that addressing broadband adoption barriers is a major function of the agency. Broadband adoption is mentioned prominently and early in NTIA's fiscal year 2016 budget submission to Congress and in the description of the agency's purpose on its website.<sup>45</sup> FCC includes updates on broadband adoption in its broadband progress reports. However, what outcomes can be expected with these efforts is unclear because FCC's strategic plan and NTIA's performance plan do not clearly communicate what they intend to achieve:

- *FCC:* In 2015, FCC released an updated strategic plan for fiscal years 2015–2018 with a strategic goal of “making networks work for everyone” including ensuring that “all Americans can take advantage of the services they provide without artificial impediments.” This goal has a supporting strategic objective to “maximize availability of broadband to all.” FCC's prior strategic plan, covering fiscal years 2014–2018, included a strategic objective to “maximize” broadband adoption and a related performance goal to “support and facilitate” broadband adoption. Although the prior strategic plan made it clear that addressing broadband adoption was a priority of FCC, the revised plan's focus on availability makes this unclear. As we discussed earlier in this report, while availability may be a barrier for some—particularly in rural areas—other issues, such as affordability, relevance, and computer skills are the principal barriers to adoption that the literature we reviewed and stakeholders we spoke to identified. Further, the efforts FCC officials told us comprise their work to address broadband adoption barriers target populations affected by these three principal barriers, such as their efforts to help low-income households afford broadband services and equipment or promoting broadband to older individuals and those living on tribal lands. FCC officials told us that the new plan was designed to have fewer but broader strategic goals and that the goals and objectives of the new plan are meant to support broadband adoption by promoting the availability of broadband, ensuring schools and libraries have broadband access, and ensuring that Americans with disabilities can access broadband—activities that align in part but not completely with

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<sup>45</sup>“About NTIA” at <http://www.ntia.doc.gov/about> (accessed Feb. 13, 2015).

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FCC's work to address adoption barriers. The goals of an agency's strategic plan are supposed to express intended outcomes and link to major agency functions consistent with the GPRA Modernization Act of 2010. With the changes in FCC's strategic plan to focus on availability, rather than adoption, it is unclear whether broadband adoption is a major function and thus a current commission priority and what outcomes can be expected of FCC's ongoing broadband adoption efforts.

- *NTIA*: The Department of Commerce's 2014–2018 strategic plan includes a goal to foster a more innovative economy under which NTIA has a key strategy to increase broadband infrastructure and use, indicating that broadband adoption is an NTIA priority. However, now that BTOP has concluded, NTIA no longer has a quantifiable performance goal or measure that assesses outcomes consistent with the GPRA Modernization Act of 2010. The Department of Commerce's Budget in Brief for fiscal year 2016 states that NTIA will work to increase broadband adoption through technical assistance and includes the number of communities in which NTIA has provided technical assistance as a performance measure.<sup>46</sup> Because this measure articulates an activity of the agency, rather than a result of an agency activity, it measures an output and not an outcome. According to NTIA officials, the agency's broadband adoption goals reflect what the agency has been funded to do and beyond BTOP, the agency has received limited funding for broadband adoption efforts. NTIA's performance plan used to include an outcome-oriented performance measure: the cumulative number of new broadband subscribers as a result of BTOP broadband adoption projects. However, the fiscal year 2016 budget states that this indicator has been retired as of fiscal year 2015 because NTIA has met its final target. NTIA officials also told us that is the case because BTOP has concluded. The budget request does seek funding for the outreach and other ongoing efforts we described earlier in this report, indicating

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<sup>46</sup>The target for 2015 is 175 communities, and the target for 2016 is 250 communities.

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that NTIA does intend to move forward with other broadband adoption efforts.<sup>47</sup>

Without an outcome-oriented goal for increasing broadband adoption in its strategic plan, it is unclear whether this is still a priority for FCC, as well as what the commission intends to achieve with its ongoing broadband adoption efforts. Although NTIA's strategic plan more clearly outlines broadband adoption as an agency priority, without goals or measures in its performance plan that point to outcomes, it is unclear what NTIA intends achieve with its post-BTOP broadband adoption efforts and how it will show progress in achieving its related goals.

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## Conclusions

The *National Broadband Plan* laid out a vision for why increasing broadband adoption is important and steps the federal government—namely FCC and NTIA—could take to achieve that vision. In the ensuing years, adoption has increased, but a significant percentage of the population has still not adopted broadband, and non-adoption rates remain higher among populations such as low-income households and older Americans. The various ways that people use broadband for everyday social and economic purposes underscore that the benefits of broadband are substantial. Through BTOP, Lifeline, and other initiatives, NTIA and FCC have worked to address barriers to broadband, but the agencies' current goals and the intended outcomes of their work are unclear. NTIA's investment in BTOP broadband adoption projects in particular represented a significant effort to address these barriers, but with that program coming to an end, ongoing efforts to address these barriers are limited. For both of these agencies, key planning documents released in 2015 that are to clearly communicate intended outcomes have dropped or revised goals included in prior years' plans related to the agencies' efforts to address broadband adoption. Consequently, it is unclear that the agencies have a clear strategy for sustaining their efforts to increase broadband adoption, and the ability to tell whether these efforts will be successful is limited.

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<sup>47</sup>NTIA's fiscal year 2016 budget request to Congress includes \$13 million for broadband programs described as continuing the momentum of BTOP by providing technical assistance and outreach to communities and stakeholder groups to address issues including broadband adoption. This funding represents a significant reduction as compared to the about \$25 million NTIA spent on broadband programs for fiscal year 2013 when BTOP was fully active.

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## Recommendations

To more clearly establish the outcomes FCC intends to achieve through its efforts to address broadband adoption barriers faced by demographic groups with low levels of adoption, we recommend that FCC take the following action:

- revise its strategic plan to more clearly indicate whether addressing broadband adoption barriers is a major function, and if so, specify what outcomes the commission intends to achieve.

To more clearly communicate what NTIA hopes to achieve with its ongoing broadband adoption efforts and to demonstrate the agency's progress, the Secretary of Commerce should take the following action:

- include in NTIA's annual performance plan a quantifiable outcome-based performance goal and a related performance indicator for the agency's broadband adoption efforts consistent with the strategic plan.

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## Agency Comments and Our Evaluation

We provided a draft of this report to FCC and the Department of Commerce for comment. Neither agency specifically agreed or disagreed with our recommendations but provided comments as summarized below.

We received written comments from FCC, which are reproduced in appendix III. In response to our recommendation, FCC's comments state that broadband adoption remains a significant focus for the commission. Further, FCC noted that in its revised strategic plan, it presented broader goals to achieve a more streamlined format but that its strategic objectives, performance goals, and two of the three strategies associated with the plan's Strategic Goal 3: Making Networks Work for Everyone are also directed at promoting adoption. However, FCC states that to the extent that its strategic plan is unclear on the role of broadband adoption in FCC's efforts, it is prepared to implement revisions that will help clarify this issue. With regard to quantifying expected outcomes of FCC's efforts in this area, FCC notes that it intends to seek comments on this issue as part of a proposed rulemaking for the Lifeline program. Specifically, the response states that FCC has drafted a Further Notice of Proposed Rulemaking seeking to refocus the program on "21st century services." FCC stated this notice will seek comment on how to best consider specific outcomes related to addressing the barrier of affordability. FCC notes it has also hired a new staff person to lead an effort to address other broadband adoption barriers, including lack of computers or

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perceived relevance. FCC also provided technical comments, which we incorporated as appropriate.

We also received written comments from the Department of Commerce, which are reproduced in appendix IV. In response to our recommendation, the Department of Commerce states that it agrees that outcome-based performance tools are important in evaluating the success of an agency program. However, it also states that an outcome-based measure like the one it used for BTOP would not be an accurate measure of NTIA's performance because the agency's ongoing efforts to provide technical assistance to communities to support broadband adoption efforts are advisory and do not provide funding to communities. Additionally, Commerce states that the communities identify the goals of these efforts. Consequently, Commerce believes other variables unique to these communities are more appropriate for determining whether a community adopts broadband or not. Further, Commerce states that NTIA's fiscal year 2015 budget allocated \$3 million for its broadband initiative, but none of these funds are authorized to be used for grants to establish broadband adoption programs. However, Commerce states that it would seek to develop outcome-based measures if it received funding for broadband adoption grants.

Our prior work has stressed the importance of setting goals and measuring progress toward those goals. We have acknowledged that agencies sometimes face difficulties in developing and using outcome measures, such as accounting for factors that are outside of an agency's control.<sup>48</sup> However, we have also found that outcome-oriented performance measures are important for helping agencies determine if their efforts are achieving their intended purpose. This includes grant programs, like BTOP, but other types of federal efforts also measure outcomes to demonstrate performance. NTIA has experience with measuring outcomes under challenging circumstances when it implemented its broadband adoption effort under BTOP, which consisted of over 40 projects in varying communities throughout the country. NTIA officials said that measuring broadband adoption was challenging and that grantees employed different methodologies to measure the number of new broadband subscriptions. NTIA officials said they worked with

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<sup>48</sup>GAO, *Managing for Results: Executive Branch Should More Fully Implement the GPRA Modernization Act to Address Pressing Governance Challenges*, [GAO-13-518](#) (Washington, D.C.: June 26, 2013).

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BTOP grantees to develop appropriate and consistent methodologies for measuring the performance of their projects. Given NTIA's experience in working with BTOP grantees to develop ways to measure broadband adoption, we believe the agency could apply what it learned from that effort to assess outcomes for its ongoing broadband adoption efforts. As our report notes, without goals or measures in its performance plan that point to outcomes, it is unclear what NTIA intends achieve with its ongoing broadband adoption efforts and how it will show progress in achieving its related goals. Thus, we continue to believe that our recommendation has merit and should be fully implemented.

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We are sending copies of this report to the appropriate congressional committees, the Chairman of the FCC, and the Secretary of Commerce. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions, please contact me at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff that made major contributions to this report are listed in appendix III.

A handwritten signature in black ink, appearing to read 'M. Goldstein', with a long horizontal flourish extending to the right.

Mark L. Goldstein  
Director, Physical Infrastructure Issues



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# Appendix I: Objectives, Scope, and Methodology

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This report examines (1) what is known about the benefits of home broadband adoption, (2) identified barriers to broadband adoption and approaches used to address them, and (3) the extent to which the Federal Communications Commission (FCC) and National Telecommunications and Information Administration (NTIA) have assessed their effectiveness and set goals for addressing broadband adoption barriers.

To determine what is known about the benefits of home broadband adoption, we identified and reviewed academic, government, industry, trade press, and other association or nonprofit literature on broadband benefits. To identify this literature, we conducted searches of various databases such as ProQuest, Lexis.com, and PolicyFile. We included in our review additional reports we obtained from NTIA. We limited the scope of literature to focus on (1) broadband benefits specific to home broadband, as opposed to mobile broadband; (2) experience within the United States; and (3) articles from January 2009 to November 2014, a timeframe we chose because it represents recent years just before and since the 2010 publication of FCC's *National Broadband Plan*. We also interviewed FCC and NTIA officials and 21 stakeholders—including researchers, consumer groups, industry associations and broadband providers, and technology organizations—about broadband benefits (see table 2 for a list of stakeholders interviewed). We identified these stakeholders as having broadband expertise based on our prior telecommunications work, their contributions to the *National Broadband Plan* and other broadband adoption literature, and recommendations from these stakeholders.

**Table 2: Academic, Consumer, Industry, and Technology Stakeholders GAO Interviewed**

Stakeholder type	Name
Researchers	John Horrigan, Pew Research Center Blair Levin, Brookings Institute Jason Llorenz, Rutgers University
Consumer organizations	AARP American Association of People with Disabilities American Library Association <sup>a</sup> Common Cause <sup>b</sup> Consumer Federation of America Multicultural Media, Telecom and Internet Council National Hispanic Media Coalition <sup>b</sup> National Urban League <sup>b</sup> New America Foundation Older Adults Technology Services United Church of Christ <sup>b</sup>
Industry organizations and companies	CenturyLink Comcast National Cable and Telecommunications Association NTCA – The Rural Broadband Association US Telecom
Technology organizations	Connected Nation EveryoneOn

Source: GAO. | GAO-15-473

<sup>a</sup>We have categorized the American Library Association as a consumer organization because the focus of our discussion was how broadband adoption barriers faced by consumers impact libraries.

<sup>b</sup>We conducted an interview with these organizations jointly, the result of outreach to the National Consumer Law Center. Representatives from the National Consumer Law Center were unable to participate in the meeting.

For contextual purposes, we analyzed household broadband adoption data from the U.S. Census Current Population Survey (CPS) for 2009

through 2013.<sup>1</sup> We used variables included in the survey for our household demographic estimates. Because the CPS uses a complex survey design, all estimates derived from CPS data have sampling error associated with them. We used the sample weights provided in the CPS data and accounted for the design of the survey in our estimation of the sampling error. We express our confidence in the precision of estimates as 95 percent confidence intervals (e.g., plus or minus 2 percentage points). This is the interval that would contain the actual population value for 95 percent of the CPS samples the Bureau of the Census could have drawn. For the various comparisons used in our analysis of the CPS data, we determined that two estimates were statistically significant when the 95 percent confidence intervals around the two estimates did not overlap. To assess the reliability of these data, we reviewed how these data have been reported by Census and NTIA and discussed with Census and NTIA officials reasons for differences in how they have reported these data, any potential limitations with how we planned to use CPS data in our report, and trade-offs between using that and another Census product, the American Community Survey, which also includes questions about broadband adoption. We determined that these data were sufficiently reliable for the purposes of showing demographic differences and recent trends in household broadband adoption.

To identify broadband adoption barriers, we identified and reviewed academic, government, industry and trade press, and other association or nonprofit literature published from January 2009 to November 2014. We also interviewed academic researchers, consumer groups, industry associations and companies, and FCC and NTIA officials about broadband adoption barriers (see previous table 2 for a list of stakeholders interviewed). To describe federal and nonfederal efforts to address broadband adoption barriers, we identified efforts by reviewing documentation and interviewing researchers, consumer groups, industry

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<sup>1</sup>These estimates come from the Computer and Internet Use Supplement of the Current Population Survey, a national household survey sponsored by NTIA and administered by the U.S. Census Bureau. For purposes of this survey, respondents are identified as having broadband if they respond that their Internet service is provided by means other than a dial-up connection, such as cable or fiber. The estimates derived from these survey data are based upon the responses of the household reference person—i.e., the person that answered the survey.

associations and companies, and FCC and NTIA officials.<sup>2</sup> For additional information about potentially promising approaches to addressing broadband adoption barriers, we selected Broadband Technology Opportunities Program (BTOP) Sustainable Broadband Adoption grant projects that met their goals for new broadband subscribers as set in their grant applications, which was 15 of the 44 projects. For these projects, we reviewed projects' reports submitted to NTIA about project outcomes, and, where available, third-party program evaluations that analyzed the effectiveness of their approaches to address broadband adoption barriers.<sup>3</sup> We interviewed representatives from the 14 grantees responsible for administering these 15 BTOP projects, which are listed in table 3.

Table 3: Selected BTOP Projects

Grantee (state)	Project(s)
C.K. Blandin Foundation (Minnesota)	Minnesota Intelligent Rural Communities
California Emerging Technologies Fund (California)	Broadband Awareness and Adoption; Access to Careers and Technology
City and County of San Francisco (California)	San Francisco Community Broadband Opportunities Program
City of Chicago (Illinois)	SmartChicago Sustainable Broadband Adoption
Connect Arkansas (Arkansas)	Expanding Broadband Use in Arkansas Through Education
Connect Tennessee (Tennessee)	Computers 4 Kids: Preparing Tennessee's Next Generation for Success
District of Columbia Government (District of Columbia)	DC Broadband Education, Training and Adoption
Eastern Upper Peninsula Intermediate School District (Michigan)	Sparkling Broadband Use in the Upper Peninsula of Michigan
Foundation for California Community Colleges (California)	California Connects
Future Generations Graduate School (West Virginia)	Equipping West Virginia's Fire and Rescue Squads with Technology and Training to Serve Communities
Mexican Institute of Greater Houston (Texas)	Sustainable Broadband Adoption through Training for Hispanic Adults

<sup>2</sup>Our review was not comprehensive of all efforts being taken to address broadband adoption barriers, since our purpose was to identify types of approaches used, not to catalog all efforts.

<sup>3</sup>NTIA did not require BTOP projects to have program evaluations; however, some projects elected to do so. We determined which projects had third-party program evaluations and obtained copies of the resulting reports from either NTIA or the project grantees or through our own research. We reviewed these evaluations to determine which ones specifically examined the effectiveness of projects' approaches for addressing broadband adoption barriers.

Grantee (state)	Project(s)
Michigan State University (Michigan)	Broadband Adoption through Education and E-Entrepreneurship in Michigan's Urban Cores
Tampa Housing Authority (Florida)	AccessALL Tampa
The Urban Affairs Coalition (Pennsylvania)	Freedom Rings: Sustainable Broadband Adoption

Source: GAO review of NTIA documents. | GAO-15-473

To determine the extent to which FCC and NTIA set goals and assessed their performance to address broadband adoption barriers, we reviewed the agencies' most recent strategic plans and performance plans to identify their goals and performance measures related to broadband adoption. We reviewed documentation, including the design and final report, from NTIA's program evaluation of BTOP. We also reviewed available third-party program evaluations done of the 15 BTOP projects listed previously in table 3.<sup>4</sup> We interviewed FCC and NTIA officials about their efforts to evaluate the effectiveness of their broadband adoption efforts and about their strategic goals and performance measures for these efforts. We evaluated their efforts against our criteria for evaluating agency performance as established in our prior work and the GPRA Modernization Act of 2010.<sup>5</sup>

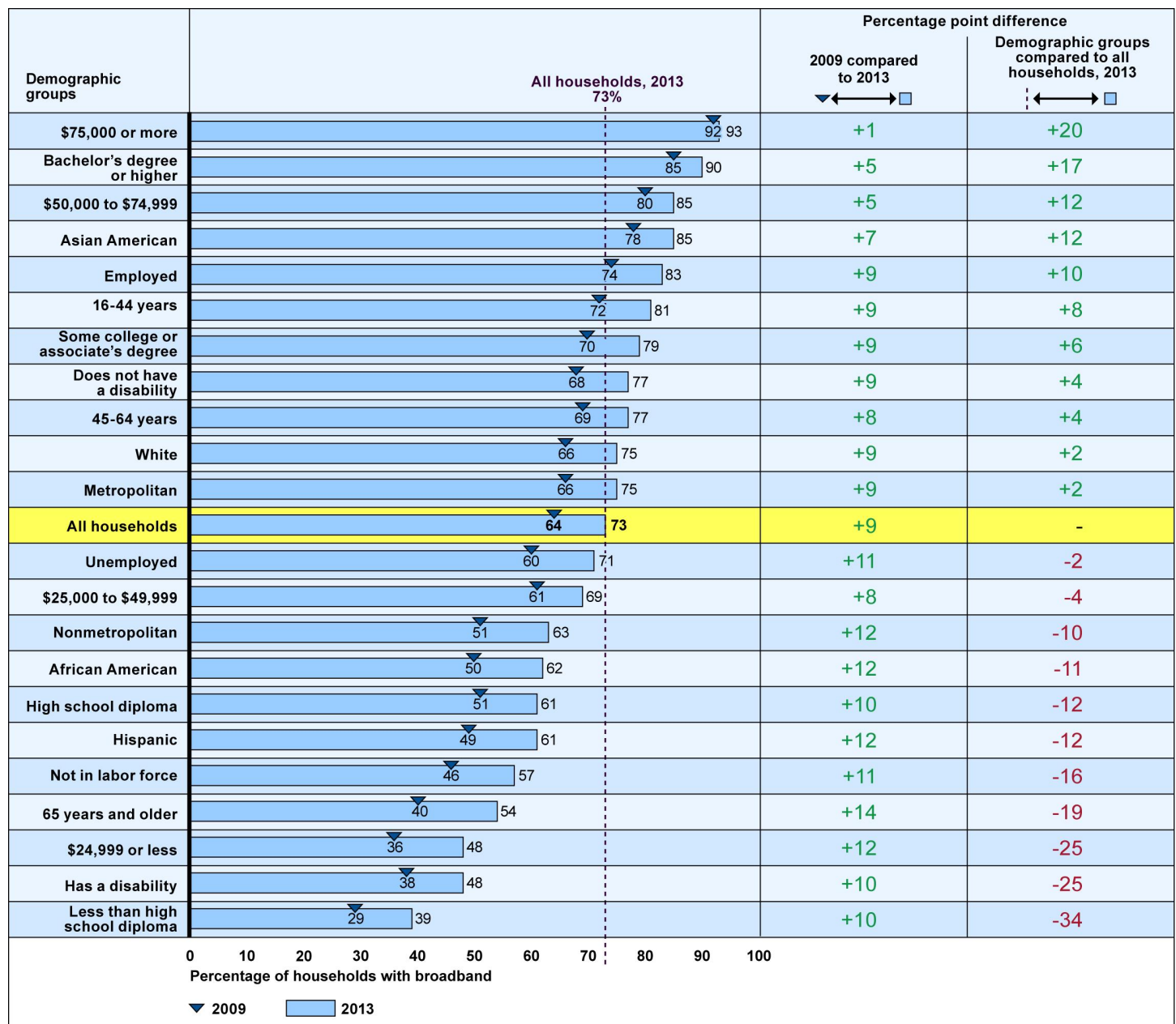
We conducted this performance audit from August 2014 to June 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

<sup>4</sup>Since NTIA did not require BTOP grantees to have program evaluations of their BTOP projects, not every project we examined had an associated evaluation. We reviewed evaluation reports that we obtained from the grantees, NTIA, and our research.

<sup>5</sup>The GPRA Modernization Act of 2010, Pub. L. No. 111-352, 124 Stat. 3866 (2011), amends provisions of the Government Performance and Results Act of 1993 (GPRA), Pub. L. No. 103-62, 107 Stat. 285 (1993).

# Appendix II: Data on Household Broadband Adoption Overall and by Demographic Groups, 2009 and 2013

Figure 2: Household Broadband Adoption among Demographic Groups Sorted by Adoption Percentage, 2009 and 2013



Source: U.S. Census Current Population Survey and GAO analysis. | GAO-15-473

Note: The Census Current Population Survey asks the respondent if anyone in the household uses the Internet from home and then asks through which types of service the Internet is accessed. Respondents who say they use dial-up are not counted as having broadband. Respondents who indicate they access the Internet through DSL, cable modem, fiber-optic service, mobile broadband plan, satellite, or some other service are counted as a household with broadband. The household

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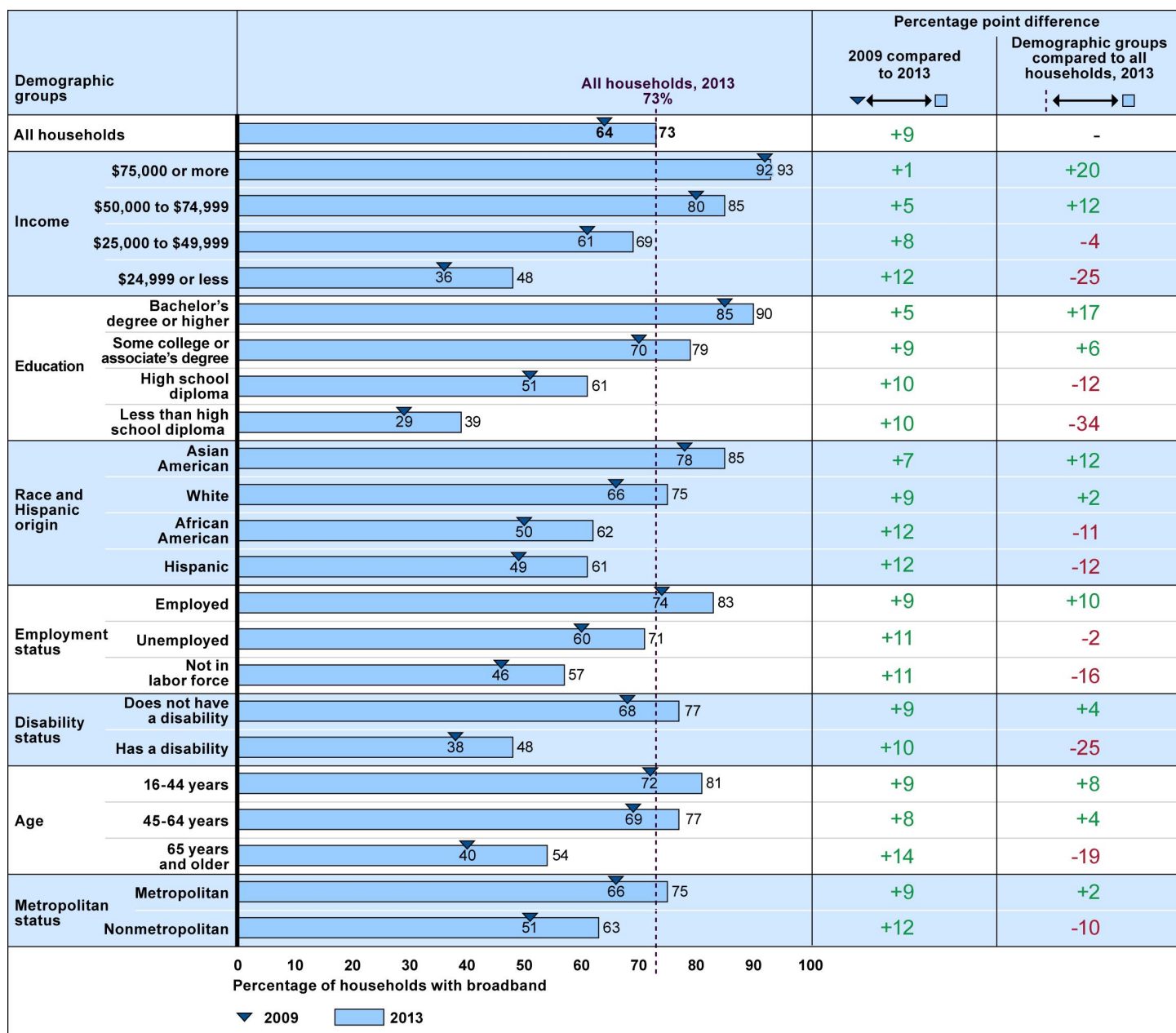
**Appendix II: Data on Household Broadband  
Adoption Overall and by Demographic Groups,  
2009 and 2013**

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broadband adoption percentages we present are estimates calculated with intervals of 95 percent confidence. They have a sampling error of no larger than plus or minus 2.6 percentage points at the 95 percent level of confidence. Where we've drawn comparisons between groups or years to show differences, those differences are statistically significant and the confidence intervals do not overlap, except in the 2013 comparison between all households (95 percent confidence interval of 72.70 to 73.69 percent) and unemployed (95 percent confidence interval of 68.36 to 73.58 percent). About 1.6 percent of household respondents indicated they were more than one race; we have included these householders under multiple demographic race categories. Starting in 2010, Census changed the methodology for its income variable, including imputing household values that had been missing in prior years to provide values without missing observations.

Appendix II: Data on Household Broadband Adoption Overall and by Demographic Groups, 2009 and 2013

Figure 3: Household Broadband Adoption among Demographic Groups Sorted by Demographics, 2009 and 2013



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**Appendix II: Data on Household Broadband  
Adoption Overall and by Demographic Groups,  
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# Appendix III: Comments from the Federal Communications Commission



Federal Communications Commission  
Washington, D.C. 20554

May 12, 2015

Mr. Mark Goldstein  
Director, Physical Infrastructure Issues  
Government Accountability Office  
441 G St, NW  
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for the opportunity to review and comment on the U.S. General Accountability Office (GAO) draft report concerning barriers to broadband adoption. We share GAO's concern that factors are preventing some households from enjoying the social and economic benefits that broadband service can provide. We therefore appreciate the opportunity to describe the Commission's efforts to address these barriers and how those efforts fit in to the Commission's mission and objectives.

In the Draft Report, GAO recommends that the Commission "[r]evis[e] its strategic plan to more clearly indicate whether addressing broadband adoption barriers is a major function, and if so, what outcomes the [c]ommission intends to achieve."<sup>1</sup> As noted in the draft report, the Commission released a new Strategic Plan in February 2015 covering fiscal years 2015-2018. This new Strategic Plan revised and reorganized some of the Commission's Strategic Goals and Objectives to present broader goals in a more streamlined format. While the Strategic Plan no longer expressly references adoption in a distinct strategic objective and performance goal, this does not reflect a diminished Commission emphasis on adoption. To the contrary, adoption remains a significant focus for the Commission in its strategic plan.

By way of explanation, the Commission considers the concept of broadband "availability" broadly, so as to encompass not only the physical network deployment, but also adoption and the related issues of price and service quality.<sup>2</sup> The Strategic Objectives, Performance Goals, and two of the three Strategies associated with the plan's Strategic Goal 3: Making Networks Work for Everyone, are thus directed at promoting adoption.

We note that, consistent with these elements of the Strategic Plan, the Commission stated in its 2015 Broadband Progress Report that it "will continue to work on removing barriers to

<sup>1</sup> Draft Report at p. 22.

<sup>2</sup> See, e.g., *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, *Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment*, 29 FCC Rcd 1375, 1378-79, para. 7 (2015) (2015 Broadband Progress Report).

infrastructure investment by identifying and helping to reduce potential obstacles to deployment, competition, and adoption.”<sup>3</sup> Also in this regard, the Commission anticipated that it would assess “the ‘totality of the circumstances’ in the next [Broadband Progress] Report by looking more robustly at other factors, such as usage allowances and price, latency, whether service at the relevant speed is available on a consistent and reliable basis, and whether the network is secure, which can be as important as speed in determining whether service is available.”<sup>4</sup>

As a further indication of the Commission’s focus on broadband adoption, the Commission also has underway two new initiatives to address barriers to broadband adoption. First, the Wireline Competition Bureau is preparing a draft Lifeline Further Notice of Proposed Rulemaking (FNPRM) for consideration by the full Commission that will refocus the program on 21<sup>st</sup> century services in a way that benefits low-income recipients, as well as the people who pay into the fund, and will continue making improvements to reduce waste and abuse. The Bureau expects the FNPRM will also ask for comment on, among other issues, whether and how the Lifeline program could make broadband services more affordable for low-income Americans and will address the Commission’s Lifeline Broadband Pilot Program, which was launched to study what policies might overcome key broadband adoption barriers and how the Lifeline program could best be structured to provide support for broadband. While service discounts were a centerpiece of many of the selected projects, the Commission encouraged projects to include non-price policy tools, which resulted in a diverse group of projects that employed different methods, implemented different strategies, and provided different services across different geographies. The Commission structured the projects in this way in order to better evaluate the effects of the many policy variables on adoption.

Second, the Chairman has recently announced that Alison Kutler is joining the Commission as Chief of the Consumer and Governmental Affairs Bureau and Special Advisor to the Chairman for Digital Opportunity. Ms. Kutler will lead an effort to address the non-price barriers to adoptions (such as lack of computers or perceived relevance) through a variety of mechanisms, including public-private partnerships.

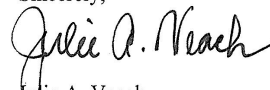
To the extent that the Strategic Plan is unclear on the role of adoption in our efforts, we are prepared to implement revisions that will help to clarify this issue. With regard to quantifying expected outcomes of the Commission’s efforts in this area, as GAO notes, broadband adoption has been steadily increasing over time. In the draft FNPRM described above, the Bureau will suggest how one barrier to adoption – affordability—might be addressed consistent with the ongoing efforts to eliminate waste, fraud and abuse, and will suggest seeking comment on how best to consider specific outcomes. And we look forward to working with Ms. Kutler when she arrives to consider the Commission’s role in removing other barriers.

<sup>3</sup> *Id.* at 1455, para. 141.

<sup>4</sup> *Id.* at 1392-93, para. 25.

We thank the GAO for its time and effort working on this important matter and appreciate the opportunity to review and comment on the draft GAO report.

Sincerely,

A handwritten signature in black ink, appearing to read "Julie A. Veach". The signature is fluid and cursive, with the first name "Julie" being more prominent.

Julie A. Veach  
Chief  
Wireline Competition Bureau

# Appendix IV: Comments from the Department of Commerce



**THE DEPUTY SECRETARY OF COMMERCE**  
Washington, D.C. 20230

May 14, 2015

Mr. Mark Goldstein  
Director, Physical Infrastructure  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for the opportunity to review the Government Accountability Office's (GAO) draft report entitled *Broadband: Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear* (GAO-15-473). I am writing on behalf of the Department of Commerce to respond to the draft report's recommendation that the Department add criteria to its strategic plan to evaluate the success of the BroadbandUSA initiative being directed by the Department's National Telecommunications and Information Administration (NTIA).

The GAO draft report acknowledges that NTIA's strategic plan continues to make increasing broadband use a key agency priority. However, it notes that without an outcome-based goal and performance indicator, it is unclear how NTIA intends to address broadband adoption barriers under its new BroadbandUSA initiative and how it will show progress in achieving its strategic goal. As a result, you recommend that the Department "[i]nclude in NTIA's annual performance plan a quantifiable outcome-based performance goal and related performance indicator for the agency's broadband adoption efforts consistent with the strategic plan."

As the GAO draft report recognizes, NTIA, through its management of sustainable broadband adoption grants funded under the American Recovery and Reinvestment Act's Broadband Technology Opportunities Program, made considerable progress in advancing broadband adoption, increasing household subscribership by more than 671,000 from 2009 to 2014. Building on lessons learned and best practices from its broadband grant programs, NTIA launched its BroadbandUSA initiative in January to provide support to communities across the country looking to provide their citizens with the broadband opportunities they need to advance economic development, education, healthcare, and public safety. NTIA's Fiscal Year (FY) 2015 budget allocates \$3 million for the BroadbandUSA initiative, but, importantly, none of these funds are authorized to be used for grants to establish broadband adoption programs. Instead, NTIA will work to assist and educate local communities looking to increase broadband adoption by providing resources such as toolkits, training programs, webinars, workshops, technical assistance, funding leads, and basic guidance.

Mr. Mark Goldstein  
Page 2

Unlike a grant program, NTIA's role in designing community broadband programs is solely advisory. The communities themselves provide the funding and identify the goals of their respective programs. This is why, for this FY, NTIA plans to use as a performance goal the number of communities to which it has provided technical assistance to assess its broadband advancement activities. A quantifiable, outcome-based measure—such as broadband adoption—would not be an accurate measure of NTIA's performance because other variables unique to communities are far more determinative of whether a community adopts broadband or not.

The Department certainly agrees with GAO that outcome-based performance tools are important in evaluating the success of an agency program. Indeed, the Commerce *Strategic Plan FY14-18* has identified the metric of “[n]umber of communities with increased broadband capabilities and capacity” as an important future indicator of progress toward NTIA's goal of increasing broadband infrastructure and use. To the extent that NTIA receives Congressional appropriations that include funding for additional broadband adoption grants for FY16 and beyond, the Department will seek to incorporate additional appropriate, outcome-based measures into its indicators for NTIA's broadband advancement activities.

Sincerely,

A handwritten signature in black ink, appearing to read "B. H. Andrews", with a long horizontal flourish extending to the right.

Bruce Andrews

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# Appendix V: GAO Contact and Staff Acknowledgments

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## GAO Contact

Mark L. Goldstein, (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Michael Clements (Assistant Director), Carl Barden, Namita Bhatia-Sabharwal, Melissa Bodeau, Elizabeth Curda, Leia Dickerson, Lauren Friedman, Adam Gomez, Andrew Huddleston, Bert Japikse, Joshua Ormond, Madhav Panwar, Cheryl Peterson, Kelly Rubin, and Larry Thomas made key contributions to this report.

# Appendix VI: Accessible Data

**Data Table for Figure 1: Household Broadband Adoption among Demographic Groups with Adoption Rates below That of All Households, 2009 and 2013**

Demographic groups	Percentage of households with broadband		Percentage point difference	
	2009	2013	2009 compared to 2013	Demographic group compared to all households, 2013
All households	64	73	+9	0
Unemployed	60	71	+11	-2
\$25,000-\$50,000	61	69	+8	-4
Nonmetropolitan	51	63	+12	-10
African American	50	62	+12	-11
High school diploma	51	61	+10	-12
Hispanic	49	61	+12	-12
Not in labor force	46	57	+11	-16
65 years and older	40	54	+14	-19
Income < \$25,000	36	48	+12	-25
Has a disability	38	48	+10	-25
Less than high school	29	39	+10	-34

Source: U.S. Census Current Population Survey and GAO analysis. | GAO-15-473

Note: The Census Current Population Survey asks the respondent if anyone in the household uses the Internet from home and then asks through which types of service the Internet is accessed. Respondents who say they use dial-up are not counted as having broadband. Respondents who indicate they access the Internet through DSL, cable modem, fiber-optic service, mobile broadband plan, satellite, or some other service are counted as a household with broadband. The household broadband adoption percentages we present are estimates calculated with intervals of 95 percent confidence. They have a sampling error of no larger than plus or minus 2.6 percentage points at the 95 percent level of confidence. Where we have drawn comparisons between groups or years to show differences, those differences are statistically significant and the confidence intervals do not overlap, except in the 2013 comparison between all households (95 percent confidence interval of 72.70 to 73.69 percent) and unemployed (95 percent confidence interval of 68.36 to 73.58 percent). About 1.6 percent of household respondents indicated they were more than one race; we have included these householders under multiple demographic race categories. Starting in 2010, Census changed the methodology for its income variable, including imputing household values that had been missing in prior years to provide values without missing observations.



**Data Table for Figure 2: Household Broadband Adoption among Demographic Groups Sorted by Adoption Percentage, 2009 and 2013**

Demographic groups	Percentage of households with broadband		Percentage point difference	
	2009	2013	2009 compared to 2013	Demographic group compared to all households, 2013
\$75,000 or more	92	93	+1	+20
Bachelor's or degree or higher	85	90	+5	+17
\$50,000-\$75,000	80	85	+5	+12
Asian American	78	85	+7	+12
Employed	74	83	+9	+10
16-44 years	72	81	+9	+8
Some college or associate's degree	70	79	+9	+6
Does not have a disability	68	77	+9	+4
45-64 years	69	77	+8	+4
White	66	75	+9	+2
Metropolitan	66	75	+9	+2
All households	64	73	+9	0
Unemployed	60	71	+11	-2
\$25,000-\$50,000	61	69	+8	-4
Nonmetropolitan	51	63	+12	-10
African American	50	62	+12	-11
High school diploma	51	61	+10	-12
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**Data Table for Figure 3: Household Broadband Adoption among Demographic Groups Sorted by Demographics, 2009 and 2013**

Demographic groups		Percentage of households with broadband		Percentage point difference	
		2009	2013	2009 compared to 2013	Demographic group compared to all households, 2013
	All households	64	73	+9	0
<b>Income</b>	\$75,000 or more	92	93	+1	+20
	\$50,000-\$75,000	80	85	+5	+12
	\$25,000-\$50,000	61	69	+8	-4
	Income < \$25,000	36	48	+12	-25
<b>Education</b>	Bachelor's or degree or higher	85	90	+5	+17
	Some college or associate's degree	70	79	+9	+6
	High school diploma	51	61	+10	-12
	Less than high school	29	39	+10	-34
<b>Race and Hispanic origin</b>	Asian American	78	85	+7	+12
	White	66	75	+9	+2
	African American	50	62	+12	-11
	Hispanic	49	61	+12	-12
<b>Employment status</b>	Employed	74	83	+9	+10
	Unemployed	60	71	+11	-2
	Not in labor force	46	57	+11	-16
<b>Disability status</b>	Does not have a disability	68	77	+9	+4
	Has a disability	38	48	+10	-25
<b>Age</b>	16-44 years	72	81	+9	+8
	45-64 years	69	77	+8	+4
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	Nonmetropolitan	51	63	+12	-10

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**Text in Appendix III: Comments from the Federal Communications Commission**

**Page 1**

Federal Communications Commission  
Washington, D.C. 20554

May 12, 2015

Mr. Mark Goldstein  
Director, Physical Infrastructure Issues  
Government Accountability Office  
441 G St, NW  
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for the opportunity to review and comment on the U.S. General Accountability Office (GAO) draft report concerning barriers to broadband adoption. We share GAO's concern that factors are preventing some households from enjoying the social and economic benefits that broadband service can provide. We therefore appreciate the opportunity to describe the Commission's efforts to address these barriers and how those efforts fit in to the Commission's mission and objectives.

In the Draft Report, GAO recommends that the Commission "[r]evis[e] its strategic plan to more clearly indicate whether addressing broadband adoption barriers is a major function, and if so, what outcomes the [c]ommission intends to achieve." [Note 1] As noted in the draft report, the Commission released a new Strategic Plan in February 2015 covering fiscal years 2015-2018. This new Strategic Plan revised and reorganized some of the Commission's Strategic Goals and Objectives to present broader goals in a more streamlined format. While the Strategic Plan no longer expressly references adoption in a distinct strategic objective and performance goal, this does not reflect a diminished Commission emphasis on adoption. To the contrary, adoption remains a significant focus for the Commission in its strategic plan.

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We note that, consistent with these elements of the Strategic Plan, the Commission stated in its 2015 Broadband Progress Report that it "will continue to work on removing barriers to

Note 1: Draft Report at p. 22.

Note 2: See, e.g., *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, *Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment*, 29 FCC Red 1375, 1378-79, para. 7 (2015) (*2015 Broadband Progress Report*).

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**Page 2**

infrastructure investment by identifying and helping to reduce potential obstacles to deployment, competition, and adoption." [Note 3] Also in this regard, the Commission anticipated that it would assess "the 'totality of the circumstances' in the next [Broadband Progress] Report by looking more robustly at other factors, such as usage allowances and price, latency, whether service at the relevant speed is available on a consistent and reliable basis, and whether the network is secure, which can be as important as speed in determining whether service is available." [Note 4]

As a further indication of the Commission's focus on broadband adoption, the Commission also has underway two new initiatives to address barriers to broadband adoption. First, the Wireline Competition Bureau is preparing a draft Lifeline Further Notice of Proposed Rulemaking (FNPRM) for consideration by the full Commission that will refocus the program on 21st century services in a way that benefits low-income recipients, as well as the people who pay into the fund, and will continue making improvements to reduce waste and abuse. The Bureau expects the FNPRM will also ask for comment on, among other issues, whether and how the Lifeline program could make broadband services more affordable for low-income Americans and will address the Commission's Lifeline Broadband Pilot Program, which was launched to study what policies might overcome key broadband adoption barriers and how the Lifeline program could best be structured to provide support for broadband. While service discounts were a centerpiece of many of the selected projects, the Commission encouraged projects to include non-price policy tools, which resulted in a diverse group of projects that employed different methods, implemented different strategies, and provided different services across different geographies. The Commission structured the projects in this way in order to better evaluate the effects of the many policy variables on adoption.

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To the extent that the Strategic Plan is unclear on the role of adoption in our efforts, we are prepared to implement revisions that will help to clarify this issue. With regard to quantifying expected outcomes of the Commission's efforts in this area, as GAO notes, broadband adoption has been steadily increasing over time. In the draft FNPRM described above, the Bureau will suggest how one barrier to adoption - affordability-might be addressed consistent with the ongoing efforts to eliminate waste, fraud and abuse, and will suggest seeking comment on how best to consider specific outcomes. And we look forward to working with Ms. Kutler when she arrives to consider the Commission's role in removing other barriers.

Note 3: *Id.* at 1455, para. 141.

Note 4: *Id.* at 1392-93, para. 25.

**Page 3**

We thank the GAO for its time and effort working on this important matter and appreciate the opportunity to review and comment on the draft GAO report.

Sincerely,  
Signed by  
Julie A. Veach  
Chief  
Wireline Competition Bureau

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**Text in Appendix IV: Comments from the Department of Commerce**

**Page 1**

The Deputy Secretary of Commerce  
Washington, D.C. 20230

May 14, 2015

Mr. Mark Goldstein  
Director, Physical Infrastructure  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for the opportunity to review the Government Accountability Office's (GAO) draft report entitled *Broadband: Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear* (GAO-15-473). I am writing on behalf of the Department of Commerce to respond to the draft report's recommendation that the Department add criteria to its strategic plan to evaluate the success of the BroadbandUSA initiative being directed by the Department's National Telecommunications and Information Administration (NTIA).

The GAO draft report acknowledges that NTIA's strategic plan continues to make increasing broadband use a key agency priority. However, it notes that without an outcome-based goal and performance indicator, it is unclear how NTIA intends to address broadband adoption barriers under its new BroadbandUSA initiative and how it will show progress in achieving its strategic goal. As a result, you recommend that the Department "[i]nclude in NTIA's annual performance plan a quantifiable outcome-based performance goal and related performance indicator for the agency's broadband adoption efforts consistent with the strategic plan."

As the GAO draft report recognizes, NTIA, through its management of sustainable broadband adoption grants funded under the American Recovery and Reinvestment Act's Broadband Technology Opportunities Program, made considerable progress in advancing broadband adoption, increasing household subscribership by more than 671,000 from 2009 to 2014. Building on lessons learned and best practices from its broadband grant programs, NTIA launched its BroadbandUSA initiative in January to provide support to communities across the country looking to provide their citizens with the broadband opportunities they need to advance economic development, education, healthcare, and public safety. NTIA's Fiscal Year (FY) 2015 budget allocates \$3 million for the BroadbandUSA initiative, but, importantly, none of these funds are authorized to be used for grants to establish broadband adoption programs. Instead, NTIA will work to assist and educate local communities looking to increase broadband adoption by providing resources such as toolkits, training programs, webinars, workshops, technical assistance, funding leads, and basic guidance.

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Unlike a grant program, NTIA's role in designing community broadband programs is solely advisory. The communities themselves provide the funding and identify the goals of their respective programs. This is why, for this FY, NTIA plans to use as a performance goal the number of communities to which it has provided technical assistance to assess its broadband advancement activities. A quantifiable, outcome-based measure—such as broadband adoption—would not be an accurate measure of NTIA's performance because other variables unique to communities are far more determinative of whether a community adopts broadband or not.

The Department certainly agrees with GAO that outcome-based performance tools are important in evaluating the success of an agency program. Indeed, the Commerce *Strategic Plan FY14-18* has identified the metric of "[n]umber of communities with increased broadband capabilities and capacity" as an important future indicator of progress toward NTIA's goal of increasing broadband infrastructure and use. To the extent that NTIA receives Congressional appropriations that include funding for additional broadband adoption grants for FY16 and beyond, the Department will seek to incorporate additional appropriate, outcome-based measures into its indicators for NTIA's broadband advancement activities.

Sincerely,  
Signed by  
Bruce Andrews

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