



Deployment of Broadband To Rural America

*An Evaluation of Current Broadband
Services To Rural Americans and
The Impact of Internet Public Policy
On Broadband Deployment*

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US Internet Industry Association

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Formed in 1994, the US Internet Industry Association is the primary trade association for companies engaged in Internet commerce, content and connectivity. USIIA serves its members through legislative advocacy and professional services. The association is headquartered in Washington, DC.

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Executive Summary

The accepted political dogma that America has in some way failed in its efforts to deploy broadband is based on a series of miscalculations. First, it confuses the level of deployment with the level of adoption, casually mixing data on each though different factors are involved. Second, it compares the data from America with data from other countries, even though this data has not been normalized for factors such as population density or percentage of rural versus suburban or urban areas. Finally, the data that does exist is presented in ways intended to support a specific policy or political view rather than allowing the data to speak to itself.

In reality, the adoption of broadband and Internet technologies by the American consuming public has been the most rapid in the nation's history. With overall home broadband penetration breaking 50% in a September 2007 survey, Pew Internet found that broadband was adopted by a majority of consumers faster than other technologies. Broadband took 10 years to break 50% adoption, followed by the CD Player at 10.5 years, the VCR at 14 years, cell phones took 15 years, color TVs took 18 years, as did the personal computer.

More to the point, a 2008 survey of its members by the US Internet Industry Association, combined with information provided by affiliated telecom associations, finds robust levels of deployment in the majority of states, and significant planned investments for expansion in the immediate future:

- ConnectKentucky, often cited as a model for broadband deployment research and public/private partnerships, has increased broadband penetration in that state from 60 percent in 2001 to 94 percent as of August, 2007, with a goal to reach 100 percent coverage of state residents by the end of 2007.
- The state of California on January 17, 2008, announced the release of the report of the California Broadband Task Force. This report notes that 96% of California residences have access to broadband.
- The Montana Telecommunications Association reported in late 2006 that the state's independent telecom companies have deployed over 5,000 (approaching 6,000) miles of fiber optic facilities statewide -- in a state with an average of fewer than three telephone access lines per mile.
- Members of the Pennsylvania Telephone Association committed to the most aggressive broadband deployment plan in the nation under Act 183 of 2004. Under the act, the telephone

companies committed to meet established goals for deployment of broadband statewide. Today, many of the companies are already 100 percent deployed.

- The Iowa Telecommunications Association, the nation's largest and second-oldest telecom association, reports that it has the largest number of broadband Internet providers in the nation (233), and that 92.9 percent of Iowa communities (1,144 out of 1,291) have access to one or more broadband providers. In Iowa, rural communities often have better access than non-rural areas – a "reverse digital divide."
- The Minnesota Center for Rural Policy and Development reports that broadband adoption continues to grow unabated throughout rural Minnesota and that 49 percent of all Minnesota households now connect to the Internet from home using a broadband connection.
- Virtually all citizens of New York have access to broadband services.
- The National Telecommunications Cooperative Association (NTCA) – the "voice of rural telecommunications" -- reported in September of 2007 that "ninety-nine percent of the 2007 survey respondents offer broadband to some part of their customer base.

This data from the heartland also indicates that while deployment is advancing rapidly, adoption of broadband by consumers – even to those who have it readily available – lags.

Data collected to date supports five conclusions with respect to rural broadband:

- Deployment of broadband has been achieved at a remarkable pace given the land mass of America and the unusually high percentage of residents in rural areas.
- There remain substantial differences between rates of rural deployment of broadband and rates of adoption.
- Issues related to broadband deployment need to be separated from issues related to the adoption and use of these technologies.
- The remaining issues of deployment have been assisted by state and local mapping projects (such as those of California and Kentucky), which have helped to identify area where additional focus and investment are needed. More and better data is needed in order to make effective broadband policy.
- There are programs emerging that focus resources on the factors related to adoption, and these need to be strengthened.

These conclusions will have a significant impact on public policy related to broadband:

- **Regulation of the Internet, from open access to network neutrality, won't stimulate adoption of broadband.**
- **More and better data is needed.**
- **Federal programs should focus on supporting state and local efforts.**
- **Infrastructure investment will still be critical.**
- **The same needs for policy support exist in urban, suburban and rural areas.**

Introduction

The adoption of broadband and Internet technologies by the American consuming public has been the most rapid in the nation's history. With overall home broadband penetration breaking 50% in a September 2007 survey, Pew Internet found that broadband was adopted by a majority of consumers faster than other technologies. Broadband took 10 years to break 50% adoption, followed by the CD Player at 10.5 years, the VCR at 14 years, cell phones took 15 years, color TVs took 18 years, as did the personal computer:

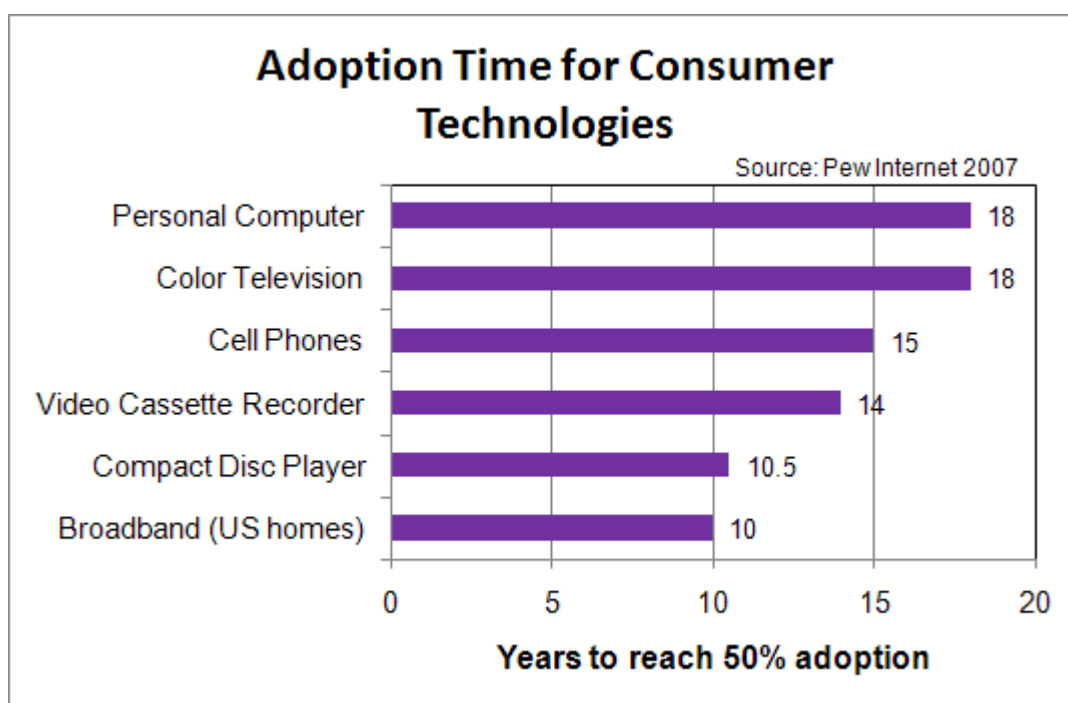


Figure 1: Adoption Time for Consumer Technology
Source: Pew Internet¹

With this rapid adoption has come a wealth of benefits, with the promise of more to come. Global consultant Accenture estimates that the universal deployment of broadband would create 1.2 million new, permanent jobs,² while a 2004 report estimated that broadband adoption could yield annual consumer

¹ <http://www.pewInternet.org>

² "Innovation Delivered - Broadband for Australia, An Economic Stimulus Package, 2001," Accenture, p8.; Building a Nationwide Broadband Network: Speeding Job Growth" by Stephen B. Pociask, pg. 1.

benefits of \$300 billion.³ Added to these are the substantial benefits available through enhanced social interactions, availability of distance learning programs and eHealth initiatives.

But from the outset, this rapid growth in broadband adoption and use presented a paradox – some segments of the American public were significantly slower to adopt and receive benefits from use of the Internet than others. Larry Irving, a former United States head of the National Telecommunications Infrastructure Administration (NTIA) at the Department of Commerce, Assistant Secretary of Commerce and technology adviser to the Clinton Administration, noted this paradox as early as 1995 and termed it the "digital divide."

The term digital divide refers to the gap between those people with effective access to digital and information technology, and those without access to it. Groups often discussed in the context of a digital divide include socioeconomic (rich/poor), racial (white/minority), or geographical (urban/rural).⁴ These digital divides, then, are identified as having two facets – the unequal access to digital technologies (deployment) and unequal ability or desire to make use of these digital technologies (adoption). But while the issue of the "digital divides" is thus multi-faceted, and might be expected to require solutions that are equally multi-faceted, that is not how the issues have been addressed in the public policy arena.

Instead, these issues have manifested in three major groups of claims. First, that cable and telephone companies "redline" some areas on racial or socioeconomic grounds. Second, that companies have failed to deploy some technologies (DSL, fiber, cable Internet, etc.) to some areas on economic grounds. Or third, that they have deliberately blocked or degraded Internet services to some areas or some customers in order to enhance sales of their own competing products. No evidence has been produced to support these claims, and deployment of broadband has continued at a rapid pace, accompanied by lower costs and faster speeds.

Claims of market failure have been more pervasive if no more persuasive. The claims of widespread market failure have been a foundation for calls for open access competition on cable, telephony and fiber networks; it was a basis for the municipal networking movement of 2004 – 2006, in which municipalities attempted to use tax dollars and other public financing to enter the private markets for

³ "Bandwidth for the People," Robert Crandall, Robert Hahn, Robert Litan, and Scott Wallsten, *Policy Review* (October and November 2004): 68.

⁴ Wikipedia definition at http://en.wikipedia.org/wiki/Digital_divide

telecommunications services; and it is today the primary basis for calls to impose common-carriage regulations on broadband Internet networks.

But the argument for market failure is countered by a second great paradox of the "digital divides" – the fact that all of the identified divides are rapidly healing without federal or state regulation of the Internet. If, in fact, regulatory intervention is necessary to heal the divides, this should be impossible. Yet clearly they are healing. As noted in the USIIA position paper on Ethnicity and Broadband Segmentation, black and Hispanic American populations are rapidly catching up to Asian and white populations in terms of Internet and broadband adoption.⁵ There is additional evidence that the disparity between urban and rural broadband adoption has closed from a four-year gap in adoption in 1999⁶ to as little as one year by 2007.⁷

Certainly, there is still work to be done in closing the digital divides in America. Equally clearly, however, this work should be based not on continuing efforts to pursue such unhelpful policies as open access, common carriage laws for broadband networks, municipal networking or network neutrality legislation. It should rather be based on the work over the past decade that has already proven successful in healing the digital divides.

This paper seeks to help in that effort by assessing progress made to date in closing the rural digital divide; identifying factors that assist or impede the deployment and adoption of broadband in rural areas; illustrating successful programs for deployment of broadband to rural residents; and defining steps that need to be taken from a legislative and regulatory perspective to embrace, expand and build upon these successful implementations.

Defining The Issue Of Rural Broadband

⁵ See <http://www.usiia.org/pubs/segmentation.doc>

⁶ US Department of Commerce data at <http://www.doc.gov>

⁷ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf

Definitions of what constitutes "rural" differ widely, and even the US government has three or more definitions, each with different quantitative measures.⁸ Nonetheless, by most measures it is agreed that as much as 97.5 percent of the land mass of the United States is rural, and that as much as 25 percent of the population lives in non-metropolitan/rural areas of the nation."⁹ Even this agreement, however, is unclear -- the Government Accountability Office notes that 45 percent of Americans defined as rural dwellers live in counties that are deemed metropolitan.¹⁰

Similar confusion and a lack of agreement hampers an effective definition of the term "broadband." The US Federal Communications Commission (FCC) generally defines broadband service as data transmission speeds exceeding 200 kilobits per second (Kbps), or 200,000 bits per second, in at least one direction: downstream or upstream.¹¹ The Organization for Economic Cooperation and Development defines broadband in terms of downloads only, at speeds equal to or greater than 256 Kbps.¹² Most observers recognize that these definitions are inadequate and need to be revisited.

Finally, there is the issue of what the goals could or should be for rural deployment and adoption of broadband nationwide. We know what the goals should be -- the deployment of broadband Internet service to every business and residence that needs or wants it, as adjusted for other variables that might diminish demand, at a price point and adoption rate on par with that of non-rural and metropolitan businesses and residences. Such a goal can be quantified by research and is attainable, based on our experience with other mass deployments of new technologies.

With this as a working definition, we need to examine the factors that affect the current rural digital divide. As previously noted, the rural divide can be divided into two major sets of factors -- those related to the physical availability of broadband Internet service (referred to as deployment of broadband) and those related to the resources and skills required to make use of broadband Internet service once it is available (referred to as adoption of broadband).

⁸ The US Department of Commerce, US Department of Agriculture and US Bureau of the Census have all released substantively different definitions

⁹ General Accounting Office, in its publication *Rural Development: Profile of Rural Areas*, <http://archive.gao.gov/t2pbat6/149199.pdf>, pp. 26-31

¹⁰ Ibid.

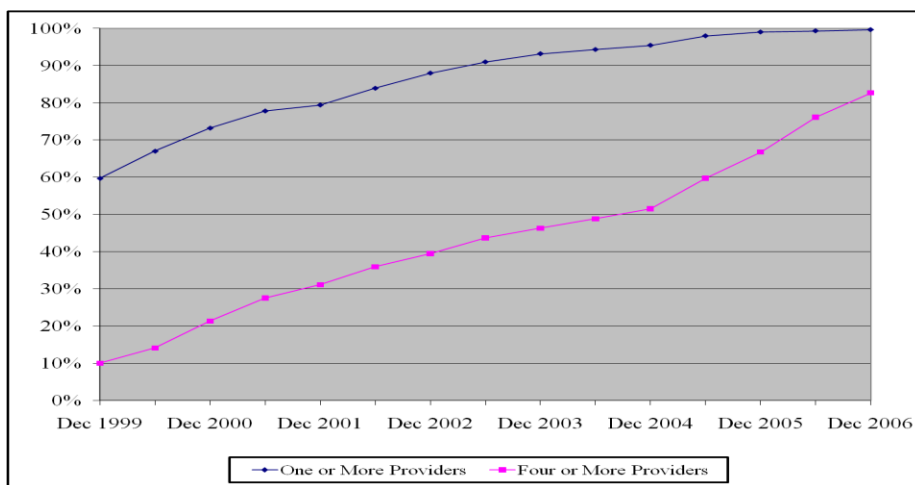
¹¹ See <http://www.fcc.gov/cgb/consumerfacts/highspeedInternet.html>

¹² See http://www.oecd.org/document/7/0,3343,en_2649_34223_38446855_1_1_1_1,00.html

Unfortunately, these two factors have become so confused in the public policy arena that we most commonly measure adoption rates and then attempt to use this data to dictate deployment policy. It may be fortunate that the United States government has to date not taken substantive action to regulate broadband, since this confusion would almost certainly have had unintended and negative effects. We will therefore address each of these two sets of factors – deployment and adoption – separately.

Factors In Rural Broadband Deployment

Collection of useful data on deployment has been made difficult by the lack of common definitions, by the need to keep proprietary corporate information and strategies confidential; and by an inability to agree on a goal whose attainment should be measured. For example, in its 2007 report on high speed Internet connections, the Federal Communications Commission reported that high-speed DSL connections were available to 79% of the households to whom incumbent LECs could provide local telephone service as of December 31, 2006, and that high-speed cable modem service was available to 96% of the households to whom cable system operators could provide cable TV service. The FCC also estimated that over 99% of Zip Codes in America were listed by at least one Internet Service Provider as providing service to that area, and that service was therefore available to more than 99% of the nation's population.¹³



FCC Data: Percent of Zip Codes With High-Speed Providers¹⁴

¹³ See http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-277788A1.pdf

While there is evidence to suggest that this data may be relevant – a study of businesses in Appalachia found that those in zip code areas in which there was a broadband provider saw productivity gains of between 14% and 17%¹⁵ -- it has also been criticized because the longer distances and average local loop lengths involved may mean that only one customer is served in that zip code.

Data from the OECD, which has for the past several years dominated policy discussions related to deployment of broadband, also gives unreliable results. The OECD data is not validated, and fails to account for Internet usage via wireless and business use. The US Department of Commerce (as well as governments of other countries) has criticized the reports as being inaccurate, with Ambassador David Gross noting that "we are concerned that the current OECD 'subscriber statistics' standing alone fail to account for tens of millions of Americans who access and use broadband services and thereby do not reflect the state of broadband not only in the United States but also in other OECD members as well."¹⁶

There is other data that can assist in identifying the current state of broadband deployment in rural areas. For example:¹⁷

- ConnectKentucky, often cited as a model for broadband deployment research and public/private partnerships, has increased broadband penetration in that state from 60 percent in 2001 to 94 percent as of August, 2007, with a goal to reach 100 percent coverage of state residents by the end of 2007. ConnectKentucky is notable not only for its success in connecting residents to broadband, but for its unprecedented scope of implementation. It is a public/private partnership with bi-partisan political support that is embraced by competing broadband providers and makes use of virtually every broadband platform, from cable and cellular to DSL, wireless and satellite. Finally, it addresses both the issues of adoption (demand for broadband) and deployment (supply of broadband infrastructure). The rapid success of this program has stirred interest from other states, and the Congress is considering legislation that would provide grants for such programs nationwide.

¹⁴ See <http://www.fcc.gov/wcb/iatd/comp.html>

¹⁵ "The Residential and Commercial Benefits of Rural Broadband: Evidence from Central Appalachia: Final Report," Huntington, WV: Center for Business and Economic Research, June 2005

¹⁶ Letter from the US Department of State to the Secretary-General of the OECD, at http://www.ntia.doc.gov/ntiahome/press/2007/State_OECD_042407.pdf

- The state of California on January 17, 2008, announced the release of the report of the California Broadband Task Force. This report notes that 96% of California residences have access to broadband, though 1.4 million mostly rural Californians lack broadband access at any speed. Of the 96 percent who do have access, barely more than half have adopted broadband at home. The report calls for state initiatives that include both a further buildout of infrastructure and targeted programs to increase adoption rates.¹⁸
- The Montana Telecommunications Association reported in late 2006 that the state's independent telecom companies have deployed over 5,000 (approaching 6,000) miles of fiber optic facilities statewide -- in a state with an average of fewer than three telephone access lines per mile. Many of these companies have Ethernet backbones, and most, if not all, are replacing their copper plant with fiber, depending on business plans. Most, if not all, greenfields developments today are being built with FTTP deployments. Several Montana ILECs jointly own VisionNet, a consortium that maintains a redundant fiber backbone ring throughout Montana and also provides statewide videoconference, E-911 and tandem services.
- Members of the Pennsylvania Telephone Association committed to the most aggressive broadband deployment plan in the nation under Act 183 of 2004. Under the act, the telephone companies committed to meet established goals for deployment of broadband statewide. Today, many of the companies are already 100 percent deployed, and the rest are making tremendous strides in meeting the commitments made to the PUC as provided for in Act 183. In other words, all of the companies have either met or exceeded their commitments.¹⁹
- The Iowa Telecommunications Association, the nation's largest and second-oldest telecom association, reports that it has the largest number of broadband Internet providers in the nation (233), and that 92.9 percent of Iowa communities (1,144 out of 1,291) have access to one or more broadband providers. In Iowa, rural communities often have better access than non-rural

¹⁷ Except where otherwise noted, information on state deployments of broadband Internet and fiber courtesy of the US Internet Industry Association, its members, and unaffiliated state telecommunications organizations.

¹⁸ See report at <http://www.calink.ca.gov/taskforcereport/>

¹⁹ Network Modernization Plans filed with the Pennsylvania Public Utility Commission pursuant to Section 3014(f) of Act 183 of 2004.

areas – a "reverse digital divide." In addition, the state has recently announced it will implement a program based on the success of ConnectKentucky to further enhance broadband availability.

- The Minnesota Center for Rural Policy and Development reports that broadband adoption continues to grow unabated throughout rural Minnesota and has clearly accelerated in the past 12 months. For example, in 2003 15 percent of all rural Minnesota households had a broadband Internet connection, but our current findings suggest that at the end of 2006 that number had more than doubled to 39.7 percent – substantially higher than the national average. 1,288,291 or 63.5 percent of all Minnesota households now maintain a home Internet connection, and 995,641 or 49 percent of all Minnesota households now connect to the Internet from home using a broadband connection. This estimate is up significantly from our previous estimate of 737,397 households at the end of 2005.²⁰
- Virtually all citizens of New York have access to broadband services. A study conducted by the Public Service Commission in 2003 estimated that over 92% of consumers have high-speed broadband services available to them. Since 2003, the telecommunications industry has continued the roll out of such services throughout the state. New telecommunications modalities such as satellite have increased the availability of such access since the 2003 study. Additionally, high-speed access from BPL, or Broadband Over Power Lines, is being developed and provided in certain areas within the state.
- The National Telecommunications Cooperative Association (NTCA) – the "voice of rural telecommunications" -- reported in September of 2007 that "ninety-nine percent of the 2007 survey respondents offer broadband to some part of their customer base, approximately equal to the 2006 rate and a dramatic increase from the 58% of the 2000 survey respondents who offered broadband. Respondents indicated that they use a variety of technologies to provide broadband to their customers: 99% of those who offer broadband utilize digital subscriber line (DSL), 32% fiber to the home (FTTH) or fiber to the curb (FTTC), 20% unlicensed wireless, 16% licensed wireless, 14% satellite and 12% cable modem."²¹

²⁰ "The 2006 Minnesota Internet Study," Minnesota Center for Rural Policy and Deployment, at <http://www.mnsu.edu/ruralmn/pages/Publications/reports/Telecom2006.pdf>

²¹ "NTCA 2007 Broadband/Internet Availability Survey report," September, 2007

Nor is this data isolated. The Pew Internet & American Life Project reported in August of 2007 that 71 percent of adults use the Internet at least occasionally from any location. While rural use continues to lag high speed adoption in urban centers and suburbs, it has improved substantially from a year ago, when only 24 percent of rural adults had broadband connections. Today, 60 percent of rural adults use the Internet from any location, compared with the national average of 71 percent.

This data, suggesting that the deployment gap between metropolitan and rural areas is closing, nonetheless shows that there is work that remains to be done in fully deploying broadband Internet services to rural areas – and beyond that, in deploying fiber Internet in order to achieve even more advanced services.

Factors In Rural Broadband Adoption

While the deployment gap is closing rapidly, however, the gap in adoption rates is closing at a much slower rate. Pew Internet data as recent as 2005 indicates that adoption of broadband stands at only 34 percent in rural America, as opposed to nearly double that rate in urban and suburban areas.

Nor can this gap be attributed to the absence of multiple competitors in every market, a market failure in broadband deployment or even the higher cost of infrastructure deployment in rural areas. If these were the significant factors, we would expect that the gap would have been small prior to broadband, and only grown significantly since the evolution from dial-up Internet to broadband.

A 2000 study by Pew, at the height of the dial-up Internet expansion, found that, "there is notably less Internet penetration in rural areas than in other types of communities. A major factor in rural areas is that a relatively large number of residents don't use computers. 57% of those in rural areas do not have access to the Internet, compared to 47% of those in urban areas and 46% of those in suburban areas. 42% of rural residents do not use computers, compared to 31% of urban residents and 34% of suburban residents who don't use computers."²²

Additional evidence may be found in the adoption rates in rural areas where broadband is available. In testimony filed before the FCC in May of 2007, the Organization for the Promotion and Advancement of

Small Telecommunications Companies (OPASTCO) noted that though its rural members now offer broadband Internet access to 90 percent of their customers, only 31 percent choose to subscribe to these services.²³

At the same time, a growing body of data indicates that other factors – notably education, computer literacy rates and household income – play a significant role in adoption of broadband. A study published in Telecommunications Policy in July, 2007 notes that "prior experience with the Internet, the expected outcomes of broadband usage, direct personal experience with broadband, and self-efficacy had direct effects on broadband intentions. Age and income, but not education or ethnicity, also had direct impacts."²⁴ Similar conclusions were reached by the Phoenix Center, which analyzed variances in broadband adoption among the individual states, "Significantly, we find that 91% of the variation is explained by demographic and economic conditions, such as household income, education and, most significantly, income inequality."²⁵

Conclusions Regarding The Rural Digital Divide

Data collected to date supports six conclusions with respect to rural broadband:

- Deployment of broadband has been achieved at a remarkable pace given the land mass of America and the unusually high percentage of residents in rural areas. While there remain challenges in deployment of rural broadband, these are largely issues of investment and technological innovation rather than issues that require changes in policy. For example, deployment in areas where the remote locations of the end user require very long local loop lengths in excess of 20,000 linear feet make it difficult to deploy DSL without further development of that technology and/or investment in sub-stations within the local loop.
- There remain substantial differences between rates of rural deployment of broadband and rates of adoption. Nor is this difference new – Pew Internet & American Life Project has consistently

²² "Who's Not Online," Pew Internet & American Life Project, September 21, 2000

²³ Before the FCC in GN Docket 07-45, May 16, 2007

²⁴ "Closing the rural broadband gap," Telecommunications Policy, July/August 2007

shown that a higher percentage of those who do not use the Internet reside in rural areas.²⁶ US Department of Commerce data in 2000 noted that while Internet adoption stood at 42 percent for metropolitan adults as early as 1995, only 39 percent of rural adults were using the Internet in 1999 — an indication that the rural/metropolitan "divide" existed in spite of the widespread availability and robust competition in Internet access in the Nineties and after. Significantly, the gap is closing -- the Pew Internet & American Life Project notes that rural adoption rates are lagging those of metropolitan adults by roughly one year as of mid-2007.²⁷

- Issues related to broadband deployment need to be separated from issues related to the adoption and use of these technologies. Casually mixing data on each leads to confusion and may negatively impact public policy for the Internet. Likewise, it may be unhelpful to compare data from America with data from other countries, because this data may not have been properly normalized for factors such as population density and percentage of rural versus urban areas.
- The remaining issues of deployment have been assisted by state and local mapping projects (such as those of California and Kentucky), which have helped to identify area where additional focus and investment are needed. More and better data is needed in order to make effective broadband policy. While the data collected by the Federal Communications Commission and by individual service providers is helpful, there may be better mechanisms for data collection on which to form valid goals and strategies.
- There are programs emerging that focus resources on the factors related to adoption, and these need to be strengthened. As the Phoenix Center notes, "policies that focus on these demand-side factors perhaps offer more "bang for the buck" in terms of increasing broadband penetration than supply-side policies, including subsidies for networks or regulation of providers. For example, programs that focus upon educational institutions in low-income communities with school age children-like ConnectKentucky's "No Child Left Offline" initiative-may boost broadband adoption rates considerably, as they leverage demand-side drivers that encourage broadband subscription (having a child in school) in a way that may overcome or mitigate the problem of income inequality. Programs that target broadband education for older and retired persons may

²⁵ "The Demographic and Economic Drivers of Broadband Adoption in the United States," Phoenix Center Policy Paper No. 31, November, 2007.

²⁶ "Who's Not Online:" September 2000, at http://www.pewInternet.org/pdfs/Pew_Those_Not_Online_Report.pdf

²⁷ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf

also be helpful."²⁸ Programs likely to stimulate demand-side factors include e-government, eHealth and Distance Learning.

Public Policy Ramifications

The data regarding deployment and adoption of broadband in rural America have significant ramifications on public policy. In particular, there are six elements that need to be communicated at both the federal and state levels:

- **Regulation of the Internet, from open access to network neutrality, won't stimulate adoption of broadband.** Virtually since the beginning of the commercial Internet, the lower adoption rates among rural consumers has been used to push a number of political agendas – from network open access to municipally owned and operated networks, and onward to the current calls for imposition of common-carriage rules on broadband networks. Since none of these "solutions" would act to enhance adoption rates, however, they would have little impact on the level of broadband use in America. If Congress and the state legislatures are to make adoption of broadband a national priority, it must be done through initiatives to educate consumers; reduce income barriers to usage; and implement service programs such as e-government and eHealth that will attract more consumers to adopt broadband into their lifestyles.
- **More and better data is needed.** Because there remain some areas that could be better served by faster and less expensive broadband, it is critical to know where investments and infrastructure buildout are still needed. Existing data does not sufficiently separate deployment from adoption. And the data collection problem should focus not on broadband deployment, where public-private partnerships such as ConnectKentucky are already proving effective in synthesizing the information needed, but rather on the more considerable issues related to adoption rates for broadband. As with any other technology data on which we wish to base policy, this data needs to be subject to validation and peer review.

²⁸ "The Demographic and Economic Drivers of Broadband Adoption in the United States," Phoenix Center Policy Paper No. 31, November, 2007.

- **Federal programs should focus on supporting state and local efforts.** Broadband deployment is a local investment issue, and broadband adoption is largely a local education issue. The best and most effective federal programs are therefore more likely to be those that support efforts that can be tailored to the unique needs of each community rather than a single, one-size-fits-all national program. Appropriate programs would thereby include federal grants and loans for infrastructure investments; educational programs for computer literacy and use; financial support for additional research at the state and local levels.
- **Infrastructure investment will still be critical.** Though it is easy to denote the dominance of demand-side policy over supply-side, there remain strong arguments that some form of stimuli for investments in rural broadband will be essential to a more rapid closure of the "rural divide." In particular, states should be encouraged to adopt public/private partnerships in which the state may utilize its resources to document areas that are underserved and to build a business case for infrastructure investments; private companies should then be encouraged or incentivized to make those investments. Additional efforts to build the "value proposition" for broadband adoption – by adding government services to online venues – will also be helpful.
- **The same needs for policy support exist in urban, suburban and rural areas.** As is being experienced with "digital divides" based on ethnicity, age and education levels, the divide between rural access and metropolitan access to broadband is healing as education, investment and innovation take root. Already, there is evidence that the disparity has closed from a four-year gap in adoption in 1999²⁹ to as little as one year by 2007.³⁰ This does not mean, however, that we should stop focusing on deployment and adoption issues in other areas. America is somewhat unique in that rural and urban areas can share the same postal zip code or county. Whatever policies are promulgated to promote deployment and adoption in rural settings should not be at the expense of urban and suburban policies or programs.

²⁹ US Department of Commerce data at <http://www.doc.gov>

³⁰ Pew Data memo, June, 2007, at http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf