

**PREPARED TESTIMONY OF CONNECTED NATION CHIEF POLICY OFFICER
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UNITED STATES HOUSE OF REPRESENTATIVES COMMITTEE ON ENERGY AND
COMMERCE,
SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY, AND THE INTERNET
“THE NATIONAL BROADBAND PLAN: PROMOTING BROADBAND ADOPTION”
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Chairman Boucher, Ranking Member Stearns, and Members of the Committee – thank you for the invitation to discuss broadband adoption within the context of the National Broadband Plan (“NBP” and “Plan”) released recently by the FCC.

Connected Nation is a nonprofit organization that works with states, local communities, and technology providers to increase broadband adoption and digital literacy for all Americans – both urban and rural. For nearly 10 years, Connected Nation has worked directly with states, local leaders, consumers, and broadband providers to build public-private partnerships to identify gaps in broadband service; understand broadband and computer adoption barriers in communities; develop grassroots technology planning teams in every county across a state for improved broadband adoption, and provide computers along with technology literacy programs for low-income and disenfranchised people. We work on behalf of American consumers, and we continue to find, time and again, in communities across our nation, that unserved and underserved people can and will overcome broadband challenges when the public and private sectors work together toward meaningful solutions.

II. NEED FOR ADOPTION STIMULATION EFFORTS

When we examine the state of U.S. broadband through the prism of supply (infrastructure) and demand (adoption), it is clear that the nation’s “demand gap” is significantly larger than the “supply gap.” As such, to the degree that policy makers desire to generate the impacts oft-associated with broadband use, it is imperative that the balance of energy and attention be dedicated to closing the broadband adoption divide.

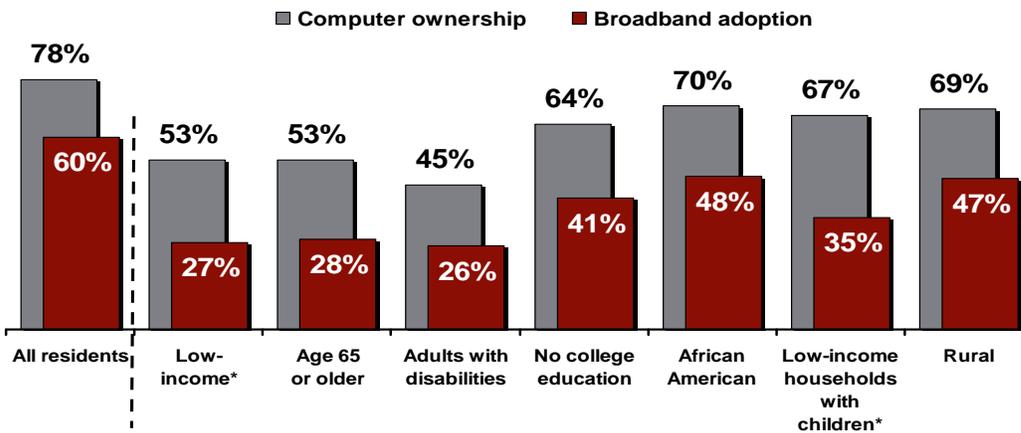
Connected Nation is currently delivering to NTIA data and broadband inventory maps for 13 states or territories (Alaska, Florida, Illinois, Iowa, Michigan, Minnesota, Nevada, Ohio, Puerto Rico, South Carolina, Tennessee, and Texas). While identifying and filling those supply side gaps is essential, in concurrence with the National Broadband Plan, Connected Nation’s experience in hundreds of American communities has taught us that broadband adoption stimulation is the key to the ultimate success of any effort to fully address the broadband challenge.

Connected Nation’s 2009 research in Ohio and Tennessee estimates household broadband availability¹ between 92% and 95%. However, only 60% of households in these states adopt the service at the home, indicating a significant gap in adoption that must be addressed (see Figure 1). The rates of adoption among certain demographic groups are even lower. These data are consistent with the FCC’s recent report on broadband adoption barriers stating that², among other key points: only 65% of adults are home broadband adopters; 50% of rural American adults adopt broadband, compared to 68% among non-rural American adults; and 6% of Americans use dial-up Internet connections as their main form of home access.

¹ State Broadband Data and Development Grant Program Notice of Funding Availability defines broadband as “Data transmission technology that provides two-way data transmission to and from the Internet with advertised speeds of at least 768 kilobits per second (kbps) downstream and at least 200 kbps upstream to end users...”
http://www.ntia.doc.gov/frnotices/2009/FR_BroadbandMappingNOFA_090708.pdf

² Broadband Adoption and Use in America: OBI Working Paper Series No. 1, February 2010, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf

Figure 1: Low Adoption Demographics



Q: Does your household have a computer?
 Q: Which of the following describe the type of Internet service you have at home?
 n=2,400 adults in Ohio and Tennessee

*Low-income here is defined as annual household income less than \$25,000
 Source: 2009 Residential Technology Assessments of Tennessee and Ohio

Connected Nation data is consistent with the FCC’s recent report on broadband (Broadband Adoption and Use in America: OBI Working Paper Series No. 1, February 2010, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf) projecting that 78% of adults are Internet users, whether that means broadband, dial-up, access from home or access from someplace other than home. The FCC reports 65% of adults are home broadband adopters. The FCC data demonstrates a rural gap in broadband adoption, reporting that 50% of rural American adults adopt broadband, compared to 68% among non-rural American adults. Further, there is an adoption gap among African-Americans, 59% of whom currently adopt broadband, and among Hispanics, whose adoption rate is only 49%. Only 42% of people with disabilities and 35% of Seniors currently adopt broadband, according to the FCC.

Similarly, the FCC also recently released a report detailing the state of broadband availability in the US, estimating broadband penetration at 95% (at speeds of 4 Mbps download and 1 Mbps upstream).³ In our experience, through public-private partnerships, the market can be harnessed with local consumer research and granular broadband maps to drive targeted broadband deployment to where it does not currently exist. Examining the state of U.S. broadband today, we quickly recognize that supply of broadband outstrips demand by between 30 and 35 percentage points.

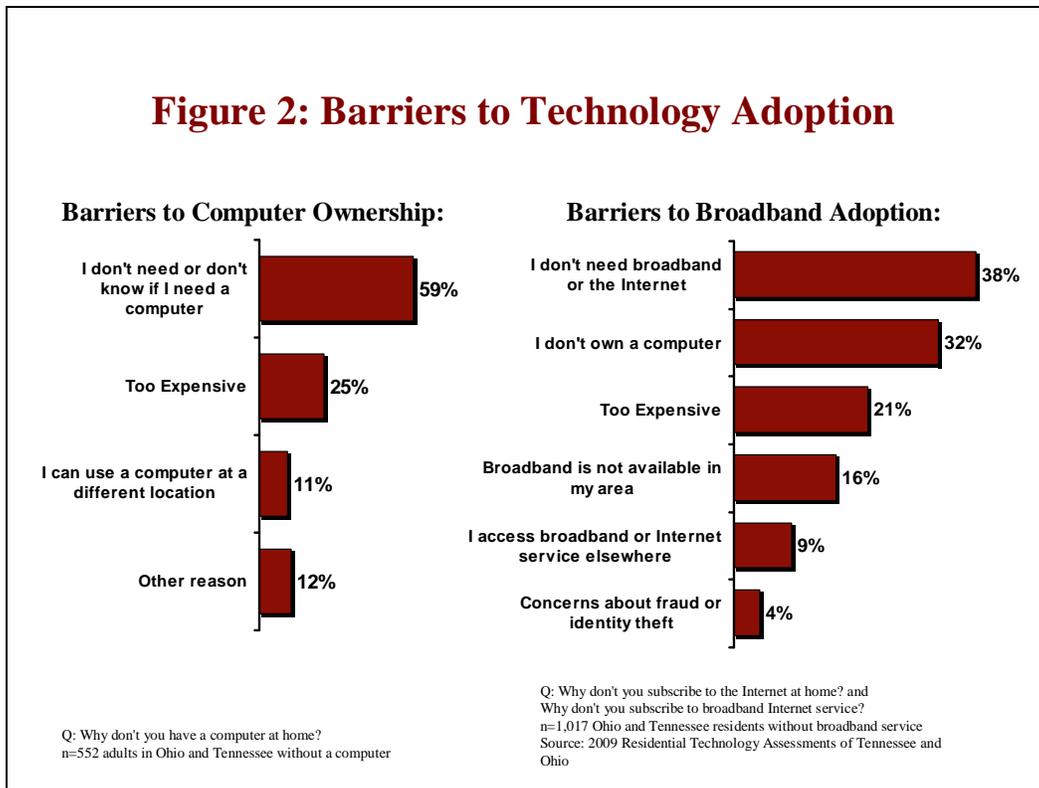
³ The Broadband Availability Gap: OBI Technical Paper No.1, April 2010, available at <http://download.broadband.gov/plan/the-broadband-availability-gap-obi-technical-paper-no-1.pdf>

These state level trends are also measured at the local level. In areas where the recession has hit the hardest, broadband adoption is much lower, even in areas where broadband is already universally available. One of the more striking examples falls in Congressman Gordon's district – Clay County, Tennessee, where 94% of residents have broadband available, yet only 38% subscribe (and that already accounts for a significant adoption increase of 15 percentage points since 2007). In communities across our country, Americans are not taking advantage of the benefits of broadband, even when it is available. This does not diminish the need for deploying broadband to areas that are unserved and underserved via stimulus funding and other programs as suggested in the National Broadband Plan. Broadband is a tool, and like any other it must be used to produce results – this is the measure by which we will gauge the true success or failure of our efforts.

Connected Nation's community-driven research demonstrates alarming broadband adoption gaps among at-risk populations. Figure 1 above illustrates computer ownership and broadband adoption rates across various vulnerable demographics in Tennessee and Ohio. Consistent with NBP findings on broadband adoption trends, these results show that while statewide broadband adoption rates in Tennessee and Ohio were estimated at 60% in 2009, only 26% of adults with disabilities, 27% of households earning less than \$25,000 per year, 28% of citizens over the age of 65, 35% of low-income households with children, 41% of adults with no college education, 47% of rural households, and 48% of African-American households subscribe to home broadband service.

The largest barrier to broadband adoption among adults who do not subscribe to broadband service in the home is relevancy, or a lack of awareness about the technology's benefits and associated value. 38% of those with no home broadband connection say "I don't need broadband or the Internet." 32% of respondents claim lack of computer ownership as the barrier to broadband adoption. Likewise, the top barrier to computer ownership is also a perceived lack of need. 59% of those who do not own a computer say, "I don't need a computer," and 25% of those who do not own a computer cite the up-front cost as a barrier. Similarly, 21% of those without a home broadband connection say broadband is too expensive (Figure 2).

Figure 2: Barriers to Technology Adoption



Last year, Connected Nation provided to this Committee a policy brief titled “The Call to Connect Minority Americans.” In it we highlighted some of the more severe broadband adoption gaps that exist in the U.S. today, including data showing that in 2007-2008 only 20% of low-income minority households adopt broadband, compared to 50% adoption rates among all Americans.⁴ Similarly, Connected Nation’s research shows a gap in adoption rates across rural (47%) and non-rural households (64%).⁵

These disparities demonstrate the need for federal support for public-private partnership driven efforts to increase broadband adoption. Innovation and demand will drive updates to both hardware and software that will require the support of faster and more robust networks, which means that broadband infrastructure investment is likely to continue increasing without significant intervention. In Connected Nation’s experience, however, programs that can drive broadband adoption represent a highly efficient use of taxpayer funds because data show that once someone begins using broadband, they tend to keep it, thus driving economic impact for their community. An April 2009 survey by the Pew Foundation’s Internet Project reported that people are twice as likely to sacrifice cell-phone service or cable television service than Internet service, with 22% of adults reporting that they had cancelled or cut back cable TV service in the previous 12 months, 22% of adults reporting that they have cancelled or cut back cell-phone

⁴ The Call to Connect Minority Americans: A Connected Nation Policy Brief, 2009, available at http://www.connectednation.org/documents/cn_minority_policybrief_final_031609.pdf

⁵ A Call to Connect Rural America: An American Farm Bureau Federation and Connected Nation Policy Brief, filed at the National Broadband Plan Public Notice # 18, available at http://www.connectednation.org/documents/AFBFCNresponseNBP18EconomicOppFINAL12_2009.pdf

service in the previous 12 months, compared to only 9% of Internet users reporting cancelling or cutting back on broadband.⁶

Connected Nation filed extensive comments, as part of the FCC's proceeding to craft a National Broadband Plan, on the model it has implemented with and on behalf of several states, which has been honed over the past five years to be scalable and replicable.⁷ For a review of this model and the experience in various states, please see "Connected Nation, Inc. Comments On A National Broadband Plan of Our Future, G.N. Docket 09-51 at http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6520220269

Further, Connected Nation has included as an appendix to this testimony a filing that summarizes Connected Nation's filings on several issue areas in the National Broadband Plan, which can also be found at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020384086>. Further, a Connected Nation filing specifically regarding broadband adoption can be found here: http://connectednation.org/documents/ConnectedNationresponseNBPNo16BroadbandAdoptionFINAL11_2009.pdf.

III. STIMULATING BROADBAND ADOPTION: WHAT HAS WORKED?

Connected Nation and its programs have been most successful at stimulating broadband adoption by inspiring and empowering communities to lead local initiatives that both reach out to disadvantaged populations and non-adopters AND also spur the creation of local applications, which create a higher level of relevancy that in turn spurs adoption.

We must note for the Committee, however, that these adoption programs do not and are not designed to function alone and should be part of a comprehensive and larger statewide or regional broadband initiative for maximum effectiveness and sustainability. Successful adoption stimulation programs implemented by Connected Nation combine:

- 1) Broadband mapping at a household and business level to identify infrastructure gaps as well as adoption barriers and other demand-side dynamics;
- 2) County level research to identify specific barriers to broadband adoption in each community;
- 3) County level technology planning teams, which will use the broadband maps and local research to develop tactical and community specific business plans for technology expansion;

⁶ (<http://www.pewinternet.org/Press-Releases/2009/Home-broadband-adoption-increases-sharply-in-2009.aspx>)

⁷ Connected Nation's NBP Comments –

Telework- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020039177>

Disabilities-

<http://connectednation.org/documents/ConnectedNationPolicyBriefTheCalltoConnectAmericanswithDisabilities.pdf>

Libraries- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020243836>

E-Gov- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020347166>

Adoption- http://connectednation.org/documents/ConnectedNationresponseNBPNo16BroadbandAdoptionFINAL11_2009.pdf

Healthcare- http://connectednation.org/documents/ConnectedNationresponseNBPNo.17Healthcare12_2009.pdf

Rural America- http://connectednation.org/documents/AFBF-CNresponseNBPNo.18EconomicOppFINAL12_2009.pdf

USF & IC- <http://connectednation.org/documents/ConnectedNationCommentsNo.19USFCombined.pdf>

Economy- http://connectednation.org/documents/CNReplyCommentsNBPNo.18EconOpportunity12_2009.pdf

Education- http://connectednation.org/documents/CN-NCBCP-BWRresponsetoNBPNo.15-Education12_2009.pdf

- 4) Computer connectivity programs for low-income and underserved populations; and
- 5) Thematic collaboration and cooperation between the public and private sectors across all program elements.

These five elements are consistent with the Broadband Data Improvement Act's Congressional mandate, which outlines a strategy to effectively address the national broadband challenge⁸. All five programmatic elements of the Broadband Data Improvement Act are critical for success in ultimately increasing broadband adoption and economic prosperity.

Public-private partnerships, such as those that Connected Nation works to foster, have proven themselves as the most effective vehicle for improving broadband availability and adoption. A key to encouraging adoption is to demonstrate how technology can impact the quality of life locally across all relevant sectors of the local economy. Central to this objective is the coordinated development of locally-relevant broadband applications that target the specific needs of each community through civic engagement (e-government), education, healthcare, and economic development. This is important because converting non-adopters requires intervention that goes well beyond "broadband cheerleading" or awareness raising campaigns; we must demonstrate that a broadband-connected computer provides value that will improve quality of life and provide wealth-creating opportunities. Such improvements tend to be local applications: job opportunities, access to school information and education services; access to health services; connection to family; and so on.

The strategy developed by Connected Nation to tackle this problem through grassroots involvement includes the creation of Local Broadband Task Forces. These volunteer teams become the point of engagement between broadband service providers, technology solutions providers, and local communities. Connected Nation empowers these local champions with essential information about the current state of technology in their community and provides pragmatic tactical plans to implement strategies at the local level for local online content and usage expansion. Importantly, each community determines how it can best benefit from broadband and technology expansion, creating a sense of local pride in ownership.

Community leaders come from key sectors, starting with local government and including other sectors such as healthcare, education, and the local private sectors, all of whom volunteer to develop and implement technology promotion plans within their communities. In this manner, the Connected Nation model fosters a sustainable, grassroots coalition of community leaders representing local government, education, healthcare, telecommunications, organized labor representatives, businesses, libraries, agriculture, tourism, and community-based organizations.

Community-level plans include detailed analysis of the best means of deploying new and available technology across each of the aforementioned sectors. The overarching purpose of these Local Broadband Task Forces is to create and aggregate demand for broadband, identify locally relevant applications or solutions, foster cooperation across both private and public sectors to ensure that the community's needs are fully addressed, and create local awareness of the opportunities of broadband.

⁸ For more information regarding the Broadband Data Improve Act mandate see the final Section of this testimony as well as the testimony of Brian Mefford, CEO of Connected Nation at: http://connectednation.com/in_the_news/testimonies_and_presentations/Mefford,%20Brian_Testimony%20and%20Appendix_H_ouse%20Sub_04022009.pdf

These teams are the heart of the success of Connected Nation's comprehensive strategy to promote broadband demand and stimulate private investment. Through these teams, communities are engaged in their digital futures and take charge of practical, viable, and sustainable solutions that address the particular barriers to broadband availability and adoption in those communities.

Below, results from Tennessee's local-level research and technology planning are explored in detail, but this type of work is also happening in every county across the state of Ohio.

Coshocton County, Ohio, in the heart of Appalachia, is a prime example of effective leadership working together for sustainable broadband expansion and adoption. In 2008, broadband adoption in Coshocton County, Ohio, was measured at only 32%, falling more than 40% below the state average. Local level research revealed Coshocton County's top barriers to broadband adoption as a lack of interest in broadband and lack of broadband availability. To overcome these barriers, the leaders of Coshocton County, Ohio, working in partnership with Congressman Zack Space and Connect Ohio, developed a model for broadband expansion using public safety towers and a local provider to create jobs and new broadband deployment into a large portion of the county. Meanwhile, the Coshocton County local technology team is developing a county-wide awareness and adoption plan centered on libraries and community colleges.

This Coshocton County effort is a public-private partnership involving many state and local agencies, local providers, and the entire community. This model has been adopted by Connect Ohio and shared across counties in Appalachian Ohio to produce seven community RFPs for broadband expansion in the past three months. These communities are proving that broadband expansion can and does occur when the public and private sectors work together, on the ground, to identify the true broadband challenges that are specific to each community, map the broadband gaps, and demonstrate an effective business case for expansion while simultaneously driving technology growth from the ground up, by addressing local needs and leveraging local resources.

TENNESSEE: A CASE STUDY FOR DRAMATICALLY IMPROVING BROADBAND ADOPTION

Connected Tennessee, a subsidiary of Connected Nation, has been working since 2007 to improve broadband adoption and availability in every Tennessee county. Connected Tennessee has partnered with local leaders in each of the 95 counties in the state to develop and implement county-level broadband strategic plans that address the key barriers measured in each community and develop pragmatic solutions that work. The results of such efforts speak for themselves. Home broadband adoption in Tennessee in 2007 was 43%. In January 2010, that rate increased to 58% accounting for 334,935 new home broadband subscribers in the state.^{9, 10} The Pew Internet and American Life Project estimates national household adoption rates at 47% in 2007 and 60% in 2010, demonstrating that efforts in Tennessee are effectively closing the divide.¹¹

Attesting to the success of the broadband adoption stimulation efforts undertaken across Tennessee, these data demonstrate faster growth in adoption of broadband service in Tennessee

⁹ July 2007 and January 2010 Connected Tennessee® Residential Technology Assessments.

¹⁰ Household estimate based on Census Bureau 2000 estimate of Tennessee household of 2,232,905.

¹¹ Pew Internet and American Life Project (surveys conducted in March 2007 and January 2010).

than in the rest of the country. In the three-year period between 2007 and 2010, the growth rate in broadband adoption in Tennessee was 35% compared to a national growth rate of 28%. Thanks to this faster growth, the lag in adoption rates in the state of Tennessee relative to the national average went from 4 percentage points in 2007 (47%-43%) to a two-point gap (60%-58%).

While Broadband adoption and Internet usage grew statewide in Tennessee between 2007 and 2010, there was notably significant growth among demographic groups who have historically been on the wrong side of the “digital divide.” For example, at the inception of Connected Tennessee, 72% of minority adults reported that they used the Internet either from home or some other location, compared to 78% of Caucasian respondents. By January 2010, though, 84% of minority adults report that they use the Internet, compared to 83% of Caucasians. Similarly, between 2007 and 2010, Tennessee cut the gap in Internet usage between rural and non-rural adults in half, from 6% to 3%. This growth is in part due to Connected Tennessee’s efforts that promoted demand stimulation among every community across the state, with a focus on vulnerable populations and low adopting groups such as minorities and rural residents.

Significantly, “take rates” in Tennessee have also increased markedly during this period. “Take rates” are defined as the percentage of households that have broadband available and also subscribe to broadband service. Measured take rates in Tennessee in 2007 were 50% and increased to 63% by 2010. In other words, while in 2007 only half of those households served chose to subscribe to broadband service, in 2010 close to two-thirds of households that have broadband available subscribe to the service.

This is an important trend, since in a market economy the demand is often the driver of investment. Higher take rates translate into higher demand, which provides a greater incentive for providers to continue providing quality service and expanding the network into unserved areas. This basic economic principle, which is at the core of Connected Nation’s model for broadband stimulation, appears to be working. Analyzing county-level data of broadband availability and adoption rates, Connected Nation has measured a positive significant correlation between county level take rates in 2007 and subsequent expansion of broadband availability at the county level.¹² This suggests that providers have responded to increasing demand by expanding their available service, whether into rural or non-rural counties.

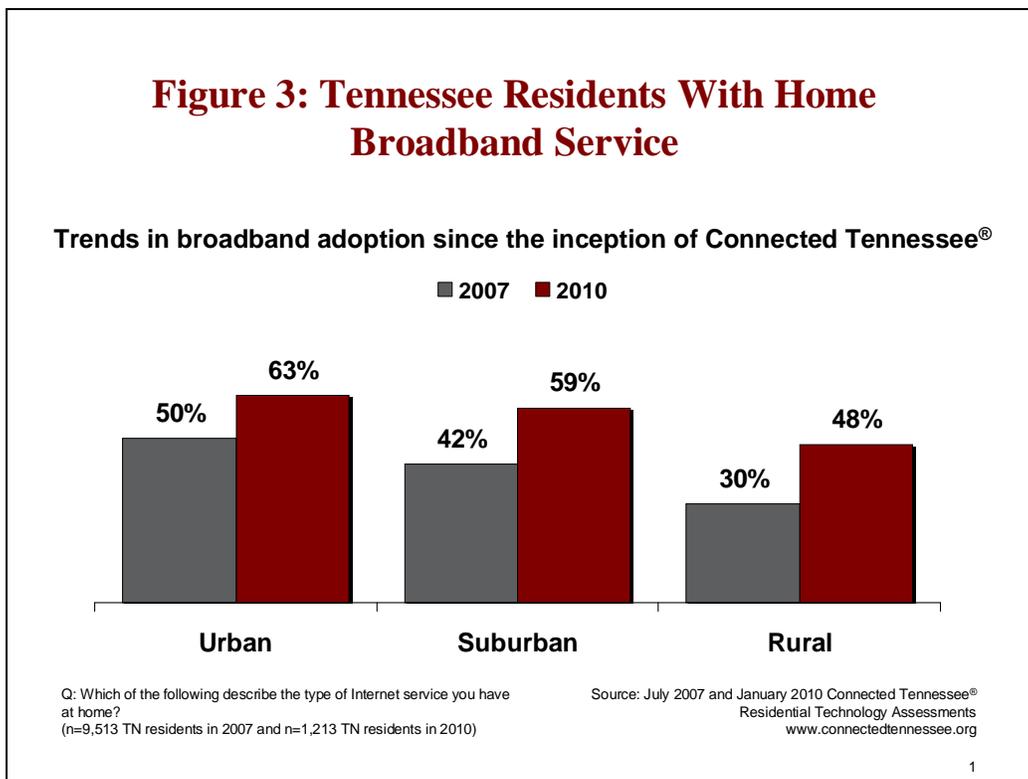
In fact, a significant portion of this growth in broadband availability and adoption is measured in rural areas. As measured in other states and consistent with FCC national findings, rural adoption rates in Tennessee lag behind urban and suburban rates. In 2007 broadband adoption rates in Tennessee among urban, suburban, and rural households was 50%, 42%, and 30%, respectively.¹³ In 2010 adoption rates across these demographics were 63%, 59%, and 48%, respectively.¹⁴ This implies that the rate of growth of broadband adoption during this period was significantly higher in rural areas than in urban areas. Between 2007 and 2010, household broadband adoption grew by 60% in rural areas of Tennessee, compared to 26% among urban households and 40% among suburban households. The strategies implemented across the state

¹² Correlation between 2007 take rates (measured as broadband adoption rates/broadband availability rates) and subsequent availability growth (increases in broadband availability between 2007 and 2010) is $r=.32972$.

¹³ 2007 Connected Tennessee® Residential Technology Assessment.

¹⁴ 2010 Connected Tennessee® Residential Technology Assessment.

of Tennessee to stimulate broadband adoption are proving particularly effective among rural communities.



Tennessee efforts to increase adoption rates among minorities in the state are also demonstrating results. In 2007 estimates for household broadband adoption among Caucasians, African Americans, and other minorities was 46%, 37%, and 37%, respectively. In 2010 home adoption rates among these same demographic groups was 61%, 47%, and 53%.¹⁵

These community programs are successful because they build sustainable, grassroots support for broadband adoption and deployment, and because they incorporate the knowledge, needs, and expertise of each local community and local government representatives. Broadband providers will invest in networks in areas where they know that demand for their service is present and sustainable — and the Local Broadband Task Forces, built at their core with state and local government assistance, provide that demand stimulation and stability.

Specific examples of the successes of the Local Broadband Task Force process include:

1. Bledsoe County, TN, where local leadership, led by Connected Tennessee, is working to expand technology outreach at the local library and offering computer training programs and experienced adoption growth rates of 400% (10% in 2007 to 41% in 2010).
2. Sequatchie County, TN, whose local leaders and the local Chamber of Commerce have actively worked with Connected Tennessee to increase broadband adoption rates by over 185%, increasing from 13% in 2007 to 37% in 2010.

¹⁵ 2007 and 2010 Connected Tennessee® Residential Technology Assessment.

3. Van Buren County, TN, whose adoption rate was only 16% in 2007. The local media aggressively supported Connected Tennessee's broadband stimulation process and adoption today stands at 42%, experiencing a growth rate of 163%.
4. Bedford County, TN, where there is strong community engagement in the Connected Tennessee local broadband task force team, adoption rates grew by 115% from 26% in 2007 to 56% 2010.
5. Warren County, TN, where the local Chamber of Commerce and library conducted IT training classes for the public and for business, emphasizing growth opportunities via e-commerce, and which experienced a doubling of home adoption rates between 2007 and 2010 (from 29% to 63%).
6. Anderson County, TN, a technology-savvy county that supports progress in education and e-government to promote the green benefits afforded by the technology, and where recreation and tourism sectors work with Connected Tennessee to increase broadband availability at river locations to support growth of water competitive sports. The county experienced adoption growth rates of 91% between 2007 (33%) and 2010 (63%).
7. Grainger County, TN, where community champions have been actively working with broadband providers to help drive improvements to broadband infrastructure and has partnered with Morgan County on a distance learning grant program, and where broadband adoption increased by 92% from 26% in 2007 to 50% in 2010.
8. Putnam County, TN, the home of Tennessee Technological University, where the Connected Tennessee public-private partnership drew significant engagement by local broadband providers and where broadband adoption rates grew by 88% from 32% in 2007 to 60% in 2010.
9. Marshall County, TN, whose leaders used the Connected Tennessee eCS process to assist in their economic development efforts, and where adoption rates increased by 87% from 31% in 2007 to 58% in 2010.
10. Rutherford County, TN, home of Middle Tennessee State University, which in 2007 experienced broadband adoption across 50% of households, and today boasts 73% adoption rate, above the national average.
11. Overton County, TN, where the local broadband task forces have been highly active, enjoyed strong community leadership and an engaged local broadband provider, and where the adoption rate increased by 81%, from 26% to 47% between 2007 and 2010.
12. Weakley County, TN, is home to E.T. Reavis and Son, established in 1890, which thanks to the successful business plan based on online sales, has grown its business beyond the local customer base of 2,800 to a become a business still located on the town square that brings in 90% of its revenue from online sales across the nation. Weakley County had a relatively high household broadband adoption rate of 51% in 2007. In 2010 adoption rates are above the national average at 68%.

Finally, Haywood County, TN, merits special consideration. Adoption rates in Haywood increased by 100% between 2007 and 2010, going from 17% to 34%. Connected Tennessee has actively worked with local elected officials and leaders to expand broadband resources. In

Stanton, Connected Tennessee's Computers 4 Kids® program last year donated 20 new Intel-based computers to the Saint John Baptist Church's After-School Program in Haywood County, a program that is serving as a hub of connectivity to a community with limited access to broadband technology. Currently, the program has 31 children signed up to participate, but hopes to eventually be able to open its doors to at least 200 – 300 children. The program also plans to ultimately welcome the entire community to use the computers at designated hours throughout the week.

State Representative Jonny Shaw serves as the pastor of Saint John Church and remarked that the impact of the computers on his rural county is especially significant since Saint John is currently one of the only locations in Stanton where the citizens can access broadband Internet.

The church is utilizing technology in various ways to expand its mission and foster economic development throughout the rural community of Stanton. They currently have a website in production and are also equipped with surveillance cameras that utilize a broadband connection to allow Pastor Shaw to view all angles of the church from the comforts of his home. Pastor Shaw hopes to continue to build upon this foundation to keep his church and community on the forefront of technology.

This church-based public computing center is one of its kind in this rural community of Stanton and today provides essential high-speed access resources as well as educational and training programs to this otherwise unconnected community.

The Committee can see this vibrant example via a testimonial by Pastor and Representative Shaw and other members of his rural community of Stanton, TN, who have leveraged state, local, and donated private resources to work with Connected Tennessee's Computers 4 Kids® program to expand a public computing center catering to children and the elderly in their community, available at this link:

http://www.connectedtn.org/multimedia/one_community_at_a_time/.

Each of these examples of the success of the Connected Nation Local Broadband Task Force process shares common trends of local engagement and communities driving their technology solutions. Equally as important, these county-level stories illustrate the importance of local consumer research in a successful broadband initiative. For each of the counties above, Connected Nation and Connected Tennessee have gathered county-specific research on the barriers to broadband adoption, broadband availability, reasons for broadband adoption, and other data necessary to craft the best broadband strategy for each community.

This granular and regularly updated research allows each local leadership team to understand better the technology benchmarks in their community, and it also allows for granular measurement of what works, what doesn't, what progress has been made, and how far we still need to go.

COMPUTER DISTRIBUTION PROGRAMS AMONG LOW INCOME COMMUNITIES IS AN ESSENTIAL TOOL TO OVERCOME KEY BARRIERS TO ADOPTION

According to 2009 research conducted by Connect Ohio, 52% of households who do not have access to Internet services at home (broadband or dialup) reported lack of a computer as the primary reason for the lack of connectivity.¹⁶ Research conducted in Tennessee and Kentucky shows similar results.¹⁷ This data is supported by academic research that shows that education and income inequality are important factors that explain low broadband adoption rates.¹⁸

Faced with this challenge to technology and broadband adoption, Connected Nation works with state and local leaders to recognize that a critical part of an effective program to address the digital divide challenge had to focus on computer distributions for the poor and disconnected.

Since its origins, Connected Nation has had the pleasure to help deliver on behalf of state government and private donors thousands of computers to low income kids and centers that serve them through our No Child Left Offline®/Every Citizen Online®/Computers 4 Kids® digital inclusion programs. These programs bring together public and private partners to promote digital inclusion by placing computers in the hands of disadvantaged children and their families. The private sector promotes the program through generous donations. In fact, the vast majority of Connected Nation's funding support from the private sector is funneled to these philanthropic programs. State government brings to the program financial support as well as the resources of multiple state agencies to help implement the program and identify and locate candidates to receive computers.

Computers 4 Kids® has already delivered more than 3,200 Internet-ready computers to disadvantaged individuals and families across the state of Kentucky, and the program is also operating in Ohio. A similar program is tackling this challenge in Tennessee where, in partnership with the state's Department of Human Services and the Department of Children's Services, Connected Tennessee and Computers 4 Kids® is scheduled to deliver 3,000 computers to underprivileged children and their families in the next three years and has delivered over 2,100 computers since 2007. Since 2006, Connected Nation has distributed nearly 6,000 computers to children and community centers in need.¹⁹

One of the more powerful success stories from this program comes from Congresswoman Blackburn's district in Perry County, TN, where the unemployment rate is one of the highest in the country. Through the Connected Tennessee Computers 4 Kids® program and a donation from the ATT Foundation, 20 computers and six printers were placed in a summer youth program, creating jobs for high school students who gained experience helping improve web-

¹⁶ Connect Ohio 2009 Residential Technology Assessment. Available at: http://connectoh.org/documents/Res_OH_06192009_FINAL.pdf

¹⁷ ConnectKentucky, 2007 Kentucky Technology Trends: Results of the 2007 ConnectKentucky Residential Survey. Available at http://www.connectkentucky.org/documents/2007KentuckyTechnologyTrends_residential_3-28-08_001.pdf

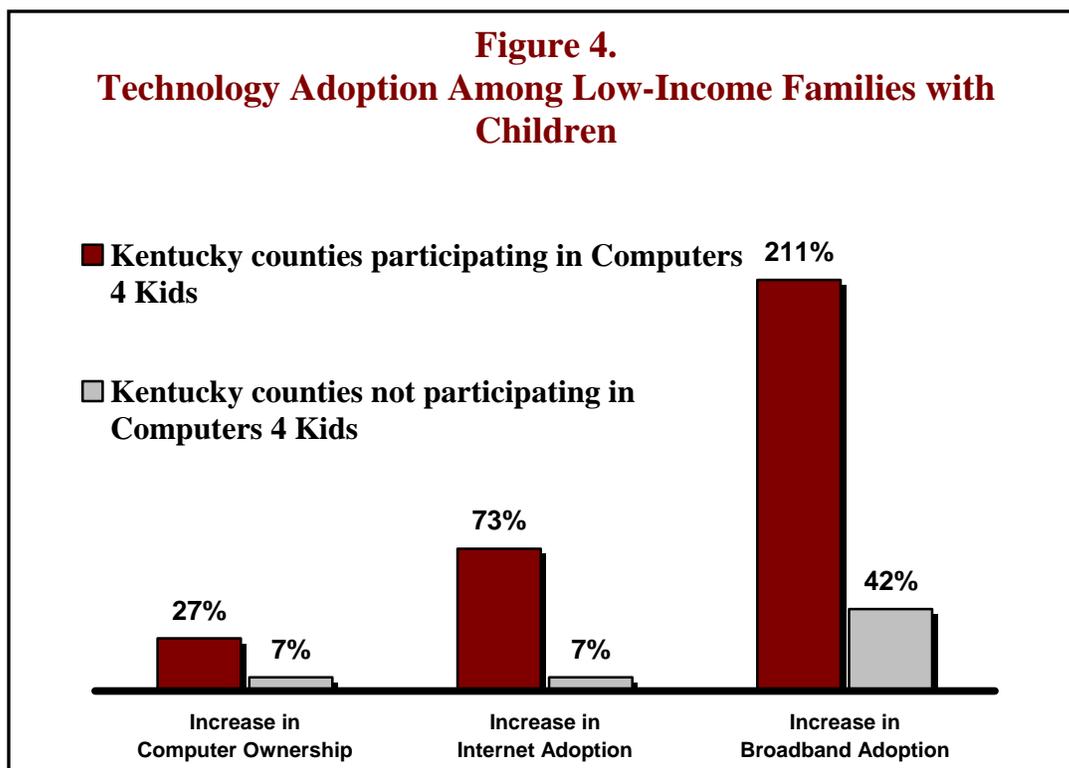
¹⁸ See G. S. Ford, T. M. Koutsky and L. J. Spiwak, The Demographic and Economic Drivers of Broadband Adoption in the United States, PHOENIX CENTER POLICY PAPER No. 31 (Nov. 2007). According to the Phoenix Center, "broadband adoption is intimately tied to demand-side factors like income inequality and education, and policies directed at those factors may be more cost effective than supply-side subsidies and regulation." Id. at 5.

¹⁹ <http://www.youtube.com/watch?v=l38Pa6IrNUk>

based tourism and economic development for the city of Linden. After this summer program ended, the computers were transformed into a digital factory, creating permanent technology jobs for young adults in Perry County.

Computers 4 Kids® and its sister programs have had a dramatic impact on the lives of thousands of families, and these distributions have a positive effect on broadband adoption rates that goes beyond the recipient households. According to the ConnectKentucky 2005 and 2007 Residential Technology Assessments, computer ownership among low-income families in Computers 4 Kids® counties grew nearly four times faster over the last two years than among low-income families in other counties. During the same two-year period, Internet adoption among low-income families in Computers 4 Kids® counties grew more than ten times faster relative to these families in other areas of the state. Broadband adoption among low-income families grew five times faster in counties that received computers through Computers 4 Kids®.

Indeed, in the last two years, home broadband adoption among low-income families has grown by over 200% in these participating counties (Figure 4).²⁰



It is quite clear that programs like Computers 4 Kids® have a substantial impact upon broadband adoption rates. And adoption rates are the key to ensuring that communities continue to receive next-generation broadband investment

²⁰ Counties participating in Computers 4 Kids include the Kentucky counties of Johnson, Clay, Wolfe, McCreary, Owsley, Carter, Lawrence, and Morgan. Low-income is defined as annual household income below \$25,000. See 2007 Kentucky Technology Trends, *supra* n. 10, at 27.

IV. THE NATIONAL BROADBAND PLAN MAKES SEVERAL GOOD RECOMMENDATIONS

In the National Broadband Plan, the FCC makes several recommendations that Connected Nation believes should be supported by both the Legislative and Executive Branches. Connected Nation applauds the FCC's emphasis on state and local efforts to increase broadband adoption. The FCC states in the NBP that keeping people online through sustainable efforts that help end-users derive value from the Internet "in his or her own way" are critical and Connected Nation wholeheartedly agrees. In our experience, the "value proposition" of broadband is found from the creation of locally-relevant content and applications that end-users can use to improve their quality of life.

As stated earlier, outreach and awareness campaigns are important elements of Connected Nation programs, but these functions are designed to go further than highlight and leverage the actions of local volunteer leadership teams. They do these things but also go beyond general broadband cheerleading to design meaningful local interventions that meet the threshold for end user relevance and value that demonstrate not only how the technology will have a positive impact on individuals but also how broadband's relevance can help users save and make money.

The FCC recommends that the NTIA "explore the potential for public-private partnerships to improve broadband adoption by working with other federal agencies." Connected Nation applauds the FCC's recognition in the Plan of the fact that "tribal, state and local governments are often in the best position to identify barriers and circumstances unique to their communities," and agrees with the FCC that "local leaders can play an important role by building on existing social programs and partnering with community organizations that non-adopters already rely on as trusted sources of information. They can tailor adoption efforts to address language barriers, lack of credit, low basic literacy levels and other issues faced by non-adopters." These principles are the foundation of Connected Nation's demand aggregation philosophy and have a proven record of success.

By recognizing "that there is no 'one-size-fits-all' answer," and that "local action, coupled with federal support, ...can connect people with technology to improve their lives," the FCC reaffirms recommendations made to this Committee by Connected Nation while Congress was crafting the legislation that became the Broadband Data Improvement Act (BDIA).

The FCC recommends, and Connected Nation agrees, that we:

- "Focus on the barriers to adoption. Successful efforts address multiple barriers to adoption simultaneously. They combine financial support with applications and training that make broadband connectivity more relevant for non-adopters. Relevance, in turn, boosts the technology's perceived value and affordability."
- "Focus on broadband in the home. While libraries and other public places are important points of free access that help people use online applications, home access is critical to maximizing utilization. Broadband home access can also help rural, low-income, minority and other communities overcome other persistent socioeconomic or geographic disparities." The importance of this point, especially for rural America and rural broadband, cannot be overstated. According to our 2009 Ohio residential broadband survey, fully 75% of broadband users access the Internet from home.²¹

²¹ Connect Ohio 2009 Residential Technology Assessment at: http://connectoh.org/documents/Res_OH_06192009_FINAL.pdf

- “Promote connectivity across an entire community. New users adopt broadband to stay in touch with others. In addition, people are more likely to adopt and use broadband if the people they care about are online and if they see how broadband can improve their quality of life in key areas such as education, health care and employment.”
- “Promote broadband utilization. Promoting access and adoption are necessary steps, but utilization is the goal. People must be able to use broadband to efficiently find information or use applications to improve their lives. A connection is just the beginning.”
- “Plan for changes in technology. Adoption programs have to evolve with technology. Both the trainers and the equipment they use to serve non-adopters must employ up-to-date technology and applications.”
- “*Measure and adjust.* Measurement and evaluation are critical to success because they allow programs to make adjustments on an ongoing basis.” Connected Nation already does this through regular and recurring research and the local level and regularly updated broadband maps.
- “Form partnerships across stakeholder groups. Promoting adoption requires federal commitment, state, local and Tribal action, industry partnership and support from nonprofits and philanthropic organizations. Sustainable broadband adoption and use will require efforts from all partners.” This recommendation embodies the state and local grassroots team aspect of Connected Nation programs.

The FCC recommends, and Connected Nation agrees, that “the federal government should support the public-private partnership model to implement ... programs at the local level; private, non-profit and community-based entities should work together to draw people online, particularly those that under adopt.”

Connected Nation would particularly urge the NTIA, and Congress, to support the NBP recommendation 9.4 and explore “the potential for public-private partnerships to improve broadband adoption by working with other federal agencies. NTIA should consider supporting public-private partnerships of hardware manufacturers, software companies, broadband service providers and digital literacy training partners to improve broadband adoption and utilization by working with federal agencies already serving non-adopting communities. Congress should consider providing additional public funds, or NTIA should use existing funds to support these partnerships.” Connected Nation is proud to be partnering with One Economy, Intel, Microsoft, AT&T, BendBroadband, Bresnan Communications, Bright House Networks, Cablevision Systems Corp., Charter Communications, Comcast, Cox Communications, Eagle Communications, Inc., Dell, Mediacom Communications Corp., Midcontinent Communications, the National Cable & Telecommunications Association (NCTA), Sjoberg’s Cable TV, Suddenlink Communications, Time Warner Cable, US Cable Group, and USTelecom, to create the Digital Adoption Coalition which represents a direct response to this FCC recommendation.

Finally, Connected Nation strongly supports section 9.6 of the National Broadband Plan, which focuses on expanding federal support for regional broadband capacity building, program evaluation and sharing of best practices.

The National Broadband Plan recognizes that not all states are able to consistently fund state-level broadband programs, such as those in Ohio and Tennessee, and that federal support for state and local initiatives is recommended in Recommendation 9.11.

The Plan states that the Broadband Data Improvement Act recognized the value of these initiatives, and recommends that NTIA “provide additional funding to support ongoing grants aligned with Section 106 of BDIA. The Recovery Act made \$350 million available to NTIA to fund the state data-gathering and development goals set in BDIA. NTIA has currently assigned only a portion of these funds; the remainder should be obligated to state-level organizations in 2010.” Connected Nation strongly agrees, both to fully fund the five-year mapping activities already underway, of which NTIA has only funded through Year Two, and to expand these grants to their full scope of activities. The NBP states, “Each of the following is consistent with the uses outlined by BDIA. These state-level organizations should:

- Complete strategic planning based on gap analysis of broadband availability, adoption and the existing capacity of local support organizations.
- Establish programs to improve computer ownership and Internet access in unserved and underserved areas.
- Provide technical expertise to local institutions, non-profits and governments to develop deployment and adoption related initiatives.
- Work with the private sector to create public-private partnerships to access infrastructure, technical expertise, training and program funding.
- Accelerate broadband application usage in key areas like government, education and health care.
- Gather state and local benchmark data to determine program success over time.
- Coordinate and enhance volunteer and non-profit programs that provide digital literacy and small business broadband training.”

In short, after several hearings and much work and deliberation, Congress outlined the most effective method to overcome broadband adoption barriers in the Broadband Data Improvement Act. In addition to bipartisan and widespread support on Capitol Hill, the Broadband Data Improvement Act attracted support from a diverse group of organizations, nonprofits, and companies.

Because the NTIA has yet to define how to use the remainder of funds available for BDIA implementation, it is important to remember, at this juncture, that mapping is just one piece of the larger grant program within the Broadband Data Improvement Act.

The clear intent of Congress, in authorizing the State Broadband Data and Development Grant Program, Sec. 106 of P.L. 110-385 and then providing up to \$350 million for that program in the American Recovery and Reinvestment Act, was to have this grant program work in concert with the other programs authorized and funded as the Broadband Technology Opportunities Program. The statutory language of the BDIA included many complementary activities. Broadband mapping was to be a starting point of support for a statewide and grassroots demand-stimulation program, with local consumer research on technology trends designed to support efforts to drive deployment and increase adoption. Finally, digital inclusion programs to provide computers to

disadvantaged populations were also included as part of the State Broadband Data and Development Grant program in order to tackle one of the documented greatest barriers to adoption: lack of a computer in the home.

Furthermore, in the Broadband Data Improvement Act, Congress states:

“The Federal Government should also recognize and encourage complementary State efforts to improve the quality and usefulness of broadband data and should encourage and support the partnership of the public and private sectors in the continued growth of broadband services and information technology for the residents and businesses of the Nation.”²²

Taken together, the BDIA and the ARRA contained a comprehensive broadband policy laid out by the U.S. Congress that will do much to improve broadband deployment and adoption in the United States.

The NTIA has worked swiftly to ensure that it is positioned to deliver a national broadband inventory map to Congress by February 2011, and is also providing grants from the Broadband Technology Opportunities Program (BTOP) for infrastructure, sustainable adoption programs, and to expand the capacity of public computing centers. Funding and authorization for BTOP, however, is mandated by the ARRA to cease by the end of Fiscal Year 2010. Authorization will still exist for the State Broadband Data and Development Grant Program, and the Federal government should use the Broadband Data Improvement Act to ensure that state government initiatives, including those funded under the BTOP sustainable adoption program, can continue or adapt to become comprehensive and statewide efforts.

This role of enabling initiatives that are driven by the public sector at the state and local government level, with information aggregated upward, is consistent with National Broadband Plan recommendations for stimulation of broadband adoption and will allow the Federal government the greatest efficiency from its allocated resources. The State Broadband Data and Development Grant Program can (and was intended to) be utilized well beyond the current Fiscal Year to fund statewide efforts that map broadband inventory, aggregate demand and grow adoption rates, drive broadband deployment into unserved and underserved areas, and conduct extensive consumer research concerning the use and demand for broadband service and related information technology services.²³

V. CONCLUSION

Through the BDIA, the ARRA and the National Broadband Plan, Congress and the FCC have laid out a clear path to address the challenge and opportunity that America faces today. Today there is a complex intersection of broadband policy issues under revision. It is important to keep an eye on the key challenges that we face as a nation.

Filling in the broadband gaps is essential to ensure that *all* Americans can participate in the twenty-first century economy. These efforts are essential to ensure that rural America remains a vibrant part of our economy and society.

²² P.L. 110-385, Sec. 102 (4)

²³ See P.L. 110-385, Section 106.

The job, however, is not complete unless we ensure that all Americans who have access to this technology are in fact using it in ever more productive ways to improve their lives and livelihoods. Congress recognized the need for federal enabling of efforts to stimulate broadband adoption across vulnerable populations that remain disconnected. The FCC, through the National Broadband Plan, has examined the challenge and proposed a series of recommendations to address them. It is imperative that as a nation we focus on programs that have a proven record of success working with local communities to identify and address the challenges that each community is experiencing.

As we embark on this extensive and complex review of our national broadband policy, addressing such complex issues as Universal Service reform, Intercarrier compensation, or net neutrality, it is important that we do not lose sight of the most important challenge – and opportunity – that we face. A debate over legal frameworks about network management means little to millions of Americans who don't have access to high-speed Internet services or who, while having access, are not able to use this technology because they are unaware of its benefits, are digitally illiterate, do not own the equipment needed to access it, or cannot afford the service. At Connected Nation, we have had the privilege to see firsthand the positive outcomes of collaboration and public-private partnerships in this arena, and never cease to be amazed at what is possible when a community and individuals have the desire and opportunity to connect and access transformative broadband technology.

Through our experience, Connected Nation has found that nonprofit organizations such as our own have an important role to play working with both public and private sector stakeholders to foster and facilitate localized strategies for broadband expansion. We look forward to continue working with Congress, the Federal government, states, and thousands of local champions who understand and share our mission for universal digital inclusion across America.

Thank you again, Chairman Boucher, Ranking Member Stearns, and Members of the Subcommittee for this opportunity to testify today, and I would be pleased to respond to any questions you might have.



**CONNECTED
NATION®**



Consumer Insights into America's Broadband Challenge and Opportunity:

**A Policy Brief by
Connected Nation**

Winter 2010

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I. Introduction

During the comment cycle opened by the FCC in connection with the National Broadband Plan proceeding (“NBP”), Connected Nation filed 10 comments offering insights stemming from our archive of state-specific survey research on consumer trends in broadband adoption¹. These comments address a myriad of issues regarding what drives and prevents adoption of broadband services across different demographic groups, including people with disabilities, minorities, families with children, library patrons, and among rural residents and businesses. Connected Nation’s comments are based on our years of experience working with communities and states to address the challenges of expanding broadband to all citizens, particularly those who are currently disconnected. Connected Nation is a not-for-profit organization working to build public-private partnerships to ensure that broadband access is available to and increasingly used by all Americans.

Our work starts with business and residential survey research to help us understand which residents and businesses are adopting broadband services, which are not, and how this technology is already affecting people’s lives and businesses. Our goal in these filings is to share key findings of this research with policy makers and others in the hope that this rich data will help inform our national broadband policy. In this briefing we present an overview of some of the key insights that stem from these filings.

A. Who is Lagging Behind Digital Adoption and Why?

Connected Nation’s data collected across several states offers a general understanding of who is adopting broadband technologies and who is not, and what are the key barriers to adoption experienced by this latter group. Consistent with other data sources on broadband adoption trends, Connected Nation’s 2009 data from the states of Ohio and Tennessee systematically reflects that the digital divide is particularly problematic among certain demographic groups. While state-wide broadband adoption rates in Tennessee and Ohio were estimated at 60% in 2009, only 26% of adults with disabilities, 27% of households earning less than \$25,000 per year, 28% of citizens over the age of 65, 35% of low-income households with children, 41% of adults with no college education, 47% of rural households, and 48% of African-American households subscribe to home broadband service (Figure 1).²

¹Connected Nation’s NBP Comments –

Telework- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020039177>

Disabilities- http://www.connectednation.org/_documents/ConnectedNationPolicyBrief-TheCalltoConnectAmericanswithDisabilities.pdf

Libraries- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020243836>

E-Gov- <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020347166>

Adoption- http://connectednation.org/_documents/ConnectedNationresponseNBPNo.16BroadbandAdoptionFINAL11_2009.pdf

Healthcare- http://connectednation.org/_documents/ConnectedNationresponseNBPNo.17Healthcare12_2009.pdf

Rural America- http://connectednation.org/_documents/AFBF-CNresponseNBPNo.18EconomicOppFINAL12_2009.pdf

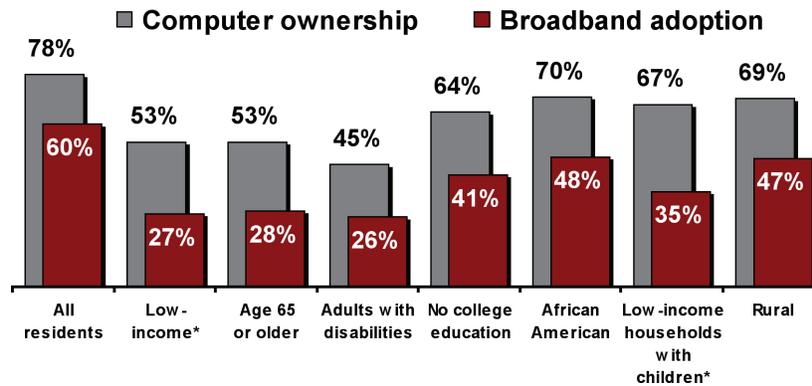
USF & IC- http://connectednation.org/_documents/ConnectedNationCommentsNo.19USFCombined.pdf

Economy- http://connectednation.org/_documents/CNReplyCommentsNBPNo.18EconOpportunity12_2009.pdf

Education- http://connectednation.org/_documents/CN-NCBCP-BWRresponsetoNBPNo.15-Education12_2009.pdf

²Connected Nation, 2009 Residential Technology Assessments of Tennessee and Ohio.

Figure 1: Low Adoption Demographics



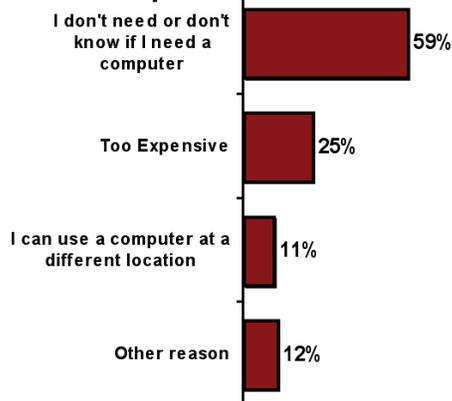
Q: Does your household have a computer?
 Q: Which of the following describe the type of Internet service you have at home?
 n=2,400 adults in Ohio and Tennessee

*Low-income here is defined as annual household income less than \$25,000
 Source: 2009 Residential Technology Assessments of Tennessee and Ohio

The largest barrier to broadband adoption among adults who do not subscribe to broadband service in the home is a lack of awareness about the technology's benefits. 38% of those with no home broadband connection say "I don't need broadband or the Internet." 32% of respondents claim lack of computer ownership as the barrier to broadband adoption. Likewise, the top barrier to computer ownership is also a perceived lack of need. 59% of those who do not own a computer say, "I don't need a computer," and 25% of those who do not own a computer cite the up-front cost as a barrier. Similarly, 21% of those without a home broadband connection say broadband is too expensive (Figure 2).³

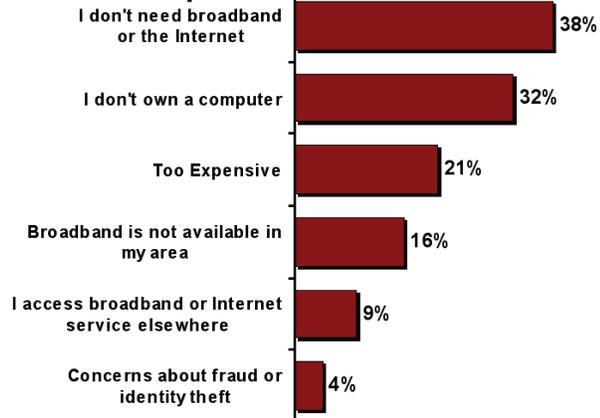
Figure 2: Barriers to Technology

Barriers to Computer Ownership:



Q: Why don't you have a computer at home?
 n=552 adults in Ohio and Tennessee without a computer

Barriers to Broadband Adoption:



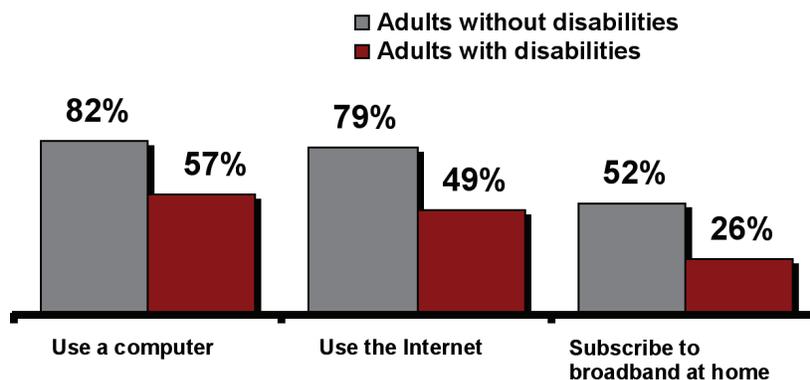
Q: Why don't you subscribe to the Internet at home? and Why don't you subscribe to broadband Internet service?

Barriers to adoption of broadband service across different demographic groups follow a similar pattern. Across several filings contributing to the NBP debate, Connected Nation was able to drill down further into patterns of adoption and use by these demographic groups.

B. Broadband Technology Among Americans with Disabilities

Connected Nation's October 5, 2009, filing regarding broadband as it affects people with disabilities indicates that adults with disabilities are falling behind the general population in the adoption of broadband technology. Despite the opportunities that a computer and broadband Internet access can provide adults with disabilities, only 57% of respondents with disabilities in Kentucky, Tennessee, and Ohio use a computer compared to 82% for the overall population, and only 26% subscribe to broadband compared to a rate of 52% across the three states under research (Figure 3).⁴

Figure 3: Technology Adoption



Source: 2007-2008 Residential Technology Assessments of KY, TN, and OH
n=2,810 KY, TN, and OH adults without disabilities and n=195 KY, TN, and OH adults with disabilities

Extrapolating this pattern to the national population, this translates into 23.4 million Americans with disabilities who lack broadband service at the home. Lack of computer ownership and perceived value of the service are the key barriers to broadband adoption for this demographic, suggesting that this group would be most impacted by policies aimed to address these demand-side barriers to broadband adoption.⁵

Broadband is an important tool that is starting to revolutionize healthcare delivery and, as such, broadband presents a particular opportunity to affect the lives and livelihood of people with disabilities. In 2009, 72% of broadband subscribers who obtain healthcare information online in Ohio and Tennessee claim that it has empowered them to be healthier (Figure 4). Forty-seven percent of broadband subscribers who obtain healthcare information online report that obtaining this information online has prevented trips to the doctor, a hospital, or a medical center (Figure 5).⁶ Such healthcare-related benefits

⁴Connected Nation's NBP Comments – Adults with Disabilities, page 1.

⁵Ibid.

⁶Connected Nation's NBP Comments – Healthcare.

stemming from broadband are particularly relevant to people with disabilities. Policies that specifically target the millions of Americans with disabilities that remain disconnected should be a key outcome of our National Broadband Policy.

Figure 4: “Obtaining healthcare information online has empowered me to be healthier”

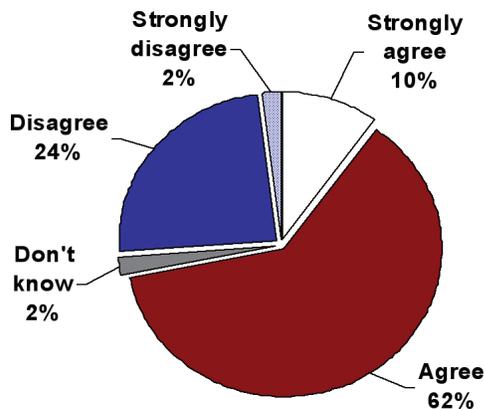
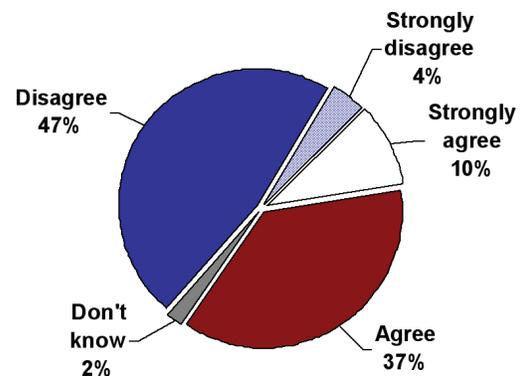


Figure 5: “Obtaining healthcare information online has prevented trips to my healthcare provider”



n=191 respondents with broadband service at home who obtain healthcare information online or communicate with healthcare providers

C. Telework in America

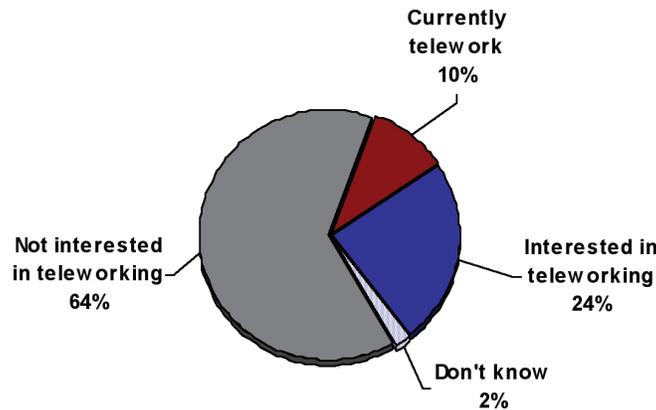
Broadband is critical infrastructure, necessary to maintain economic stability and encourage economic growth. Several studies have shown that with a solid broadband foundation, America’s opportunities for economic growth will quickly improve. Connected Nation’s October 22, 2009, filing demonstrates that as the United States becomes ever more reliant on broadband, a key economic opportunity for our nation is emerging – Americans working from home through a broadband connection, commonly known as teleworking.

Residential surveys conducted by Connected Nation in Kentucky, Tennessee, and Ohio from 2007- 2008 show that while 10% of employed adults currently telework, an additional 24% of employed adults who do not currently telework would be interested in doing so if they were empowered to telework (Figure 6).⁷ Nationally, this would equate to nearly 35 million potential teleworkers, for a total of 49.5 million or 34% of the employed adult population.⁸

⁷Connected Nation’s NBP Comments – Telework, page 9.

⁸Ibid.

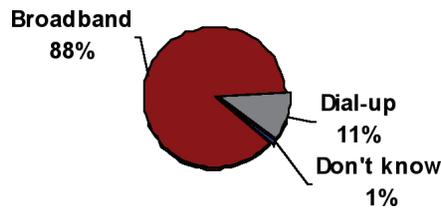
Figure 6: Interest in Teleworking Among Employed Adults



Based on employed civilian labor force of 145.5 million, reported by the US Bureau of Labor Statistics for Q3, 2008 (www.bls.gov)

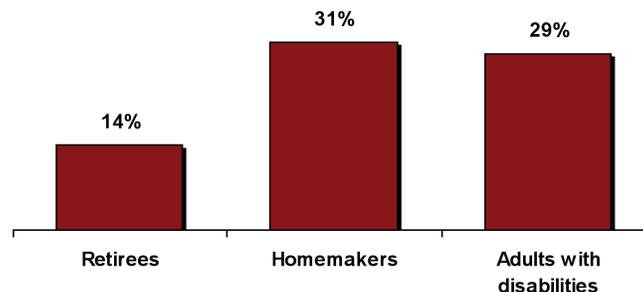
While it is impossible to reduce the entire teleworking population down to a “typical” teleworker, Connected Nation’s survey research enable us to create a profile of the current teleworking population. The vast majority of teleworkers rely on their home broadband connection to work from home (Figure 7),⁹ once again showing how important broadband adoption is to the growth in teleworking.

Figure 7: Teleworkers by Internet Connection



Telework becomes an enabler for non-working Americans by transforming employment into something that is compatible with the realities in their lives. Fourteen percent of retirees, 31% of homemakers, and 29% of adults with disabilities said they would be willing to join the workforce if they could telework through a broadband connection (Figure 8).¹⁰

Figure 8: Likely to Telework Via Broadband



⁹Ibid, page 11.
¹⁰Ibid, page 17.

If we assume that new teleworkers earn the national average income, these new teleworkers would create an additional \$739 billion income earnings annually.¹¹ That includes over \$163 billion for retirees, \$103 billion for homemakers, and \$166 billion that would be earned by adults with disabilities each year.

In order to benefit from this growth in teleworking, though, America needs to place a high priority on increasing both the availability and the adoption of home broadband service. Nearly nine out of ten teleworkers rely on a broadband connection to work from home, and the broadband connection speeds of teleworkers are significantly higher than the average broadband user.¹² Because of the benefits that accompany ubiquitous broadband availability and adoption, highlighting the benefits of teleworking has rightfully been recognized as a key component of the Commission's National Broadband Plan. The first step is for the Commission to strive for a fast, reliable, secure broadband infrastructure by addressing both supply and demand barriers to provide broadband for every American community. Connected Nation's research has shown that teleworking can provide new opportunities for the American workforce, but to do so, home broadband availability and adoption must both increase in order to realize the full potential growth.

D. Impact of Broadband Among Low Income, Minority and Rural Households with Children and its Implications for e-Education Policy

As Figure 1 above reports, low income households and minority households with children present in the home are statistically less likely to use broadband services, despite the fact that the presence of children in the home is shown to be a driver for adoption of computer and broadband services.¹³ Figure 9 below reports broadband technology adoption in Tennessee and Ohio during 2009 among households with children in the home from different demographic groups. While 72% of all households with children subscribe to home broadband service – a figure much higher than the national average across all households - our data suggest that only 35% of low-income households with children living at home say they subscribe to broadband. Further, 49% of minority households with children, and only 55% of single-parent households, report that they subscribe to home broadband service.¹⁴

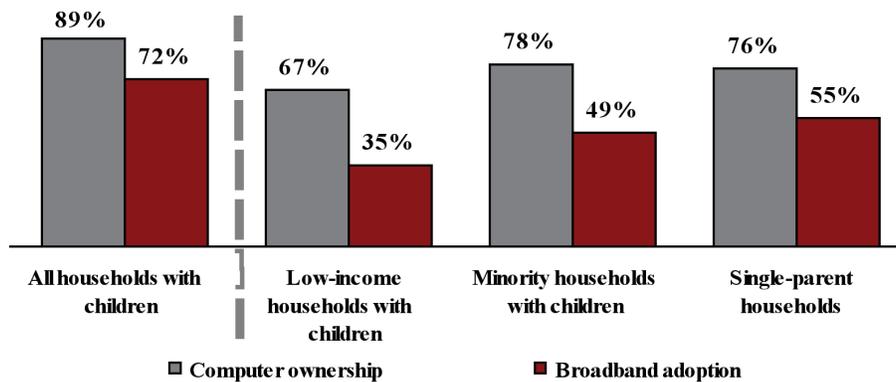
¹¹Based on the 2008 mean annual income of \$42,270, as reported by the United States Bureau of Labor Statistics (http://www.bls.gov/oes/current/oes_nat.htm).

¹²*Ibid*, page 11.

¹³*Consumer Insights into American Broadband Challenges: A Connected Nation Policy Brief*, page 6.

¹⁴*Connected Nation's NBP Comments – Education*, page 7.

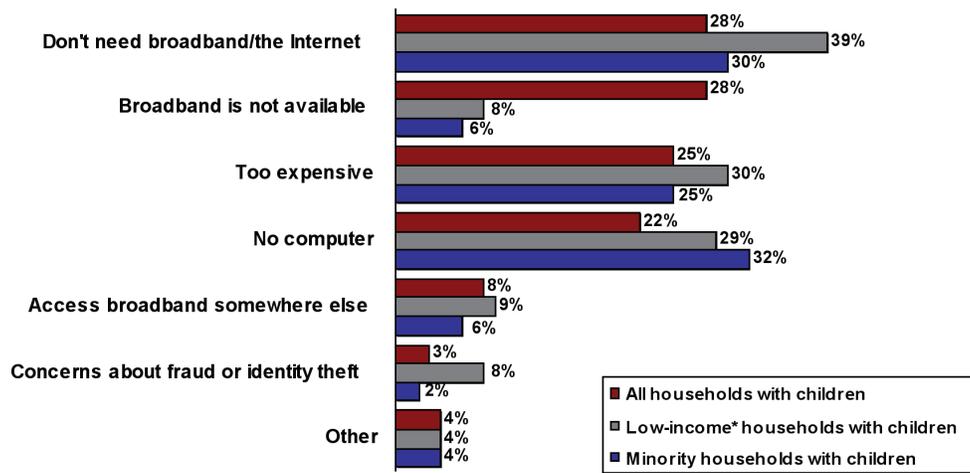
Figure 9: Technology adoption among households with children



n=244 Tennessee and Ohio residents with children living at home who do not subscribe to home broadband service.

A comparison across reported barriers to broadband adoption in Tennessee and Ohio among low-income and minority households with children and the average household with children reveals differences that have policy implications. Figure 10 reports that while the key barriers to broadband usage among all households with children is a lack of perceived need and lack of broadband availability (among 28% of all household with children respondents), the top barriers to adoption of broadband service among low-income and minority households with children are a perceived lack of need, a lack of home computer ownership, and affordability of the service (Figure 10).¹⁵ These data suggest that key policy strategies affecting these demographic groups are those focused on ameliorating the barriers to computer and broadband adoption, as well as addressing the affordability of the service.

Figure 10: Barriers to Broadband Adoption



*Low-income=households with annual incomes less than \$25,000

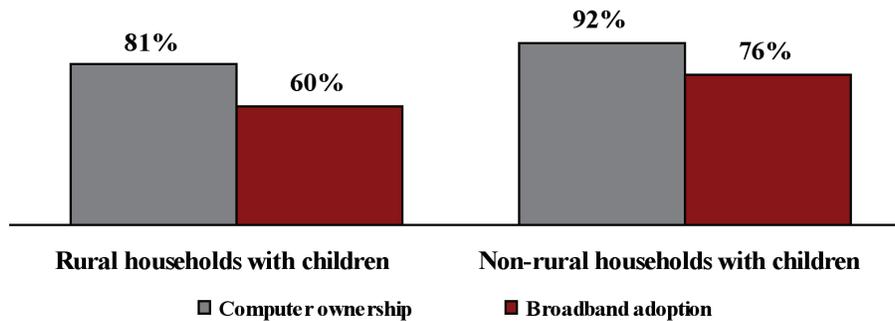
n=244 Tennessee and Ohio residents with children living at home who do not subscribe to home broadband service, 77 of whom are low-income and 63 of whom are minority.

Source: 2009 Residential Technology Assessments in Tennessee and Ohio

¹⁵ibid, pages 8 and 9.

Rural households with children also lag behind non-rural counterparts in computer and broadband adoption (Figure 11). Rural households with children are less likely to own a computer (81% of rural households, compared to 92% of non-rural households) and only 60% of rural households with children subscribe to home broadband service, compared to 76% of their non-rural counterparts.¹⁶

Figure 11: Technology adoption among rural households with children



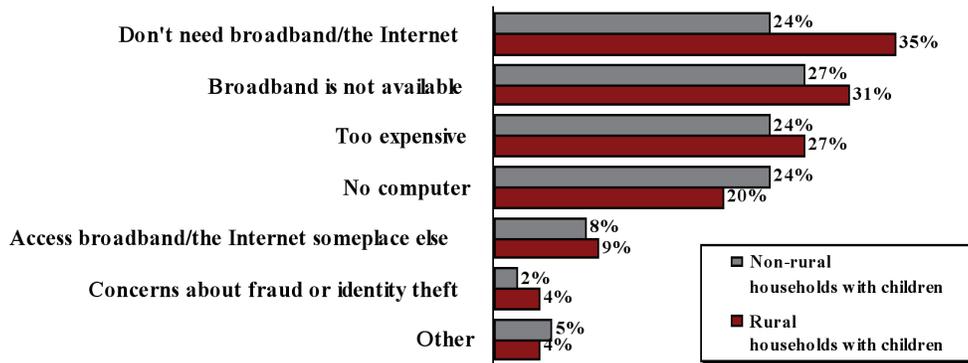
See Corey Murray, Translation Tool Tackles Language Barrier: Grant Program uses IBM Technology to Help Schools Translate E-Mails, Web Sites, eSchools News (March 29, 2007), available at <http://www.eschoolnews.com/news/top-news/index.cfm?i=45788&CFID=2844512&CFTOKEN=46694510> (last visited September 1, 2009) ([this technology program is being used to] “teach members of the Hispanic community about computers, show English-language learners how to conduct online research, better engage parents in their children’s education, and encourage ESL students to share their language—and their heritage—with their English-speaking friends.”)

A comparison of barriers to broadband adoption across rural and non-rural households with children who do not subscribe to broadband indicates, as one might expect, that not having broadband available at the point of residence is a barrier among rural dwellers (31% of rural households with children who do not subscribe to broadband indicate that broadband availability is a factor, compared to 27% of non-rural households with children who do not subscribe to broadband). Less predictably, data reveals that lack of perceived need and affordability of the service present greater barriers to adoption of broadband service for rural households with children than their counterpart in non-rural areas. This suggests that while policies that address network infrastructure expansion in unserved areas will have an impact among this demographic group, policies that promote awareness of the value proposition of the service, affordability, and other barriers to adoption will also have an important impact among rural households with children (Figure 12).¹⁷ In other words, many rural children need to have broadband made available where they live. However, rural children, like many of their non-rural counterparts, will also benefit from policies that directly address endemic barriers to broadband adoption, such as awareness of the value proposition, computer ownership, and affordability of the service.

¹⁶ibid, page 11.

¹⁷ibid, page 12.

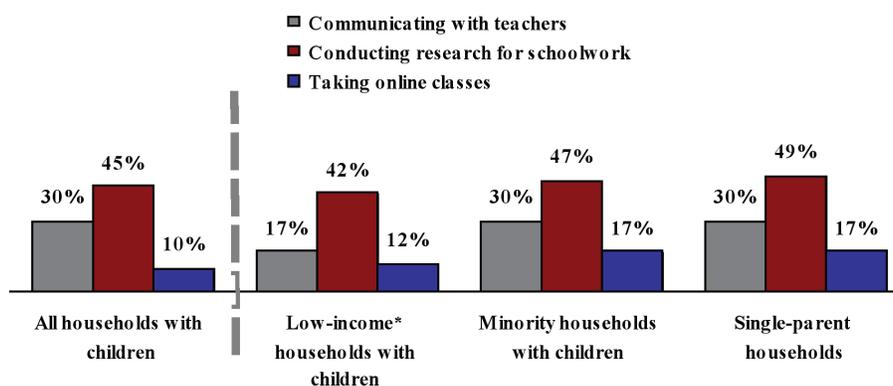
Figure 12: Barriers to broadband adoption among rural households with children



2009 Residential Technology Assessments of Ohio and Tennessee. n=858 OH and TN residents who have children living at home.

These data have important repercussions for the national discussion of how broadband access is affecting the education of children today in America. In particular, the data reveals that today some American children do not have the means to enjoy the online educational tools that other American children have readily available in their homes. As online educational applications continue to take hold among children across our nation it is imperative that policy makers address this imbalance. Failure to do so will imply lesser opportunities for development and economic potential for those children who are experiencing digital exclusion, including those in low-income, minority, and rural households and others, who are often unaware of what it is they are missing. Figures 13 and 14 below report different online educational applications used by households with children across different demographics. The data suggests that low-income and rural households with children are lagging behind other households with children in their use of educational online tools.¹⁸

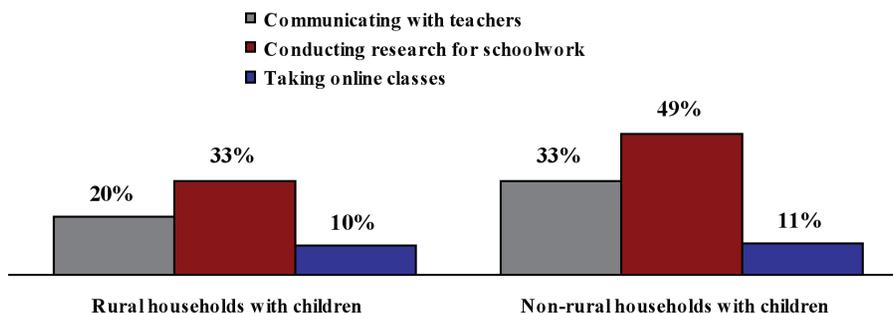
Figure 13: Use of various online educational applications among households with children



2009 Residential Technology Assessments of Ohio and Tennessee. n=858 OH and TN residents who have children living at home.

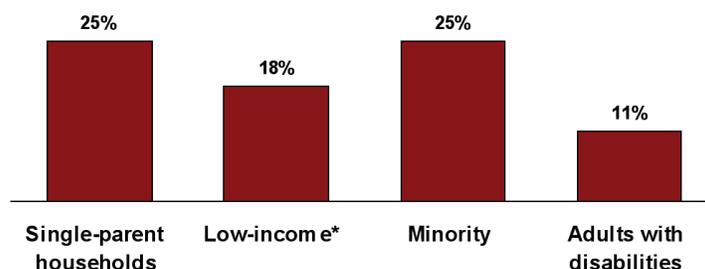
¹⁸bid, page 14.

Figure 14: Use of various online educational applications among rural households with children



2009 Residential Technology Assessments of Ohio and Tennessee. n=858 OH and TN residents who have children living at home.

Figure 15: Percent of each demographic group using the Internet at their library



n=2,400 residents of Tennessee and Ohio

*Low-income=annual household incomes below \$25,000

Source: 2009 Residential Technology Assessments in TN and OH

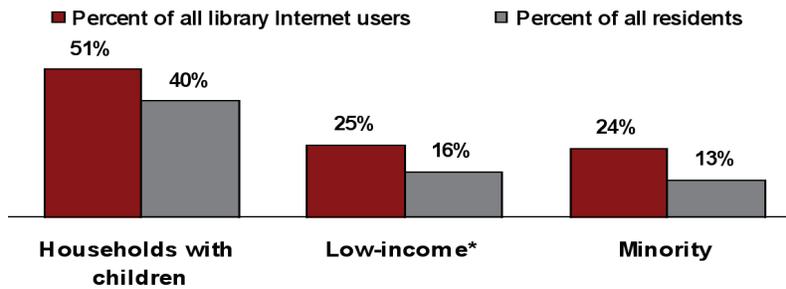
E. The Role of Libraries as Community Broadband Centers

Connected Nation's filing of October 29, 2009, contributed a discussion about the role of libraries as important – sometimes the only – means of high-speed access to the Internet among citizens who do not have the benefit of a broadband connection in the home or place of work. In 2009, Connected Nation conducted surveys to better understand the role of libraries as community technology hubs.¹⁹ The findings indicate that libraries are vital in filling an access void in local communities where the library is most often the only source of free Internet availability. Significant percentages of those who normally don't subscribe to broadband – specifically single parents, minorities, and low-income residents – are relying on the local library as their sole or primary Internet resource: 25% of single parents, 25% of minorities, 18% of low income residents, and 11% of people with disabilities depend on libraries for Internet connections (Figure 15).²⁰

¹⁹Connected Nation's NBP Comments – Libraries, page 2.

²⁰ibid, page 2.

Figure 16: Percent of library Internet users compared to all residents, by demographic



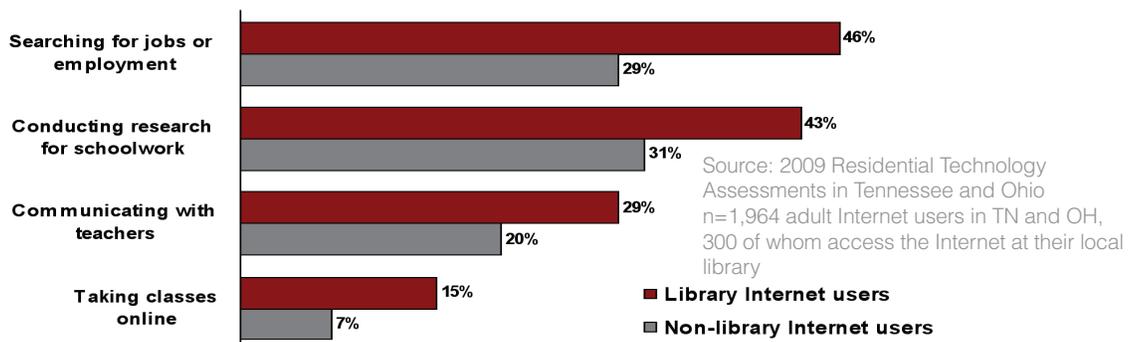
n=2,400 TN and OH residents, 300 of whom access the Internet at their local library *Low-income=annual household incomes below \$25,000

Source: 2009 Residential Technology Assessments in Tennessee and Ohio

Upon examining the demographic make-up of library Internet users, three demographic groups stand out with significantly higher representation than average. The share of Internet library users who are minority, have annual household incomes below \$25,000, or who have children living at home, is each significantly larger than in the population as a whole. More than one-half (51%) of library Internet users have children at home, suggesting that a significant portion of those who use the Internet at their library are children. Further, 25% of library Internet users are low-income, and 24% represent minority populations. In all three groups, these percentages are significantly higher than in the population as a whole, suggesting that Internet access at the local library is especially important for parents and children, low-income residents, and minorities (Figure 16).²¹

Connected Nation’s surveys also found that library Internet users are statistically more likely than other Internet users to employ broadband for education, workforce development, civic engagement, and communicating with healthcare professionals. The surveys found that library Internet users are more likely than other Internet users to use the Internet for improving their education and finding employment. Forty-six percent of library Internet users search for jobs online, compared to 29% of other Internet users. Library Internet users take online classes more than twice as often as other Internet users, and library Internet connections are also used frequently for completing homework and communicating with teachers (Figure 17).²²

Figure 17: Internet users who conduct educational and workforce development activities online

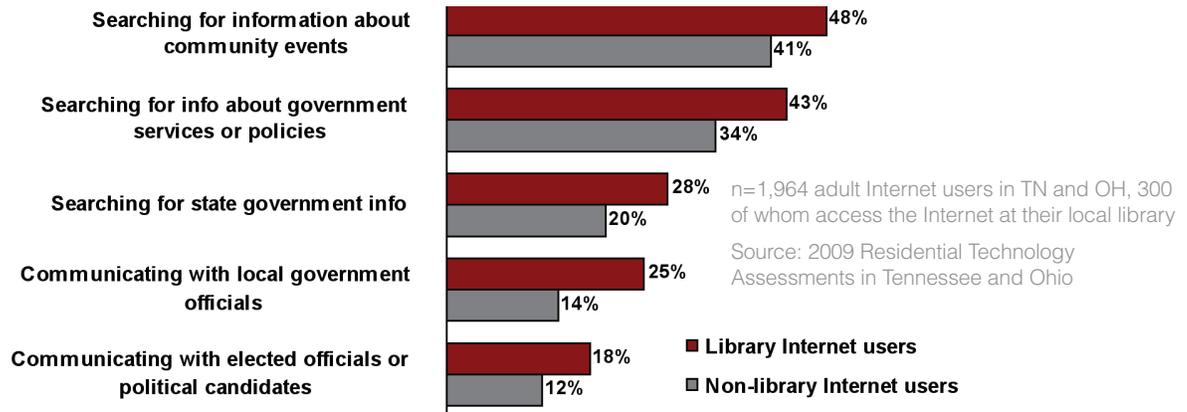


²¹Ibid.

²²Ibid, page 4.

Libraries are meeting an essential community need by helping community residents find work, as well as improve their job skills to increase their productivity and help provide job security. Further, library Internet users are more likely to depend on the Internet as an enabler and resource for civic engagement and information. Of particular note, library Internet users are nearly twice as likely as other Internet users to communicate online with local government officials (Figure 18).²³

Figure 18: Internet users who engage in civic activities online



F. E-Government Services: A Vital Tool for All Citizens

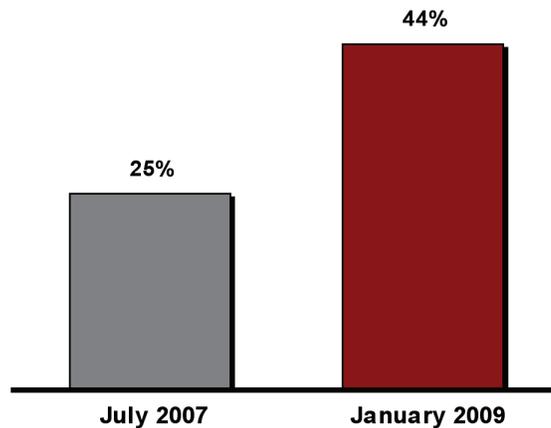
Connected Nation's filing on November 6, 2009, provided input and examples of successful state and local government initiatives, programs, and participation that have positively impacted available knowledge on broadband/technology data, broadband deployment, and the rate of household broadband adoption. In many states, including those in which Connected Nation has been an active player, state, local, and tribal governments have been a key driver in broadband improvement to date. E-government services, or the use of the Internet to access government information and services, is a vital online tool for many Americans, and one that is growing in importance as more government agencies at the local, state, and federal level provide a greater variety of online services to clients, businesses, and other governmental agencies.

Connected Nation research shows that a growing share of both residents and businesses rely on their home broadband connection to stay in touch with local, state, and federal government agencies. Research from 2009 in Tennessee showed that 44% of all Tennessee adults use their home broadband connection to conduct e-government activities (Figure 19).²⁴ This represents a 76% growth rate in the adoption of e-government from July 2007 when only 25% of adults used their home broadband services to access to e-government services.

²³Ibid, page 5.

²⁴Connected Nation's NBP Comments – E-Gov, page 11.

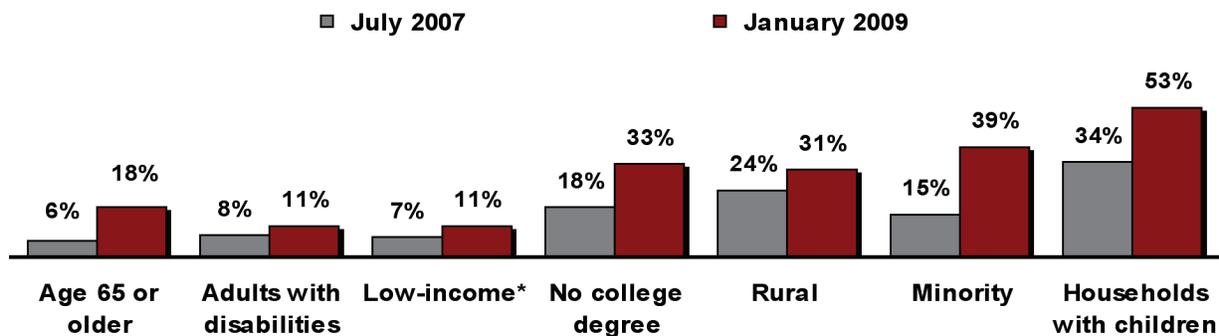
Figure 19: Tennessee adults who use broadband for e-government services



Source: July 2007 and January 2009 Tennessee Residential Technology Assessments. n=9,513 TN residents in 2007 and 1,200 TN residents in 2009. e-Government activities include contacting government officials, searching for government service and policy information, interacting with state or local government, and making online transactions with the government. January 2009 survey results were used due to a change in methodology in the way that application questions were asked in the July 2009 Connected Tennessee Residential Technology Assessment.

Additionally, a growing number of different demographic groups rely on their home broadband service to connect with their local, state, and federal government offices (Figure 20).²⁵

Figure 20: Percent of all Tennessee residents who use home broadband service to access e-government services



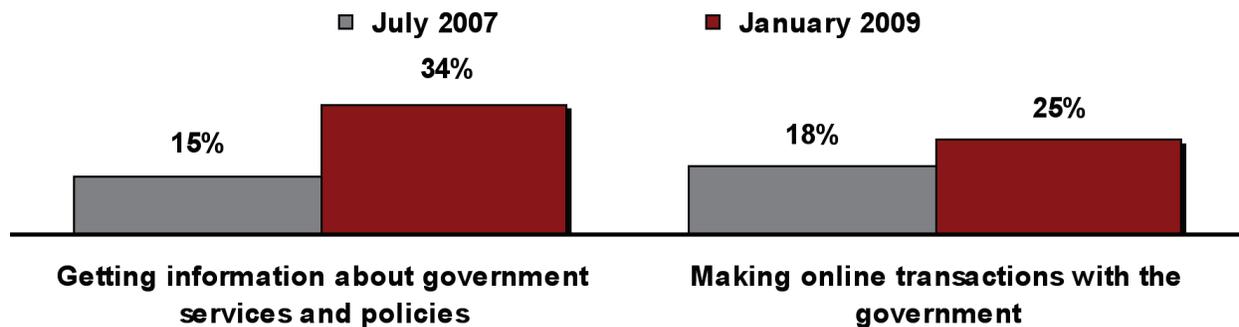
Source: July 2007 and January 2009 Tennessee Residential Technology Assessments. n=9,513 TN residents in 2007 and 1,200 TN residents in 2009. *Low-income=households where the annual household income is less than \$25,000.

Consumers who access e-government services through their home broadband connection reported that they do so for a number of reasons, most of which fall into two distinct categories: using the Internet to learn about government services and policies, and conducting online transactions with government offices (Figure 21).²⁶

²⁵Ibid, page 12.

²⁶Ibid, page 13.

Figure 21: Type of e-government applications accessed by Tennessee adults using a home broadband connection



Source: July 2007 and January 2009 Tennessee Residential Technology Assessments. n=9,513 TN residents in 2007 and 1,200 TN residents in 2009.

Connected Nation research shows that online access to e-government services has been growing steadily in recent years, rapidly becoming a “killer application” for broadband services: an application providing tangible value, and hence a key reason to adopt and continue using broadband access, to both citizens and the private sector. This trend should continue and be strengthened through the promotion and investment by government in these services. It is important that all levels of government continue expanding the array of e-government services provided online, as well as the effectiveness of online e-government platforms. Such investments will trigger greater growth in e-government services, resulting in government savings and benefits for the private sector.

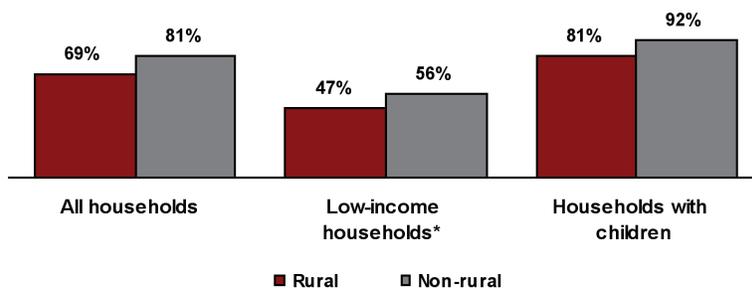
G. Understanding the Rural versus Non-Rural Gap

In their joint filing in the NPB debate of December 4, 2009, the American Farm Bureau Federation and Connected Nation measured differences in adoption and usage of broadband service across rural and non-rural areas for both businesses and residential consumers.²⁷ Data from Connected Nation’s 2009 surveys in Tennessee and Ohio show a gap across rural and non-rural households in adoption of computers and broadband. While 81% of all households in non-rural areas report owning a home computer, only 69% of rural respondents do. Similarly, 47% of rural low-income households (earning less than \$25,000 annually) report owning a computer, compared to 56% of low-income non-rural households. Among households with children, computer ownership rates go up, but the rural-non-rural gap is still measurable: 81% of rural households with children report having a computer at home, compared to 92% among non-rural respondents (Figure 22).²⁸

²⁷ *Connected Nation’s NBP Comments – Rural.*

²⁸ *Ibid*, page 3.

Figure 22: Computer Ownership Among Rural and Non-Rural Residents by Demographic



Q: Does your household have a computer?
 (n=2,400 adults in Tennessee and Ohio, 683 of whom are rural,
 449 of whom are low-income, and 858 of whom have children
 under the age of 18 living at home)

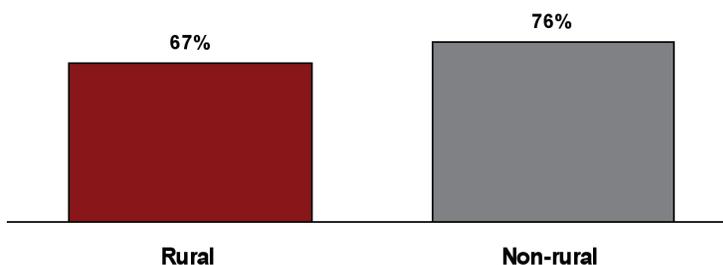
*Low-income=households with annual household incomes below
 \$25,000

Source: 2009 Residential Technology Assessments of Tennessee and Ohio

Broadband adoption trends show a similar pattern. While 64% of non-rural households report subscribing to broadband in the home, only 47% of rural households adopt the service. While 28% of low-income, non-rural households subscribe to the service, only 24% of rural, low-income homes do so. Similarly, while 76% of non-rural households with children report subscribing to broadband, only 60% of households with children in rural areas have broadband at the home.²⁹

Importantly, this adoption lag in rural areas cannot be explained in full by a supply-side or network infrastructure gap. Figure 23 compares “take rates,” or the percentage of broadband subscribers relative to all households that have broadband available to them (including those that report subscribing to broadband and those who do not subscribe but report having broadband available at their homes), across rural and non-rural areas in Ohio and Tennessee. The data show that while 76% of non-rural dwellers with broadband access choose to subscribe to the service, only 67% of rural dwellers that have broadband access subscribe. This represents a significant gap that illustrates the demand-side challenge facing rural America.³⁰

Figure 23: Broadband “Take Rates” Among Rural and Non-rural Residents Who Report Having Broadband Available*



Q: Which of the following describe the type of Internet service you have at home? (Broadband, Dial-up, None, Don't Know)
 (n=1,435 adults in Tennessee and Ohio who either subscribe to home broadband service or report that broadband is available where they live)

*“Take rates” = (% of home broadband subscribers) / (% of residents who EITHER subscribe to home broadband service OR report that broadband service is available where they live)

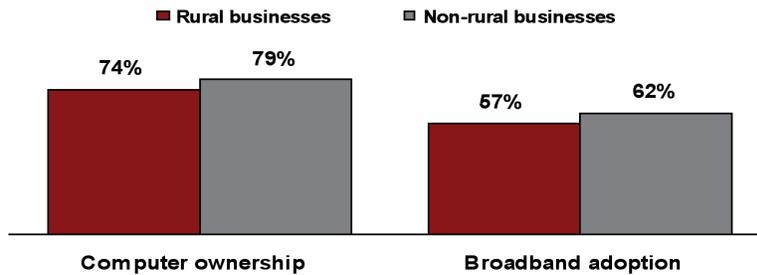
Source: 2009 Residential Technology Assessments of Tennessee and Ohio

²⁹Ibid, page 4.

³⁰Ibid.

Technology adoption trends among businesses also measure a demand-side gap across rural and non-rural areas. Figure 24 indicates that, in 2009 in Tennessee and Ohio, 74% of rural businesses report owning a computer, compared to 79% among non-rural businesses. Broadband adoption among rural business lags behind, at 57%, compared to adoption rates of 62% among non-rural businesses.³¹

Figure 24: Computer Ownership and Broadband Adoption among Businesses in Tennessee and Ohio

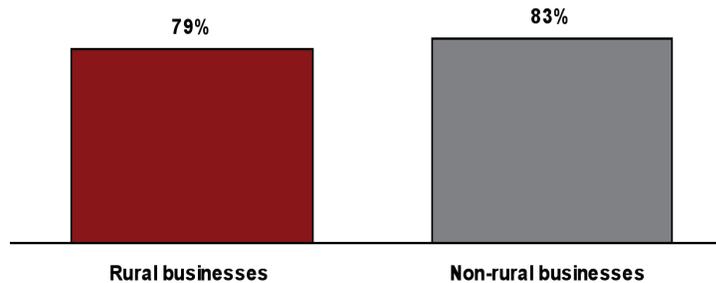


Q: Does your company use any type of computer technology to handle some or all of its business functions? And
 Q: Which of the following describes the type of Internet access your company has? (n=1,609 businesses in TN and OH)

Source: 2009 Business Technology Assessments of Tennessee and Ohio

As was the case among residential consumers, this gap in broadband adoption is not fully explained by a lack of available broadband service. Among businesses that have service available, “take rates” differ across rural and non-rural businesses. Figure 25 indicates “take rates” of 79% for rural businesses compared to 83% among businesses in non-rural areas.³²

Figure 25: Broadband “Take Rates” among Rural and Non-rural Businesses That Report Having Broadband Available*



Q: Which of the following describes the type of Internet access your company has? (Broadband, Dial-up, None, Don't Know) (n=1,306 businesses in Tennessee and Ohio, 326 of which are rural, that either subscribe to broadband service or report that broadband is available at their location)

*“Take rates” = (% of broadband subscribers) / (%of businesses who EITHER subscribe to broadband service OR report that broadband service is available at their location)

Source: 2009 Residential Technology Assessments of Tennessee and Ohio

These findings suggest that the lag in the adoption of broadband services among rural dwellers is real and cannot be explained solely due to the remaining gaps in infrastructure availability; that is, supply-side factors. Demand-side barriers to technology adoption and usage are a significant factor affecting

³¹Ibid, page 6.

³²Ibid.

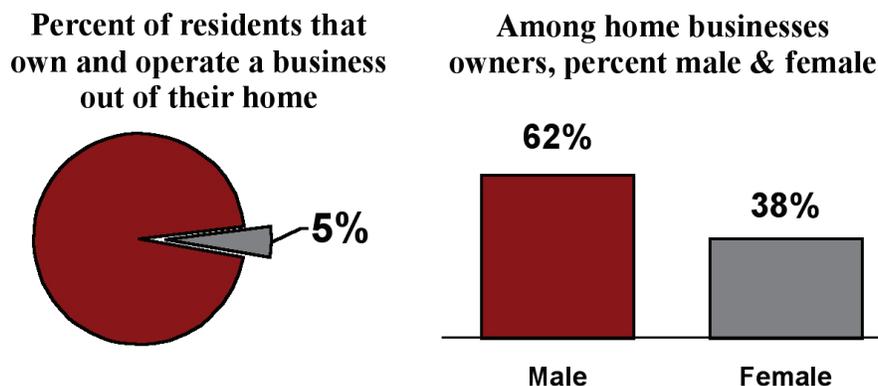
this technology lag among rural populations. The National Broadband Plan should address both challenges simultaneously by subsidizing network build-out where private investment is unlikely to flow and by addressing demand-side barriers to adoption with measures aimed at building awareness about the benefits of broadband services for rural businesses and dwellers, expand digital literacy programs, promote computer ownership, and strengthen rural community anchor institutions' broadband capacity and services.³³

H. Businesses: The Relationship Between Broadband and the Economy

On December 11, 2009, Connected Nation filed comments on the relationship between broadband and economic opportunity and its impact on businesses.³⁴ Our research illustrated that adoption patterns across businesses in different sectors can greatly vary. While 61% of all businesses surveyed adopt broadband service, different adoption patterns exist across different sectors. Businesses within the high-tech sector are the most likely to adopt broadband (78%), followed by Professional and Financial Services (76%), the Manufacturing sector (72%), and Wholesale and Transportation (64%). The sectors least likely to subscribe to a broadband connection are Healthcare (43%), Agriculture, Mining, Construction and Utilities (AMCU, 50%), and Retail, Recreation, Food and Lodging (Retail & Hosp, 56%).³⁵

Data from Tennessee and Ohio collected pertaining to home-based business ownership shed light into varying patterns of usage and adoption by male and female home-based business owners. Figure 26 shows that 5% of all adults surveyed report being home business owners. Of these, 62% are male and 38% are female (Figure 26).³⁶

Figure 26



Q: Which of the following describe the way you work from home, when you do so? And
 Q: Gender
 (n=2,400 TN & OH residents) And
 (n= 133 TN & OH residents that own and operate a business out of their home)

Source: July 2009 Connected Tennessee® and 2009 Connect Ohio® Survey of Businesses

³³For a more in depth discussion of policy options concerning the Rural Broadband Strategy see *Comments of Connected Nation, Inc., FCC GN Docket No. 09-29*, March 25, 2009, available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520203594>.

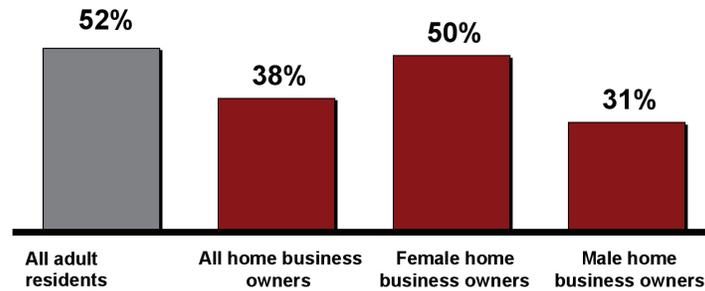
³⁴*Connected Nation's NBP Comments – Economy*.

³⁵*Ibid*, page 4.

³⁶*Ibid*, page 5.

Home business owners on average are less satisfied with the speed of their broadband delivery than the average home broadband subscriber. While 52% of all home broadband subscribers are very satisfied with their broadband speeds, only 38% of home business owners are. Furthermore, female home business owners appear to be more satisfied than their male counterparts. Half of female home business owners report being very satisfied with their connection, compared to 31% of their male counterparts (Figure 27).³⁷

Figure 27: Home business owners who are “very satisfied” with the speed of their broadband delivery



Q: To the best of your knowledge, what is the approximate download speed or bandwidth provided by your Internet service provider?
(n= 1,383 TN & OH residents with a broadband connection at home)

Source: July 2009 Connected Tennessee® and 2009 Connect Ohio ® Residential Survey

³⁷Ibid, page 12.



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