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# Broadband and Economic Development

University of Washington Technology Law and Public Policy Clinic

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## Broadband and Economic Development

“To attract the best jobs and newest industries, we’ve got to out-innovate, out-educate, out-build and out-hustle the rest of the world.” - President Barack Obama<sup>1</sup>

The Case Study on “Connected Nation” with special emphasis on “Connect Kentucky” on page 7 of this white paper.

### I. Introduction

Technology is essential for economic growth and job creation. Ensuring Washington has 21st century digital infrastructure, such as high-speed broadband Internet access, fourth-generation (4G) wireless networks, new healthcare information technology and a modernized electrical grid, is critical to the long-term prosperity and competitiveness of our state.<sup>2</sup> The Internet is a global platform for communication, commerce and individual expression, and now promises to support breakthroughs in important national priorities such as healthcare, education and energy. Additionally, the Internet and information technology can be applied to make government more effective, transparent and accessible to all Americans.<sup>3</sup>

For Washington, improvement of broadband access will open up ways for our state’s innovators and entrepreneurs to reassert and extend national and global leadership. It will unlock doors of opportunity long closed by geography, income, and race. It can enable education beyond the classroom, healthcare beyond the clinic, and participation beyond the town square.<sup>4</sup>

As of December 2010, nearly 170 million U.S. households had broadband connections.<sup>5</sup> 1.3 million of those households were in Washington.<sup>6</sup> Yet, with more than 2.6 million total households in the state, only about half of all households have adopted broadband.<sup>7</sup> Moreover, nearly 100,000 Washington households currently have no access to broadband at all.<sup>8</sup> Even by the end of 2011<sup>9</sup>, 3.88 percent of households had

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<sup>1</sup> Speech by President Barack Obama, The white House, [http://voices.washingtonpost.com/posttech/2011/02/marquette\\_mich\\_in\\_this.html](http://voices.washingtonpost.com/posttech/2011/02/marquette_mich_in_this.html)

<sup>2</sup> Washington State Broadband Office, Broadband Mapping Frequently Asked Questions, <http://wabroadbandmapping.org/FAQ.aspx>.

<sup>3</sup> Federal Communications Commission, National Broadband Plan, Chapter 3: Current State of the Ecosystem, available at <http://www.broadband.gov/plan/3-current-state-of-the-ecosystem/>

<sup>4</sup> *Id.*

<sup>5</sup> Federal Communications Commission, Getting Broadband, <http://www.fcc.gov/guides/getting-broadband>.

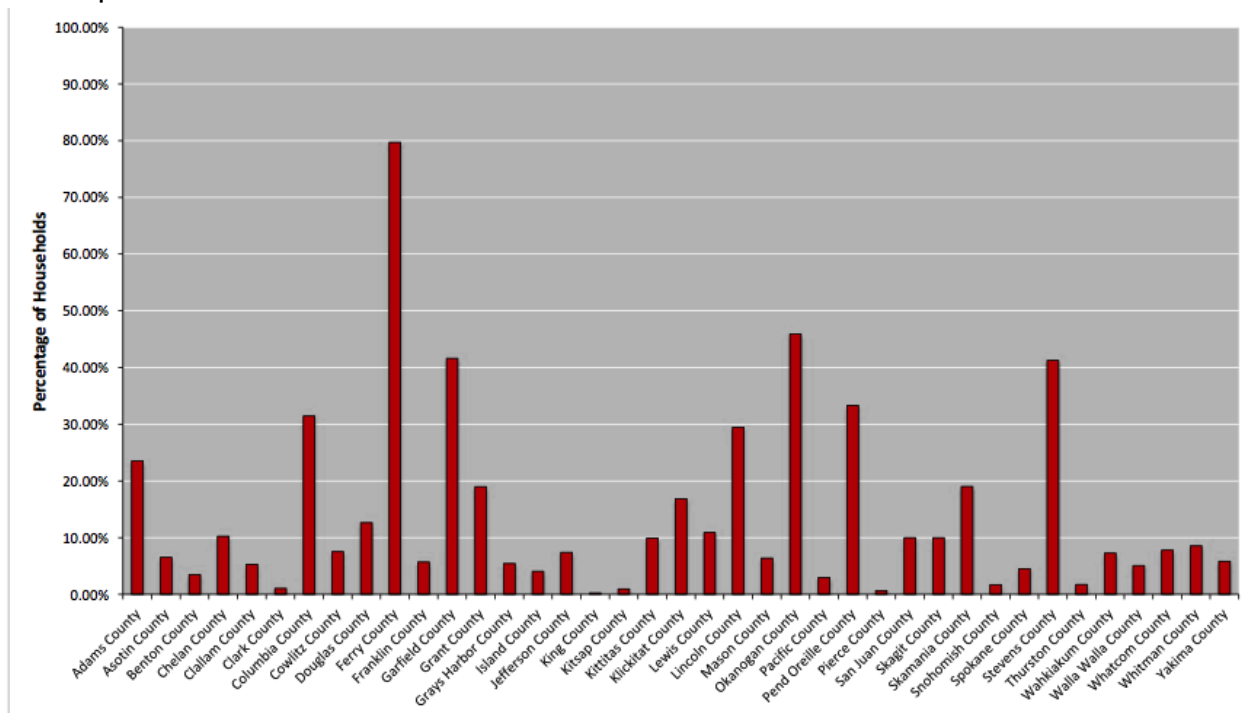
<sup>6</sup> Washington State Broadband Office, 2011 Annual Report on Broadband In Washington, 4.

<sup>7</sup> United States Census Bureau, QuickFacts: Washington, <http://quickfacts.census.gov/qfd/states/53000.html>.

<sup>8</sup> Washington State Broadband Office, 2011 Annual Report on Broadband In Washington, 4.

no access to broadband and 2.3 percent of the state's households only had access to speeds of 768 kilobytes per second (Kbps) to 3 megabytes per second (Mbps). Furthermore, some sparsely populated areas are the areas rich in 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. The same has been displayed in the figure A below.

This paper is aiming at showing broadband access is a catalyst for economic development.



Source: Sanborn

**Figure A (Percentage of Households with no Broadband Access in Washington)<sup>10</sup>**

### A. Major broadband benefits

High-speed Internet access allows users to access the Internet and Internet-related services<sup>11</sup> (such as: email, world wide web ((Research, Personal web sites, on

<sup>9</sup> Washington 2011 annual report

[http://www.leg.wa.gov/documents/legislature/ReportsToTheLegislature/2011BBAnnualRptFINAL\\_9fb9071e-b3b9-4843-a318-a3ace0234926.pdf](http://www.leg.wa.gov/documents/legislature/ReportsToTheLegislature/2011BBAnnualRptFINAL_9fb9071e-b3b9-4843-a318-a3ace0234926.pdf)

<sup>10</sup>

[http://www.leg.wa.gov/documents/legislature/ReportsToTheLegislature/2011BBAnnualRptFINAL\\_9fb9071e-b3b9-4843-a318-a3ace0234926.pdf](http://www.leg.wa.gov/documents/legislature/ReportsToTheLegislature/2011BBAnnualRptFINAL_9fb9071e-b3b9-4843-a318-a3ace0234926.pdf)

<sup>11</sup> <http://faculty.washington.edu/baldasty/march7.htm>

line shopping, Shareware)), threaded conference, online chat rooms, multi users dimensions<sup>12</sup><sup>13</sup>, streamed broadcast, internet telephone and video phone, etc.), at significantly higher speeds than those available through “dial-up” Internet access services. Broadband speeds vary significantly depending on the particular type and level of service ordered and may range from as low as 200 Kbps, to 30 Mbps, Recent offerings include speeds up to 50 to 100 Mbps.

The uses for broadband are limitless. And the utility of the service will only continue to grow as technology develops. However, there are a few concrete uses, which will directly benefit Washington State in the near future.

**Telemedicine:** Broadband makes “telemedicine” possible: patients in rural areas can confer online with medical specialists in more urban areas and share information and test results very quickly. This will ultimately reduce medical costs, improve access, and allow for medical services to be administered more quickly in urgent situations.

**Improve our Communities:** Broadband will help communities efficiently access and use their reference and cultural resources, such as library and museum resources and archive materials.

**Improve our Schools:** Broadband is necessary to take advantage of many distance learning opportunities which are becoming available to our students, like online college or university courses. Additionally, broadband can reduce costs and improve both access and efficiency for continuing or senior education programs. In both circumstances, broadband access will improve the educational services, which are available to rural Washingtonians or those communities with fewer resources.

## **B. Other general benefits of broadband services**

As the result of broadband investments in Washington State we would be able to achieve the following:

- Public safety agencies could provide enhanced 911 services, improved response times, a more responsive Amber Alert system<sup>14</sup>, and enhanced police response.

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<sup>12</sup> Bartle, Richard (2003). Designing Virtual Worlds. New Riders. pp. 9–10, 741. ISBN 0-13-101816-7. “[pp. 9-10] TinyMUD was deliberately intended to be distanced from the prevailing hack-and-slay AberMUD style, and the “D” in its name was said to stand for “Dimension” (or, occasionally, “Domain”) rather than “Dungeon;” this is the ultimate cause of the MUD/MU\* distinction that was to arise some years later. [pp. 741] The “D” in MUD stands for “Dungeon” [...] because the version of ZORK Roy played was a Fortran port called DUNGEN.”

<sup>13</sup> Hahn, Harley (1996). The Internet Complete Reference (2nd ed.). Osborne McGraw-Hill. pp. 553. ISBN 0-07-882138-X. “[...] muds had evolved to the point where the original name was too confining, and people started to say that “MUD” stood for the more generic “Multi-User Dimension” or “Multi-User Domain”.”

<sup>14</sup> <http://amber.ny.gov>

Public safety agencies are increasingly using commercial broadband systems to support their missions besides continuing maintaining their traditional land mobile radio (LMR) systems<sup>15</sup>. Such agencies are adopting modern broadband systems including using laptop computers in vehicles, as secondary communications devices (e.g., a smartphone), or for remote video monitoring.<sup>16</sup>

- School districts, one quarter of which are currently hindered by slow Internet connections, will now be able to provide online instruction and learning, research and information exchange between institutions, and remote access to college courses.
- Essential state services can be more reliably and continuingly preserved in emergency situations through cloud computing, which is made possible through broadband technology.
- Citizens will benefit from faster, more efficient government services such as online permitting, improved information access, health care, access to justice and other important programs.
- State and local government will have access to online training, conferences and collaboration; reduced travel and per diem expenses; and reliable connectivity between government entities and state and local data centers.
- Library patrons using technologies and applications that require high-quality Internet bandwidth, such as high definition video-conferencing, desktop video chat (e.g. Skype), online learning and assessment, streaming video, and Voice over Internet Protocol (VoIP), will benefit from fast speeds and higher quality services. Broadband access for libraries means community access.
- Healthcare providers will have the speed they need to deliver lifesaving services in real time, enabling remote diagnosis, immediate assessment and guidance to emergency workers via videoconferencing, improved access to the most current lifesaving drugs to rural areas, and tele-health to exchange large digital files and provide remote specialty consultation.
- Rural communities will be able to provide the high-speed telecommunications services that are required for robust economic development, enabling credit card and Internet-based e-commerce, automated inventory and fulfillment systems, web sales and online advertising for small businesses, commodities trading – a key competitive advantage to the family farmer, advanced 4G cellular capability/access and local broadband providers' access.

## **II. How Broadband Stimulates the Economy**

Since the mid-1990s, when businesses and households began to use the Internet, observers have been trying to predict and assess the link between Internet

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<sup>15</sup> <http://www.cisco.com/en/US/docs/wireless/lmr/design/guide/lmrover.html>

<sup>16</sup> The Benefits of Transitioning to a Nationwide Wireless Broadband Network for Public Safety available at <http://www.whitehouse.gov/sites/default/files/uploads/publicsafetyreport.pdf>

access on economic development. Some of the early predictions about the Internet and related technologies, such as causing the “death of cities,” have clearly not materialized.<sup>17</sup> Yet the Internet has transformed many areas of life, providing individuals and businesses with easy and immediate access to communication, information, and entertainment. But it takes considerable time to develop applications and adjust business processes and organizations to take full advantage of new technologies and we still know very little about the economic effects of many Internet-based technologies.<sup>18</sup> The federal and state broadband initiatives presume multiple economic and social benefits will accrue from increasing broadband access. Local economic development ranks high among these benefits. Other economically relevant benefits include improvements in access to education, energy efficiency, health care cost and availability, and public safety. To date, the evidence on the extent to which broadband provides any of these benefits has been quite limited.<sup>19</sup>

In recognition of its importance, public investment in broadband is surging. The American Recovery and Reinvestment Act (ARRA) of 2009 allocated \$7.2 billion for broadband investment and commissioned a National Broadband Plan to promote universal access, foster economic development, and achieve additional potential benefits through this technology. Federal and state broadband policies seek to invest in broadband in underserved areas to close the digital divide. Yet closing the digital divide is not the only broadband policy that could affect economic development outcomes; and policies that support and hasten early-stage rollout of next-generation technologies, such as extremely fast fiber-to-the-home or new technologies that affect business processes, have better economic development outcomes.<sup>20</sup>

The Internet has transformed the way small businesses operate, communicate with employees, and interact with customers. Internet service is an important tool for achieving strategic goals, improving competitiveness and efficiency, reaching customers, and interacting with vendors. High-speed (broadband) Internet access is as essential to their business as other utilities such as water, sewer, or electricity.<sup>21</sup>

### III. Broadband Equals Economic Development

Broadband technology is a contributor to **economic growth** at several levels.<sup>22</sup>

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<sup>17</sup> The Benefits of Transitioning to a Nationwide Wireless Broadband Network for Public Safety available at <http://www.whitehouse.gov/sites/default/files/uploads/publicsafetyreport.pdf>

<sup>18</sup> 2012 Annual Report on broadband in Washington, Washington State Broadband Office <http://www.commerce.wa.gov/Documents/Broadband-WA-Office-2011-report.pdf>

<sup>19</sup> SEVENTH BROADBAND PROGRESS REPORT AND ORDER ON RECONSIDERATION, Federal Communications Commission, FCC 11-78, May 20, 2011 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-11-78A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-78A1.pdf)

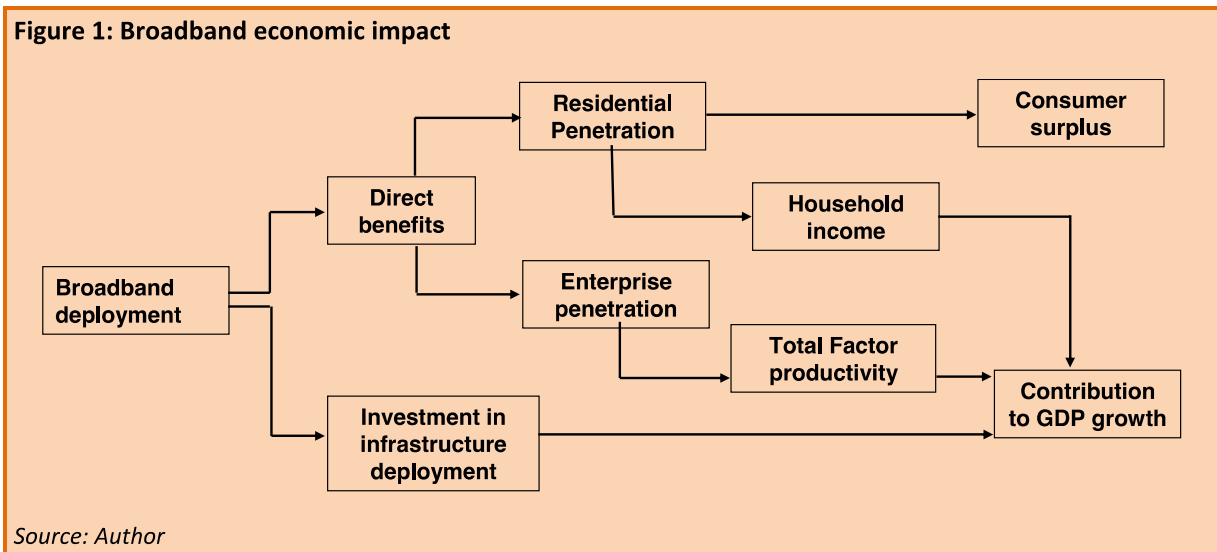
<sup>20</sup> [http://www.ppic.org/content/pubs/report/r\\_110jkr.pdf](http://www.ppic.org/content/pubs/report/r_110jkr.pdf)

<sup>21</sup> [http://www.sba.gov/sites/default/files/rs373tot\\_0.pdf](http://www.sba.gov/sites/default/files/rs373tot_0.pdf)

<sup>22</sup> [http://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports\\_Impact-of-Broadband-on-the-Economy.pdf](http://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_Impact-of-Broadband-on-the-Economy.pdf)

1) The deployment of broadband technology across business enterprises improves productivity by facilitating the adoption of more efficient business processes (e.g., marketing, inventory optimization, and streamlining of supply chains). An example would be the use of broadband in the agricultural supply businesses. The growth of mobile technology in agriculture has outpaced the speed of past technological developments in the sector worldwide. The integration of GPS technology into farmers' tractors and mobile technology that inventories acreage and production equipment clearly emphasizes that the broadband Internet access is key for farmers to be able to run and market their operations. The capacity of farmers to utilize these new products and other wireless communications technologies requires adequate broadband infrastructure<sup>23 24</sup>.

2) Extensive deployment of broadband accelerates innovation by introducing new consumer applications and services (e.g., new forms of commerce and financial intermediation<sup>25</sup>). One of the examples of the e-commerce from business to consumer is "line of credit"<sup>26</sup>. Line of Credit is an arrangement between a financial institution, usually a bank, and a customer that establishes a maximum loan balance that the bank will permit the borrower to maintain.



**Figure B: Broadband Economic Impact<sup>27</sup>**

<sup>23</sup>

[http://icma.org/en/icma/knowledge\\_network/blogs/blogpost/962/Growing\\_Agriculture\\_for\\_Economic\\_Development](http://icma.org/en/icma/knowledge_network/blogs/blogpost/962/Growing_Agriculture_for_Economic_Development)

<sup>24</sup> <http://bookstore.icma.org/freedocs/E43398.pdf>

<sup>25</sup> <http://www.clickz.com/clickz/news/1700078/broadband-boosts-e-commerce-new-media-adoption>

<sup>26</sup> <http://www.investopedia.com/terms/l/lineofcredit.asp#axzz2Kp6LdbHi>

<sup>27</sup> [http://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports\\_Impact-of-Broadband-on-the-Economy.pdf](http://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_Impact-of-Broadband-on-the-Economy.pdf) at p 3.

3) Broadband leads to a more efficient functional deployment of enterprises by maximizing their reach to labour pools<sup>28</sup>, access to raw materials, and consumers, (e.g., outsourcing of services, virtual call centres.)

#### IV. Case in Point

##### “Connect Kentucky”

Connect Kentucky is the first state-wide broadband expansion program that the Connected Nation <sup>29</sup> (a leading technology organization working towards making available affordable broadband connectivity in US) has adopted, it has become a model for broadband deployment and adoption for other states throughout the nation.

According to the 2008 Connected Nation groundbreaking report,<sup>30</sup> in 2004, only 60% of Kentucky households had broadband available for subscription. From 2005-2007, broadband adoption (the number of homes subscribing to high-speed broadband service) in Kentucky increased 83%, which was far beyond the expectation compared to the nationwide trends for household broadband adoption (57%). Up to 2008, there was 95% of Kentuckians can now access broadband in their homes. Besides, between 2005 and 2007, the growth rate of broadband adoption in rural counties of Kentucky was 106%, which is 34% more than the growth rate of the average of the United States. Moreover, there was 7% growth in broadband adoption in Kentucky over the expected.

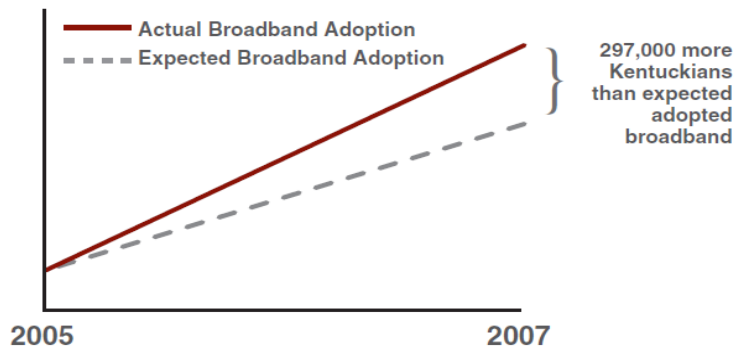


Figure C: (Kentucky’s Actual versus Expected Broadband Adoption in 2007)

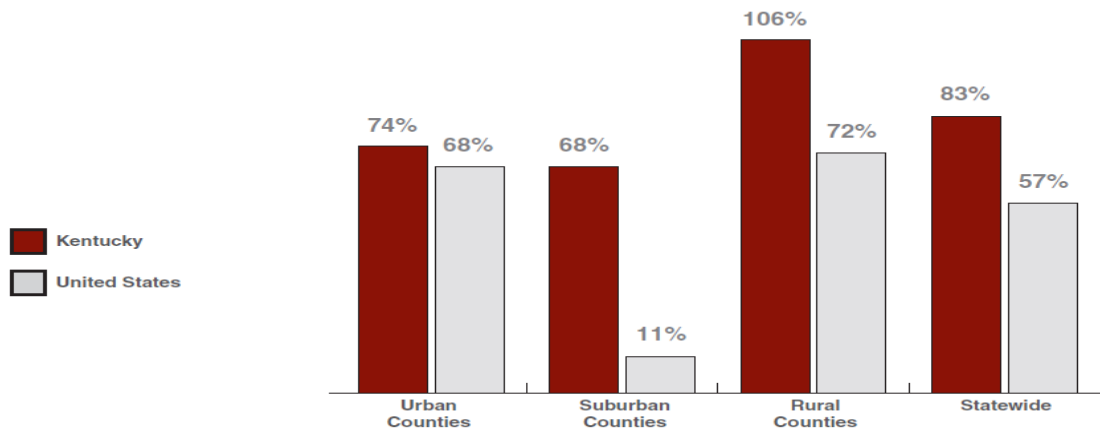
<sup>28</sup> <http://rru.worldbank.org/documents/toolkits/labor/toolkit/glossary.html#l>

<sup>29</sup> <http://www.connectednation.org/broadband-core-services>

<sup>30</sup> The economic impact of stimulating broadband nationally

[http://www.connectednation.org/documents/connected\\_nation\\_eis\\_study\\_full\\_report\\_02212008.pdf](http://www.connectednation.org/documents/connected_nation_eis_study_full_report_02212008.pdf)





**Figure D: (Broadband Adoption Growth Rates in Kentucky and United States in 2005-2007)**

The rapid broadband coverage in Kentucky resulted in economic booming in the following variable ways:

- 1 **Employment:** The above 7% unexpected growth has resulted in an additional 63,417 jobs created or saved in Kentucky between 2005 and 2007. The average annual economic value of these jobs can be estimated at \$1.06 billion in direct wages (see detailed discussion below). It has been observed, “for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2 to 0.3 percent per year.”<sup>31</sup>
- 2 **Health cost savings:** An estimated 35% of all broadband users report saving an average of \$217 as a direct result of becoming healthier through obtaining healthcare information online. This translates into a \$9.4 million dollar annual self-reported health-care cost savings for the additional 297,000 broadband users above the expected in Kentucky.
- 3 **Mileage Costs Saved:** Using the United States General Services Administration reimbursement rate for driving of \$0.485 per mile, it can be said that the Connect Kentucky initiative has yielded an annual savings of \$92.1 million in consumer driving costs.
- 4 **Environmental Pollution:** In addition to the positive environmental impact and using the standard measurements for carbon dioxide (CO<sub>2</sub>) emissions credits, the annual economic impact of 46.7 million pounds of carbon emissions can be estimated at \$252,200.

<sup>31</sup> Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis Of U.S. Data,” Issues in Economic Policy: The Brookings Institution, No. 6, July 2007, p. 2.

## **Summary of “Connect Kentucky” Impact:**

The direct economic impacts of the additional 297,000 individuals accessing broadband in Kentucky can be quantified directly as follows:

- \$1.06 billion in annual direct wages from jobs created or saved in Kentucky.
- \$9.4 million in annual self-reported health-care costs savings (examples below).
- \$92.1 million per year in mileage savings from broadband preventing unnecessary driving.
- 46.7 million lbs of CO2 emissions reduction per year in Kentucky (\$250,000 emission credits).
- \$429.8 million value in the 53.4 million hours saved per year from accessing broadband at home.

## **V. Important Observations**

The observations are based on the survey conducted by Connected Nation for the various states it operates in with special reference to the States of Kentucky and Alaska.

### **1. Job creation related surveys<sup>32</sup>**

High-speed Internet service is changing how job creators and job seekers identify each other (explained below) and link up in the United States. Up to 2012, data indicates<sup>33</sup> that there are 2.5 million businesses in the United States currently use the Internet to advertise job openings or accept job applications.

## **Examples from “Connect Kentucky”**

### **A. Online Job Searches**

- Almost one-third (31%) of adult residents access the Internet for job searching and employment information, up significantly from 16% observed in 2005.
- Nearly half (49%) of residents with broadband service at home report using the Internet to search for employment.
- Over one-quarter (28%) of adult residents who search for employment online report that they found a job in this fashion. This translates to approximately 280,000 jobs filled. Of these, two-thirds were filled by residents with broadband service.
- With broadband at home, the majority of unemployed residents and one third of disabled residents use the Internet for job searching.

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<sup>32</sup> Broadband Impacts on Employment, ConnectKentucky  
[http://www.connectednation.org/sites/default/files/online\\_and\\_in\\_touch\\_-\\_part\\_two\\_-\\_online\\_job\\_searching.pdf](http://www.connectednation.org/sites/default/files/online_and_in_touch_-_part_two_-_online_job_searching.pdf)

<sup>33</sup> [http://www.connectednation.org/sites/default/files/cn\\_biz\\_whitepaper2012\\_final.pdf](http://www.connectednation.org/sites/default/files/cn_biz_whitepaper2012_final.pdf)

## B. Telework Habits and Potential

- Among employed residents with a broadband connection at home, 11% (or about 110,000 workers) report that they regularly work from home through their broadband connection. These individuals comprise 6% of all employed adults, but another 23% of workers are interested in teleworking.
- Among adults who are not employed in the labor force today, one-quarter say they would be likely to work if they could work from home through a broadband connection.

## C. Working At Home Online

- Apart from a formalized telework arrangement described above whereby workers regularly work at home through their broadband connection, the survey also finds that nearly one-third (32%) of employed adult residents use the Internet to do some work from home.
- Working from home is most strongly associated with high income and highly educated workers and those who have laptop computers.

## 2. Cost of broadband:

### Examples from “Connected Nation”

As per the survey conducted by Connected Nation of the nine states it is closely representing, it was observed that the price ranged from \$72.61 for a median speed of 2.6 Mbps in Alaska to \$68.95 for a median speed of 6.9 Mbps in the study.

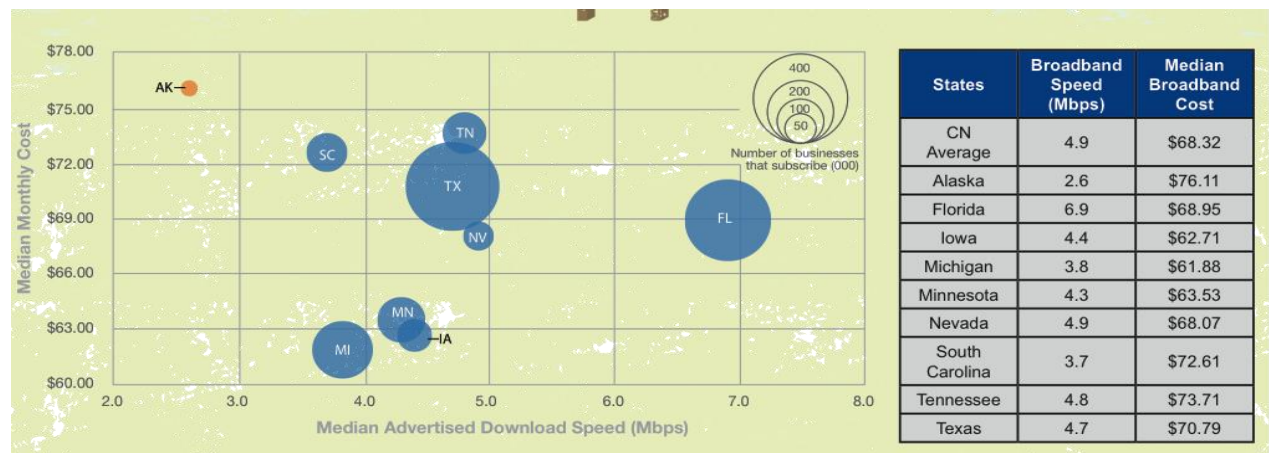


Figure E: (a graph from the Connected Nation survey report<sup>34</sup>)

<sup>34</sup> [http://www.connectednation.org/sites/default/files/ak\\_biz\\_2012.pdf](http://www.connectednation.org/sites/default/files/ak_biz_2012.pdf)

### 3. Technology used:

#### Examples from “Connect Alaska”

As per the survey conducted by Connected Nation for the State of Alaska, discussed in figure B, almost 84% Alaskans use computer, 70% of those have adopted broadband and almost 34% uses it for telework.

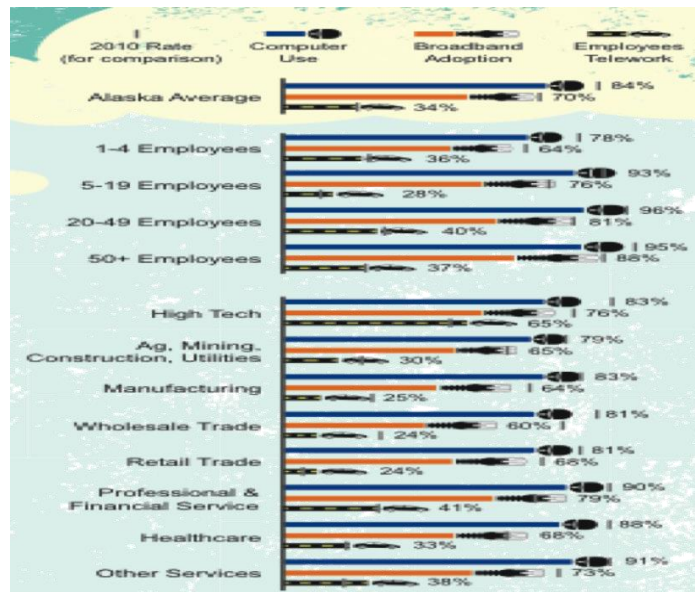


Figure F: (a graph from the Connected Nation survey report<sup>35</sup>)

## VI. Conclusion

The economic impact of broadband has many positive effects.<sup>36</sup> First and foremost, the evidence is fairly conclusive about the contribution of broadband to GDP growth. While the amount of this contribution varies, the discrepancies can be related to different datasets as well as model specifications. Secondly, broadband stimulates employment growth, spanning opportunities as a result of the network construction programmes as well as the telecommunications sectors. Finally, beyond economic growth and job creation, broadband will have a positive in communities--things not immediately captured in GDP figures. These include efficient access to information, savings in transportation and benefits in health and entertainment, and can be measured in terms of the difference between consumers' willingness to pay for the broadband service and actual prices.

<sup>35</sup> [http://www.connectednation.org/sites/default/files/ak\\_biz\\_2012.pdf](http://www.connectednation.org/sites/default/files/ak_biz_2012.pdf)

<sup>36</sup> Id.

## [Appendices]

### Current Broadband Availability

#### A) Washington

According to 2011 annual report of Washington state broadband office<sup>37</sup>, 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. Digital literacy is the ability to effectively and critically navigate, evaluate and create information using a range of digital technologies. It requires one "to recognize and use that power, to manipulate and transform digital media, to distribute pervasively, and to easily adapt them to new forms"<sup>38</sup>. The level of digital literacy is divided into familiarity with computers and Internet navigation (the basic level) and engagement in online commerce. The Internet has been undoubtedly changing the way people doing business and socializing. The non-adopters will be left out of main social community and massive e-commerce business opportunities. Most importantly, they may be very likely to undermine the benefit that internet may possibly bring to them.

The Federal Recovery Act<sup>39</sup>, is boosting economic development, enhancing Internet connections in schools and libraries, improving health care delivery and wiring homes and small businesses in isolated places that major broadband providers have been slow to reach. The result is phenomenal and one of the leading example of it is NoaNet<sup>40</sup>. Ten public utility districts in Washington are leading a digital charge together, known as NoaNet, the "Northwest Open Access Network". This nonprofit, wholesale provider of broadband has more than 1,800 fiber miles serving nearly 260,000 people in rural and underserved areas. Thanks to an infusion of \$140 million in federal stimulus grants, NoaNet is expanding to nearly 3,000 fiber miles. By August 2013 the network is expected to reach more than 170 communities and 2,000 schools, hospitals, emergency responders, libraries, colleges and universities. One of NoaNet's most notable successes is along the Columbia River in the center of the state. That's where fiber lines to Quincy – along with the lure of cheap hydropower – brought in Microsoft, Yahoo and other firms to build large server farms.<sup>41</sup>

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<sup>37</sup> <http://www.commerce.wa.gov/Documents/Broadband%20WA%20Office%202011%20report.pdf>

<sup>38</sup> Jenkins, Henry (2009). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Cambridge, MA: The MIT Press.

<sup>39</sup> <http://www.recovery.gov/News/featured/Pages/RecoveryFundsforSatelliteBroadband.aspx>

<sup>40</sup> <http://www.noanet.net/pdfs/NoaNetLargeBrochureJuly2011.pdf>

<sup>41</sup>

<http://www.noanet.net/pdfs/Need%20for%20speed%20Broadband%20comes%20to%20rural%20areas%20Spokesman%20Review%209.16.12.pdf>



**Map A: (A map of the NoaNet Network in the State of Washington<sup>42</sup>)**

## **B) Nationwide Overview**

According to FCC broadband progress report<sup>43</sup>, up to May, 2011, there was approximately 26 million Americans are denied access to the jobs and economic opportunity made possible by broadband, most of them are living in rural communities located in every region of the country.

The FCC report also finds that while the infrastructure of high-speed Internet is unavailable to those Americans, there is approximately one-third of Americans still do not subscribe to broadband, even when it's available. This suggests that there are various barriers to adoption – such as cost, low digital literacy, and concerns about privacy – remain too high. The Report also suggests that limited broadband capacity for schools and libraries as a further indicator that broadband is not being reasonably and timely deployed as well as not available to all Americans.

<sup>42</sup>red lines across the State of Washington represent the NoaNet fiber optic backbone, largely available today (portions are to be built over the next two years), open to use by all. It is built as an advanced telecommunications infrastructure, capable of 10 gigabit Ethernet speeds. As such, the network is one of the fastest and most capable fiber optic networks available in the world today.

<sup>43</sup> *Id.*

	Total Annual Economic Impact	Jobs Created or Saved Annually	Direct Annual Income Growth from the Increase in Broadband	Average Annual Healthcare Costs Saved	Average Annual Mileage Costs Saved	Average Annual Hours Saved	Annual Value of Hours Saved	Average Annual lbs of CO <sub>2</sub> Emissions Cut	Value of Carbon Offsets
<b>Alabama</b>	<b>\$1,598,907,799</b>	<b>33,461</b>	<b>\$1,148,936,872</b>	<b>\$10,187,810</b>	<b>\$98,216,185</b>	<b>67,715,987</b>	<b>\$464,065,535</b>	<b>50,265,885</b>	<b>\$271,403</b>
Alaska	\$317,168,552	4,846	\$212,849,167	\$1,484,307	\$14,018,776	8,408,897	\$58,797,954	7,100,920	\$38,349
<b>Arizona</b>	<b>\$2,498,704,935</b>	<b>45,865</b>	<b>\$1,630,864,424</b>	<b>\$13,559,679</b>	<b>\$128,827,410</b>	<b>77,894,884</b>	<b>\$574,408,744</b>	<b>62,808,111</b>	<b>\$383,775</b>
Arkansas	\$963,684,222	20,577	\$635,196,771	\$6,226,667	\$60,352,819	35,275,319	\$261,742,869	30,570,465	\$165,097
<b>California</b>	<b>\$17,287,110,388</b>	<b>252,042</b>	<b>\$11,877,925,716</b>	<b>\$80,761,065</b>	<b>\$758,277,259</b>	<b>467,827,557</b>	<b>\$4,868,943,717</b>	<b>385,164,873</b>	<b>\$2,101,641</b>
Colorado	\$2,351,248,032	39,665	\$1,644,109,297	\$10,529,720	\$101,888,351	59,652,980	\$594,441,946	51,609,425	\$278,718
<b>Connecticut</b>	<b>\$1,838,748,950</b>	<b>29,765</b>	<b>\$1,268,285,381</b>	<b>\$7,768,852</b>	<b>\$76,468,984</b>	<b>48,989,361</b>	<b>\$488,022,593</b>	<b>38,782,264</b>	<b>\$209,174</b>
Delaware	\$452,660,929	7,796	\$324,919,691	\$1,890,627	\$18,478,024	10,710,782	\$107,322,040	9,359,659	\$50,547
<b>Florida</b>	<b>\$7,531,665,950</b>	<b>143,405</b>	<b>\$5,136,762,865</b>	<b>\$40,072,671</b>	<b>\$388,029,270</b>	<b>227,020,868</b>	<b>\$1,864,649,681</b>	<b>202,119,881</b>	<b>\$1,081,654</b>
Georgia	\$3,907,660,865	71,059	\$2,639,837,894	\$20,743,080	\$197,143,135	117,513,714	\$1,049,397,466	99,858,756	\$539,290
<b>Hawaii</b>	<b>\$578,001,028</b>	<b>10,284</b>	<b>\$397,274,880</b>	<b>\$2,887,649</b>	<b>\$28,011,744</b>	<b>16,132,486</b>	<b>\$140,790,130</b>	<b>14,168,787</b>	<b>\$78,827</b>
Idaho	\$585,942,345	10,859	\$378,002,347	\$3,248,525	\$30,661,907	18,403,549	\$153,945,689	15,531,152	\$83,876
<b>Illinois</b>	<b>\$6,237,869,318</b>	<b>106,622</b>	<b>\$4,321,003,867</b>	<b>\$26,426,467</b>	<b>\$278,619,588</b>	<b>181,000,081</b>	<b>\$1,680,768,862</b>	<b>138,748,281</b>	<b>\$748,914</b>
Indiana	\$2,679,847,808	52,863	\$1,860,248,442	\$13,985,762	\$134,940,477	79,232,151	\$670,303,994	68,351,293	\$369,133
<b>Iowa</b>	<b>\$1,237,290,273</b>	<b>28,064</b>	<b>\$866,032,289</b>	<b>\$9,805,940</b>	<b>\$84,670,485</b>	<b>\$7,423,874</b>	<b>\$288,204,871</b>	<b>\$2,767,488</b>	<b>\$178,806</b>
Kansas	\$1,154,893,120	22,828	\$798,081,721	\$6,123,002	\$58,974,133	34,688,036	\$291,552,939	29,872,121	\$161,325
<b>Kentucky</b>	<b>\$1,587,289,487</b>	<b>31,699</b>	<b>\$1,061,003,244</b>	<b>\$9,317,330</b>	<b>\$91,163,941</b>	<b>62,764,546</b>	<b>\$424,915,687</b>	<b>48,172,134</b>	<b>\$248,364</b>
Louisiana	\$1,556,816,993	31,313	\$1,030,199,954	\$9,498,299	\$91,233,861	53,809,773	\$425,635,307	46,212,615	\$249,572
<b>Maine</b>	<b>\$544,607,277</b>	<b>10,677</b>	<b>\$371,978,460</b>	<b>\$2,387,862</b>	<b>\$28,676,200</b>	<b>16,885,288</b>	<b>\$140,145,182</b>	<b>14,989,783</b>	<b>\$80,904</b>
Maryland	\$2,813,857,230	43,922	\$1,933,873,816	\$12,440,005	\$121,232,549	70,475,128	\$745,979,225	61,407,827	\$331,635
<b>Massachusetts</b>	<b>\$8,946,781,425</b>	<b>5,411</b>	<b>\$2,766,157,106</b>	<b>\$14,289,724</b>	<b>\$141,618,944</b>	<b>80,794,187</b>	<b>\$916,324,165</b>	<b>71,781,143</b>	<b>\$387,388</b>
Michigan	\$4,637,508,875.7	6,200	\$3,141,722,166	\$22,363,953	\$217,268,265	126,696,281	\$1,255,560,149	110,052,723	\$594,343
<b>Minnesota</b>	<b>\$2,791,482,532</b>	<b>48,891</b>	<b>\$2,021,172,987</b>	<b>\$11,448,205</b>	<b>\$111,408,012</b>	<b>64,845,061</b>	<b>\$547,163,506</b>	<b>56,429,893</b>	<b>\$304,761</b>

	Total Annual Economic Impact	Jobs Created or Saved Annually	Direct Annual Income Growth from the Increase in Broadband	Average Annual Healthcare Costs Saved	Average Annual Mileage Costs Saved	Average Annual Hours Saved	Annual Value of Hours Saved	Average Annual lbs of CO <sub>2</sub> Emissions Cut	Value of Carbon Offsets
Mississippi	\$905,743,973	18,723	\$570,305,184	\$6,447,452	\$61,452,087	36,526,113	\$267,371,146	31,127,277	\$168,104
<b>Missouri</b>	<b>\$2,501,967,723</b>	<b>41,692</b>	<b>\$1,738,282,696</b>	<b>\$12,942,827</b>	<b>\$126,066,930</b>	<b>79,829,711</b>	<b>\$536,783,822</b>	<b>63,886,491</b>	<b>\$344,863</b>
Montana	\$337,218,046	7,198	\$225,220,226	\$2,092,557	\$20,700,888	11,854,754	\$89,147,748	10,485,604	\$56,628
<b>Nebaska</b>	<b>\$783,129,301</b>	<b>16,280</b>	<b>\$663,411,616</b>	<b>\$3,917,222</b>	<b>\$37,736,489</b>	<b>22,191,847</b>	<b>\$182,971,776</b>	<b>19,109,062</b>	<b>\$103,199</b>
Nevada	\$1,175,028,256	23,482	\$845,359,452	\$5,528,117	\$52,939,525	31,317,891	\$271,056,344	26,815,416	\$144,817
<b>New Hampshire</b>	<b>\$594,082,323</b>	<b>11,874</b>	<b>\$446,419,298</b>	<b>\$2,912,785</b>	<b>\$28,980,278</b>	<b>16,801,406</b>	<b>\$156,660,758</b>	<b>14,969,287</b>	<b>\$79,222</b>
New Jersey	\$4,636,703,229	71,109	\$3,231,890,665	\$19,326,718	\$188,794,006	109,489,738	\$1,196,175,390	95,629,679	\$616,451
<b>New Mexico</b>	<b>\$684,119,694</b>	<b>19,164</b>	<b>\$447,977,812</b>	<b>\$4,326,644</b>	<b>\$41,283,989</b>	<b>24,629,490</b>	<b>\$201,405,488</b>	<b>20,919,480</b>	<b>\$112,860</b>
New York	\$9,909,345,962	147,884	\$6,776,023,161	\$42,767,217	\$420,637,031	242,284,874	\$2,668,767,889	213,064,943	\$1,150,663
<b>North Carolina</b>	<b>\$3,628,061,051</b>	<b>88,492</b>	<b>\$2,466,214,087</b>	<b>\$19,818,004</b>	<b>\$196,623,448</b>	<b>111,145,685</b>	<b>\$946,163,383</b>	<b>86,605,080</b>	<b>\$621,182</b>
North Dakota	\$264,354,171	5,755	\$186,703,927	\$1,408,578	\$13,960,441	7,979,877	\$62,243,037	7,071,371	\$38,189
<b>Ohio</b>	<b>\$5,186,789,104</b>	<b>88,212</b>	<b>\$3,696,187,716</b>	<b>\$25,426,175</b>	<b>\$247,668,322</b>	<b>144,044,384</b>	<b>\$1,283,618,588</b>	<b>126,803,188</b>	<b>\$878,323</b>
Oklahoma	\$1,270,219,076	25,603	\$833,901,696	\$7,928,700	\$76,474,057	44,917,679	\$351,705,426	38,736,344	\$209,197
<b>Oregon</b>	<b>\$1,663,084,131</b>	<b>28,383</b>	<b>\$1,133,288,869</b>	<b>\$8,187,950</b>	<b>\$80,861,438</b>	<b>46,443,083</b>	<b>\$430,629,812</b>	<b>40,963,816</b>	<b>\$221,171</b>
Pennsylvania	\$5,618,124,596	103,916	\$3,905,168,316	\$27,558,567	\$274,060,290	156,124,817	\$1,410,587,724	138,819,542	\$749,699
<b>Rhode Island</b>	<b>\$517,884,418</b>	<b>8,896</b>	<b>\$360,983,164</b>	<b>\$2,384,979</b>	<b>\$23,673,532</b>	<b>13,386,078</b>	<b>\$130,606,256</b>	<b>11,940,882</b>	<b>\$84,486</b>
South Carolina	\$1,628,562,600	32,629	\$1,089,806,446	\$9,572,467	\$93,461,551	54,228,946	\$435,466,470	47,341,006	\$255,666
<b>South Dakota</b>	<b>\$296,081,945</b>	<b>6,718</b>	<b>\$204,842,288</b>	<b>\$1,782,119</b>	<b>\$16,788,192</b>	<b>9,812,771</b>	<b>\$71,679,545</b>	<b>6,485,981</b>	<b>\$45,829</b>
Tennessee	\$2,450,739,704	49,142	\$1,682,608,846	\$13,377,207	\$130,689,201	75,784,562	\$623,706,946	66,197,898	\$357,503
<b>Texas</b>	<b>\$8,424,006,380</b>	<b>173,117</b>	<b>\$6,206,206,887</b>	<b>\$32,074,887</b>	<b>\$496,029,518</b>	<b>298,013,274</b>	<b>\$2,581,866,143</b>	<b>\$46,188,147</b>	<b>\$1,329,546</b>
Utah	\$1,066,414,382	20,728	\$736,673,777	\$5,648,921	\$50,494,153	32,082,271	\$273,459,402	25,576,764	\$138,128
<b>Vermont</b>	<b>\$276,369,824</b>	<b>6,270</b>	<b>\$191,533,398</b>	<b>\$1,382,066</b>	<b>\$13,988,567</b>	<b>7,829,796</b>	<b>\$66,482,416</b>	<b>7,087,884</b>	<b>\$38,170</b>
Virginia	\$3,764,632,826	63,344	\$2,625,619,577	\$16,930,580	\$165,834,683	95,915,137	\$955,794,341	84,080,111	\$453,645
<b>Washington</b>	<b>\$3,066,689,915</b>	<b>48,886</b>	<b>\$2,076,389,306</b>	<b>\$14,166,025</b>	<b>\$138,608,982</b>	<b>80,234,787</b>	<b>\$687,963,448</b>	<b>70,306,968</b>	<b>\$379,166</b>
West Virginia	\$616,017,781	12,690	\$398,961,244	\$4,028,290	\$40,504,254	22,821,071	\$172,413,192	20,516,588	\$110,800
<b>Wisconsin</b>	<b>\$2,513,219,482</b>	<b>50,745</b>	<b>\$1,683,875,896</b>	<b>\$12,388,819</b>	<b>\$126,671,181</b>	<b>69,791,988</b>	<b>\$516,782,982</b>	<b>61,224,784</b>	<b>\$330,646</b>
Wyoming	\$215,933,328	4,383	\$150,308,768	\$1,140,841	\$11,197,254	6,463,094	\$53,255,896	5,671,736	\$30,630
<b>TOTAL</b>	<b>\$134,235,457,615</b>	<b>2,352,552</b>	<b>\$91,927,439,829</b>	<b>\$ 661,941,807</b>	<b>\$6,413,230,933</b>	<b>3,759,833,246</b>	<b>\$35,215,301,497</b>	<b>3,248,488,796</b>	<b>\$17,543,549</b>

Table 1 (A State-by-State Summary of the Annual Economic Impact Associated with Accelerating Broadband for Each State<sup>44</sup>) 2008 Survey

<sup>44</sup> [http://www.connectednation.org/\\_documents/connected\\_nation\\_eis\\_study\\_full\\_report\\_02212008.pdf](http://www.connectednation.org/_documents/connected_nation_eis_study_full_report_02212008.pdf)