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BEYOND THE DIGITAL DIVIDE:
Broadband Internet Use and Rural Development in Pennsylvania:

Final Report to the Center for Rural Pennsylvania

Executive Summary

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Harnessing the power of the Internet is an important issue for rural Pennsylvania. Over the past several years, trends indicate that telecommunications providers in rural areas are increasingly offering advanced telecommunication services—including broadband Internet services—to their rural customers. While access to technology is still far from universal in rural Pennsylvania, it has become widespread enough for academic researchers and policymakers to move beyond simply arguing that lack of access to the technology is obstructing social and economic development in rural areas. We must now begin asking a new set of questions aimed at understanding the broader implications of the Internet for rural Pennsylvania. How are people in rural parts of the Commonwealth using broadband access to the Internet? How does this use differ in different sectors of society, and among different population groups? How is the use of broadband access shaping opportunities for social and economic development in rural Pennsylvania? In what ways might state policy and practice help to improve the use of broadband Internet use?

Point of Departure

At the core of the analysis is a distinction between *transactional use* and *transformational use* of the Internet. *Transactional use* refers to common practices such as the use of a dictionary or the perusal of the local newspaper, only instead of using a book or a paper copy of a newspaper, the Internet reflects the device of conveyance. The same activities of inquiry are undertaken, only using a different media. The query process is the same—the way of acquiring the information has changed. In contrast, the Internet offers something more profound, a capability that may be termed *transformative*. In other words, the Internet is not only used to access information, but to create new information based on the power of collaborative software that allows users of websites to add, remove, and otherwise edit and change available content.

In this report, the transactional and transformational use of broadband Internet access is examined in four different sectors important to rural Pennsylvania society: healthcare, education, government, and small business. In each sector, current types of practices are examined, as well as activities that may be considered transactional or transformative uses of the technology

In general, transformational use of broadband Internet access in rural Pennsylvania is hampered by a wide range of factors. High costs of bandwidth, restrictive policies, lack of education and exposure to technological capabilities, hierarchical power relations with a few dominant actors in each sector and/or lack of coordination among critical actors within the sector, are all factors that limit the use of broadband to more traditional, transactional uses. Nonetheless, in each sector, exciting instances of transformational use point to significant future possibilities. This suggests that state policy is best developed in a collaborative fashion that involves stakeholders throughout these vibrant networks, and focuses on the diffusion of transformative practice through these networks.

Elements of the Analysis

The report begins with a review of basic information on broadband Internet, and a description of broadband access and current information about levels of access to broadband in the rural U.S. and in

Pennsylvania. This is followed by an explanation of methodology and includes an assessment of best practice around the country and in the four specific sectors examined in some depth in Pennsylvania: healthcare, government, education, and small business. Next, a review is provided of global best practices in the use of broadband in these four sectors, followed by the discussion of the case study results.

Case Study Summaries

Local Government

To assess the ability of rural Pennsylvanians to interact with their local government (both county and municipality[1]) via the Internet, selected websites were evaluated based on a series of functional dimensions Among the counties analyzed, use of the Internet for transactional purposes varied considerably across the sampled counties. It appears, for example, that being close to an urban county makes a difference in the quality of Internet interaction possible in counties. At the same time, being adjacent to an urban area is no guarantee of high transactional capability. Population size also seems to have an important relationship to e-government score. The absolute size of a county's budget also has a relationship to the e-government score. Within the sub-categories of the e-government rating, the individual item that was the most common across all websites was the availability of downloadable forms.

In analyzing the quality of e-government services among municipal governments (including boroughs, townships and cities), the most striking finding was how little local governments in rural Pennsylvania use the Internet at all as measured by the availability of a website. The exception, a county with a strong tourism economy, had a high-level Internet presence. No relationship could be discerned between these e-government ratings and either the size of the municipality's population or its location. Similarly, there was no relationship between the size of the population and e-government rating. Given the overall low level of Internet usage in municipalities, and the highly fragmented structure of local government in Pennsylvania (making it difficult to interpret, for example, population size of a municipality within its broader geographic context), it is likely that a significant amount of e-government is driven by a set of factors that could only be captured through more detailed qualitative and quantitative research.

Education

Education is clearly benefiting from the availability of broadband services. Students in schools with available broadband can conduct sophisticated searches for information, communicate with students in other locations, and engage in real-time virtual realities. At the same time, such capability requires considerable investment in infrastructure and ongoing technology support and training access to optimize the use of technologies. Of importance is the challenge of ensuring that technology is up-to-date and that continuous broadband service is available. Access to the Internet as made available through broadband has a huge capacity to transform the learning experience, opening up the educational system to greater involvement of students and parents in curriculum development and other realms of community learning.

As with the majority of applications, broadband services require an ongoing infusion of human capital to achieve successful implementation and to maintain service quality. This requires a high level of resources allocated to ongoing training of teachers and support staff. At the same time,

[1] Note that use of the term municipality encompasses all classes, including boroughs, towns, townships, and cities.

fundamental technical requirements in the form of bandwidth inhibit the usage of all opportunities available and afforded by broadband technologies.

Healthcare

Healthcare in many ways offers a compelling context in which to deploy broadband services. Configured correctly with the help of broadband services, IT infrastructure can provide patients and other users of healthcare access to huge amounts of information, treatment management services, as well as direct engagement with medical personnel. The implementation of such a level of service is more about the willingness of the practitioner to use the technology than the presence or absence of the service capability itself. Interviews reported consistently that the age of the medical practitioner was the best predictor of service utilization. “Under the age of 50” was a prevalent refrain heard from IT administrators commenting on factors limiting IT uptake. Another factor correlated with high-level service utilization was membership in a health maintenance organization in which multiple locations created a ready benefit from effective communication capability. The need to communicate across service activities almost necessitated the availability of broadband.

Small Businesses

In the Powdered Metal industry case study, small businesses were using the Internet primarily to identify new market opportunities, reduce cost of supplies, and communicate more effectively within supply-chain networks. Few of the interviewees in the PM sector understood the potentially transformative uses of the Internet for their business. Firms in the tourism sector, in contrast, could clearly see the transformative potential of broadband Internet services. Here, the problems of lack of transformational use were not rooted in lack of awareness, but instead were rooted in fragmentation, individualism, and lack of coordination, along with limited skills.

Policy Recommendations

With regard to specific sectors, in education teachers must be provided with the tools, training and have access to the required support staff to truly take advantage of the capabilities of broadband services. To do so will require considerable technical support and new reward structures that encourage and facilitate teachers’ uptake of this new capability.

In the field of public health, there are significant opportunities to change and augment the way public health and health services are generally provided. The aim of interventions and policy programming should be to enable the consumer to have greater access to healthcare in more efficient and effective forms.

Business and small business in particular needs incentives and specific programming to alter status quo behavior. The cost of changing practices is high on a one-off basis. Policies should be developed to encourage groups of firms in the same sector to take up these new technologies and capabilities. Efforts to stimulate clusters of like groups offer ample opportunities to piggy-back on existing efforts to optimize firm practices.

There is a huge opportunity to facilitate the integration of new technology across a host of sectors. Optimization is the watchword; this requires cooperation across groups that currently are only loosely confederated and largely go it alone in service provision.

e-Government has so much to offer, and yet is likely to be an area in which innovation is slow to develop. Incentives and identification of joint projects can significantly influence the evolution of e-government toward actions that empower residents and businesses to learn to use the evolving technology platform. In the optimal situation, government should act as an intermediary and facilitator of broadband utilization.