High-speed Telecommunications Infrastructure in Oklahoma: Issues and What Communities Can Do

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The Internet has become an important contributor to the everyday lives of many Oklahoma residents. Some use it to communicate with distant relatives via e-mail, others check out the movie schedule for the weekend, still others have set up on-line businesses and are fully participating in the growing world of e-commerce. As Internet access has become more and more commonplace, residential and business users have increasingly opted for connections with quicker download times – or high-speed connections.[1] Access to high-speed infrastructure has become a major factor in where many young people decide to live, where aging baby boomers decide to retire, and where businesses decide to locate. Community leaders throughout Oklahoma seeking to increase education and income opportunities should take an interest in promoting high-speed telecommunications infrastructure as well as its productive use by their citizens.

A Historical Perspective of High-speed Access and Infrastructure

Figure 1 shows the trends in United States household connection types over the period 1999 - 2005, while Figure 2 shows the number of high-speed lines per capita provided in the U.S. and in Oklahoma over the same time period. Clearly, more individuals and businesses are becoming connected, and high-speed access is dramatically rising.
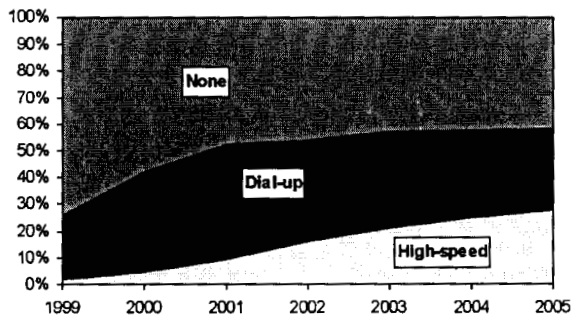

Figure 1. U.S. Household Internet Access Rates. Sources: Current Population Survey – 2000, 2001, 2003; PEW Internet & American Life Survey – 2002, 2004; and GAO Telecommunications Report to Congress – 2006.

1 High-speed connections, also known as broadband, are defined by the Federal Communications Commission (FCC) as 200 kilobytes per second (Kbps) of data throughput in at least one direction. This is about 4 times faster than most 56 Kbps dial-up modems.

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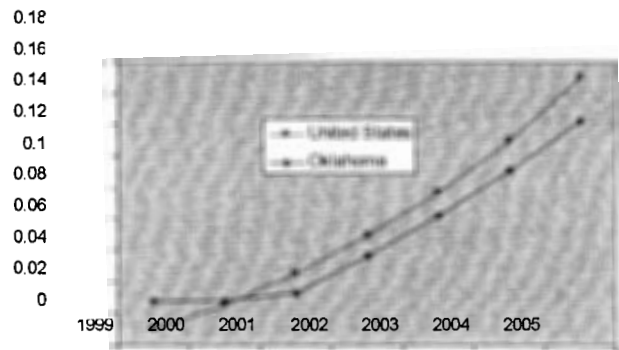

Figure 2. Number of High-speed Lines Per Capita (U.S. and OK). Sources: FCC Form 477 Filer Data, 1999 – 2005, U.S. Census Bureau.

However, rates of high-speed access in Oklahoma lag behind the national averages (Figure 3). This is not surprising, as Oklahoma is a relatively rural state (with 65 of its 77 counties classified as rural) – and a distinct gap in high-speed access rates between rural and urban areas has been noted for the nation as a whole. Data from 2005 indicates that the percentage of households subscribing to high-speed access was between 10 and 15 percentage points lower in rural areas. This gap appears to be continuing as high-speed access has become more prevalent (Figure 4).
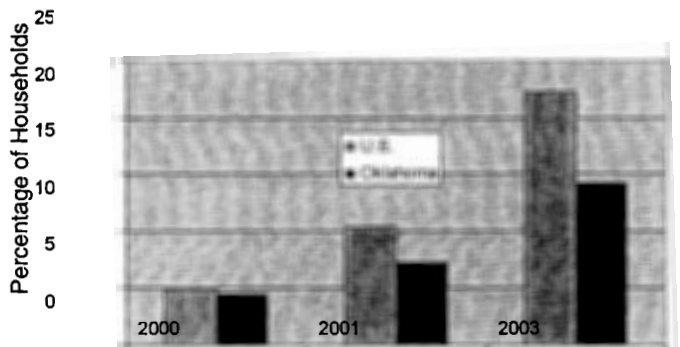

Figure 3. U.S. and Oklahoma Rates of Residential High-speed Access. Source: Current Population Survey – 2000, 2001, 2003.
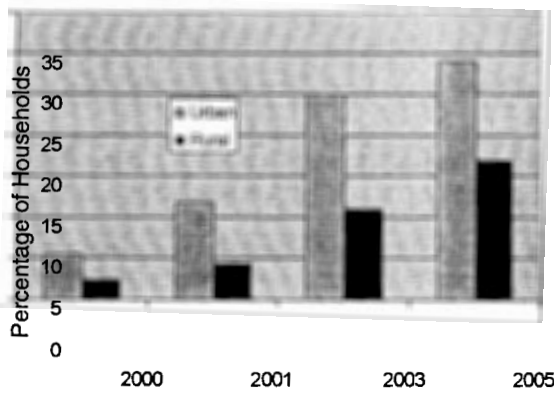

Figure 4. U.S. Rural - Urban Rates of Residential High-speed Access. Sources: Current Population Survey – 2000, 2001, 2003 and GAO Telecommunications Report to Congress – 2006.

It should come as no surprise that rural areas lag their urban counterparts in terms of high-speed access. The vast majority (99 percent) of residential and business high-speed connections in the U.S. are through cable Internet or Digital Subscriber Lines (DSL), with the other 1 percent coming from satellite or wireless connections.[2] The very nature of these wired technologies implies that it is more expensive to provide service to the more spread out, less populated, rural areas. While these technologies have become more widespread in Oklahoma over time (Figure 5), there are still disparities in the availability of infrastructure between rural and urban areas (Figure 6). However, lack of infrastructure is only one possible reason for lower rates of access in rural areas. Households and businesses must be aware of the potential benefits of Internet access before they make a commitment to purchase it. Hence, while the lack of infrastructure focuses on the *supply* of Internet access, attention must also be paid to individual *demand* for access. Some of the gap in high-speed access is likely due to demand issues, since individuals must have a desire and ability to pay for broadband infrastructure when it is in place. Rural areas may be particularly impacted by lower "networking" effects that take place when people share information about an innovation.

Why Should Communities Care About Their Telecommunications Infrastructure?

Given a better understanding of its benefits, both households and businesses will probably be interested in obtaining and using high-speed infrastructure in their communities. Several research reports on this topic have expressed concern that rural areas will be left further behind in terms of economic and social opportunities if they do not address this persistent digital divide. Recent research has supported the notion that broadband access positively affects economic activity in terms of employment growth, number of overall businesses, and businesses in information technology-intensive sectors. A

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2 While most Oklahomans continue to connect via DSL or cable, some Oklahoma-based wireless providers such as Vroom Wireless or OK WiFi have become more popular during the mid 2000s. These wireless providers typically deal with a limited geographic portion of the state.
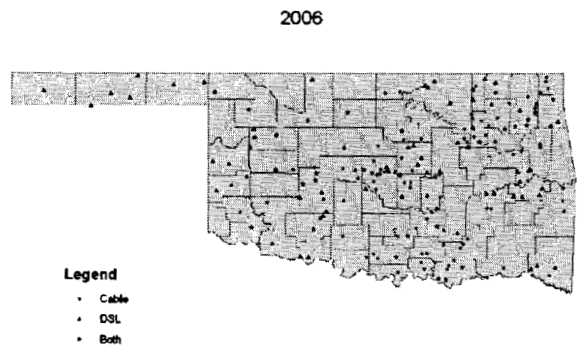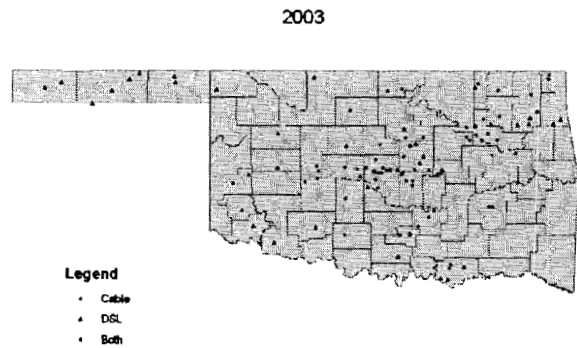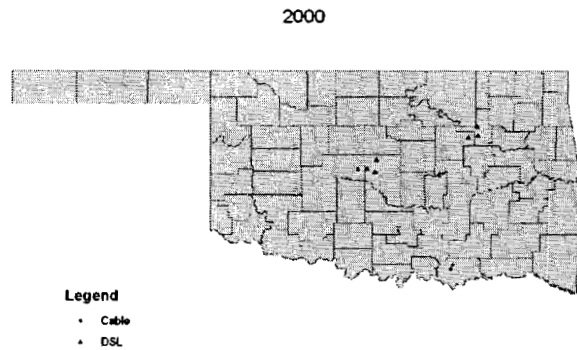

Figure 5. Oklahoma Cities with Cable and DSL Infrastructure - 2000, 2003, and 2006. Source: NECA Tariff #4 Data, Warren Publishing Cable TV Factbook, 2000, 2003, 2006.

number of household and business opportunities related to broadband access are discussed below.

Household Opportunities

Education
*   Many people take classes over the Internet in an effort to further their education. Diplomas ranging from GED equivalency to Master's degrees or Ph.D.s can be earned online. The primary benefit of enrolling in online classes is that it allows the individual to take the course around his
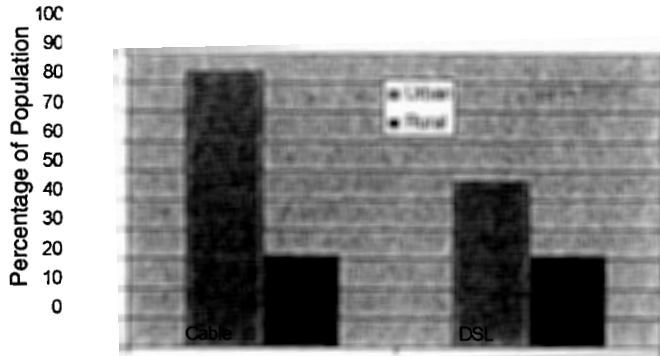
Figure 6. Cable/DSL Broadband Availability in Oklahoma, 2006.

Source: NECA Tariff #4 Data, Warren Publishing Cable TV Factbook - 2006, U.S. Census Bureau

or her own schedule, such as at night after work, without having to travel to the school's physical location. Submitting papers, downloading large datasets, or watching a video online all require high-speed access.

Income
- The Internet brought about a number of innovative ways for an individual to increase their income. The introduction of e-commerce allows people to sell almost anything online. Sites like eBay (www.ebay.com) or Craigslist (www.craigslist.com) let people list individual items for sale, and then ship them off to the highest bidder. Home-based businesses have also increased dramatically as people advertise and promote their cleaning services, computer / technical help, pet services, and a vast array of other entrepreneurial activities online. Similar to the education example above, running an online business from home or heavily participating in auction sites requires the use of high-speed Internet. Oklahoma State Cooperative Extension has published a fact sheet dealing with the development of a home-based business (see F-915 of the Fact Sheet series). Extension programs from several states have also focused on using the Internet to sell various goods, including the programs at the University of Minnesota, Iowa State, and Pennsylvania State.

Social groups / contacts around the world
- Groups that share a common interest find it increasingly easier to stay in touch via the Internet. Some Voice-Over Internet Protocol (VOIP) providers allow individuals to make free phone calls all over the world. Additionally, email is now the most common method of communication for youth athletic events in many communities. People attracted to a certain religious organization, social club, or professional association can connect with other like-minded individuals over the Internet, regardless of the physical distance separating them.

Entertainment
- Downloading the latest song, movie trailer, or playing a video game online are all most easily done with high-speed access. Sites such as www.youtube.com and various webloggin sites (also known as "blogging") allow

users to upload videos of themselves or document their own thoughts for others to observe. These activities represent an important component of most American's leisure time. High-speed Internet access allows people to enjoy a multimedia environment from the comfort of their own home.

Business Opportunities

Community Advancement
- Businesses take many factors into consideration when planning their locations. In an increasingly connected world, one of those factors is the availability of high-speed access. One study shows that between 1998 and 2002, communities with broadband access experienced more rapid growth in employment and number of businesses overall than those without access. Therefore, there is evidence to suggest that obtaining high-speed infrastructure will benefit a community in terms of job and income growth.

Increased Productivity / Efficiency
- High-speed Internet access creates a number of opportunities to increase the productivity of a business, including taking advantage of online training courses or quickly transferring large files between co-workers.
- Consumer demand for online transactions has increased dramatically since the inception of the Internet. High-speed access is necessary to provide efficient and reliable transactions for customers.

New Audiences / Connections
- Creating a website allows companies to compete on a global level, accessing millions of potentially new customers.
- Just as customers can search the web for the product that suits their needs, a business can search for more competitive suppliers or potential relationships with other businesses.

Loyalty / Respect
- Slow connections do not make anyone happy! By reducing waiting time, employees are more likely to be more productive and less frustrated at work.
- Many businesses are catering to customer needs by offering a web presence and quick ways to contact them (e-mail/online service forms). Businesses without web sites or e-mail addresses are often seen as inferior businesses and are less likely to be embraced by the increasingly technology-savvy general population.

What Communities Can Do

Communities should be concerned with the two distinct components of broadband access noted above: supply and demand. Measures need to be taken to ensure that community members have access to broadband infrastructure (supply) and also to promote knowledge about what the Internet is and how it can be useful so that individuals will be interested in having it in their own household or business (demand).

Supply

There are a number of ways your community can obtain broadband infrastructure. The most popular is the private sec-

tor route, where private providers such as the phone or cable company invest in infrastructure for a community. Unfortunately, there is often little incentive for these companies to provide broadband infrastructure in rural communities, since the low population densities and inferred low levels of demand may not provide enough return to justify the initial investment. Still, several Oklahoma providers (notably AT&T, who is bringing DSL to over 50 small Oklahoma communities in 2006 – 2007) are promoting the diffusion of broadband infrastructure. It is always helpful to discuss the situation with the local phone or cable companies. Notifying these companies that demand for high-speed access exists in your community provides some additional incentive for these private companies to upgrade to broadband infrastructure. However, if broadband service cannot be obtained through these companies, it can still be brought to the community via two other methods – municipal broadband (local government) or public/private partnerships.

Municipal broadband is typically operated through a municipal utility. The basic premise is that the local government builds, owns, and operates the broadband system, which delivers service within their regulatory boundaries. In Oklahoma, examples of these types of systems have been setup in Sallisaw (with fiber optic cables) and Oklahoma City (with wireless access). While this delivery method allows local communities to take the lead in establishing broadband access and allows funding through bonds and grants, they face similar obstacles as the private sector – namely high startup costs and low population density. A separate model, the public-private partnership method, takes advantage of the skills and assets of both sectors, which allows for greater efficiency and better access to capital. Contractual arrangements for this type of partnership can take a wide variety of forms, but typically allow for sharing of resources and rewards. Several examples of rural public-private partnerships are the BRAIN project in Pennsylvania, the Regional Fiber Consortium in Oregon, and UTOPIA in Utah. Understanding previous efforts in this type of partnership can be very helpful in establishing one of your own.

Several small wireless providers have taken matters into their own hands in some parts of rural Oklahoma, setting up towers that provide broadband access to areas with no "wired" service. These providers, such as Omega-1 in western Oklahoma and WaveLinx in central Oklahoma, present yet another option for communities looking to obtain broadband access. Interacting with entrepreneurial members of your community who may be interested in financing such an operation provides an investment opportunity for them and could potentially solve your access issues.

Demand

The most effective way to increase demand for broadband infrastructure is to educate community members about the possibilities the Internet introduces. Newspaper articles or editorials informing others about personal uses of broadband (i.e. e-commerce or distance learning success stories) are a great way to let people know how their fellow townspeople are using the Internet. More interactive experiences are probably better for some individuals – small group sessions providing hands-on training are perhaps the best way to allow people insight into the "ins and outs" of the broadband way of life. One-on-one interaction with group leaders can also

be very effective in communicating the potential benefits for businesses or organizations. Some information technology training opportunities likely already exist in your community, whether in high school classes or at the local community college. Working with these educators will be beneficial to everyone involved, as they have experience in the subject and will be happy to see others taking an interest. Different strategies may be employed based on the type of group being addressed. For example, community-wide events such as Chamber of Commerce or local government meetings should combine presentations with show-and-tell and small group discussions. This will actively involve the participants, and also provide a forum to identify volunteers and information regarding broadband in the community. For businesses or individuals interested in e-commerce, basic training should be offered demonstrating the use of the Internet to boost productivity – for example, how to use browsers, send word processing or spreadsheet files, or develop your own web-site. Younger generation users (and concerned parents) may be more interested in virtual communities such as www.myspace.com, video depositories, and regional blogs and videocasts. Tailoring the most relevant aspects of the Internet to a particular group will generate high levels of demand for broadband access.

Summary

The presence of high-speed telecommunications infrastructure is more important than ever for communities in Oklahoma. Understanding the benefits of high-speed access and knowing the different methods available for obtaining infrastructure allows communities to get a firm grasp on their own broadband situation. In order to take advantage of today's information-based society, both the demand for and supply of high-speed infrastructure must be stimulated. Methods to accomplish this include:

Supply
- Create a list of local businesses/groups interested in obtaining broadband
- Notify local cable/phone company that demand for high-speed access exists in your area
- Contact state/local legislators
- Contact rural broadband advocacy groups (see listing in "Where to go for help" section)
- Discuss potential wireless tower options with local entrepreneurs

Demand
- Articles or editorials touting broadband success stories
- Small group sessions with groups or businesses tailored to their needs
- Hold technology classes at libraries or public schools

Finally, it should be noted that obtaining broadband infrastructure is a long-term process, typically requiring several years to accomplish. Creating and maintaining contacts of individuals and groups interested in broadband access will allow for continuing efforts to obtain and effectively use high-speed infrastructure in a given community.

Where To Go For Help

- Groups focusing on rural broadband issues or broadband in general
  - Rural Broadband Coalition (www.ruralbroadbandcoalition.net)
  - The Benton Foundation (www.benton.org)
  - Design Nine – broadband planning and design (www.designnine.com)
- Local Oklahoma Cooperative Extension Service Office
- Private high-speed providers in Oklahoma
  - Lists of local phone providers are available from Oklahoma Corporation Commission Public Utility Division: (405) 521-4114
  - Lists of local cable providers are available from Oklahoma Cable and Telecommunications Association: (405) 843-8855
- Oklahoma Technology Council (www.oktechcouncil.com)
- Oklahoma Municipal League (www.oml.org)
- State / Local legislators

Adapted in part from "Connecting Rural Communities," Southern Rural Development Center.

Additional Reading / Sources

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Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.

- It is administered by the land-grant university as designated by the state legislature through an Extension director.

- Extension programs are nonpolitical, objective, and research-based information.

- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.

- More than a million volunteers help multiply the impact of the Extension professional staff.

- It dispenses no funds to the public.

- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.

- Local programs are developed and carried out in full recognition of national problems and goals.

- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.

- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.