New Research on the Digital Divide and Broadband's Economic Impact

A roundup of recent studies about the growing chasm between broadband haves and have-nots, how to overcome this divide, and the costs and benefits of reducing it

By Masha Zager / *Broadband Communities*

The Digital Divide Is Larger Than It Appears

Official broadband maps are becoming more inaccurate each year, especially in rural areas, and the rural-urban digital divide is growing despite efforts to bridge it.

That's the takeaway from "Broadband Availability and Access in Rural Pennsylvania," a major research study led by Sascha Meinrath of Pennsylvania State University and published by the Center for Rural Pennsylvania, a legislative agency of the Pennsylvania General Assembly.

Key findings of the report include the following:

- Although FCC broadband maps (which are based on ISP reports) indicate that all Pennsylvania residents have access to 25 Mbps broadband, the 11 million speed tests the research team collected show that median speeds in most areas of the state did not meet the FCC's broadband criteria. In fact, there was no Pennsylvania county in which 50 percent of residents received broadband that met the FCC criteria.
- Residents of rural counties received much slower speeds than residents of urban counties. The only areas where median speeds met the FCC's criteria were clustered around major metropolitan areas, especially Philadelphia and Pittsburgh.
- By reviewing the historical archive of 15 million tests conducted in Pennsylvania since 2014, the team found that the discrepancy between map speeds and speed-test speeds grew substantially over five years in rural counties. The discrepancy did not grow significantly in urban counties. The researchers comment that "this may indicate a systematic and growing overstatement of broadband service availability in rural communities."
- Although efforts to bridge the digital divide, using a diverse array of business models, have improved connectivity for many Pennsylvania residents, the rural-urban divide appears to be growing.
- Successfully addressing the digital divide will require both old and new approaches. Better mapping and infrastructure investments should be considered.

The research team, which hopes that its study will become the gold standard for this type of research, is freely and publicly releasing all its data, mapping methodologies, scripts and visualization tools.

See the full report at https://tinyurl.com/y59cyybz.

Training Is Key to Effective Internet Use

A combination of motivation and training draws new subscribers to internet use that can impact their lives. People subscribe to broadband for a variety of purposes, but often they go on to use it in ways they hadn't planned. For example, though parents often subscribe to broadband for the benefit of their children, digital-skills training opens doors to household internet use for jobs and learning.

"Reaching the Unconnected," a report by John Horrigan of the Technology Policy Institute (TPI), is based on a survey that TPI conducted of 1,275 new subscribers to the Comcast Internet Essentials (IE) program. The survey group was compared with a group of 200 people who began but did not complete the sign-up process for IE. Since 2011, more than 1.5 million low-income households have subscribed to discounted internet services through this program, offering a valuable opportunity for learning more about the benefits of home broadband adoption.

The survey found the following:

- IE households were more likely than households in the control group to focus on the benefits of broadband to their children. More than 70 percent of those with school-age children said they use the internet for homework, and nearly 80 percent said the internet helps them be more responsive to what is happening at their children's schools.
- IE households were more interested than control households in obtaining additional training on using the internet. A majority of respondents were interested in learning about protecting their privacy and security, communicating with their children's schools and improving their workforce skills.
- Once IE respondents had formal computer or internet training, they were more likely to engage in a variety of online activities, such as performing schoolwork, searching for jobs or accessing government services. The effect holds up regardless of whether people who pursue training are simply highly motivated individuals.
- Most IE users saw home broadband access as a valuable way to save time on day-to-day activities and as a tool to help manage their families' schedules.

As this research shows that training on how to use the internet expands the suite of online activities that new users pursue, an important insight for stakeholders is that they should integrate training into "onboarding" new broadband users. New or reconnected household internet subscribers may see training on how to use broadband as a seamless part of the process of obtaining service. Encouraging them to pursue training should help them reach their goals faster.

The full report is available at https://tinyurl.com/y3m7oe2h.

Broadband Speed Matters

Unemployment rates are lower where broadband speeds are higher, according to new research by Bento Lobo and colleagues at the University of Tennessee at Chattanooga.

In theory, broadband adoption could have positive or negative effects on unemployment. It could decrease unemployment by improving labor efficiency, but it could increase unemployment by causing changes in the demand for particular labor skills. One effect might dominate in the short term and another in the long term.

Lobo and his team studied 85 counties in Tennessee – 37 urban and 48 rural – over the period 2011 to 2016, using National Broadband Map data (and FCC data after the maps were transferred to that agency). Because Tennessee's broadband access is fairly similar to national averages with respect to wired broadband coverage; average download speed; access to 25 Mbps, 100 Mbps and gigabit speed service; and underserved population, the study results may be applicable to the United States as a whole.

There is always a possibility that the lower unemployment in faster-broadband counties isn't caused by the fast broadband but is an effect of the same ultimate cause – for example, higher education levels. As in many other studies of this kind, the researchers were careful to eliminate this possibility using a variety of econometric techniques.

Findings included the following:

- Counties with fast broadband (100 Mbps or higher) had unemployment rates roughly 0.26 percentage points lower than counties with low-speed broadband.
- Rural counties with fast broadband benefited even more. They had roughly 0.38 percentage points lower unemployment rates than high-speed urban counties. On the other hand, the effects for urban counties alone were not statistically significant, possibly because most urban areas had fast broadband by the time the study period began.
- The unemployment differential is greater for counties that adopted high-speed broadband earlier. For instance, counties that adopted high speed in 2011 had the largest differential in unemployment rates in 2016 (1.57 percent) relative to counties with low-speed broadband.
- In Hamilton County, the county in which Chattanooga is located, fast broadband saved or created an estimated 489 jobs each year, or roughly 2,444 jobs over a five-year period. Among high-speed counties generally, the median number of jobs saved or created each year was 59.

The full report is available at https://tinyurl.com/y58wwgry.

Understanding the Rural Broadband Problem

In 2013, the cellular provider C Spire launched an ambitious fiber-to-the-home initiative in its home state of Mississippi that aimed to create "the first statewide 1 Gbps FTTH network in the United States." The FTTH initiative leveraged the statewide fiber backbone C Spire had built for its wireless network. Several years later, the company followed up with additional broadband initiatives, including fixed wireless and DSL. Yet in 2019, despite considerable efforts by C Spire and others, Mississippi was ranked 46th of the 50 states in broadband access. Mississippi's lack of access is related to its lack of densely populated areas; the state is ranked 47th in terms of urban population.

"Cost to serve is the primary challenge associated with bringing broadband to rural areas," says a new white paper published by the C Spire Rural Broadband Consortium, a group that includes Airspan Networks, Microsoft, Nokia and Siklu along with C Spire. The consortium was formed in early 2019 to find new ways to approach the rural broadband problem.

Internet usage at broadband speeds is even lower than broadband availability. In Mississippi, for example, although FCC data show broadband availability at 72.3 percent, a Microsoft study showed broadband usage at only 17.8 percent. In some counties, the disparity is even wider. Usage may lag behind availability because availability is overstated, actual speeds are lower than advertised speeds or high internet prices cause people to subscribe to low-speed internet service – or some combination of these and other factors.

The paper explains that because rural areas have fewer customers and less available revenue, service providers must either accept longer return on investment periods or charge higher prices for internet services. Most service providers can't tolerate lengthy ROI periods, and most customers can't pay high prices. In areas where the service charge exceeds the ability of many residents to purchase service, there may be internet availability, but usage will still be limited. If a monopoly provider offers poor, expensive internet access, it isn't always clear whether the area cannot support competition because its population cannot afford broadband or whether there is pent-up demand for affordable broadband.

In addition, technology challenges, including rough terrain, power and backhaul availability, and distance limitations for fiber and wireless transmissions, are difficult to overcome with any amount of money. The paper concludes that some areas of the United States (and the world) may not be served until those technology problems are solved. In the meantime, new business and technology solutions need to be discovered and explored.

See the full white paper at https://tinyurl.com/yxr9zkkr.

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FBA: 90 Percent Fiber Coverage Is Within Reach

How much would it cost to wire the United States with fiber? The Fiber Broadband Association commissioned the consulting firm Cartesian Inc. to determine how many households could be economically served with fiber and at what cost. Key findings included the following:

- In the next 10 years, consistent with current deployment rates, the percentage of American homes passed cost-effectively by all-fiber networks could increase from its current level of 40 percent to 90 percent. The projected cost to achieve this objective is approximately $70 billion. Passing only 80 percent of U.S. households with fiber would cost approximately $50 billion.
- Because of extensive and cost-effective all-fiber deployments over the past decade, the total cost to pass 90 percent of U.S. homes is much lower than was estimated a decade ago.
- Targeted, efficiently distributed government support, along with builds by municipalities, innovative private groups and public-private partnerships, helped expand all-fiber networks in rural areas in the last 10 years. Continued government support and innovative deployment models can further propel all-fiber deployments in the next decade to ensure that virtually all people and businesses across the country have access to future-proof networks. ❖

See more details here: https://tinyurl.com/y4ezyahp.

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