2011 Annual Report
on Broadband in Washington

Washington State
Broadband
Office

Learn more about
our program

January 10, 2012

Dear Readers:

It is my pleasure to deliver the 2011 Annual Report on Broadband in Washington. This report builds on strategy established by the High Speed Internet Working Group, the Governor's Broadband Advisory Council, and the community of broadband stakeholders in the public and private sectors.

Since Washington first studied broadband deployment, the infrastructure has changed significantly. New technologies have improved the speeds of wireline networks such as cable and DSL, fiber-optic lines with nearly limitless capacity have been built by Washington's private providers and public utility districts; and Smartphones and tablets are revolutionizing the mobile broadband market and creating an entirely new "apps economy" that requires fast and ubiquitous broadband in order to thrive.

Though the state's infrastructure is growing, our challenge will be to capitalize on these network investments to drive economic growth. Broadband can be an important part of entrepreneurship, job creation and improved health and education in Washington. Helping businesses and communities in our state realize those benefits will enable the state to continue as a technology leader and a strong competitor in the global economy.

Sincerely,

Rogers Weed
Director

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EXECUTIVE SUMMARY

Where we are

At the close of 2011, Washington State's broadband networks are more robust than they have ever been. Analysis of provider-reported service areas shows that 96.1 percent of the households in the state have broadband available to them at a rate of 3 megabits-per-second (Mbps) download or more (For an explanation of residential and business broadband speeds see Appendices A and B). Data collected by the Federal Communications Commission as of December 31, 2010 indicates that there are more than 1.3 million broadband connections in Washington.

In the heavily populated Interstate-5 corridor and portions of Clark, Yakima and Spokane counties available broadband speeds jumped from less than 10 Mbps in June of 2010 to 25 Mbps or more in June of 2011 (see Appendix C).

Gaps are shrinking but still exist: 3.88 percent of all households had no broadband service available in 2011 (down from 4.3 percent in 2010). And 2.3 percent of the state's households had access to broadband at speeds less than 3 megabits-per-second (Mbps) – sufficient to send e-mails and stream a feature movie, but not fast enough to

Photo credit: Pace Engineers, Inc.

conduct high definition (HD) two-way telelearning, or have multiple users viewing HD-quality video.

Developments and progress in 2011

Several significant investments in broadband in Washington State were announced or initiated during 2011. Broadband infrastructure build-out began on projects funded by the American Recovery and Reinvestment Act (ARRA). Principal among these is the NoaNet project – a middle mile network expansion with statewide impact. All told, recipients of the National Telecommunications & Information Agency (NTIA) Broadband Technology Opportunities Program (BTOP) received more than $165 million for infrastructure projects. All of Washington's BTOP grant recipients that accepted their awards began work on their projects in 2011.

BTOP funds also supported adoption programs.

- $4.1 million was awarded to the EdLab Group, which began work this year with 21 sub-grantees working on access and skills training in communities with low broadband adoption rates in 11 counties.

- Toledo Telephone was awarded $2.1 million for its adoption work in Lewis County.

- Zero Divide was awarded $1.3 million for a multistate project which includes parts of Washington State.

The U.S. Department of Agriculture (USDA) awarded grants and loans to broadband providers in Washington through its Broadband Initiatives Program (BIP). More than $49 million was awarded to four providers and two tribes.

- Ecliptixnet Broadband was awarded $14.3 million and has begun work on a wireless

broadband network in three counties in Eastern Washington.

- Hood Canal Telephone was awarded $2.7 million and is beginning work on broadband infrastructure in Mason County.

- McDaniel Telephone has begun work on improving its Digital Subscriber Line (DSL) service (see guide to terminology page 33) but has not yet expended any of its $1.2 million grant.

- Public Utility District 1 in Okanogan County was awarded $5.5 million and has begun work on its project to provide broadband access to 6,000 homes in its service area.

- The Quinault Indian Nation and the Jamestown S'Klallam Tribe used their grants to develop plans for broadband deployment in their communities.

Washington has also been the beneficiary of large-scale private investment. Verizon and AT&T are aggressively building out wireless networks and much of their investment will result in 4G coverage for heavily populated portions of the state. Cable television networks have continued their consistent record of investment, and wireline providers CenturyLink and Frontier are enhancing their broadband service, committing $80 million and $40 million respectively to major deployment projects in

the next few years.

Future focus: 2012

Major improvements to the broadband infrastructure of the state are already underway. The challenge for the Washington State Broadband Office (WSBO), broadband stakeholders and policy makers will be to capitalize on those improvements. WSBO will focus on three activities and four goals we believe will help the state realize a return on those investments.

The activities are:

1. Developing Regional Technology Planning Teams

2. Supporting an applications contest

3. Maintaining and improving our mapping.

The goals are:

1. Finding value in the network – identifying and quantifying the value of robust broadband in the state.

2. Promoting telehealth in Washington – supporting the work of the Washington State Health Care Authority and its partners in the eHealth Collaborative Enterprise.

3. Encouraging infrastructure integration – leveraging public and private broadband investment through coordination with federal, state and local infrastructure projects.

4. Integrating broadband with other Department of Commerce programs – realizing the ARRA goals of job creation and economic development by working closely with economic development staff on programs already underway.

INTRODUCTION

2011 was a watershed year for broadband connectivity in Washington. Planned public and private investment in broadband in the state is at a high point. Technologies are competing for broadband business in a demand-rich market and technology is one of the state's stronger sectors in a recovering economy. Although connectivity is not yet ubiquitous, service is expanding and speeds are increasing.

Thanks to support from the Washington State Legislature, the NTIA and broadband providers across the state, WSBO is able to collect and validate broadband service information every six months to support the state broadband map and contribute to the National Broadband Map.

In this document, the Washington State Broadband Office of the state Department of Commerce presents its annual report on Broadband Mapping, Deployment and Adoption, as envisioned in RCW 43.330.409.

Broadband is growing

The state of broadband in Washington State looks brighter than it did just a year ago thanks to a combination of improved mapping data and a surge of private and public investment in broadband infrastructure and programs to increase broadband awareness and adoption. Data collected by the FCC shows that there are more than 1.3 million connections in Washington at a rate of 3 Mbps or more[1] as of December 30, 2010.

Yet there are still unserved and underserved areas in Washington. WSBO's 2010 report "Creating Opportunities for Washington: A Report on

Broadband in Washington State" found that 4.3 percent of Washington households (98,011 households or 245,027 people) had no access to any kind of broadband service. By the end of 2011 those figures had changed. Just 3.88 percent of households had no access to broadband and 2.3 percent of the state's households only had access to speeds of 768 kbps to 3 Mbps. These improvements, while modest, came during a year when major providers and BTOP grantees had barely started their network build-outs. (Figures 1 and 2).

FIGURE 1: Percentage of Households Unserved
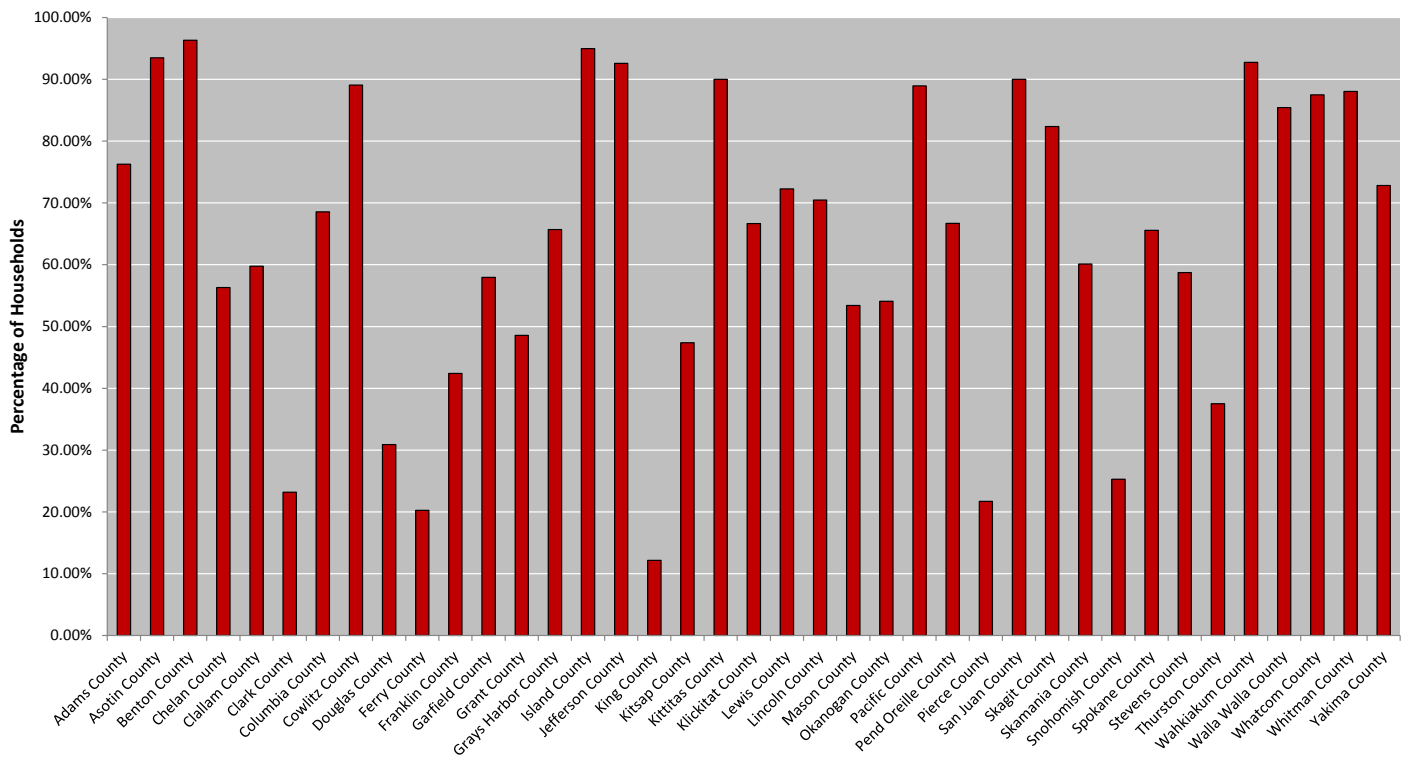
Source: Sanborn

Source: Sanborn

Where gaps still exist

Portions of the state with no provider listed remain in sparsely populated areas (less than 20 people per square mile) and/or in particularly rugged terrain such as the foothills of the Cascade Mountains. However, some sparsely populated areas are also rich agricultural lands where broadband-enabled technologies could help increase farm production. Other unserved parts of the state also have high percentages of Department and Social Health Services (DSHS) clients. For instance, Yakima, Grays Harbor, Whatcom, Ferry and Clallam counties all have areas with no broadband provider, and list between 34 to 50 per every 100 residents as clients of medical, economic or vocational rehabilitation services from DSHS. Not only might these communities benefit from the economic development opportunities broadband offers, but they also could more easily access and apply for services through the social services portal WashingtonConnection.org.[2]

More than just availability

Broadband networks in Washington represent a significant opportunity and advantage for the state's economy and residents, but the state will need more than service availability in order to take advantage of the opportunity; we will need substantial commitment to adoption, literacy, and the digital economy.

National and state programs working on adoption are still refining a definition of digital literacy. The Communities Connect Network (CCN), a consortium of community technology experts from the private, nonprofit and public sectors in Washington State defines technology literacy as attaining the "skills required in order to utilize the equipment and Internet effectively for essential services, education, employment, civic engagement and cultural participation."[3]

Even with a common definition, digital literacy can be difficult to measure. Programs can measure the

number of people who have taken basic and advanced classes, but in some cases they have no accurate way to measure which participants go on to subscribe to broadband service and use it for job searches or business development.[4] In some cases, success is likely to require a combination of services and support, including broadband awareness, skills training, broadband affordability, and technical or language support.

Washington has a track record on digital literacy, most notably the Community Technology Opportunity Program (CTOP) of 2008-2009[5] which identified early benchmarks for assessing programmatic success and led to the development of resources and evaluation methodology now in use by ARRA recipients such as CCN and the WSBO. Comprehensive measurement requires sufficient funding and collaboration to collect and analyze the data. Washington State is fortunate to have highly skilled, experienced, and internationally recognized evaluators working in this sector.

In the year ahead, WSBO plans to work more closely with the BTOP grantees focused on adoption programs, to identify and where possible address the challenges of defining and measuring digital literacy for state planning purposes. WSBO also intends to participate in discussions with the NTIA working group that will examine evaluation challenges, questions, and methodologies. The feedback will be used to inform technical assistance to BTOP recipients, facilitate the sharing of evaluation expertise, tools and systems, and build relationships among grantees.

In 2011, wireline broadband availability increased, though not at the same rate for all markets. According to data collected by Sanborn, Inc., WSBO's mapping vendor, 76 percent of the households in Washington had access to 25 Mbps in late 2010. A year later, 79 (78.74) percent of Washington households had access at 25 Mbps, a three percent increase in one year.

The most significant speed growth occurred most often in and around the state's major population centers, Seattle, Spokane, the TriCities and Vancouver.

This increase in the number of households with access to higher broadband speeds was, in part, the result of the broader deployment of more advanced and more standard transmission technologies. For instance, Comcast's service area includes 62 percent of the state's households. And cable providers, including Comcast, reported a significant increase in the number of areas served by the latest generation of Cable broadband technology (DOCSIS 3.0[6]) between data submissions in 2010 and 2011.

Photo: WSBO

Broadband Mapping

Washington's broadband map at broadband.wa.gov, first authorized by the legislature in 2009 and updated semiannually thanks to support from the NTIA, has developed significantly and now reflects validated service area data from 112 providers, nearly double the number that participated in the April 2010 submission.

During 2011, WSBO continued its broadband mapping work with the mapping vendor, Sanborn. Providers are asked to submit broadband availability data twice per year, and the map is updated semi-annually. Map updates occurred in June 2011 and November 2011. Each data submission round also gives WSBO and Sanborn an opportunity to improve the map's accuracy. The state's interactive broadband map[7] not only began using 2010 Census data but also integrated demographic information such as income and education levels as options available for filtering data. Consumer feedback is available on the state interactive map.

As providers have supplied more complete and detailed information about their service areas, it has become apparent that network speeds are increasing noticeably. In 2010, data showed that 76 percent of households in the state had access to broadband at speeds of 25 Mbps or more. By June 2011, nearly 80 percent of Washington residents had access at that speed. Washington is seeing robust investment by a diversity of providers that could be a significant benefit for the state's economy in years to come. The state's three largest wireline providers have made commitments to improve broadband deployment and adoption efforts in connection with recent mergers and acquisitions. For example, CenturyLink has agreed to invest $80 million in broadband infrastructure in Washington State as part of its merger with Qwest.[8] These agreements are discussed in more detail later in the report.

Wireless

In 2011, Washington's wireless networks increased their maximum offered speeds significantly, as indicated in the following maps. Rural areas of central Washington and the Olympic Peninsula went from wireless maximum speeds of around 3 Mbps (light brown areas on the maps) to maximum speeds of nearly 10 Mbps (green). The Seattle and Vancouver metro areas jumped to 25 Mbps. Wireless speeds experienced by users depend significantly on distance from the nearest tower, the number of users active in the area, obstructions etc., but wireless capacity in some areas appears to be reaching speeds competitive with wireline last-mile technologies. (See Figures 3 and 4.)

As Washington communities increased their rates of broadband access and speed, the number of subscribers to those services increased. The FCC requires most broadband service providers to provide subscriber information through its Form 477.[9] The WUTC analyzed the last available set of aggregated 477 data to determine where subscribership had increased or decreased. Between June and December 2010, subscribers decreased slightly in Clallam and Clark counties (1 percent and 3 percent respectively). They also decreased by 22 percent in Ferry County but the number is skewed by a small population base (71 subscribers stopped their service). Other counties posted sizeable increases in subscribership. Pend Oreille County saw a 107 percent increase; subscribership rose by 55 percent in Whitman County and one of the state's most populated counties, Snohomish County, saw a 17 percent increase in subscribers (Figure 5).

FIGURE 3: Washington State Maximum Advertised Wireless Broadband Speeds As of June 31, 2010
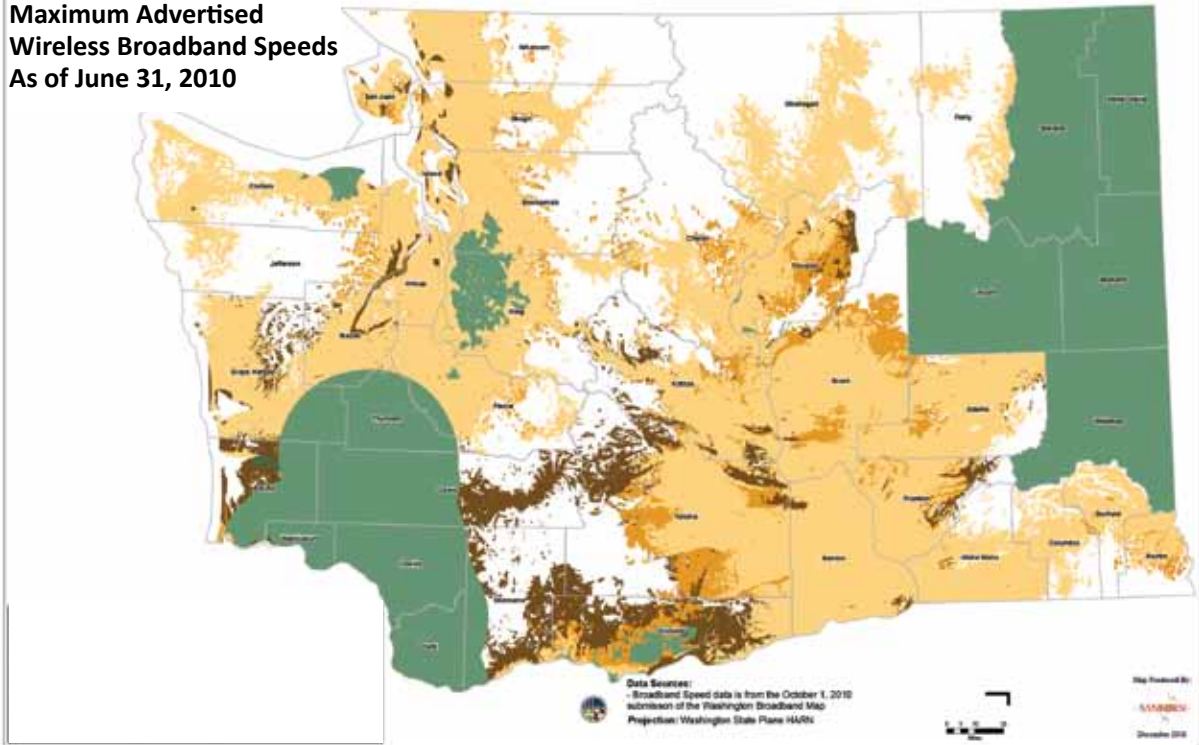
Source: Sanborn

FIGURE 4: Washington State Maximum Advertised Wireless Broadband Speeds As of June 31, 2011
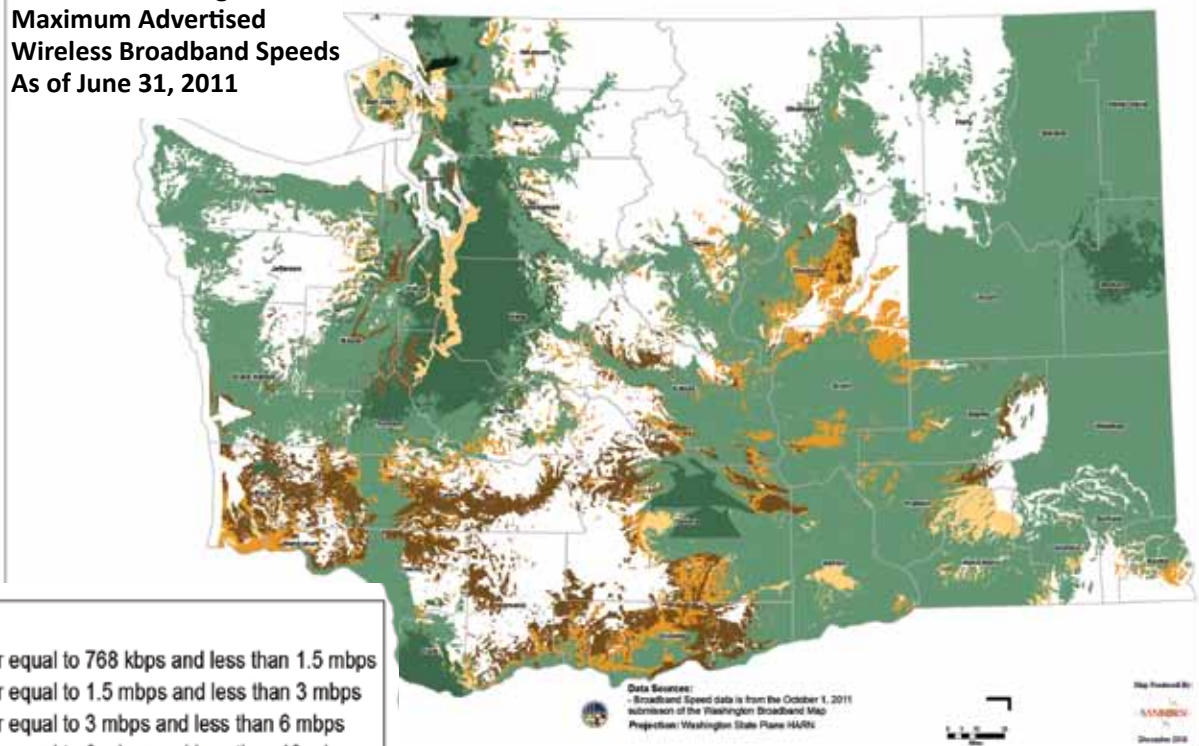
Source: Sanborn

Legend

- Greater than or equal to 768 kbps and less than 1.5 mbps
- Greater than or equal to 1.5 mbps and less than 3 mbps
- Greater than or equal to 3 mbps and less than 6 mbps
- Greater than or equal to 6 mbps and less than 10 mbps
- Greater than or equal to 10 mbps and less than 25 mbps
- Greater than or equal to 25 mbps

Figure 5: Percentage Change in Broadband Subscriptions during 2010 by County
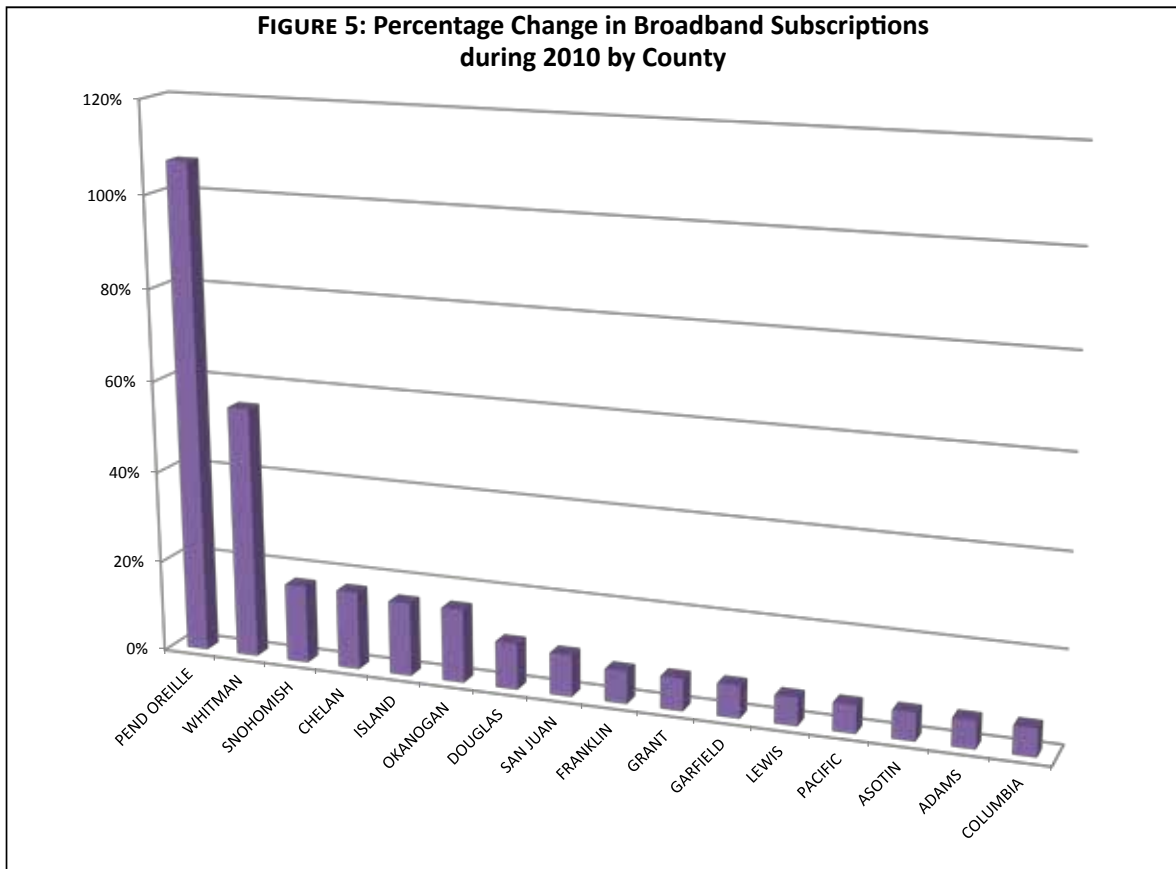
Source: Washington Utilities and Transportation Commission

How does Washington rank?

As one might expect in a sector as dynamic as broadband, different sources provide different answers to the question of how Washington's broadband capabilities stack up when compared to other states. Yet knowing where Washington stands is important if the state is to keep — or improve — our competitive advantage in the export, technology, and e-commerce sectors.

The Washington State Department of Commerce tracks Washington against nine competitor states — usually Texas, Colorado, North Carolina, Maryland, Oregon, Idaho, Virginia, California and Massachusetts.[10] As WSBO reviewed the state's ranking in various studies, special attention was paid to our ranking relative to these competitor states. (Figure 6).

Figure 6: Washington Ranking Among States with Access to 3 mbps

Rank	State	Speed Combo DL>3UL>.07
19	Michigan	99.1%
20	Utah	99.0%
21	South Carolina	99.0%
22	Nebraska	99.0%
23	Washington	98.9%
24	North Dakota	98.9%
25	Tennessee	98.9%
26	Maine	98.7%
27	Oregon	98.7%

Source: National Broadband Map

Availability: 23rd out of 50

The National Broadband Map,[11] compiled from data collected by WSBO and similar broadband programs across the country, ranks Washington in the middle range of states, number 23 of 56 states and territories participating in the project. The map is compiled with data voluntarily made available by providers, and reflects the maximum advertised speeds available as reported in December 2010.

Even with a ranking of 23rd, data from the map indicates that 98.9 percent of the people in Washington State have access to some form of broadband at speeds in excess of 3 Mbps download and 768 kbps upload. "Competitor" states,

Maryland, Colorado, Texas and Massachusetts have higher percentages of households with access to broadband at 3 Mbps download, but the difference between the most connected states and Washington is only 1.1 percentage points.

More choices than most of the U.S.

Forty-four percent of Washingtonians have access to at least four wireline providers – significantly above the national average of 9.3 percent. As indicated by the comparison below (Figure 7), most Americans have access to only two or three wireline providers.

FIGURE 7: Washingtonians with access to at least four wireline providers

Number of Wireless Providers	Percent Population		Nationwide
0	2.2%		4.1%
1	7.8%		11.6%
2	20.2%		44.4%
3	17.2%		27.6%
4	44.5%		9.3%
5	7.7%		2.3%
6	0.4%		0.5%
7	0.1%		0.1%
8+	0.0%		0.1%

Nationwide average

Percent Washington Population
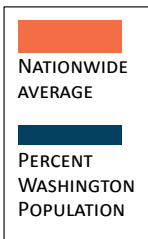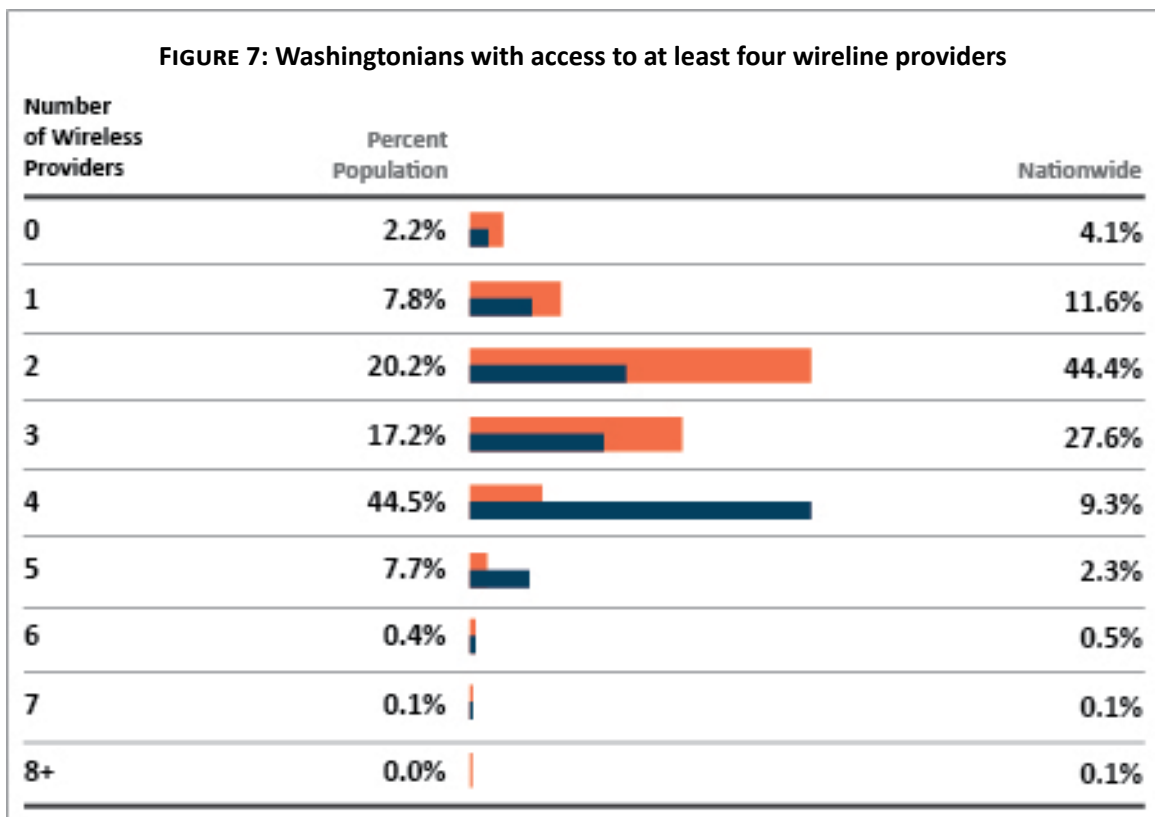
Source: National Broadband Map

53 percent of Washingtonians have access to at least five wireless providers (Figure 8) – significantly above the national average of 24.8 percent.

FIGURE 8: Washingtonians with access to at least five wireless providers

Number of Wireless Providers	Percent Population	Nationwide
0	0.3%	1.0%
1	1.4%	3.5%
2	3.6%	6.9%
3	8.2%	10.9%
4	12.2%	23.4%
5	53.5%	24.8%
6	8.4%	17.2%
7	8.6%	6.0%
8+	3.6%	6.4%

NATIONWIDE AVERAGE

PERCENT WASHINGTON POPULATION
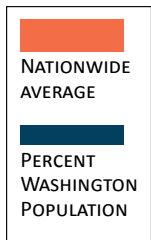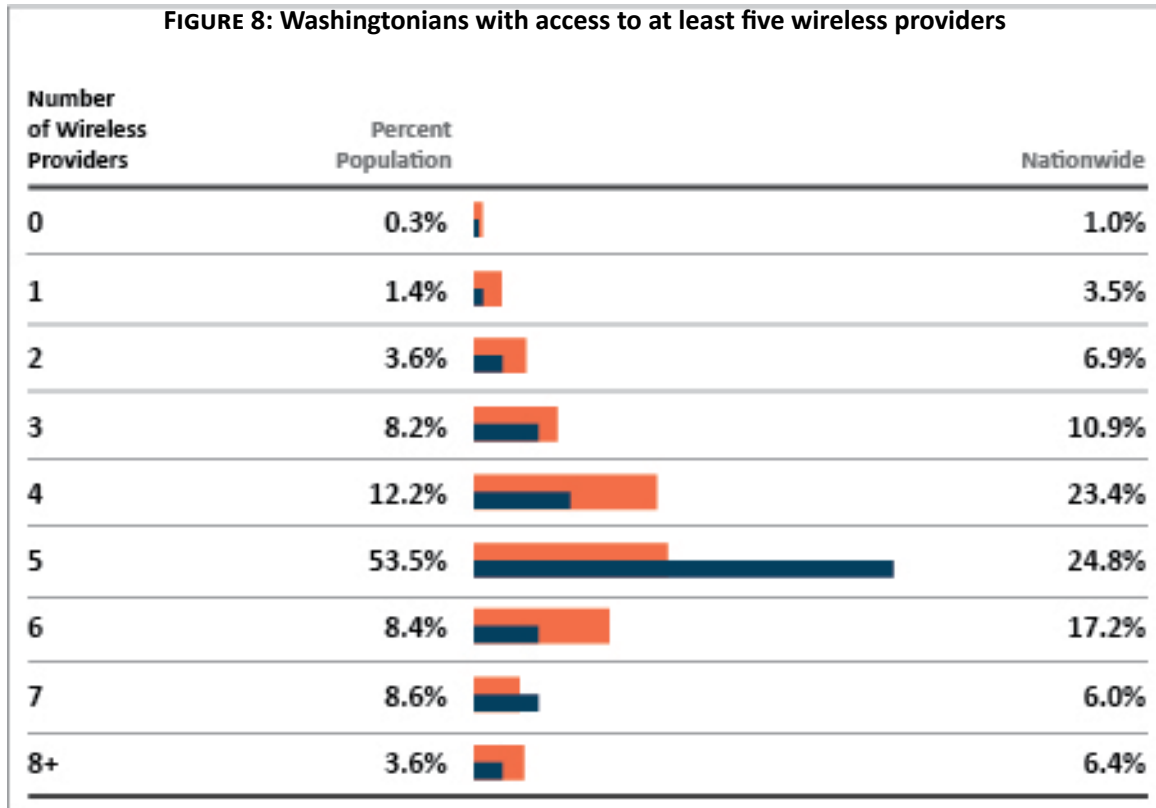
Source: National Broadband Map

Near the top in broadband adoption

Recent studies show Washingtonians use broadband services more readily than most other states. According to the NTIA study based on data collected by the U.S. Census Bureau,[12] Washington has the nation's third highest adoption rate at 77 percent. (Figure 9) Washingtonians in rural areas are only 9 percent less likely to use broadband services than those in urban areas. By comparison, Mississippi had the greatest disparity between urban and rural broadband use: 41 percent in rural areas and 67 percent

in urban areas, while California had virtually no difference in adoption rates between its urban and rural regions (73 percent) (Figure 10).

FIGURE 9: Broadband Use by State

National Ranking	State	
3	Washington	
4	Massachusettes	
6	Oregon	
10	Maryland	
13	California	
17	Colorado	
15	Idaho	
23	Virginia	
34	Texas	
37	North Carolina	
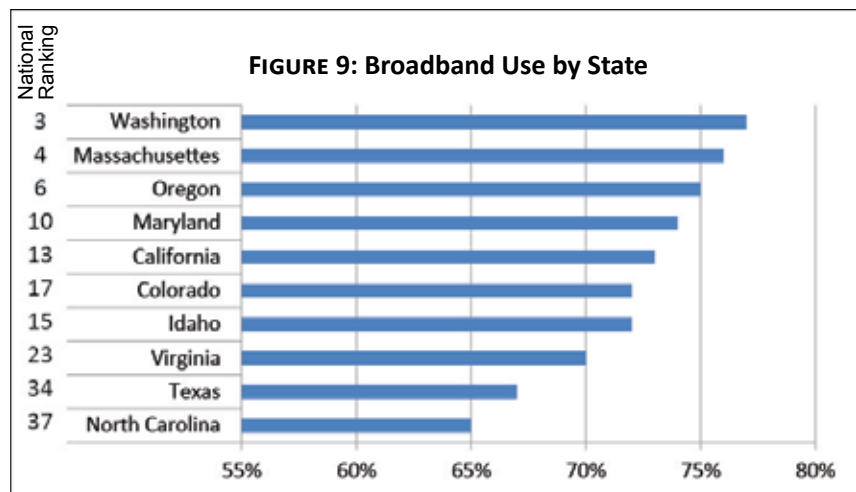
Source: NTIA report

Multiple views of the state's broadband

Provider data gives us a snapshot of areas they serve. Data from the U.S. Census and NTIA tells us how many residents use broadband at any location (Figure 10) and FCC data from 477 Reports tells us about household broadband subscriptions. The combination of these three data points are best available indicators of broadband's reach.

In detail: subscriber information from the FCC

The FCC collects subscriber information and publishes an annual report of that data. In a data set from December 2010, the FCC reported that Washington had 1.3 million households with connections above 3 Mbps (download) for a subscriber ratio of 0.51.[13]

Washington ranks in the top 10 states (7th place) among all states in the United States with a subscriber ratio of 0.51 for connection speeds at 3 Mbps download/768 upload. The subscribership ratio averaged for the entire U.S. is 0.35. States highlighted in green in Figure 11 are "competitor" states to which Washington's economy is often compared.

Notably, the greatest relative change in Washington's broadband subscriptions during 2010 was in several rural counties, as illustrated by Figure 11.[14]

FIGURE 10: Broadband Internet Use in Urban and Rural Locations, by State, 2010 (by Overall Household Broadband Adoption Rate)
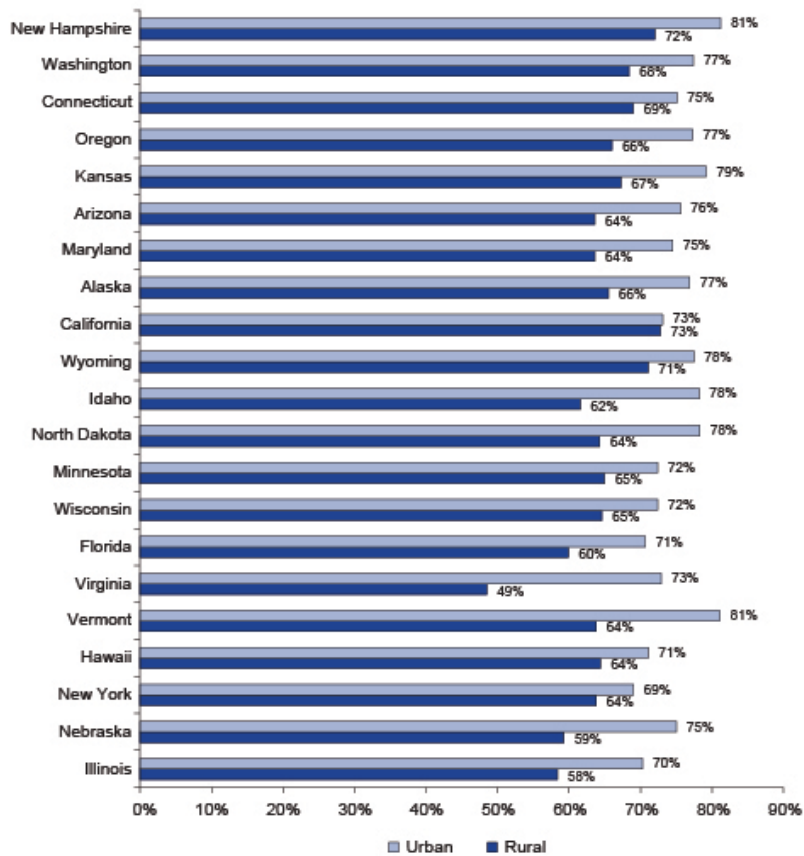
Source: NTIA report, November 2011

FIGURE 11: Broadband Subscriptions by State as of December 31, 2010
(Numbers shown in thousands)

State	Connections	Households	Sub. Ratio
New Jersey	2,194	3,192	0.69
Massachusetts	1,640	2,568	0.64
Delaware	210	343	0.61
Maryland	1,304	2,158	0.60
Virginia	1,652	3,052	0.54
New Hampshire	267	513	0.52
Washington	1,321	2,615	0.51
Colorado	988	1,978	0.50
Vermont	125	248	0.50
Connecticut	658	1,358	0.48
Oregon	694	1,522	0.46
Pennsylvania	2,275	4,927	0.46
New York	3,316	7,339	0.45
Utah	390	894	0.44
California	5,137	12,634	0.41

Source: Federal Communications Commission 477 Report

Success stories

During the next few years, Washington will see significant further investment in broadband from both public and private providers. Yet many communities are already the beneficiaries of broadband investment from those same sources. For instance, just four years ago the Washington town of Krupp, on the border between Lincoln and Grant counties had only dial-up service. Mayor Tracy Lesser said he knew something had to be done when he tried to install and update an antivirus program on his computer.

"The internet service was constantly kicking me off," Lesser said. "It took eight or 10 hours to install the program."

Lesser, and a local wireless internet service provider, Odessa Office Equipment, came up with a solution: to augment Odessa's tower in Ephrata with a repeater on a grain elevator owned by Central Washington Grain. Because the costs of this new system would have been more than the 40 or so residents of the town could bear alone, Krupp kicked in $1,000 toward the equipment. And Central Washington Grain got free internet service in exchange for the use of the elevator.

Now customers in the area get 10 Mbps in both upload and download speeds, said Marlon Schafer, owner of Odessa Office. Lesser said one home business north of town sells specialty grains online and a local businessman who deals in antique and used car parts is also considering an online venture. Tracy Lesser now has another problem. His family constantly runs the risk of exceeding their contracted monthly limit of data and paying more than they budgeted for broadband thanks to one of his children.

"I have a son who's learning a lot of things about a lot of things," Lesser said. "The internet is a fantastic tool."

WSBO posts news, success stories and grant opportunities on its website: Broadband.wa.gov.

You can also follow us on

RSS   Twitter   facebook.

QR code for Washington State Broadband Office

During 2011 Washington providers dramatically expanded their networks, and community groups around the state began significant new efforts to stimulate adoption, literacy and digital inclusion.

Among the most significant events in broadband deployment and adoption in 2011 was the beginning of direct investment by the federal government, using funds from the ARRA. Federal funding is supporting broadband work in Washington through two federal agencies, the NTIA and the USDA RUS. Most grant recipients received their award and began work in 2011.

BTOP grantees began work

ARRA provided $4.7 billion to NTIA to support the deployment of broadband infrastructure, enhance and expand public computer centers, encourage sustainable adoption of broadband service, and develop and maintain a nationwide public map of broadband service capability and availability. NTIA made all grant awards by September 30, 2010.[15]

All told, recipients of BTOP funding through NTIA were awarded more than $165 million for Washington infrastructure projects.[16] The largest award ($140 million) went to NoaNet,[17] a nonprofit open-access broadband network formed by several Washington public utility districts. NoaNet's broadband project will touch 170 Washington communities and 2,200 schools, hospitals, libraries, colleges and public safety facilities.[18] In 2011, the project broke ground on nearly 1,000 miles of new fiber routes and had completed more than 170 miles by mid-September. For more information on the NoaNet project's progress, see http://www.washingtonbroadband.org/broadband-expansion.aspx.

In June 2011, Pend Oreille Public Utility District (PUD) No. 1 began construction on its fiber-to-the-premises project that will eventually span 565 miles and provide wholesale broadband access to approximately 5,000 households, 360 businesses and 24 community anchor institutions. Eighty percent of the funds ($27.2 million) for the $34 million project came from a BTOP grant. When the

Photo: Pend Oreille PUD

Ribbon-cutting ceremony for Pend Oreille County Public Utility District #1 fiber project. Pictured left to right: Joe Onley, Commuity Network System Manager, Dan Peterson, Commissioner District 1, Rick larson, Commissioner District 3 and Bob Geddes, General Manager

project is completed in April 2013, the PUD also will have added a backbone line that provides critical redundancy for their network.[19]

Adoption and Public Computer Centers

The EdLab Group was awarded $4.1 million in BTOP funding for the development of public computing centers to provide broadband access and skills training for communities that have historically had low broadband adoption rates in 11 counties across the state. This Communities Connect Network Project (CCNP) is investing in direct resident services, enhanced technology, and program capacity building for community institution partners in the public and non-profit sectors. This unique project also includes the state justice system. By the third quarter of 2011, EdLab Group reported that it had 21 subrecipients including organizations as diverse as the Chinese Information and Service Center, the Edith Bishel Center for the Blind and Visually Impaired, and the Yakama Nation Library. The participating public computing centers supplied over 9,500 computer training hours to 2,900 weekly users, on average, in the third quarter of 2011. By end of the fourth quarter of 2011, CCNP delivered 177 new or replacement workstations to these centers. Three public computer centers received updated broadband connectivity, one center got new broadband wireless connectivity and 89 additional hours of access to public computer centers were added as a result of BTOP funds. The funds also made possible a variety of training programs including basic internet and computer use, office skills, English as a Second Language and college preparatory classes.[20] A partnership with the Workforce Development Council has provided additional learning and online tools, such as the Self-Sufficiency Calculator, to trainees. In addition, Train-the-Trainer modules have been delivered on social media, job search skills, and financial literacy; upcoming are access to legal services, youth programming, and assistive technologies.

The project also launched a new CommunitiesConnect.org resource hub featuring a state directory of public computing centers, and a library of educational materials and best practices shared nationally.

One Economy received $28 million for Sustainable Adoption programs in 60 cities and towns nationwide. Seattle and King County were locations identified in their nationwide grant, and by June 2011, One Economy reported it was in negotiations with public housing organizations to install a wireless mesh network in housing for low-income families. Once the network is installed,

By the third quarter of 2011, EdLab Group reported that it had 21 subrecipients including organizations as diverse as the Chinese Information and Technology Center, the Edith Bishel Center for the Blind and Visually Impaired and the Yakama Nation Library.

One Economy anticipates training Community Technology Associates to maintain the network and train residents on use of the internet.[21] At the end of 2011, One Economy launched the national Connect2Compete initiative. There has been some delay in implementation as the organization restructures. They are still moving forward on the BTOP implementation, but with broadband industry developments are also looking at the feasibility of partnering on direct wireless connections to residents. The EdLab Group Communities Connect Network sites are also promoting the new home broadband discounts available to low-income residents through Comcast and CenturyLink.

The Inland Northwest Community Access Network (Tincan) in Spokane was awarded $1.2 million for development and support of Public Computer Centers[22] and just more than $980,000 to support Sustainable Adoption[23] programs. By June 2011, Tincan had facilitated installation of 235 new publically accessible workstations in the region and was reporting an average of 4,823 users per week. Tincan had also expanded training in its main lab and along with project partners (such as the YWCA) had conducted training on social media, game development and film. Additionally, Tincan expanded training with an emphasis on digital literacy and workforce readiness as part of implementation of its Microsoft Elevate America grants.

Toledo Telephone was awarded $2.1 million for its Sustainable Adoption[24] program. Toledo Telephone's project offers discounted broadband service and a loaned laptop to participants who complete a basic digital literacy course, also provided by the company. By June 2011, the company had engaged 746 participants and added 246 new broadband subscribers. Among their strategies was the combination of outreach efforts with the Cowlitz Tribe annual tribal council meeting and traditional salmon bake.

Zero Divide received $1.3 million for its multistate Sustainable Adoption[25] program. Zero Divide identified King, Snohomish, Pierce, Skagit and Island

Photo: Tincan

counties as their areas of focus in Washington State. Zero Divide's grant funding provided a variety of video, animation, art and editing training to 145 girls and young women through the Reel Grrls organization in Seattle. The project goal of increasing the business enterprise capacity of these organizations is starting to be realized with a Reel Grrls production team contracting out their services after being trained.

A Washington State Council on Digital Inclusion meets quarterly to share best practices, leverage partnerships, and share broadband adoption strategies and research.

USDA programs and BIP

The USDA has a longstanding commitment to broadband deployment and service improvement in rural communities. For many years, a variety of USDA rural development programs have funded either broadband infrastructure or hardware and development. USDA's longstanding relationships with Washington providers and longer project timelines enable these programs to complement the more accelerated approach of the BTOP grants described earlier in this report. USDA is a key channel for broadband funding under ARRA. The grants were awarded through the agency's RUS BIP.[26] All told, Washington BIP applicants were awarded $49 million in funding by USDA and many have already begun work. The largest award was made to Public Utility District No. 1 of Chelan County, which won $25 million for a major fiber deployment project,[27] but PUD commissioners voted to cancel the project in April of 2011, and declined the award.[28]

The second largest grant of $14.3 million was awarded to Ecliptixnet Broadband for construction of a fixed and mobile wireless broadband network that will provide access to 90 percent of the rural properties in Ferry, Stevens and Spokane counties. According to the company's most recent report on

Recovery.gov, Ecliptixnet has completed acquisition and engineering contract work and is waiting for funds to be advanced from USDA.[29]

Hood Canal Telephone was awarded $2.7 million for broadband infrastructure in Mason County. The company completed an eight-month permitting process in December and plans to procure materials in early 2012.

McDaniel Telephone Company in Salkum has begun work on its project to improve digital subscriber line (DSL) broadband in its service area, but has not yet expended any of the $1.2 million it was awarded.[30]

Public Utility District No. 1 of Okanogan County reports that it has spent $389,000 of its $5.5 million award. It is nearly finished with engineering design and is waiting on environmental approval. When complete the project will leverage an existing fiber backbone by adding wireless access points and provide high-speed broadband access to more than 6,000 homes in the PUD service area that currently lack such access.

Two of the state's tribes were also awarded BIP grants. The Quinault Indian Nation was awarded $200,000 for technical assistance to develop a plan for building broadband infrastructure. The tribe has spent $177,000 of the award on that work and the plan is set to be presented to the tribal council soon.[31] Jamestown S'Klallam Tribe has spent $25,000 of its $196,000 grant award and has completed a basic design and concept of their broadband plan and is also nearly finished with its strategy plan.[32]

Among the companies that benefitted from ARRA broadband build-outs is Pilchuck Contractors Inc. of Kirkland, Washington. The company specializes in underground utilities work and has the capacity to install gas, electric, cable and broadband utilities, said Ben Nelson, vice president of operations.

In the early part of 2011, Pilchuck employed 300 people. In March, the company lost its contract

with Puget Sound Energy and was forced to lay off 250 workers. That's about the time the company got news that they would be doing broadband infrastructure work for NoaNet. By July, Pilchuck employees were working in the Davenport area of Eastern Washington and the Longview area of Southwest Washington. The company has been able to restore some of the family-wage union jobs that were permanently lost earlier in the year.

"We're up over 100 employees," Nelson said. "(The NoaNet work) has been a fair percentage of our revenue."

Nelson said he expects the work in this round of the NoaNet build out will continue for about six more months. And Pilchuck also hopes to get more work when NoaNet begins its second round of infrastructure next year.

Photo: Pace Engineers, Inc.

University of Washington (UW) becomes Gig.U partner

Encouraging private enterprise at the other end of the scale is the purpose behind another broadband project in Washington. In the fall of 2011, the UW became one of 30 research universities across the nation to join Gig.U, a project to accelerate deployment of next-generation ultra-high-speed networks and applications to their surrounding communities. In cooperation with the City of Seattle, the UW wants to bring the same high-speed

networking available on campus to surrounding businesses and households by lowering deployment costs for commercial providers. Seattle's South Lake Union district has been targeted for the project's first round because of its concentration of technology, biomedical research, and the UW's Medicine Research Campus. The aim of the project, which is not expected to use any federal money, is to attract startup companies, bolster the local economy, and stimulate next-generation innovation.[33]

Private investment by providers

While private providers are being asked to consider involvement in the Gig.U project, some of those same providers have also committed to major investment in broadband in the state for other reasons. (Figure 12)

Broadband providers CenturyLink and Qwest merged in 2011. As part of a settlement agreement negotiated by the company, WUTC staff, and the Public Counsel Unit of the Washington State Office of the Attorney General, the combined company will invest $80 million in its networks in Washington, including the expansion of fiber optic infrastructure in many communities.

Frontier Communications committed to $40 million in network investment in a similar regulatory proceeding at the WUTC in 2010, when they acquired the landline business of Verizon Northwest. Frontier has committed to increasing availability of broadband at

download speeds of 3 Mbps to at least 85 percent of transferred lines by the end of 2013, and to increase that speed to 4 Mbps by 2015. Frontier representatives report they have already deployed broadband in 25 communities as of March 2011.

While wireline broadband improved because of mergers, head-to-head competition among wireless broadband providers also pumped millions of dollars worth of infrastructure into the state's broadband ecosystem. Both Verizon and AT&T heavily promoted new 4G LTE service to the state's metropolitan areas of Seattle, Tacoma, Everett, Spokane and Olympia. AT&T said it has spent $1.3 billion in network upgrades in Washington between 2008 and 2010, and that it intended to spend still more in the state as part of a $19 billion upgrade to its national system.

Verizon said the company had invested $114 million in infrastructure in the state during 2010 and by August 2011, had spent an additional $94.4 million. Included in that infrastructure investment was the construction of new cell towers, hardware and software upgrades, upgraded switch centers and wireless transmitters to improve reception in public buildings.

FIGURE 12: Investment Commitments in Selected Washington Networks
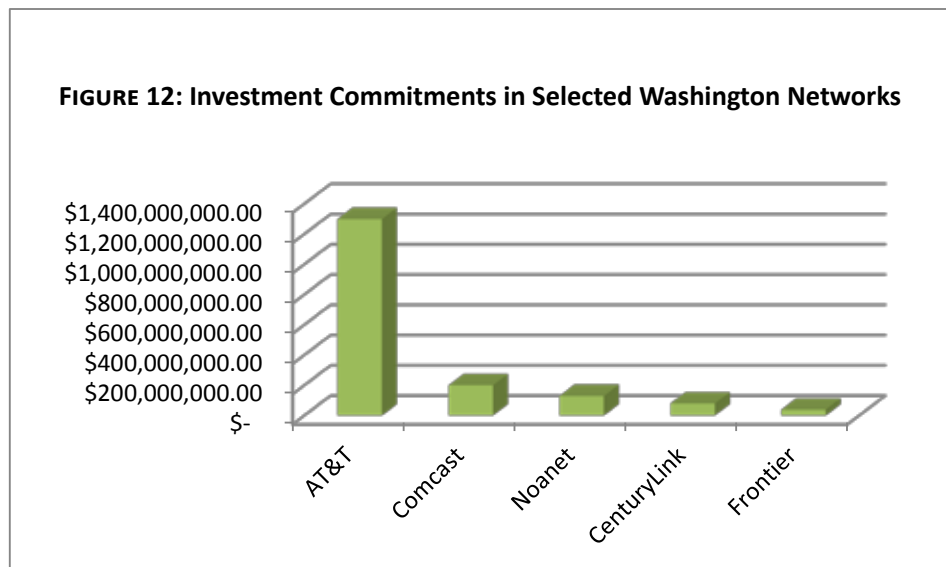
Source: Compiled by WSBO

The last year has seen tremendous change in the broadband landscape in Washington, extending beyond the value created by ARRA funded broadband build-out. The state continues to suffer through an economic recession with the state unemployment rate hovering at 9 percent, and some counties still posting unemployment rates in excess of 12 percent.[34] Revenue forecasts have continued to predict shortfalls in the state budget.[35]

Department of Revenue e-Commerce and Information and Communication Technologies (ICT) numbers

One bright spot in the recovering economy has been the growth of gross business income in the online sales sector. Between 2009 and 2010, income for wired telecommunication companies grew only slightly and wireless telecommunication company income remained essentially flat. Electronic shopping income has exploded however, increasing year-over-year by $4 billion.

These state numbers are in line with national predictions for online sales. According to the Los Angeles Times, retail internet sales topped $176 billion last year and are expected to hit $279 billion by 2015. Nationally, online sales accounts for 9 percent of all retail sales, and over the next few decades are expected to make up more than a quarter of all retail.[36]

FIGURE 13: Broadband-related Gross Business Income in Washington
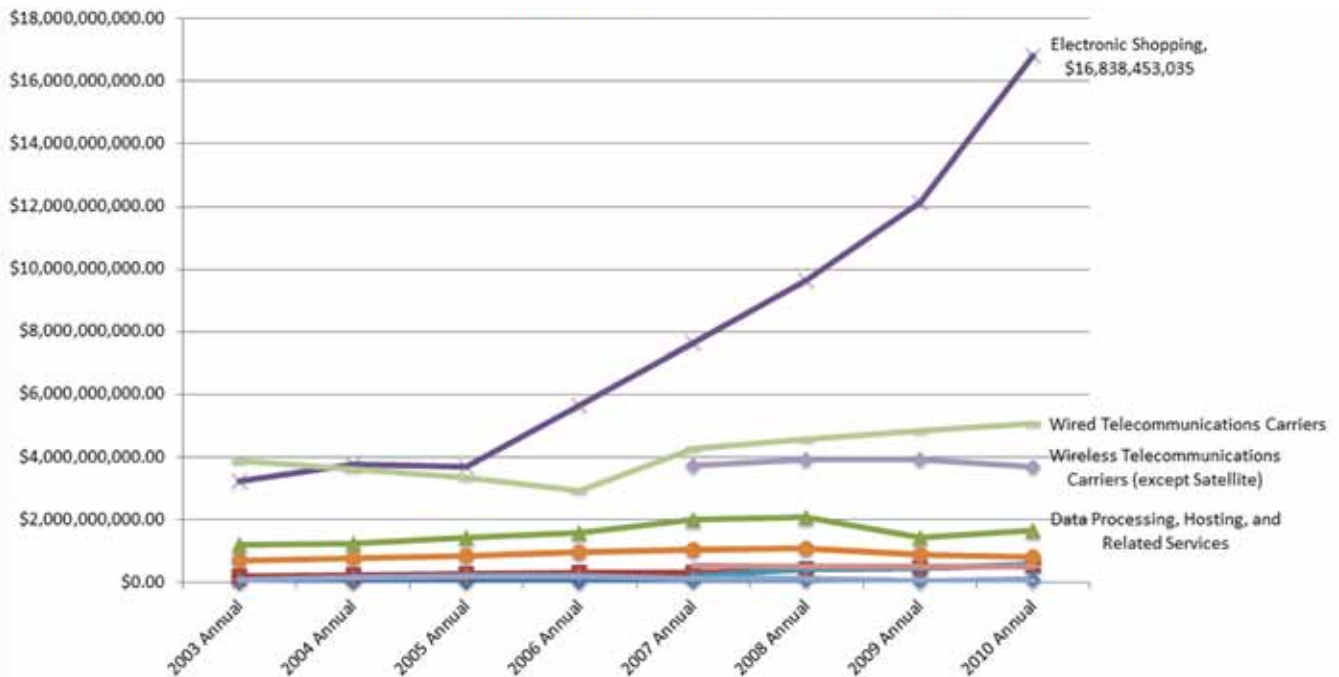
Source: Department of Revenue e-Commerce and ICT numbers

Photos: Buggy Barn

Online sales have contributed not only to the success of Washington's online giants such as Amazon and Microsoft, but also have helped small businesses across the state. In Reardan, a small town in Eastern Washington, two sisters, Pam Soliday and Janet Nesbitt, started a quilt shop in the carriage house of a local farm. Soon after they opened in 1996, they realized that the town itself (pop. 571) would not support their business and began to use broadband to market their unique quilt supplies and patterns. Now they use social media and electronic newsletters to stay in contact with as many as 15,000 people per month. Customers order fabric, supplies and books from as far away as Germany, Italy and Japan.

"We ship something overseas almost daily," Soliday said.

 Their business has grown to the point that they have 15 part-time employees, and some of them commute from the nearest large city, Spokane (pop. 208,000), to work in Reardan. The sisters also began designing their own fabric in 2004. The graphics files for those designs are too large to be sent using their broadband connection, even though they have increased their bandwidth at least half a dozen times since the shop opened. And, a trip to town is still required to upload instructional videos for their website[37] to YouTube.

"We'd always take more speed," Soliday said.

Information and Communications Technologies (ICT) contributions to the state economy

Sales of telecommunications-related products and services contribute significantly to the state's economy. For instance, investments in construction costs and telecommunications services for data centers in Grant County are likely reflected in the high per capita sales numbers in that county. And some less populated counties saw a doubling in telecommunication related sales (including on-line retail sales), between 2005 and 2010. As broadband build-out continues, it is expected that those numbers will continue to increase. (See Figure 14.)

Figure 14: 2010 Per Capita Retail Sales by County for Selected Telecommunications Industries

Per Capita Retail Sales

- ☐ Less than $250
- ☐ $250 - $1,000
- ☐ $1,000 - $20,000
- ☐ Greater than $20,000

Counties whose per capita sales have doubled since 2005
are indicated by rank of percent increase.

County Shapefile: Washington State Department of Ecology
Retail Sales Data: Washington Department of Revenue
Telecommunications Industries here include NAICS codes:
237130, 454111, 454112, 515210, 517110, 517210,
517410, 517911, 518210, 519130

Grassroots movement for broadband

While the authors of the National Broadband Plan and the Governor's Broadband Advisory Committee report were thinking about how best to encourage broadband deployment in underserved areas, consumers in some of those areas of the state began organizing their own efforts. In Klickitat and Skamania counties, a telecommunications committee was formed with the guidance of a Washington State University Extension program originally designed to address poverty in those areas.[38]

As early as 2008, Ferry County was identified as an underserved county, with 30 percent of the county having no access to broadband at any speed in a study conducted on behalf of the WUTC.[39] That study was just one of several to reach the same conclusion. Community members, including economic development staff members and representatives of local government have regularly advocated for improved broadband in their region.

Other groups came together independent of any formal structure. For instance, potential broadband consumers in the Mt. Baker area of Whatcom County, outside of Deming, began to meet regularly to identify ways to improve their broadband access.

Adoption programs by major providers

In 2011, both CenturyLink and Comcast announced broadband programs aimed at low-income individuals and families which do not currently subscribe to their broadband service. CenturyLink introduced its Internet Basics[40] program in October. The program offers broadband at 1.5 Mbps at

$9.95 per month for 12 months and the option to purchase a netbook computer for $150. To qualify, participants must live in a CenturyLink broadband service area; not have subscribed to CenturyLink service in the last 90 days; have no overdue CenturyLink bills or unreturned equipment; and qualify for Lifeline[41] or Washington Telephone Assistance Program.[42]

Comcast introduced its Internet Essentials[43] program in 2011. The Comcast program also includes broadband service for $9.95 per month, and has conditions similar to the CenturyLink plan regarding overdue bills and unreturned equipment. For the Comcast plan, qualifying families must live in a Comcast service area and have at least one child receiving free school lunches through the National School Lunch Program. Comcast also offers families the option of purchasing a computer for $149.99. Both programs include online and/or in-person digital literacy training. Other providers are likely to follow suit adding programs for low-income subscribers to their services.

The price of broadband service has been the second most frequently cited reason why people don't use broadband according to a May 2010 tracking survey conducted by the Pew Internet & American Live Project.[44] The most-often cited reason (48 percent of non-users) was the lack of relevance to their lives. Both the Comcast and CenturyLink programs attempt to address these concerns.

Universal Service reform and the Connect America Fund (CAF)

The FCC took action this year to dramatically change two key mechanisms that have supported telecommunications deployment, the Universal Service Fund (USF) and the intercarrier compensation regime.

The new rules include support for broadband-capable networks as an express goal of the USF program. Though many telecommunications providers that receive support from the universal service fund have deployed broadband service in their networks, until this year the fund was not set up to support them.

The FCC's reforms to the intercarrier compensation regime, which is the foundation of regulated telephone service, are no less significant than the CAF, but are only tangentially related to this report and will be fully reviewed by the WUTC in due course.

Under the new rules:

- broadband services are required as a condition of eligibility for universal service fund support.

- a special fund, entitled the CAF, is created to support the expansion of broadband to reach the unserved, based on a cost model to be developed by the FCC. Wireline providers must offer service with a minimum speed of 4Mbps download and 1 Mbps upload.

- a special fund is created to support mobile broadband. Wireless providers will compete for support to serve unserved areas, and will have to deploy 3G service in two years or 4G service within three years.

- a special fund is created to provide one-time support for wireless service deployment to tribal lands.

- a special fund is created to support the deployment of alternative broadband services in the country's most remote areas.

The FCC's reforms will significantly change the business models used by many of Washington's rural network operators. Some of these providers may reconsider investment plans in light of the order, and challenges have already been filed in other jurisdictions.

Lifeline

As of the publication of this report, the FCC is still working on revisions to its rules governing support for low-income phone subscribers, known as Lifeline/Link-up. Like other USF programs and Washington's own Telephone Assistance Program (WTAP, RCW 80.36.410 et seq), this support has historically been limited to telephone service.

Net Neutrality

The FCC adopted rules this year on what has come to be known as "Net Neutrality" — an issue much debated in the press and in Washington DC. The FCC's new rules seek to strike a balance between the non-discriminatory transmission of data over the internet, and reasonable network management practices that enable providers to keep their networks running efficiently. Though the extent and details of the FCC's involvement in this issue going forward are not yet clear, one early notable provision of the rules requires providers to clearly communicate their network management practices to customers.

New lending by USDA Rural Development

In November 2011, the U.S. Department of Agriculture announced that it would make Rural Development Broadband Loan Program funds to three Washington broadband service providers.[45] Inland Telephone Company was offered $24.8 million to be used to expand Inland's fiber-to-the-premises system and connect new subscribers. Toledo Telephone Company now has access to $18 million in loan funds to install 292 miles of buried fiber throughout a proposed fiber-to-the-premises system. Western Wahkiakum County Telephone in Rosburg also was offered $12 million in UDSA loan funds for a fiber to the home project for all of its subscribers.[46]

Photo : WSBO

WSBO activities

The WSBO focused its activities in 2011 on becoming the state's authoritative source on broadband issues. The program's outreach campaign and communications plan have been focused on making WSBO a credible and technology-neutral clearinghouse for information.

Building on the work of the previous year, WSBO staff accomplished several important goals:

Increased broadband education and awareness. Program staff was asked to speak on expert panels at technology summits and workshops. We discussed the state perspective on timely topics such as emerging information technologies and the opportunities they present for Washington[47] and the approaching spectrum challenge. We reported on the current level of broadband penetration and areas for improvement at professional meetings such as the Association of County & City Information Systems Conference and the West Sound Technology Alliance Summit.[48]

Facilitated discussions with and between private providers. For instance, as NoaNet was completing the permitting process, private providers were able to identify, in conversation with this BTOP grantee, areas of the state that already had broadband

infrastructure so grant money could be used most effectively. After a similar issue arose at a city hall meeting in a small Washington community, NoaNet was also able to reach an agreement with the local provider that helped both organizations expand coverage.

Met with wireless internet service providers from all around the state. Particularly in rural and remote areas of the state, small independent wireless internet service providers (WISPs) are the only providers who can cost-effectively provide broadband service. WISPs are an important center of innovation for Washington's digital economy, and are encouraged to participate in the state's interactive mapping program and policy forums.

Continued stakeholder outreach. WSBO staff supported the work of the Communities Connect/ Ed Lab grantees through participation in the BTOP grantee's Summer Convening event. In September 2011, WSBO hosted its own roundtable event in Davenport, Washington. The date and location were planned to coincide with construction work underway as part of NoaNet fiber installation in Eastern Washington. More than 45 people attended the event.

Began work toward Local Technology Planning Teams. The work plan for the WSBO ARRA grant includes developing a grant program for Local Technology Planning Teams with grant awards of up to $50,000 per year for as many as five teams.[49] As part of the program's work in 2011, staff began exploring possibilities for the program with active community groups already advocating for broadband in their region. We intend to incorporate what we have learned in a program launch in 2012.

Photo: WSBO

WSBO Program Director Will Saunders speaks to the Klickitat Skamania Horizon Telecom Committee

Regional Technology Planning Teams

The Washington Regional Technology Planning Team Program was first envisioned by the High Speed Internet Strategy Working Group in 2008 to support and facilitate the development of local and regional planning teams based on geographic regions, unique anchor tenants, tribes, public safety, and unserved and underserved communities across the state. With grant support from NTIA we will launch the program in 2012.

Over the course of three years, the program will award up to $250,000 annually to organizations and entities that establish or support regional planning efforts designed to identify community needs, set goals, articulate performance expectations, and implementation strategies to achieve shared goals. Eligible projects and entities will include tribal, public safety, community or regional teams that are multi-disciplinary with a preference for entities that have a record of collaboration in unserved and underserved areas. The program will seek to fund projects and entities that address needs including:

- Improve the inventory of data, studies, and other resources to enhance the deployment of broadband technology.

- Create a shared, structured, and formalized process for the collection and dissemination of information critical for the successful deployment of broadband infrastructure and technologies.

- Identify and benchmark regional or community specific information and broadband performance needs, requirements, and interests.

- Develop region or community specific broadband deployment and monitoring plans to address the specific needs, requirements, and interests.

The technology planning teams will be encouraged to work with WSBO and to ensure alignment and coordination between the national, state, and local initiatives.

Application Usage and Development Initiative (Apps Contest)

The Geospatial Data, Social Media, and Washington "Apps to the People" Contest will launch in 2012 with grant support from NTIA. Though still in development, the program will increase the amount and quality of publicly available data, improve the tools available to application developers using Washington data, and sponsor a contest to encourage unique application development.

Photo credit: WSBO

Winthrop, WA

Find economic value in the network

Broadband was a target for the ARRA because of its potential as a key piece of infrastructure for economic development and job creation. As WSBO helps inform state policy and encourages private and public investment in last mile build-outs, identifying and quantifying the economic value in the network will be critical to increasing both deployment and adoption.

Promote telehealth in Washington

Washington is home to a robust health care system that includes everything from life-science research institutions to rural clinics which care for remote communities. Broadband deployment and adoption improve outcomes across the continuum of health care providers and improve the quality of life for all Washington residents.

WSBO supports the Washington State Health Care Authority and its partners in the eHealth Collaborative Enterprise, who work to coordinate statewide activities relating to the federal HITECH Act and state health infrastructure activities.[50]

Maintain and improve the map

Improvements to the state's interactive map will continue along with semiannual data updates in 2012. As consumers and businesses in Washington get familiar with the map, they are also starting to use it as part of their screening process for site selection. Map text suggests that potential broadband subscribers contact providers listed as serving a specific location to verify their service boundaries. This puts subscribers in direct contact with the best information available, but does not cure some underlying shortcomings now apparent in the mapping data structure currently in use around the country. The following are specific shortcomings for which we are seeking solutions:

1. Census-block aggregation: broadband data is reported at the census-block level for blocks over two square miles. This means that in the predominantly rural areas where census blocks are large, an address that cannot be feasibly served will appear to have access to broadband speeds available elsewhere in the area. WSBO is familiar with at least one example of a property that appeared to be in a well-served area, which proved to be unreachable — with negative consequences for a Washington small business. As our experience with broadband data improves, we will seek a simpler and more precise reporting methodology based on served and unserved addresses that preserves proprietary information.

2. Participation not universal: though provider participation in the state broadband initiative has increased significantly since 2009 and the vast majority of providers are participating, there are a few that do not, or that cannot regularly afford the staff time or resources to report. This means that Washingtonians using the state broadband map may have more providers available to them than the map reports.

3. Limited infrastructure data is available: the broadband map shows areas that can be or are served by one or more broadband providers, but not the fiber routes, conduit, transmission paths etc. that make that service possible. For city planners, economic development professionals and network engineers, it would

be quite beneficial to have readily available maps of non-proprietary network infrastructure. This data was envisioned by the NTIA through the collection of middle mile point data, but the reporting is complex, and few providers have chosen to participate to date. As we develop capacity in local and regional technology planning, we will seek opportunities to make this information more readily available.

As we gain confidence in the quality of broadband mapping data available, we will seek opportunities to integrate this data with other mapping applications, as well as maintaining a current selection of comparison datasets relevant to the broadband map. Currently the map reflects service areas where fiber is available to the home or business. Providers in Washington are making significant investments in fiber optic network expansion across the state, which dramatically increases the capacity of the state's broadband network and is increasingly relevant for economic development, infrastructure planning and permitting efforts. WSBO staff will work with providers and mapping experts to bring aggregated information to professional communities who can use it to grow the economy, recover from disasters, and plan development.

Integrate broadband with other Department of Commerce programs

During 2011, WSBO moved into the Washington State Department of Commerce (Commerce). This timely transition aligns us with the state's strategic focus on jobs and the economy, while affording a number of opportunities to efficiently integrate broadband into existing state and local programs. During 2012 and 2013, many of the large middle-mile broadband infrastructure projects will be completed. But by definition these projects do not bring fiber, DSL or wireless broadband capacity to homes and businesses. And the toughest last-mile build-outs will be in areas where a business

case cannot easily be made to support investment in infrastructure. Instead, costs for broadband could be mitigated or alleviated by thinking about broadband as infrastructure like a water main or sewer pipe.

Commerce provides administrative support for the Community Economic Revitalization Board (CERB). CERB finances public infrastructure to encourage new development and expansion in targeted areas.[51] In 2012, WSBO can assist CERB with projects that include broadband with other infrastructure work.

Commerce is the home of the state's Public Works Board. The Board has the authority to administer the state's Public Works Assistance Account and substantial infrastructure programs funded from this account. In 2012, WSBO staff can support broadband project elements in public works projects.[52]

Provide a community toolkit

In 2011, Washington State saw dramatic changes to the broadband ecosystem. And the most current mapping data shows deployment issues still exist in pockets of the state, but much of Washington has access to multiple providers at speeds that are at least appropriate for most households. But access alone does not necessarily create jobs, yield immediate economic development results or improve the quality of life in a community. During 2012 WSBO will study and publish best practices in communities that have maximized the potential of broadband.

Monitor and promote e-government

Washington should be a leader in e-government, just as it is a leader in information and communications technology. As a key service provider to the citizens and businesses of the state, the enterprise of state government has a continuing need for innovation, reform and efficiency across agencies. Broadband can and should enable agency efforts to deliver services online. For example, the Washington Connections project has deployed a user-friendly but sophisticated new eligibility portal for economic support services and is starting to support training of residents in using online government services. In 2012 we will seek to build partnerships to increase awareness of state e-government services, to partner with public computing centers for training, and/or to increase integration of broadband adoption efforts in other state programs.

CONCLUSION

Today Washington is mid-course in its broadband strategy. With policies in place and funding committed, there is activity across the state and moderate progress is already apparent in network speeds offered, areas served, and adoption growth. Jobs have been created, online sales are growing, and digital literacy is proliferating.

In 2008, the High Speed Internet Strategy Working Group set out a broadband strategy consisting of mapping, benchmarking, local technology planning, and adoption initiatives. At that time there was little reliable service area information available and no benchmarks or methodology existed to assess the extent or significance of broadband services. In 2009, the Governor's Broadband Advisory Council directed the Department of Information Services to begin mapping work and to create WSBO as a clearinghouse for information to support public-private partnership in the deployment and adoption of broadband, while maintaining a focus on underserved areas and the "middle mile" that often separates those communities.

Today we have a broadband map as envisioned by the Working Group, are developing partnerships between public and private organizations, and seeing substantial public and private network investment in the "middle mile." In the next year we will launch support for Local Technology Planning Teams and a major adoption initiative in the form of an apps contest.

This body of information and the evolving partnerships that draw upon it have been made possible by a collaborative community of public and private sector stakeholders who design, build, use and reimagine networks that support the state's digital economy and society. As a state, we have much to work with and the next few years should be fruitful and exciting.

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[42] Department of Social and Health Services WTAP information available at http://www.dshs.wa.gov/wtap.shtml

[43] Comcast Internet Essentials program information available at http://internetessentials.com/www.lifeline.gov/lifeline_Consumers.html

[44] Pew Internet and American Life Project Home Broadband 2010 report available at http://www.pewinternet.org/Reports/2010/Home-Broadband-2010/Summary-of-Findings.aspx

[45] United States Department of Agriculture news release No. 0485.11 accessed Dec. 13, 2011 http://www.usda.gov/wps/portal/usda/usdahome?contentid=2011/11/0485.xml&navid=NEWS_RELEASE&navtype=RT&parentnav=LATEST_RELEASES&edeployment_action=retrievecontent

[46] Interview with Carol Larson of Western Wahkiakum County Telephone on Dec. 7, 2011

[47] Technology Alliance 2011 Washington Innovation Summit agenda available at http://www.technology-alliance.com/events/2011summit_agenda.html

[48] More information on West Sound Technology Alliance is available at http://www. westsoundtechnology.org/ events/upcoming-events/oct-20-ww-summit/summit-agenda

[49] BroadbandUSA website http://www2.ntia.doc.gov/grantee/washington-state-department-of-information-services

[50] For more information on the eHealth Collaborative Enterprise see http://www.hca.wa.gov/arra/ehealth.html

[51] More information on CERB is available at http://www.choosewashington.com/business/financing/revitalization/Pages/default.aspx

[52] If the Board finds that broadband deployment and adoption could help meet the stated goals of the program. Information on the Public Works Board is available at http://pwb.wa.gov/default.aspx

GUIDE TO TERMINOLOGY

BIP

Broadband Initiatives Program disperses American Recovery and Reinvestment Act (ARRA) broadband funding from the U.S. Department of Agriculture Rural Utilities Service.

BTOP

Broadband Technologies Opportunity Program is the program which disperses from the American Recovery and Reinvestment Act (ARRA) broadband funding National Telecommunications and Information Agency (NTIA).

Cable Modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

CCN

Communities Connect Network a consortium of community technology experts from the nonprofit and public sector in Washington State

CTOP

Community Technology Opportunity Program an adoption program administered by the Washington State University from 2008 to 2009.

Digital Subscriber Line (DSL)

DSL is a wireline transmission technology that transmits data faster over traditional copper telephone lines already installed. DSL can either be asymmetrical with different download and upload speeds or symmetrical with equal downstream and upstream speeds.

Fiber-Optic Cable (Fiber)

Fiber optic technology converts electrical signals carrying data to light and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps.

Satellite

Just as satellites orbiting the earth provide necessary links for telephone and television service, they can also provide links for broadband services. Satellite broadband is another form of wireless broadband.

Wireless

Wireless broadband can be mobile or fixed. Wireless fidelity (WiFi) is a fixed, short range technology that is often used in combination with DSL or cable modem service to connect to the Internet. With newer services now being deployed (WiMax), a small antenna located inside a home near a window is usually adequate, and higher speeds are possible.

Mobile wireless broadband services, such as 3G and 4G, are available from mobile telephone service providers, such as wireless phone companies, and others.

WSBO

Washington State Broadband Office of the Department of Commerce

APPENDIX A: HOUSEHOLD BROADBAND SPEEDS

Household Broadband Guide

Use the chart below to compare minimum download speed (Mbps) needs for light, moderate and high household use with one, two, three or four devices at a time (such as a laptop, tablet or game console).

You can also compare typical online activities with the minimum Mbps needed for adequate performance for each application by using our Broadband Speed Guide.

	Light Use	**Moderate Use**	**High Use**
	(Basic functions only: email, web surfing, basic streaming video)	(Basic functions plus one high-demand application: streaming HD, video conferencing, OR online gaming)	(Basic functions plus more than one high demand application running at the same time)
1 user on 1 device (e.g., laptop, tablet, or game console)	Basic	Basic	Medium
2 users or devices at a time	Basic	Basic	Medium/Advanced
3 users or devices at a time	Basic	Basic/Medium	Advanced
4 users or devices at a time	Basic/Medium	Medium	Advanced

Source: Federal Communications Commission

Basic Service = 1 to 2 Mbps*

Medium Service = 6 to 15 Mbps
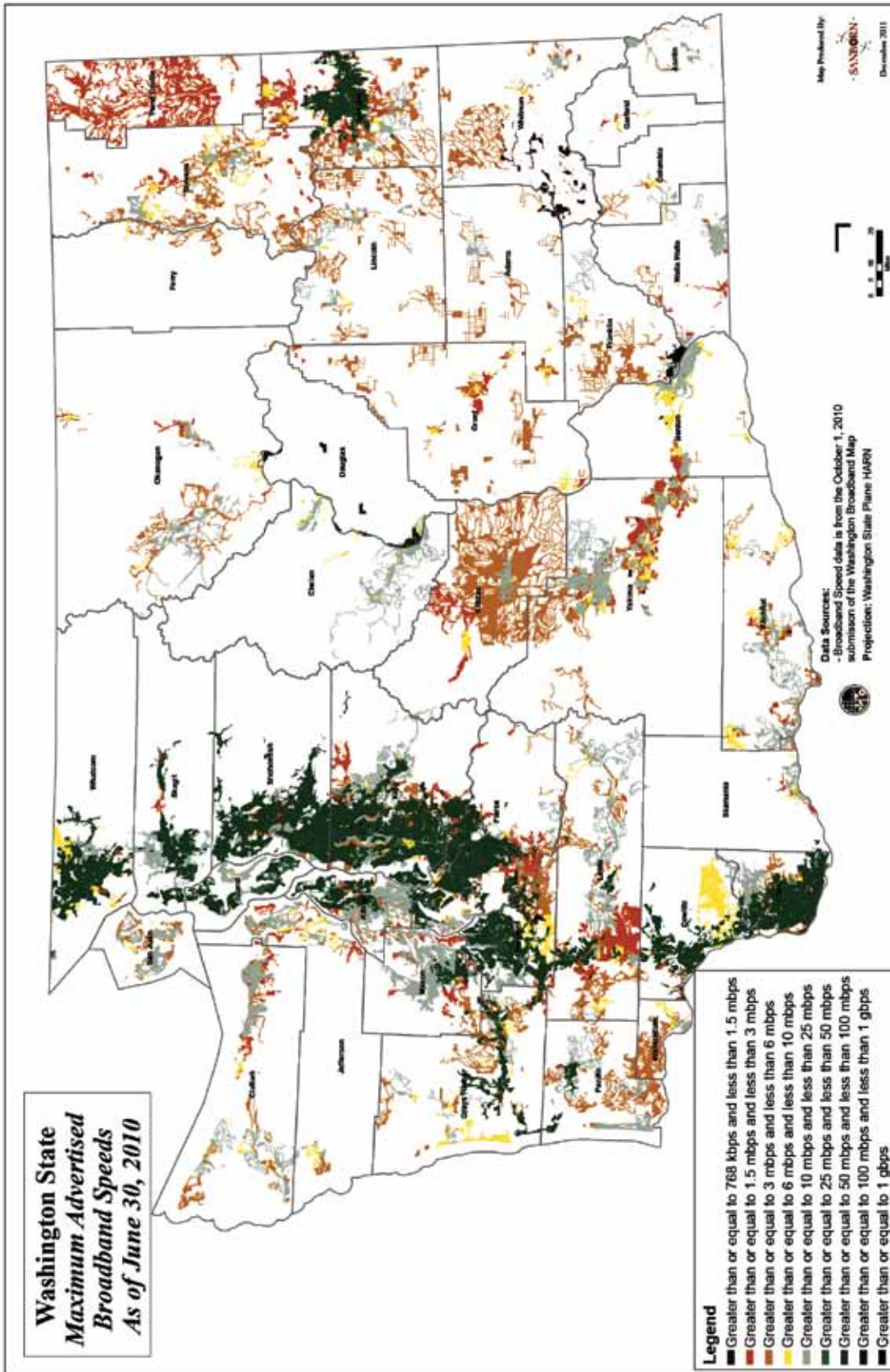
Advanced Service = More than 15 Mbps

*Mbps (megabits per second) is the standard measure of broadband speed. It refers to the speed with which information packets are downloaded from, or uploaded to, the internet.

| Upload Speeds	Download Speeds						
	> 768 kbps < 1.5 mbps	> 1.5 mbps < 3 mbps	> 3 mbps < 6 mbps	> 6 mbps < 10 mbps	> 10 mbps < 25 mbps	> 25 mbps < 100 mbps	> 100 mbps
> 200 kbps < 768 kbps	Basic E-Mail Low-Res Video	Telework Standard def video (download only)	Multi channel Internet Television (IPTV) File sharing (download only)	Remote diagnostics (download only) Online Internet gaming (low upload enabled games)	Telemedicine (download only) Online education (download only)	Smart building monitoring (limited)	NA
> 768 kbps < 1.5 mbps	Basic E-Mail Low-Res Video	Telework Standard def video (download only)	Multi channel Internet Television (IPTV) File sharing	Remote diagnostics (download only) Online Internet gaming (low upload enabled games)	Telemedicine (download only) Online education (upload limited)	Smart building monitoring (limited)	NA
> 1.5 mbps < 3 mbps	Basic E-Mail Low-Res Video	Telework Standard def 2-way Video	Multi channel Internet Television (IPTV) File sharing	Remote diagnostics (download only) Online interactive gaming	Telemedicine (limited) Online education (limited)	Smart building monitoring (limited) Campus wide educational services (limited)	NA
> 3 mbps < 6 mbps	Basic E-Mail Low-Res Video	Telework Standard def 2-way Video	Multi channel Internet Television (IPTV) File sharing	Remote diagnostics (limited upload) Online interactive gaming	Telemedicine (limited) Online education (limited)	Smart building monitoring (limited) Campus wide educational services (limited)	Technology and business parks
> 6 mbps < 10 mbps	Basic E-Mail Low-Res Video	Telework Standard def 2-way Video	Multi channel Internet Television (IPTV) File sharing	Remote diagnostics Online Internet gaming	Telemedicine (limited) Online education (limited)	Smart building monitoring (limited) Campus wide educational services (limited)	Technology and business parks

Appendix C: All Speeds Maps

More detailed information is available on the WSBO interactive map at Broadband.wa.gov.

Washington State
*Maximum Advertised
Broadband Speeds
As of June 30, 2010*
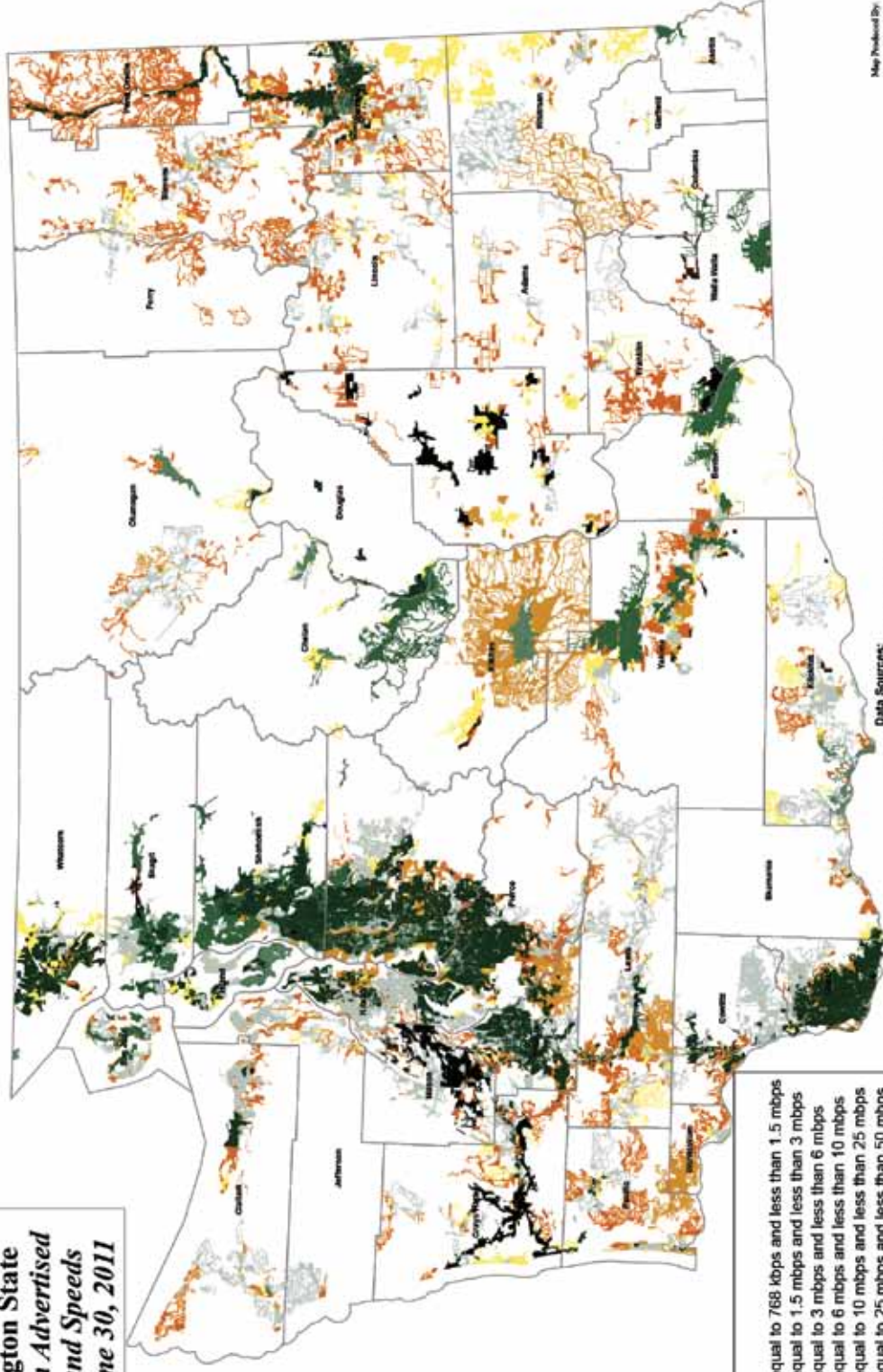
Legend

- Greater than or equal to 768 kbps and less than 1.5 mbps
- Greater than or equal to 1.5 mbps and less than 3 mbps
- Greater than or equal to 3 mbps and less than 6 mbps
- Greater than or equal to 6 mbps and less than 10 mbps
- Greater than or equal to 10 mbps and less than 25 mbps
- Greater than or equal to 25 mbps and less than 50 mbps
- Greater than or equal to 50 mbps and less than 100 mbps
- Greater than or equal to 100 mbps and less than 1 gbps
- Greater than or equal to 1 gbps

Washington State
Maximum Advertised Broadband Speeds
As of June 30, 2011

Legend

- Greater than or equal to 768 kbps and less than 1.5 mbps
- Greater than or equal to 1.5 mbps and less than 3 mbps
- Greater than or equal to 3 mbps and less than 6 mbps
- Greater than or equal to 6 mbps and less than 10 mbps
- Greater than or equal to 10 mbps and less than 25 mbps
- Greater than or equal to 25 mbps and less than 50 mbps
- Greater than or equal to 50 mbps and less than 100 mbps
- Greater than or equal to 100 mbps and less than 1 gbps
- Greater than or equal to 1 gbps

Data Sources:
- Broadband Speed data is from the October 1, 2011 submission of the Washington Broadband Map
Projection: Washington State Plane HARN

Map Produced By:
SANBORN

December 2011

Maps like the ones below are available at Broadband.wa.gov.

All Wireline Download Speeds
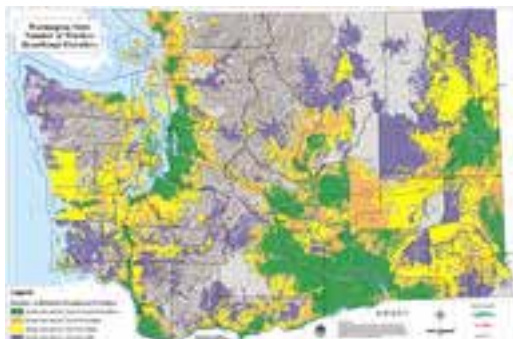

DSL Coverage

All Wireless Download Speeds

Fiber Coverage

Number of Wireless Providers

Wireless Coverage

Cable Coverage

Areas with No Broadband Service

Acknowledgements

The Washington State Broadband Office (WSBO) would not have been able to produce this report without the ongoing support of the Department of Commerce and the assistance of broadband stakeholders from across the state. Information about the numbers of served and unserved households, as well as our state's national broadband ranking, come from information voluntarily supplied by 112 broadband providers.

Photos included in this report come from a number of organizations including Pace Engineers Inc., the Buggy Barn in Reardan, Washington, Pend Oreille Public Utility District, The Inland Community Access Network (Tincan) and NoaNet. For these images we are very much obliged.

A report of this nature must be a community effort, and we are thankful for the patience and insight of our team of reviewers, drawn from public and private organizations with substantial history and knowledge of the broadband ecosystem.

We also greatly appreciate this report's graphic design and layout by Jessica Morgan of Olla Creative LLC and the faithful copyediting of our colleague at the Department of Enterprise Services, Amy Ray.

We look forward to continuing our work in the next few years with the many broadband stakeholders of the state of Washington.

Will Saunders
Program and Policy Director
Washington State Broadband Office