CONQUERING THE CHALLENGES OF BROADBAND ADOPTION

April 2014

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"It is important to ensure broad participation in the benefits of broadband telecommunications technologies, because broad participation allows more people to use those benefits to develop their talents, which lead to higher economic growth and higher living standards in the future."

- The Annual Report of the Council of Economic Advisers, March 2014

"This isn't about faster Internet or fewer dropped calls. It's about connecting every part of America to the digital age. It's about a rural community in Iowa or Alabama where farmers and small business owners will be able to sell their products all over the world. It's about a firefighter who can download the design of a burning building onto a handheld device; a student who can take classes with a digital textbook; or a patient who can have face-to-face video chats with her doctor."

- President Barack Obama, January 2012

Intro/Overview

Perhaps more so than any other transformative innovation in recent history, the Internet has changed our daily lives in significant and long-lasting ways. Certainly, the transformation has occurred faster than others. Over the space of 13 years, home broadband adoption has grown from 3% of all American adults age 18 and older to 70%.[1] By comparison, it took the telephone 76 years and electricity 33 years to reach the same level of penetration.[2]

And while the benefits that the Internet has brought are certainly dramatic, they ultimately fail to reach their full potential due to the fact that a significant segment of society is not using the Internet. Nearly all Americans have access to broadband service, but three in 10 are not availing themselves of the myriad benefits that broadband can bring.

Currently, the United States ranks 15th among the 34 OECD nations in per capita broadband adoption.[3] As always, these types of rankings are subjective—many of the top-ranked nations are relatively small and have citizens that live in tightly packed population clusters. Other nations have governments that heavily subsidize broadband service. Having said that, it is interesting to note that although admittedly middle-of-the-pack, the United States ranks ahead of both France and Japan, as well as the 15 nations of the European Union taken as a whole.

But while the United States may be doing a decent job in terms of broadband adoption when compared with other nations, the more salient point is that the United States could be doing better, and more of its citizens could be benefitting from increased broadband adoption. Ensuring that the numerous benefits of being online are brought to as many Americans as possible is a goal that is as challenging as it worthwhile.

Part I of this white paper looks at where we currently stand in terms of broadband adoption and deployment, and the gains that have been realized over the past few years. It examines the barriers that are keeping non-adopters from taking broadband service, and what it will take to overcome these obstacles. Part II looks at the why increasing broadband take rates is an important initiative, examining the potential benefits to be gained by individual users and possible gains to be realized by the economy as a whole. Part III suggests some next steps that can be undertaken to help facilitate growing the overall rate of broadband adoption.

[1] Pew Research Center, "Home Broadband 2013," August 2013, p. 2.
[2] Rita McGrath, "The Pace of Technology Adoption is Speeding Up," Harvard Business Review Blog Network, November 25, 2013.
[3] The Information Technology and Innovation Foundation, "The Whole Picture: Where America's Broadband Networks Really Stand," February 2013, p. 28.

Part I: Where Are We Now?

Deployment.

The stated goal of 2010's national broadband plan was to bring high-speed Internet access to all U.S. residents. While that goal has not yet been achieved, broadband availability continues to approach ubiquity—albeit at a slow pace.

In August 2012, the FCC released its "Eighth Broadband Progress Report." In the report, the commission estimated that, as of June 30, 2011, 94% of Americans has access to fixed broadband service at 3 Mbps downstream/768 kbps upstream (3/768).[4] The FCC found a sizeable rural/urban differential: 98.2% of Americans in non-rural areas have access to 3 Mbps broadband service, versus 76.3% of rural residents. As the FCC report puts it, "rural Americans are more than 13 times more likely to lack access to fixed broadband than Americans in non-rural areas." The FCC estimates that 29% of Americans residing on tribal lands do not have access to 3 Mbps broadband service—nearly five times that of the nation as a whole.[5]

The FCC report indicated that progress was being made in bringing broadband access to the unserved. Between June 2010 and June 2011, the FCC estimated that the number of Americans without access to broadband service of at least 3 Mbps fell from 26.4 million to 19 million.[6]

In May 2013, the National Telecommunications and Information Administration (NTIA) published a study that found that as of June, 2012, 98.2% of Americans had access to wired or wireless broadband at an advertised speed of at least 3 Mbps downstream/768 kbps upstream.[7] While 93% have access to advertised wireline speeds of 3/768, nearly the same amount have access to advertised speeds of at least 6 Mbps, and 91% have access at 10 Mbps. Like the FCC, NTIA found a substantial rural/urban gap in broadband availability: Nearly 100% of urban residents have access to download speeds of 10 Mbps, versus only 82% of rural residents that have similar access.

In terms of gains in broadband deployment between 2010 and 2012, NTIA found that the largest growth occurred at the higher-speed tiers. While availability at 3 Mbps and above rose from 95.49% to 98.18% over that time, availability of broadband service of 6 Mbps and above rose from 90.33% to 96.17%, and service in excess of 10 Mbps rose from 85.37% to 94.39%.[8]

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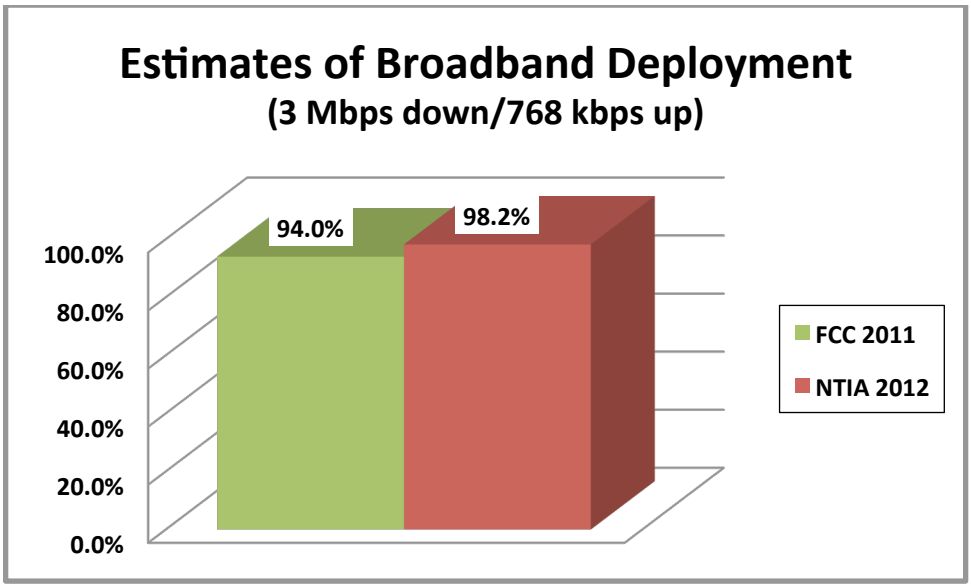
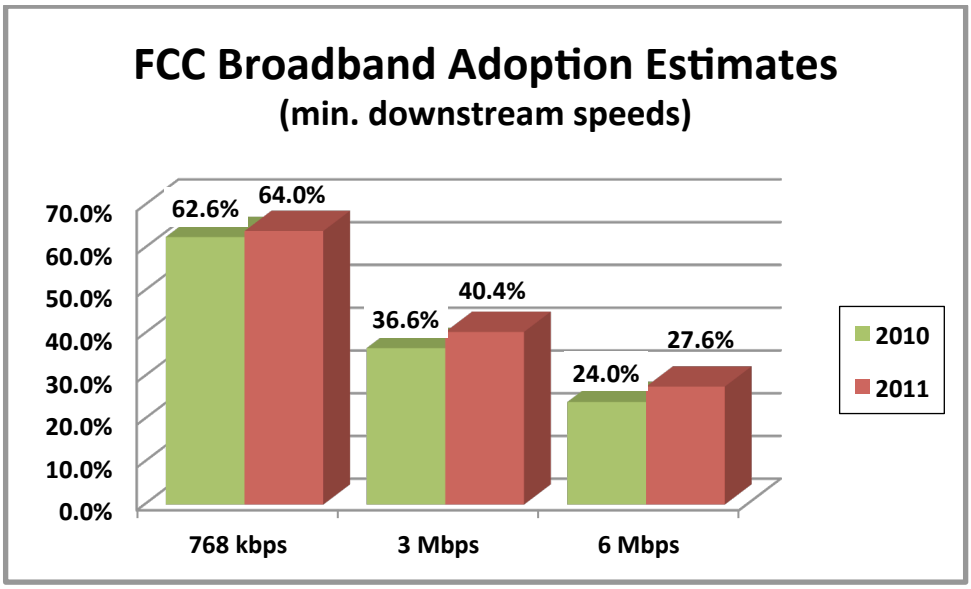
[4] Federal Communications Commission (FCC), "Eighth Broadband Progress Report," GN Docket No. 11-21, rel. August 21, 2012, p. 29.
[5] *Id.,* p. 30.
[6] *Id.,* p. 32.
[7] National Telecommunications and Information Administration (NTIA), "U.S. Broadband Availability: June 2010 – June 2012," May 2013, p. 4.
[8] *Id.*, p. 6.



Source: FCC, "Eighth Broadband Progress Report," August 2012; NTIA, "U.S. Broadband Availability: June 2010 – June 2012," May 2013.

Adoption.

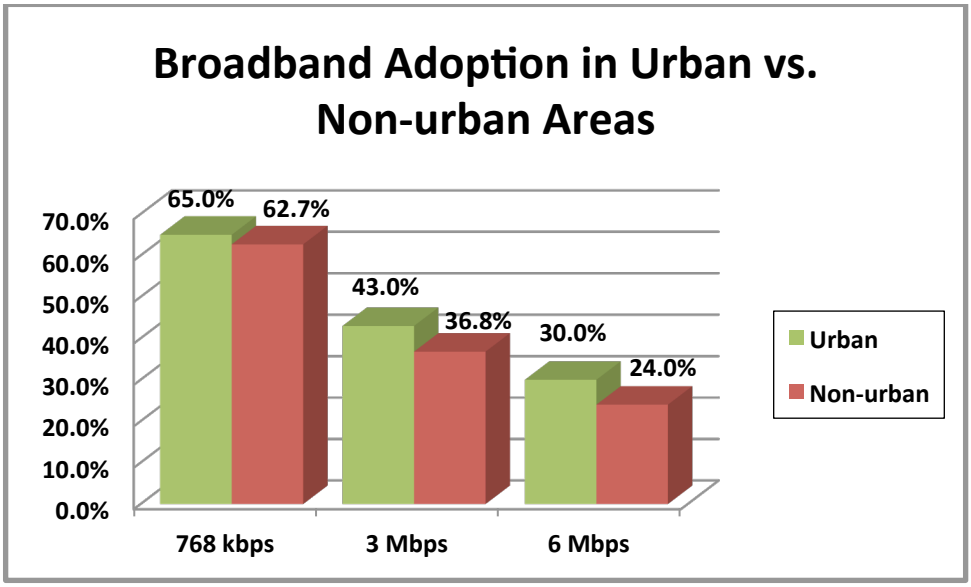
In its "Eighth Broadband and Progress Report," the FCC estimated that in June 2011 64% of U.S. households with access to broadband service of at least 768 kbps subscribed to that service, 40.4% subscribed to service of at least 3 Mbps, and 27.6% to service of at least 6 Mbps. These estimates represent slight increases from the 62.6%, 36.6%, and 24.0% respectively, estimated adoption rates in June 2010.[9]



Source: FCC, "Eighth Broadband Progress Report," August 2012.

[9] FCC, "Eighth Broadband Progress Report," p. 46.

The FCC sees a rural/urban divide in adoption. While 65% of urban households with access to broadband service of at least 768 kbps subscribed, only 62.7% of rural households did. The gap is greater at 3 Mbps: 43% versus 36.8%.[10] The adoption rate for households on tribal lands at 768 kbps was 51.2%, well below the 64% for the United States as a whole; at 3 Mbps, the tribal adoption rate was 25.9%, compared with the overall adoption rate of 40.4%.[11]



Source: FCC, "Eighth Broadband Progress Report," August 2012.

In May 2013, Pew estimated that 70% of American adults age 18 and older has a high-speed broadband connection at home.[12] This represents an increase from 66% in April 2012 and 62% in August 2011.

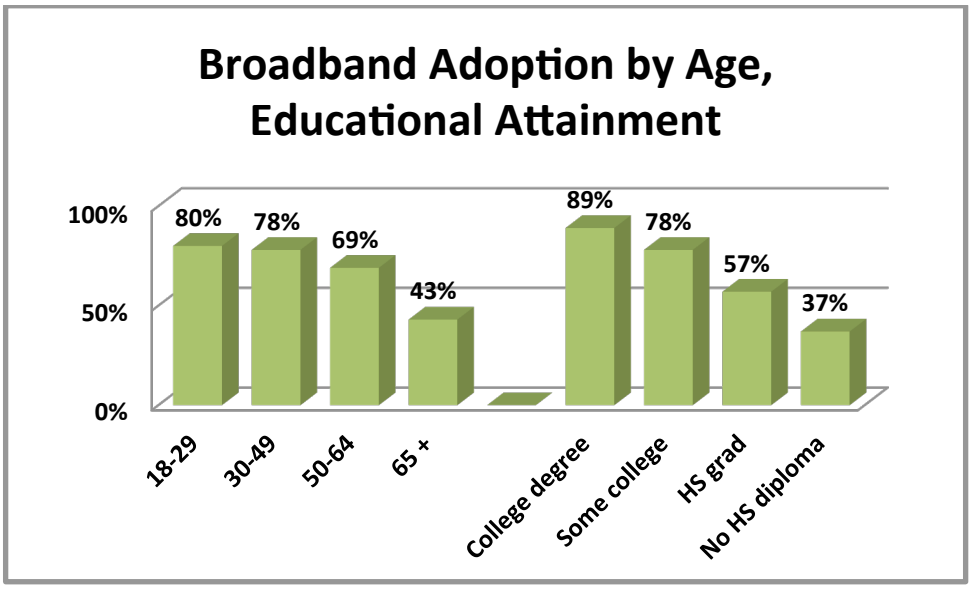
NTIA estimated that, as of October 2012, 72.4 percent of U.S. households—88 million in total—have high-speed Internet access at home.[13] This is a 5.5% increase from NTIA's July 2011 estimate.

Certain demographic characteristics impact broadband adoption rates. Generally, broadband adoption rates are positively correlated with income levels, educational attainment and population density. Adoption rates are negatively correlated with age.

[10] *Id.,* p. 47.
[11] *Id*., p. 48.
[12] Pew Research Center, "Home Broadband 2013," August 2013, p. 2. "High-speed broadband connection" is defined as a non-dial up connection.
[13] NTIA Press Release, "Household Broadband Adoption Climbs to 72.4 Percent," rel. June 6, 2013.

Further, broadband adoption rates for certain ethnic groups lag those of the population as a whole. Historically, adoption rates for Hispanics and African Americans have lagged those of the general population.

Pew's survey results bear this out. They find very little gender bias: The adoption rate for men is 71%, for women 69%. However, looking at age, 80% of those between 18 and 29 years old have a broadband connection at home, compared with 78% of those 30 to 49, 69% of those 50 to 64, and only 43% of those age 65 or older. In terms of educational attainment, 89% of those with a college degree or more are adopters, as are 78% of those with some college, 57% of high school graduates, and 37% of those without a high school diploma.



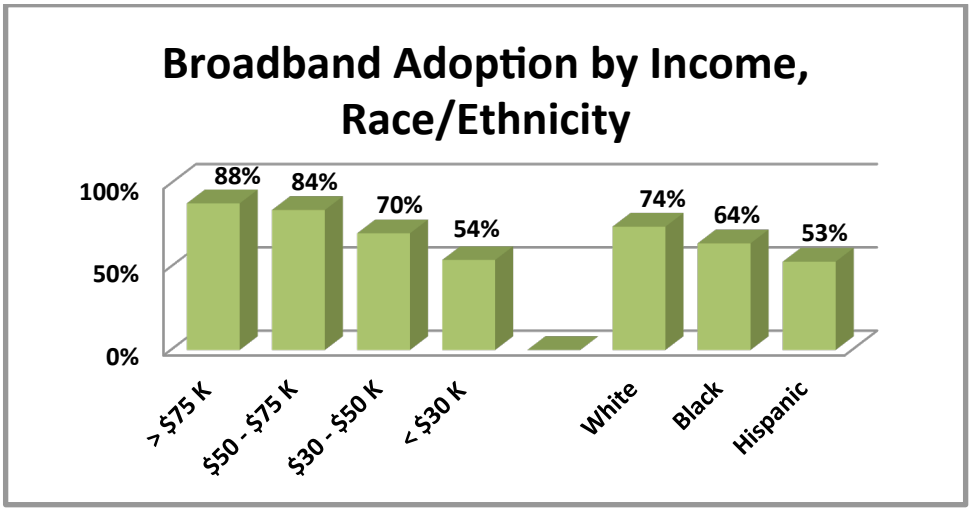
Source: Pew Research Center, "Home Broadband 2013," August 2013.

Eighty-eight percent of American adults with annual incomes of $75,000 or more are adopters, as are 84% of those with incomes between $50,000 and $74,999, 70% between $30,000 and $49,999, and 54% less than $30,000 annually.

Pew also finds a rural/urban divide in broadband adoption. Seventy percent of urban residents have a broadband connection, as do 73% of suburban residents and 62% of rural residents.

Seventy-four percent of white, non-Hispanic adults has a broadband connection, versus 64% of black, non-Hispanic adults and 53% of Hispanic (English- and Spanish-speaking) adults.[14]

[14] Pew, "Home Broadband 2013," p. 3.



Source: Pew Research Center, "Home Broadband 2013," August 2013.

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The bottom line is that there remains a substantial and persistent gap between availability and adoption. The good news is that the broadband gap, particularly among those in demographic groups with the lowest rates of adoption, is slowly shrinking. But as long as there are Americans who have access to broadband service yet do not avail themselves of the benefits that broadband can allow, there will be a net deadweight loss to society as a whole.

Increasing broadband adoption rates is a two-step process. First, it is necessary to understand why non-adopters are not subscribing to broadband. Once the "why" is ascertained, it will be possible to design and implement programs that can overcome these barriers and allow non-adopters to enter the broadband world. Subsequent sections of this paper will examine these issues in greater detail.

Barriers to Adoption

There is widespread agreement that the barriers to broadband fall into the following categories:

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

If each non-adopter exhibited only one of these barriers, drafting a solution would be a relatively easy matter. The difficulty lies in the fact that non-adopters are typically impeded by two or more of these barriers at a time. For example, a person may not own a computer, and does not perceive a need for broadband in their life. Or, another person may not be able to afford broadband service, and does not know how to go about getting on line in the first place.

This intertwining of barriers makes the job of policymakers more challenging. Designing programs to attack one barrier at a time is difficult; effectively eliminating multiple barriers is considerably more so.

In 2013, Pew Research Center conducted a survey to gain additional insight into why Americans with access to broadband were not subscribing to the service.[15] They found that, overall, 15% of American adults above the age of 17 did not use the Internet or email at all, either from home or elsewhere. Of those non-adopters, 34% believed that the Internet was not relevant to their lives. Thirty-two percent of non-adopters thought that the Internet was not easy to use, 19% cited the expense of purchasing a computer or paying for a broadband subscription, 7% indicated they did not have access to the Internet, and 7% cited "Other."[16]

Pew goes on to break down the four broad categories (relevance, usability, price and availability) even further:

Relevance:

▪ Just not interested:	21%
▪ Don't need/want it:	6%
▪ Waste of time:	4%
▪ Too busy:	3%
	34%

[15] Pew Research Center, "Who's Not Online and Why," September 2013.
[16] *Id.,* p. 2.

Usability:

- Too difficult: 10%
- Don't know how: 8%
- Too old to learn: 8%
- Physically unable: 4%
- Privacy/viruses: 3%

32%

Price:

- Don't have a computer: 13%
- Too expensive: 6%

19%

Availability:

- Don't have access: 7%

7%

Source: Pew Research Center, "Who's Not Online and Why," September 2013.

While not broadband adopters in the strict sense of the word, many of these individuals do find ways to make use of the Internet. Pew reports that 44% of non-adopters indicated that they have asked a friend or relative to complete an on-line task for them. Further, nearly a quarter (23%) indicated that they live in a household where somebody else uses the Internet at home. Finally, 14% of non-adopters were Internet users at one time, but no longer are for some reason.[17]

Of the 85% of American adults who use the Internet on a regular basis, Pew reports that 76% do so from home and 9% do so elsewhere. Bringing non-adopters onboard will certainly prove challenging: Only 8% of the non-Internet users expressed a desire to get online, while 92% were uninterested.[18] And even if the interest barrier can be overcome, bringing non-adopters online will require significant resources: 63% of offline adults indicated they would need some help in order to go online, while only 17% possess sufficient knowledge to go online on their own. The remaining 19% either were not sure or would not want to start using the Internet.[19]

In their June 2013 "Exploring the Digital Nation: America's Emerging Online Experience" report, the NTIA and Economics and Statistics Administration (ESA) reached similar conclusions. They

[17] *Id.,* p. 3.
[18] *Id.*, p. 8.
[19] *Id.,* p. 9.

found that 48% of broadband non-adopters felt they didn't need the Internet at home and weren't interested in it; 28% found it to be too expensive, 13% either had no computer or an inadequate computer; 3% used the Internet outside of their home; 1% said that broadband service was not available in their area; 1% cited privacy or security concerns; and 7% gave another reason.[20]

NTIA and ESA found that demographics played a role in the specific barrier impacting non-adopters. For example, lack of interest in using the Internet at home is more likely to be cited by families with incomes exceeding $100,000 annually than those with incomes less than $25,000, 53% versus 45%. Eight percent of those with the highest income levels said that they were able to access the Internet elsewhere, as opposed to only 2% of those with the lowest income level. Similarly, 67% of non-adopters age 65 and above cited lack of a perceived need for Internet service, as opposed to 26% of non-adopters between the ages of 16 and 44.[21]

Another interesting finding of the NTIA and ESA research was the role that the presence of children in the household plays in shaping attitudes toward broadband. Non-adopter households without children were exactly twice as likely as those with children to cite non-interest in the Internet as a reason for non-adoption (52% vs. 26%).[22]

Overcoming the Obstacles

Relevance

Like many other life-changing technologies (such as electricity, the automobile, or voice telephone service), broadband Internet service's benefits are better experienced than described. And like these other innovations, once end users have experienced the benefits to be gained from use of the new technology, they are hard pressed to imagine their life without it.

The key to overcoming the relevance barrier is to make non-adopters aware of the numerous ways that the Internet can have a positive impact on their lives. One way that this can be accomplished is through focused educational campaigns that could be comprised of bill inserts, ads in local newspapers, and television and radio spots. These campaigns could be further focused to pinpoint those demographic groups with lower overall take rates.

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[20] NTIA and Economics and Statistics Administration in the U.S. Department of Commerce, "Exploring the Digital Nation: America's Emerging Online Experience," June 2013, p. 36. "Although respondents reported a range of other reasons, the data do not reveal discernible patterns in the responses."
[21] *Id.,* pp. 36-37.
[22] *Id.*, p. 37.

Another way that providers can expose non-adopters to broadband is by setting up demos at shopping malls, county fairs, government centers, and other places that people frequent. By showing them firsthand all that the Internet has to offer and allowing them to get some hands-on experience with PCs connected to the Internet, these demos can possibly provide the impetus that leads non-broadband subscribers to become adopters.

There has been some evidence to show that students who use broadband in schools exert influence over their parents to obtain access at home.[23] In their schools, these young people witness firsthand what can be done online, and relay that information to their parents.

Usability

To long-term Internet users, the idea that using the Internet can be challenging may be hard to grasp. But it is important to remember that every user at one point went online for the first time, and had instruction from somewhere or somebody as to exactly how to go about making the online connection.

Digital literacy training need not be complex or time consuming. Teaching just the basics—how to operate a computer and mouse, an overview of the World Wide Web, and how to avoid viruses, scams and spyware—will provide a non-adopter with all of the tools needed to go online.

This training can come from any number of community organizations. Senior living communities, houses of worship, and service providers all can offer classes at minimal cost that will provide non-adopters with invaluable skills. The hardest part will be convincing the non-adopter to participate in the first place.

Price

The problem of affordability is two-pronged: Users must be able to shoulder both the cost of a computer (primarily a one-time cost), and the monthly cost of broadband access (an ongoing cost.)

Connected Nation recently did a statistical analysis of the price sensitivity of broadband non-adopters. It estimates that 39% of current non-adopters would subscribe to broadband service

[23] *See,* for example, NTIA *et al.*, "Exploring the Digital Nation," p. 37.

if the price were lowered to a level they considered to be acceptable.[24] Based on the result of a random survey of more than 15,000 non-adopters in seven states, Connected Nation concluded that the optimal price point that would be considered acceptable by broadband non-adopters was $21 per month, with a range from $19 per month to $29 per month. The same survey shows that the average price facing these same customers was just over $46 per month, more than double the optimal price point.[25] Thus, a pure subsidy aimed at boosting broadband adoption rates would need to be approximately $25 per customer per month to maximize the number of new broadband adopters.

In 2013, the FCC launched the Lifeline Broadband Pilot Program. Funded by nearly $14 million reclaimed from the Lifeline program, the commission solicited "experiments" that would provide low-income, non-broadband adopters with different types of subsidies over the course of the 12-month trial period. After reviewing the submissions, the Wireline Competition Bureau ultimately selected 14 pilot projects, covering 21 states and Puerto Rico, to receive funding as part of the pilot program. The year-long pilot program is nearing its conclusion, and the data ultimately obtained will provide valuable insight into the role that price plays in broadband adoption.

It should be stressed, however, that the decision to subscribe to broadband service or not is based on value more than strictly price. In other words, consumers will look at the cost of the service and compare that to the benefits that will be provided in return. This is where the relevance barrier comes into play—if consumers can be educated as to what broadband can do for them and how it can change their lives, they may decide that it is worth more of their disposable income than they otherwise might think.

Availability

As noted previously, Pew found that 7% of non-adopters did not have access to broadband Internet service. This is perhaps the most frustrating group of all, as these are individuals who very likely may be ready and willing to avail themselves of the advantages that being online can bring, but cannot through little fault of their own.

The reality is that bringing high-quality broadband service to the last few Americans lacking it has been, and will continue to be, a very difficult and expensive process. Those lacking service are typically those living in the highest cost, hardest to serve and most remote parts of the country.

[24] Dev Joshi, Chris McGovern, Raquel Noriega, Elizabeth Riesser, Hongqiang Sun and John Walker, "Let's Make a Deal: Price Sensitivity and Optimal Subsidies Among Broadband Non-Adopters," August 2012, p. 8.
[25] *Id.,* pp. 15-16.

Policymakers will need to work closely with service providers if the stated goal of the national broadband plan—ubiquitous broadband availability—is to become a reality. Doing so will require commitment, hard work, and creative thinking. Numerous groups have done an excellent job of working together to bring high quality broadband service to some of the hardest to reach parts of the country. Reaching those few who still do not have broadband access will prove even more difficult. But as a nation that has conquered other seemingly insurmountable challenges in the past, there's no reason to believe that we can't ultimately achieve this goal, as well.

The Role of Smartphones

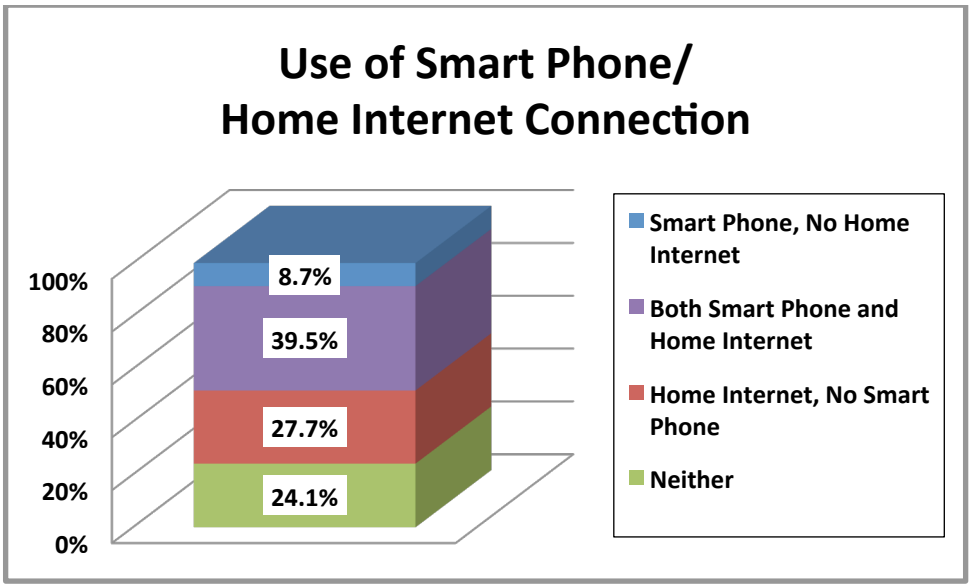
In recent years, both the use of smartphones and the capabilities of these devices have grown tremendously. While users can access the Internet, there are significant limitations that keep smartphones from being the equivalent to a wired broadband connection.

First, 3G and even 4G smartphones cannot consistently approach the connection speeds available via a dedicated home broadband connection. Second, manipulating large documents and forms on a smartphone is considerably more challenging than on a PC. Carriers often place data caps on their users, penalizing those who download significant quantities of data.

Smartphones do, however, have a role to play in encouraging broadband adopters to become part of the digital age. For some, smartphone Internet access is a first taste of what may be available online. As such, it can serve as a gateway, and can encourage users to seek out a more powerful home broadband connection.

The U.S. Census Bureau estimated that 48.2% of all individuals 15 years of age and older used a smartphone in 2011, representing more than 117 million Americans. Further analysis reveals that only 8.7% (21.2 million) have a smartphone but do not also have a home Internet connection, while 39.5% (96.3 million) have both.[26] Clearly, smartphones are viewed as complimentary to home Internet connections, rather than as substitutes for home-based broadband services.

[26] United States Census Bureau, "Computer and Internet Use in the United States: Population Characteristics," May 2013, p. 11.



Source: U.S. Census Bureau, "Computer and Internet Use in the United States: Population Characteristics."

Unfortunately, those individuals who are smartphone users tend to fall into those demographic groups that have already embraced the Internet—those with higher educational attainment, those in higher income brackets, and those who are younger. In fact, when the smartphone-only Internet users are added to the home Internet users, the gap between the various demographic groups grows rather than shrinks. So while smartphones may in some instances allow Internet access to those who would not otherwise have it, it is not a wide-scale solution to the adoption problem.

Part II: What Does the Internet Have to Offer?

End-User Benefits

Broadband service is like electricity—the true value to the end user lies not in the commodity itself, but rather in what can be done with it. And broadband service provides users with an almost limitless variety of potential benefits.

Internet access has become a critical component of the job search process. In the very recent past, traditional newspaper want ads have virtually disappeared. Pew Research cites Newspaper Association of America estimates showing that total expenditures for recruitment advertising in U.S. newspapers has fallen from $8.7 billion in 2000 to $720 million in 2012, a decline of more than 92% in just over a decade.[27] At the same time, Connected Nation estimates that 2.5 million U.S. businesses used the Internet in 2011 to advertise job openings and accept job applications, and approximately 139,000 U.S. businesses accept only online applications.[28] Clearly, the Internet has become a critical component of the job search process. Lacking a broadband connection to the Internet, job seekers are all but shut out from the process of finding, and applying for, a position.

The Internet is becoming increasingly important in the distribution of high-quality health care. Health care is a relatively larger concern for older citizens, who tend to fall into the lower broadband adoption demographic. The Internet provides a valuable source of information on health-related topics, and can allow users to conduct research into their health-related issues. Taking it one step further, the Internet can allow patients to interface directly with health care professionals a great distance away. Doing so, however, requires that the patient have access to a robust broadband connection—upstream, as well as downstream.

The Internet is playing an increasingly important role in the relationship between local government and its citizens. The Internet also allows users greater access to real-time local news, and can keep citizens informed during local emergency situations.

Broadband facilitates teleworking, allowing certain workers to do their jobs from wherever they have a broadband connection, eliminating wasted commuting time and reducing consumption of scarce energy resources and the accompanying impacts to the environment. It also allows workers the flexibility to work when it makes sense for them, essentially freeing them from the traditional 9-to-5 routine. The end result is a workforce that is happier and more productive,

[27] Pew Research Center's Project for Excellence in Journalism, "The State of the News Media 2013: An Annual Report on American Journalism," May 2013, http://stateofthemedia.org/2013/newspapers-stabilizing-but-still-threatened/newspapers-by-the-numbers/.

[28] Connected Nation, "The 2012 Jobs and Broadband Report: National Projections on How American Businesses Use Computers and Broadband to Grow, Hire and Thrive," May 2012, p. 1.

with concomitant benefits to society as a whole. Employers are embracing the trend: Connected Nation estimates that in 2011 some 2.4 million U.S. business establishments allowed their employees to telework.[29]

The Internet enables distance learning, allowing students to take advantage of opportunities that they would not otherwise have access to in their own communities. It allows large educational institutions to reach out and impact the lives of students that they otherwise could not reach.

Finally, the Internet has numerous miscellaneous benefits. Users can take part in various social networks, thereby keeping in touch with friends and family as well as making new friends. Online shopping allows for customers to quickly and conveniently compare prices, take advantage of special sales, and have goods delivered right to their doorstep. Broadband also facilitates an almost unlimited number of entertainment options, including (but not limited to) music and video streaming. End-user access to commercial video content is perceived as a critical component to building attractive broadband offerings. A 2011 National Association of Regulatory Utility Commissioners (NARUC) resolution characterized video content as "the leading, if not the 'killer' application" for successful business plans and access to capital.[30] This finding illustrates the role of content in encouraging adoption.

In short, there is something online for almost everyone. While broadband connections allow users to best tailor their online experience to meet their specific preferences, those who are unable to overcome the specific barrier(s) to adoption that confront them risk being left behind.

The Economic Impacts of Broadband Adoption

In addition to the entertainment choices that the Internet provides, there is a very real economic component to being online, as well. In May 2012, Connected Nation looked at the impact that broadband has on U.S. businesses. They found that 2.4 million U.S. businesses (32% of all businesses) earn revenues from online sales, and that businesses that use broadband report median annual revenues that are approximately $300,000 higher than businesses that do not use broadband. They estimate total online sales at $411.4 billion annually.[31]

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[29] *Ibid.*

[30] National Association of Regulatory Utility Commissioners, "Resolution on Fair and Non-Discriminatory Access to Content," adopted February 16, 2011, http://www.naruc.org/Resolutions/Resolution%20on%20Fair%20and%20Non%20Discriminatory%20Access%20to%20Content.pdf.

[31] Connected Nation, "The 2012 Jobs and Broadband Report," p. 1.

A 2014 survey of more than 1,000 Nebraska businesses echoed these findings. Survey results found that the Internet was directly tied to job growth, as 364 respondents reported a net increase of 654 jobs due to the Internet. Overall, more than 50% of net jobs reported by respondents were directly attributed to their use of the Internet. Respondents reported that 25% to 45% of their net revenues were directly attributable to the Internet.[32]

Investment in broadband infrastructure can have beneficial impacts on the macroeconomy, as well. A Brookings Institute working paper found that every one percentage point increase in broadband penetration in a state increases overall employment by 0.2% to 0.3% a year.[33] A 2008 Connected Nation study estimated that a 7% increase in U.S. broadband adoption would create up to 2.4 million jobs and add $134 billion to the overall economy.[34]

International studies have reached similar conclusions. A 2009 University of Munich study of the OECD countries found that a 10% increase in broadband penetration would result in an increase in per capita gross domestic product (GDP) of between 0.9% and 1.5%. That same year, the World Bank estimated that in 66 "high income" countries, a 10% increase in broadband penetration corresponds to a GDP gain of 1.21%.[35]

Finally, at the individual end-user level, in addition to all of the benefits noted previously, there are significant, quantifiable benefits to be reaped from Internet use, as well. Erik Brynjolfsson, director of the MIT Center for Digital Business, reports that so-called "free goods"—which would include web sites such as YouTube, Wikipedia, and Facebook, which consumers don't pay for explicitly aside from their broadband connection—added an estimated $139 billion of consumer surplus to the economy in 2010. This is not calculated as part of the GDP, but if it were, it would add an additional 1% to the total, or $647 for every person in the United States.[36] Similarly, a study by economists Austan Goolsbee and Peter Klenow found that while 0.2% of consumer spending in the United States went for Internet access, the consumer surplus gained from all time spent online was about 2% of full-income per user.[37] Particularly in today's economy, that kind of return on investment simply cannot be ignored.

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[32] The Rapid City Journal, "Nebraska Businesses Say Broadband is Key to Growth," March 18, 2014, http://rapidcityjournal.com/news/local/communities/chadron/regional/nebraska-businesses-say-broadband-is-key-to-growth/article_2e140b68-aeca-11e3-9123-001a4bcf887a.html.

[33] The Brookings Institute, Issues in Economic Policy No. 6,"The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data," July 2007, p.2.

[34] Connected Nation, "The Economic Impact of Stimulating Broadband Nationally, February 2008, p. 7.

[35] Cited in ITU, "The Impact of Broadband on the Economy: Research to Date and Policy Issues," April 2012, p. 4.

[36] Erik Brynjolfsson, "Measuring the 'Attention Economy,' http://digitalcommunity.mit.edu/community/latest_research/blog/2012/09/19/measuring-the-attention-economy.

[37] Austan Goolsbee and Peter J. Klenow, "Valuing Consumer Products By the Time Spent Using Them: An Application to the Internet," NBER Working Paper 11995, January 2006, p. 1.

Part III: Conclusion/Next Steps

One of the more challenging realities of striving for ubiquitous broadband adoption is that the final third of the population will be the hardest to reach. This remaining group of non-adopters tends to be older, less educated and at lower income levels than those who have already embraced the online world. Yet, in many ways these are the very segments of society that have the most to gain from the Internet, whether through obtaining higher quality health care or pursuing a more rewarding job. Encouraging more of them to become broadband adopters will benefit all.

How can this be accomplished? It will take a multi-faceted effort on the parts of many different players, in both the private and the public sector. As with achieving any common goal, there will need to be coordination and cooperation. It will not be easy, and progress will at times be slow, but it is a challenge that can be met.

The following steps will play a vital role in bringing the remaining broadband non-adopters online:

Continue to Assess the Situation. It seems only fitting that information be a key factor in encouraging more citizens to take part in the information economy. Studies like those presented in this paper, which examine not just the extent of broadband adoption but also break it down by various demographic segments, provide invaluable information about where resources need to be focused. Given the fluidity of the situation, these assessments need to be in-depth and ongoing.

Compare Best Practices. The only way that the relative success of various efforts to increase broadband adoption can be compared is through the free sharing of information. The FCC plans to do exactly this when the year-long broadband adoption pilot program comes to an end in mid-2014. A national best practices clearinghouse—recommended in 2010's national broadband plan but not yet implemented--would prove invaluable in crafting strategies for increasing broadband take rates.[38] Industry forums and workshops, whether organized by the FCC, state regulators or trade groups, will allow concerned parties to share important information and learn from the experience of others. There can be as much to be learned from failures as successes. Free sharing of information will help ensure that future efforts to increase adoption rates benefit from all that has gone on before, and it will increase the chances of success going forward.

Take Steps to Ensure Policy Coordination. It is critical that current and future government programs aimed at increasing adoption rates leverage, to the extent possible, efforts

[38] FCC, "Connecting America: The National Broadband Plan," March 2010, p. 168

undertaken as part of other programs. Increasing take rates will require funding—whether in the form of subsidies for broadband subscriptions, distribution of free or low-cost refurbished computers, or digital literacy training programs. As with all things, government funds available for use in increasing broadband rates of adoption are finite. Only through close cooperation and coordination of various efforts can it be ensured that the positive benefits to be gained from the expenditures of time, energy and money are maximized.

Encourage Private/Public Partnerships. Clearly, much of the funding associated with bringing broadband non-adopters online will come for the public sector. This has already begun to happen, as with the use of Lifeline program funds to finance the FCC's broadband adoption pilot program, or the funds made available through the BTOP program. But private entities will need to do their part, as well. Though coordinated efforts with the public sector, they must effectively leverage the resources provided by the public sector in order to enhance the results that would otherwise be obtained by either working on their own.

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While it is relatively easy in the aggregate to understand why some individuals choose not to adopt home broadband service, at a more granular level it is extremely complex. The barriers holding non-adopters back are themselves clear, but many individuals are confronted by two, three, or even more simultaneously. Consequently, the challenge of how to increase broadband take rates is a complex one, as well. One hundred percent broadband adoption is not a realistic goal—there will always be, and always have been, those who resist the clarion call of technological innovation. But for every non-adopter who enters the online world, and for every incremental increase in the overall broadband take rate, there are significant benefits to be realized not only by that individual, but also by his or her community, and by the nation as a whole.

References:

Connected Nation, "The 2012 Jobs and Broadband Report." (May 2012.)

Federal Communications Commission, "Connecting America: The National Broadband Plan." (March 2010.)

------, "Eighth Broadband Progress Report." (August 2012.)

Federal-State Joint Conference on Advanced Services with NTIA, "2013 Broadband Summit: Broadband Adoption and Usage – What Have We Learned?" (February 2013.)

Horrigan, John. "Broadband Adoption in 2012: Little Movement Since '09 & Stakeholders Can Do More to Spur Adoption." (March 2012.)

The Information Technology & Innovation Foundation, "The Whole Picture: Where America's Broadband Networks Really Stand." (February 2013.)

Joshi, Dev, Chris McGovern, Raquel Noriega, Elizabeth Riesser, Hongquiang Sun, and John Walker, "Let's Make a Deal: Price Sensitivity and Optimal Subsidies Among Broadband Non-Adopters." Sponsored by Connected Nation. (August 2012.)

National Telecommunications and Information Administration, "2013 NTIA Broadband Adoption Toolkit." (May 2013.)

------, "U.S. Broadband Availability: June 2010 – June 2012." (May 2013.)

National Telecommunications and Information Administration and Economics and Statistics Administration in the U.S. Department of Commerce, "Exploring the Digital Nation – America's Emerging Online Experience." (June 2013.)

National Urban League, "Connecting the Dots: Linking Broadband Adoption to Job Creation and Job Competitiveness." (Winter 2012.)

Office of Science and Technology Policy and The National Economic Council, "Four Years of Broadband Growth." (June 2013.)

Pew Research Center, "Home Broadband 2013." (August 2013.)

------, "Who's Not Online and Why." (September 2013.)

United States Census Bureau, "Computer and Internet Use in the United States: Population Characteristics." (May 2013.)

About NTCA–The Rural Broadband Association: *NTCA–The Rural Broadband Association is the premier association representing nearly 900 independent, community-based telecommunications companies that are leading innovation in rural and small-town America. NTCA advocates on behalf of its members in the legislative and regulatory arenas, and it provides training and development; publications and industry events; and an array of employee benefit programs. In an era of exploding technology, deregulation and marketplace competition, NTCA's members are leading the IP evolution for rural consumers, delivering technologies that make rural communities vibrant places in which to live and do business. Because of their efforts, rural America is fertile ground for innovation in economic development and commerce, education, health care, government services, security and smart energy use. Visit us at www.ntca.org.*

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