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Broadband Study Report
Prepared for the
Washington Utilities and Transportation Commission

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Report on the Broadband Study for the Washington Utilities and Transportation Commission

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ATTACHMENTS

(See Separate Document of Attachments to the Broadband Study)

EXECUTIVE SUMMARY

CBG Communications, Inc. (CBG) was selected by the Washington Utilities and Transportation Commission (UTC) to conduct a Broadband Study to evaluate broadband availability, adoption, and use in five Washington Counties – Columbia, Ferry, Grays Harbor, Lewis and Stevens (the "five counties" or "subject counties"). The Broadband Study traces its roots to Section 149 of the 2007-09 Omnibus Operating Budget. That budget proviso specifically directed the Utilities and Transportation Commission:

> to conduct a survey to identify factors preventing the widespread availability and use of broadband technologies. The survey must collect and interpret reliable geographic, demographic, cultural, and telecommunications technology information to identify broadband disparities in the state. The commission shall consult appropriate stakeholders in designing the survey.[1]

CBG was engaged by the UTC to assist it in meeting the Legislature's directive by employing a variety of survey and other research methodologies to identify factors affecting broadband availability, deployment and consumer utilization disparities.

Broadband service (also known as high-speed Internet access) allows residential and business consumers to access the Internet and Internet-related applications and services at significantly higher speeds than those typically available through "dial-up" Internet access services. Until recently, the Federal Communications Commission (FCC) defined broadband service as data transmission speeds exceeding 200 kilobits per second (Kbps), in at least one direction: downstream (from the Internet to a computer) or upstream (from a computer to the Internet). In March of 2008, the FCC further defined broadband by distinguishing several classes of broadband service. First generation broadband continues to be defined as 200 Kbps. From there, the FCC has established seven additional tiers of broadband service with the highest tier

[1] SHB 1128, Sec. 149(3).

reflecting any broadband service offering having a transmission speed of 100 Mbps or more. The United States Department of Agriculture - Rural Utilities Service' (RUS), which provides federal loan assistance to telecommunications carriers deploying broadband services, requires loan recipients to offer a minimum of 200 Kbps in each direction. The stakeholders that were consulted during the design of the survey suggested that 1.5 Mbps downstream and upstream was seen by many as constituting broadband service. Because of the limited availability of broadband services in the five counties studied, CBG has reviewed and reports herein on various levels of broadband service offerings and capabilities.

The Broadband Study was designed to achieve four key objectives:

- **Identify broadband availability**, including infrastructure and service offerings within the five counties,
- **Evaluate broadband adoption and use**, including its importance and value to residents, businesses, and other constituent groups,
- **Identify various means to enhance broadband deployment** and analyze their potential for assisting economic development or enhancing quality of life, and
- **Provide a research template** that could potentially be used for follow-on research.

CBG employed a number of information gathering methodologies and related activities as part of the Broadband Study in order to meet the project's objectives. These methodologies and activities included:

- **Review of background information** including, but not limited to, documents prepared by broadband and technology work groups within the subject counties and prior telecommunications, economic development, and broadband studies conducted within the subject counties and other regions of Washington.
- A random, statistically valid **survey of the residential community** within each of the five counties.

- A sectorized, random telephone **survey of business and nonprofit entities** within each of the five counties, augmented by an online survey disseminated through local chambers of commerce.

- Online and written **surveys of other organizations and communities of interest,** including local governments, tribal nations, library districts and educational institutions.

- **In-depth interviews and focused discussions with key communities of interest representatives** within the five counties, as well as in-depth interviews with key staff and elected officials representing statewide interests.

- A written **broadband providers survey**, supplemented by review of provider-generated marketing materials, interviews with service provider representatives, and a 2,700 mile ride-out and review of physical infrastructure within the five counties.

- Subsequent to the information gathering stage, CBG conducted **a variety of analyses of the underlying information** to reliably interpret and make informed conclusions about the data. This stage of the Broadband Study included:

    - An economic impact analysis.

    - A digital divide analysis.

    - A comparative analysis, including an assessment of best practices.

    - A broadband infrastructure and service analysis.

    - A gap analysis.

    - A future requirements analysis.

After three months, several thousand miles and more than 2000 interviews, CBG is pleased to offer the following principal conclusions regarding factors affecting the deployment, availability and use of broadband services in the five counties subject to the Broadband Study:

- **Broadband availability varies widely within each county and across the counties.** Seventy-two percent (72%) of residents in the studied counties have Internet access, but just 32% have wireline broadband and in some counties like Ferry, just 15% of residents have wireline broadband. Nationally, 54% of residents have broadband. Generally, the higher the population density, the closer the proximity to other dense areas and the closer the proximity to major transportation corridors, the higher the availability of broadband service including the likelihood of multiple options. For example, counties with more broadband access, like Grays Harbor, had a stronger presence of thriving small and medium businesses, as well as a larger percentage of households operating a home-based business.

Type of Internet Access Connection	Columbia	Ferry	Grays Harbor	Lewis	Stevens	Average Across the Five Counties
Dial-Up	17%	35%	11%	25%	34%	24%
DSL (Digital Subscriber Line)	31%	7%	17%	27%	19%	20%
Cable Modem	7%	8%	33%	9%	5%	12%
Satellite Internet Service	7%	12%	3%	3%	10%	7%
No Internet Access	29%	30%	28%	27%	23%	28%

This chart reflects the top reported types of internet connections in the studied counties.

- Major **inhibitors to broadband availability** are:
    - low population density,
    - distance from a major transportation corridor,
    - mountainous and heavily forested terrain,
    - permitting delays and problems,
    - providers not being included in the community planning process,
    - longer than acceptable Return on Investment, and

  - limitations of existing technology.

- Even if a high percentage of the population wanted to subscribe to broadband, **in many rural areas there is simply not sufficient demand (i.e., revenue potential) for the service to justify the level of private investment needed for deployment.** This remains a hard reality without either technological changes that reduce costs substantially or substantial subsidies from government or foundation sources, like the mechanisms used historically to promote the universal availability of wireline telephone service.

- Generally, **broadband adoption follows availability**. Where broadband availability and options are plentiful, consumer use of broadband service and the value of such use expands significantly. The study suggests a couple of important exceptions to this general conclusion. In rural areas served by broadband, subscription rates to high speed internet services are generally lower than in urban pockets. Research suggests that this is because the perceived value of high speed internet access is not always readily seen by rural residents. There is clearly a segment of residential consumers that do not want or require broadband service or access to the Internet, even if it is available. However, it is equally evident that a certain percentage of residential consumers would embrace broadband service but they would need enhanced access to computing devices and/or training to really understand and take advantage of the opportunity offered by broadband.

- There are several key **inhibitors to broadband adoption and use** that coalesce around the price/value relationship of broadband service access. These include:

  - Service not available or not easily available.

  - Relatively high cost of service.

  - Lack of viable, multiple competing options.

- **"It takes good, forward thinking people,"** Grays Harbor Chamber Focus Group participant.

Overall, champions will be needed to pursue broader deployment and adoption. Study participants frequently mentioned the powerful role individuals play in resolving gaps in broadband. For example, the K-20 Network leadership was described as being able to get the job done and demonstrate the value of furthering broadband to rural schools in the State. Others mentioned one of the provider's general managers and cited his willingness to think outside of the box to expand broadband within his territory. The energy of forward thinking people that can help create rationales and have a resolve to close the broadband gap is essential to bringing more broadband options to the unserved and underserved.

Once critical factors were identified concerning broadband availability, adoption, and use within the five counties subject to the Broadband Study, CBG evaluated broadband infrastructure and service deployment models and options. We did so in order to develop recommendations for initiatives that could enhance the broadband service environment within the five counties studied and, where possible, address similar circumstances statewide.

The following steps to promote expansion of broadband availability in the five counties crystallize the gaps and the actions required to address them:

Gap	**Future Actions**
Lack of Broadband	Initially work to determine the most effective methods to enhance and expand backbone infrastructure.
Address Governmental Policies in Place Today that Inhibit Deployment	Work with the State, county and other local governments to address existing inhibitors to local deployment of broadband.
Lack of Backbone Infrastructure	Work with State agencies such as DOT, WSP and DIS and local agencies to fully identify all currently available infrastructure.
	Work with State agencies such as DOT, WSP and DIS and local agencies to determine planned deployment of infrastructure in the near and long term.

Gap	Future Actions
	Work with State agencies such as DOT, WSP and DIS and local agencies to determine how new deployment can be leveraged to add additional capacity for broadband deployment long term, including the closest points of connection to existing and potential new last mile infrastructure. Meet with large and small providers to determine desire to participate in, for example, a "Backbone Deployment Cooperative". Determine how this Cooperative might help the State reduce its costs to deploy fiber optic infrastructure throughout the counties and therefore accelerate deployment.
Creation of Redundant Backbone	Determine what level of redundancy is needed to offer reliable service and to promote adoption of the backbone network by small and large providers. Determine how cooperative efforts will minimize deployment costs of a backbone and therefore how redundancy can be built into the network at the lowest possible level.
Creation of Additional Last Mile Infrastructure	Determine the best methods of delivering last mile services based on the closest point of connection to an enhanced, expanded backbone.

The Broadband Study Report explores several deployment models and options to facilitate the actions needed. All of these will ultimately require vigorous consideration of the difficult policy decisions to be made by the Legislature concerning the best approach or mixture of approaches that may be taken:

- **Encourage the Private Sector to Build** – The State is already involved in this type of effort through an extensive backbone network that facilitates private investment in facilities supporting governmental agency interconnection and the K-20 Network. The State could expand its role as an anchor tenant by taking steps to expand the backbone into at least one location in all counties. Establishing this objective affirmatively as a matter of State policy could potentially spur investment by entities looking for opportunities to provide not only backbone service, but to stimulate or expand broadband

infrastructure in unserved or underserved areas that happen to be contiguous to or near the backbone. Any expansion of the K-20 Network to accomplish this recommendation would require a thorough review of the terms and conditions of existing federal funding used (i.e., the federal e-rate program) in support of the network.

Providers could also be encouraged to build new broadband infrastructure through a concept known as "ROI gap funding." Such funding could be made available by appropriate entities such as governmental, business, consortia, etc., subject to conditions. This funding would enable providers to extend service within targeted counties and municipalities, by supplementing the typical investment that they would make to provide service, which in lower density areas is unlikely to generate an adequate return.

- **Create a State Broadband Authority** – Washington does not currently have a "one stop shop" where collective thinking to address broadband needs is available. As a result, study participants indicated that broadband stakeholders were not always aware of each others' activities and therefore could not take advantage of synergies that might exist in the deployment of infrastructure. Some type of authority could serve as a clearinghouse for broadband initiatives. Stakeholders believed this type of centralized ability to converse with other providers could go a long way in helping to address broadband needs in the five counties. A broadband authority could, for example, identify potential wholesale opportunities for certain public entities such as Public Utility Districts (PUDs), appropriate local entities, or the State itself to provide services by leveraging private and public resources that may be currently available and that potentially could be expanded (i.e., State backbone, PUD fiber optic infrastructure, local government fiber, and wireless infrastructure). Careful study of current restrictions and parameters surrounding provision and use of public resources would need to be made to insure that current positive attributes of the broadband marketplace are not lost or impaired in any effort to expand broadband service availability. Additionally, it is important to note that, as is the case for private providers, in rural areas there would need to be careful consideration of the demand (i.e., revenue potential) for broadband services to justify the level of public investment that may be required for deployment.

- **Create a Public/Private Partnership** – Develop a truly viable public/private partnership that may include a nonprofit element, but must include measurable parameters that will benchmark and determine success of the partnership(s) over time.

All of these options, as well as details and findings from the various information gathering activities CBG undertook for the Broadband Study Report, are discussed in the specific sections that follow this Executive Summary. The Report is organized into 22 major sections and attachments which speak to specific observations about broadband service within and across the five counties subject to CBG's research.

Section A
Introduction and Background

INTRODUCTION AND BACKGROUND

"Internet is for everyone - but it won't be until in every home, in every business, in every school, in every library, in every hospital in every town and in every country on the Globe, the Internet can be accessed without limitation, at any time and in every language.

Internet is for everyone - but it won't be if it is too complex to be used easily by everyone. Let us dedicate ourselves to the task of simplifying the Internet's interfaces and to educating all that are interested in its use."[2]

Overview

CBG Communications, Inc. (CBG) was selected by the Washington Utilities and Transportation Commission (UTC) to conduct a Broadband Study to evaluate broadband availability, adoption and use in five Washington Counties – Columbia, Ferry, Grays Harbor, Lewis and Stevens (the "five counties" or "subject counties"). The Broadband Study project traces its roots to Section 149 of the 2007-09 Omnibus Operating Budget. That budget proviso specifically directed the Utilities and Transportation Commission:

> to conduct a survey to identify factors preventing the widespread availability and use of broadband technologies. The survey must collect and interpret reliable geographic, demographic, cultural, and telecommunications technology information to identify broadband disparities in the state. The commission shall consult appropriate stakeholders in designing the survey.[3]

After consulting with principal stakeholders involved with the development of the Broadband Study legislation, five counties were selected where it was commonly understood there were service disparities, economic development challenges, and there were other diverse issues that likely contribute to impaired broadband availability, adoption and use. Once the counties were

[2] Memo to Network Working Group, The Internet Society, **The Internet is for Everyone,** Vint Cerf (commonly referred to as the "father of the Internet"), April 2002.
[3] SHB 1128, Sec. 149(3).

chosen, the UTC established a number of objectives for the Broadband Study to achieve the legislation's goals. The UTC grouped the objectives into the following broad categories:

1) **Broadband Availability** – Identify currently available broadband infrastructure within the counties and how extensively the infrastructure is deployed. Evaluate residential and business accessibility to current infrastructure, technologies and services. Identify the geographic areas of the counties that are currently served by one or more retail broadband services. Identify broadband transmission speeds available to residents and businesses within the counties.

2) **Broadband Adoption and Use** – Evaluate how broadband infrastructure and services are used to create value for the counties' economy. Identify how available broadband services create economic opportunities for organizations and residents. Identify how and which organizations and residents benefit from available broadband technologies. Evaluate the costs of broadband services available to residents and organizations including low-priced and no-cost services.

3) **Broadband Deployment Options** – Evaluate and identify various broadband deployment options that may enhance the quality of life of the counties' residents and organizations. Identify best practices that could contribute to economic opportunity through broadband deployment. Identify existing programs (i.e., infrastructure and service development efforts such as Centralia's BPL trial) operating in the county that could potentially compliment broadband deployment efforts.

4) **Research Template** – Analyze how the Study could serve as a template for statewide broadband research including how the Survey should be expanded, modified, and how results should be measured.

CBG was engaged by the UTC to assist it in meeting the Legislature's directive and the objectives. We employed a variety of survey and other research methodologies to identify

factors affecting broadband availability, deployment and consumer adoption and utilization disparities. These methodologies are described in more detail below.

Study Methodology

As part of the Broadband Study, CBG performed a variety of tasks including:

- Review of background information including, but not limited to, documents prepared by broadband and technology work groups within the subject counties, prior telecommunications, economic development and broadband studies conducted within the subject counties and other regions in Washington and other similar materials.

- Consultation with a wide variety of communities of interest including government, community, business, non-profit, educational, tribal representatives, and other interested parties who received and responded to information about the Broadband Study Project during initial contacts and interviews.

- A telephone survey of the residential community within each of the designated Broadband Study counties. Specifically, a survey instrument designed to obtain information about residential broadband availability, adoption and use was developed; statistically valid sampling and telephone contact methodologies were applied; the resulting data set was analyzed, correlated and cross-tabulated; and the results are presented in Section B herein. Three hundred (300) individual residential telephone interviews were completed within each county; a total of 1,500 across the five counties.

- Regarding the business and non-profit community, broadband availability, adoption and use was determined from a variety of methodologies, including: a telephone survey of a random sample of businesses by sector (100 businesses were surveyed in each of the three largest counties [Grays Harbor, Lewis and Stevens], 50 businesses were surveyed in each of the smaller counties [Columbia and Ferry], for a total of 400 completed telephone surveys); an online survey disseminated through local chambers of commerce (101 completed responses were received from various entities throughout the five counties);

interviews of key members of prominent businesses and non-profit community organizations; and participation in focus groups and focused discussions within each county.

- For other organizational communities of interest (government, educational, libraries and tribal), written and online surveys were disseminated and completed. Representatives of many of these communities also participated in the focus groups.

- Eight focus groups and focused discussions were conducted towards the end of the information gathering process (two in each of the largest counties, with one community-wide focus group held in each of the two smaller counties). As further described herein, the focus groups involved a wide variety of participants and were designed to encourage in-depth discussions to explore and develop, in more granular fashion, findings related to broadband availability, adoption and use as well as potential deployment options for the future. Participants were encouraged to react to each of the topic areas and to interact with each other regarding expressed opinions, perceptions, needs, interests and concerns.

- A broadband providers survey, seeking information from a variety of telecommunications/broadband service providers, was performed. The information received was supplemented by a variety of other information gathering activities, including information received from service users during the other information gathering efforts described above, as well as review of marketing materials and service provider agreements such as cable franchises and interviews with service providers and resellers.

- Additionally, a comprehensive physical audit, including a 2,700 mile ride-out of service provider distribution lines throughout the five counties, was conducted in order to provide the level of information needed to obtain the most feasible review of current broadband providers, infrastructure and services.

- Once the information was gathered, CBG conducted a variety of analyses of the underlying information to reliably interpret and make informed conclusions about the data. This included:

  - An economic impact analysis.
  - A digital divide analysis.
  - A comparative analysis of best practices.
  - A broadband infrastructure and service analysis.
  - A gap analysis.
  - A future requirements analysis.

- All of the foregoing information gathering, review and analysis efforts resulted in the development of options for broadband service and infrastructure deployment models to help guide the State as it makes decisions based on the information reported herein.
- A Project Template description is also included at the end of the Report that discusses how the existing Broadband Study methodology could be applied to other areas in the State, as well as enhancements that can be made to augment current data gathering capabilities.

CBG's Project Manager for the Broadband Study was Tom Robinson, Executive Vice President. The CBG Project Team included Dick Nielsen, Senior Engineer, who supervised the broadband provider information gathering effort and performed the physical plant ride-out. Dr. Constance Book supervised information gathering from the residential, business and educational communities and performed a wide range of statistical analyses on the information gathered. Krystene Rivers, Research Associate, assisted all the team members in their various tasks.

CBG would like to thank the UTC for its invaluable assistance in working with us to help facilitate expeditious, efficient and effective data gathering. Also, CBG wishes to thank the many state, local, community, business and other representatives who provided assistance in bringing together critical participants for interviews, focus groups and other information gathering efforts.

Background on the Five Counties

It is important to understand the nature of the residential community, business and industry, the educational community and other key demographics and characteristics of the five counties included in the Broadband Study, before reviewing the data that pertains to them and the interpretations and analysis that CBG presents in this Report. Accordingly, below are brief descriptions of the five counties.

Overview of Columbia County

Columbia County is 874 square miles in area and located in the southeastern corner of the State of Washington. Columbia County was formerly part of Walla Walla County and is named for the Columbia River which flows through Walla Walla. The county had an estimated population of 4,087 people in 2006, an increase of 0.6% from 2000.

In 2000, there were 1,687 households with approximately 2.3 people in each. By 2025, Columbia County's population is expected to decrease slightly. Ninety-four percent (94%) of Columbia County's population classifies themselves as white, while 6% are of Hispanic origin and 1% identify themselves as American Indian and Alaskan Native.[4]

On their way to the Pacific Ocean in 1805, Lewis and Clark made camp in the area that would become the City of Dayton in Columbia County. At that point, Dayton was actually used by regional American Indians as a racetrack. Columbia County was originally a portion of the larger Walla Walla County until it was created in 1854. In 1859, homesteaders began to inhabit the area and by 1872 Dayton had become a city.

[4] American FactFinder. United States Census Bureau. Retrieved on June 15, 2008.

Presently, Dayton remains the largest city in the county as well as the county seat. Dayton had a population of 2,655 people in 2000, and accounts for over half of the county's population. The town of Starbuck is the second largest municipality in the county, but it has a much smaller population compared to Dayton; 130 people in 2000.

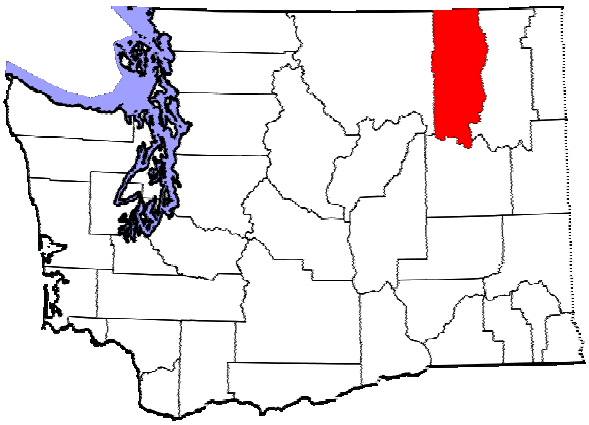
The five industries that account for the majority of the wages paid to employees in Columbia County are local government; construction; agriculture, forestry, fishing and hunting; the retail trade; and wholesale trade.

The top five employers in Columbia County are Dayton's general hospital, Ski Bluewood, the county itself, Dayton's public schools, and the Federal government.[5] The unemployment rate in Columbia County has varied somewhat over the last five years. At present, 6% of the county's 1,500 person workforce is unemployed.[6]

Since 1975, Columbia County has been working with county residents to identify the needs of the county and develop sustainable ways to address those needs. This has included, but is not limited to, developing county land use plans, identifying valuable historic sites, and developing appropriate zoning proposals.[7]

[5] Ski Bluewood is a recreation-based company.
[6] Palouse Economic Development Council. Retrieved June 15, 2008 from http://www.palouse.org/tables.htm#2.
[7] Source: American Fact Finder, United States Census, retrieved April 21, 2008; http://www.ofm.wa.gov/localdata/colu.asp, retrieved April 21, 2008; http://www.choosewashington.com, retrieved April 21, 2008; http://www.co.columbia.or.us/lds/pdfs/compplan.pdf

Overview of Ferry County



Ferry County is 2,257 square miles in area and located in the northeastern corner of the State of Washington. Sometimes referred to as "frontier" country, Ferry County is not known as an easy destination to reach because of its mountainous terrain and northern Canadian border. Ferry County had a population of 7,559 people in 2007. In the 2000 census, it had 2,823 households. Ferry County is expected to grow to 9,727 residents in 2025.

The land that is now called Ferry County was originally populated by American Indians who were mostly of the Colville tribe. In 1825, the Hudson's Bay Company built a trading post called Fort Colville in present-day, neighboring Stevens County. Though the fort was in Stevens County, it helped build up the population of Ferry County, which was officially created out of Stevens County in 1899. Before the county became official, the Colville Reservation was established in 1872. At present, the Colville Confederated Tribe owns part of southern Ferry County.

Within Ferry County, the City of Republic formed out of a gold rush in 1896. Today, it is Ferry County's only incorporated city and the county seat. The City of Republic has a population of 985. Though it is the county's only incorporated city, 13% of the residents of Ferry County live in the city. This means the majority of the population is spread out in a more rural fashion throughout the county.

The community of Inchelium is a designated place according to the U.S. Census. Inchelium had a population of 389 residents, 153 households, in the 2000 census. In the 2000 census, 76% of residents in Inchelium designated themselves as American Indian or Alaskan Native. Among all of Ferry County's 7,500 residents, the 2000 census found that 77% are white, 19% are American Indian or Alaskan Native, and 3% are Hispanic. The significant number of American Indian and

Alaskan Natives in Ferry County can be attributed to the presence of the Colville Tribe both historically and presently.

The five leading industries that account for the majority of the wages paid to employees in Ferry County are local government, the Federal government, the retail trade industry, the agriculture, forestry, fishing and hunting industry, and the construction industry. The top five employers in Ferry County are Colville Confederated Tribes, Ferry County Memorial Hospital, Ferry County Government, Columbia Cedar and Kinross Gold.

Colville Confederated Tribes is located on the Colville Reservation and has a handful of tribal business ventures. Columbia Cedar is a lumber company, while Kinross Gold is a mining company. Along with wood products, the other industry clusters present in Ferry County are electronics and computers, aerospace, and agriculture and food products. As of 2007, the unemployment rate in Ferry County had declined to 7% from 13% in 2003. Thus far in 2008, unemployment has increased from 7% to 11%.

From an economic development perspective, Ferry County puts significant emphasis on the county's outdoor recreational resources as well as the local artistic talent and historic information that its citizens possess.[8]

[8] Sources: American Fact Finder. United States Census Bureau, retrieved on April 23, 2008.
http://www.historylink.org/essays/output.cfm?file_id=7787, retrieved on April 23, 2008;
http://www.ofm.wa.gov/databook/county/ferr.asp, retrieved on April 23, 2008
http://quickfacts.census.gov/qfd/states/53/53019.html, retrieved on April 23, 2008

Overview of Grays Harbor County

Grays Harbor County is located along the coast of the State of Washington. The county is 1,917 square miles in area and is the 15th largest of the 39 counties in Washington. Grays Harbor County had a population of 70,800 people in the year 2007 which is expected to increase to 80,213 residents in the year 2025.

In 2006, 90% of Grays Harbor County's population classified themselves as white, while 5% of the county's residents considered themselves American Indian or Alaskan Native.

Present-day Grays Harbor County was first occupied by American Indians from the Quinault and Chehalis tribes as well as other tribes in the area. The American Indians dwelled in stable villages, and battled Spanish explorers claiming their land in 1775. By 1864, the majority of the tribes were required to make deals with the United States government for reservation land.

People first came to Grays Harbor County in large numbers to work at timber mills or in other aspects of the lumber industry. In 1915, Grays Harbor County, named after Grays Harbor Bay, was officially recognized. In 1920, industries that had once fueled the Grays Harbor economy began to decline. In the 21st century, projects such as a new prison facility, the Quinault Tribe Casino and Resort at Ocean Shores, Olympic National Park and other recreational attractions have stimulated economic growth. The Chamber of Commerce reports that tourism constitutes 25% of the county's economy.

The largest city in Grays Harbor County is the City of Aberdeen, which has a population of 16,450 residents. Hoquiam is the second largest city with 8,845 citizens. The Cities of Ocean Shores, Montesano and Elma follow in size, with 4,705, 3,550, and 3,140 residents, respectively.

The six industries that account for the majority of the wages paid to employees in Grays Harbor County are local government, the manufacturing industry, the retail trade industry, the construction industry, the State government, and the agriculture, forestry, fishing and hunting industry.

The top five manufacturing employers in Grays Harbor County are Westport Shipyard, Weyerhauser, Simpson Door Plant, Grays Harbor Paper and Briggs Nursery. These companies specialize in shipping management, forestry, doors, paper products and farming, respectively.

Other important employers include Stafford Creek Prison, with 530 employees, G.H. Community Hospital, with 691 employees, and the Aberdeen School District, with 490 employees. Ocean Spray also operates a facility in Grays Harbor County with more than 130 employees.

From 2003 to 2007, the unemployment rate in Grays Harbor County decreased from 9% to 6%. However, in 2008, the county's rate increased once again to 8%. [9]

Overview of Lewis County

Lewis County is 2,407 square miles in area and located towards the southwestern corner of the State of Washington. Lewis County had a population of 74,100 people in 2007. By 2025, Lewis County's population is expected grow to 90,593 people.

Meriwether Lewis, who was a Captain on the Lewis and Clark expedition, inspired the name Lewis County. Major cities in Lewis County include the City of Centralia, which has a population of 15,250 people and was founded in 1892.

[9] Sources: http://www.knowledgerush.com/wiki_image/9/96/Map_of_Washington_highlighting_Grays_Harbor_County.png, retrieved April 22, 2008.; http://www.historylink.org/essays/output.cfm?file_id=7766, retrieved April 22, 2008. http://quickfacts.census.gov/qfd/states/53/53027.html, retrieved April 22, 2008.

Chehalis is the next largest city with a population of 7,045 people and also has been the county seat since 1872. The next largest cities are all similarly sized. These include Napavine, with a population of 1,492, Winlock, which has a population of 1,370, and the City of Morton, with a population of 1,140.

The three industries that account for the majority of the wages paid to employees in Lewis County are local government, the manufacturing industry and the retail trade industry. However, the State government, the transportation and warehousing industry, the construction industry and the agriculture, forestry, fishing and hunting industry also play a significant role in Lewis County's economy.

The top five employers in Lewis County are Providence Centralia Hospital, with 800 employees, Fred Meyer, with 400 employees, Wal-Mart, with 380 employees, Hampton Affiliates, with a staff of 350 people, and Transalta, with 310 employees. The major industry clusters in Lewis County are the electronics and computer industry as well as the wood products industry. Lewis County's unemployment rate declined from 9% in 2003 to 6% in 2007. Thus far in 2008, it has increased to 9%.

Lewis County's Economic Development Council is presently working on creating an environment that is more inviting to new businesses while also providing an improved foundation that existing businesses in the area need in order to thrive. By determining appropriate ways to solve problems inherent in the county's transportation and regulatory systems, the Council has already assisted many local businesses.

In early December of 2007, Lewis County experienced one of the worst floods in its history. The flood shut down some of the county's businesses and water-logged farmland. The Coast Guard

and the American Red Cross responded to the floods and the area is still undergoing recovery activities.[10]

Overview of Stevens County

Stevens County is located in the northeastern corner of the State of Washington. The County is 2,478 square miles in area and had a population of 43,000 people in 2007, approximately 17 people per square mile.

When compared to the populations of the 39 other counties in Washington, Stevens County is presently ranked 23rd. In 2025, Stevens County's population is predicted to increase to approximately 64,000 people.

In 1811, European settlers discovered the heavily forested, mountainous land that would become the Fort Colville trading post in 1825. Stevens County was not formally created until 1863 when it was named after Isaac I. Stevens, who was the Washington Territory's first Governor soon after its formation in March of 1853.

The largest city in Stevens County is Colville, which has a population of approximately 5,000 people and is the county's seat. Other major, incorporated cities in Stevens County include Chewelah, Kettle Falls, Marcus, Northport and Springdale. These Cities' populations range from around 2500 residents to under 200. However, less than 10% of the county's population resides in these six cities.

[10] Sources: http://www.wa.nrcs.usda.gov/news/flood.html, retrieved April 23, 2008.
http://www.ofm.wa.gov/localdata/lewi.asp, retrieved April 23, 2008.
http://www.epodunk.com/cgi-bin/genInfo.php?locIndex=23029, retrieved April 23, 2008.
http://www.choosewashington.com/counties/Detail.asp?county_id=55, retrieved April 23, 2008.
http://www.choosewashington.com/counties/Labor_Force.asp?county_id=55, retrieved April 23, 2008.
http://www.chamberway.com/history/, retrieved April 23, 2008.
http://www.askfactmaster.com/Image:Map_of_Washington_highlighting_Lewis_County.png, retrieved April 23, 2008.

The industries that account for the majority of the wages paid to employees in Stevens County are the government, the manufacturing industry, healthcare and social assistance, construction, and the agriculture, forestry, fishing and hunting industry. The top three industrial employers in Stevens County are Boise Cascade, Aladdin Hearth Products and Vaagen Brothers Lumber. Two of these companies produce lumber products while Aladdin Hearth Products produces wood and pellet stoves. Major non-industrial employers are Colville National Forest, Colville School District, Stevens County, Wal-Mart and Northeastern Washington Rural Resources. Stevens County's unemployment rate is 8% as of April, 2008.

Ninety percent (90%) of Stevens County's population classifies themselves as white and 5% identify as American Indian and Alaskan Native. There is a significant American Indian influence in Stevens and the surrounding counties. The majority of the Spokane Indian Reservation is located within the boundaries of Stevens County. Around 1,500 American Indians of the Spokane Tribe and 600 other persons occupy 237.5 square miles that is federally designated tribal land.

In the last few years, Stevens County has worked to establish regulations for the use of land that would allow the government to better assist economic development in the community.[11]

[11] Sources: http://www.choosewashington.com/counties/detail.asp?county_id=66, retrieved April 23, 2008.
http://www.co.stevens.wa.us/Misc/about.htm, retrieved April 23, 2008.
http://www.historylink.org/essays/output.cfm?file_id=7995, retrieved April 23, 2008.
http://www.ofm.wa.gov/databook/county/stev.asp, retrieved April 23, 2008.
http://quickfacts.census.gov/qfd/states/53/53065.html, retrieved April 23, 2008.

Section B
Review of Residential Community Broadband Availability, Adoption and Use

REVIEW OF RESIDENTIAL COMMUNITY BROADBAND AVAILABILITY, ADOPTION AND USE

Project Overview Across The Five Counties

As part of a statewide initiative to address broadband availability and adoption, the Washington Utilities and Transportation Commission (UTC) retained CBG Communications, Inc., to perform a Broadband Study which included, in part, a broadband residential survey of five of the State's rural counties. Studied counties included Columbia, Ferry, Grays Harbor, Lewis and Stevens. A survey instrument that explored residential computer and high-speed Internet access and usage was developed. The survey was administered by telephone to 1500 randomly selected households, 300 in each of the impacted counties, during April and May 2008.

The residential survey was designed in a collaborative effort between the Washington Utilities and Transportation Commission and stakeholders in broadband initiatives. These included, but were not limited to, representatives from state telecommunications organizations, such as the Washington Association of Telecommunications Officers and Advisors, the Center to Bridge the Digital Divide at Washington State University, and Stone Soup, a non-profit organization that addresses creating rural, sustainable communities in the State of Washington.

Stakeholders provided consultation at formative stages and the end result was a survey instrument that queried residents on topics related to their current computer ownership and Internet usage, satisfaction with Internet service, the level and importance of high-speed Internet access, specific Internet applications and activities and how important it is to establish more robust broadband choices in their respective counties.

A telemarketing firm, Issues and Answers, Inc., headquartered in Virginia Beach, VA, was secured to conduct all telephone interviews. The firm has over 40 years of combined experience in social science research using telephone survey methodology. Calls were placed from four call centers around the United States, during a variety of times of day, during weekdays and

weekends, to ensure that varying demographics and lifestyles were represented in the data collected. Issues and Answers used trained interviewers and a call back procedure to protect the reliability and validity of the data collected. Telephone numbers were selected using a random selection technique from the base of area phone numbers associated with the studied counties. The survey instrument was translated into Spanish and Spanish speaking interviewers were available in the call room should such a household be reached during interviewing. Continuous callbacks were made to numbers without answers and to numbers with answering machines or voice mail so that these numbers were not removed from the pool of potential respondents.

This Section of the report provides an overview of the survey results for the five counties collectively (a review of the results for each county individually can be found in Attachment 8 of the Broadband Study Attachments document). When considering the margin of error of the numbers reported, the sample size of the five counties provides an overall margin of error of 2.5%. This means that if the study was conducted a second time, using the same random digit dialing procedures and universe of telephone numbers, one can anticipate observing the same responses to the questions posed within a range of plus or minus 2.5 percentage points. For each individual county, when considering that the sample size was 300, the margin of error for the results observed in each county is plus or minus 5.5%.

Residential Community Broadband Survey Findings Across the Five Counties

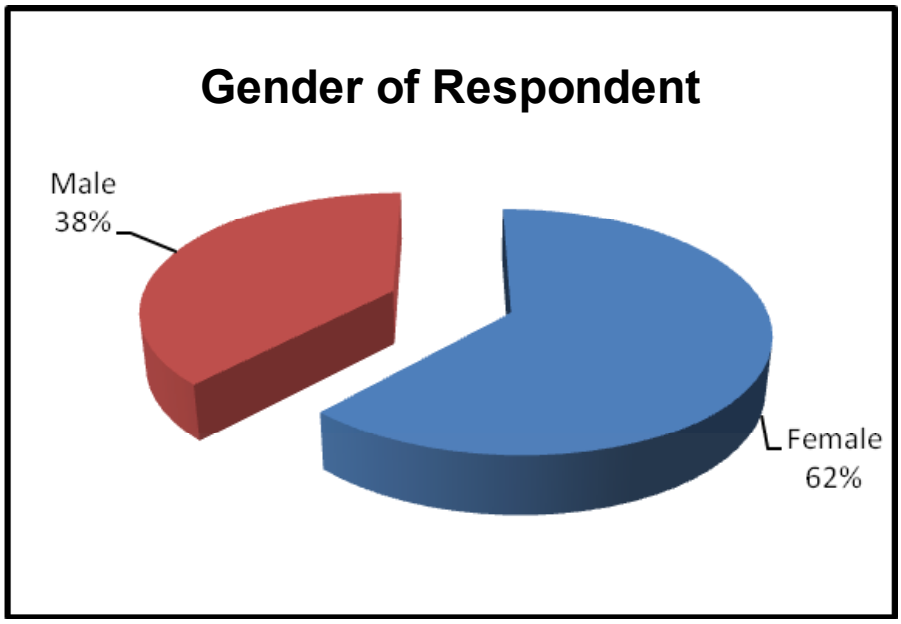
DEMOGRAPHICS

Before launching into a discussion of the findings, it is appropriate to understand the demographics of the responding sample. Comparative data as to how the responding sample compares with the census in each community is available in the community specific sections, found in Attachment 8 to this report.

Sample Description

The sample for this survey consisted of 1500 randomly selected residents from five counties (Columbia, Ferry, Grays Harbor, Lewis and Stevens) in the State of Washington with 300

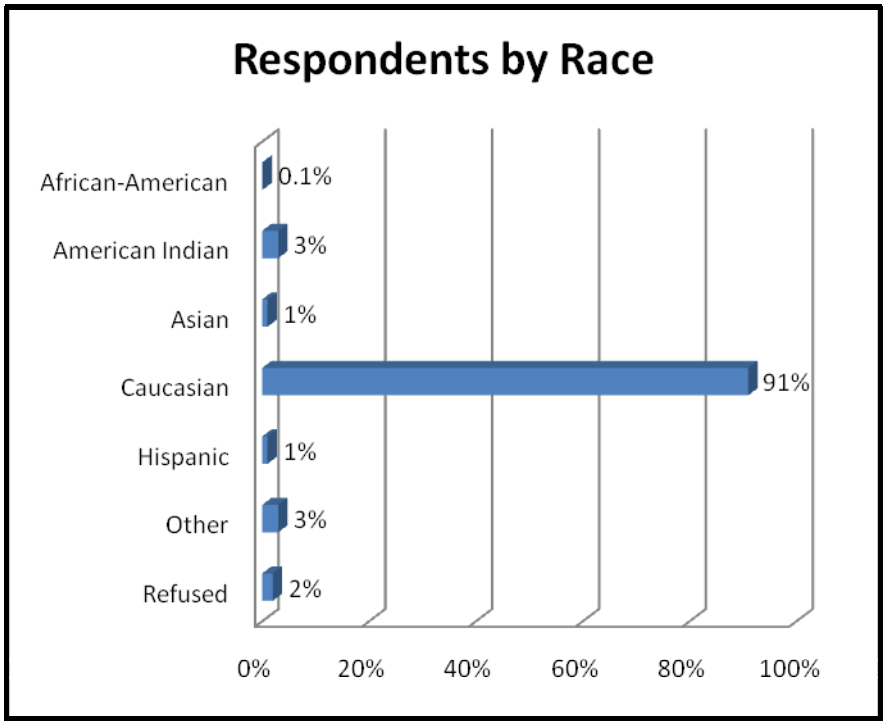
respondents from each county.[12] An initial screening question was posed to ensure that respondents were currently living in one of those five counties. All respondents were 18 or older. Overall, 38% of the respondents were male and the remaining 62% were female.[13]



Most respondents were Caucasian (91%). Three percent (3%) were American Indian, 1% were Hispanic, 1% were Asian and 0.1% were African American. Three percent (3%) of respondents identified with another racial type not presented by the surveyor and 2% chose not to provide racial information.

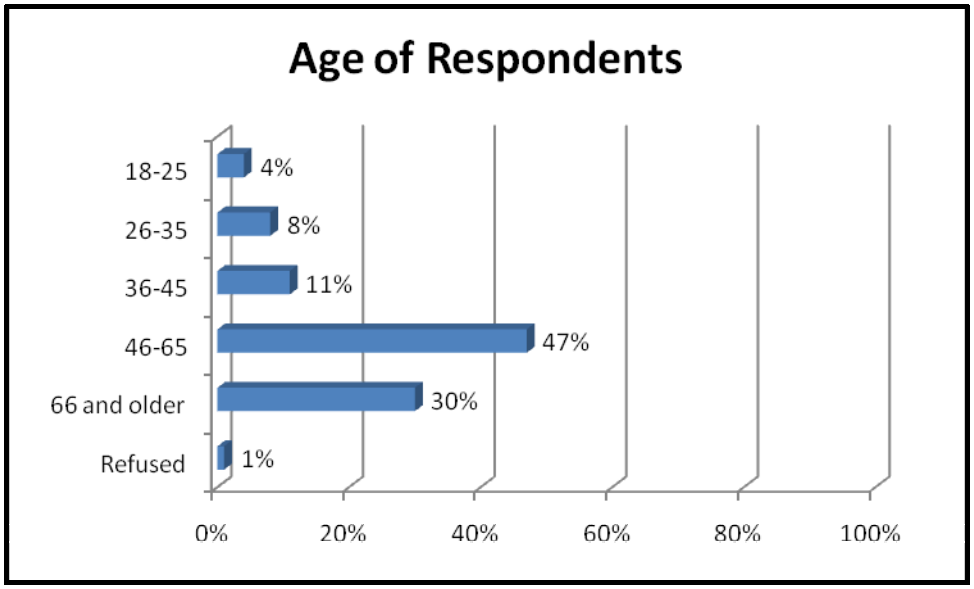
[12] Percentages presented in the report were rounded upward to the whole at .5. Therefore, the totals presented in the report will fall between 99% and 101%.

[13] The telephone is most likely to be answered by a woman in the household. McGuckin, Nancy (2001). Hang-ups, Looking at non-response in telephone surveys. www.fhwa.dot_gov/uhim/hang-ups. Retrieved May 26, 2008.



Forty-nine percent (49%) of respondents live with another person in their home while 19% live alone, 13% of responding households have three people, 9% have four people, and 5% have five people living in the home. The rest of the respondents (5%) had larger families. On average there were 2 people per household. About one in four, 23% of the sample, had children under the age of 18 in the household. Most respondents (99%) spoke English in their home while 1% spoke Spanish.

The respondents represented a wide range of ages. Those between 46 and 65, and those 66 and older, accounted for 77% of respondents. Younger residents accounted for the remaining 23%. Eleven percent (11%) of respondents were between 36 and 45, 8% were between 26 and 35 and 4% of respondents were in the youngest age group, under 25 years of age.



The sample represented a broad range of education level. Forty-one percent (41%) had completed some college, attended vocational school or had obtained a two year degree. Seven percent (7%) completed some grade school or high school and 26% of respondents graduated from high school. A smaller percentage (15%) completed college and 10% had completed post graduate work or had obtained a graduate degree. One percent (1%) declined to report their highest education level.

There was a fairly even distribution of income ranges for the sample. Sixteen percent (16%) of the sample had an income of $25,000 or less. Thirteen percent (13%) had an income between $25,000 and $35,000. Eighteen percent (18%) had an income between $35,000 and $50,000. Sixteen percent (16%) had an income between $50,000 and $75,000. Nine (9%) had an income between $75,000 and $100,000. Seven percent (7%) of respondents make more than $100,000 in their household. Finally, 22% declined to report their annual household income.

Most respondents were either employed full time (31%) or were retired (38%). Ten percent (10%) were employed part time, 7% were self-employed, 6% were homemakers and 4% were disabled and unable to work. Other respondents included students (1%), unemployed but looking for work (2%) and unemployed and not looking for work (1%). One percent (1%) declined to provide information about their employment. Among the disabled, a follow-up

question was posed, asking if their disability hampered their use of the Internet. One in three respondents indicated that it did.

Of the respondents that were actively employed (N=753), 22% completed some of their work from home while 78% described themselves as working only in the workplace. Of the 163 people that worked at home, 20% were telecommuters, 60% worked at a home-based business and 20% performed "other" work from home. The top three responses for "other" work in the home were: medical related work such as transcription or caretaking, operating a small home-based business in addition to their normal work and agricultural-related work.

ACCESS TO COMPUTERS

One of the key objectives of the study was to determine the penetration of personal computers and Internet use in the rural counties selected for study. Of the 1500 people surveyed, 80% reported having a computer in their household. Most of the respondents had at least one computer (59%), while 27% and 10% of the respondents owned two and three computers, respectively. Of those who owned computers (N=1198), 40% had a laptop while the majority (60%) owned a desktop computer.

Of the respondents that did not own a computer (N=302), the top three responses as to why they did not own one were: (a) they didn't want one (47%), (b) it was too expensive (17%), and (c) they don't know how to use it (16%).

Those without computers were asked how much they would be willing to pay for a new computer. The majority (40%) indicated nothing. Of the remaining 60% willing to pay something for a computer, the most common response, the mode, was $300.

ACCESS TO THE INTERNET

A significant number of survey respondents (72%) had some form of Internet access in their home. On average, these individuals were paying $45 dollars per month for their Internet service.

Of the respondents that did not have Internet access at home, the most common reasons were the same as those for not having a computer. Thirty-three percent (33%) said that they didn't want it, 18% said that it was too expensive and 14% said that they didn't know how to use it. When asked how much they would be willing to pay for Internet service a month, the range was from nothing, indicated by 25% of respondents, to $200 per month. The average reported amount was $20 dollars per month.

INTERNET USE

When asked who uses the computer or the Internet in the household, the majority of respondents (85%) first replied that they do. The second most common user was a spouse or partner (12%) and the third most common was children (3%). Other responses mentioned by the respondents indicated that grandchildren and other relatives also use the computer and the Internet.

The type of Internet connection that was most common among the respondents who reported having the Internet (N=1081), was dial up (34%). Twenty-eight (28%) used Digital Subscriber Line (DSL), 17% used a cable modem and 10% used satellite Internet service. Other forms of Internet service mentioned were infrequent, but included fixed wireless broadband (3%), cell phone air cards (.3%) and fiber to the home (.3%).

Those with Internet service were asked who their provider was. Respondents were most likely to name their phone company, such as Qwest (N=187) or CenturyTel (N=107), as their Internet provider. Other ISPs included Wild Blue (N=54) and Blue Mountain (N=30). Comcast provided the majority of the cable modem service in the area under study (N=187).

The speed of the Internet connection was highly variable for the respondents. Most respondents were unable to give a specific connection speed. Many just described their connection as "dial-up". Of those who knew their connection speed, most reported a speed of less than 100 Kbps (23%). Nineteen percent who knew their connection speed had between 101 and 500 Kbps, 10% had between 501 Kbps and 1 Mbps, 23% had between 1.1 and 5 Mbps, 18% had between 5.1 and 10 Mbps and 6% had greater than 10 Mbps.

Of those respondents who did not have high-speed Internet connections (N=478), the chief reason for not selecting a faster Internet connection was because it was not available in their area (50%). Twenty-two percent (22%) of respondents' first responses were that it costs too much and 14% said that they did not need it.

To further explore how and where the Internet was used, respondents were asked about their Internet use at home and away from home. At home, respondents reporting spending between no time online (1%) to 10 hours a day online (2%). The mode, or the most frequent response, was that they spent an hour online a day. The average time online was 2 hours and 20 minutes a day.

Respondents were asked whether they used the Internet in a place other than their own home. A majority (65%) replied that they only used the Internet in their home while 35% (N=515) said that they access the Internet at a place other than their home. Over the past thirty days, respondents reported that the range of time spent online away from home, was from no time (41%) to 168 hours (.1%). The most frequently reported amount of hours spent online in the last 30 days away from home among those that reported some activity was 10 hours. The average time online away from home was 18 hours in the last 30 days or roughly 40 minutes a day.

One in four respondents indicated that they used the Internet at work (24%). If the respondent indicated that they spent time online at work, a follow-up question was posed asking if they were a computer professional. Two percent (2%) of all survey respondents indicated that they were computer professionals.

The majority of the sample was not currently enrolled in school (95%). Of those that were, the range of online time was between 15 minutes and three hours, with an hour a day online at school indicated as the most frequent response.

Nine percent (9%) of respondents indicated using the Internet service available at the public library. A majority of these (74%) were residents reporting not having an Internet connection. This suggests that the library has become a key location for those without broadband access to use the Internet.

Fifteen percent (15%) of respondents reported that they used the Internet at a friend or relative's house. This included, but did not represent predominantly those respondents that indicated they did not have Internet service at home. Similarly, while 4% of the sample reported using the Internet at retail locations, this did not consist mainly of those without Internet at home, but did tend to be rural residents with laptop capabilities.

In the other "outside of the home usage" category, the top three places that respondents mentioned were specific towns, Main Street or downtown areas with "hot spots", and local businesses, such as coffee shops.

The average number of e-mail accounts for respondents with Internet access in the five counties surveyed was 2 email accounts. The range was from 0 (5%) to 50 (.5%), with the majority indicating that they had one email account (45%) and one in three indicating that they had two accounts (32%). Respondents that were employed or in school were more likely to report having multiple e-mail accounts.

In describing their primary email account, most respondents used their e-mail for personal reasons (71%), while 28% used it for work and 1% used it for school. Respondents most likely used their second email account for work or school.

A large majority of the individuals with an Internet connection replied that they used their e-mail account at least once a day (73%) or once or several times a week (20%). A smaller percentage (7%) use their e-mail account less than once a week.

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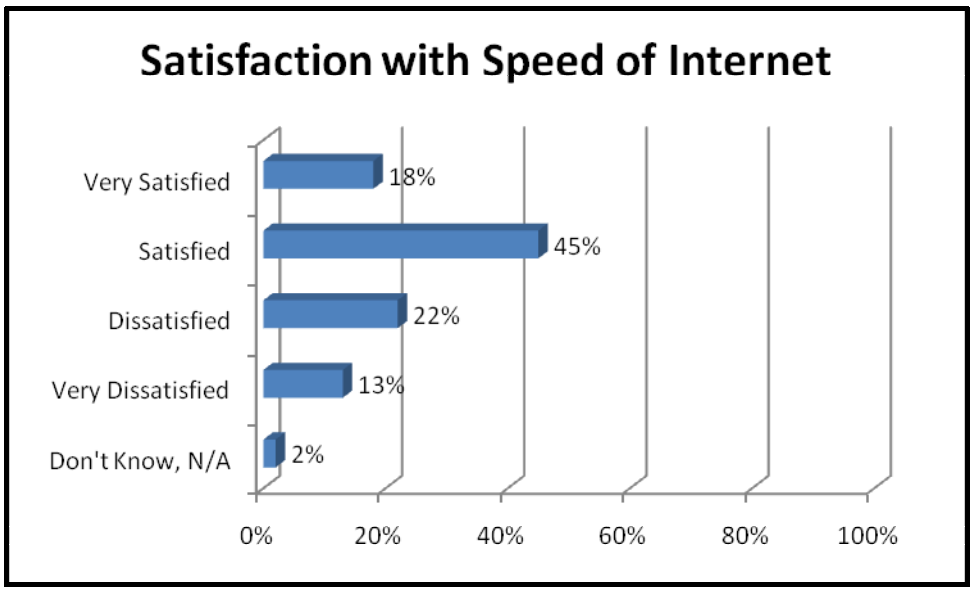
E-Mail Usage	Total N=1080
At least once a day	73%
Once a week/ Several times a week	20%
Less than once a week	7%

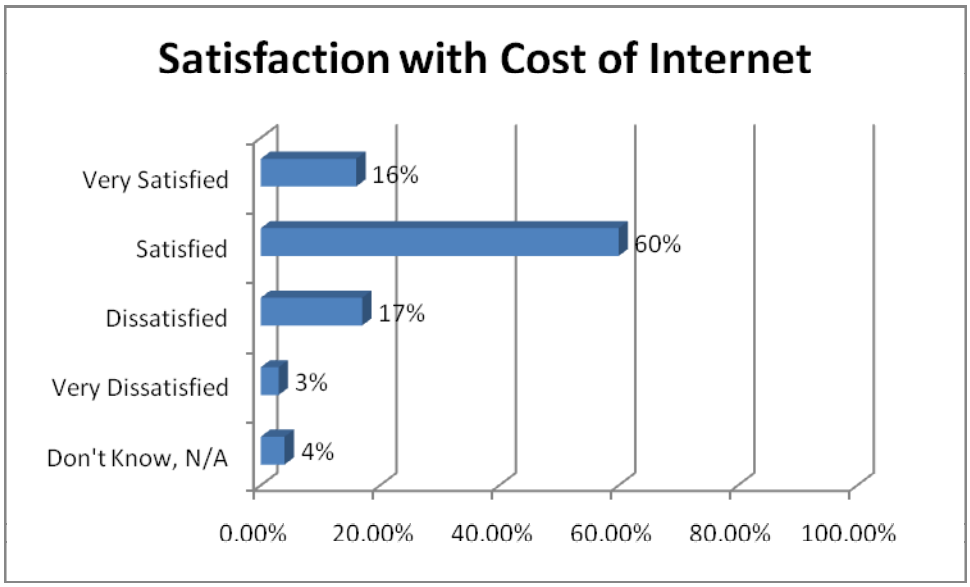
OVERALL SATISFACTION WITH INTERNET SERVICE

Respondents with an Internet connection (N=1080) were asked to rate their satisfaction with specific business practices and characteristics of their Internet services. The areas with the highest satisfaction, with 91% of respondents indicating being "satisfied" or "very satisfied," were billing practices of the Internet provider and the ease of use.

The most dissatisfaction was expressed with the speed of the Internet connection, with 35% of respondents indicating that they were "dissatisfied" or "very dissatisfied." This was indicated most frequently by dial-up users; however there was also some dissatisfaction expressed by satellite Internet users with the speed of the connection.



One in five respondents was dissatisfied or very dissatisfied with the costs of Internet services.



Additionally, a little more than 1 in 10 respondents (12%) expressed dissatisfaction with the reliability of the service. This was most frequently reported by dial-up users and satellite Internet service users.

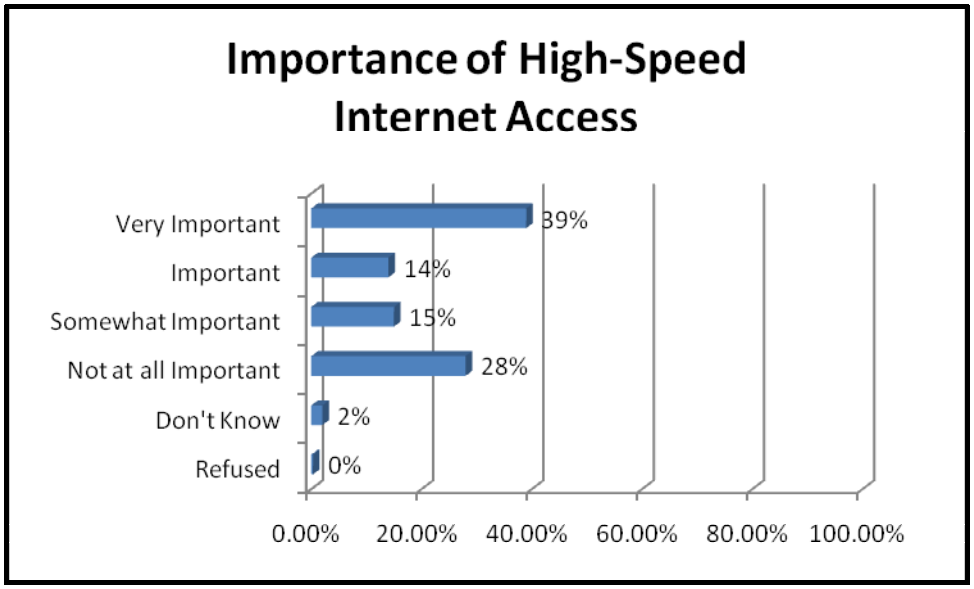
Customer service knowledge and technical support received generally positive ratings.

Responses to the specific Internet service characteristics rated during the interview are shown in the chart below.

Internet Service Characteristics	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	Don't Know/ N/A
Speed	18%	45%	22%	13%	2%
Cost	16%	60%	17%	3%	4%
Billing Practices	24%	67%	4%	1%	5%
Reliable Access	27%	60%	9%	3%	2%
Ease of Use	26%	65%	5%	2%	2%
Customer Service Representative's Knowledge and Courteousness	29%	46%	5%	2%	18%
Technical Support	23%	49%	7%	2%	19%

IMPORTANCE OF HIGH-SPEED INTERNET ACCESS

All respondents were asked questions about broadband, also known as high-speed Internet access. When asked whether it was important for them to have high-speed Internet access, results varied but the largest number of respondents indicated a high level of importance. Specifically, thirty-nine percent (39%) said that they felt it was "very important" to have high-speed Internet access and 14% indicated that it was "important." Only 15% indicated it was "somewhat important" while one fourth of the respondents (28%) said that it was "not at all important."

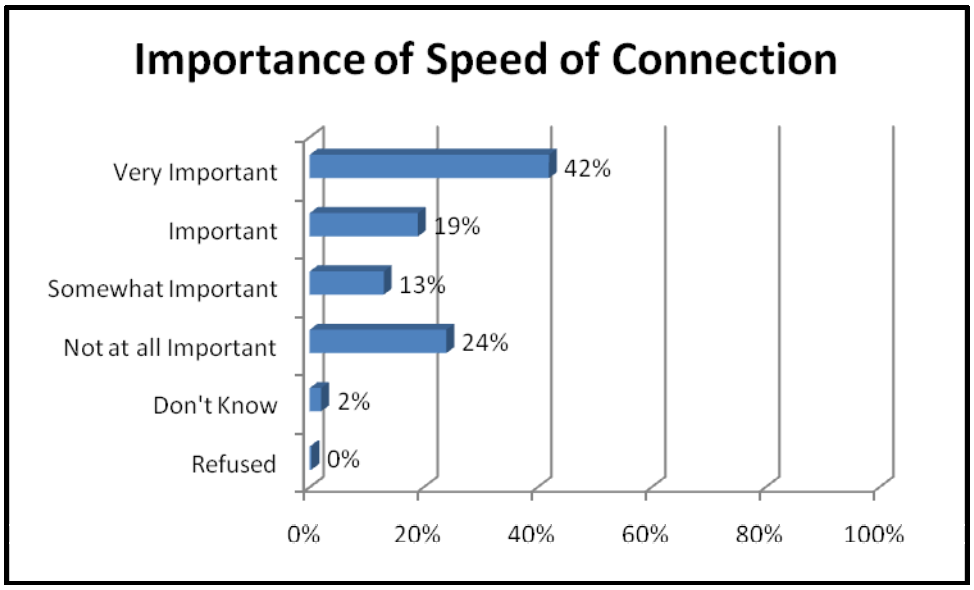


Those that responded it was "very important" or "important" to have high-speed Internet were asked to give reasons why. The most common reason offered was that it was faster and so it saves time (N=512). Other principal reasons as to why high-speed Internet is important included: needed for work (N=123) and communication with others (N=31). The top five reasons are listed in the chart below:

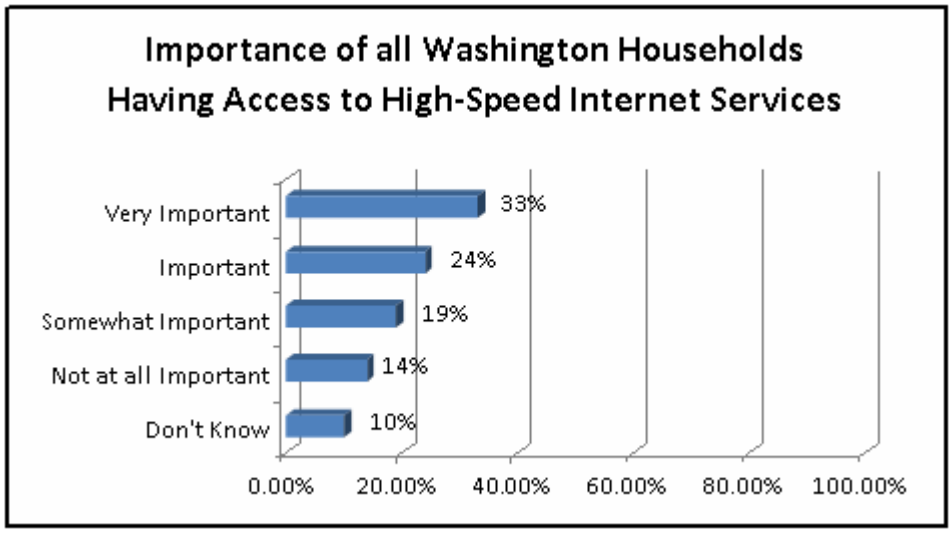
Reason why High-speed Internet is Important	N= 895
Saves Time/Efficiency	512
Needed for Work	123
Communication with Others	31
Better Downloading Capabilities	26
Better Access to Information	20

All respondents were also asked how important the speed of their Internet connection was to them and these responses mirrored the responses given when asked whether it was important for them to have high-speed Internet access. Forty-two percent (42%) said that they felt it was "very important" to have high-speed Internet access and 19% indicated that it was "important." Only

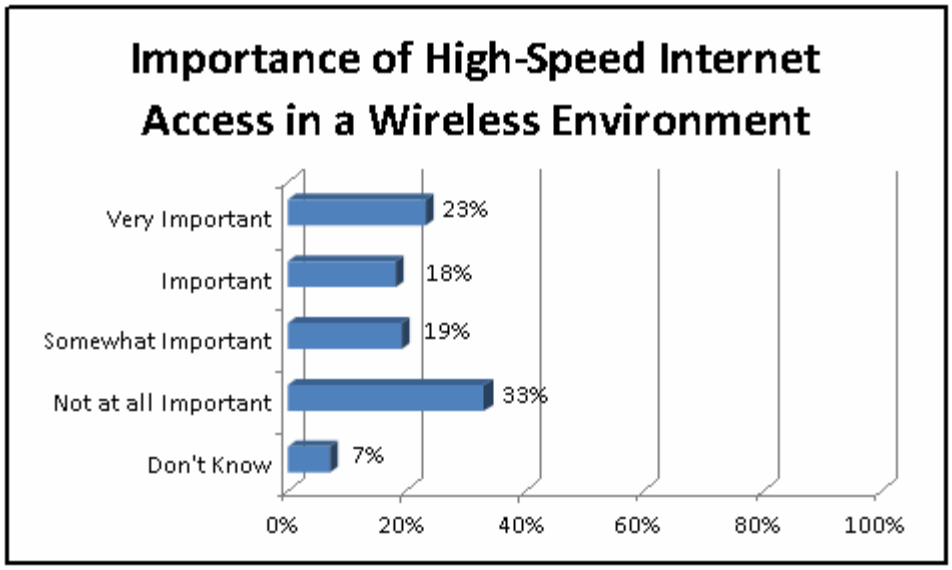
13% indicated it was "somewhat important" while one fourth of the respondents (24%) said that it was "not at all important."



When asked how important it was for all Washington households to have access to high-speed Internet, responses (N=1155) improved slightly with 33%, 24%, and 19% of respondents indicating that it was "very important," "important," or "somewhat important," respectively. Fourteen percent (14%) indicated that it was not important at all.



When asked how important it was that the respondent has access to high-speed Internet in a wireless environment, responses were evenly distributed. Twenty-three (23%) of respondents indicated it was "very important" and 18% indicated it was "important." Nineteen percent (19%) indicated it was "somewhat important" and 33% said it was "not at all important."



Of the respondents that said it was "very important" (N=270), the majority (58%) indicated that it was important to them because they had 24/7 access to the Internet. Other reasons were to stay in touch with the office (4%), stay in touch by e-mail (3%) or access the Internet while at lunch (2%). The rest of the respondents (34%) listed other reasons. The top three "other" responses were that the connection is fast (N=108), it is important for work/education (N=17) and that lack of wires allows for increased mobility (N=16).

TYPES OF INTERNET USE

A list of common reasons to use the Internet was presented to the respondents and the results are presented in the chart below. The "National Yes Figure" is based on the Pew Internet and American Life project findings.

The most popular reasons for using the Internet were to keep in touch with family and friends (91%), research retail prices and product information (79%), share photos (69%) and find medical information (68%). Fewer people use the Internet to make phone calls (8%) and perform language translation (11%).

Reasons for Use of the Internet	**Yes**	**National Yes Figure**	**No**
Keep in touch with family and friends	91%	92%	9%
Research retail prices and product information	79%	81%	21%
Purchase goods and services	73%	66%	27%
Share photos	69%	37%	31%
Find medical information	68%	80%	31%
Get local news	59%	47%	41%
Access local government services	58%	66%	42%
Visit Washington government's website	56%	66% (their state)	43%
Bank online	55%	53%	45%
Find legal information	39%	--	61%
Find state or federal social services and government assistance	38%	66%	61%
Educational	37%	13%	63%
Play video games	36%	35%	64%
Find local school information	33%	57%	67%
Watch television or other videos	24%	56%	76%
Contribute to a website, blog or other online forum	23%	22%	77%
Sell goods or services	19%	15%	80%
Perform language translation	11%	--	89%
Make telephone calls	8%	13%	92%

Respondents in the rural studied counties are more likely to take a class online, sell goods or services, purchase goods or services and share photos. They are less likely to watch video

online, look for government services online, find local school information and make a phone call online.

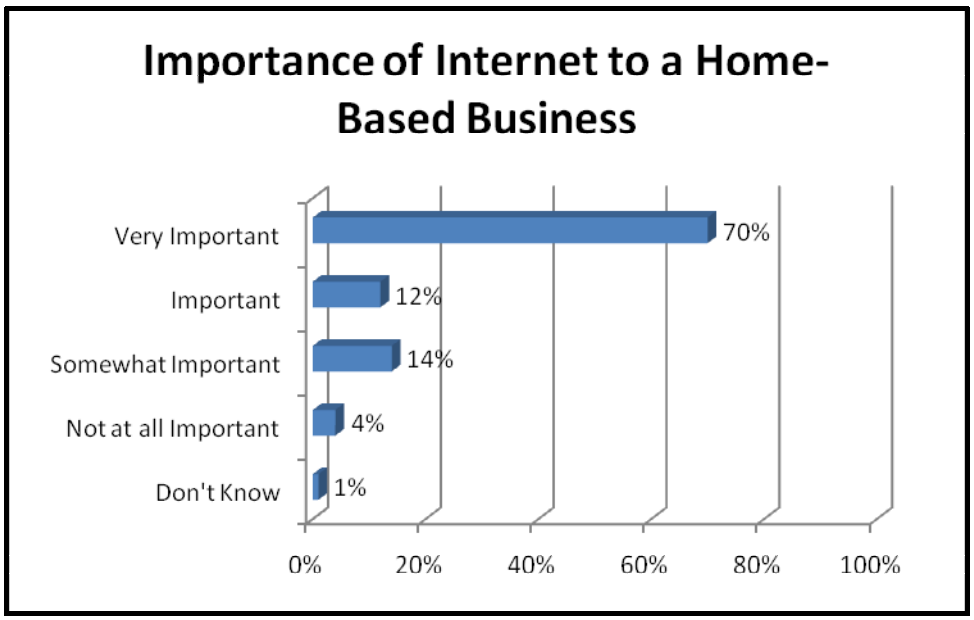
ON LINE CIVIC PARTICIPATION

When asked how they would like to access government services, a majority of individuals with Internet capabilities (N=1155) indicated that they would prefer to access the information on the web or via e-mail (51%). Twenty percent (20%) said they would prefer to access information by telephone and 15% preferred obtaining the information in person.

In addition, respondents were asked to give reasons if they believed that e-mail was a less than very effective way to communicate opinions about issues that affect the community. Some people did not know why they believed that e-mail was a less than very effective way of communicating (N=76), but the top five responses were that an e-mail could be ignored or deleted (N=154), personal contact is lost (N=110), they don't need to communicate with the government (N=55), it takes too long to write and get a response (N=39) and an e-mail can be easily misunderstood (N=11).

BUSINESS AND ECONOMIC DEVELOPMENT ISSUES

Of those respondents that indicated they had an Internet connection (N=1155), 16% have used the Internet to operate a business from their home. Of those 189 individuals who have done so, the majority (70%) believe that the Internet has been "very important" to the success of their home-based business. Twelve percent (12%) say that the Internet has been "important", 14% say it has been "somewhat important," and only 4% say that it is "not at all important."



Respondents with Internet capability were asked if, in the past year, they had used the Internet to find information about local businesses. Sixty percent (60%) responded that they had, and of those 697 individuals, 57% said that they have purchased goods or services from local or state businesses online.

60% of respondents use their Internet connection to find information about local businesses.
Of those, 57% have purchased goods or services online.

When asked to rate their satisfaction with the information about local businesses on the Internet, 78% said they were "very satisfied" or "satisfied." Eighteen percent (18%) said they were "dissatisfied" and 3% said they were "very dissatisfied."

CLOSING THOUGHTS

At the end of the survey, respondents were asked if they had any thoughts about how to enhance broadband availability in the community and 24% (N=360) offered suggestions. Most

respondents said that it was important to get high-speed access to more rural areas by building more towers and running cables to those areas (N=165).

Ninety-nine (N=99) people said that making it more affordable would help as well. Also, there was a group of people who believed that increasing competition and decreasing the monopoly on broadband service would also help.

When asked if they had anything additional to add about broadband that was not covered in the survey, 14% of people added additional thoughts. Among those that did, the most common was a reiteration of the perception that broadband opportunities need to be enhanced for rural areas (N=40) with more service options and providers. Thirty-one respondents (N=31) said that they wanted Internet services and computers to be "cheaper" and "more affordable." Others said that they would just really like to have broadband (N=25).

Key Findings in Residential Survey Across All Five Counties

The key findings from the residential survey of broadband availability, adoption and usage in the five counties of Columbia, Ferry, Grays Harbor, Lewis and Stevens are:

ACCESS TO COMPUTERS:

- Eighty percent (80%) of respondents report having a computer in the home. This is consistent with estimates of PC penetration for the US by the Consumer Electronics Association.[14]
- Twenty-seven percent (27%) of these homes have two computers. Ten percent (10%) have three computers in the home.
- Forty percent (40%) of residents describe at least one of their computers as a laptop.
- The primary reasons for not owning a computer are: don't want one (47%), too expensive (17%) and don't know how to use it (16%).
- Sixty percent (60%) of non-PC owners are willing to buy a computer and most commonly indicate a willingness to pay $300.

ACCESS TO THE INTERNET:

- Seventy-two percent (72%) of respondents have access to the Internet at home. This is consistent with the United States' average subscription rate. Internet access costs an average of $45 a month. The average cost is lower than the U.S.

[14] PC ownership is tracked by the Consumer Electronics Association, www.ce.org.

average because of the significant reliance on dial-up. The average American pays $53.06 per month for high-speed Internet access.[15]

- Of those with Internet access: 34% have dial-up, 28% have DSL, 17% have a cable modem and 10% use a satellite Internet service. In other words, 32% of total residents in the five studied counties have wireline broadband services. If you add satellite Internet services to that number, broadband penetration grows to 39% of the five studied rural counties. These numbers are consistent with the Pew Internet and American Life rural broadband study that noted nationwide approximately 31% of rural Americans have broadband compared to 49% of suburban Americans and 52% of urban Americans.[16]

- Those with Internet service, but without broadband, said the primary reason for not having broadband was because it was not available in their area (50%); 22% said that it cost too much; 14% said that they didn't need it.

- Concerning those without Internet service: 33% said that they didn't want it, 18% said that it was too expensive and 14% said that they didn't know how to use the Internet.

- Those without Internet service but who are willing to pay to get it said they would pay $20 a month to obtain Internet service.

- The top three residential service providers in the five counties are Qwest, CenturyTel and Comcast.

QUALITY OF INTERNET SERVICE:

- One in three Internet users are dissatisfied or very dissatisfied with the speed of their Internet connection (13% very dissatisfied and 22% dissatisfied).

[15] Broadband penetration and costs are tracked by the Pew Internet and American Life Project. www.pewInternet.org.
[16] These figures are provided by the Pew Internet and American Life Project, www.pewInternet.org.

- One in five Internet users is dissatisfied with the cost of Internet service (mostly satellite and cable modem users).
- One in ten Internet users (mostly dial-up) expressed dissatisfaction with the reliability of the service.

IMPORTANCE OF INTERNET ACCESS:

- The majority of respondents felt that access to high-speed Internet was important or very important (53%). When describing its importance, most said that it was important because it saved time and created efficiencies for work and for keeping in contact with others.
- The speed of the Internet connection was described as very important or important by 61% of residential respondents.
- Eighty-two percent (82%) of respondents felt that it was important or very important for all Washington residents to have access to high-speed Internet.
- Forty-one percent (41%) of respondents thought access to the Internet in a wireless environment was very important or important. When asked why, most indicated such access was critical for work, the ability to stay in touch and check e-mail and for mobility purposes
- Fifty-one percent (51%) of residential respondents indicated they would like to access government services via the web or e-mail.

INTERNET USE:

- Average time online per day at home was two hours and 20 minutes.
- Sixty-five percent (65%) of respondents only use the Internet at home.

- Of the 35% of respondents that use the Internet away from home: 1 in 4 use it at work; 5% use it at school; 9% go to the public library; 15% use it at a friend or relative's house; and 4% bring their laptop to a retail outlet or use a computer there.

- The library is also a key location for those without Internet access at home to use a broadband connection. Visiting the library to use the Internet was reported by 74% of those without home Internet service.

- Most residents with Internet access have on average two email accounts (73%), that 3 in 4 check every day.

- The most popular Internet activities are checking e-mail, researching retail prices and purchasing goods. Respondents in the five counties are more likely to make purchases online than a national sample of Internet users and to sell goods online. The residential Internet users surveyed are also more likely to take a class online or seek other educational opportunities. They are less likely to use online video or use the Internet to find federal and state social services and government assistance.

ECONOMIC INDICATORS AMONG RURAL WASHINGTON RESPONDENTS:

- Sixteen percent (16%) of residents with Internet access indicated that they have used that connection to operate a business from their home and, of those, 70% described the Internet as "very important" to the success of their home-based business.

- Sixty percent (60%) of respondents had used the Internet to access information about local businesses and 57% of those said that they had purchased goods online from a local or Washington business.

DIGITAL DIVIDE ANALYSIS

To better understand the broadband availability and adoption gap between urban/suburban and rural, an advanced analysis of the data obtained was conducted on three key variables: not owning a personal computer, not having Internet access at home and not having broadband (high-speed Internet access) at home. Researchers have found that adoption of broadband in rural areas is a paradox in that even when access is available, adoption has lagged behind other urban areas. In fact, rural residents are more likely to say high-speed Internet access isn't available when it is.[17] As a result of this paradox, the broadband gap concerning the five counties studied is rooted in two fundamental digital divide issues: availability of broadband and demographics of a rural population.

NOT OWNING A PC

Twenty percent (20%) of residents in the five counties studied did not own a personal computer. That finding was tested against the other variables measured in the residential study and several significant relationships were found across all of the counties. Those without personal computers were more likely to be older, live alone and more likely to be retired. This finding is consistent with national studies on rural broadband, such as the Pew Internet and American Life Project's study of rural broadband that found:

> "Older individuals are more likely to live in rural areas, therefore they account for a larger portion of the population. In rural areas the population of older individuals is around 22% while in suburban and urban areas the population is about 16% and 14% respectively." (p. ii)[18]

Those without computers were significantly less likely to have persons under the age of 18 living in the home, significantly less likely to have a college degree, significantly more likely to be disabled and significantly less likely to be white.

[17] Robert LaRose, Jennifer L. Gregg, Sharon Strover and Serena Carpenter (2007). Closing the rural broadband gap: Promoting adoption of the Internet in rural America. Telecommunications Policy 31, pp. 359-373.
[18] www.pewInternet.org, Report on Rural Broadband. Retrieved April 19, 2008.

By race, a reported lack of a computer in the household was significantly more likely to be found in an American Indian home. Households that earn less than $35,000 a year are more likely not to own a personal computer.

NO INTERNET ACCESS AT HOME

When considering the presence of Internet access at home, all of the counties reported a comparable level of Internet access; 72% of county residents. Those without Internet access were significantly more likely to be older. This finding is consistent with other studies that have found age and income to be the key discriminating demographic variables related to the adoption of Internet access at home. In general, senior citizens are less likely to use the Internet. Only 17% of rural seniors go online, making up about 6% of all rural users. [19]

Respondents without Internet access were also significantly less likely to have children under the age of 18 in the home and more likely to live alone. By education, the respondent without Internet access at home was significantly less likely to have a college degree. The Pew study found that individuals accessing the Internet in rural areas are more likely to have a college degree. Individuals with a college education access the Internet in a similar manner as other college graduates in suburban areas (p. 18-19).

The disabled were significantly less likely to have Internet access at home.

Those without Internet access at home are significantly more likely to use the Internet at the public library or at a relative or friend's house. This is consistent with other researchers who find that a portion of rural Internet users depend on Internet connections at places other than work or home. Rural users are more likely than urban and suburban users to go online from a third location – some place other than home or work. The main reason for this is because such people are more likely to lack an Internet connection and therefore need to access the Internet in another location.

[19] Robert LaRose, Jennifer L. Gregg, Sharon Strover and Serena Carpenter (2007). Closing the rural broadband gap: Promoting adoption of the Internet in rural America. Telecommunications Policy 31, pp. 359-373.

Not surprising, those without Internet access are significantly less likely to identify English as the primary language spoken in the home. The Internet is still largely an English speaking-based phenomenon and while the language issue is being debated, it is quite possible that those without Internet access might not find much value in an Internet that does not cater to their native tongue.

Additionally, even though minority use of the Internet is increasing in urban and suburban areas, the same cannot be said about rural areas.

The residents without Internet access in the five counties were also significant less likely to value Internet access. This speaks to the other digital divide issue, one of a lack of awareness of the benefits of Internet and broadband or, once broadband benefits are known, they don't quickly translate to improving their quality of life. The Pew rural broadband study also found that rural individuals with fewer than three years of Internet experience have more "mixed feelings" about the Internet and computers (p. 29). Researchers are promoting education about the personal benefits of broadband as a means to educate current non-users to its potential.

The Pew study also found that many rural residents earn less than $30,000 per year. The threshold for Internet use is at this point, which means individuals earning under this amount are less likely to have Internet access than those with an income above $30,000. This accounts for the fact that more people with lower incomes are less likely to have an Internet connection. (p. 20)

TYPE OF INTERNET CONNECTION

The type of Internet connection subscribed to varied significantly by county and this was directly related to availability of services. Ferry and Stevens County were significantly more likely to have dial-up Internet access users. Grays Harbor was significantly less likely to have dial-up users with the majority of those with Internet access subscribing to cable modem services provided by Comcast or Coast.

When considering broadband adoption by demographics, the cable modem users in the five counties were significantly likely to be younger. Households with more than two persons were

more likely to have higher speed connectivity, whereas households without children were more likely to have Dial-up access.

Respondents with higher levels of education are significantly more likely to use higher speed connectivity and Dial-up users are more likely to use the Internet at the public library.

High-speed connections were more likely to be found in households where the Internet was used at work and where the household income was greater than $50,000.

Dial-up, satellite Internet and DSL users were more likely to report that high-speed Internet access is important for all Washington residents.

Households with higher speed connections were significantly more likely to say wireless Internet services were important.

Households with higher speeds were significantly more likely to: visit government websites, shop online, perform language translation, watch videos, search for school information, bank online, share photos, get local news, take a class online, research online, play video games, find medical information and keep in touch with family and friends. These are similar findings to the Pew Internet and American Life study that found individuals in rural areas are less likely to bank online, purchase products, or make travel reservations. Contrary to expectations, we found that rural respondents in the five counties are more likely than the national average to purchase goods online. It could be that the increased availability of common household goods online is increasing online purchasing activity in rural areas.

Higher speed-connected residents are more likely to operate a home based business and report telecommuting. This finding was also consistent with the Pew study.

Our analysis of computer ownership, Internet access and broadband adoption suggests a two pronged effort to close the gap:

1. create more broadband resources in the area and then

2. address the demographic issues that result in non-adoption.

Researchers suggest that efforts to promote the personal benefits of broadband and advanced Internet communication technology (ICT) literacy skills among potential Internet users in rural areas is a sound place to start and to ultimately see results.

Section C
Review of Business and Non-Profit Communities of Interest

REVIEW OF BUSINESS AND NON-PROFIT COMMUNITIES OF INTEREST

Introduction

As part of a statewide initiative to address broadband availability and adoption, a business survey was performed as part of the Broadband Study of five of the State's rural counties. Studied counties included Columbia, Ferry, Grays Harbor, Lewis and Stevens. Working in conjunction with stakeholders at the UTC and others involved in community and economic development initiatives, a business survey instrument that explored broadband access for businesses, as well as adoption and usage, was developed. The survey was administered by telephone to 400 randomly selected businesses across the five counties during May 2008.

A contracted telemarketing firm, Issues and Answers, Inc., headquartered in Virginia Beach, VA conducted telephone interviews. Issues and Answers has over 40 years of combined experience in social science research using telephone survey methodology. Calls were placed from four call centers around the United States, during a variety of times of the business day. Issues and Answers used trained interviewers who asked to speak with the person at the business best able to discuss high-speed Internet access and broadband issues. Business telephone numbers were selected using a random selection technique from area phone numbers within the studied counties. In all, 400 business surveys were completed.[20] When considering the margin of error of the number reported, a sample size of 400 provides the overall project with a margin of error of plus or minus 5%.[21] This means that if the study were conducted again, using the same random selection procedures, one can anticipate that you would find the same responses to the questions within plus or minus five percentage points.

[20] A complete listing of the businesses surveyed, along with their addresses, contact information and websites, are contained in an electronic file with CBG.
[21] The margin of error for any given County will be higher.

RESPONDING BUSINESSES

The responding businesses were randomly sampled across the five counties. Fifty (50) businesses completed the study in Columbia County, 50 businesses in Ferry, 100 businesses in Grays Harbor, 100 businesses in Lewis and 100 businesses in Stevens.

When asked how many employees were present in the business, responses ranged from 1 to 400 with the average being 8 employees and the most common response, one employee (N=98/25%).

The business person completing the survey was most likely to be owner of the company (N=156). Other respondents were general managers (N=23), office managers (N=20) or secretaries (N=16).

By gender, the respondent was most likely to be female (57%) versus male (43%).

Nineteen percent (19%) of the businesses operated a website and 9% indicated that they had satellite offices or were a satellite office themselves.

Each of the businesses provided a name and a description of what their businesses did. The complete information set is available electronically in a spreadsheet maintained by CBG. In this section of the report, types of responding businesses have been collapsed into categories. The following chart illustrates the type of responding businesses by sector represented. When considering the group as a whole, all sectors of industry were represented in the study with retail trade the most common, representing 18% of the sample. This was followed by forestry, agriculture and fishing at 9% of the responding sample. These two primary categories are reflective of economic data from the studied counties. Additionally, a good representation was found of businesses from the real estate and construction sectors, as well as the non-profit and medical communities.

Type of Business	**Grays Harbor N=100**	**Lewis N=100**	**Stevens N=100**	**Columbia N=50**	**Ferry N=50**	**Total N=400**
Agriculture, Forestry, Fishing	6%	4%	15%	10%	10%	9%
Mining	0%	0%	1%	0%	0%	.3%
Utilities	2%	3%	3%	4%	6%	3%
Construction	5%	8%	2%	2%	8%	5%
Manufacturing	6%	4%	6%	2%	0%	4%
Wholesale Trade	0%	0%	1%	2%	2%	1%
Retail Trade	16%	22%	14%	22%	14%	18%
Transportation and Warehousing	4%	9%	2%	2%	0%	4%
Information	1%	0%	2%	0%	0%	1%
Finance and Insurance	5%	3%	3%	0%	2%	3%
Real Estate and Rental Leasing	5%	1%	7%	4%	6%	5%
Federal Government	0%	0%	0%	2%	0%	.3%
State Government	0%	0%	0%	4%	0%	1%
Local Government	0%	0%	1%	0%	0%	.3%
Non-Profits, Non Governmental Organizations	2%	2%	2%	2%	4%	2%
Educational Non-Profits	8%	4%	7%	8%	4%	6%
Medical Services	11%	7%	8%	8%	14%	9%
Arts, Entertainment and Recreation	10%	12%	10%	6%	10%	1%
Professional, Scientific and Technical Services	12%	5%	6%	4%	12%	8%
Refused	2%	4%	4%	4%	4%	4%
Other	3%	9%	5%	6%	4%	6%
Media and Marketing	2%	1%	1%	2%	0%	1%
Public Safety	0%	2%	0%	0%	0%	1%
Libraries	0%	0%	0%	4%	0%	1%

DATA AND INTERNET SERVICE PROVIDERS

Of the 400 businesses surveyed, a majority (84%) used the Internet. Of the 16% (N=65) that did not use the Internet as part of their business, the primary reason for not having it was that the Internet was not needed (N=38). These businesses tended to be ones that are not data driven, such as local farming, restaurants, small grocery stores and automotive and small engine repair. Other industries not using the Internet included: trucking services, co-op markets, a note keeping service, a lawn cutting service and a handful of hair salons. Ten individuals (N=10) said that the Internet was too expensive for their business to afford. Other responses included that they did not want it (N=4), there was no computer at the business to be able to use the Internet (N=2) and that the connection was not fast enough (N=2). The chart below presents all the reasons why these businesses do not have Internet service.

Listed Reasons for No Internet Service	**Total (N=65/16%)**
My business does not need the Internet	38
Internet service is too expensive	10
Other** (listed below)	9
Internet service (high-speed) isn't available	3
I'm not comfortable using the Internet	2
Another company supports my Internet service needs	2
I don't know how to use the Internet	1
**Other Reasons for No Internet Service: Do not want it No computer Will have connection in the future Fast connection is not available Access elsewhere Too expensive to have	9

Of those 65 individuals that do not have an Internet connection for their business, ten (N=10) said that they hope to establish Internet service in the future, while the remaining 55 respondents are not planning to do so. Of those respondents that do want Internet service, six (N=6) plan on establishing a connection within the next 6 months, while one plans on doing so within a year, two in over a year, and one respondent stated they planned on doing so sometime in the future.

Of the 335 respondents that have an Internet connection, the majority use Qwest as their Internet supplier (N=62). In addition, thirty-nine (N=39) other businesses use Comcast, 22 use Internet Xpress and 20 use CenturyTel. The chart below shows other common Internet providers.

Current Internet Provider	**N=335**
Qwest	62
Comcast	39
Internet Xpress	22
CenturyTel	14
TV Assoc. of Republic	8
Rainer Connect	12
Wild Blue Internet	8
Verizon	6

The most common type of Internet connection is DSL with 40% of the businesses using this type of service. Nineteen percent (19%) use dial-up and 16% use a cable modem to access the Internet for their business. Eight percent (8%) rely on satellite Internet services.

The chart below shows the type of Internet connection that is used, by County where the business is located.

Internet Connection	Grays Harbor N=87	Lewis N=80	Stevens N=89	Columbia N=36	Ferry N=43	Total N=335
Dial-up	7%	24%	28%	19%	19%	19%
Satellite Broadband	0%	6%	18%	6%	7%	8%
Fiber to the Premises	0%	0%	0%	3%	0%	.3%
DSL	54%	49%	38%	36%	5%	40%
Fixed Wireless	0%	0%	9%	3%	5%	3%
Cable Modem	23%	8%	1%	11%	49%	16%
Frame Relay	1%	1%	0%	0%	0%	1%
T-1	1%	4%	3%	3%	5%	3%
BPL[22]	5%	4%	2%	0%	5%	3%
Other	9%	5%	0%	19%	7%	7%

Stevens County businesses were the most likely to report use of dial-up Internet services (28% of responding businesses). This was followed by Lewis County with 24% of responding businesses. Columbia and Ferry had 19% of responding businesses using dial-up and Grays Harbor had 7% of businesses using dial-up.

The reported speed of Internet connection was dependent on the type of Internet connection that was being provided to each business. Of the respondents that knew their Internet connection speed for DSL, 19 said it was between 1.1 and 5 Mbps. A number of individuals with dial-up had Internet connection speeds below 56 Kbps. Six (6) businesses with a cable modem had below 1 Mbps while 5 had between 5.1 and 10 Mbps connections.

Most respondents were unable to give their specific connection speed. If a speed was provided, most tended to fall between 1-2 Mbps.

[22] Although BPL (Broadband over Power Lines) was provided as an Internet connection response by 3% of businesses, this could only have occurred in Centralia in Lewis County where a BPL trial was underway at the time of the survey. Most likely, the respondent was aware that the power company may have been involved in some way with the provision of their service (such as the Grays Harbor PUD that provides wholesale services) and thus indicated a broadband service provided by the power company that was then categorized as BPL. This response also falls within the margin of error of the survey.

Currently the price that these businesses are paying for their Internet service is dependent on the type of service they are being provided and the robust nature of their broadband access. The chart below shows the average price per month for each service.

Type of Internet Connection	Most Frequent Reported Cost of Monthly Internet Service
Digital Subscriber Line (DSL)	$50.00
Dial-up	$20.00
Cable Modem	$50.00
Satellite Broadband	$59.99
Other	$40.00
Fixed Wireless	$45.00
T-1	All unique (ranged from $225 to $317)
Frame Relay/Fractional T-1	No costs provided.
Fiber to the Premises	No costs provided.

The price of the Internet service reported was also dependent on the term of the service contract and the provision of bundled services. Most businesses, regardless of the Internet connection, are paying on a month to month basis (N=114/28%). Sixty-seven (N=67/16.75%) businesses have signed a year long contract. Other companies have a two (N=17) or three year or greater contract (N=3).

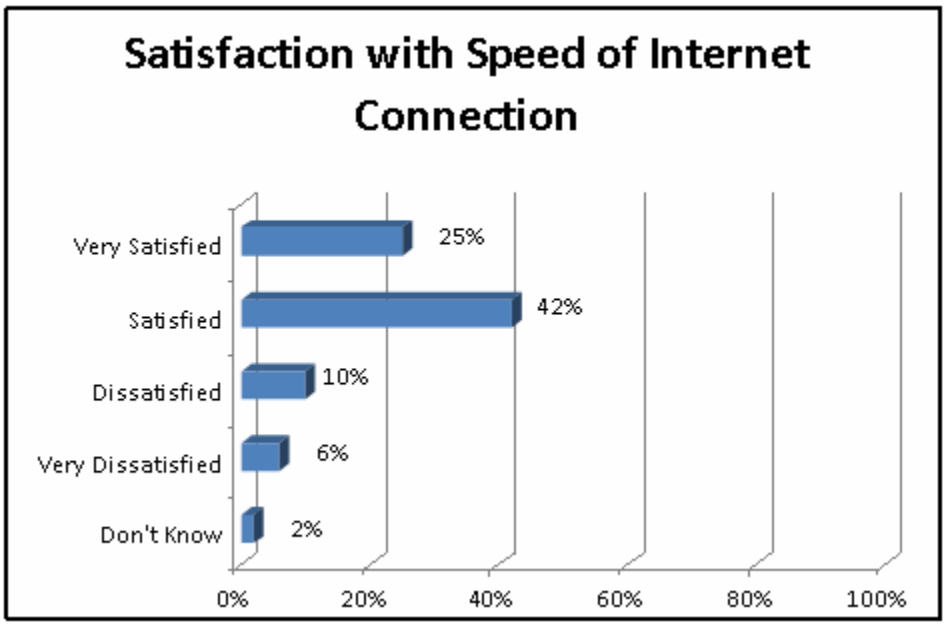
As part of the survey, businesses were also asked to rate the availability of multiple, competing broadband options. The largest group of respondents (32%) said that there was no competition at all and that only one provider was available to provide them with service. Twenty-eight percent (28%) said they could choose between two providers, 17% said they had a handful of options, and only 10% said that the field of broadband Internet service providers was "competitive" with many options available to them.

SATISFACTION WITH INTERNET SERVICE

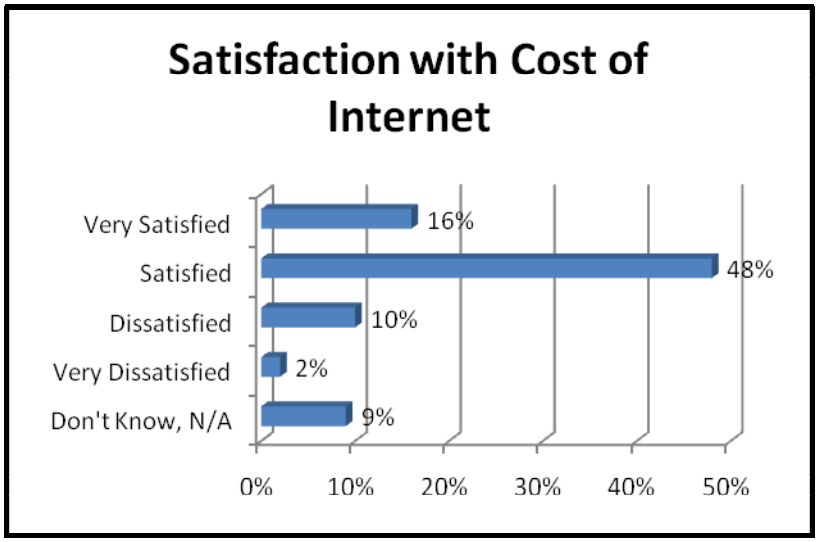
Respondents that had Internet service at their business were asked to rate how satisfied they were with specific service issues associated with their Internet provider.

The most satisfaction, with 80% of respondents being "very satisfied" or "satisfied", came when respondents rated the ease of use. Reliable access to the Internet also scored very high with 76% of businesses being "satisfied" or "very satisfied" with this service characteristic.

One in six businesses (16%) is "dissatisfied" or "very dissatisfied" with the speed of the online connection. Twenty-five percent (25%) of businesses are "very satisfied" while 42% are "satisfied."



Another area of Internet service which showed higher rates of dissatisfaction was the cost of the Internet or network services. Sixteen percent (16%) said they were "very satisfied" and 48% said they were "satisfied" with the cost. However, 12% said they were either "dissatisfied" or "very dissatisfied" with the cost of the Internet service.



Generally, customer service and technical support received positive ratings from the businesses that had used those services. A full listing of the satisfaction of businesses with various service characteristics can be found in the chart below.

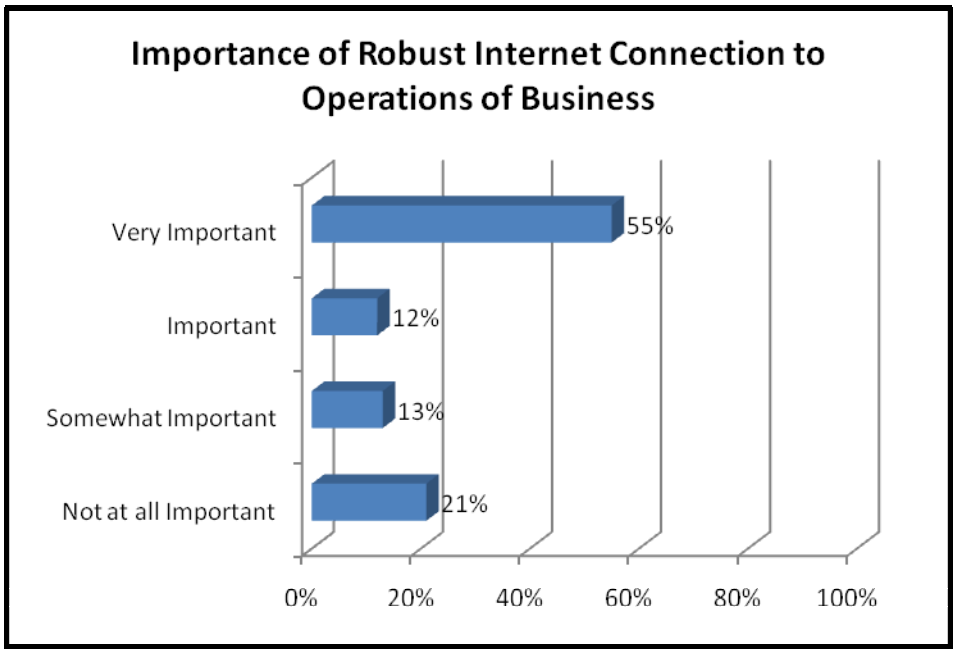
Service Issue	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	Don't Know/Not Applicable
Cost of Internet/network service	16%	48%	10%	2%	9%
Speed of the online connection	25%	42%	10%	6%	2%
Billing practices of your provider	25%	46%	3%	1%	10%
Reliable access to the Internet	30%	46%	6%	1%	1%
Ease of use	33%	47%	3%	1%	.3%
Training and Technical Support	22%	38%	4%	.3%	20%
Customer Service Representative's knowledge and courteousness when you call for service	34%	38%	2%	1%	9%
Installation technician's ability and courteousness	32%	34%	2%	1%	16%

INTERNET USE

Specific Internet applications were tested to determine what businesses were primarily using the Internet for at their places of employment. The primary function reported by 92% of businesses is e-mail. Only one business reported "video conferencing". The other most likely applications were e-business to e-business functions, such as ordering office supplies or making stock transactions, followed by website applications (primarily retail trade) and research (2% of all businesses). In the "other" category, businesses indicated using the Internet to pay bills, sell fish and wildlife, shop for business supplies and broker stock.

IMPORTANCE OF A BROADBAND CONNECTION

Respondents with an Internet connection in their business were asked to rate how important a robust broadband connection is to their day to day operations. Fifty-five percent (55%) said that it was "very important" and 12% said it was "important." Thirteen percent (13%) said that it was "somewhat important" and only 21% said that it was "not at all important."



Of the people that responded that the Internet was important (N=282), most responded that it was crucial to running their business efficiently and timely (N=82). Another large portion of

businesses said that it allowed them to accomplish tasks more quickly, which helped to get more done in a day (N=69). The third most given reason as to why the Internet is important is that it provides a good way to communicate with other businesses and customers (N=43).

Reasons why Broadband is Important to Business	N=282 (70%)
It is crucial to running the business efficiently and timely	82
Get more done because it is faster	69
Easier to communicate with others	43
Better access to information	34
Used for accounting/finance purposes	17
Better ability to download	8
Convenient	5
Easier to have it	6
I work directly with the Internet	9
It's not	9

Respondents to this business survey were also asked if they believed it would be beneficial for broadband in their area to be enhanced. Fifty-seven (57%) of respondents indicated that it would be beneficial. Of those businesses that provided a reason why, 101 said that it would allow businesses to provide faster/more timely services. In addition, another 30 businesses believed that enhancing the broadband environment would provide competition for other Internet providers which would help to lower the cost of Internet access. A list of responses is given below.

Reasons why it would be Beneficial to Enhance Broadband	N=228 (57%)
Faster service allows for more to get done	101
More cost effective	32
Allows for connectedness and Internet accessibility	31
More competition for Internet Providers	30
Customers would be able to access more information for better business operations	12
It would be more reliable	8

Reasons why it would be Beneficial to Enhance Broadband	N=228 (57%)
Better ability to download large files	7
It would be nice	3
Ease of use	2
I am satisfied with what I have	2

Businesses participating in this survey were given the opportunity to add any thoughts about what the State or another entity could do about enhancing broadband availability in the county in which they were located. Of the 105 (26%) that responded, a little under half said that it was important to begin to take measures to ensure that rural communities could have high-speed access to the Internet by installing the infrastructure needed to bring broadband to such areas (N=44) and help provide for the future economic viability of their business. Seventeen (N=18) businesses wished that the State would stay out of it and let private businesses handle it their own way and 12 respondents said it was important to stop the monopoly on Internet service provision.

Enhancing Broadband Availability (Top 5 responses)	**Total N=105**
Install cables/towers to provide rural access	44
Have the State stay out and let private business handle it	18
Stop the monopoly on Internet service provision	12
Make it more affordable	14
Have the government help with regulating companies and prices	4

In conclusion, businesses were asked if they had anything additional to add that was not covered by the surveyor. Only 13% (N=52) of respondents added something, but nearly half of those said that it was important to help the rural areas of Washington State get better Internet access. Seven businesses (N=7) reiterated the fact that they wished there were more Internet providers and 3 respondents said they were just glad to have the service.

Key Findings from the Business Survey Across All Five Counties

The key findings from the business survey of broadband availability, adoption and usage in the five counties under study are:

DATA AND INTERNET SERVICE PROVISION

- Eighty-four percent (84%) of businesses use the Internet. Of the 16% that do not use the Internet, the most popular reasons were that it was not needed (56%), too expensive (15%) and do not want it (6%).
- Among those businesses that use the Internet, the most popular providers are Qwest, Comcast, Internet Xpress and the TV Association of Republic.
- Forty percent (40%) of businesses with Internet access have a DSL connection, 19% use dial-up, 16% use a cable modem and 8% use satellite Internet services.
- Stevens County had the highest percent of dial-up business users (28%), followed by Lewis County (24%), Columbia County (19%) and Ferry County (19%).
- Businesses pay between $20 a month for dial-up to more than $300 a month for T-1 connections. Businesses pay approximately $50 a month for either DSL or cable modem access.
- Twenty-five (25%) of businesses pay on a month-to-month basis. Thirteen percent (13%) have a year-long contract.
- Thirty-two (32%) said there was no competition among service providers and only one provider was available to them. Twenty-eight percent (28%) said they could choose between 2 providers and 14% said they had a handful of options. Only 8% said they had many options available to them.

SATISFACTION WITH INTERNET SERVICE

- Eighty percent (80%) of businesses are very satisfied or satisfied with the ease of use of their Internet service.
- Seventy-six percent (76%) are very satisfied or satisfied with the reliability of their access to the Internet.
- Sixteen percent (16%) of businesses are dissatisfied or very dissatisfied with the speed of their online connection.
- Twelve percent (12%) said they are dissatisfied or very dissatisfied with the cost of Internet service.

INTERNET USE

- Ninety-two percent (92%) of businesses use the Internet for e-mail.
- Other applications described by businesses were e-business to e-business functions, research, website applications, paying bills, shopping for office supplies and online brokering. Only one business reported the use of video conferencing.

IMPORTANCE OF A BROADBAND CONNECTION

- Fifty-five percent (55%) of respondents with an Internet connection said that Internet access is very important to their daily operations, while 12% said that it is important and 13% said that it is somewhat important.
- Broadband was described as being important to daily business operations because it helps: run the business efficiently (29%), get things done faster (24%), make it easier to communicate with others (15%), offer better access to information (12%) and facilitate accounting functions (6%).

- Fifty-seven percent (57%) of respondents said that it would be beneficial for broadband service in their area to be enhanced. Of those respondents, 43% said it would allow their businesses to provide faster services, while 13% believed that it would foster competition among service providers and potentially lower the cost of high-speed Internet access.

STATE OR OTHER ENTITY ACTIONS

Among respondents who chose to offer comments about whether the State or any other entity could help enhance broadband availability (27%), approximately 40% said that it is important to take measures to ensure that rural communities have access to high-speed Internet which will help provide for the future economic viability of their business.

Online Business and Non-Profit Survey

Businesses and non-profit organizations that were not included in the random sample were given the option to complete the survey online. The survey was completed by 101 businesses[23] across the five counties. Of the 101 respondents, 34% are located in Grays Harbor County, 33% in Stevens County, 20% in Columbia County, 8% in Ferry County and 4% in Lewis County. Most of the respondents were the business owner or worked in the business' administration.

The majority of the businesses (67 respondents) were small businesses of 10 employees or less. Of the 101 respondents, 49 of the businesses had 1-5 employees. Eight (8) of the businesses had 50 or more employees, with the largest business employing approximately 200 people. A wide variety of industries were represented including retail sales, art, pharmaceuticals and medicine, marketing, education, construction and hospitality.

In terms of Internet access, 98% of the businesses reported that they have Internet service at their place of business. Only two respondents indicated a lack of Internet service and both indicated

[23] Information on the business names, location, phone number, fax number, email address and other contact information is available with CBG.

that the reason was the high cost of service. Among the two without Internet service, one plans to establish service in the future and one does not plan to establish service.

Qwest was the most popular Internet Service Provider followed by Internet Xpress, Comcast and WildBlue. More than half of the businesses completing the online survey indicated that they use one of these four providers. Other providers mentioned at least twice were Coast Communications, NetZero, HughesNet, Clearwire, Techline, CenturyTel and TV Association of Republic.

DSL is the most popular Internet connection with 38 % of businesses using DSL. The next most popular connections were satellite broadband (22 %), dial-up of 56 Kbps or less (18%), T-1 (13%) and fixed wireless (13%). Approximately 8% of businesses connect to the Internet through fiber to the premises.

The cost of Internet service for the businesses varied greatly from $9.95 per month to $3400 per month for one business's connection. The majority of businesses reported paying between $35 and $70 each month for their Internet connection. Only 9 businesses reported paying $100 or more per month for Internet access. The most common service contract was a month-to-month contract, although several businesses did indicate that they have one or two year contracts. Three businesses reported that they have a 3-year contract, the longest indicated contract length.

When rating satisfaction levels with various aspects of their Internet service, a number of businesses were either dissatisfied or very dissatisfied with several aspects of their Internet service.

The greatest dissatisfaction expressed among respondents was with the speed of their Internet connection (25% dissatisfied and 20% very dissatisfied). Approximately one in four (26%) were dissatisfied with the cost of Internet service.

Additionally, 26% were dissatisfied with the reliability of their access to the Internet. Approximately 24% were dissatisfied with the technical support they received, while 16% were

dissatisfied with their provider's customer service representatives' knowledge and courteousness when they called for service. Approximately 58 % of businesses were satisfied with the ease of use of their Internet service.

All of the respondents (100%) indicated that they had used e-mail within the last 30 days. Other common applications that the businesses indicated using were banking (68%), website applications (63%), research (57%), file-sharing (53%), business to business functions (53%), e-business (43%) and online education (33%). A small percentage of businesses indicated using their Internet connection for video conferencing (15%), Internet telephone (11%) and system monitoring functions (10%).

Of the respondents with an Internet connection, 85% said that high-speed Internet access was very important to the day-to-day operations of their business. The remaining 15% of responding businesses indicated that a high-speed connection was important or somewhat important to their day-to-day business operations. None of the respondents with an Internet connection indicated that it was not at all important to their business operations.

The businesses indicated that a high-speed Internet connection was very important because they use the Internet to communicate with customers, advertise, make shipping arrangements, bank online, pay bills, order supplies, make travel reservations, conduct employee education and training, conduct research, send files, maintain websites and sell merchandise.

A majority of the businesses (52%) indicated that when they sought broadband service at their location they found the selection of providers not competitive at all with only one provider option. Nearly 24% of businesses found the selection of providers to be only slightly competitive with only two provider options. Only 13% of businesses felt that the market for service providers was somewhat competitive or competitive, with a handful of options or many options. Nearly 12% of businesses said that they found no broadband option available to suit the needs of their business.

A large majority of the businesses (92%) felt that it would beneficial to their business if the broadband environment in their area was enhanced. Only 8% felt that broadband enhancement would not be beneficial to them.

Finally, the businesses were asked for any thoughts or comments about how the State or another entity could help enhance broadband availability in their county and about the general state of broadband service and availability for businesses. Some of the ideas for how the State could help included providing tax incentives to the private sector willing to invest in infrastructure, public funding for the installation of networks, grants for rural improvements and support for wireless services provided by PUDs.

The general comments on broadband availability overwhelmingly indicated a desire for more high-speed Internet options and greater access to new technologies and higher connection speeds. Many of the respondents reiterated how essential the Internet is to their business functions and indicated a desire for higher-speed connections. One business owner indicated that there was no broadband access in his area and that the dial-up connection is so slow that it is practically useless.

Another business manager, who lives only 3 miles from the center of town, waited nearly 4 years for high-speed Internet service to be available in his area. Another business owner said he was on a satellite service's waiting list for over a year, and while waiting, had to use a dial-up connection with a speed of only 14 Kbps.

Other businesses owners said people should be educated about the many uses of high-speed Internet access. As people learn how it can benefit their business, interest in the service will increase - possibly leading to more cooperation from the Internet Service Providers in terms of investing in the infrastructure to make broadband available.

Other business owners indicated that high-speed Internet is necessary both for economic growth and for the people in the rural areas of Washington to be a part of the information age along with the rest of the country and the world.

ANALYSIS OF BROADBAND'S ECONOMIC IMPACT

Recent reports have found that broadband access does have an impact on the economy based on several different measures of economic progress. One objective of this Study was to test these results in a Washington context to the extent feasible.

One study, by Criterion Economics (2005) found that broadband, through changes to shopping, commuting, home entertainment and health habits had the potential to contribute an extra $500 billion to the GDP by 2006.

The New Millennium Research Council estimated that more than 1 million jobs could be created from the construction and use of a nationwide broadband network. Other studies have found that a failure by the United States to improve the country's broadband availability and adoption could lead to a reduction in U.S. productivity growth.

Working off of the determinations made by these previous reports, researchers from MIT and Carnegie Mellon studied broadband's economic impact in terms of several economic factors. The researchers found that broadband does enhance economic activity. However, the increase in broadband availability can have both positive and negative economic impacts.

While broadband can stimulate overall economic activity, resulting in job growth, by increasing worker productivity, it can also result in slower job growth because as the businesses become more productive and efficient they might require less workers. However, the researchers found that broadband did lead to economic development, but not always in terms of an increase in wages. The researchers even pointed out that home access to broadband might make workers more productive at their place of employment because they will spend less time fulfilling non-work obligations such as paying bills, shopping, doctors' appointments, etc.

The areas in which broadband does have a relationship to positive economic growth are property values and industry structure and mix. Between 1998 and 2002, communities in which

broadband was available by December 1999 experienced more growth in employment, number of businesses overall and number of businesses in the IT sector. IT intensive industries are more likely to demand and use broadband services. These businesses, which require broadband access, expand operations in locations with broadband access. Areas with broadband availability in December 1999 also saw higher market rates for rental housing.[24]

In terms of public policy, the authors argue that if broadband affects the base growth rate of the local economy, then the sooner a community can get broadband access, the sooner the benefits of broadband access can continue to compound into the future. The authors make a point that once broadband is widely available throughout the country, economic growth will depend more on the uses of broadband rather than its availability. The authors also pointed out that it is important for policy makers to pay attention to both supply-side and demand-side issues because economic development depends as much on adoption and use--as availability.[25] If broadband access is made available to businesses but they are not made aware of this and demand does not increase, then the resulting positive economic impact will not be realized. The researchers pointed out that if policy makers create a portfolio of broadband related policies that balance both supply-side and demand-side issues (for example – training users) they are more likely to see positive economic outcomes. If policy makers only focus on making broadband available but do not put effort into educating citizens (on how to get broadband, why it will be useful to them and how to use it), then they will not see the positive economic impact because broadband usage will not have actually seen an increase alongside the increase in broadband availability.

In a study of broadband access in West Virginia, 93 percent of zip codes in the state had access to high-speed service providers. However, there were still some rural communities where broadband access was not available. Marshall University researchers studied the annual incomes of workers in various West Virginia zip codes and found that workers in the Finance and Service

[24] William Lehr, Carlos Osorio, Sharon Gillett, Marvin Sirbu, "Measuring Broadband's Economic Impact," *Broadband Properties*, December 2005.
[25] Ibid.

sectors[26] located in areas with high-speed broadband access earn between $1000 and $2000 more per year than comparable workers located in areas without broadband access.

Researchers also found that many industries will not locate or expand in areas where broadband is not available.[27]

One important finding of the West Virginia study was that broadband pricing was not always a significant predictor of the decision to subscribe to broadband service. Residential broadband users were relatively insensitive to price. Other important predictors of broadband usage were household size, family incomes, and broadband access at work.[28]

The three sources of economic benefit from the development of broadband services were utility for residential users (i.e. telecommuting, home based businesses), engaging external network users, and increased firm productivity. Broadband provides utility to residential Internet users because they are able to use more programs and applications such as online gaming, music and video downloads and voice over Internet protocol. Furthermore, the utility of the network to existing users increases as more users choose to participate in the same network. Finally, broadband used by businesses may result in increases in productivity and therefore the quantity of outputs. The researchers found that broadband access resulted in increased efficiency and productivity in the Finance and Service sectors, but not for the economy as a whole.

One interesting finding is that most firms in the study chose their locations prior to the development of broadband. When the researchers studied the firms of similar age they found that for each firm located in an area with broadband access, productivity increased 14 – 17 percent compared to a firm in a non-broadband area but of a similar age. The researchers also found that younger firms, who chose their locations after the development of broadband, primarily chose to locate in areas with broadband access and are generally more productive.[29]

[26] The financial service sector includes banking institutions, insurance companies, investment banks, brokering firms, financial advisors, etc.
[27] Mark Burton and Michael Hicks, "The Residential and Commercial Benefits of Rural Broadband: Evidence from Central Appalachia," Center for Business and Economic Research, Marshall University, July 2005.
[28] Ibid.
[29] Ibid.

The researchers also saw an increase in wages in areas with broadband access in West Virginia, Pennsylvania and Ohio. In the financial sector in particular, workers in West Virginia in broadband areas made almost 11.2 percent more than workers in non-broadband areas. The researchers estimated that this would translate into $2,250 more per worker or $12.2 million in statewide earnings if broadband were extended into areas that do not currently have access.[30] The researchers felt that the relationship between broadband access and increasing wages was most notable in the Finance and Service sectors because those sectors depend more than other sectors on the speed of broadband Internet to perform duties essential to their business. The researchers did make note that although it would likely have a positive economic impact to develop broadband in underserved areas, it is important to remember that there would most likely also be a positive economic impact achieved by improving service speeds and pricing in areas that already have broadband access.[31]

COMMUNITY EXAMPLES

The USDA, through the Community Connect program, has awarded more than $10.3 million to support 19 broadband projects across the United States in rural, economically challenged communities of up to 20,000 inhabitants. In order to qualify, a community cannot currently have access to high-speed Internet from a broadband provider. One recipient of a CommunityConnect grant was Marcus, Washington. The town received $834,881 from the USDA to introduce broadband service in the town and to provide the Marcus firefighters access to online training videos and reports.

The town of Darbyville, Ohio received $603,200 to build a community center and computer lab that will offer high-speed Internet access to universities and medical centers state wide. The Navajo Mountain area in Utah is more than 100 miles away from the nearest hospital and received $205,416 in grant funding to build a wireless network that will provide online public safety notices, educational opportunities, and telemedicine services.[32]

[30] Ibid.
[31] Ibid.
[32] National Telecommunications and Information Administration, "Networked Nation: Broadband in America 2007," United States Department of Commerce, January 2008.

Analysis of Economic Impact in Washington

Some local agencies which feel they cannot rely on the private sector to provide advanced telecommunications services are building FTTH (Fiber to the Home) networks within their communities. This is the case in Grant County, Washington. The Public Utility District in the county began by deploying a trial FTTH network serving 100 homes and 30 businesses in the City of Ephrata, Washington. The PUD owns and operates the fiber network, but independent telecommunications providers provide high-speed Internet access, voice and video over the fiber network. Over the last three to five years, the PUD has extended the network to much of the rest of the homes and businesses within the county. The PUD chose to build the FTTH network for several reasons including the need to diversify their business and upgrade their current communications infrastructure. One important aspect of the PUD's strategy was to hire telecommunications experts to join their development team. Financing for the project comes from the District's capital budget.[33]

The following is a specific discussion related to economic development in each of the five counties and the relationship of broadband within the economic development focus.

COLUMBIA COUNTY

Columbia County is part of the Palouse Economic Development Council which represents four counties. There are only two incorporated cities in the county, with Dayton being the largest. The Dayton Chamber of Commerce serves Columbia County.

Connections to Internet access vary throughout the county. Some areas are served with DSL while others are limited to dial-up access. Dayton has DSL, cable modem, wireless and satellite high-speed Internet options. According to the Palouse Economic Development Council, Columbia County continues to participate in the education and use of Internet based services.

[33] Emy Tseng, "Competition in Fiber to the Home: A Technology and Policy Assessment," *Massachusetts Institute of Technology*, September 2001.

The location of the County has the potential to have a negative impact on the economy. The County is a considerable distance from metropolitan areas which increases the importance of telecommunications access, particularly high-speed access. One of the goals of the Palouse EDC is to encourage economic development and one of the ways that they hope to achieve development is to "support, facilitate, and promote adequate funding for improved and expanded telecommunication services." As a part of the EDC's five-year plan for Columbia County, they plan to improve high-speed access in rural areas.[34]

The following shows the range of high-speed Internet access available in various sections of Columbia County.

Name of Broadband Service Provider	**Network Speed**	**Costs to Subscriber**
HughesNet	Home: 700 Kbps Pro: 1.0 Mbps Pro Plus 1.5 Mbps	$59.99 $69.99 $79.99 Upfront $399 investment on equipment required for this rate.
ReachOne-DSL Reseller	256 Kbps 1.5 Mbps	$19.95/mo. $29.95/mo.
WildBlue	128 Kbps/512 Kbps 200 Kbps/1.0 Mbps 256 Kbps /1.5 Mbps	$49.95 $69.95 $79.95 All plans require $518 (minus discounts when available) equipment fee
SkyWay USA	Phone Upstream 256 Kbps 512 Kbps 786 Kbps 1.5 Mbps	 $29.95 $49.95 $59.95 $79.95
Touchet Valley Television	256 Kbps/512 Kbps	$39.95 $4.95 modem charge per month
Columbia Rural Electric Association	256 Kbps/256 Kbps 512 Kbps/512 Kbps 768 Kbps/768 Kbps 1.024 Mbps/1.024 Mbps 1.536 Mbps/1.536	$39.95 $49.95 $79.95 $119.95 $199.00

[34] Palouse Economic Development Council, "Comprehensive Economic Development Strategy for the Southeast Washington Counties of Asotin, Columbia, Garfield &Whitman," 2008, http://www.palouse.org/Documents/2008%20CEDS.pdf (May 30, 2008).

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
	Mbps	
Qwest	896 Kbps/256 Kbps 896 Kbps/1.5 Mbps 896 Kbps/7 Mbps	$31.99 $44.99 $54.99
CenturyTel	128 Kbps/256 Kbps 256 Kbps/1.5 Mbps 512-768 Kbps/3-6 Mbps	$31.20 $41.20 $51.20

FERRY COUNTY

Ferry and Stevens Counties are both a part of the Tri-County Economic Development District which represents three counties in Washington: Ferry, Stevens and Pend Oreille. The Tri-County Economic Development District has a website which was undergoing construction and was unavailable at the time of our review.[35] The largest City in Ferry County is Republic. High-speed Internet access is offered for as little as $28.00 per month in the Republic area by the TV Association of Republic, which is owned and operated by Association members (subscribers) in Republic. Interested parties in the county have been seeking an expanded broadband climate, with a working document and action plan most recently updated in late 2006. The following indicates high-speed Internet access options in various parts of Ferry County.

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
HughesNet	Home: 700 Kbps Pro: 1.0 Mbps Pro Plus 1.5 Mbps	$59.99 $69.99 $79.99 Upfront $399 investment on equipment required for this rate.
ReachOne-DSL Reseller	256 Kbps 1.5 Mbps	$19.95/mo. $29.95/mo.
WildBlue	128 Kbps/512 Kbps 200 Kbps/1.0 Mbps 256 Kbps /1.5 Mbps	$49.95 $69.95 $79.95 All plans require $518 (minus discounts when available) equipment fee
SkyWay USA	Phone Return 256 Kbps	 $29.95

[35] www.teddonline.com

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
	512 Kbps 786 Kbps 1.5 Mbps	$49.95 $59.95 $79.95
CenturyTel	128 Kbps/256 Kbps 256 Kbps/1.5 Mbps 512-768 Kbps/3-6 Mbps	$31.20 $41.20 $51.20
TV Association of Republic (Cable Modem)	128 Kbps/256 Kbps 128 Kbps/384 Kbps 256 Kbps256 Kbps 384 Kbps/384 Kbps	$28.00 $38.00 $43.00 $48.00 Additional $10.00 for non cable TV subscribers
TV Association of Republic (Fixed Wireless)	384 Kbps/384 Kbps	$526.00 for 1 year includes startup fees $35.50 per month thereafter

GRAYS HARBOR

According to the Grays Harbor County Economic Development Council (EDC), the County's PUD has invested in a significant telecommunications network created under a public/private partnership in the main business areas of the community. The backbone of this network is made up of a publicly owned 72-strand fiber optic line that runs from the main facilities back towards the I-5 corridor and into Aberdeen. The wide area networks established in the area are provided a level of redundancy via this backbone resulting in more up-time in the event of a disaster or an emergency situation. According to the EDC, the fiber optic network provides high-speed access throughout business areas of the County at reasonable costs. The Public Utility District (PUD) operates the network. The Satsop Development Park is connected to the fiber network.

Residents are provided Internet access by various private telecommunications companies with copper, microwave and fiber optic lines running throughout the County. Wireless Internet technology is available in some locations. Multiple ISPs in the area provide Internet access. These include Techline, TSS, ReachOne, Comcast Cable, Coast Communications and telephone company DSL services. There are also wireless/satellite Internet providers, including HughesNet satellite, and cellular mobile broadband from Verizon and others. There are four major private landline telecommunications providers: Qwest, CenturyTel, Coast and Comcast. TechTel

operates a 24/7 Network Operations Center (NOC) at Satsop Development Park.[36] High-speed Internet access options include:

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
HughesNet	Home: 700 Kbps Pro: 1.0 Mbps Pro Plus 1.5 Mbps	$59.99 $69.99 $79.99 Upfront $300 investment on equipment required for this rate.
ReachOne (reseller)	256 Kbps 1.5 Mbps	$19.95/mo. $29.95/mo.
Techline (reseller)	256 Kbps 1.5 Mbps	$39.99 $49.99
TSS (reseller)	144 Kbps 320 Kbps 1040 Kbps 3100 Kbps	$49.95/mo. + $135 one time $69.95/mo. + $135 one time $220.95/mo. + $185 one time $895.00/mo. +$280 one time
Verizon	5 GB 50 Mbps	$59.99/mo. $39.99/mo
WildBlue (Satellite Internet service)	512Kbps/128 Kbps 1.0 Mbps/200 Kbps 1.5 Mbps/256 Kbps	$49.95 $69.95 $79.95 All plans require $249 equipment fee
CenturyTel	128 Kbps/256 Kbps 256 Kbps/1.5 Mbps 512-768 Kbps/3-6 Mbps	$31.20 $41.20 $51.20
Coast Communications	1.0 Mbps/6 Mbps 1.0 Mbps/8 Mbps	$42.95 $69.95
Qwest	896 Kbps/256 Kbps 896 Kbps/1.5 Mbps 896 Kbps/7 Mbps	$31.99 $44.99 $54.99
Comcast	356 Kbps/6 Mbps 786 Kbps/8 Mbps	$45.95 $55.95

The Gray's Harbor Chamber of Commerce set policy objectives in November of 2004 with a particular focus on economic development in rural areas. One of the policy objectives was to

[36] Gray's Harbor Economic Development Council, "Gray's Harbor County Telecommunications," Telecommunications Page, February 29, 2008, http://www.ghedc.com/ghtech.html (May 30, 2008).

build a strong economy for the County, especially rural areas. The Chamber outlined several ways of achieving this goal; in particular, investment in public infrastructure and the Community Economic Revitalization Board (CERB). The Chamber also emphasized allowing Public Utility Districts to create a fiber optic network where it is currently unavailable from the private sector.[37]

The Gray's Harbor Economic Development Council conducted a telecommunications survey of 4000 County residents and businesses between April and July of 2002.[38] They found "considerable disparity" in the County's telecommunications infrastructure. The majority of respondents believed that the County has "serious telecommunications infrastructure problems." They found that overall, 74% of respondents use the Internet, but only 15% of them had connection speeds faster than 56 kbps dial-up. Approximately 54 percent of computer users accessed computers at multiple locations, with home and work being the most prevalent. Of Internet users, a majority indicated a desire for faster connections and 45 percent were willing to pay more for faster connections or new services. A majority of users also said they support the PUD bringing high-speed fiber optic networks directly to businesses and households.

In terms of particular communities in the County, the EDC found in 2002 that Aberdeen, Cosmopolis and Hoquiam (where 40% of the County's residents resided at the time) were without affordable high-speed Internet access. Qwest Communications argued at the time that it was economically unfeasible to provide high-speed access to these areas. Verizon provides telephone service to the communities of Westport and Grayland, but also claimed that it was economically unfeasible to provide these areas with high-speed Internet access. The communities of Elma, McCleary and Montesano are provided affordable high-speed access through CenturyTel Communications and Comcast. Ocean Shores has high-speed access provided by Coast Communications. In the community of Hoquiam and throughout the eastern part of the county, AT&T facilities exist, but AT&T does not provide broadband service because

[37] Gray's Harbor Chamber of Commerce, "Government Policy Objectives VII," *Government Policies Page*, November 19, 2004, http://www.graysharbor.org/gov_policy.php (May 30, 2008).
[38] http://www.ghedc.com/downloads/assessment.pdf.

of cost limitations.[39] As discussed elsewhere herein, based on our most recent review, the climate has improved since the 2002 Survey.

LEWIS COUNTY

Qwest Communications and CenturyTel are the primary telecommunications providers in Lewis County. The Lewis County Economic Development Council provides financial assistance through a lending network (a community based small business lender) to qualifying businesses locating in Lewis County. These loans are available for the financing of infrastructure development, including telecommunications infrastructure, as well as for other projects. Over the past 8 years, 40 loans have been approved for a total of more than $4.6 million. The following are high-speed and other Internet options in various parts of Lewis County:

Name of Broadband Service Provider	**Network Speed**	**Costs to Subscriber**
HughesNet	Home: 700 Kbps Pro: 1.0 Mbps Pro Plus 1.5 Mbps	$59.99 $69.99 $79.99 Upfront $300 investment on equipment required for this rate.
ReachOne (reseller)	256 Kbps 1.5 Mbps	$19.95/mo. $29.95/mo.
Techline (reseller)	256 Kbps 1.5 Mbps	$39.99 $49.99
TSS (reseller)	144 Kbps 320 Kbps 1040 Kbps 3100 Kbps	$49.95/mo. + $135 one time $69.95/mo. + $135 one time $220.95/mo. + $185 one time $895.00/mo. +$280 one time
Verizon	5 GB 50 Mbps	$59.99/mo. $39.99/mo
WildBlue (Satellite Internet service)	512Kbps/128 Kbps 1.0 Mbps/200 Kbps 1.5 Mbps/256 Kbps	$49.95 $69.95 $79.95 All plans require $249 equipment fee
CenturyTel	128 Kbps/256 Kbps 256 Kbps/1.5 Mbps 512-768 Kbps/3-6 Mbps	$31.20 $41.20 $51.20
Qwest	896 Kbps/256 Kbps 896 Kbps/1.5 Mbps 896 Kbps/7 Mbps	$31.99 $44.99 $54.99

[39] Gray's Harbor Economic Development Council, "Telecommunications Survey," September 16, 2002. Available for download at www.ghecd.com.

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
Comcast	356 Kbps/6 Mbps 786 Kbps/8 Mbps	$45.95 $55.95
TDS Telecom	512 Kbps/768 Kbps 512 Kbps/1.5 Mbps 512 Kbps/3 Mbps	$29.95 $39.95 $49.95
Toledo Telenet	256 Kbps/640 Kbps 512 Kbps/2 Mbps	$39.99 $49.99 $99 Install
Broadstripe	512 Kbps/4 Mbps	$34.95 $39.95 Activation fee $49.95 Installation fee

STEVENS COUNTY

Stevens County is one of the three counties that make up the Tri-County Economic Development District. The Colville Chamber of Commerce is one of the chambers that serve Stevens County. According to the Colville Chamber, the Colville area offers a variety of Internet Service Providers. Phone-line based dial-up services can be accessed anywhere in the County, while high-speed access is available in pockets within the County. In Colville, for example, dial up and DSL are available from Qwest Communications. Wireless service is available through Internet Xpress and Eltopia. Within a 10-mile radius of Colville, Internet Xpress and Eltopia have strategically placed wireless towers, but there must be a clear line of sight between the user location and the tower for service; there can be no blocking trees, mountains or buildings. Wild Blue and HughesNet offer high-speed satellite broadband data service to areas in the County, but terrain, weather and latency can affect these services. High-speed Internet options available to various parts of Stevens County include:

Name of Broadband Service Provider	Network Speed	Costs to Subscriber
HughesNet	Home: 700 Kbps Pro: 1.0 Mbps Pro Plus 1.5 Mbps	$59.99 $69.99 $79.99 Upfront $300 investment on equipment required for this rate.
ReachOne (reseller)	256 Kbps 1.5 Mbps	$19.95/mo. $29.95/mo.
Techline (reseller)	256 Kbps 1.5 Mbps	$39.99 $49.99
TSS (reseller)	144 Kbps 320 Kbps 1040 Kbps 3100 Kbps	$49.95/mo. + $135 one time $69.95/mo. + $135 one time $220.95/mo. + $185 one time $895.00/mo. +$280 one time
Verizon	5 GB 50 Mbps	$59.99/mo. $39.99/mo
WildBlue (Satellite Internet service)	512Kbps/128 Kbps 1.0 Mbps/200 Kbps 1.5 Mbps/256 Kbps	$49.95 $69.95 $79.95 All plans require $249 equipment fee
CenturyTel	128 Kbps/256 Kbps 256 Kbps/1.5 Mbps 512-768 Kbps/3-6 Mbps	$31.20 $41.20 $51.20
Qwest	896 Kbps/256 Kbps 896 Kbps/1.5 Mbps 896 Kbps/7 Mbps	$31.99 $44.99 $54.99
Comcast	356 Kbps/6 Mbps 786 Kbps/8 Mbps	$45.95 $55.95
Eltopia	256 Kbps/256 Kbps 1.0 Mbps/1.0 Mbps 3.0 Mbps/3.0 Mbps	$30.00 $45.00 $75.00
Internet Xpress (wireless)	256 Kbps/256 Kbps 1.5 Mbps/1.5 Mbps	$35.95 $49.95
Internet Xpress (DSL Reseller)	128Kbps/256 Kbps 1.5 Mbps/1.5 Mbps	$35.95 $49.95

Also instructive are certain key business and economic development related findings from the Focus Groups detailed in Attachment 9. Specifically, in the various counties we found the following:

STEVENS COUNTY

"Patchwork Quilt" of Services

Two focus groups were conducted in Stevens County and both had representatives from area businesses. Business owners indicated that the County is served by a "patchwork quilt" of service providers. Both hospitals (Mt. Carmel and St. Joseph's) are connected through T-1 lines. Some participants indicated that they were connected through satellite, provided by Hughes, Wild Blue and Starband. A few Internet users in the County use dial-up or cellular "air cards" which rely on an open line of sight to a cell tower.

Need High-speed for Various Applications

The members of the focus group indicated that the lack of redundancy and an overall lack of good quality high-speed Internet are problems. This lack of high-speed Internet access hinders the ability for many workers to telecommute. Mt. Carmel Hospital also indicated that they use video conferencing, but anticipate that they will need a much higher connection speed and degree of granularity in order to use video for some of the more advanced procedures.

The cited reasons that many areas do not have adequate bandwidth included high cost, locations that have limited services and inconsistency of service provider from location to location.

Negative Economic Impact

Members of the focus group indicated that based on the wide range of demographics that currently use high-speed Internet access at the public libraries, high-speed access would benefit all sectors of the County. Also, the businesses indicated that they want to try to recruit college graduates that are tech-savvy, but if these graduates are used to access to high-speed Internet, they are likely to chose other locations if broadband is not available in the area. Mt. Carmel Hospital also indicated that the lack of broadband had been an inhibitor in their recruiting efforts. It was also mentioned that when major corporations look for locations for branches, the lack of high-speed, cost-effective access to a home office could inhibit their desire to locate in Stevens County.

Solutions

The group suggested that the government should have more involvement in building infrastructure (similar to the building of highways) and should try to reduce the monopoly of broadband service providers in the area. All agreed that grants (especially rural development grants) would be useful. They also said that if the return on investment is a significant issue, the State could get involved and try to shorten the return on investment for the providers so that providing broadband to more areas would be feasible.

COLUMBIA COUNTY

Need Access to Information

Business members of the focus group indicated a strong desire to have more access to information through the Internet. Several of the participants also indicated that the general public needs to be educated about the benefits of broadband and what is available. Also, broadband access could connect different parts of the County and the State. While the western side is urban and the eastern side is rural, broadband has the capability to connect the two sides of the State.

Economic Impact

Many entrepreneurs and businesses in the County have a need to connect with other people around the world. For their businesses to be successful, they need broadband so that they can share ideas, research and communicate. Furthermore, as the County plans for the future, they must recognize that young people demand access to broadband and, without it, they may not come to or stay in Columbia County. The focus group said that broadband must be available everywhere because the economy today is international. Some believed that gas prices (and the desire to telecommute) also contribute to the need for broadband access. Not having broadband fully available in the County creates an economic barrier that other counties with broadband access do not face. In the industry of healthcare in particular, hospitals and doctors are relying more on telemedicine and access to this information is key, especially in rural areas.

FERRY COUNTY

Inconsistent Service and Pricing

Many participants indicated that Internet service is spotty. There is cable modem access in Republic, but problematic technical issues have been frequent. There is currently no DSL access in and around Republic. Verizon Wireless provides wireless broadband in Ferry via its cellular network. AT&T Cellular broadband service is spotty while Sprint has limited to no service in Ferry. Inconsistent pricing is also an issue as T-1s are costly with limited capacity. DS-3 is also costly with constant price quote changes and inconsistent offerings from Verizon.

Slow Connections

Many Internet users indicated that they have very slow connections, with a Dial-up speed of 21.6 Kbps considered a typical connection. Some homes near Republic can get a 56 Kbps connection. Some mentioned that when many people were on the cable network, it tended to slow down the cable modem Internet service.

Inhibitors to Broadband Deployment

The main inhibitors to broadband deployment appear to be a problematic return on investment and the cost of technology implementation and operation. Another inhibitor could be a lack of interest in broadband by some citizens. Some people don't know why broadband is relevant to them or don't want to put financial or personal information online and therefore have apathetic attitudes towards broadband development.

Economic Impact

For economic growth, the County needs to have better access to broadband. Some uses for high-speed connections include telemedicine, community services and education. It would be beneficial for the economy if students could consistently take online classes and if citizens could consistently see medical specialists through a videoconference. Some supported the idea that the government should not create jobs, but needs to create the infrastructure needed for the private sector to locate in the area and create jobs. Many entrepreneurs in the area need broadband to conduct business.

GRAYS HARBOR

The Role of the PUD

Significant discussion centered around the Public Utility Districts (PUDs). The PUD in Grays Harbor wholesales services to various entities and can provide Ethernet services from 10 Mbps to 1 Gbps. There is a need for additional services from the PUD, particularly because they can do things that other private companies can't because they can absorb a longer ROI. However, one of the main problems for the PUDs is trying to get the needed permits to expand broadband, as they have to go through many agencies (the DOT, the DNR, the U.S. Fish and Wildlife Department, etc.). The PUD currently has a number of different customers and uses both fiber and wireless connections. The PUD most desires to engage in public/private partnerships. The PUD has worked with CenturyTel to build portions of a fiber network and many think that more public/private partnerships would be beneficial. However, it can be difficult to work with some companies, such as Qwest, who want a "do not compete" clause regarding any shared infrastructure. Participants believe that the key is really to provide an incentive to the private sector. The group also felt that the State could be involved by making sure that providers, particularly when it comes to public/private partnerships, are focused on cooperation and collaboration in order to make broadband service available to everyone in the County.

Costly, Spotty Service

One common theme of the focus groups was that service is costly. Because some of the cost is calculated based on mileage, some needed circuits can cost as much as $1500 a month. Even though service is costly, businesses indicated that it is also quite inconsistent. Comcast provides broadband wherever it provides cable, but does not provide broadband in areas that do not meet its density criteria. CenturyTel is able to provide service because they receive Universal Service Fund money. Qwest service is also spotty because they only provide DSL from certain COs and where they have remotes off of their COs. In some areas, Verizon provides T-1s but will not provide DSL, and these T-1s are expensive. Participants also indicated that topography is a problem, especially when it comes to obtaining permits for traversing certain restricted areas.

Economic Impact

Many members of the focus group believed that greater access to broadband would have a positive economic impact. The group felt that the State could be involved in helping the County by focusing on economic development and helping develop broadband access to all areas of the County so that businesses will locate in the County.

Economic Impact Analysis Conclusion

After review of all the factors related to the impact of the presence or lack of broadband infrastructure and service availability, its adoption and use within the five studied counties, it is evident that the lack of broadband inhibits economic development and the presence of broadband supports economic development within the five counties. For example, to further understand how broadband adoption impacted responding businesses in the five rural counties studied, a test of significance was conducted and the following tested concepts were found to be significant related to business broadband adoption: greater satisfaction with provider billing practices, greater satisfaction with the installation technician, significantly greater number of Internet applications in use at the place of business, less satisfaction with the number of choices among broadband providers and more likely to have a larger number of employees.

Additionally, when analyzing Business Survey results in tandem with information gathered during in-depth interviews and focused discussions, the lack of a truly reliable, competitive broadband environment creates the following negative impacts:

- Movement of businesses away from low or no broadband areas to areas with a better broadband environment.
- Higher operational costs.
- Difficulty in recruitment.
- Slower, more inefficient and inconsistent operations.

- Less provision of services to, and access of services by, citizens thus reducing related quality of life components.

The presence of a competitive, reliable broadband environment has the inverse effect on economic development, including:

- Movement of businesses into the area, as well as retention and expansion of existing businesses.
- More efficient and consistent operations.
- Enhancement of related components of quality of life.

Section D
Review of Educational Communities of Interest

REVIEW OF EDUCATIONAL COMMUNITIES OF INTEREST

Introduction and Overview

As part of this Study, educational organizations within the five counties were surveyed regarding their broadband data networks. The survey was designed to measure broadband availability to the schools, usage, needs and interests. To assist in this effort, key networking staff in the educational community were interviewed and engaged to assist in identifying the right staff person within the public school districts and area community colleges to respond to the survey.[40]

Washington's K-20 Education Network, launched in 1996 with funds from the Washington State Legislature, provides educational organizations across the state, in communities of all sizes and in urban and rural areas, with dedicated, scalable telecommunications capacity. Educators and students at more than 400 public education sites including community and technical colleges, baccalaureate institutions, independent colleges, the public library system, K-12 school districts and educational service districts are able to use K-20 Network technology to communicate with one another. The network is built with a high-speed telecommunications backbone that connects the various sites and breaks the traditional barriers of distance and cost.[41] The K-20 Network is active in all five studied counties and provides the major gateway in and out of the school districts.

Within the school district itself, each is individually responsible for establishing an intra-school district network that links the frequently multiple school district sites to each other and then to the K-20 Network. These intra-district school connections are dependent on the existing infrastructure available near the school district office. Educational organizations have used a variety of means to engage local providers in supporting these elements of their network.

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[40] The Managing Partner of Network Communications International and K-20 Network Office Contract staff for the State of Washington assisted in identifying the regional K-20 Network coordinators that represented the impacted studied counties. These district level coordinators assisted in mapping the current network availability at each of the public schools and community colleges in the area. The Educational Technology Coordinator for the Office of State Public Instruction (OSPI), also assisted in sending a query to targeted instructional technology coordinators to complete the online survey that is detailed in this report.

[41] Washington State Department of Information Services, "K-20 Education Network," *Enterprise Initiatives Page*, 2008, http://www.dis.wa.gov/enterprise/k20network/ (May 28, 2008).

Contact was also established with the handful of private schools in the area and telephone interviews were conducted. These schools are not eligible to partner with the K-20 Network and described establishing high-speed Internet service with a variety of providers including DSL from Qwest, commercial cable modem services and satellite Internet providers.

The following narrative details the responses of educational organizations regarding their individual networks.

Responding educational entities included 82% of all public school districts operating in the five studied counties. Additionally, data was collected from the community colleges in the area. Several of these use the K-20 Network; however, others rely on their own established infrastructure and are satellite organizations to larger institutions.[42]

Responding school districts included:

County	School District
1. Columbia	Dayton School District
2. Columbia	Starbuck School District
3. Ferry	Curlew School District
4. Ferry	Inchelium School District
5. Ferry	Keller School District
6. Ferry	Orient School District
7. Ferry	Republic School District
8. Grays Harbor	Aberdeen School District
9. Grays Harbor	Cosmopolis School District
10. Grays Harbor	Hoquiam School District
11. Grays Harbor	Lake Quinault School District
12. Grays Harbor	McCleary School District
13. Grays Harbor	Montesano School District
14. Grays Harbor	North Beach School District
15. Grays Harbor	Oakville School District
16. Grays Harbor	Ocosta School District
17. Grays Harbor	Satsop School District
18. Grays Harbor	Taholah School District
19. Grays Harbor	Wishkah Valley School District

[42] Not all educational entities shown completed the on-line Survey. Information for several of the school districts and the universities and community colleges was provided via on-site interviews and discussions with Educational Service District personnel.

20. Lewis	Boistfort School District
21. Lewis	Centralia School District
22. Lewis	Chehalis School District
23. Lewis	Evaline School District
24. Lewis	Morton School District
25. Lewis	Mossyrock School District
26. Lewis	Napavine School District
27. Lewis	Onalaska School District
28. Lewis	Pe Ell School District
29. Lewis	White Pass School District
30. Lewis	Winlock School District
31. Stevens	Columbia River Christian Academy
32. Stevens	Colville School District
33. Stevens	Kettle Falls School District
34. Stevens	Loon Lake School District
35. Stevens	Northport School District
36. Stevens	Onion Creek School District
37. Stevens	Summit Valley School District
38. Stevens	Wellpinit School District

Community Colleges, Telemedicine Sites and Regional Universities:

County	School	T1s	Total T1 Capacity (Mbps)
Ferry	Spokane Community College-Inchelium	2	3.0
Ferry	Spokane Community College-Republic	3	4.5
Grays Harbor	Grays Harbor College[43]	1	1.5
Grays Harbor	Grays Harbor College-Elma	1	1.5
Grays Harbor	Washington State University-Aberdeen	1	1.5
Grays Harbor	UW-Grays Harbor Community Hospital	1	1.5
Grays Harbor	UW-Mark Reed Hospital	1	1.5
Lewis	Centralia College[44]	1	1.5
Lewis	Centralia College-East County Center	2	3.0
Lewis	UW-Morton General Hospital	1	1.5
Stevens	Spokane Community College-Colville	4	6.0
Stevens	Washington State University-Colville	1	1.5

[43] Also has fast Ethernet capacity, 10 Mbps.
[44] Also has fast Ethernet capacity, 10 Mbps.

RESPONDING SCHOOL DISTRICT CHARACTERISTICS

Most of the respondents that completed the survey were technology personnel (N=21). Four superintendents, 3 teachers, 2 administrative assistants, a librarian and a principal also completed the survey as the school district's representation.

The number of employees at each school district ranged from 3 to 515. Most districts had between 26 and 50 employees (N=10). Nine districts (N=9) had between 3 and 25 employees and 5 districts had between 51 and 100 employees. The remaining 6 had over 100 employees at their location.

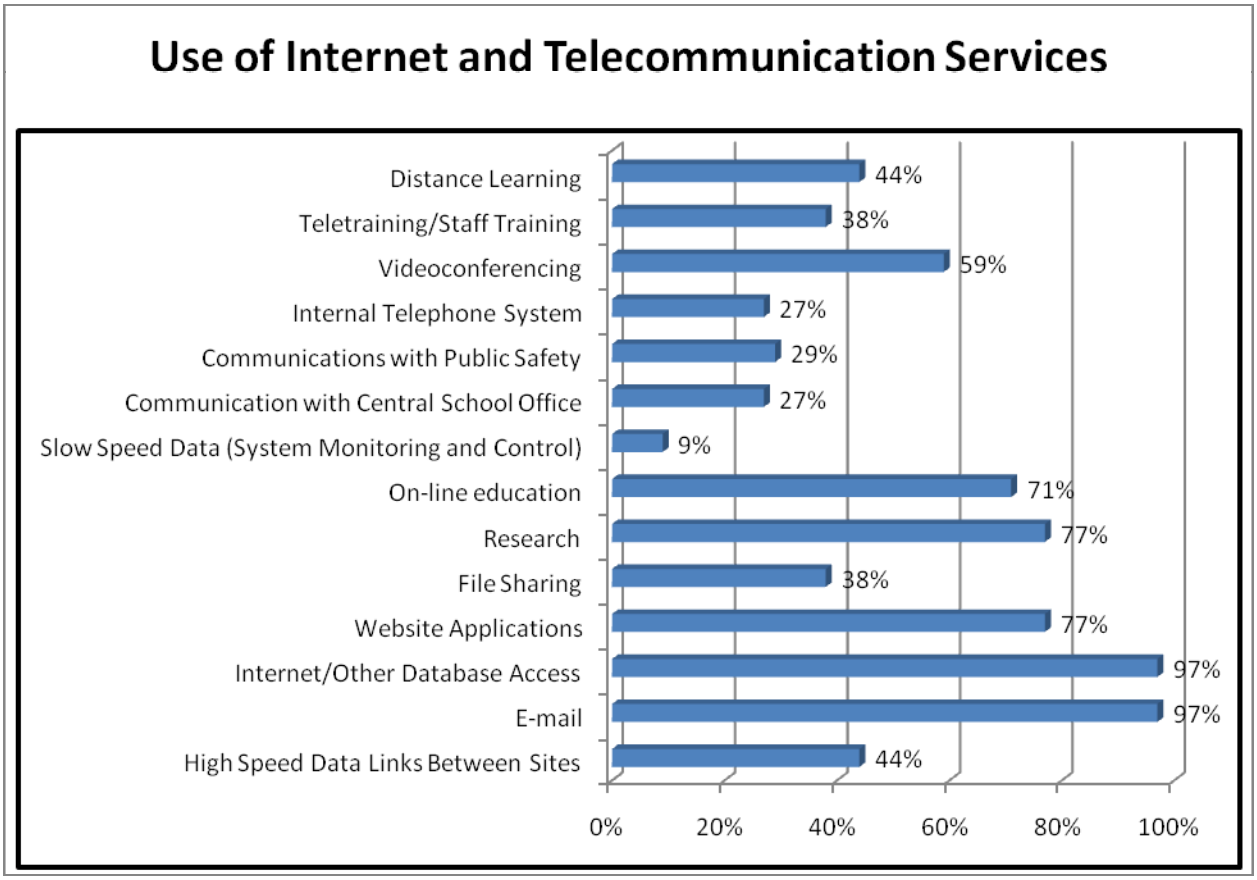
Number of Employees	**N=32**
0-25	9
26-50	10
51-100	5
100-200	3
201-300	2
301-400	1
Greater than 400	1

Use of Internet and Telecommunications Services

Network and telecommunications services are used by 97% of districts for both access to the Internet and also for e-mail. In addition, 77% of districts use these same services to be able to do research and also to run website applications.

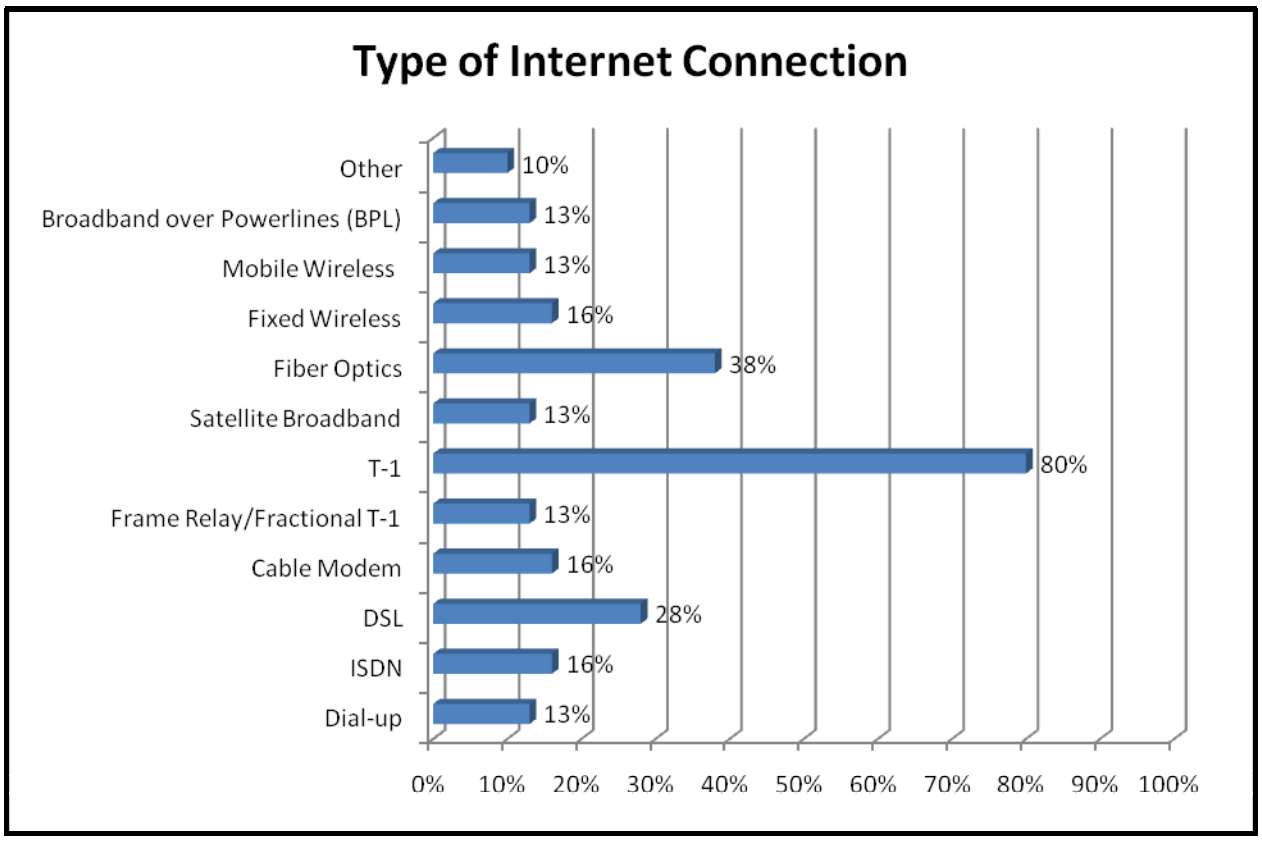
Online education was in use by 3 of 4 responding school districts. Additionally, 59% of responding districts used their network for video conferencing, 44% used it for distance learning and 38% used the network for staff training.

Slow speed data is used by 9% of the districts. Every option tested was used by at least one in four districts, demonstrating that having network access is important to many aspects of these educational institutions' operations. The chart below shows the complete list of the uses of network and telecommunications services.



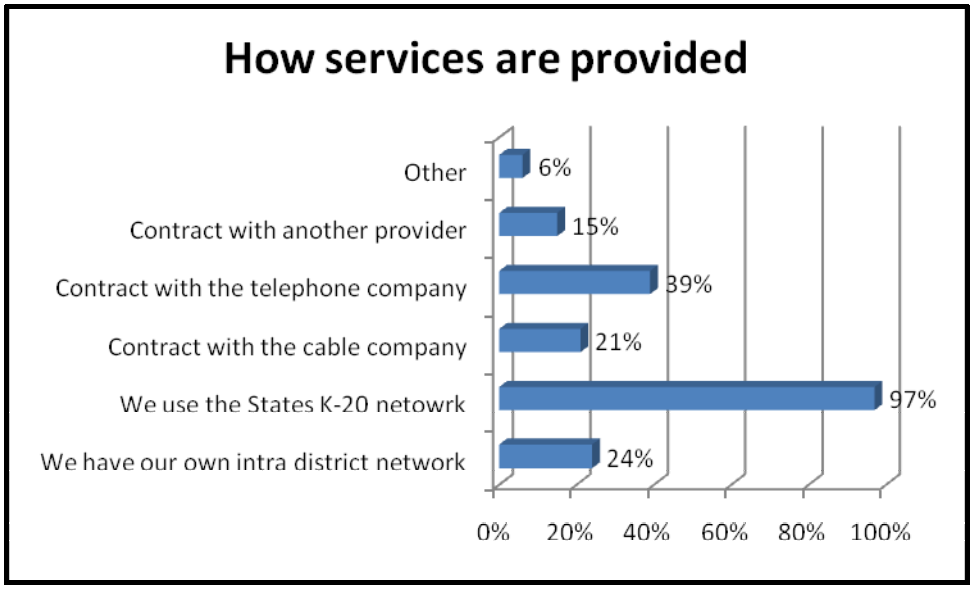
TYPE OF INTERNET CONNECTION

Most of the surveyed districts use a T-1 connection via the K-20 Network to access the Internet (80%). Thirty-eight (38%) of districts also use fiber optics and 28% of them also use DSL. Very few respondents were able to provide their connection speed. One respondent knew that their connection speed was 100 Mbps and the other reported having 2.7 Mbps. Two districts with fiber optic networks indicate that they had speeds of 10 to 100 Mbps, while two districts with DSL said their connection speeds were either 256 Kbps or 768 Kbps.



Note: BPL was only available in Centralia at the time of the survey. Most likely, some respondents were aware that their power company (such as the Grays Harbor PUD) was involved in some manner in the provision of their network services and so chose BPL as one of the service options that they utilize.

Network services are provided through a variety of means. Ninety-seven percent (97%) of responding school districts uses the State's K-20 Network for their services. Thirty-nine percent (39%) have a contract with the telephone company. CenturyTel (N=3) and Qwest (N=2) were the most common providers of that service. In addition, 24% have built their own intra-district network. One in five districts (21%) has a contract with a local cable company. Comcast and Coast Communications were listed as providers for these schools.



Network services cost between $2000 and $118,000 dollars annually. Most districts (N=8) pay between $2000 and $2999 dollars per year for their Internet access. Three districts (N=-3) pay between $3000-$3999 dollars and 3 pay more than $4000 dollars per year.

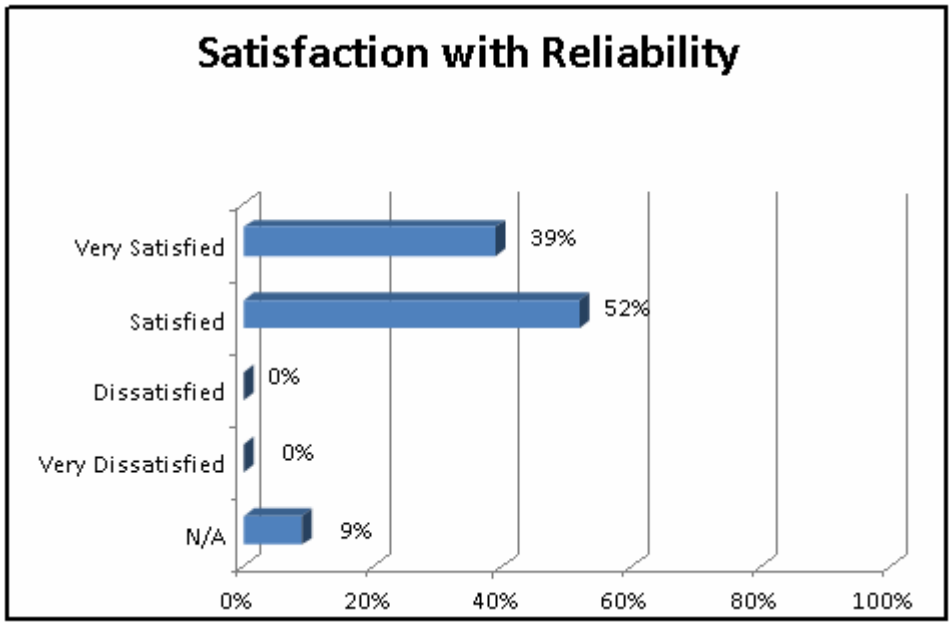
The term of these contracts is generally 1 year long (N=10). A couple of districts (N=2) have a contract that lasts longer than three years and another group of respondents (N=11) were unaware of the length of their contract.

Of the providers of network services in the area, 26 out of 30 districts indicated that the K-20 Network was their primary provider. Two districts have CenturyTel (N=2). Other service providers include Techline (N=1)

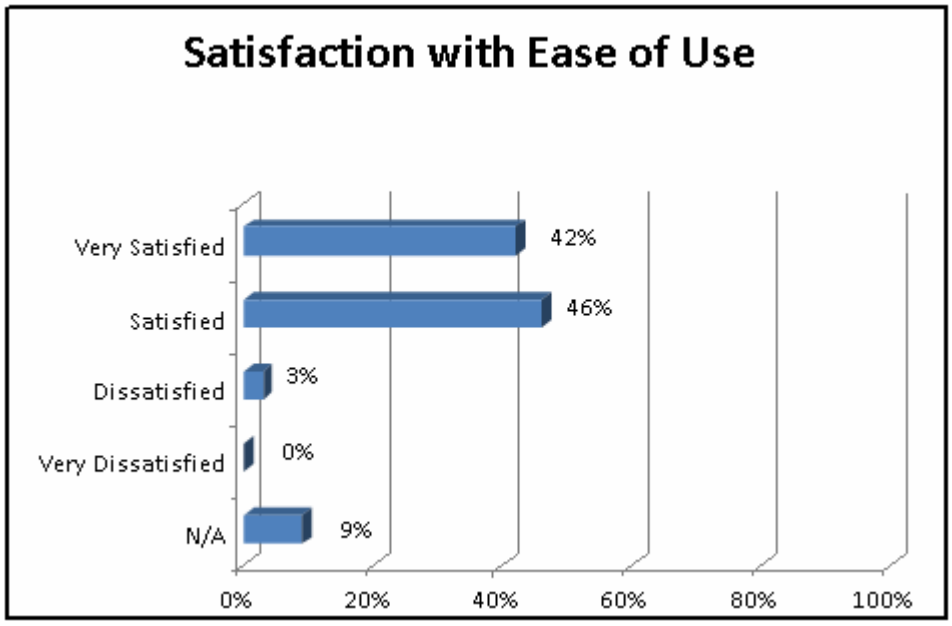
Primary Network Provider	**N=30**
K-20 Network	26
CenturyTel	2
Techline	1
Don't Know	1

SATISFACTION WITH INTERNET SERVICE

The service characteristics that schools are most satisfied with, in terms of their primary contracts, are the reliability and the ease of use. Ninety-one percent (91%) of people say that they are "satisfied" or "very satisfied" with the reliability of their service. No one reported being "dissatisfied" or "very dissatisfied" with this aspect of service.

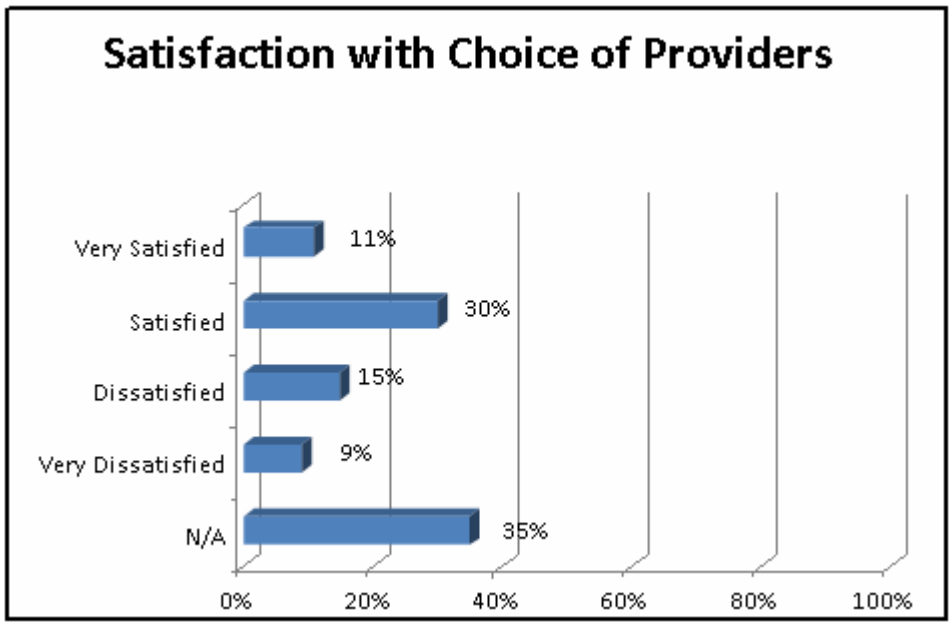


Ease of use was similarly ranked with 88% of respondents indicating that they were "satisfied" or "very satisfied" with this aspect of service.

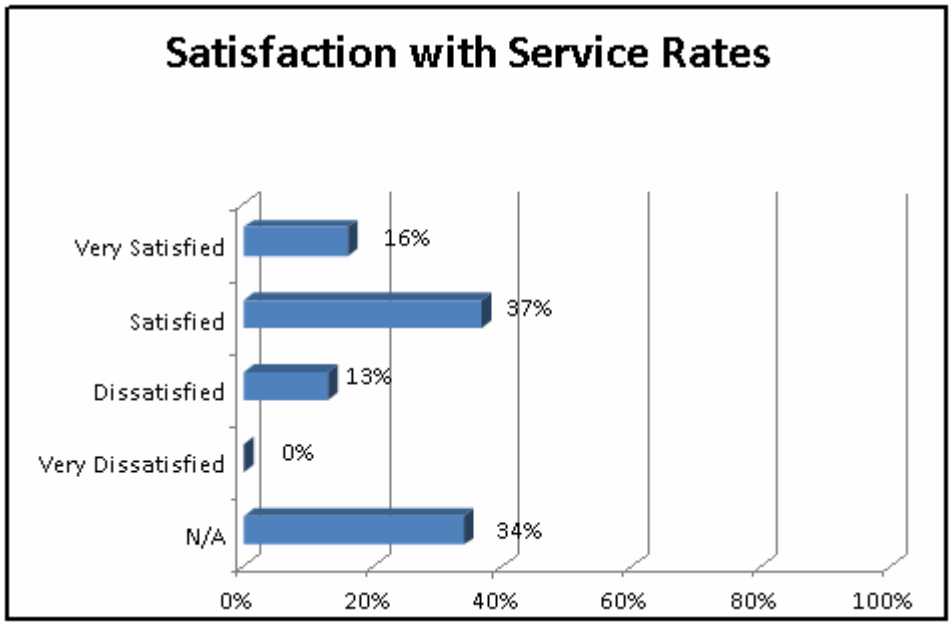


No one indicated that they were "dissatisfied" or "very dissatisfied" with billing practices. In addition, customer service and technical support generally received positive ratings.

The most dissatisfaction was found with the number of companies to choose from when looking for a telecommunications provider. Overall, one in five schools reported being "dissatisfied" or "very dissatisfied."



The only other area which showed significant rates of dissatisfaction was service rates. Thirteen percent (13%) were "dissatisfied"; however, no one was very dissatisfied and the majority (53%) were "very satisfied" or "satisfied."



A complete listing of the satisfaction rates for various service characteristics can be found below:

Characteristics of Network Services	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	N/A
Number of Companies to choose from	12%	30%	15%	9%	35%
Service Rates	16%	38%	13%	0%	34%
Billing Practices	19%	47%	0%	0%	34%
Reliability	39%	52%	0%	0%	9%
Ease of Use	42%	46%	3%	0%	9%
Training and Support	16%	47%	6%	0%	31%
Customer Service Representative knowledge and courteousness	25%	44%	0%	0%	31%
Installation technicians ability and courteousness	19%	47%	0%	0%	34%

K-20 NETWORK

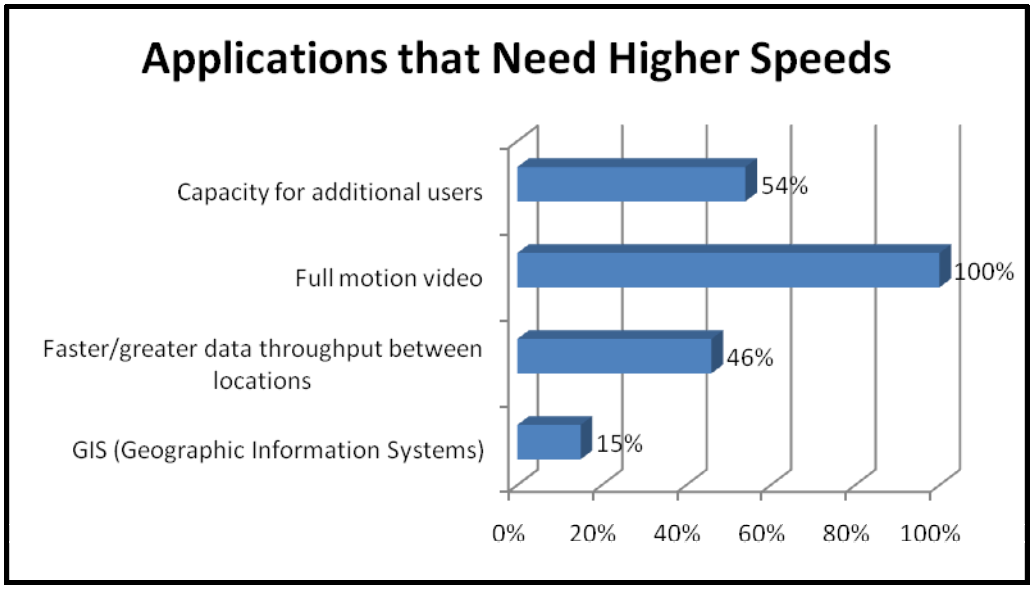
Ninety-seven percent (97%) of the districts surveyed responded that they use the Washington State K-20 Network. Most of them (N=23), when asked how they use it, mentioned that it provided their access to the Internet. Other reasons that were mentioned included supporting connectivity between schools (N=1), being able to access more information (N=1), and using E-rate (N=1).

NETWORK CAPABILITIES

Respondents were also asked whether they thought that their current network(s) or services were too slow or unable to meet their current or projected application demands. Fifty-two percent (52%) indicated that the network was too slow, while the remaining respondents indicated that it was sufficient.

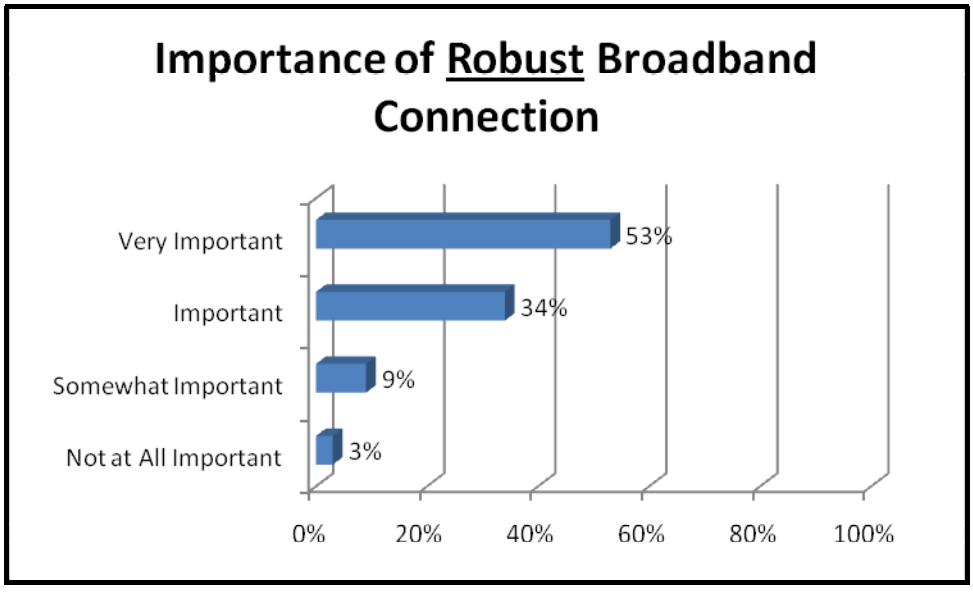
The respondents that said the connection was too slow or insufficient all mentioned that full motion video is one of the applications that needed higher speeds. Over half (54%) said that the capacity for additional users needs to be increased, and 46% said that faster speed was important to be able to transfer data between locations more quickly.

A smaller percentage of schools (15%) mentioned that Geographic Information Systems (GIS) applications need higher speeds. Other applications listed include supporting the ability to educate students online and to be able to have an interactive web curriculum.



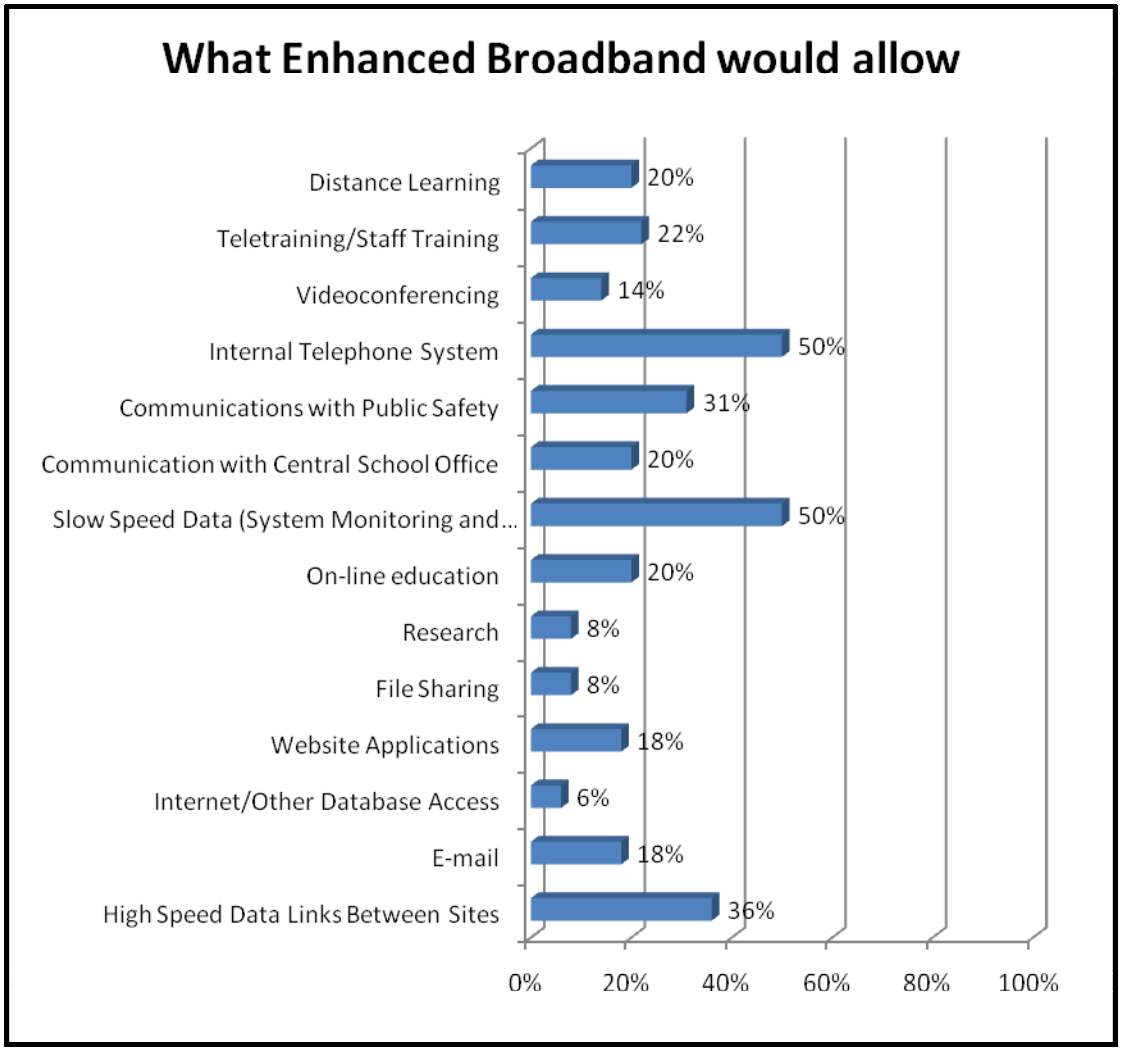
In an attempt to further understand the capabilities of the network connection, the schools were asked if their current data, voice and video systems were reliable. Eighty-eight percent (88%) indicated that they were.

When asked if a robust broadband connection was important to day-to-day school operations, over half said that it was very important (53%). Thirty-four percent (34%) said it was important, 9% said it was somewhat important and only 3% said it was not at all important.



Of those that said it was important (N=23), 7 mentioned its importance for long distance education programs. Six (N=6) wrote about how important it was for office and administration work and 5 said it was important for access to necessary information. Other responses as to why broadband is important included having a fast connection (N=2), being able to connect with other places (N=2) and having the ability to have video conferences (N=1).

If broadband service was enhanced in their area, each district was asked what they would use such enhanced service to accomplish. Half of the respondents (50%) said that enhanced broadband would facilitate an internal telephone system and slow speed data applications. Thirty-six percent (36%) said that they would use it for a faster link between educational sites. Districts would also use enhanced broadband for Internet and other database access (6%), research (8%) and file sharing (8%).



Some districts (N=4) also said that they plan to use enhanced broadband to allow for better online education programs. One district mentioned that it would be used for better video conferencing.

IMPORTANT NETWORK-RELATED ISSUES

Respondents were asked to provide the most important network-related issue facing their district at the present time. Of the 20 respondents who completed this question, six (N=6) mentioned that networking hardware needs to be upgraded or installed. Four districts (N=4) said that high cost was an issue that needs to be addressed and another four said that bandwidth needs to be increased. Two (N=2) districts said that faster service was needed. One district each said that

they needed to update their equipment, make it easier to use and find a way to be able to enhance distance education through the Internet.

Most important current network issue	**N=20**
Improve networking infrastructure and hardware	6
Lower cost	4
Increase bandwidth	4
Provide faster service	2
Staff training online	1
Update equipment	1
Ease of use	1
Online education	1
None	1

In addition to the short term problems, the schools were also asked about their most critical long-term issues that need to be addressed. The majority of respondents said that it would be important in the future to replace old network hardware (N=9). Four (N=4) said that it would be critical to improve the bandwidth of their connection. Other issues that will have to be addressed in the future include improving the telecommunications budget (N=2), increasing bandwidth (N=2) and providing digital security applications (N=2).

Most important long-term network needs	**N=25**
Replace old hardware	9
Improve connection	4
None	3
Improve budget	2
Increase bandwidth	2
Security concerns	2
Video conferencing	1
Better connections	1

Most important long-term network needs	N=25
Online education	1

CLOSING COMMENTS

Respondents were given the opportunity to provide thoughts about how the State or any other entity could help enhance broadband availability in their area. Eleven districts had a response, and the majority (N=6) said that it would be helpful to run more fiber infrastructure to the area. Two districts (N=2) said that the phone system needed to be upgraded, another two believe that help is needed to provide more affordable access and one said that it was important to provide higher throughput speeds.

Ideas on how to enhance broadband	N=11
Run more fiber optics to the area	6
Upgrade phone system	2
Provide cheaper access	2
Provide higher speed	1

Seven respondents (N=7) added thoughts when asked if they had any other comments about broadband service and infrastructure availability in their area. Three districts (N=3) reiterated the importance of providing more competition for the area to be able to drive down prices. Two respondents stressed bringing more fiber infrastructure into the district. Other responses were to improve rural residential broadband access so that students would be able to access high-speed Internet at home and to provide higher speed access to the school systems.

Key Findings from the Educational Survey Across All Five Counties

The following are key findings concerning broadband network availability and use among educational organizations in the five studied counties:

- Washington's K-20 Education Network is providing a valuable resource to schools within the five rural counties. It was described by the majority of the districts as their primary Internet connectivity point.
- Community colleges and affiliated regional sites for major universities in the State that reside in the studied counties have established T-1 lines to provide between 1.5 and 6 Mbps of bandwidth capacity.
- The primary uses of school district networks are to access e-mail and the Internet.
- Seventy-seven percent (77%) of school districts use their network to conduct research and 59% use their network connection for video applications. These are most often associated with distance learning initiatives.
- Online education activities were reported by 3 of 4 school districts in the five counties.
- A majority of the schools supplement the K-20 Network with their own intra-district networks. One in four have built their own network, 28% use DSL connections, 16% use cable modem service, 13% use satellite broadband and 13% use dial-up.
- Schools pay from $2,000 to $118,000 annually for telecommunications services and infrastructure support. Most of the districts' service contracts are for three or more years.
- A high level of satisfaction exists with the reliability of the K-20 Network.
- School technology officers expressed the most dissatisfaction concerning the number of companies to choose from when looking for a telecommunications service provider. One in four was dissatisfied.

- Several educational applications were described as needing greater bandwidth by more than half of responding school districts. These applications included delivering web-based interactive courses, full motion video, Geographic Information Systems and capacity for additional network users.

- New applications desired, if more bandwidth were available, include internal telephone systems, data monitoring and control circuits and public safety applications like surveillance cameras.

- A robust broadband environment was described as very important or important by 87% of all educational respondents.

- When describing the "most important" network issue currently facing educational organizations, most described the need to upgrade their network to greater bandwidth capacity and the need for new networking hardware. Several school districts also indicated the need for additional funding to support broadband deployment efforts.

Section E
Review of Library Communities of Interest

REVIEW OF LIBRARY COMMUNITIES OF INTEREST

LIBRARY COMMUNITY BROADBAND SURVEY

Introduction

The four library districts that serve the five counties were surveyed to determine how the districts currently use broadband network infrastructure and services and what impact broadband has on the operations of the district within the respective counties. The survey also sought information on the provision of certain library services enabled by their broadband connectivity, such as public access to the Internet.

Key Findings

The following are the key findings from the survey across all four library districts related to broadband availability for, and use by, the districts:

- All of the districts provide public access to the Internet, and the utilization of that access is very high for all of the districts.
- The districts indicate that their current broadband service climate is either somewhat competitive or not competitive at all.
- All of the districts indicate that their current networks or services are unable to meet their current or projected application demands. Most need faster/greater data throughput between locations. All of the districts indicate that a robust broadband connection is very important to their day-to-day library operations.
- Three of the four districts indicate that it would be beneficial for their broadband environment to be enhanced. Enhanced network infrastructure and services would be used to expand existing capacity and add new services such as video conferencing and downloadable books.

- The number of applications for telecommunications/broadband networks/services varies with the nature of the library district, with the least rural having the most applications.

- The above also correlates with the type and speed of broadband connections that are available to the districts, with the least rural having 10/100 Mbps fiber optic connections and the most rural having a 384 Kbps cable modem connection.

- The library districts indicate that they use the best connection available in the area for the applications they utilize. For the Stevens County Rural Library District, for example, this equates to everything from a dial-up line to a 6 Mbps cable modem connection, depending on the area that the branch library is in.

District Profiles

Because of their importance in providing high-speed access to the Internet to those that do not have such access at home, we have profiled each library district individually below:

THE TIMBERLAND REGIONAL LIBRARY

The Timberland Regional Library (TRL) serves Grays Harbor and Lewis Counties as well as surrounding areas. Within the two counties it has branches in Aberdeen, Centralia, Chehalis, Elma, Hoquiam, McCleary, Montesano, Oakville, Packwood, Randle, Salkum, Westport and Winlock.

TRL uses broadband networks and services for nearly every application surveyed, except for video conferencing and slow speed data. Specifically, it uses its networks' services for everything from high-speed data links between sites, such as from branches to the central library office, to Internet and other database access, online education, distance learning, teletraining, voice communications and other applications.

TRL's network is based on T-1s and 10 Mbps and 100 Mbps fiber optic connections. Qwest is TRL's primary network/service provider and the K-20 Network provides Internet access.

TRL indicates that it is satisfied with its service rates and the number of companies to choose from when looking for a provider, and it is very satisfied with other characteristics of service, such as reliability and ease of use.

Regarding public access to the Internet, TRL rates utilization of such access as very high, with the libraries in Grays Harbor and Lewis County combining to account for over one-third of the 674,341 total public Internet sessions in 2007 across the five county library system.

TRL indicates that its current network or services are too slow to meet current or projected application demands. Specifically, this assessment revolves around the need for higher speeds of connection to provide greater throughput between locations and to enable the use of full motion video.

TRL rates robust broadband connections for its day to day library operations as very important. This level of importance stems in part from the fact that its public Internet access is used in remote areas where there is no affordable high-speed access at home or no high-speed access options at all. Additionally, TRL notes that as web applications increase, its bandwidth requirements will require upgraded connections. It also notes that its network includes a significant number of central systems which require reliable connectivity between the 27 libraries in the system and the TRL Administrative Services Center.

TRL believes that the current broadband marketplace for the district is only somewhat competitive and that it would be beneficial for the broadband environment to be enhanced. TRL notes that it would be significantly beneficial if the cost of broadband services were reduced. Specifically, it will need to upgrade its network capacity, but additional T-1s or 10 Mbps Ethernet connections needed are either too costly or Ethernet connections are not available in the required locations.

If enhanced broadband network infrastructure and services were available to TRL, it would continue to use and expand existing services and augment them with video conferencing and system monitoring and control data communications.

NORTH CENTRAL REGIONAL LIBRARY

The North Central Regional Library (NCRL) serves Ferry, Chelan, Douglas, Grant and Okanogan Counties and the incorporated cities and towns which are either annexed to, or contracting for service from, the library district. The only NCRL branch in Ferry County is the Republic Community Library (RCL).

The Republic Community Library uses its current broadband connection for e-mail, Internet and other database access, research and communication with the NCRL Central Office in Wenatchee. The broadband connection used is provided by the cable company in Republic (the TV Association of Republic – TVAR). NCRL listed the speed of the cable modem service as unknown, but the service rate paid ($50.50 per month) would be equivalent to a symmetrical 384 Kbps connection.

While RCL indicated that it is generally satisfied with its broadband service rates, billing and ease of use and very satisfied with the customer service representatives' (CSRs) knowledge and the installation technicians' ability, it indicated that it is very dissatisfied with the number of companies to choose from when looking for a provider and dissatisfied with the reliability of its broadband service. NCRL's Republic Community Library is currently not connected to the K-20 Network.

The Republic Community Library provides public access to the Internet and rates its utilization as very high. The Republic Library has three Internet terminals for access to the system.

NCRL indicates that current broadband services are too slow to meet current or projected application demands; specifically faster/greater data throughput between locations (at a related

focus group, the library representative indicated that the Republic Community Library has the slowest connection speed of all NCRL branches).

Regarding reliability, the Republic Community Library notes a significant number of dropped connections which cause the staff to continually reboot the Horizon database used by the NCRL libraries.

NCRL cites a robust broadband connection as very important to its day to day library operations, especially related to the ability for the community to do research and to better enable the circulation of library material.

The Republic Community Library notes that the broadband marketplace in Republic is not competitive at all with only one provider option. Accordingly, RCL believes it would be beneficial to enhance the broadband environment in Republic and in Ferry County overall. Specifically, the library would use an enhanced network for higher speed data communications than it currently can access or provide, e-mail, the Internet, file sharing, research and communications with the central library office. In the longer term, it would look at facilitating an internal telephone system as well as engaging in teletraining using higher speed connections.

NCRL notes that its most critical current and long-term network related issue is developing and maintaining appropriate database connections between branches and the main library.

STEVENS COUNTY RURAL LIBRARY DISTRICT

The Stevens County Rural Library District (SCRLD) serves all of Stevens County with a main location in Loon Lakes and partnerships with the Chewelah, Colville and Kettle Falls Public Libraries. SCRLD indicates that it currently uses its telecommunications/broadband network services for high-speed data links between sites, e-mail, Internet and other database access, web site applications, research, online education, communication between branches and the central library office, teletraining and distance learning.

SCRLD uses a variety of types of connections for its library network including a dial-up line at its Onion Creek location, 768 Kbps DSL, a 6 Mbps cable modem connection, T-1s, satellite broadband at 1.5 Mbps and a fixed wireless connection at 1.5 Mbps (at a related focus group, the SCRLD Administrator indicated that it uses the best available broadband connection at each library location). Similarly, SCRLD uses a variety of providers including Comcast, wireless providers Eltopia, Internet Xpress and Wild Blue, and the Washington K-20 Network.

SCRLD lists its primary network/service provider as the Washington K-20 Network. It indicates that it is very satisfied with all aspects of the services provided by the K-20 Network. SCRLD notes that it receives its Internet service from the K-20 Network and that the Network helps facilitate access to its web server and data server. It also notes that the Library of the Lakes and the Colville Public Library are connected via point-to-point T-1s provided by Qwest.

SCRLD provides public access to the Internet and indicates that utilization by the public is very high. The district provides both computers for the public to use as well as wireless hotspots that patrons can access with their own laptops.

SCRLD notes that its current network/services are too slow to meet current or projected application demands. Specifically, it needs higher speeds for faster/greater data throughput between locations.

SCRLD indicates that it is very important to its day to day library operations to have a robust broadband connection. Specifically, it states that the public has come to expect high-speed connections and that its circulation service requires broadband in order to give timely services.

SCRLD notes that the broadband environment for the district in Stevens County is only somewhat competitive with a handful of options.

SCRLD indicates that its most current network related issue is that the public wants streaming media, which requires more bandwidth than it currently has available. Long-term, SCRLD notes that it will continue to need “more bandwidth”.

COLUMBIA COUNTY RURAL LIBRARY DISTRICT

The Columbia County Rural Library District (CCRLD) has one facility, the Dayton Memorial Library, that serves the City of Dayton and the surrounding area in Columbia County. CCRLD uses its current broadband connection for Internet and other database access, website applications, file sharing, research, online education, and teletraining. This connection is provided by cable modem service with a transfer rate of 1 Mbps downstream and 512 Kbps upstream. The cable company, Touchet Valley Television, provides the cable modem service free of charge. CCRLD does not use the State's K-20 Network.

CCRLD notes that it provides public access to the Internet and rates utilization as very high. It provides four computers for accessing the Internet, plus a free Wi-Fi service for those with laptops.

It notes that its current network or services are too slow to meet its current or projected application demands and indicates that its most significant need is for more Internet computers (which would, though, then place a higher demand on the current connection).

CCRLD also indicates that its current video, voice and data systems are not reliable. Specifically, it indicates that it needs microphones and other equipment for staff to adequately participate in online interactive seminars.

CCRLD indicates that it is very important to the library's day to day operations to have a robust broadband connection. Specifically, it notes that many in the Columbia community are low income residents and have no other type of Internet service. The library also offers computer classes and provides access to distance learning. CCRLD also believes that the broadband connection is very important to the maintenance of the library's website.

CCRLD notes that the broadband environment in Dayton is only somewhat competitive with a handful of options. Accordingly, the library believes that it would be beneficial if the broadband

environment in Dayton was enhanced. Specifically, it indicates that if more people had access to higher connection speeds at home, the library could consider the provision of services requiring high bandwidth, such as downloadable books, video and other services. CCRLD notes that most people only have dial-up connections and consequently use the library for high-speed Internet access.

In the short-term, CCRLD would use an enhanced broadband network to enable greater use of the same applications that it currently uses, as well as for system monitoring and control data communications. In the long-term, it would add high-speed data links to facilitate connection to future additional branches (which would require remote connections to a central server) and add video conferencing (it notes that no one in Dayton has this service at this time and it would be beneficial to work with the Community College in Walla Walla to provide college classes to those in Dayton. CCRLD notes that its staff would also take advantage of this type of video teletraining.).

CCRLD notes that its most important network related issue at this time is providing additional computers for public use. In the long-term, it needs to access high-speed data links and establish additional branches throughout Columbia County.

CCRLD noted that the state could work, similar to its facilitation of the K-20 Network, to have phone companies and power companies provide fiber optic connectivity in rural locations such as Columbia County. CCRLD noted that because of the topography, satellite and other wireless systems often provide unreliable and inconsistent service in Columbia County.

Section F
Review of Local Government and Tribal Nations Communities of Interest

REVIEW OF LOCAL GOVERNMENT AND TRIBAL NATIONS' BROADBAND NEEDS AND INTERESTS

GOVERNMENT BROADBAND NETWORK SURVEY

Introduction

In additional to the information received concerning the availability and use of broadband networks and services to and by local governments through in-depth interviews and focused discussion sessions, an extensive outreach effort was made to obtain formal survey responses from all of the counties under study and the incorporated municipalities within their boundaries. Specifically, this survey was focused on the broadband data network usage, needs and interests of local governments. It was designed to gain a better understanding of each jurisdiction's utilization of infrastructure and services and how such utilization lends itself to the provision of government services, including each local government's perception of the impact that broadband has on their operations.

In all, 32 local governments were requested to complete surveys. Of this number all five (5) counties and 19 of their incorporated municipalities responded.

Detailed information from the government respondents can be found in Attachment 5, Local Government Broadband Data Network Survey Mark-up. The key findings from this survey effort are described below:

Findings

Typically, staff from the Information Services or IT Department, but also City Administrators, elected officials such as Mayors, Planners, Financial staff and City Clerks, especially for the smaller jurisdictions, responded to the survey for their respective local governments.

The responding local governments ranged in size from small cities with as little as one full-time and one part-time employee to the larger counties with approximately 500 employees.

The number of locations varied from one (1) for the smaller towns (i.e., no satellite or field offices) to multiple facilities in multiple locations for the larger counties.

One hundred percent (100%) of those responding to the survey question on network applications use their networks and services for e-mail, with nearly 100% utilizing them for Internet and other database access. From there, the next largest applications were research (65%), website applications (57%) and online education and file sharing (both at 39%). The smallest use, at 9%, was system monitoring and control data.

Regarding the type of network connections used, the largest number of responding local governments (57%) used DSL connections and the next largest group (35%) utilized fiber optic links. A variety of other services from cable modem to T-1s to mobile wireless services were also used, including dial-up lines used by 26% of responding local governments. The smallest number of respondents (9%) use ISDN.

The speeds of connection vary significantly from 28 Kbps for dial-up lines used by the Town of Marcus to 1 Gbps connections over fiber optics used by three of the five counties (Stevens County, Lewis County and Grays Harbor County).

The largest number of responding local governments primarily contract with various telecommunications service providers (52% of respondents). Nineteen percent (19%) have their own network (primarily counties) while 38% also contract with the cable company. Some local governments, such as Lewis County, also use services provided by the PUD.

The amount paid for services varies significantly from $15 a month for dial-up connections used by the City of Vader to $850 a month for a T-1 connection to Davenport for Stevens County.

A significant number of local governments have one and two year contracts for broadband network services. When asked to designate their primary service provider, only 25% of responding local governments indicated the local exchange carrier for their area. Most indicated either alternate carriers or the cable company.

Local governments responding to the survey were generally satisfied with their primary contract-provided networks/services. The biggest area of dissatisfaction was related to the number of companies to choose from when looking for a provider.

Five (5) of the responding local governments indicated that they were connected to the IGN; all of these five were the counties under study.

Twenty-one percent (21%) of responding local governments indicated that their services are too slow or are unable to meet their current and projected application demands. Of these, the majority, 67%, indicated that the applications that need higher speeds are faster/greater data throughput between locations and capacity for additional users.

Approximately the same number (24%) indicated that their current networks and systems were not reliable. When asked to provide supporting detail, Ferry County, for instance, indicated that there is no redundancy for their voice or data lines, so when the network backbone is down, they have no service. Stevens County indicated the same concern, citing that "most of our sites are single point connections with no redundant paths available". The majority of the responding local governments (55%) said that a robust broadband connection is very important to their day-to-day government operations, with an additional 15% indicating "important" and 25% indicating "somewhat important". When asked to describe why broadband connections were important to them, local governments stated a variety of reasons, most centered around facilitation of e-government functions, day-to-day operations, critical public safety data communications and economic development.

No local government believed that their broadband service and infrastructure climate was "competitive". Twenty-six percent (26%) felt that it was somewhat competitive, 32 % felt that it

was only slightly competitive and the largest number of respondents (37%) indicated that the climate was not competitive at all.

In line with this, the vast majority of local governments (83%) indicated that it would be beneficial if the broadband environment in their area was enhanced. Respondents cited a range of benefits, many related to higher speed connections, greater redundancy and reliability, more service options and competitive costs, and bringing service to remote locations. If an enhanced broadband network was developed in their jurisdiction, the most often cited need that would be fulfilled was enhanced public safety communications, with high-speed data links, internal telephone systems and video conferencing the next longer term needs that would be satisfied.

The most important network related issues facing local governments at this time included problems with broadband coverage, lack of fiber connectivity, affordability issues, secure remote connectivity, single points of failure, having only dial-up in smaller jurisdictions and a lack of up-to-date technology. The most critical long-term network related needs echoed the short-term needs, but also included other issues such as the need to enable mobility of system users and the ability to work quickly and smoothly with other government agencies.

Regarding thoughts about how the State or any other entity could help enhance broadband availability in their jurisdiction, local governments indicated that grants or some other form of support funding would be helpful, as well as the provision of State resources to help meet the data interactivity requirements placed on them by State offices and encouragement of more providers to offer services within their area. Additionally, local governments indicated in final, open-ended comments that having a greater variety of service providers and getting local telecommunications companies to expand their current capabilities in rural areas were critical.

Key Findings

The following are key findings among local governments in the five studied Washington counties that responded to the survey, concerning broadband network availability and use:

- Eighty-three percent (83%) of local governments indicate that it would beneficial if the broadband environment in their area was enhanced. Most would use an enhanced broadband network for higher speed connections, greater redundancy and reliability, bringing service to remote locations, enhancing public safety communications and adding services such as video conferencing.

- Fifty-five percent (55%) of responding local governments said that a robust broadband connection is very important to their day-to-day government operations, with an additional 15% indicating that it is "important" and 25% indicating "somewhat important".

- The vast majority of local governments believe that their current broadband service climate lacks competition, with the largest response (37%) indicating that the climate is not competitive at all and an additional 32% indicating that it is only slightly competitive.

- Twenty-one point one percent (21%) of responding local governments indicate that their networks or services are unable to meet current or projected application demands. The greatest needs are higher speed connections for faster/greater data throughput between locations and capacity for additional users.

- Many types of network connections are used by local governments with the highest amount being DSL connections (57%), and the next largest being fiber optic lines (35%).

- The speed of connection varies significantly from 28 Kbps for dial-up lines to 1 Gbps for fiber optic connections (used by three of the five counties).

- The highest applications for telecommunications/broadband network/services are e-mail (100%), Internet and other database access (96%) and research (65%).

TRIBAL NATION BROADBAND NETWORK SURVEY

Introduction

Four tribal nations that are within the geographic area of the five counties under study were surveyed. This included the Quinault Indian Tribe in Grays Harbor County, the Chehalis Confederated Tribes in Grays Harbor County, the Colville Confederated Tribes in Ferry County and the Spokane Tribe in Stevens County.[45]

Key Findings

The following are key findings related to broadband network availability and use among Tribal Nations surveyed within the geographic area of the five studied Washington counties:

- The responding Tribal Nations indicated that it would be beneficial if the broadband environment in their area was enhanced. An enhanced broadband network would be used to improve network stability, bring broadband throughout the whole reservation, reduce cost through more competition and add additional services such as video on demand.

- The importance of a robust broadband connection to the day-to-day operations of the Tribal Nations varied from very important to important.

- Two of the Tribal Nations surveyed indicated that their networks and services were too slow to meet current or projected application demands. Common applications that need higher speeds include faster/greater data throughput between locations and the use of GIS (Geographic Information Systems) data transfer.

[45] A number of communications (both telephone and e-mail) concerning the Broadband Study were initiated with the Spokane Indian Tribe (within the geographic area of Stevens County), including offers to meet in-person. At the time of the Report, the Spokane Indian Tribe had not yet responded to our requests for information.

- The responding Tribal Nations all have fiber optic backbones between their core facilities. Other network connections included dial-up lines, mobile wireless, fixed wireless, T-1s, satellite broadband, DSL, cable modem and other connections. These have been chosen based on the best available connection for the application to the Tribes' satellite or remote office locations.

- Responding Tribal Nations use their telecommunications/broadband network/services for a variety of applications. The most common applications were e-mail, Internet and other database access, file sharing, intergovernmental functions, communications with public safety and internal telephone systems.

Tribal Nation Profiles

Because of their unique position as sovereign nations within the boundaries of the five counties under study who also interact with state and local government agencies concerning network applications and services, we have profiled each tribal nation individually below.

THE QUINAULT INDIAN NATION

A survey response was provided by the IT Manager of the Quinault Indian Nation. A follow-on interview was also done to obtain additional information. The Quinault Indians have a variety of satellite and field offices including Queets Village, the Tsa'Alal field office (Lake Quinault), the Aberdeen TANF (Temporary Assistance for Needy Families) Office and offices at Salmon River and Mercer Island. These offices are connected together or through the Internet by a variety of services (listed below).

The Quinault Indians use their broadband networks and services for Internet and other database access, e-mail, file sharing, research, intergovernmental functions, public safety communications, their internal telephone system and a variety of video applications including video conferencing, teletraining and distance learning.

As indicated above, they have a variety of broadband connections, including 1.5 Mbps DSL, T-1s, 1.5 Mbps satellite service, 802.11 g wireless communications and 10/100 Mbps fiber optic communications in a campus architecture in Taholah (they will be upgrading this fiber optic network to a 1 Gbps backbone).

The Quinault Indians note that they are in the process of replacing DSL service with two bonded T-1s for Internet access (3 Mbps in total connection speed) and installation of a point-to-point T-1 (1.5 Mbps) from their central network in Taholah to Queets Village.

The Quinault Indians have deployed their own fiber optic connections. The other landline connections are provided by CenturyTel. CenturyTel is also their ISP. Their contracted circuits have a three year term, including the bonded T-1s at $850 per month and the point-to-point T-1 at $185 per month. DSL connections are approximately $50 each. Their satellite service is provided by Starband.

The Quinault Indians indicate that they are largely dissatisfied with their current contracted network services concerning service rates, reliability, ease of use, CSR knowledge and the number of companies to choose from when they are looking for a provider. They are however satisfied with the billing practices and the installation technician's ability. Some of this dissatisfaction comes from slow response time from their provider.

The Quinault Indians indicate that current networks and services are too slow to meet their current and projected application demands. Specifically, they need higher speeds for faster/greater throughput between locations and the transport of GIS information. It is also important to them that these links be more secure than current connections, have greater stability and also have some level of redundancy. Related to this, they indicate that they do have some interruptions on their network.

The Quinault Indians indicate that it is important for them to have a robust broadband connection, because many of their day-to-day and critical processes (both internal to the Tribe and external communications) are greatly dependent upon their network and the Internet.

The Quinault Indians state that they are very interested in having more options for services, indicating that their current broadband environment is not competitive at all with only one provider option.

They indicate that it would be beneficial if the broadband environment in their area was enhanced. They also indicate a number of different types of broadband-related needs in the future, mostly centering on enhancement of existing applications. This includes for example, building on their current use of video conferencing (which is used now for the University of Washington Cancer Program and other training) and distance learning, which is used by many of the Quinault Indians for working toward their advanced degrees.

Their most critical short-term and long-term network related issue is obtaining adequate bandwidth that is stable at a reasonable cost. Additionally, the Quinault Indians would like to have the Washington K-20 Network provide 10 Mbps or higher services to the Taholah School so that the Tribal schools would have the same benefits as all of the other school districts in the State.

THE CHEHALIS CONFEDERATED TRIBAL NATION

An interview was held with the IT Director for the Chehalis Confederated Tribal Nation on May 16, 2008 at the Tribal Headquarters near Oakville. At the time of this Report, the Chehalis Tribe had not yet filed their written survey.

The Chehalis Confederated Tribal Nation indicated that there are a number of facilities at the main Tribal Center campus location connected via a 10 Gigabit backbone ring. With this capability, they are able to provide gigabit to the desk top. Facilities connected included the Tribal Center, the Family Resources Center, Family Services, the Elder Center, Head Start, the

Youth Center and the Natural Resources location which also houses DNR. There are additional T-1 connections to the Clinic and the core/public safety location.

Qwest is the provider of the T-1 services, but provides no DSL on the reservation. Comcast provides broadband services to the Hotel and Casino through cable modem communications. The company also provides cable modem connections on the reservation but not to all homes.

They are also connected to the Washington K-20 Network through multiple T-1s which enable connections to the Indian Health Service (IHS) for medical video conferencing with consulting physicians. The K-20 Network also enables connections from higher educational institutions to Head Start and other Tribal educational programs including GED certification.

Their network connections are used for a variety of applications including voice over IP, Internet access and other database access. The Chehalis Tribe also operates some wireless communications for public safety and other connectivity purposes. They are considering broad implementation of wireless broadband so that the whole Tribe is connected to broadband communications, but must consider the cost/benefit relationship (approximately $600,000 in funding will be needed to develop wireless broadband that would blanket the reservation).

The IT Director indicates that medical and educational issues will drive the need for higher bandwidth over time, including the need for more advanced telemedicine applications as well as video-on-demand and public safety emergency response applications. In that vein, redundant circuits for all their backbone connections would be extremely beneficial. Overall, it is of prime importance for their network to continually stay up and running.

THE COLVILLE CONFEDERATED TRIBES

The Colville Confederated Tribes are based in Nespelem but serve a large reservation area that stretches through Ferry and Okanogan counties. The tribal nations survey was completed by the Project Manager who works on telecommunications issues.

Their current network facilitates a host of applications including every one surveyed except for video conferencing (essentially this means that the Tribe uses every application from high-speed data and Internet access to an internal telephone system and distance learning). The Colville Confederated Tribes use a variety of connections in order to enable their network operations, including dial-up lines, T-1s, fiber optic links (operating at speeds of 100 Mbps to 1 Gbps), fixed wireless at 11-54 Mbps and 256 Kbps mobile wireless (cellular aircard) data communications. The Colville Confederated Tribes not only have their own network but also contract with Qwest. They indicate that they are very satisfied with Qwest's reliability, ease of use, CSR knowledge and installation technicians' ability. The Colville Confederated Tribes also use the IGN.

They are concerned that their current network and services are too slow to meet their current and projected application demands, including GIS, faster/greater data throughput between locations, full motion video, capacity for additional users and Voice over IP communications.

They indicate that their current data, voice and video systems are reliable and that it is very important for the Tribe to have a robust broadband connection for their day-to-day operations. This includes medical, financial, legal and research and development applications.

The Colville Confederated Tribes note that their current broadband environment is somewhat competitive with a handful of options and that it would be beneficial for their environment to be enhanced. Specifically, they need higher speeds for enhanced services and more competitors to foster better pricing. This would allow them to continue to enhance all of their current applications as well as add video conferencing.

Their most critical short-term and long-term needs are having the best network availability, reliability, security and speed available to them for their operations.

Section G
Review of Broadband Providers, Technologies, Infrastructure, Services and Costs

BROADBAND PROVIDERS, TECHNOLOGIES, INFRASTRUCTURE, SERVICES AND COST

REVIEW AND ANALYSIS

Introduction

The ability of any provider to offer broadband services will be based on the technology used and the infrastructure available to deploy that technology. We have profiled below the types of technologies commonly used and the services available in each of the five counties. The current level of infrastructure available to provide broadband services varies widely among the five counties, but in all cases there are gaps apparent between infrastructure and services currently needed and what is currently available.

CBG applied a variety of methods to achieve the goals of the study in determining where broadband is currently available to residents and businesses in each of the five counties. In practice we found that no single method produced adequate results.

Our first method of collecting data involved researching potential broadband providers in the State who would be asked to participate in the Study based on their service areas. We then sent a survey to each identified potential broadband provider in the State believed to provide service in one or more of the counties. We developed the Broadband Provider Survey to gather information related to: areas within each county currently served by the provider, wireless or wireline technology infrastructure, levels of service or bandwidth provided and the corresponding cost for each. CBG also asked the providers to provide maps showing in some detail where they offer each service level. If the provider deemed this information as proprietary or confidential, they were asked to suggest a procedure whereby the maps could be accessed or viewed by CBG at the company's location.

We further asked the providers to describe any planned deployment of broadband services in the five counties within the next two or more years. The survey then asked what obstacles stand in

the way of further deployment of broadband services by the company. The results of these surveys are summarized below and in the Attachments.

In order to supplement the surveys or gain information where surveys or survey sections were not completed by providers, we conducted in-person and telephone interviews. In some cases we received a call or e-mail stating that the company does not currently provide services in the five counties included in this Study. In other cases, providers informed CBG that some or all of the information is considered confidential or proprietary and therefore could not be provided in the context of this public effort.[46]

After finding that many of the providers were not likely to define the nature and extent of services provided within their service areas, we performed a drive out of the five counties to determine approximate service areas for each provider. We drove out the main highways, routes and roads within each of the counties as well as numerous city streets, secondary county roads and other less traveled roads leading to less inhabited areas of the counties. This process helped to fill in the information not released by many of the companies surveyed or interviewed.

Finally, we conducted focus groups and interviews throughout the Study area and gathered additional information providing more insight into broadband availability to the residents of the five counties. Notes and conclusions from these focus groups are detailed in Attachment 9 to this Report.

DEFINITION OF BROADBAND

There are numerous technological methods for connecting to the Internet. Several common ones are further discussed below with their respective bandwidths or speeds. Broadband is commonly and broadly defined as high-speed connectivity to a network and therefore the Internet. In March of 2008, the FCC further defined broadband by distinguishing several classes of broadband service. First generation broadband continues to be defined as 200 Kbps. From there, the FCC has defined seven tiers of broadband service up to the highest tier of 100 Mbps or more. The United States Department of Agriculture - Rural Utilities Service (RUS), which provides federal

[46] For sample responses, please see Attachment 7 to this report.

loan assistance to telecommunications carriers deploying broadband services, requires loan recipients to offer a minimum of 200 Kbps both upstream and downstream.[47] The stakeholders that were consulted during the design of the survey suggested that 1.5 Mbps downstream and upstream was seen by many as constituting broadband service. Because of varying definitions and the limited availability of broadband services in the five counties studied, CBG has reviewed and reports herein on various levels of broadband service offerings and capabilities.

TECHNOLOGIES AND SERVICES

Dial-up

Although dial up connectivity to the Internet is not a broadband service, a significant number of residents in the five counties are accessing the Internet via a dial-up service. Dial-up uses a standard phone line going to a residence or business to connect the user's computer via modem to a specific Internet Service Provider (ISP). Dial up service is limited to 56 Kbps by the technology behind the standard phone line - meaning that a larger document or file will take a substantial amount of time to download or upload as compared with more contemporary broadband facilities.

Although dial-up service is referred to as 56 Kbps, it will in many cases provide a real-world service level significantly below that due to various factors. The most significant contributor to lower real-world speeds is the age, size or gauge, condition and length of the phone cable between the phone company's Central Office (CO) and the customer's computer. These conditions also play a significant role in determining where DSL service is available as explained below in the section on DSL. Speeds cited by respondents to the surveys varied widely, but dial-up speeds ranging from 25 Kbps to 30 Kbps appear to be common in the areas we studied.

[47] **DEPARTMENT OF AGRICULTURE Rural Utilities Service, 7 CFR Part 1739, RIN 0572–AC09, Community Connect Broadband Grant Program:** *Broadband Transmission Service* means providing an information-rate equivalent to at least 200 kilobits/second in the consumer's connection to the network, both from the provider to the consumer (downstream) and from the consumer to the provider (upstream).

Dial-up service can be obtained through the local phone company or through other providers such as AOL and EarthLink for around $21.95 per month or less for basic Internet access and e-mail service.[48]

Consumer Satellite Service

Consumer level satellite Internet services do not meet the 1.5 Mbps threshold suggested by some stakeholders for this study; however, this service is widely used in the five counties - primarily when it is the only option faster than dial up. Satellite Internet providers, such as WildBlue and Hughesnet, offer service levels, as listed on their websites and confirmed with their customer service personnel, as high as 1.5 Mbps in the downstream direction. However, the upstream speeds are significantly slower.[49] Another prominent issue with satellite Internet is the signal delay that is inherent in this technology. This phenomenon will not significantly affect many data applications, but real time, two-way, services such as Voice over Internet Protocol (VoIP) telephone service and interactive gaming will not work properly on this type of network. We observed mixed reactions to satellite Internet service in this study - especially regarding its reliability - but many respondents indicated that satellite is a useable option where other higher speed connections are not available, and that it is preferable to dial-up.

During the driveout portion of the project, WildBlue appeared to be the most widely adopted satellite Internet provider in the five counties. It offers services ranging from 512 Kbps to 1.5 Mbps downstream and up to 256 Kbps upstream speed. These service levels range from $49.95 to $79.95 per month with upfront equipment, shipping and installation costs of $518.00 for a basic installation. Special offers, such as reduced equipment and installation costs, are sometimes available. WildBlue also has maximum upload and download levels (total amount of information that may be transported on the network by the users) that vary with each package. If these levels are reached during any given month, the customer drops to dial-up speeds for the remainder of the month.[50]

[48] Qwest's survey response states that dial-up is available throughout its service areas for $21.95 per month. CenturyTel's survey response details dial-up service for $12.95 to $17.95 per month.
[49] Research of HughesNet's website on May 28, 2008: http://go.gethughesnet.com/speed.cfm, Discussion with WildBlue's Customer Service on May 28, 2008: 1-866-769-0404
[50] Discussion with WildBlue's Customer Service on May 28, 2008: 1-866-769-0404

HughesNet offers satellite services with similar plans to WildBlue. These packages range in speed from 700 Kbps to 1.5 Mbps forward and 128 Kbps to 200 Kbps upstream with speeds dropping as much as 50% in both directions during peak periods. HughesNet charges $59.99 to $79.99 per month for this service if the customer purchases the equipment for $399.00. As shown on HughesNet's website, if the customer does not purchase the equipment up front, the service costs an additional $20.00 per month.[51]

Starband offers satellite-based Internet service with several options for residents electing to receive their service. The first option is for upstream speeds of 128 Kbps and downstream speeds of 1 Mbps with pricing for a 1 year subscription of $79.99 per month or, with a two year commitment, $69.99 per month. Starband's second level of service is 256 Kbps upstream and 1.5 Mbps forward for $109.99 per month with a one year commitment, or $99.00 per month with a two year commitment. Both service levels require an equipment charge of $299.99.[52]

SkyWay USA is another provider of satellite service with similar downstream speeds to WildBlue and HughesNet. SkyWay USA, however, uses a phone line for the upstream connection and therefore has upstream speeds that may be less than 56 Kbps. SkyWay USA offers service levels as high as 1.5 Mbps downstream, based on information found on its website, costing $79.95 per month, with a lower service level of 256 Kbps costing $29.95 per month. Both downstream levels are paired with a phone line for upstream traffic. Both plans require activation and installation fees of about $200.[53]

Digital Subscriber Line

Digital Subscriber Line (DSL) is a broadband service designed to provide high-speed Internet over traditional telephone lines to the subscriber's home or business. Qwest, CenturyTel, Toledo TeleNet, TDS (McDaniel Telephone Company) and Inland Telephone Company provide DSL service in one or more of the five counties. DSL is typically provided as an "asymmetric" service (more speed or transfer rate downstream and less upstream), with upstream speeds as slow as 128 Kbps and downstream speeds as fast as 10 Mbps.

[51] Research of HughesNet's website on May 28, 2008: http://go.gethughesnet.com/speed.cfm
[52] Research of Starband's website on May 29, 2008: http://www.starband.com/services/
[53] Research of Skyway USA's website on May 29, 2008: http://www.skywayusa.com/order.php

To deploy DSL service, providers feed signals over copper phone lines (twisted pair) starring out of a CO (Central Office) to residents or businesses located near the CO. Providers also commonly use fiber optic cables from the CO to a neighborhood or remote wire cabinet, or DSL extender, where the service is then provided along the traditional copper telephone lines into the home or business premises. In addition, DSL resellers can offer service utilizing the local phone company's lines with approximately the same speed and cost on a monthly basis.

A device within the central office called a Digital Subscriber Line Access Multiplexer (DSLAM) communicates with a DSL modem at the customer's location in order to provide the high-speed Internet connection. The DSLAM is in turn connected to the Internet server.

DSL service cannot usually be provisioned beyond approximately 15,000 to 18,000 feet from the central office (or a DSL extender) based on the size (gauge) and condition of the copper wires. As with dial-up modem service, the further the customer is from the central office or extender the lower the speed of connection that can be provisioned until a point is reached where DSL service cannot be reliably provided.

Cable Modem Service

Cable modem service is offered in some of the counties by Comcast, Touchet Valley Television, Coast Communications, TV Association of Republic and Broadstripe. Pursuant to Federal law, counties and municipalities cannot require the provision of broadband or high-speed Internet service as part of a cable franchise, because such a service is classified as an "Information Service".[54] However, all the listed cable providers offer service levels ranging from 384 Kbps to 6 Mbps in the downstream direction and 384 Kbps to 2 Mbps in the upstream direction. Monthly costs, excluding promotions, range from $34.95 to $94.95 per customer, plus tax, fees and other

[54] FCC CS Docket No. 02-52

charges. Installation charges are as low as $34.95 for a self installation to around $100.00 for an installation by the provider.[55]

To deploy cable modem service, providers commonly use a HFC (Hybrid Fiber Coaxial) network. A HFC network is characterized by fiber from the nearest "head end" or hub to neighborhood "nodes" that serve about 500 homes with coaxial cable. The system then employs Cable Modem Termination System (CMTS) gear in the headend or hub which communicates with the individual cable modems or routers in subscribers' homes. The CMTS also communicates with its main server which is connected to the Internet. This provides the high-speed Internet connection from the company to the home or business location.

Broadband Over Cellular

For a number of years, cellular telephone providers have also been providing broadband services over their cellular networks using a variety of what are known as 3G (or "Third Generation") technologies. Verizon, for example uses a system called EVDO (Evolution Data Optimized) while AT&T /Cingular uses a system called EDGE. Essentially, this broadband service can be used in a fixed location, or as a mobile service. The current providers of mobile broadband data services in the five counties include all the major cellular carriers: AT&T/Cingular, Sprint/Nextel, Verizon, US Cellular, T-Mobile and others. One representative example of services and pricing is for AT&T's Data Connect Service. As shown on AT&T's website, and confirmed with AT&T customer service personnel, this service costs from $19.99 for a total monthly throughput of 5 Mbits to $64.99 for unlimited access. In addition, an aircard (cellular broadband modem) or USB adapter is needed to access the service at a cost of $49.99 to $99.00. These plans require a two year commitment in order to receive this pricing.[56]

The ability to use the service is similar to the ability to use cellular voice service. It depends upon the amount of cell coverage that is available in the counties, and the strength of signal. This also affects the transfer rate that is provided (typically between 512 Kbps and 1.4 Mbps

[55] Information gathered on-site from the Television Association of Republic and from the following websites on May 27, 2008: http://www.comcast.com/; http://www.broadstripe.com/broadstripe_pages/pricing_login.php; http://www.touchetvalleytv.com/pages.php?section=Internet

[56] Discussion held May 26, 2008 with AT&T Consumer Sales: 1-888-333-6651

symmetrical). Similar to cable modem service, it is also a shared service, so the more users trying to access the service from a single cell tower, the slower the transfer rate per user will be.

Finally, cellular carriers don't always provide mobile data services where they provide cellular telephone services. This leaves significant gaps in coverage, even in areas that appear to be included in the provider's broadband coverage area.

Fixed Wireless

Fixed wireless broadband services are also wireless services, but typically are provided in a point-to-point configuration from a central tower location or through a series of towers (hops) through a mesh network to a customer premise location. Sometimes these systems use proprietary (non-standards-based) technology specifically designed to operate effectively at certain frequencies and use certain modulation techniques designed to gain both line of sight and nonline of sight transmission.

Providers offering service in the five counties include: Columbia Rural Electric Association, Eltopia, EcliptixNet, Internet Xpress, Air Pipe, TV Association of Republic and others. These providers typically offer service levels of 128 Kbps to 1.5 Mbps in the upstream direction and 256 Kbps to 3.0 Mbps in the downstream direction. Pricing varies significantly between the providers and counties as shown in the County by County Review section below, but ranges from $28.00 per month to $259.00 per month.[57]

Wi-Fi

Wi-Fi is a popular wireless broadband technology because so many laptop computers are built with Wi-Fi components installed or it is very easy to get a "Wi-Fi card" that can be installed in an external port of a laptop (USB-enabled transceivers are currently the most popular). Wi-Fi "hot spots" or access points (APs) are typically available in locations such as airports, fast food restaurants, coffee shops, bookstores, etc. There are very few Wi-Fi wireless broadband locations available for public use in the counties, with as few as 3 in Columbia, including the

[57] Information based on the Broadband Provider Survey response from Internet Xpress and on site interviews with Eltopia, Columbia Rural Electric Association and TV Association of Republic.

public library, to approximately 15 advertised hotspots and 7 Library locations in Lewis County that offer service. Hotspots can be provided by both commercial organizations and public entities such as libraries and government agencies.

Access points can be combined, often in a "Mesh" network architecture, where APs communicate with not only the end user but between each other to provide maximum coverage and efficiency in operation. These combinations are often called "hot zones". There are currently no known hot zones within the counties.

To further deploy hot spots or create hot zones would require the establishment of access points in the counties (each access point, depending upon the technology used, topology, foliage density, building heights and types, etc., can cover a radius from 300 to as much as 1500 feet). Coverage also depends upon the height of the antenna. Additionally, each access point (or in the case of a Mesh network, a gateway node) would need to have some type of backhaul connection to the Internet (again, a landline connection or wireless connection), as well as power. Often these devices are mounted on power and telephone poles, street lights, the sides of buildings, and other structures at least 12 feet tall. Anywhere from 15 to 45 APs are needed per square mile, depending upon the density of potential users as well as whether both indoor and outdoor coverage is needed.

Broadband Over Power Lines

Broadband over Power Lines (BPL) is a technology that provides high-speed Internet access at speeds roughly equivalent to DSL, through the power system infrastructure. The City of Centralia deployed BPL as part of a pilot project but this pilot was being discontinued as this study concluded. There are no other current providers of BPL service within the counties.

From one standpoint, the use of BPL would be an ideal technology for deployment in the counties because power goes to every home, including those that only have dialup services available now. However, BPL has been around for a number of years with very few initial and ongoing installations. The technology had a lot of problems with successful implementation,

including interference with both broadcast television and ham radio operations (since the technology uses unshielded power lines) and other problems.

Fiber Optics

Fiber optics is often thought of as the "holy grail" of broadband infrastructure, since it has near limitless capacity to provide broadband services. Verizon, for example, is spending approximately $23 billion to bring Fiber To The Premises (FTTP) services to about one-third of its service area; initially the more dense suburban sections. Through its FIOS FTTP system, Verizon can provision a great amount of video, voice and broadband data services, including high-speed Internet access up to 50 Mbps, hundreds of analog, standard and high-definition digital video channels, thousands of on-demand video services, including high-definition on-demand, and voice services, while only using a portion of its capacity. The rural nature of Verizon's service area within Ferry County is not consistent with the build-out element of Verizon's FIOS business model, so Verizon will likely not bring FIOS FTTP service to Ferry County. There are no known significant deployments of FTTP in the five counties studied, outside of fiber to institutional premises.

There is, though, a certain amount of fiber infrastructure in the counties. For example, cable TV companies have fiber to all of their HFC nodes, as described earlier. The phone companies have fiber to their central office and remote locations. In addition, AT&T and others have fiber running through some of the counties.

PROVIDERS

We contacted all the known providers thought to potentially provide service in the five counties to ask if they would take part in the Study. We sent surveys to most of the companies contacted and performed interviews with companies, especially when we received contact information late in the data gathering process. Not all of the providers returned the surveys and some simply stated that they could not provide significant information for confidentiality or proprietary reasons. Others provided significant information but did not offer maps of their infrastructure to show exactly where they provide service. Companies that filled out a survey or participated in an interview, as well as their service level(s) and pricing information are:

Qwest Corporation

Qwest offers telephone service in portions of all five of the counties and also offers DSL in Columbia County, Grays Harbor County, Lewis County and Stevens County. Qwest showed which CO's have DSL service available, but did not offer specific details of the extent to which their services are available within those areas. As described above in the DSL section, DSL service is very dependent on the distance from the company's CO or remote DSLAM locations. As part of our system drive out, we determined approximate service areas for Qwest's DSL service based on discussions with residents and businesses in each of the counties and have included this information on the maps in Attachment 10.

All of Qwest's DSL levels of service provide "up to" 896 Kbps upstream with downstream speeds of 7 Mbps for $54.99 per month, 1.5 Mbps for $44.99 per month and 256 Kbps for $31.99 per month. In addition, Qwest offers business class service with upstream speeds up to 896 Kbps and downstream speeds of 7 Mbps for $69.25, per month, 1.5 Mbps for $50.50 per month and 256K for $38.00 per month.[58]

Qwest stated that broadband deployment is based on economic analyses that evaluate return on investment. Taken into account are existing network design, capacity, population density and competition. Qwest filed a Washington Rural Broadband Expansion Plan - (Docket UT-061625) designating deployment of broadband services in Columbia County at its Waitsburg wire center, in Lewis County at its Rochester and Winlock wire centers and in Stevens County at the Deer Park, Northport and Springdale wire centers. Qwest did not provide specific information related to which specific areas will be affected and therefore, especially in the wire centers located outside of the five counties, it cannot be accurately determined what the final impact for each of the counties' residents will be. However, the Plan states availability in Northport will go from 0% to 33%, Springdale will go from 0% to 32%, Waitsburg will go from 0% to 79%, Napavine from 49% to 68%, Deerpark from 34% to 42% and Winlock from 58% to 66%. Construction pursuant to the Plan was to begin in 2007 and be completed in 4 years.

[58] Service levels and pricing information from Qwest's Broadband Provider Survey Response found in Attachment 7.

Qwest stated in its response "Qwest is not providing any proprietary information in its responses regarding its broadband deployment in Washington because there is currently no provision for protection of such data."

TDS Telecom

TDS Telecom provided a map of their current and proposed DSL coverage areas in Lewis County. This information is approximated and included on the Lewis County maps attached. TDS offers three levels of DSL service in their service area with all levels having upstream speeds of 512 Kbps and downstream speeds of 3 Mbps for $49.95 per month, 1.5 Mbps for $39.95 per month, and 768 Kbps for $29.95 per month. TDS also offers business class service starting with T-1s (1.54 Mbps symmetrical) with pricing dependent on the distance of the connection and the speeds desired. TDS, although stating their plans are not cast in stone, hopes to increase its DSL coverage area from the current 67% to 83% of their service area within the next two years.[59]

CenturyTel

CenturyTel offers DSL service within its service areas in all five counties. The areas where DSL service is available are included on the maps attached. CenturyTel's service levels vary per county with speeds of 128 Kbps upstream and 256 Kbps downstream costing $31.20 per month and 256 Kbps upstream and 1.5 Mbps downstream costing $41.20 per month offered in all five counties. CenturyTel also offers additional service levels in some areas with upstream speeds of between 512 Kbps to 786 Kbps and downstream speeds from 3 Mbps to 10 Mbps for $51.20 per month. The available speeds are likely determined by the distance from CenturyTel's DSLAM.

Toledo Telenet

We sent a survey to Toledo Telenet at the beginning of the data collection process of this Study. Although we have not received a survey back from Toledo Telnet, we have held discussions with representatives of the company and have ascertained that they offer DSL in their exchange area

[59] Services, pricing and expansion information is from TDS' Broadband Provider Survey Response found in Attachment 7.

with service levels of 256 Kbps upstream and 640 Kbps downstream for $39.95 per month. They also offer a service level of 512 Kbps upstream and 2 Mbps downstream for $49.99 per month with a one time installation fee of $99.00 which includes the modem cost.

Eltopia

Eltopia is a fixed wireless Internet provider doing business in Stevens County. They offer service in several pockets of Stevens County as depicted on the map in Attachment 10. Eltopia offers symmetrical speeds of 256 Kbps for $30.00 per month, 1 Mbps for $45.00 per month and 3Mbps for $75.00 per month.

TV Association of Republic

The TV Association of Republic is offering two options for Internet service for residents of Ferry County. The first is cable modem based service in the City of Republic and just outside of town. This service provides speeds of 128 Kbps upstream and 256 Kbps downstream for $28.00 per month, 128 Kbps upstream and 356 Kbps downstream for $38.00 per month, 256 Kbps upstream and 256 Kbps downstream for $43.00.00 per month and 384 Kbps symmetrical for $48.00 per month. These prices are for cable TV subscribers, with an additional $10.00 per month for none cable TV subscribers. The TV Association of Republic also offers fixed wireless service to a significant portion of the Northwest portion of Ferry County with service levels of 384 Kbps symmetrical for a one year commitment and cost of $526.00 for 13 months and this includes installation and the membership fee for the Association.

Comcast

Comcast was contacted early in the data gathering stages of the Study and mentioned that confidential information could not be provided unless it was insured that the information could be held confidential. Comcast did agree to complete the survey; however, at the time of development of this Report we have not received the survey back from Comcast.

In lieu of information from Comcast, we determined approximate service areas during our drive out of the counties as well as through discussions with residents and businesses. We also researched available speeds and pricing on Comcast's website for the areas where service is

available. We have included the service areas on the maps in Attachment 10. Comcast provides cable modem service levels of 356 Kbps in the upstream direction with 6 Mbps downstream for $45.95 per month and 786 Kbps upstream and 8 Mbps downstream for $55.95 per month. There is also a charge for the modem either upfront or on a monthly basis. Comcast offers speeds up to 16 Mbps in other markets and has rolled out a business class service with upstream speeds of 5 Mbps and 50 Mbps downstream in the Twin Cities, Minnesota, but these service levels do not appear to be available in the five counties at this time.

Rainier Connect

Rainier Connect was also contacted early in this study and was sent a survey to complete. After some time, Rainier Connect sent an e-mail stating, "We do provide competitive, high-speed broadband in Lewis County. For competitive reasons, we choose not to respond further." We did not find specifically identifiable Rainier Connect infrastructure during the drive out of the county and therefore they are not included on the map in Attachment 10.

Internet Xpress

Internet Xpress offers fixed wireless service in Stevens County. It provides service at speeds of 768-1.5 Mbps synchronous for $75.00 to $225.00 per month. Its canopy wireless system offers speeds of 256 Kbps to 1.5 Mbps synchronous for $35.95 to $49.95 per month. In addition, Internet Xpress is a reseller of DSL service where Qwest and CenturyTel offer DSL service in the county. This service has speeds of 128 Kbps to 865 Kbps in the upstream and 256 Kbps to 7 Mbps in the downstream direction. DSL service ranges in price from 35.95 to 49.95 per month depending on the speed available to and chosen by the customer. Internet Xpress's coverage area for their wireless service is shown on the map in Attachment 10.

Charter Communications

Charter Communications was contacted early in the data gathering process and informed CBG that they do provide cable TV to some areas within the study group of counties. Charter received the survey; however, they only filled in contact information in their reply with no further information or comments. Based on this lack of information, we researched Charter's web site and also spent time looking at their infrastructure during the drive out. From the information

gathered during the drive out as well as from web based research, it appears Charter is not currently providing Internet service in any of the five counties.

Inland Telephone Company

Inland Telephone Company is providing DSL service from its Prescott exchange CO. This CO is located in Walla Walla County and serves a very small area in Columbia County. Inland states that it believes 100% of the Prescott exchange customers can be served by DSL; however, only two percent of these customers reside in Columbia County. Inland also stated in its cover e-mail that they "only have 5 subscribers in Columbia County". We received the survey from Inland later in the process and therefore have not included them on the maps. Inland Telephone Company offers speeds of 128 Kbps upstream and 384 Kbps in the downstream direction from its Prescott Exchange.

Broadstripe

Attempts were made to contact Broadstripe later in the data gathering process, but the company hasn't returned our calls as of the date of compilation of this Report. During the drive out of Lewis County it was determined that Broadstripe offers Cable TV service in significant areas of the Highway 12 corridor from just west of Morton to Silver Brook and also in the area around Packwood. Broadstripe offers cable modem service around Packwood but we did not find a resident who was aware of them offering cable modem service from Morton to Silver Brook. However, it was observed that Broadstripe is significantly upgrading their network in this area and will likely be offering cable modem service in the near future. Therefore they are included on the Lewis County map in Attachment 10.

Where Broadstripe does offer cable modem service, they provide speeds of 4 Mbps downstream for $39.95 per month when ordered without cable TV service and they also offer 512 Kbps for $34.95 per month. There is a $5.00 Monthly rental fee for the cable modem and an activation fee of $39.95 and install fee of $49.95.

Columbia Rural Electric Association

The Columbia Rural Electric Association (REA) provides wireless service in Columbia County to the Dayton, Starbucks and surrounding areas utilizing a fixed wireless network. This network is comprised of several antenna locations in Columbia and Walla Walla counties providing the backbone for the network as well as the distribution for feeding signal to and from residents of the two counties. Service levels are symmetrical and include 256 Kbps for $39.95 per month, 512 Kbps for $49.95 per month, 768 Kbps for $79.95 per month, 1,024 Kbps for $119.95 per month and 1.536 Mbps for $259.95 per month. In addition, there is an installation charge of $199.00. REA's service areas are shown on the Columbia map in Attachment 10. REA plans to expand its network as funding is available and sees the service provided as more filling the unmet need of its energy customers for broadband than it does a for profit business venture.

Touchet Valley Television

Touchet Valley Television is offering cable modem service in the City of Dayton. The services they offer include residential service with 256 Kbps upstream and 512 Kbps downstream for $39.95 per month plus a $4.95 monthly fee for rental of the cable modem, or the modem can be purchased for $49.95. If the resident is a customer of Touchet Valley Television's cable TV service, the monthly cost drops $5.00. Touchet Valley Television also offers two levels of business class service. For upstream speeds of 512 Kbps and 1.024 Mbps downstream the monthly cost is $54.95 for non cable TV customers and $5.00 less for Cable TV subscribers. The highest tier of service is also a business class with 768 Kbps upstream and 1.536 Mbps downstream for a monthly cost is $94.95 regardless of whether the customer has Cable TV service or not.

County by County Infrastructure Review

Each of the counties has areas where broadband options currently exist and areas where there are more than one provider competing to provide service to the residents and businesses in these areas. However, there are significant portions of each of the counties that only have dialup and satellite service available to them. In many of these cases, there are not even hotspots available to residents for Internet access for over 100 miles and therefore broadband has no realistic availability, let alone competition.

Each county's population, number of households and square mileage has been compared to the census recognized communities within the county to determine the percentages of residents and geographical areas that cannot receive broadband today. It should be noted that in nearly all cases we were not provided exact boundaries, and in most cases no boundaries, from the broadband providers. That combined with the fact that provider's technologies, in particular wireless, do not follow city boundaries makes it difficult to provide exact percentages. However, CBG believes that these numbers give a good representation of the current state of broadband availability in each of the counties.

COLUMBIA COUNTY

Columbia County is a rural County consisting of 874 square miles with two Cities within its boundaries comprising just under 2 total square miles. The population of Columbia County is 4,087 people. Of these people 69% live in Dayton and Starbuck, leaving 31.5% of the people living outside of the two Cities. The County had 1687 households in 2000 with 1146 of these in the two Cities. With 872 square miles making up Columbia County and 1.7 miles within the City's of Dayton and Starbuck this leaves 99.8% of Columbia County outside of City limits.

There are five providers of broadband services in Columbia County. These are CenturyTel, REA, Qwest, Inland Telephone Company and Touchet Valley Television.

The City of Dayton has service provided by Qwest from its Dayton wire center offering speeds of up to 896 Kbps in the upstream direction with 256 Kbps to 7 Mbps in the downstream

direction. These services range in price from $31.99 to $54.99 per month. Qwest also has DSL service out of its Pomeroy wire center in Garfield County however with the wire center being in excess of 6 miles from Columbia County point to point and more than 10 miles via roadways it is highly unlikely the wire center offers DSL service to any residents in Columbia County. Furthermore, during the drive out of Columbia County, no DSL services were found to be offered in this area of the county. Qwest also has a wire center in Walla Walla County that feeds parts of Columbia County. This wire center does not offer DSL today.

Columbia County is included in Qwest's Washington Rural Broadband Service Expansion Plan as detailed in the Provider subsection above, but it is not clearly defined what specific areas of the county will ultimately be affected and therefore it is not possible to draw definite conclusions on the outcome for the residents and business in the county.

CenturyTel is offering DSL service from its Starbucks location with service levels of 128 Kbps upstream and 256 Kbps downstream for $31.20 per month. CenturyTel also provides a service level of 256 Kbps upstream and 1.5 Mbps downstream for $41.20 per month. It appears this service is offered within the City of Starbuck and within a few miles of the City.

Columbia Rural Electric Association offers fixed wireless service to the Dayton and Starbuck areas of the county. The service levels offered are symmetrical and include: 256 Kbps for $39.95 per month, 512 Kbps for $49.95 per month, 768 Kbps for $79.95 per month, 1,024 Kbps for $119.95 per month and 1.536 Mbps for $259.95 per month. In addition, there is an installation charge of $199.00.

Touchet Valley Television is offering cable modem services within the City of Dayton and are providing residential service levels of 256 Kbps upstream and 512 Kbps downstream for $39.95 per month for non-cable TV subscribers with a $5.00 discount for residents signed up to receive cable TV. Touchet Valley Television also offers two business classes of service including 512 Kbps upstream and 1024 Kbps downstream for $54.95 per month for non cable TV subscribers and $49.95 per month for cable TV subscribers and 768 Kbps upstream and downstream of 1.536 Mbps for $94.95 per month regardless of whether or not a cable TV subscription is held by

the business. Both services also require a purchase of a cable modem or a monthly modem charge of $4.95.

Inland Telephone Company is providing DSL service from its Prescott exchange CO located in Walla Walla County. Of the residents served form this CO only 2% reside in Columbia County and indeed Inland Telephone Company says they have 5 customers in Columbia County. As we received Inland's response late in the data gathering process, combined with the fact that no one in Columbia County seemed to know that Inland Telephone Company serves this small area of the county, we do not have them included on the maps in Attachment 10. Inland offers speeds of 128 Kbps upstream and 384 Kbps in the downstream direction from its Prescott (Walla Walla County) Exchange for $49.95 per month.

COLUMBIA COUNTY CONCLUSION

Columbia County has relatively good broadband options within Dayton and Starbuck. However, just outside of these towns, as shown on the attached Columbia County maps, there are no providers or options for broadband by residents or businesses.

FERRY COUNTY

Ferry County was comprised of 7,559 people living in 2,823 household according to the 2000 Census and the county is comprised of 2,257 square miles of land. Republic and Inchelium are the only communities included as Census recognized communities and combined they have 954 residents living in 411 households on 1.6 square miles of land. This equates to 13% of the population, 14.5% of the households and .07% of the land area within these communities. There are areas of the county that are outside of these "recognized communities" that would be included as being able to get broadband services. Therefore we estimate that approximately 25% of the residents in Ferry County could receive Broadband service if they desired it.

CenturyTel is offering DSL service along Lake Roosevelt from the Kettle Falls area to Inchelium. During the drive out it was found that residents' ability to receive DSL service from CenturyTel got spotty in the area between Kettle Falls and Inchelium and therefore this corridor does not have 100% coverage.

CenturyTel is offering DSL services in this corridor at 128 Kbps upstream and 256 Kbps downstream for $31.20 per month, 256 Kbps upstream and 1.5 Mbps downstream for $41.20 per month, and in the Kettle Falls area between 512 Kbps and 786 Kbps upstream combined with between 3 Mbps and 10 Mbps downstream for $51.20 per month.

The TV Association of Republic is offering two options for Internet service for residents of Ferry County. The first is cable modem based service in and around the City of Republic. This service provides speeds of 128 Kbps upstream and 256 Kbps downstream for $28.00 per month, 128 Kbps upstream and 356 Kbps downstream for $38.00 per month, 256 Kbps upstream and 256 Kbps downstream for $43.00.00 per month and 384 Kbps symmetrical for $48.00 per month. For non cable TV subscribers there is an additional cost of $10.00 per month. They also offer fixed wireless service to a large portion of the Northwest portion of Ferry County with service levels of 384 Kbps symmetrical for a one year commitment and cost of $526.00 for 13 months including installation and the membership fee for the Association. After the first year the monthly charge is $35.50.

Qwest and Verizon both offer telephone service in the county and therefore dial-up; however, neither of them offers DSL broadband services in Ferry County. Verizon in its response to the Survey states that they offer T-1 service of 1.544 Mbps symmetrical in Ferry County. No rates were given for this service as this depends on the characteristics of each customer's order.

FERRY COUNTY CONCLUSION

Ferry County has a significant geographic area of the county that cannot obtain broadband services today. The TV Association of Republic is filling some of this gap, and has plans to expand their network as funding can be made available, by offering its fixed wireless service. There are two hurdles that must be overcome to provide DSL service to at least a small area in an exchange area. The first is the need for backhaul or backbone service to tie the area being served back to the Internet. The second is the need for equipment at the CO to distribute DSL service into an area. It seems that Verizon has conquered the most significant and therefore potentially most costly of these issues by having the backbone in place. We base this on two findings. The

first is that we found Verizon owned fiber optic infrastructure entering Ferry County from Okanogan County along Highway 20, it enters Republic and then goes north to Curlew. In addition, in order for Verizon to offer T-1 service, they must have the equipment in place on this fiber network to get back to the Internet. The second hurdle for offering DSL service is the need for equipment at the CO or hub to deploy DSL onto the copper phone lines. It seems that deployment of DSL at least to small areas in Republic and Curlew would be relatively inexpensive for Verizon.

GRAYS HARBOR

Grays Harbor consists of 1917 square miles of land area. Of this, 122.5 miles (6.39%) are inside of Census recognized cities and communities. The County also had a 2007 population of 70,800 and total households in 2000 of 26,808. The number of people living in Census recognized communities in 2000 was 48,514 (72.2%) with 20,774 (77.49%) households in these areas. This equates to 72.2% of the population living in 122.5 miles and these people are able to receive broadband services from one or more providers. With areas just outside of recognized communities being able to receive broadband services, we estimate that approximately 85% of the land area is not served by Broadband and 25% of residents cannot receive broadband services from any of the providers in the county.

Qwest is currently providing service in the Aberdeen area, with residential DSL services including up to 896 Kbps in the upstream and 256 Kbps downstream for $31.99 per month, 1.5 Mbps for $44.99 per month, and 7 Mbps for $54.99 per month. Qwest also provides business class services at the same levels for $38.00, $50.50 and $69.25 per month respectively.

Qwest's Washington Rural Broadband Service Expansion Plan does not include any areas in Grays Harbor.

CenturyTel is offering DSL service in areas along the Pacific coast between Pacific Beach and Taholah as shown on the maps of Grays Harbor in Attachment 10. In addition, CenturyTel also has DSL service areas in the Lake Quinault area as well as Humptulips and Ocosta areas of the county. These are also shown on the maps.

CenturyTel is offering DSL services at 128 Kbps upstream and 256 Kbps downstream for $31.20 per month, 256 Kbps upstream and 1.5 Mbps downstream for $41.20 per month, and between 512 Kbps and 786 Kbps upstream and between 3 Mbps and 10 Mbps downstream for $51.20 per month.

Coast Communications is offering cable TV based services in the area along the Pacific Coast from around Pacific Beach down to and including Ocean Shores. Although we did not receive a survey back from Coast, we did drive out the entire area and made the following findings. Coast has cable modem service available in most of its coverage area and is upgrading areas of the system that do not have the capability to offer broadband services. We came across two gentlemen splicing in new equipment in one of the resort areas along the coast and this area will then be able to offer cable modem service.

Coast has two service levels for its modem service up to 1 Mbps for upstream for both services with 6 Mbps downstream costing $42.95 per month and 8 Mbps costing $69.95 per month.

Comcast offers cable modem service in significant portions of Grays Harbor from Hoquiam to Elma along the Highway 12 corridor and from Westport to Aberdeen along Highway 105 as well as in the Oakville area. Comcast provides cable modem service levels of 356 Kbps in the upstream with 6 Mbps downstream for $45.95 per month and 786 Kbps upstream and 8 Mbps downstream for $55.95 per month. There is also a charge for the modem either upfront or on a monthly basis.

GRAYS HARBOR CONCLUSION

Grays Harbor and Lewis County have the most extreme examples of broadband have and have-nots in the study group of five counties. Where there are significant population centers along Highway 12 and the Pacific coast, broadband exists and in most areas there are at least two options for broadband and therefore a level of competition. However as you move away from these population centers into rural areas of the county, broadband competition disappears and shortly thereafter broadband is not available at all.

LEWIS COUNTY

Lewis County has 2,407 square miles of land with 74,100 residents in 2000 and 26,306 households in the county in 2000. There are 10 communities that are recognized by the census. In these 10 communities reside 29,718 people in 11,608 households covering 22 square miles of land. This translates into 43% of the population of Lewis County residing on .91% of the land area within the county. As the availability of broadband closely mirrors the population centers in the county and reaches just beyond those areas, we estimate that about 10% of the geographic area of the county is served by broadband. Furthermore, approximately 45% of the county's population has at least 1 broadband option available to them.

Providers include Qwest serving a few miles east and west of the I-5 corridor from the northern border of the county to just north of the southern border. Lewis County is included in Qwest's Washington Rural Broadband Service Expansion Plan and outlines that Qwest will increase the percentage of residents able to get DSL service out of there Rochester CO from 46% before the deployment to 55% after the deployment of advanced services. In addition, the Winlock Wire Center will be upgraded from its current capability to offer DSL service to 58% of the residents to 66% being fed from this location.

The areas described above (before deployment) and shown on the Lewis County map in Attachment 10, are offered DSL service by Qwest and are offered speeds of up to 896 Kbps in the upstream direction with 256 Kbps to 7 Mbps in the downstream direction. These services range in price from $31.99 to $54.99 per month.

CenturyTel is offering DSL service in the City of Pe Ell, and in areas along Wildwood Road to I-5. In addition, CenturyTel has a DSLAM feeding Mineral as well as service along Highway 12 from west of Morton to Packwood. CenturyTel is offering DSL services at 128 Kbps upstream and 256 Kbps downstream for $31.20 per month, 256 Kbps upstream and 1.5 Mbps downstream for $41.20 per month in all of the areas of Lewis County. In addition, CenturyTel is offering service levels between 512 Kbps and 786 Kbps upstream and between 3 Mbps and 10 Mbps

downstream for $51.20 per month in the Vader area as well as the area between Morton and Packwood.

Comcast provides Cable modem service along the I-5 corridor from the northern border of the county to the southern Border. Comcast is offering speeds of 356 Kbps in the upstream with 6 Mbps downstream for $45.95 per month and 786 Kbps upstream and 8 Mbps downstream for $55.95 per month. There is also a charge for the modem either upfront or on a monthly basis.

TDS Telecom is offering DSL service throughout portions of its exchange area as shown on the Lewis County map in Attachment 10. TDS Telecom hopes to extend its service area for DSL from the current 67% of the three exchanges they have to as much as 83% or more within the next two years. It should be noted that these plans could potentially change. Where TDS does offer DSL service, upstream speed is 512 Kbps with options for downstream speeds of 3 Mbps for $49.95 per month, 1.5 Mbps for $39.95 per month, and 768 Kbps for $29.95 per month. TDS also offers business class service including T-1s (1.54 Mbps symmetrical) with pricing dependent on the specific distance to the customer's location as well as desired speeds.

Toledo Telenet offers DSL service in 100% of its Exchange area. This area is depicted on the Lewis County maps in Attachment 10. Service levels offered by Toledo Telenet include 256 Kbps upstream and 640 Kbps downstream for $39.95 per month and 512 Kbps upstream and 2 Mbps downstream for $49.99 per month with a onetime installation fee of $99.00 which includes the modem cost.

Broadstripe currently offers Cable TV service along the Highway 12 corridor from West of Morton to Silver Brook and also in the area around Packwood. Broadstripe offers cable modem service around Packwood but we did not find a resident who was aware of them offering cable modem service from Morton to Silver Brook. However, it was observed that Broadstripe is upgrading their network in this area and will likely be offering cable modem service in the near future. Broadstripe's known infrastructure is included on the Lewis County map in Attachment 10.

Where Broadstripe does offer cable modem service they provide speeds of 384 Kbps upstream and 6 Mbps downstream for $39.95 per month when ordered without cable TV service and they also offer 512 Kbps downstream for $34.95 per month. There is a $5.00 Monthly rental fee for the cable modem and an activation fee of $39.95 and install fee of $49.95.

LEWIS COUNTY CONCLUSION

Lewis County, like Grays Harbor, has the most glaring gap between areas with broadband and those without. Population centers tend to have at least two broadband options and the lower density rural areas are not offered broadband at all. Some of the areas with density levels somewhere in the middle of high and low density are likely provided with broadband because providers need to pass these areas to serve the next high density pocket in the county. Examples of this are along Highway 12 where areas have low enough densities where the major providers would not likely consider serving them with broadband on a standalone basis. However, as long as they are passing through with their backbone, in order to get to the next pocket of homes, they could conceivably drop broadband off and pick up the potential customers along their path.

STEVENS COUNTY

Stevens is comprised of 2,478 square miles with a population of 43,000 people. Approximately 26% of the population resides in communities recognized by the census. With the availability of fixed wireless being a contributor to residents outside of these areas being able to receive broadband, we estimate approximately 35% of the population in Stevens County can receive broadband from one or more providers.

Qwest is offering DSL service from its Loon Lake wire center. However, during the drive out, the availability was found to be spotty where some residents on the northeastern side of Loon Lake can receive DSL and others cannot. In addition, the south western side of the Lake cannot receive DSL service as reported by residents. Qwest also delivers DSL service in the Colville and Deer Park areas of the county. These areas are depicted on the map in Attachment 10. Where DSL is available, Qwest offers speeds of up to 896 Kbps in the upstream direction on all three service levels and 256 Kbps downstream for $31.99 per month, 1.5 Mbps downstream for $44.99 per month and 7 Mbps downstream for $54.99 per month.

Stevens County is included in Qwest's Washington Rural Broadband Service Expansion Plan. It is not clearly defined what specific areas of the county will ultimately be affected but enhancements are scheduled to occur in the Deer Park area, bringing availability up from 34% currently to 42%, the Northport area will go from 0% availability to 33% and the Springdale area will go from 0% availability of DSL to 32%. This expansion is not depicted on the maps as it is not possible to determine the specific area affected with the information provided by Qwest.

CenturyTel is offering DSL service from its Chewelah, Hunters, Kettle Falls and Valley wire centers. These areas are shown on the map in Attachment 10. CenturyTel offers DSL service levels of 128 Kbps upstream and 256 Kbps downstream for $31.20 per month, 256 Kbps upstream and 1.5 Mbps downstream for $41.20 per month in all areas served in Stevens County. In addition, CenturyTel is offering service levels between 512 Kbps and 786 Kbps upstream and between 3 Mbps and 10 Mbps downstream for $51.20 per month in the Chewelah and Kettle Falls areas.

Comcast serves the Southeastern area of the county around Clayton with cable modem service offering speeds of 356 Kbps in the upstream with 6 Mbps downstream for $45.95 and 786 Kbps upstream and 8 Mbps downstream for $55.95 per month. There is also a charge for the modem either upfront or on a monthly basis.

Eltopia is a point to point wireless company offering service in Stevens County. They provided their approximate coverage areas during an on-site visit and these areas are incorporated onto the maps in Attachment 10, CBG also discussed speeds and pricing during the visit. Eltopia offers dialup service; however, they also offer wireless broadband services with symmetrical speeds of 256 Kbps for $30.00 per month, 1.0 Mbps for $45.00 per month and 3.0 Mbps for $75.00 per month. Eltopia anticipates expanding their network as economic concerns and demand dictate.

Internet Xpress offers fixed wireless service in Stevens County. It provides service at speeds of 768 Kbps-1.5 Mbps synchronous for $75.00 to $225.00 per month. Its canopy wireless system offers speeds of 256 Kbps to 1.5 Mbps synchronous for $35.95 to $49.95 per month. In addition,

Internet Xpress is a reseller of DSL service where Qwest and CenturyTel offer DSL service in the county. This service has speeds of 128 Kbps to 865 Kbps in the upstream direction and 256 Kbps to 7 Mbps in the downstream direction. DSL service ranges in price from $35.95 to $49.95 per month depending on the speed available to and chosen by the customer. Internet Xpress's coverage area for their wireless service is shown on the map in Attachment 10.

Charter has cable TV systems in the county. However, from information gleaned during the drive out of Stevens County, they are not providing cable modem services at this time.

STEVENS COUNTY CONCLUSION

Stevens County has areas of the county that are provided with broadband options such as in and around Colville, Chewelah, Valley, Kettle Falls and the Loon Lake/Clayton area. Outside of these areas broadband options deteriorate quickly. The fixed wireless providers in Stevens County have minimized the areas of the county with no broadband availability, but there are significant geographical areas and associated residents that have no options today.

Broadband Providers in Each County

	Columbia	Ferry	Grays Harbor	Lewis	Stevens
Airpipe					**X**
Broadstripe				**X**	
TV Association of Republic		**X**			
CenturyTel	**X**	**X**	**X**	**X**	**X**
Coast Communications			**X**		
Columbia Rural Electric Association	**X**				
Comcast			**X**	**X**	**X**
Eltopia					**X**
Inland Telephone (small area not included on map)	**X**				
Rainier Connect (location of infrastructure not provided – not shown on maps)				**X**	

Broadband Providers in Each County

Touchet Cable TV	**X**				
Toledo Telenet				**X**	
TDS (McDaniel)				**X**	
Qwest	**X**		**X**	**X**	**X**
Verizon		**X**	**X**		

GAP AND FUTURE REQUIREMENTS ANALYSIS

As part of their business model, companies use a density formula regarding households (or homes) passed per plant mile to determine whether it is cost feasible for the company to provide services and recoup its investment within a period of time consistent with typical industry and company ROI (Return On Investment). Although each company is using a different formula, CBG has seen Comcast and other cable TV providers decline to build out their network to areas with less than 30 homes per linear mile of infrastructure needed. In order for these companies to provide wireline services in other areas, they would need to extend their systems by adding additional fiber optics, additional nodes or DSLAMs and additional coaxial or twisted pair cables, either underground by trenching and placing conduit and cable or aerial by developing additional pole attachments and pulling strand and cable.

Although each of the counties has unique characteristics related to broadband availability, they also have similar issues.

Throughout the five counties one theme holds true. The large providers such as Qwest, Comcast, CenturyTel and Verizon, as well as most of the mid to small-sized companies, provide service in the main population centers of the counties where household density reaches the company's minimum threshold. These centers tend to be along major highways and areas such as the Pacific coast. These providers do not leave these population centers unless a business case can be made to deploy further. The irony is that these providers will not share information on the location of their facilities because it is deemed to be confidential and another provider may overbuild their area and compete. These companies are more than willing to compete with several other companies in more densely populated areas, but will not move into areas with even slightly lower than their minimum density requirements, even when there is no competition. It seems that if information that the companies are holding confidential truly is confidential and that it keeps competitors out of their service areas, they would build into areas they see as not being able to support more than one or two providers, but capable of supporting one provider with no competition.

Taking into account the differences in the number of, and size of, population centers in the five counties and therefore the number of pockets of broadband availability, one significant difference between the counties is that providers have moved into areas of the three least populated counties of Columbia, Ferry and Stevens to offer service with fixed wireless networks. These networks require lower subscriber numbers and thus lower financial return to provide an ROI that can justify deployment. An example of this is in Columbia County where there is only broadband availability close to and within Dayton and Starbuck from Qwest and Touchet Valley Television. This leaves significant numbers of residents near Dayton, and to a lesser degree Starbuck, with no available options except for dialup and satellite based access to the Internet. REA saw this as a problem for its existing power customers and deployed a fixed wireless system to fulfill a need in the community. Although REA intends to continue to rollout its service to more areas within Columbia County, they must adhere to a business plan that will dictate a slower rollout than they would prefer. REA has found that a business case can be made for initial roll-out in areas just outside of a small city and eventually further into the rural areas of the county.

As stated throughout the Report, the more rural an area is in the five counties the more likely it is that broadband is not available to residents. There is certainly little or no competition in the most rural parts of the counties. The result of the lack of competition is evident in the case of Columbia and Garfield (the location where the Prescott exchange is fed from) Counties where Inland Telephone is providing service at levels of 128 Kbps upstream and 384 Kbps downstream for $49.95 per month. Although this level of service is slightly better than dialup, the cost is far higher than people would be required to pay in more urban areas of the State for far faster speeds. For instance, where Comcast offers service, in more urban areas where competition exists, they offer 356 Kbps in the upstream with 6 Mbps downstream for $45.95 and 786 Kbps upstream and 8 Mbps downstream for $55.95 per month. Some of this cost differential is likely due to the higher cost of deploying a service on a per subscriber basis in a rural area. However, some of this variance is likely related to the lack of competition as well.

Another contributor to the absence of broadband in rural areas is the lack of backbone infrastructure or the inability of a company to use infrastructure that is in place. If a company is

considering whether to deploy broadband in an area where other larger providers have not entered due to low density, one of their first concerns is whether they can obtain a backbone connection to the Internet and if so, at what cost? In a very small deployment where relatively low infrastructure development is needed and therefore the business case can be made to deploy, the lack of an affordable backbone solution may derail deployment.

BACKBONE INFRASTRUCTURE

Overall there is a significant gap in the backbone infrastructure available in all of the five counties. This gap is far more evident in the counties of Columbia, Ferry and Stevens. The Counties of Grays Harbor and Lewis have significant backbone infrastructure along the highway corridors and Pacific coast.

In order to promote expansion of broadband availability in the counties and ultimately other similar areas of the State, this needs to be the first issue addressed. Without a sufficient network backbone into a given area, building a distribution network to offer broadband will not be successful. The old adage that a chain is as weak as its weakest link is very fitting regarding broadband deployment. A provider can offer an extremely high-speed distribution network. However, if the link to the Internet is slow, the network is far less effective. An example of this is the TV Association of Republic in Ferry County where customers of both the cable modem and the wireless service mentioned during focus group meetings that Internet access is very slow during peak times of the day. The TV Association of Republic attributes this to a slow backbone connection. They have recently moved from 2 T-1s for connection back to the Internet to a 100 Mbps wireless connection. As this occurred at the end of the data gathering stage of this project, we only have preliminary feedback on the success of the high-speed backbone connection, but what we have received appears to be positive.

Having a sufficient, cost-effective backbone in place will likely allow the major providers to expand into rural areas where there are population pockets that would meet their ROI, if not for the large expense of reaching the area with backbone infrastructure. In addition, this will allow fixed wireless providers to be able to reach farther out into rural areas, again by minimizing one of their greatest expenses.

With hotspots being a stop gap measure for providing broadband to residents in rural areas, an enhanced backbone connection to the Internet will make these hotspots much more effective as well.

Redundant Backbone

As shown above, a significant backbone infrastructure is needed throughout the five counties to provide the basis for providers to effectively move forward with additional broadband deployment. Another key element of this backbone infrastructure is redundancy. This becomes an issue on two fronts. First, there is a critical need to keep Internet access available to the networks that are deployed in order to ensure residents, businesses, governmental, educational and other users are provided a significantly higher level of network availability (up-time) for deployed networks. Although closely related, the second reason for building redundancy into a backbone is to offer a more appealing network to potential providers, as well as to increase the geographic area covered by the backbone, therefore removing another barrier to further deployment of broadband into areas that are underserved or not served today.

FUTURE ACTIONS TO ADDRESS THE GAPS

The major providers have deployed broadband in all of the areas with large enough population densities to achieve their stipulated ROIs. They have picked the relatively "low hanging fruit". However, they are not likely to expand their networks significantly beyond their current boundaries without considerable growth in population or methods to improve their ROI. These methods will likely need to include having the backbone in place as mentioned above, as well as making it easy for the providers to enter Rights-of-Way and having infrastructure in place that can be readily accessed to minimize the capital needed to deploy.

Counties and cities within the counties need to take proactive measures, in advance of broadband deployment, such as placing conduit into open trenches when road construction is done or when the PUDs, Electric Co-ops, water and sewer utilities and providers are performing other work in the right-of way. With construction of wireline being the most significant capital expenditure, this may bring the ROI into line with a company's standards.

Overall, the gaps in broadband availability have developed closely with the line between densely populated areas of the counties and lower density areas. As shown throughout the Report, there are three significant areas that should be addressed in a viable manner:

Affordable and reliable backbone infrastructure to low density areas of the counties must be a high priority - This is the foundation that allows deployment of broadband networks in both high density areas and low density areas. Backbone issues are not prevalent in high density areas, because private industry can find a viable business model to implement the backbone.

Ease of entry into a geographic area - Everything feasible that can be done by the local, County and State governments should be done concerning ease of entry. This includes streamlining the process for potential providers to gain access to the Rights-of-Way as well as sharing in the cost of deployment by cooperating with providers during planned construction activities so they can deploy infrastructure in the most cost effective manner.

Facilitating access to government network facilities - This may include, for example, space on a tower or it may include utilization of excess fiber or conduit that is currently in place for placement of new fiber. Governmental entities can also be proactive by installing excess capacity during the roll-out of infrastructure for internal purposes.

In an attempt to address areas that do not have viable broadband options today and begin to address getting viable broadband into these areas, it will be important to consider holding discussions with large and small providers that exist today as well as seek out potential providers and discuss what areas they believe would benefit from a collaborative deployment of backbone infrastructure. Topics of these discussions would be potentially how a "backbone partnership" could serve the most areas in the quickest manner, as well as working to create a full redundant backbone throughout the counties over time. Essentially, the above can be delineated in the following way:

Gap	Future Actions
Lack of Broadband	Initially work to determine the most effective methods to enhance and expand backbone infrastructure.
Address Governmental Policies in Place Today that Inhibit Deployment	Work with the State, county and other local governments to address existing inhibitors to local deployment of broadband.
Lack of Backbone Infrastructure	Work with State agencies such as DOT, WSP and DIS and local agencies to fully identify all currently available infrastructure.
	Work with State agencies such as DOT, WSP and DIS and local agencies to determine planned deployment of infrastructure in the near and long term.
	Work with State agencies such as DOT, WSP and DIS and local agencies to determine how new deployment can be leveraged to add additional capacity for broadband deployment long term, including the closest points of connection to existing and potential new last mile infrastructure.
	Meet with large and small providers to determine desire to participate in, for example, a "Backbone Deployment Cooperative".
	Determine how this Cooperative might help the State reduce its costs to deploy fiber optic infrastructure throughout the counties and therefore accelerate deployment.
Creation of Redundant Backbone	Determine what level of redundancy is needed to offer reliable service and to promote adoption of the backbone network by small and large providers.
	Determine how cooperative efforts will minimize deployment costs of a backbone and therefore how redundancy can be built into the network at the lowest possible level.
Creation of Additional Last Mile Infrastructure	Determine the best methods of delivering last mile services based on the closest point of connection to an enhanced, expanded backbone.

Section H
Comparative Analysis and Best Practices

COMPARATIVE ANALYSIS AND BEST PRACTICES

A comparison of broadband activity by and within the State with similar efforts around the nation and world show that Washington has momentum and that broadband is expanding, but that additional efforts will be needed to catch up and keep pace with other states and nations. Specifically, when reviewing other activity and best practices, the following is found:

Broadband Initiatives in Other States

As access to reliable, affordable Internet service is becoming a key component of economic development, many states have implemented statewide broadband initiatives to promote higher levels of broadband access and adoption in rural areas previously underserved by Internet service providers. Rural residents have long trailed residents of cities and suburbs in terms of both Internet usage and broadband adoption. According to Horrigan and Smith (2007), 31 percent of rural Americans have home broadband connections, compared with 49 percent of suburban residents and 52 percent of urban residents.[60] Recently, rural broadband has experienced growth, which can partially be attributed to various statewide rural broadband initiatives. Between 2006 and 2007, high-speed Internet usage among rural adults grew by 24 percent, versus 18 percent for urban residents and 7 percent for suburban residents. In other words, rural broadband is the final mile, so to speak, in the United States' efforts to bring the assets of high-speed Internet access fully to its citizens.

Horrigan and Smith (2007) found a significant, negative correlation between living in a rural area and broadband usage. They point to the lack of infrastructure in rural areas as a contributing factor in the slow growth in rural broadband adoption.[61] In terms of access to broadband at home or at work, only 38 percent of rural residents have access to broadband at their home or their work, compared to 56 percent of suburban residents and 58 percent of urban residents.[62]

[60] John B. Horrigan and Aaron Smith, "Home Broadband Adoption 2007," *Pew Internet & American Life Project*, June 2007, http://www.pewInternet.org/pdfs/PIP_Broadband%202007.pdf (May 26, 2008).
[61] Horrigan and Smith, "Home Broadband Adoption 2007," p. 8.
[62] Horrigan and Smith, "Home Broadband Adoption 2007," p. 8.

Most statewide broadband initiatives aim to develop infrastructure in rural areas allowing for broadband deployment. Some of the key components that states must consider when developing broadband programs are: the policy goals of the broadband initiative, the funding sources, how public right-of-way usage will be made available, infrastructure elements that need to be built or enhanced, the geographic locations to be served, what provider will build and operate the system, and who will financially contribute to the broadband initiative.[63]

The Center for Digital Government (CDG) found that states who have already adopted an active broadband infrastructure initiative seem to take one of three general approaches. The CDG has found that all three approaches can be successful, and all three have been implemented by various states.

Encourage the Private Sector to Build

The first statewide approach aims to encourage the private sector to install high-capacity infrastructure throughout the state with the creation of a statewide public network connecting all levels of government, education and healthcare. States like Washington and Colorado have used this approach to varying degrees and acted as aggregators of public demand for advanced telecommunications infrastructure and anchor tenants that purchase enough statewide service to create the demand required to convince service providers to invest the required resources to deliver broadband access to all parts of the state.

Create a Broadband Authority in the State

The second approach is to create a broadband authority with powers and duties conferred either through executive order or legislation. California is one state that has used this approach and created a state Broadband Authority with the legal power to collect funding. The Authority then makes grants or loans to commercial infrastructure providers or communities.

[63] Center for Digital Government, "Arizona Broadband Initiative Framework: Analysis and Report," *Arizona Government Information Technology Agency Page*, March 2007, http://www.azgita.gov/telecom/ciac/supplementary/CDG%20Az%20Broadband%20Initiative%20Framework%20Final.pdf (May 26, 2008)

Create a Public/Private Partnership

The third approach is to create a public/private partnership where private companies and government entities work together to promote broadband availability. Kentucky and Utah are two states that rely on a public/private partnership that coordinates infrastructure expansion efforts that rely on both public and private funding.

One key aspect for the successful implementation of broadband initiatives at the state level is a coordinated, analytic approach which seeks to evaluate and understand the extent of broadband access and adoption. Kentucky is one state that has been particularly successful in mapping the availability of broadband access and using maps to plan future broadband expansion projects.

KENTUCKY

The ConnectKentucky program is a public/private, non-profit, technology-based development partnership that is funded through state, federal and private dollars. The goal of the ConnectKentucky program is to leverage federal and private investment to blanket Kentucky with high-speed Internet access. The program also aims to create a more useful online presence for all Kentucky communities, to improve citizen services and promote economic development. The program seeks to create an eCommunity Leadership Team in every county, where local leaders assemble to develop and implement technology growth strategies.

The program has been successful in expanding broadband availability and connectivity by creating a network of public/private partnerships that "relieve the short-term return on investment pressure and instead create an environment where a long-term view of return of investment is calculated." Since part of the investment is coming from the public sector, the return can be calculated to include economic development, distance learning and the improvement of electronic government capabilities.

Kentucky closely and regularly updates its records of the number of households actually connected to the Internet via broadband access. As of August 2007, 94 percent of Kentucky households are able to subscribe to broadband, compared to only 60 percent in 2001.[64]

CALIFORNIA

California has a broadband initiative model based on state executive leadership. In October of 2006, the Governor of California issued Executive Order S-21-06 entitled "Twenty-First Century Government Expanding Broadband Access and Usage in California." The executive order established a broadband task force to advise the government on how to promote broadband access and usage and designated the Business, Transportation & Housing (BT&H) Agency as the lead coordinator for implementing the state's broadband policy and ensuring its efficiency.

The executive order called for BT&H to collect and analyze current data on broadband so the state government could accurately map existing resources. The executive order called for fair cost of rights-of-way access so that Internet service providers could afford to develop the broadband network across the state. The order also called for streamlined, expedited rights-of-way permitting procedures to accelerate broadband development.[65] The state also determined that they will switch to a cost-only fee basis for fiber optic installation, passing on to private companies only the actual costs incurred for permits and other construction.

The California Teleconnect Fund (CTF) Program, established in 1996, has also helped to increase broadband access throughout the state. The CTF program provides a 50 percent discount on certain telecommunications services to qualifying schools, libraries, public hospitals and health clinics and community based organizations.

COLORADO

The state of Colorado instituted the Multi-Use Network (MNT) Program in 1998. Colorado's MNT is a public/private partnership to build a high-speed fiber optic network across the state.

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[64] Tracie Rotermann, "ConnectKentucky Success Spurs Growth," *ConnectKentucky Press Release*, August 9, 2007, http://www.connectkentucky.org/_documents/PressRelease_Legg_True_Final.pdf (May 28, 2008).
[65] State of California, "California Teleconnect Fund," *California Public Utilities Commission Page*, 2007, http://www.cpuc.ca.gov/PUC/Telco/Public+Programs/CTF/ (May 28, 2008).

Qwest Communications was the partner selected to build the MNT with the state serving as an anchor tenant. The state agreed to aggregate its data communications circuits onto the MNT and purchase a large portion of bandwidth if Qwest Communications would build a high-speed digital network comprised of fiber optic infrastructure. It took three years to complete the network, but with the basic system in place, it made it feasible for service providers to offer service to more rural areas. As of 2007, 97 percent of all county seats in Colorado have at least DSL service. Furthermore, Colorado officials report that the number of technology-dependent jobs in rural areas has increased 6 percent.[66]

Colorado has also implemented the "Beanpole" project, managed by the Department of Local Affairs, to address providing broadband access to the last of the rural areas. Beanpole funding is provided for community level aggregation of network traffic, also known as community incentive funding. The Department of Local Affairs and the Colorado Rural Development Council manage the $4.6 million program. The money for the Beanpole project came from the state legislature as outlined below.

Of the total budget for the Beanpole project, $3,176,000 came from the capital construction fund that the community-based access grant program established. Of this amount, $2,800,000 was deposited into the capital construction fund from the Colorado Advanced Technology Institute's share of the proceeds of Supernet, and $376,000 represents funds transferred to the capital construction fund. A sum of $1,500,000 was made available to local governments for the community-based access grant program coming from the local government severance tax fund. In addition to other appropriations, $124,000 was appropriated to the Department of Local Affairs.[67]

Priority for Beanpole funding was directed towards those communities that demonstrated a very high likelihood of success in attracting private sector deployment of infrastructure and to communities that were close to where the initial phase of the Multi-Use Network backbone connection to an Aggregated Network Access Point (ANAP) was expected to occur.

[66] Colorado Division of Information Technologies, "MNT 2005-2006 Annual Report," October 2006, http://www.colorado.gov/dpa/doit/mnt/DoIT-MNTAnnualReport-FinalWeb06.pdf (May 28, 2008).
[67] Colorado State Legislature, "House Bill 99-1102," *Colorado State Government Page*, 1999, http://www.state.co.us/gov_dir/leg_dir/sess1999/hbills99/hb1102.htm (May 28, 2008)

Beanpole funding is allocated through a competitive grants system, with applicants applying for grants in one of three categories: Basic Technical Assistance Planning Grant Funding; Advanced Technical Assistance Planning Grant Funding; and Implementation Funding. Beanpole funding is not provided for personnel costs.

MONTANA

The Montana Health Research and Education Foundation (MHREF), on behalf of the Montana Health Association (MHA), applied to be a part of an FCC pilot program to develop a statewide infrastructure to connect all hospitals, mental health centers and community health centers through a secure, dedicated broadband healthcare network.[68] This would enable multiple applications, such as video conferencing, electronic health records and other data services to run simultaneously.

On May 3, 2008, Blackfoot Telecommunications Group announced that it would launch a new business package named BizBundles to fit the needs of rural business owners located in 22 Western Montana communities. BizBundles will provide these communities with up to 15 Mbps of high-speed Internet access. Blackfoot indicates that it recognizes that access to quality high-speed Internet will be critical for the future of businesses in rural Montana and thus has created an enhanced fiber optic network to allow them to deliver bundled business services at an affordable price and at speeds usually only offered in metropolitan areas.[69]

UTAH

In 2002, a group of 16 cities in Utah, 11 of which pledged financial backing, formed a consortium to create the Utah Telecommunication Open Infrastructure Agency (UTOPIA), which delivers high-speed Internet access through a fiber optic cable. UTOPIA is a non-profit government agency that is considered an extension of the municipalities that created it. UTOPIA is funded through municipal bonds issued by participating communities. UTOPIA pays back its bonds by collecting a fee whenever a service provider signs up a homeowner for one of its

[68] Federal Communications Commission, "Montana Healthcare Telecommunications Alliance Application," *Consumer & Governmental Affairs Bureau Page*, May 4, 2007, http://www.fcc.gov/cgb/rural/rhcp_applications.html (May 27, 2008)
[69] Kate Olney, "Blackfoot Delivers Unprecedented Broadband Speed to Rural Costumers," Market Wire, May 5, 2008.

services. There are four service providers available on the network, and at a minimum, UTOPIA delivers 100 Mbps of bandwidth to every connected home and 1 Gbps of Bandwidth to every business. The network was designed in a way that future upgrades to higher speeds should be a relatively inexpensive process.

UTOPIA was designed to meet the following principles: UTOPIA is a wholesale network open to unlimited potential service providers. The network is made up of secure and scalable infrastructure delivering carrier-class reliability. The network is capable of integration with hardware from multiple vendors. UTOPIA can deliver dedicated bandwidth at speeds of 100 Mbps or greater to every address.[70]

UTOPIA has run into a number of problems along the way, but is still pushing forward with building the fiber optic network. A number of municipalities have abandoned UTOPIA amid financial difficulties, only leading to further financial woes for the utility.[71] Faced with serious financial problems, UTOPIA asked member cities to approve a $181 million refinance. The Agency's leadership argues that "the UTOPIA plan ran into unforeseen challenges, including a faulty loan from the federal government through the Rural Utility Service."[72]

Other UTOPIA shortcomings have included a lack of telecommunications experts working on the project and a failure to communicate with elected officials. As the refinance was debated, many UTOPIA opponents called for the Agency to sell. These opponents claimed that UTOPIA is trying, unsuccessfully, to compete with private network providers. UTOPIA leadership claimed that the network is not trying to compete with major companies such as Qwest and Comcast, but rather to provide an infrastructure that allows those major companies to provide their services.[73] UTOPIA proponents have called UTOPIA a necessity and compared the open

[70] UTOPIA, "Architecture," *Utopia Connecting Communities Page*, 2006, http://www.utopianet.org/what/agency/network.html (May 26, 2008)
[71] Christopher Rhoads, "Cities Start Own Efforts to Speed Up Broadband," *The Wall Street Journal,* May 19, 2008, Business Section.
[72] Rebecca Palmer, "10 of 11 cities OK $181 million UTOPIA Refinance," *Deseret Morning News*, May 6, 2008, News Section.
[73] James Davis and Rebecca Palmer, "Payson Again Rejects Plan to Refinance UTOPIA," *Deseret Morning News*, May 13, 2008.

infrastructure to a highway or interstate, something that everyone uses but the government pays to build.[74]

Of the 11 member cities who pledged to financially support UTOPIA, all but one voted for the $181 million refinancing plan. In May of 2008, the Town of Payson, Utah voted 4-1 against the UTOPIA refinancing plan. With support from 10 of the 11 municipalities, UTOPIA plans to go ahead with the refinancing plan. UTOPIA expects that it will be able to continue building fiber optic rings in member cities and that increased customer sign-ups will provide the capital needed for further construction. However, UTOPIA has declined to answer questions about how build-out will occur and about connection fees.[75]

OREGON

In 2001, Oregon's Senate Bill 765, created the Oregon Telecommunications Coordinating Council (ORTCC) to bring high-speed, digital telecommunications to all of Oregon. The ORTCC is "responsible for enhancing the coordination of local, regional and state telecommunication plans to accelerate the development of advanced telecommunication services to the entire state of Oregon."[76]

According to the ORTCC, "Oregon has a telecommunications infrastructure extending throughout the state that is world class. Fiber optic backbone networks and extensive broadband access provide excellent network reliability and connectivity throughout the state."[77] One way that Oregon promotes the development of broadband access across the state is by offering a tax credit for capital asset investment, including the installation of broadband infrastructure, by firms engaged in electronic commerce if they are located in approved or designated areas.[78] However, the ORTCC admits that Oregon must recognize that infrastructure is always a work in progress

[74] Rebecca Palmer, "10 of 11 cities OK $181 million UTOPIA Refinance."
[75] Rebecca Palmer, "10 of 11 cities OK $181 million UTOPIA Refinance."
[76] Oregon Telecommunications Coordinating Council, "Senate Bill 765," *ORTCC Creation Law Page*, July 29, 2005, http://www.ortcc.org/lawpage.html (May 27, 3008)
[77] ORTCC, "From Silicon Forest to Internet Forest: A Vision for the Oregon Economy," *ORTCC Reports Page*, January 22, 2007, http://www.ortcc.org/PDF/InternetForest1-22-07.pdf (May 26, 2008).
[78] Erin Lee, "State Efforts to Expand Broadband Access," *National Governors Association Center for Best Practices Page*, May 20, 2008, http://www.nga.org/Files/pdf/0805BROADBANDACCESS.PDF (May 26, 2008)

and that Oregon needs to work to further support broadband access for commerce, education, healthcare and personal use.

However, a recent article in the Portland Business Journal contends that Oregon has not pursued the types of aggressive statewide initiatives implemented by some of its neighbor states, but only has some smaller projects underway. One project is the Oregon Health Network, an effort to link all of Oregon's health care facilities through high-speed broadband. The project has received $20 million in funding from the Federal Communications Commission as part of an initiative to improve rural healthcare across the United States.[79]

Some rural communities in Oregon are building their own advanced networks. Two small cities in Oregon, Monmouth and Independence, have created a joint, non-profit fiber optic network to serve their communities with high-speed broadband. The network delivers competitively priced Internet service, telephone and video services.[80]

The Oregon Telecommunications Coordinating Council is proposing that the state create a public/private partnership to develop several new Internet traffic "nodes" in Oregon that would have the dual effect of routing international Internet traffic through the state and making intrastate Internet traffic faster and more efficient. Currently, Oregon has two primary Internet routing nodes: one at the University of Oregon and one in downtown Portland**.** If Oregon established more nodes, some of the Internet traffic could be routed into the state, creating more business opportunities. [81]

IDAHO

In 2006, the Idaho state legislature appropriated $5 million for extending broadband access to rural communities. The program offered grants for up to 50 percent of the costs of projects with a cap of $1 million for any specific project. In June 2006, $4.9 million in grant funds were made available to four Idaho companies, yielding a total public/private investment of $9.8 million to finance 79 projects to bring broadband access to 50,000 potential new subscribers.[82]

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[79] Aliza Earnshaw, "Organizing Oregon's broadband assets," *Portland Business Journal*, November 30. 2007, Industry section.
[80] Aliza Earnshaw, "Organizing Oregon's broadband assets."
[81] Aliza Earnshaw, "Organizing Oregon's broadband assets."
[82] Center for Digital Government, "Arizona Broadband Initiative Framework."

The IDANET project, Idaho's broadband digital telecommunications initiative, is the state's attempt to leverage its buying power. "By aggregating existing dollars spent by state agencies and higher education -- and serving as an anchor tenant -- the state hopes to encourage telecommunications carriers to deploy broadband telecommunications services in Idaho to not only serve state government but also serve the public at large."[83] All IDANET contracts have an initial term of five years with two 2-year options to renew after the initial term. The contracts provide statewide access to telecommunications services and can be used by State agencies, higher education, K-12, local government and other public entities.[84]

NORTH CAROLINA

The North Carolina General Assembly created the e-NC Authority on August 14, 2003 when Governor Michael Easley signed House Bill 1194, calling for the e-NC Authority to continue the work of the Rural Internet Access Authority. The e-NC Authority is dedicated to "increasing prosperity for North Carolina citizens and businesses by creating jobs through technology-based economic development, which requires a broadband Internet platform for success."[85] The initiative is a public/private partnership between the North Carolina Rural Economic Development Center, the legislature and state government, the telecommunications industry, non-profit organizations and individuals.

The goals of e-NC include: providing high-speed Internet at competitive prices to all North Carolinians, to increase the number of Internet subscribers in North Carolina, to establish telecenters in the state's most economically distressed areas and to develop Internet applications that improve government services, particularly education and healthcare.[86] The e-NC Authority also tracks the telecommunications infrastructure and the availability of high-speed Internet services in all 100 North Carolina counties. This allows the Authority to advocate for

[83] IDANET, "About IDANET," *Connecting Idaho Today and Tomorrow Page*, 2002, https://www2.state.id.us/idanet/about.htm (May 27, 2008).
[84] IDANET, "What is the status of IDANET," *Connecting Idaho Today and Tomorrow Page*, 2002, http://www2.state.id.us/idanet/faqs.htm (May 27, 2008).
[85] North Carolina e-NC Authority, "What is e-NC?" 2004, http://www.e-nc.org/Webpage.asp?page=10 (May 28, 2008).
[86] North Carolina e-NC Authority, "What is e-NC?"

telecommunications expansion in underserved counties. The organization's efforts are technology-neutral and do not advocate for any specific vendor or type of connectivity.[87]

The e-NC authority primarily serves the state's 85 rural counties (a county with a population density of 250 people per square mile or less). Only 15 North Carolina counties are not classified as rural. The Authority also serves "distressed urban communities," which are communities where more than 10 percent of children enrolled in public school meet the requirements for the USDA Food Stamp Program, or where 10 percent of the citizens meet the U.S. Department of Health and Human Services requirements for Temporary Assistance for Needy Families, or where 25 percent of the children in the public school district meet the requirements for a federal government-sponsored free lunch.[88]

The e-NC Authority has funded several initiatives in North Carolina including digital literacy training, e-communities implementation, e-communities planning, Leg-UP (the Local e-Government Utilization Project), public access initiatives and telecenter initiatives. Twenty-seven sites have received e-NC grants for digital literacy training which have been used for Spanish language portals. Fifty-three sites have received $5,000 grants for support of public access sites, and 64 rural counties have received $12,000 of public access grants. Ten communities have received e-NC funding for local telecenters.[89]

As a part of a public/private partnership, the e-NC Authority awarded an incentive grant of $1.21 million to Embarq Corporation on January 18, 2008 to fund the expansion of high-speed Internet services in 4 rural counties: Gates, Green, Jones and Warren counties. These four counties are considered critically underserved areas as less than 50 percent of households in each of the counties have access to high-speed Internet. These funds were available to qualified service providers through a structured and competitive Request for Proposals process. The grant was made available through an allocation from the 2007 North Carolina General Assembly and the

[87] North Carolina e-NC Authority, "What is e-NC?"
[88] North Carolina e-NC Authority, "Population Served?" 2004, http://www.e-nc.org/Webpage.asp?page=10 (May 28, 2008).
[89] North Carolina e-NC Authority, "Grants Funded?" 2004, http://www.e-nc.org/Grantsfunded.asp (May 28, 2008).

award will be matched by Embarq. The e-NC authority requires that these grants be matched dollar-for-dollar by the corporation awarded the grant.[90]

As of January 18, 2008, approximately 83 percent of North Carolina households had the ability to access a high-speed Internet connection, according to e-NC. Approximately 20 counties remained critically underserved (less than 70 percent of households having the ability to access a high-speed Internet connection) as of January 2008.[91]

In November 2007, several North Carolina projects were selected to participate in the FCC's Rural Health Care Pilot Program and receive federal funding. These projects include the North Carolina Telehealth Network, the Western Carolina University Broadband Network, the Albemarle Network Telemedicine Initiative and the University Health System of Eastern Carolina.

The North Carolina Telehealth Network is a regional network that will connect approximately 16 health care facilities in 11 counties with patients in their homes and at work to provide home monitoring, personal health records and prescription drug use compliance information. The maximum support from the FCC for this project will be $6,023,985.[92]

Western Carolina University will receive up to $3,596,290 to use in collaboration with the Eastern Band of Cherokee Indians to create a broadband network that will connect the University health care system to health care facilities serving residents on the Cherokee reservation and in outlying areas. More than 200 facilities will be connected to the network at speeds between 10 Mbps and 100 Mbps.[93]

[90] e-NC, "State Grants Extend High-Speed Internet to Four Rural Counties," e-NC Press Release, January 18, 2008, http://www.e-nc.org/pdf/2008-01-25_incentive_grant.pdf (May 28, 2008).
[91] e-NC, "State Grants Extend High-Speed Internet to Four Rural Counties," e-NC Press Release, January 18, 2008, http://www.e-nc.org/pdf/2008-01-25_incentive_grant.pdf (May 28, 2008).
[92] Universal Service Administrative Company, "Rural Health Care Pilot Program," Selected Participants Page, January 10, 2008, http://www.usac.org/rhc-pilot-program/tools/selected-participants.aspx (May 28, 2008).
[93] Universal Service Administrative Company, "Rural Health Care Pilot Program."

Under the Albemarle Network Telemedicine Initiative, which can receive up to $1,583,076, approximately 65 health care facilities will have access to a broadband network enabling computerized physician orders.[94]

With FCC support of up to $960,939, the University Health System of Eastern Carolina will add approximately 16 rural health care facilities to their existing fiber network. This expanded network will serve a rural population which suffers from higher rates of chronic disease than the state average.[95]

WASHINGTON

The State of Washington has built a "Network of Networks" to support public sector telecommunications statewide. According to the Center for Digital Government, "Nearly all of the data transport in state government is combined onto the state Department of Information Services' (DIS) managed Wide Area Network (WAN) infrastructure." This allows DIS to "competitively acquire large amounts of bandwidth from private sector providers, thereby driving down costs for telecommunications goods and services while boosting available speed and capacity." This Next Generation Network (NGN) is a high-speed, high-capacity telecommunications infrastructure that has an established access point in all 39 Washington counties.[96]

Washington's K-20 Education Network, launched in 1996 with funds from the State Legislature, provides educational sectors across the state, in communities of all sizes and in urban and rural areas, with dedicated, scalable telecommunications capacity. Educators and students at more than 400 public education sites including community and technical colleges, baccalaureate institutions, independent colleges, the public library system, K-12 school districts and educational service districts are able to use the K-20 Network technology to communicate with

[94] Universal Service Administrative Company, "Rural Health Care Pilot Program."
[95] Universal Service Administrative Company, "Rural Health Care Pilot Program."
[96] Washington State Department of Information Services, "K-20 Education Network Background," *Enterprise Initiatives Page*, 2008, http://www.dis.wa.gov/enterprise/k20network/K20_Briefing_111506.pdf (May 28, 2008).

one another. The network is built with a high-speed telecommunications backbone that connects the various sites and breaks the traditional barriers of distance and cost.[97]

Part of the hoped success of Washington's program is that by aggregating public service and education demand, the Department of Information Services presents this need to the private sector as a single package. Telecommunication providers know the requirements and have specific capacity needs clearly defined for each location in the state.[98] Service providers can then submit cost quotes for sections of the network or for the entire network and DIS selects providers for each of the segments and creates a virtual, single, statewide network.

Although Washington is making efforts to bring broadband to more rural areas, as Jerry Cornfield, a writer for the Daily Herald observed, "there are still large chunks of the state and of the population without DSL, cable, fiber optic, wireless or satellite service because it's either not available or not affordable."[99]

On March 28, 2008, Governor Christine Gregoire signed Engrossed Second Substitute Bill 6438 into law, to go into effect on June 12, 2008.[100] The law requires the development of a strategy to deploy high-speed Internet access across the state, especially to underserved areas. The strategy will be a public/private collaboration between the government and private companies and individuals involved in local community development and planning. The bill also created the Community Technology Opportunity Program to provide access to broadband technologies and broadband training to low-income, disabled and underserved residents. [101]

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[97] Washington State Department of Information Services, "K-20 Education Network," *Enterprise Initiatives Page*, 2008, http://www.dis.wa.gov/enterprise/k20network/ (May 28, 2008).
[98] Washington State Department of Information Services, "K-20 Education Network," *Enterprise Initiatives Page*, 2008, http://www.dis.wa.gov/enterprise/k20network/ (May 28, 2008).
[99] Jerry Cornfield, "State hopes to increase access to high-speed Internet," *The Daily Herald*, May 19, 2008, Local News Section.
[100] Washington State Legislature, "SB 6438," Bill Information Page, April 1, 2008, http://apps.leg.wa.gov/billinfo/summary.aspx?bill=6438&year=2007 (May 28, 2008).
[101] Washington State Legislature, "SB 6438,"

TechNet conducted research in 2003 and developed a State Broadband Index ranking system which ranks states based on state laws, regulations and policies that can significantly impact broadband deployment based on three categories: policies that encourage broadband deployment, supply-side policies and demand-side policies. TechNet analyzed the policies of each state and assigned a numerical value for each policy. Washington was ranked 6th in the overall state broadband index.[102]

Local Level

Regarding efforts at the local level, besides those profiled in other sections of this Report concerning Springdale, Marcus and Northport in Stevens County, Centralia and Chehalis in Lewis County, FTTP system development in Grant County and Pend Oreille's FTTP planning effort, there are a number of other projects, pilots and plans underway at the local level throughout the State, including FTTP systems in Chelan County and FTTP planning in Seattle, wireless broadband provision in Douglas County and Spokane, broadband system planning in various areas of King and Pierce Counties, broadband system development in Forks, WA and other initiatives. This shows a high level of activity at the local level in Washington as well as the State's current statewide initiatives.

Federal Funding

States seeking to implement broadband initiatives to give rural areas access to high-speed Internet can look to the Federal Communications Commission (FCC) as one possible source of funding. The FCC's Schools and Libraries Universal Service Program (commonly known as "e-rate") provides financial support for initiatives aimed to provide broadband services to schools and libraries. The "e-rate" program, established as part of the Telecommunications Act of 1996,

[102] Kathryn Keller, "TechNet Releases New State-by-State Ranking of Broadband Policies," *TechNet In the News Page*, July 17, 2003, http://www.technet.org/news/release/?postId=6296&pageTitle=TechNet+Releases+New+State-by-State+Ranking+of+Broadband+Policies+-+Texas+Ranks+4th (May 27, 2008).

provides affordable telecommunications services for all eligible schools and libraries, particularly those in rural and economically disadvantaged areas. According to the FCC, "The level of discount is based on a school's or library's level of economic disadvantage and its location. Facilities in rural areas receive higher discounts in certain instances than their urban counterparts."[103]

The Rural Health Care Support Program provides financial support for broadband deployment to rural health care providers, both public and non-profit. The program is intended to ensure that rural health care providers pay no more for Internet access in the duty of providing health care services than urban health care providers. According to the FCC, "The program will pay for 25% of the cost of Internet access, and up to $180 a month in toll charge credits if toll-free service to an Internet service provider isn't available."[104]

The FCC announced the Rural Health Care Pilot Program on November 19, 2007. The FCC selected 69 participants from 42 states and 3 U.S. territories to receive funding for up to 85 percent of the costs associated with the construction of a state or regional broadband network and the advanced telecommunications and information services provided over that network, connecting to Internet 2 or National LambdaRail (NLR), and connecting to the public Internet. The Universal Service Administrative Company (USAC) administers the program under the oversight of the FCC. The Commission planned for approximately $417 million to be spent over a three year period on the pilot program.[105]

The U.S. Department of Agriculture (USDA) provides low-interest loans that may be used to build new telecommunications networks in rural areas or to modernize existing networks. The USDA's Rural Development Broadband Program provides loans and loan guarantees "to fund

[103] FCC, "Support for Broadband Services in Schools and Libraries," *Funding for Rural Broadband Services Page*, January 31, 2008, http://wireless.fcc.gov/outreach/index.htm?job=funding (May 27, 2008).
[104] FCC, "Assistance for Rural Telemedicine Services," *Funding for Rural Broadband Services Page*, January 31, 2008, http://wireless.fcc.gov/outreach/index.htm?job=funding (May 27, 2008).
[105] FCC, "Rural Health Care Pilot Program," *Consumer & Government Affairs Bureau Page*, March 28, 2008, http://www.fcc.gov/cgb/rural/rhcp.html#faq1 (May 28, 2008).

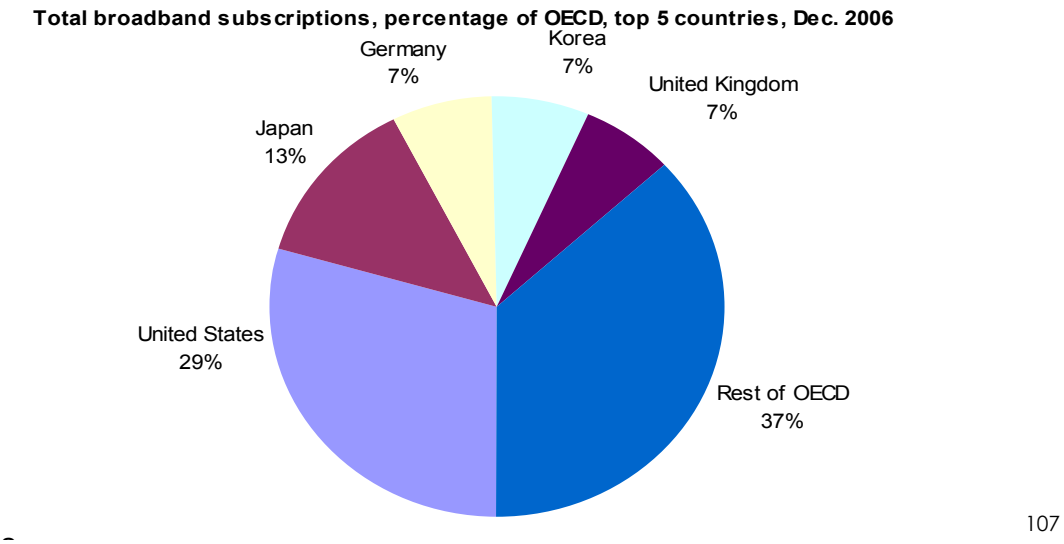
the cost of construction, improvement, or acquisition of facilities and equipment for the provision of broadband service in eligible rural communities." [106]

International Broadband Initiatives

In April 2007, when the Organization for Economic Cooperation and Development (OECD) released its Broadband Statistics Report for 2006, it was clear that the United States was falling behind many leading European and Asian countries in terms of broadband deployment and adoption. When the OECD first collected this data in 2001, the United States ranked 4th. The United States now ranks 15th among the 30 OECD nations according to the organization's semiannual survey of broadband subscriptions. The U.S. does have the largest total number of broadband subscribers in the OECD's ranking at 58.1 million.

The report also showed that the total number of broadband subscribers in the OECD increased 26 percent from December 2005 (157 million subscribers) to December 2006 (197 million subscribers). The report also highlighted the continued advance of European countries in achieving high broadband penetration rates. In December 2006, Denmark and the Netherlands became the first two countries in the OECD to surpass 30 subscribers per 100 inhabitants. Fiber-to-the-home (FTTH) and fiber-to-the-building (FTTB) connections also increased as several countries have continued upgrading to fiber optic networks. Korea and Japan each have more than 6 fiber based broadband subscribers per 100 inhabitants. Japan leads the OECD rankings in FTTH with 7.9 million FTTH subscribers in December 2006. FTTH subscribers in Japan alone outnumber total broadband subscribers in 23 of the 30 OECD countries.

[106] FCC, "Broadband Funding," *Broadband Opportunities for Rural America Page*, January 31, 2008, http://wireless.fcc.gov/outreach/index.htm?job=broadband_home (May 27, 2008).



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The OECD released its most recent broadband statistics, updated through December 2007. According to this recent report from the OECD, Denmark, the Netherlands, Iceland, Norway, Switzerland, Finland, Korea and Sweden lead the OECD with broadband penetration rates well above the OECD average, each surpassing a 30 subscribers per 100 inhabitants threshold. The OECD also found that South Korea and Japan lead the way in the development of fiber optic networks as fiber connections (either FTTH or FTTB) account for 40 percent of all Japanese broadband subscriptions and 34 percent of all Korean broadband subscriptions.[108] In 2007, the fastest advertised broadband connections were in Japan, South Korea, Sweden, France and Finland. NTT in Japan offers 1 Gbps connections to apartment buildings while the other operators offer FTTH at 100 Mbps to individual apartments or houses.[109]

In 2008, the Information Technology & Innovation Fund (ITIF) released worldwide rankings of nations' broadband development based on three key categories: household penetration, speed of

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[107] Organization for Economic Cooperation and Development, "OECD Broadband Statistics to December 2006," *Directorate for Science, Technology and Industry Page*, December 2006, http://www.oecd.org/document/7/0,3343,en_2649_33703_38446855_1_1_1_1,00.html (May 28, 2008).

[108] Organization for Economic Cooperation and Development, "OECD Broadband Portal," *Directorate for Science, Technology and Industry Page*, December 2007, http://www.oecd.org/document/54/0,3343,en_2649_33703_39575670_1_1_1_1,00.html (May 28, 2008).

[109] Organization for Economic Cooperation and Development, "Broadband Growth and Policies in OECD Countries," *OECD Broadband Portal Page*, March 2008, http://www.oecd.org/dataoecd/32/57/40629067.pdf (May 28, 2008).

average download and price. South Korea was ranked first with household penetration at 93 percent, average download speeds of 49.5 Mbps and average cost at $.037 per Mbps. The top five countries (in order) were: South Korea, Japan, Finland, the Netherlands and France. Although Japan came in second, it had a very close composite score to South Korea. South Korea has higher penetration rates, but Japan has higher download speeds and a lower cost of access. The United States ranked 15th, with household penetration of 57 percent, average download speed of 4.9 Mbps and average cost of $2.83 per Mbps.[110]

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[110] The Information Technology & Innovation Foundation, "2008 ITIF Broadband Rankings," *Policy Issues Page*, May 2008, http://www.itif.org/index.php?id=143 (May 28, 2008).

Where the U.S. Stands Today		
Category	US	Top Ranked Nation
Household Penetration	Ranks 10th with 57% penetration	South Korea 93% penetration
Average Mbps	Ranks 15th 4.9 Mbps	Japan 63.6 Mbps
Price (monthly price per Mbps)	Ranks 18th $2.83 per Mbps	Japan $0.13 per Mbps
Source: ITIF 2008 Broadband Rankings		

JAPAN

The e-Japan program was launched by the Japanese government in 2001 to spread broadband access and decrease connection fees across the country. Japan wanted to transform itself into the world's most advanced IT nation by 2005. As of March 2001, there were .85 million high-speed Internet subscribers paying a usage charge of approximately 7,800 Yen on average. By August of 2004, Japan saw an increase in the number of subscribers to 16.9 million and a decrease in the average usage charge to 2,500 Yen. Another goal of e-Japan was to realize an always-on connection by 2005 for 30 million high-speed households and 10 million ultra-high-speed households. By March of 2005, the e-Japan effort resulted in 46.3 million DSL (high-speed) households and 35.9 million FTTH (ultra high-speed households).[111]

After reaching those initial goals, Japan decided to cease thinking and acting as though it had to catch up with the more advanced IT nations. They believed that they had become the world's most advanced IT nation. Accordingly, starting in 2006, they chose to play an active role in contributing internationally to the advancement of IT as the frontrunner in broadband availability and usage. In 2006, Japan started a program called u-Japan. They chose the letter "u" from the word "ubiquitous," meaning everywhere. Japan wants ubiquitous networks that are accessible everywhere. Ideally, all aspects of Japanese society will be linked together through ubiquitous networks by 2010.

[111] Ministry of Internal Affairs and Communications, "Contributing to Future Deployment of e-Japan Strategies," *U-Japan Page*, 2007, http://www.soumu.go.jp/menu_02/ict/u-japan_en/new_outline01.html (May 28, 2008).

There are three main goals of u-Japan. The first is for Information Communications Technology (ICT) to permeate all aspects of Japanese people's daily lives at the grassroots level. This will be achieved through the development of a ubiquitous network integrating both fixed and wireless networks into a "seamless access environment." The second goal is for ICT to foster development of solutions to social issues. This will be achieved by mastering advanced uses of ICT so that it can be applied to various fields. The third goal is for u-Japan to create a network where anyone can use ICT with assurance of their privacy and security. This will be done by upgrading the enabling environment.

The end goal of u-Japan is for the network to be not only ubiquitous, but also universal, user oriented and unique. Ideally, this network will connect everyone and everything. Everyone, including the elderly and disabled will have the ability to use ICT with ease. Japan hopes to foster a huge increase in communication that transcends generation, distance and language. Japan aims for Internet commerce to shift from provider-oriented to user-oriented. Finally Japan hopes that ICT will transform society "from one of uniformity and standardization to one that is creative and vigorous, and which strives to achieve more creative business approaches and services, as well as a new social system and values."[112]

As of 2008, according to the ITIF, Japan ranked second in the world in terms of the most developed broadband network. The ITIF found that Japan had a household penetration rate of 55 percent with an average speed of 63.6 Mbps. The average monthly cost (in US $) per Mbps was $0.13.[113]

SOUTH KOREA

In 1995, the South Korean government invested $1.5 billion in advancing their country's broadband development. They invested this money in a nationwide high-capacity broadband network over which any service provider could offer its services. The government also offered

[112] Ministry of Internal Affairs and Communications, "The u-Japan Concept," *u-Japan Page*, 2007, http://www.soumu.go.jp/menu_02/ict/u-japan_en/new_outline03.html (May 28, 2008).
[113] The Information Technology & Innovation Foundation, "2008 ITIF Broadband Rankings," *Policy Issues Page*, May 2008, http://www.itif.org/index.php?id=143 (May 28, 2008).

subsidies so that 45 million Koreans could purchase inexpensive computers.[114] Then, in 2003, the South Korean government and telecommunications industry embarked on a mission to upgrade the country's national broadband network. The goal of the project was to bring the top speed of South Korea's core broadband infrastructure to 100 Mbps by 2010. The South Korean government set aside 990.5 billion won for the project and expected the private sector to provide financial backing for the rest of the upgrades. The country also aimed to link South Korea's wireless networks to create a universal system that features e-health and education initiatives.[115]

By 2006, 90 percent of South Koreans had broadband connections of 3 Mbps at home and similarly high connections on the road. The market for broadband service became increasingly competitive, leading to a drop in the cost to the consumer. As of 2006, broadband service cost the average consumer less than $20 per month. There are also more than 20,000 Internet cafes in South Korea where you can rent a computer with a high-speed connection for approximately $1 an hour.[116]

As indicated earlier, in 2008, the ITIF released a report which ranked South Korea's broadband network as the most developed in the world. The ITIF took into account the penetration rate of broadband, the average speed of the network and the cost of access. According to the ITIF, the penetration rate in South Korea was 93 percent with an average speed of 49.5 Mbps and an average cost of $0.37 per Mbps.[117]

FINLAND

Finland has one of the highest broadband penetration rates in Europe. DSL provides a significant amount of broadband delivery in the country, but there is also an extensive FTTH network as well as wireless broadband and a limited broadband over power line presence.[118] In 2008, the ITIF ranked Finland third in its broadband development rankings. Finland has an

[114] Chris Taylor, "The Future is in South Korea," Business 2.0, June 14, 2006.
[115] BBC, "Korea Plans Ultra Fast Broadband," *BBC Online*, November 20, 2003, Online edition.
[116] Chris Taylor, "The Future is in South Korea," Business 2.0, June 14, 2006.
[117] The Information Technology & Innovation Foundation, "2008 ITIF Broadband Rankings."
[118] Paul Budde Communication Research, "Finland – Broadband Market," *Reports Page*, March 11, 2008, http://www.budde.com.au/buddereports/1598/Finland_-_Broadband_Market_-_Overview_Statistics__Forecasts.aspx (May 28, 2008).

average household penetration rate of 61 percent with an average download speed of 21.7 Mbps. The average cost of access in Finland is $0.42 per Mbps.[119]

Comparative Analysis Conclusion

After analysis of all of the foregoing, including evaluation of data from other localities, states and nations, we believe the following comparisons can be made concerning the five counties under study and other similarly-situated areas, as well as non-similar areas, including consideration of the funding support, incentive-based programs, public/private partnerships and regulatory measures that have been applied in each situation:

- The broadband availability and adoption rates in the five counties studied are consistent with the availability and adoption rates, on average, in similarly-situated, rural areas around the United States.

- However, availability and adoption rates are behind similar areas in other states where proactive measures to advance the broadband climate are farther along, depending on when those efforts were started and how they have been developed.

- There were active broadband development efforts in each of the counties under study. Successful efforts to date have received necessary funding. Efforts that have been stymied to date have not received necessary funding, or face regulatory and other hurdles that would need to be addressed (more information on these can be found in the next to last Section of this Report).

- There is a disparity between the availability of multiple, competing broadband options between the five counties under study and more populous areas (such as Seattle and King County). This disparity is not uncommon when compared to the disparity in other urban/suburban versus rural areas around the United States, and other countries, except those profiled herein that have taken aggressive efforts (and provided the associated funding) to upgrade their broadband infrastructure and advance adoption of broadband

[119] The Information Technology & Innovation Foundation, "2008 ITIF Broadband Rankings."

services (such as Japan, which finds high rates of availability both in its cities and rural sections based on the e-Japan and u-Japan initiatives).

- Public involvement (such as by PUDs, local governments, Economic Development authorities and others) has led to advancements in broadband infrastructure and services in the five counties. This is consistent with the results of public involvement in many jurisdictions throughout the country.

- Public/private partnerships, and their efforts to bring expansions in broadband service, have seen a wide range of success and failure around the country. Within the five counties studied, there have been a few public/private partnerships (such as the activities of the Grays Harbor PUD) that have been successful. It will be important to build on these efforts going forward, and not duplicate the failures experienced in other jurisdictions around the country (most often based on either a flawed technology concept [typically resulting in higher cost to fix the initial system design] or a flawed business plan [typically resulting in lower revenues and a longer ROI than anticipated]).

- Regulatory measures such as right-of-way management and zoning provisions have enabled infrastructure to be placed which has resulted in a lower cost of broadband infrastructure development in other areas around the country (such as the placement of excess conduit during road construction and other activities or the involvement of telecommunications providers in community infrastructure development projects such as downtown redevelopment which enabled the provision of telecommunications infrastructure while other construction is going on, thus lessening the cost of construction). These types of provisions do not appear to be largely in place in the five counties studied. A concerted effort to pursue and develop these types of regulatory and cooperative initiatives would be beneficial, based on the benefits achieved in other jurisdictions.

Overall, as we have indicated in other Sections, there is momentum within the five counties that could be accelerated by proactive steps at the local, State and/or national level.

Section I
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

After review and analysis of all the information gathered during the Broadband Study and as reported herein, CBG presents the following observations that are evident from the accumulated evidence regarding broadband availability, adoption and use in the State of Washington.

Additionally, at the end of this section, we have provided narrative regarding potential options the State may consider for broadband infrastructure development and deployment, should there be a desire by policymakers, particularly the Washington Legislature, to take affirmative steps to promote expanded availability and use of broadband services.

The Level of Broadband Availability

The level of broadband availability varies widely within and across each of the five counties covered by the Broadband Study. For example, the highest level of broadband services noted in the surveys were 1 Gigabit Ethernet service (10 Mbps or 100 Mbps services were more prevalent) which are generally provisioned over direct fiber optic connections. Such connections were generally found in or near the largest municipalities in the larger, more densely populated counties. In the smaller counties with notably lower population densities, the higher speed broadband connections were available only in limited fashion, such as along a provider's backbone connection, or they were simply not available.[120]

Not unexpectedly, even within the larger counties, data and information gleaned from the surveys indicate that as you leave or move away from densely populated communities and away from major transportation corridors, the level of broadband availability (or coverage area) and service (or speed) options dwindle rapidly. As an example, within most of the limits of the City

[120] The "larger counties" are defined as those with larger populations relative to their land mass. Grays Harbor (1,917 square miles, 70,800 people) and Lewis County (2,407 square miles, 74,100 people) fall into this category. The "smaller counties" are defined as those with smaller populations relative to their land mass. Columbia (874 square miles, 4,087 people) and Ferry County (2,257 square miles, 7,500 people) fall into this category. Interestingly, Stevens County (2,478 square miles, 43,000 people) with a large land mass, but far less population than Grays Harbor and Lewis County, showed attributes of both a small and large county depending on the factor under review.

of Centralia in Lewis County (which parallels the I-5 corridor) a number of broadband service options are available generally to local businesses, institutions, and households. These options include DSL service, wireless broadband services, cable modem services and dedicated high-speed institutional and business broadband connections using dedicated fiber optic facilities. As a result of having sufficient high-speed Internet access options, Centralia broadband subscribers are more likely to engage in Internet activities that avail themselves of reliable and robust connections, such as online banking and watching videos on the Web. Residents in Centralia with multiple broadband options are also more satisfied with the cost, speed and reliability of their Internet service than dial-up users in Centralia and residents in other areas with less options. In contrast, move either east or west along Route 12, (i.e., away from the I-5 corridor) and the options available to consumers rapidly diminish. As opposed to the full range of service options available in the densest portion of Centralia, consumers in outlying areas are limited to dial-up access and may or may not be able to access satellite broadband [121] between certain pockets of population density. Additionally, availability of DSL or cable modem services (not always both) is spotty, at best, within or between population pockets depending on the size and density of a particular area. Consumers accessing the Internet in these areas exhibit less robust utilization of the Internet and lower satisfaction levels.

The density/broadband availability relationship can be thought of in the following way: the higher the population density, the closer the proximity to other dense areas (so extension of services can be more easily achieved) – **and -** the more significant the transportation corridor and the closer to that transportation corridor a consumer may be, the higher the likelihood that broadband service will be available and the greater the options.

The highest levels of broadband availability in the five counties studied are the most densely populated portions of the I-5 corridor in Lewis County (especially Centralia/Chehalis), the more

[121] It is important to note that, in many locations where dial-up service is available and chosen by consumers, satellite broadband could be available, but, for a variety of factors, has not been selected due to concerns about latency, slow upload speeds (although 512 Kbps is quoted), weather-related outages and restrictive "fair use" policies. These factors, plus the higher cost of satellite broadband and reception problems where proper look angles cannot be achieved, is inhibiting its adoption for dial-up users. Additionally, T-1s may also be an option as opposed to dial-up, but the cost of accessing this type of service for household, home-based business or telecommuter use, as noted in the Report, is prohibitive at as much as $400-$800 a month (as opposed to 10% or less of that amount for a high speed DSL or cable modem connection).

densely populated portions of the US 12 corridor in Grays Harbor (especially from Montesano west), the southeastern portion of Stevens County along the 395 corridor just north of Spokane, as well as the more densely populated pockets along the Route 395/20 corridor in Stevens County. It should be noted that in both Grays Harbor and Stevens Counties, the availability of reliable broadband service is impaired by a lack of a failsafe, redundant backbone (evidenced by a couple of crippling outages in the recent past).

In keeping with the density/broadband availability relationship described above, it should not be surprising that the lowest level of broadband availability observed in the Study was in Ferry County. Even in the more densely populated sections of this County and those areas that parallel major transportation routes, broadband service options, as noted in sections B, C, and G of this Report, are appreciably limited.

It should be noted that local governmental or public agency involvement at an integral level may influence or enhance broadband availability. CBG notes for example, that the PUD in Grays Harbor has been very active in extending and providing fiber-based infrastructure and in pursuing collaborative wholesale service relationships with unaffiliated providers, system integrators and alternate carriers to further the broadband environment in Grays Harbor. For example, the PUD worked with one provider to share the cost of fiber backbone construction. Based on this cooperative effort, both entities were able to access twice the amount of fiber infrastructure than they would have otherwise. On a wholesale basis, the PUD has also worked successfully with unaffiliated retail service providers to use PUD fiber infrastructure to provide broadband services to formerly unserved or underserved areas, as well as provide another competitive option.

Inhibitors to Broadband Availability

Survey results, coupled with input received from focus groups and existing service providers, provide a reasonable assessment of the major inhibitors to broadband availability in the five counties studied. These inhibitors are many and, for the most part, reflect inversely those factors that contribute or enhance prospects for availability. They are:

Low Population Density – Most providers indicate that the number of potential customers and anticipated take rates, the cost of building and extending infrastructure, and the resulting Returns on Investment (ROIs) that provision of broadband services may bring, simply do not pencil out in low density areas, particularly in an environment where investor-owned utilities are under significant pressure to shorten the ROI timeframes and increase returns.

CenturyTel, which serves numerous rural exchanges throughout a number of states including Washington, noted in its response to the Broadband Providers Survey that:

> "[t]he single biggest obstacle that works against deployment of broadband services to the last remaining unserved areas is the lack of a viable business case. Without some form of universal service assistance, customer density is often too low and cost per customer too high to provide broadband service at a more equitable price that will cover cost."

Distance from a Major Transportation Corridor – Major transportation corridors tend to drive the placement of and investment in broadband infrastructure because of the relatively higher number of fixed users that surround population centers that have already located and expanded along those corridors (for a variety of reasons), as well as mobile users that traverse those corridors,. Such investments include, but are not limited to, placement of cell towers that wireless carriers can utilize to deliver broadband over cellular service. Additionally, these same or other towers can be effectively leveraged under the right conditions for fixed wireless services. As an example, Eltopia, a wireless broadband provider in Stevens County, states that it would utilize existing cellular towers based on the towers' prime locations in municipalities and along major corridors in Stevens and other counties. However, Eltopia has not to-date entered into lease arrangements with cellular tower owners because it has found the lease fees to be prohibitive. Instead, Eltopia leases space on towers owned by other entities including ISPs and cooperatives such as the Big Bend Electric Cooperative in Ritzville, Washington.

Also in these corridors, critical backbone infrastructure is placed to provide continuity between various distribution points and to support long haul communications between major metropolitan areas. Finally, major transportation corridors are often routed through less topographically challenged areas, which enables easier construction along and near road and rail rights-of-way.

Move away from the major transportation corridors and the incentive for infrastructure investment decreases, so the services do not deploy as fast or in as concentrated a manner as along a major transportation corridor; a direct result of lower ROIs, lower density, and higher construction costs.

Terrain – On a cost per location served, wireless broadband communications can be an effective means of bringing broadband to individuals in lower density areas. However, many of the areas that we studied have challenging environments (such as dense forest and mountainous terrain) and other topographical issues which present difficult problems for wireless technological solutions. For example, many of the technologies that are capable of providing wireless broadband are most effective on a line of sight (LOS) basis and, as such, are not always conducive to offering service in mountainous areas. Additionally, fiber optic backhaul connections from master towers is often preferred for wireless systems, but fiber (as well as the electrical power infrastructure needed to support transmission equipment) may be difficult and costly to bring to such tower locations.

Permitting – Service providers and those involved in network design indicated that they had considerable difficulty obtaining permits for network development in some cases and this certainly slowed, if not completely barred, broadband development in certain areas, especially those areas that are environmentally sensitive. For example, river crossings that require approval from the U.S. Fish and Wildlife Service, construction through State forest land that requires approval from DNR, and similar permissions and approvals can take a lengthy amount of time as well as be costly to implement once approved. Railroad crossings were another permitting issue cited as creating time lags (90 days or more to acquire permits) and a high cost ($4,000-$5,000 to acquire a crossing permit).

Planning – Examples were given where the cost of broadband system development could have been reduced if providers had been included earlier in local government and other planning processes (e.g., when roads are widened, reconstruction and repaving is done, or utility trenches are opened). Earlier participation would have enhanced infrastructure deployment by reducing both time and cost. In areas where the ROIs may already be marginal, to nonexistent, such delays can impede broadband availability significantly.

Lengthy ROI – As indicated above and considering the other deployment factors, in many cases ROIs may be lengthened beyond that considered acceptable by broadband service providers. In addition to CenturyTel, other large providers expressed similar positions. For example, Verizon Northwest, Inc., indicated in its Broadband Survey response that "[i]n general, obstacles to deployment may include high capital and operating costs compared to likely revenue." Essentially, even if a high percentage of the population wanted to subscribe to broadband, in many rural areas there is simply not sufficient demand (i.e., revenue potential) for the service to justify the level of private investment needed for deployment. This remains a hard reality without either technological changes that reduce costs substantially or substantial subsidies from government or foundation sources, like the mechanisms used historically to promote the universal availability of wireline telephone service. Potential means to address lower ROIs are discussed in Section H of this Report.

Capabilities of Existing Technologies – Participants in the Study noted that the characteristics, capabilities and limitations of existing broadband technologies were an inhibitor to availability and that perhaps the employment of new technologies such as WiMAX may help to overcome some of these limitations. For example, WiMAX technology is generally viewed as superior to other wireless infrastructure in addressing line of sight issues, capacity problems, and the need for ever-higher mobile broadband capacities.

Participants noted however, that just like other new technologies, because of the huge investment required to develop new networks, it was likely that WiMAX will be provisioned in the densest sections of Washington State initially and would simply provide more broadband service options

to those consumers that already have a number of options.[122] Accordingly, WiMAX likely does not pose a wholly effective solution for rural areas for quite some time.

Broadband Adoption and Use

As stated throughout the Broadband Study, adoption of broadband services by consumers generally follows availability. The more that broadband is available, and with a greater variety of service options, the higher the level of adoption by consumers and use for more diverse applications. This proved true for observed results in all communities of interest. For example, 36% of households in Lewis County, where broadband is more widely available than some of the other counties studied, purchase some form of broadband service. This was especially true along the I-5 corridor where there appear to be multiple providers and varied service options. Conversely, in Ferry County, where there are fewer service options and providers, only 15% of its households obtain some form of broadband service.

Also, where broadband availability and options are plentiful, the uses of broadband and the value of those uses expand significantly. For example, our survey results indicated there is a 23% gap in the use of video over the Internet between broadband consumers and low-speed Internet service users. As reported herein, this trend holds for a variety of other applications such as taking a class online or banking online. Those with broadband in the five counties studied are also more likely to buy a product online.

[122] A consortium of Sprint, Clearwire, Comcast, Time Warner, Brighthouse Networks, Google and Intel is spending $14.5 billion on a nationwide roll-out, for example.

Internet Activity	Nationwide[123]	Broadband Subscribers in the Five Counties[124]	Dial-Up Subscribers in the Five Counties
Send or read e-mail.	92%	93%	90%
Take a class online, educational purposes.	12%	39%	32%
Watch a video.	56%	34%	11%
Sell something online.	15%	21%	19%
Bank online.	53%	63%	47%
Buy a product.	66%	77%	67%

There are notable exceptions to this observation regarding broadband adoption. For example, data from the Broadband Study indicated that even where broadband is or were to be available, a certain segment of the population simply does not want or need it. These individuals are technologically agnostic, either unable or unwilling to alter their lifestyle that is relatively unencumbered by computer technology and the Internet. Some of these consumers simply do not understand the value that broadband service offers them because they do not know how to utilize computers, the Internet, or broadband. However, there is also a certain percentage that moved to, or lives in, rural Washington because they either do not believe in the value of a higher degree of technology, or they wanted to "get away from it all" and appreciate the fact that they are living in a low technology area. For example, 8% of those without Internet access at home earn more than $50,000 a year and have a college degree. It would take a significant paradigm shift for these residents to adopt broadband.

Regarding broadband adoption by businesses, those that placed a high value on broadband exhibited the following consumption characteristics: they have a much greater number of Internet applications in use at the place of business, less satisfaction with the number of choices among broadband providers and they were more likely to have a larger number of employees.

[123] Based on tracking done by the Pew Internet and American Life Project. www.pewinternet.org.
[124] Broadband subscribers are defined as those having DSL or cable modem services for the purpose of this chart.

Additionally, when analyzing our Business Survey results in tandem with information gathered during in-depth interviews and focused discussions, CBG found that the lack of a truly reliable, competitive broadband environment creates the following negative economic impacts:

- Movement of businesses away from low or no broadband areas to areas with a better broadband environment.
- Higher operational costs.
- Difficulty in recruitment.
- Slower, more inefficient and inconsistent operations.
- Less provision of services to, and access of services by, citizens thus reducing related quality of life components.

Inhibitors to Broadband Adoption and Use

Generally, several key inhibitors to broadband adoption and use (i.e., uncertainty as to the benefits of broadband, lack of reliable broadband service and cost of service) are interwoven and coalesce around the price/value relationship concerning service access. For instance, residents in rural areas may be able to receive satellite broadband, but the cost can be significantly higher than dial-up service, likely the only alternative to satellite broadband service in their area. Nevertheless, consumers may choose to adopt such offerings, but they tend to experience more significant service problems such as latency, service outages and the service-barring effects of certain "fair use" policies that may be applied. Some rural consumers choose to "un-adopt" and go back to dial-up because the value of satellite service has diminished relative to the cost. Some remain on satellite broadband service, albeit frustrated and greatly dissatisfied with the quality of service. When other service options are available, evidence suggests that many will migrate to those options. Similarly, evidence suggests, when there are multiple options, that the price and types of services are broad-based enough that value is established for users at very high levels.

Two additional inhibitors to broadband adoption and use are computer/access device availability and computer/technology literacy and training. Just as it will be significantly challenging to bring new and better broadband access options to areas of the five counties where service is unavailable or lacking, so too will it be challenging to find easy answers to address these two adoption inhibitors. Sometimes lack of computer/access device capability is a choice based on personal reasons and preferences. Sometimes, though, it's based on cost and also on the ability to gain access to necessary training. CBG found that community colleges, libraries and Economic Development authorities were actively engaged in programs and outreach to increase computer understanding and utilization which then leads to Internet use, understanding and value. It is clear, however, that a number of consumers have either ignored or avoided these programs for a variety of reasons.

The cost of service issue is very real for those with low or moderate incomes and taking service forces such consumers to have to make hard choices regarding other necessary household expenses such as transportation. This is true even though prices for computers, Internet and broadband access services have generally fallen over the past decade.

In summary, to increase broadband adoption and use to the levels seen in other countries, Washington policymakers may consider four major initiatives:

- Increasing the number and type of broadband availability options to ensure affordable, reliable access,
- Augmenting existing computer/technology literacy efforts,
- Determining ways to increase affordable access to computers (including potentially more public access computers), and
- Looking at whether the paradigm could be changed for those that truly don't want or don't need broadband.

Broadband Service And Infrastructure Development And Deployment

There appears to be a pervasive perception by some participants in the Study that the more rural, eastern part of the State has become a "second class" citizen when it comes to the provision of broadband services and the State's efforts to enhance broadband services. Even in western Washington, as the location becomes more rural, a similar perception of "second class" broadband status becomes more and more evident. One participant in a Lewis County focus group, for example, noted that Lewis County was an "eastern Washington county on the western side of the State". Accordingly, the challenges are many and varied to addressing and overcoming the perception of there being a "second class" status for rural areas and the reality of reduced broadband options.

An additional challenge is finding an effective way to engage the broadband service provider community to share critical information. CBG found that providers are very reluctant to provide existing infrastructure information - or even service deployment information - based on their characterization of such information as proprietary and confidential. Without fail, they contend that the release of such information would compromise their ability to compete effectively in the marketplace. We believe their view does have some validity where there are multiple competitors, but it doesn't ring quite as true where, literally, there are no viable competitive options at this time. Since such providers are the major distributors of broadband services and have firsthand knowledge of where there are gaps in coverage, the State may not be able to completely develop detailed and targeted investment incentives or service deployment options for particular areas without access to the information they possess. This dynamic must be addressed straightforwardly and effectively, while dealing with their confidentiality concerns, if efforts to change broadband deployment and use are to grow.

Providers also noted from time to time that broadband is an "information service" regulated ostensibly at the Federal level and that this limits the State's role in pursuing provision of such services. Clearly though, an occurrence such as Qwest's current operation under an Alternative

Form of Regulation (AFOR) with the UTC has resulted in commitments to augment or enhance broadband service in its territory. The AFOR commitment includes certain exchanges in Qwest's service areas that are in the five counties covered by the Broadband Study (Northport, Springdale, Napavine and Winlock). Even after completion of its obligations, though, these exchanges will not have full DSL service, which again leads to the need for further deployment efforts. Additionally, lengthy ROI, specified by several providers as an inhibitor to deployment suggests that the State needs to look at and address funding options that can somehow facilitate longer, but acceptable, ROIs if possible. As explained below, this could involve more active participation by PUDs or involvement of the State or other entities in providing "ROI Gap Funding."

Broadband Deployment Models

As described earlier in this report, states and localities around the nation including Washington and local entities within the State, are currently taking three (3) approaches to state involvement in enhancing the broadband service and infrastructure environment. These include:

- Encouraging the Private Sector to Build
- Creating a Broadband Authority in the State
- Creating a Public/Private Partnership

After review of all of the information gathered, we believe that it will be important to pursue elements of each one of these models to best be involved in a successful pursuit of an enhanced broadband environment. Specifically, regarding the above three (3) approaches, the State could:

- **Encourage the Private Sector to Build –** As noted previously herein, the State has already developed a statewide backbone to provide services to State and local government agencies, greater public access to the Internet and educational services through the K-20 Network.

As a result of the State's efforts, private providers were able to expand their infrastructure in order to create the backbone and build distribution off of the backbone. There is a potential to expand this effort in two ways. First, the State could do something similar to what Colorado has done, put Network Operations Center (NOC) or Hub locations in each of the State's 39 counties, or at least in the areas where additional fiber backbone and Hub infrastructure is needed. These facilities could be extended at least to the county seats in each location where, understandably, it is most needed. This would bring high-capacity infrastructure to central locations in each of the counties which could be leveraged to encourage further development. It would also mean that, since it would constitute an expansion of the existing redundant backbone, each county would now have a greater level of redundancy which our Report indicates is not available in a number of locations presently.

Beyond this, new backbone facilities could be utilized to provision a higher level of services for resellers, alternate access carriers and others that may then distribute services from the Hub or locations along the backbone. Similar to the PUDs, this would put the State potentially in the role of a wholesaler, so it would have to look at all the ramifications of such a move including any possible effect on existing federal funding used (i.e., the federal e-rate program) in support of the K-20 Network.

Another way of encouraging private investment would be to provide "ROI Gap Funding". Essentially, the cost to bring service to an underserved or unserved area would be developed. This amount would then be compared to the minimum ROI typically acceptable to a provider who could enter the market and establish service. Then, the difference in cost would be provided by some entity (it could be the State, a local government, a consortium of local governments, an economic development group, a business consortium, a PUD or other entity, for example) to the provider over an established period of time that balances an acceptable return versus the provision of a required level of service.

This required level of service should incorporate a number of measurements critical to ensure an appropriate return on the investment of the entity providing the Gap Funding, including:

- Timeframe for development of services to an entire target area, including phased implementation
- Creative means to bring broadband services to the area as an interim measure while more long term plans are developed
- Engagement in adoption encouragement and support activity
- Nature of the services provided, including range and scalability
- Ability of the system to enable competitive offerings
- Expansion requirements over time to keep pace with technology
- Self-sustainability at a given point that would serve as an end-point for support funding

- **Create a State Broadband Authority –** Washington does not currently have a "one stop shop" where collective thinking to address broadband needs is available. As a result, study participants indicated that broadband stakeholders were not always aware of each others' activities and therefore could not take advantage of synergies that might exist in the deployment of infrastructure. Some type of authority could serve as a clearinghouse for broadband initiatives. Stakeholders believed this type of centralized ability to converse with other providers could go a long way in helping to address broadband needs in the five counties. A broadband authority could, for example, identify potential wholesale opportunities for certain public entities such as Public Utility Districts (PUDs), appropriate local entities, or the State itself to provide services by leveraging private and public resources that may be currently available and that potentially could be expanded(i.e., State backbone, PUD fiber optic infrastructure, local government fiber and wireless infrastructure). For example, Stevens County with appropriate funding, could utilize existing and new County assets to provide a high-capacity wireless backbone for the provision of redundancy and other services. The PUD in Grays Harbor already brings power to remote locations and potentially could provide broadband services to those

locations, based on the longer return on investment that they can absorb as a public utility, but would need to know that they were guaranteed the return on investment because no other provider was going to provide that service. Careful study of current restrictions and parameters surrounding provision and use of these resources would need to be made to insure that current positive attributes of the broadband marketplace are not lost or impaired in any effort to expand broadband service availability. Additionally, as is the case for private providers, in rural areas there would need to be careful consideration of the demand (i.e., revenue potential) for broadband services to justify the level of public investment that may be required for deployment.

- **Create a Public/Private Partnership** – We understand that there has been interest at the State level to look at developing a public/private partnership, such as the Connect Kentucky project which includes a non-profit element to oversee and plan efforts to develop ubiquitous high-speed Internet access. This approach may have some merit and should be pursued, but again there would need to be some set parameters that the partnership would need to achieve (timeframe, baseline service level, efforts to pursue adoptions once affordable availability has been established, etc.) in order to ensure that success could be achieved.

  Also, it will be important to look at the experience of other public/private partnerships that have not succeeded to avoid the problems that derailed those efforts (flawed business plans, technical problems, a too broad or too narrow focus, lack of pertinent political or constituent support, problematic organizational structures, etc.). Specific examples to study would include such cases as the various municipal wireless broadband projects that included EarthLink as a partner, where the level of investment escalated well beyond projections, while the payback elongated beyond an acceptable business case.

Based on the information gathered herein, one underlying theme is that the State should not create artificial barriers to the provision of services where it would be helpful to households and businesses and thus positively impact the State's economic development and overall quality of life. This most likely means that any solution chosen should not necessarily detract from other

possible solutions. Rather, similar to how multiple broadband options in several locations studied have provided higher levels of satisfaction and use, multiple deployment options working in tandem may ultimately achieve the best outcome for the State.

Clearly there are broadband disparities within the five counties studied, reflecting significant gaps in both availability and adoption that are having a negative impact on those counties' economies and the quality of life for their citizens. Our study indicates that proactively addressing and reversing the situation, so that broadband availability and adoption rates increase will have the inverse effect – a positive economic impact and enhancement in the quality of life. State policymakers should review the approaches we have recommended and determine the most effective way to proceed.

We applaud the State's proactive efforts to study broadband disparities and move to determine ways to address them. We believe that such proactive efforts will help the State keep pace with other states that have improved their broadband environment and nations that exhibit high levels of broadband availability and adoption. In turn, this will allow Washington to compete more effectively in both the national and global economies.

CBG wishes to thank the UTC for the opportunity to work on these critical issues by performing this Broadband Study. We especially wish to thank Will Saunders and others at the UTC and other state and local agencies for their invaluable assistance in achieving a successful project outcome.

Section J
Project Template

PROJECT TEMPLATE

The experience of performing the Broadband Study Project shows that the methodologies used and the activities employed were successful in obtaining the information needed to meet the objectives of the State within the five counties. Accordingly, with some refinements and enhancements, we believe the methodology that has been employed could be used as a template for other similar survey projects throughout the State or even on a statewide basis. (Clearly, additional time would need to be factored in if more than a five-county area was to be studied or an area where there are more dense sections and, therefore, more communities of interest representatives may be involved in the information gathering efforts.)

The Study methodology compares favorably with the methodologies used concerning both the type and depth of information gathered in other similar research projects around Washington State and throughout the country. For example, CBG Communications has applied the same methodology successfully to establish detailed information about broadband needs, interests, usage, applications and availability in the Pierce County, Washington communities represented by the Rainier Communications Commission, as well as nine (9) Valley Cities in southern King and northern Pierce Counties, Marin County, California and other jurisdictions around the country.

Looking at studies performed by other entities, the methodology and depth of level of information is consistent with that, for example, gathered by the City of Seattle as part of its 2004 Information Technology Residential Survey. Additionally, the data gathering techniques regarding business and economic development findings and service provider infrastructure and service information and related data were consistent with some of those used by Washington State University's Center to Bridge the Digital Divide in its extensive information gathering and Report on the Olympic Coast Region Economic Development Project (October 2004).

When comparing and contrasting the goals and objectives of the different studies and looking at some of the key methodologies and data fields incorporated within their information gathering

methodologies, we recommend that the following be included in a project template that would be viable for other Broadband Study projects throughout the State. This would include:

- **Telephone Survey for the Residential Community – Key Data Fields**
    - Level of access to the Internet.
    - Availability and adoption of high-speed access to the Internet.
    - Level of importance of having access to high-speed Internet.
    - Applications used over the Internet (use a set of questions or applications that is easily compared to the applications developed by the Pew Internet and American Life Study. This allows comparisons to national data [as discussed in an earlier section in this Report]).
    - If not a high-speed Internet, why not?
    - If not a computer user, why not?
    - Demographic information to determine if findings are across all demographic groups or specific to certain sectors.

A similar set of data fields should be utilized for business broadband survey use, with modifications made related to business operations versus household activities including:

- The level of importance of the Internet and then use of high-speed Internet as opposed to low-speed Internet, for day-to-day business operations
- Key business applications used over the Internet and then a comparison of high-speed Internet applications versus low-speed applications
- What type of business they are (so that Internet and high-speed Internet use can be compared for different business sectors to determine whether similar needs run across sectors or are specific only to certain sectors)

- Would an enhanced broadband environment benefit their business?

Supplementing telephone surveys with online/written surveys was found to be very important in the case of businesses, since those that took the survey online indicated a higher degree of online use and thus a higher degree of need for both the Internet and high-speed Internet. Online business survey data can then be compared with the telephone survey data to look at whether key business sectors are differentiated concerning the need for high-speed Internet access.

A great depth of information can also be obtained using online/written surveys for institutional users (educational organizations, governments, libraries, tribal nations, etc.) in order to determine the impact that varying degrees of network infrastructure and services have on their day-to-day operations and their ability, in turn, to meet the needs of those that they serve (citizens, residents, clients, patrons, students, etc.).

Finally, supplementing the survey data with in-depth interviews and focus groups allows the ability to test interpretations of the data in a "drill-down" format with diverse interests, as well as determine the highest priority issues, based on the consensus of such diverse interests.

In summary, the above methodologies and data fields taken from those used for this Broadband Study would be the key components of a template that would be viable for Broadband Study projects throughout the State.

The refinements and enhancements to the current template center around the changes that will continue to occur in the broadband infrastructure, service and technology deployment environment, as well as changes in the broadband adoption and use patterns of key demographic groups. For example, if WiMAX technology and development of related services in the marketplace expand more rapidly than anticipated, or into less dense areas faster than anticipated, then an increased focus on either public or private provision of that service, and its potential use by the various communities of interest, may need to have a larger role in the study. Similarly, if use of landline telephones by certain demographic groups continues to diminish, this will require some changes in telephone survey methodology to ensure that such users are accurately represented within the samples. (Telephone survey firms, for example, are looking at

a number of possibilities, including working to match exchanges known to correspond to cell phone use with geographic areas within the scope of the study, and then augmenting the survey questions, when cell phone users are reached, with an initial question focus that determines whether the respondent is using their cell phone in place of a landline. A large group of these cell phone numbers would be developed within the study area and then randomly selected based on penetration numbers available for landline use versus cell phone at home use in those areas.)[125]

Also, it would be extremely helpful to be able to require, rather than request, a greater level of information related to infrastructure and services from service providers, or have some mechanism under State law to hold that information confidential, so that it could be analyzed and reported on within the Conclusions, even if specific data is not reported within the Findings.

Essentially then, the methodology employed in this Study could be used in large measure as a template for any similar future study, because it comprehensively covered all the various communities of interest. This is important, since no one methodology would give a complete picture of the broadband environment at this particular point. Then, at the time the study was performed, adjustments would be made to any of the individual information gathering efforts based on particular elements which may need more in-depth pursuit (for example, if greater focus needed to be placed on educational use of broadband, rather than weighting its focus evenly with the other constituent groups and applications).

[125] Telephone studies rely on landline-only residents for surveying. With the growth of cell phone usage and ultimately, cell phone only households, survey researchers are sensitive to potential bias in the sample. The empirical data concerning the potential for such bias is just beginning to be collected in the United States. For example, researchers have found that landline only household respondents are significantly more likely to be over 50 than those in cell phone only households. Additionally, among the largest differences noted, those in landline-only households were less likely to be men, less likely to be single and less likely to be a racial/ethnic minority. The same study also found that respondents in cell phone only households were more likely to be aged 18 to 34 years, single or never married, Hispanic, a student, and out of work. Those in cell phone only households were less likely to be married, a college degree recipient, non-Hispanic white, or retired. Link MW, Battaglia MP, Frankel MR, et al., "Reaching the U.S. cell phone generation: comparison of cell phone survey results with an ongoing landline telephone survey." *Public Opinion Quarterly* 2007;71:814–39.