

Idaho Broadband Investment Social and Economic Impact Study--- Phase 1

SECTION 1: EXECUTIVE SUMMARY

The State of Idaho has established the expansion of broadband access, adoption and application as a major priority for the state. With an eye to understanding the underlying cost-benefit relationship this study examines the economic and social impact of expanded broadband investment. Both the speed of the connection available and type of technology (e.g., mobile vs wireline) determine what can be achieved from additional broadband build out. Three specific scenarios are considered. Those scenarios and the types of economic and quality of life applications enabled are described in Figure 1:

Figure 1: Impact Scenarios and Opportunities Enabled

Scenario	Types of Opportunities Enabled
Scenario 1, National Standard Wireline Broadband defined as a wireline connection delivering at least 4 Mbps download speed.	<ul style="list-style-type: none"> • Basic e-mail and web searches. • Basic video streaming capabilities. • Basic two way video-conferencing. • Download of video content. • Access to standard data-bases. • On-line education content. • Basic home health monitoring. • Livestock buying and selling • Small business processing of credit card information.
Scenario 2, Advanced Wireline Broadband defined as a wireline connection delivering at least 10 Mbps download speed.	<ul style="list-style-type: none"> • HD video delivery • Multi-point video conferencing • Capacity to support needs of mid-sized or larger businesses • Precision manufacturing technologies • Tele-radiology • Tele-psychiatry consultation • Classroom whiteboards
Scenario 3, Advanced Wireless Broadband defined as a wireless connection delivering at least 10 Mbps download speed.	<ul style="list-style-type: none"> • Emergency communications from anywhere in Idaho • Ability to manage dispersed operations from remote area • Distribution of visitor information • Management of transportation fleets • Broadcast emergency alerts

This document describes results from the first phase of a nine-month (two-phase) study to assess the economic and social impact of Idaho broadband investments that would results from fulfillment of each of these three scenarios.

Through this initial phase of the study, four aspects of economic and social impact of broadband investments are considered:

- **Direct Provider Investment:** Idaho purchases of cable, towers, electronics, land, buildings, construction and other equipment or services required to expand broadband available as well as on-going annual operating costs associated with the provision of expanded services.
- **Community Reinvestment Dividend:** Additional sales, jobs, income and taxes that accrue to Idaho communities as a result of provider investments.
- **Economic Development Dividend:** New or expanded Idaho business opportunities that are possible as a result of higher quality or more available broadband service.
- **Quality of Life Dividend:** Better access to education, health care, public safety or other quality of life factors that are directly improved as a result of higher quality of more available broadband service.

The implications of executing any of these three scenarios are significant. From a broadband reach perspective:

- Executing Scenario One expands/improves the wireline broadband access for over 237,000 people who live in Idaho.
- Executing Scenario Two expands/improves the wireline broadband access for over 369,000 people who live in Idaho.
- Executing Scenario Three expands/improves the mobile wireless broadband access to over 373,517 people who live in Idaho

From a jobs and economic impact perspective the initial construction effort has a significant albeit one-time impact.

- Executing Scenario One creates \$172.8M of construction expenditures, 1,944 temporary construction jobs, labor income of \$85.3M and additional indirect business tax payments of \$5M

- Executing Scenario Two creates \$576M of construction expenditures, 6,481 temporary construction jobs, labor income of \$284.6M and additional indirect business tax payments of \$18.7M
- Executing Scenario Three creates \$164.9M of construction expenditures, 1,855 temporary construction jobs, labor income of \$81.5M and additional indirect business tax payments of \$5.3M

In addition, as the expanded broadband network goes operational, the economic impact expands in a more sustained way as operational expenditures are made.

- Executing Scenario One creates \$41.2M of expanded annual operations expenditures, 96 operational jobs, labor income of \$4.5M and additional indirect business tax payments of \$2.4M
- Executing Scenario Two creates \$90.0M of expanded annual operations expenditures, 210 operational jobs, labor income of \$9.8M and additional indirect business tax payments of \$5.3M
- Executing Scenario Three creates \$113.8M of expanded annual operations expenditures, 265 operational jobs, labor income of \$12.4M and additional indirect business tax payments of \$6.7M

In terms of the study process, the Idaho cost model was utilized to estimate the amount Idaho providers would need to spend to fulfill each scenario. Those costs were then applied within an economic impact model to estimate the overall economic impact of those investments. This document provides additional detail on the process (including the underlying model) and presents results from the first phase of a nine-month study to assess the economic and social impact of Idaho broadband investments that would result from fulfillment of each of these three scenarios.

Provider investment to fill infrastructure gaps results in significant hiring from the construction sector to complete projects. Construction firm owners and employers in turn earn profits, wages and salaries of which at least a portion is spent in other Idaho businesses resulting in a “multiplier effect”. Direct construction employment plus additional employment generated by the larger multiplier effect results in the total employment impact for the Idaho economy. The following ratios summarize the expected impact of broadband construction investment on the employment, labor income and overall sales for Idaho Communities.

Employment: Each 100 jobs created directly through a broadband construction project results in 47 additional jobs created at local businesses throughout Idaho.

Labor Income: Each one-hundred dollars paid for construction work results in approximately 41 dollars in wages, salaries and proprietors income earned in other Idaho businesses.

Output (Sales): For each 100 dollars invested in a broadband construction project, output/sales in other Idaho businesses will expand by 61 dollars.

While construction impacts are a one-time boost to the local and the state economy, the expanded broadband infrastructure creates the need for providers to expand annual operations investments in Idaho. As providers hire additional employees or vendors to support ongoing operations, those additional expenditures have a sustained a multiplier impact on the Idaho economy. The following ratios summarize the expected impact of broadband operational spending on the employment, labor income and overall sales for Idaho Communities.

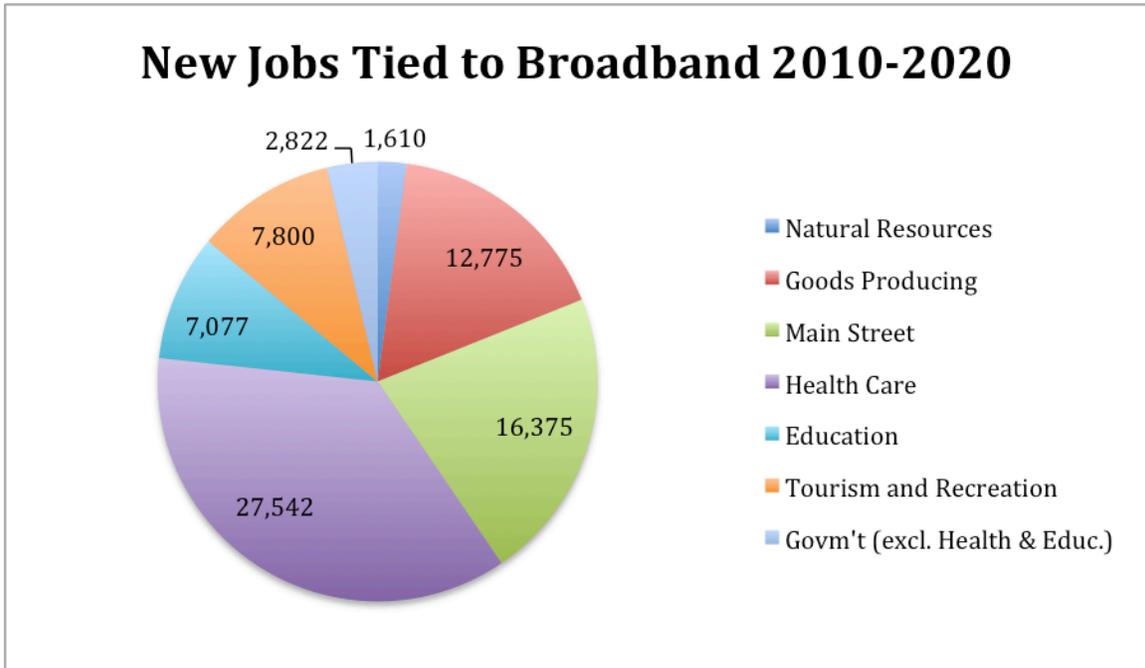
Employment: Each 100 jobs created to support expanded broadband network operations results in 219 additional jobs created at local businesses throughout Idaho.

Labor Income: Each one-hundred additional dollars paid to telecommunications sector employees results in approximately 176 additional dollars in wages, salaries and proprietors income earned in other Idaho businesses.

Output (Sales): For each 100 dollars paid annually for broadband operations, output/sales in other Idaho businesses will expand 55 dollars.

Details of level of construction investments and annual operations cost associated with each scenario and the impact on the Idaho economy are provided in the expanded text of this document.

Figure 2: Economic Development Impact Associated with More Available Quality Broadband



While the impact on the Idaho economy from the construction and future operation of expanded broadband is significant, the greatest impact occurs as a result of enabling business development throughout the broader economy. Figure 2 above illustrates the distribution of projected new jobs tied to available adequate broadband service by sector for the ten year time period 2010 to 2020. This impact reflects both the level of expected growth with major economic sectors and the dependence of those sectors on broadband to support successful economic activity. For example, health care is projected as the fastest growing sector of the Idaho economy between 2010 and 2020 (with employment projected to grow 36%). An estimated 96 percent of health care occupations utilize some form of computers, databases and access to the Internet on a daily basis.

Overall, a projected total of 103,543 Idaho jobs expected to be created between 2010 and 2020 are directly tied to the availability of broadband communications. Those Idaho communities that lack adequate broadband service will most likely be left behind in participating in the economic opportunities and quality of life benefits associated with this expected future growth.

SECTION 2: OVERVIEW OF STUDY OBJECTIVES AND METHODOLOGY

Broadband technology plays an increasingly important role in the Idaho economy and provides the means to access to education, health care, public safety and other aspects associated with a high quality of life. Each year purveyors of broadband service continue to invest in the deployment of technology demanded by Idaho businesses, households and public institutions. In spite of this on-going investment, there remain areas of Idaho that lack sufficient broadband service access.

LinkIDAHO was launched in 2011 to discover opportunities to further encourage and incent broadband investment needed to achieve Idaho's economic development and quality of life objectives. As is the case in all states, Idaho faces many important priorities. It is important to have credible objective data on the economic and social benefit that can be achieved through successful expansion of broadband infrastructure.

Figure 3: Categories of Economic and Social Impact



This study seeks to address this important information need. Specifically four aspects of economic and social impact of broadband investments are considered:

Direct Provider Investment: Idaho purchases of cable, towers, electronics, land, buildings, construction and other equipment or services required to expand broadband available as well as on-going annual operating costs associated with the provision of expanded services.

Community Reinvestment Dividend: Additional sales, jobs, income and taxes that accrue to Idaho communities as a result of provider investments.

Economic Development Dividend: New or expanded Idaho business opportunities that are possible as a result of higher quality or more available broadband service.

Quality of Life Dividend: Better access to education, health care, public safety or other quality of life factors that are directly improved as a result of higher quality of more available broadband service.

Various factors such as population density, technology type, terrain and so forth impact the amount of provider investment required to achieve a particular broadband service goal. For example, it is particularly costly to extend service into less populated and remote areas compared to areas of the state with higher population density. The investment required for a broadband network that delivers higher download speeds (the rate of data transmission to your computer or phone), or higher upload speeds (the rate of data transmission from your computer or phone), increases for higher targeted service goals. Costs also vary with the type of technology that is being deployed. These cost drivers are visually reflected in the LinkIDAHO map that displays available broadband service across the state.

For purposes of this study, three possible broadband investment scenarios are explored:

- Scenario 1—Encourage investment necessary to provide access to a wireline broadband network capable of delivering speeds of at least 4 Mbps download to every Census Block area within the state of Idaho.
- Scenario 2 – Encourage investment necessary to provide access to a wireline broadband network capable of delivering speeds of at least 10 Mbps download to every Census Block area within the state of Idaho.
- Scenario 3 – Encourage investment necessary to provide a access to a mobile wireless broadband network capable of delivering speeds of at least 10 Mbps download to every Census Block area within the state of Idaho.

networks. Figure 4 above illustrates providers, often more than one are located throughout Idaho, but with the greatest concentration in areas with high population density.

According to data collected through the LinkIDAHO initiative, approximately 99 percent of the Idaho population lives in a Census Blocks with access to a wireless service meeting at least the minimum broadband standard¹. Approximately 91% of the Idaho population have access to a DSL (traditional telecommunications broadband solution) and/or a cable or other wired technology that delivers a speed of connection at least meeting the minimum standard for broadband. Approximately 97% of Idaho’s households are in Census Blocks with a provider advertising a broadband service delivering at least 3 Mbps down. About 91% are in Census Blocks with a provider advertising a service delivering at least 10 Mbps down.

Figure 5: Employment, Labor Income, Property Income, Indirect Business Taxes and Output for Wyoming’s Telecommunications Sector, 2011

	Average Annual Jobs	Labor Income	Property Income	Indirect Business Taxes	Total Output
Region 1	401	\$22,129,768	\$39,841,801	\$6,706,432	\$173,496,204
Region 2	161	\$8,453,023	\$15,916,939	\$2,683,293	\$68,935,677
Region 3	2,468	\$114,322,578	\$245,002,481	\$41,180,279	\$1,043,271,729
Region 4	463	\$20,922,832	\$45,890,255	\$7,723,998	\$195,097,824
Region 5	423	\$19,035,000	\$41,963,630	\$7,045,136	\$165,851,135
Region 6	73	\$3,689,620	\$7,306,584	\$1,224,021	\$31,325,476
Idaho Statewide	4,590	\$205,681,625	\$455,367,454	\$76,584,908	\$1,933,016,479

Source: MIG IMPLAN data, 2011

Idaho’s telecommunications sector employs an average of 4,590 full time equivalent workers. The sector contributes over \$2 billion in sales and production to the Idaho economy each year. Notably, every region of the state benefits from the direct employment, labor income, property income and business taxes collected from the telecommunications industry. Approximately one-half of the industry’s contribution to the Idaho economy occurs in the Southern Region 3 area.

The direct employment, labor income, property income, business tax and output contribution of the telecommunications sector only tells part of the story. Providers

¹ The NTIA has established the minimum standard defining broadband as 768 kbps download and 200 kbps upload speed. For a summary of Idaho population accessing the minimum standard of broadband by technology type see the National Broadband Map at <http://www.broadbandmap.gov/summarize/state/Idaho>.

also contribute to the economy as they purchase goods and services from other businesses in their community. The workers employed by telecommunications companies spend a portion of salaries earned at local grocery stores, restaurants, gas stations, to pay for housing and so forth.

This study utilizes an economic model known as IMPLAN to estimate the additional impact on the Idaho economy associated with an increase in jobs and/or output in the state’s telecommunications sector. Results from this model estimate that every new job in the telecommunications sector will create approximately one additional job through a ripple effect of spending into local stores and businesses. Every dollar of new output sold by telecommunications providers results in an estimated 68 cents in additional sales for other Idaho businesses.

Figure 6: Example of Idaho Sectors Most Impact By Telecommunications Sector Growth

Economic Sector	Jobs Created in Sector As a Result of 100 New Telecommunication Jobs
Telecommunications	8 additional jobs
Food Services	10 additional jobs
Real Estate	9 additional jobs
Maintenance & Repair	6 additional jobs
Engineering Services	5 additional jobs
Business Support Services	5 additional jobs
Accounting Services	4 additional jobs
Motion Pictures	4 additional jobs
News Paper Publishers	4 additional jobs
Banks	3 additional jobs

Source: MIG IMPLAN model SAM multiplier estimates for telecommunications sector (351).

Figure 6 provides a detailed breakout of the ten most impacted economic sectors as estimated using the IMPLAN model employment multiplier calculations for the Idaho telecommunications sector. An investment creating 100 new jobs within the telecommunications sector creates even more jobs within the telecommunications sectors as companies within this sector purchase goods and services from each other. However the impact on the local Idaho economy is much larger. For example if the Idaho telecommunications sector expands by 100 new jobs, an additional 10 jobs are needed to support associated growth in the food services sector and an additional 9 jobs are needed to support associated growth in Real Estate. The list of the top ten impacted sectors in Figure 6 illustrates the diversity of Idaho economic sectors that are impacted when the telecommunications industry grows.

In addition to these economic benefits associated with telecommunications sector earnings are the overall benefit for Idaho economic development and quality of life

associated with access to quality and affordable high speed Internet infrastructure. The remainder of this document will explore in more depth the four types of economic impact associated with expanded Idaho telecommunications sector investments:

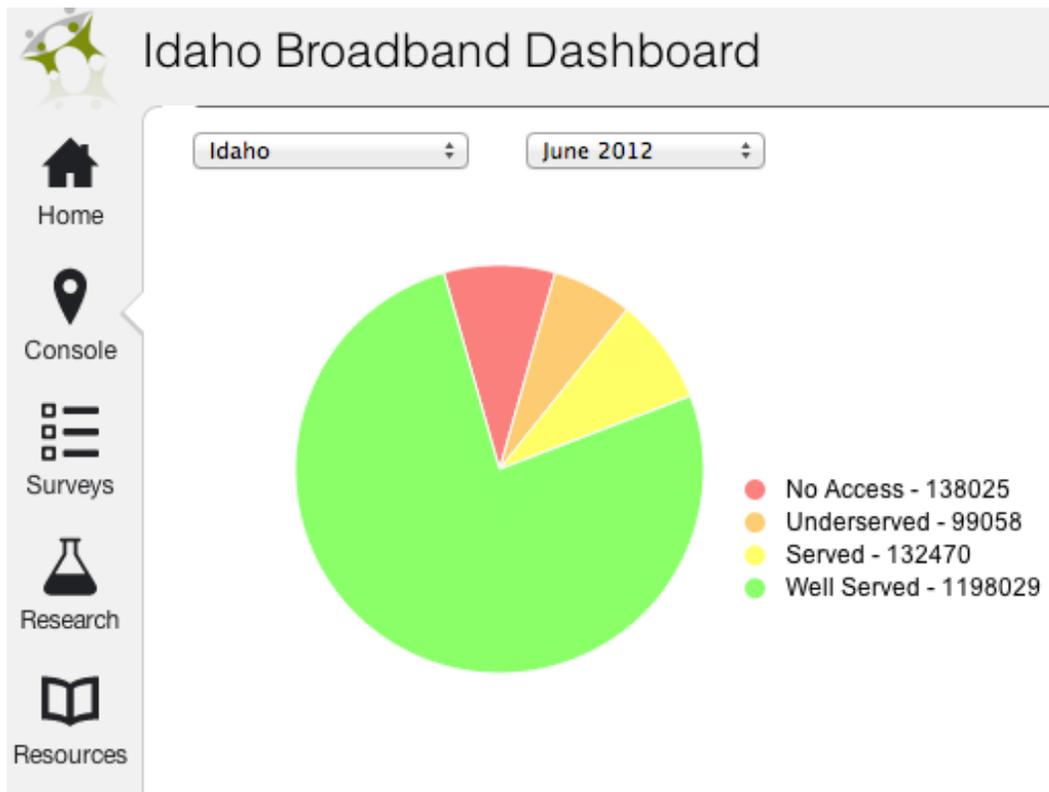
- Direct Provider Investment (Section)
- Community Reinvestment Dividend (Section)
- Economic Development Dividend (Section)
- Quality of Life Dividend (Section)

SECTION 4—ESTIMATED DIRECT PROVIDER INVESTMENT IN IDAHO FOR EACH TARGET SCENARIO

LinkIdaho commissioned customized runs of the Idaho cost model² to estimate investment required to accomplish the construction and on-going operation of enhanced broadband networks consistent with each of three scenarios. This section describes the provider investment required to accomplish each scenario and the resulting direct contribution to the Idaho economy. A customized design utilizing the IMPLAN input-output model is utilized to estimate the additional community reinvestment dividend resulting from provider construction and operations expenditures associated with the expanded broadband network.

Enhanced Wireline Broadband Service

Figure 7: Idaho Wireline Service Access, June 2012



² See Analytics section of LinkIDAHO web site at LinkIDAHO.org

Approximately 85% of the Idaho population live in areas of the state where there is at least one broadband service provider that advertises the availability of a wireline option that provides a minimum of 3 Mbps download speed (see Figure 7). That is a network that achieves a level of service delivery approximately equal to the standard advocated within the National Broadband Plan (4 Mbps down and 1 Mbps up) or greater. Three-quarters of Idaho residents live in locations with an advertised wireless service that substantially exceeds the National Broadband Plan service goal. Only 9% of Idaho residents live in areas of the state where there is no wireline broadband service advertised or there is a service advertised but it is less than that advocated within the National Broadband Plan.

Figure 8: Broadband Wireline Service Is Not Advertised In Many Of The More Remote Areas of Idaho

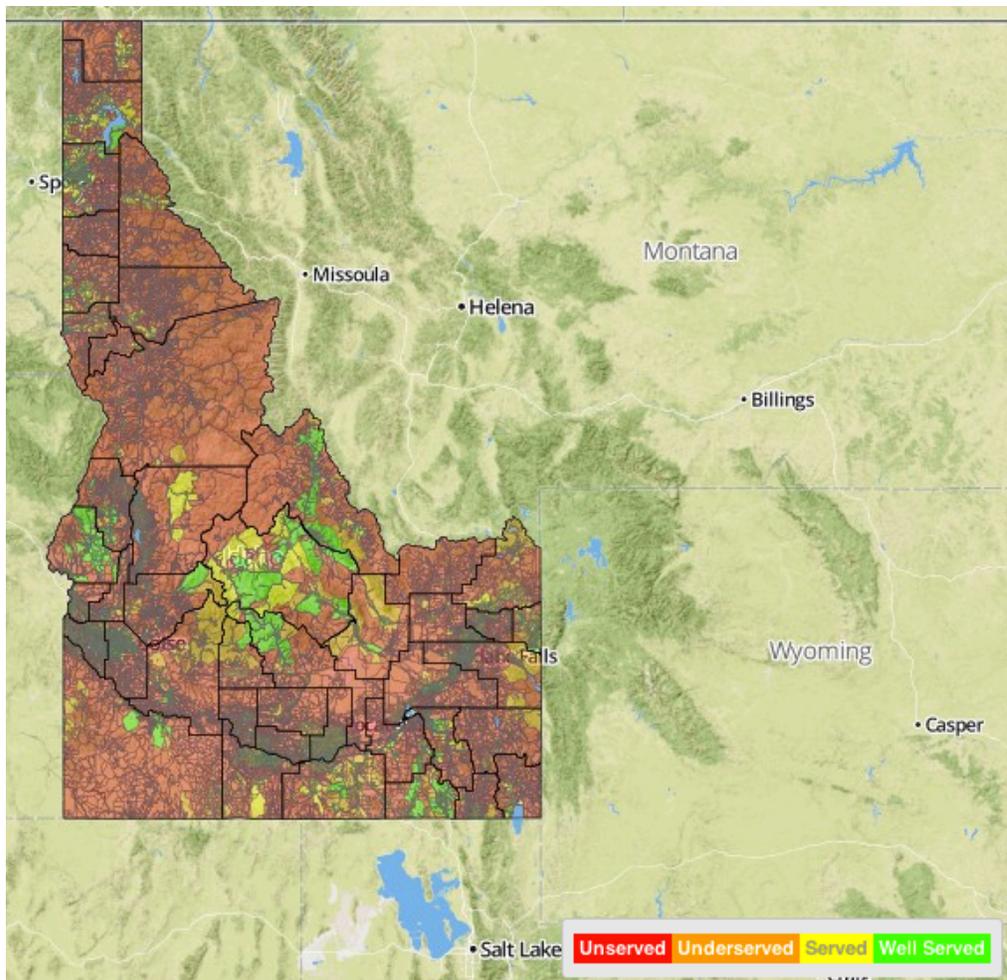


Figure 8 illustrates that even though the vast majority of Idaho’s residents live in areas with an advertised wireline service option, there are huge geography’s where there is no or limited wireline broadband service available. While some of those areas are wide open spaces where there are not homes, there are still many homes

scattered throughout Idaho with no available broadband service or service that is limited in bandwidth capability. Scenario one of this economic and social impact study contemplates incentives that would result in provider investments that would connect all Idaho residents presently living in “unserved” or “underserved” areas would be connected with a broadband option delivering at least the National Broadband Plan standard of 4 Mbps download. This represents expanded service to just over 237,083 people.

Scenario 2 is considerably more ambitious. Scenario 2 would create a statewide network that would deliver at least 10 Mbps download speeds to every inhabited Census Block in Idaho. This represents expanded broadband connections to over 369,000 people scattered throughout Idaho.

A specialized broadband infrastructure deployment cost model was developed as a component of the LinkIDAHO project³. For purposes of estimating the direct investment required for each of the two wireline broadband upgrade scenarios, costs are separated into three broad categories: 1) electronics, 2) construction and 3) Operations Expenses (OPEX). The reason for these separations is to accurately reflect the sourcing of goods and services that make up the enhanced wireline broadband network. Only those goods and services purchased from Idaho vendors or performed by employees based in Idaho contribute to state economic impact.

After informal consultation with representatives from the Idaho telecommunications industry it has been assumed that in general electronics are purchased from vendors outside the state of Idaho. Approximately 50% of the construction expenditures are paid to Idaho vendors and/or employees of Idaho telecommunications companies. As far as operations expenditures, it is assumed those costs are incurred by providers located in Idaho. These assumptions are intended to be representative of a typical Idaho wireline upgrade project recognizing the extent of Idaho purchases of goods and services for a project will vary from one company to another.

Figure 9 describes the total upgrade costs by major category associated with fulfillment of the Scenario 1 objective of enabling all IDAHO households and businesses to access a broadband connection with a download speed of 4 Mbps down. Figure 10 describes the total upgrade costs by major category associated with the more ambitious objective of enabling all Idaho households and businesses to access a wireline connection of 10 Mbps or greater.

³ The LinkIDAHO cost model is developed by CostQuest Associates with assumptions and model parameters consistent with that used by the Federal Communications Commission. Additional information and documentation for the LinkIDAHO cost model available at: **xxxxxx**

Figure 9: Scenario 1 --Estimated Cost of Statewide Wireline Network Upgrade to at least 4 Mbps Download by Major Expense Category

	Network Electronics	Network Construction	Annual Operations Expense
Region 1			
Boundary	\$2,657,524	\$9,115,147	\$942,702
Bonner	\$6,587,800	\$13,821,724	\$2,150,692
Benewah	\$3,413,345	\$9,258,748	\$1,066,580
Kootenai	\$4,480,188	\$8,968,593	\$1,435,975
Shoshone	\$2,494,931	\$12,208,152	\$1,098,747
Region 2			
Idaho	\$9,273,067	\$38,027,722	\$3,578,602
Latah	\$2,566,896	\$6,769,655	\$776,877
Lewis	\$1,579,385	\$4,474,095	\$461,062
Nez Perce	\$2,890,434	\$7,436,655	\$1,011,053
Clearwater	\$2,664,957	\$9,777,424	\$991,807
Region 3			
Valley	\$4,312,081	\$12,947,814	\$1,652,365
Washington	\$1,021,710	\$3,102,661	\$356,552
Owyhee	\$4,258,422	\$19,235,198	\$1,900,828
Gem	\$1,565,737	\$3,622,770	\$490,499
Ada	\$1,534,057	\$3,315,662	\$498,114
Elmore	\$3,831,952	\$14,595,511	\$1,502,710
Payette	\$1,083,034	\$2,389,311	\$356,552
Canyon	\$3,928,529	\$4,541,698	\$1,502,710
Adams	\$1,643,717	\$5,579,183	\$669,572
Boise	\$3,533,468	\$11,450,216	\$1,293,092
Region 4			
Blaine	\$1,733,827	\$6,358,810	\$648,840
Camas	\$1,579,205	\$5,984,096	\$550,782
Jerome	\$2,016,648	\$3,328,474	\$583,936
Lincoln	\$1,257,588	\$3,786,384	\$404,822
Gooding	\$1,981,127	\$3,952,099	\$584,143
Minidoka	\$144,436	\$396,622	\$54,794
Twin Falls	\$3,363,199	\$8,458,115	\$1,210,788
Cassia	\$2,205,259	\$7,531,918	\$857,367
Region 5			
Bear Lake	\$1,534,682	\$4,785,026	\$501,958
Bannock	\$2,704,849	\$5,785,366	\$822,613
Oneida	\$648,040	\$3,420,195	\$334,873
Power	\$1,902,089	\$5,501,594	\$622,592
Caribou	\$2,547,329	\$8,349,022	\$821,236

Bingham	\$4,278,146	\$9,649,036	\$1,322,657
Franklin	\$2,484,275	\$5,102,661,	\$684,883
Region 6			
Custer	\$917,888	\$6,336,046	\$624,896
Teton	\$512,334	\$1,511,093	\$206,411
Freemont	\$3,290,950	\$8,369,452	\$1,138,086
Madison	\$1,568,472	\$2,768,892	\$549,452
Jefferson	\$3,549,934	\$5,326,559	\$1,094,621
Bonneville	\$2,722,829	\$6,792,959	\$988,082
Butte	\$668,186	\$4,133,852	\$405,966
Lemhi	\$4,786,634	\$21,945,645	\$1,973,296
Clark	\$1,719,507	\$5,446,884	\$750,982
Idaho	\$115,438,665	\$345,658,759	\$41,271,913

Figure 10: Scenario 2 --Estimated Cost of Statewide Wireline Network Upgrade to at least 10 Mbps Download by Major Expense Category

Region 1			
Benewa	\$1,293,854	\$34,327,168	\$2,568,748
Bonner	\$3,093,421	\$78,265,371	\$6,330,335
Boundary	\$1,320,103	\$34,496,829	\$2,608,655
Kootenai	\$2,040,156	\$51,678,928	\$4,207,640
Shoshone	\$1,254,996	\$35,786,800	\$2,947,696
Region 2			
Clearwater	\$1,415,722	\$31,121,077	\$2,391,097
Idaho	\$3,687,745	\$90,415,206	\$6,504,814
Latah	\$1,505,079	\$33,145,896	\$2,407,395
Lewis	\$867,429	\$14,170,598	\$1,111,213
Nez Perce	\$1,274,936	\$27,929,114	\$2,333,483
Region 3			
Ada	\$551,543	\$13,661,417	\$1,097,431
Adams	\$663,479	\$16,528,565	\$1,372,951
Boise	\$1,213,198	\$34,986,377	\$2,589,777
Canyon	\$1,397,480	\$33,496,786	\$2,874,640
Elmore	\$1,149,303	\$35,344,661	\$2,662,090
Gem	\$522,284	\$13,859,231	\$1,033,439
Owyhee	\$1,330,424	\$41,459,257	\$3,041,983
Payette	\$386,260	\$10,139,130	\$781,432
Valley	\$1,521,589	\$37,954,336	\$2,980,044
Washington	\$725,678	\$17,471,380	\$1,402,374
Region 4			
Blaine	\$689,380	\$16,962,558	\$1,229,811

Camas	\$514,628	\$12,772,609	\$861,532
Cassia	\$1,378,307	\$25,260,202	\$2,051,809
Gooding	\$860,764	\$19,067,857	\$1,423,832
Jerome	\$890,406	\$18,903,646	\$1,453,044
Lincoln	\$545,286	\$13,000,921	\$898,412
Minidoka	\$99,438	\$2,206,873	\$186,569
Twin Falls	\$1,453,117	\$31,186,364	\$2,635,298
Region 5			
Bannock	\$1,616,445	\$25,690,175	\$2,072,126
Bear Lake	\$571,354	\$12,681,984	\$919,494
Bingham	\$1,857,638	\$36,413,195	\$2,846,471
Caribou	\$1,314,525	\$21,331,917	\$1,560,565
Franklin	\$1,508,110	\$24,392,330	\$2,007,393
Oneida	\$394,337	\$8,970,877	\$751,509
Power	\$730,300	\$14,530,901	\$1,085,288
Region 6			
Bonneville	\$1,149,626	\$23,532,523	\$2,012,475
Butte	\$443,265	\$10,861,103	\$917,090
Clark	\$665,178	\$10,050,458	\$1,039,096
Custer	\$500,592	\$13,478,291	\$1,164,377
Freemont	\$1,519,342	\$36,550,274	\$2,853,105
Jefferson	\$1,766,241	\$23,583,900	\$2,250,097
Lemhi	\$1,521,410	\$40,418,130	\$2,850,715
Madison	\$654,760	\$13,710,113	\$1,198,348
Teton	\$428,946	\$10,342,061	\$964,177
Idaho	\$50,288,074	\$1,152,137,389	\$90,479,870

Scenario 1 is assumed to be accomplished substantially by adding new electronics to expand the capability of the legacy copper network along with additional construction as needed to bring service within 12 kilo feet of each housing or business unit in Idaho. The Scenario 2 assumptions require building out a largely fiber network that replaces much of the existing copper network. In the case of Scenario 2, the cost model network design builds a point of aggregation within 5 kilo feet of every household or business in the state. Consequently for Scenario 1 the modeled investment in electronics is substantially higher than for Scenario 2. However, modeled construction costs are substantially higher for Scenario 2. Scenario 2 operations costs are also higher in part because a much larger number of households and businesses must be supported with upgraded infrastructure.

Figure 11: Idaho Specific Direct Impact Associated with Wireline Upgrade Investments

	<i>One Time Construction Costs:</i>	
	Scenario 1	Scenario 2
Total Idaho contractor/employee construction expenditures	\$172,829,372	\$576,068,670
Temporary construction related jobs:	1,944	6,481
Labor Income earned for construction:	\$85,391,580	\$284,624,155
Additional indirect business tax payments:	\$5,605,875	\$18,685,303
	<i>Annual Operations Expenditures:</i>	
	Scenario 1	Scenario 2
Annual maintenance and operations expenditures:	\$41,271,914	\$90,068,698
New telecommunications sector jobs:	96	210
Additional annual telecommunications sector labor income	\$4,478,747	\$9,774,078
Additional indirect business tax payments resulting from expanded broadband deployment	\$2,436,993	\$5,318,309

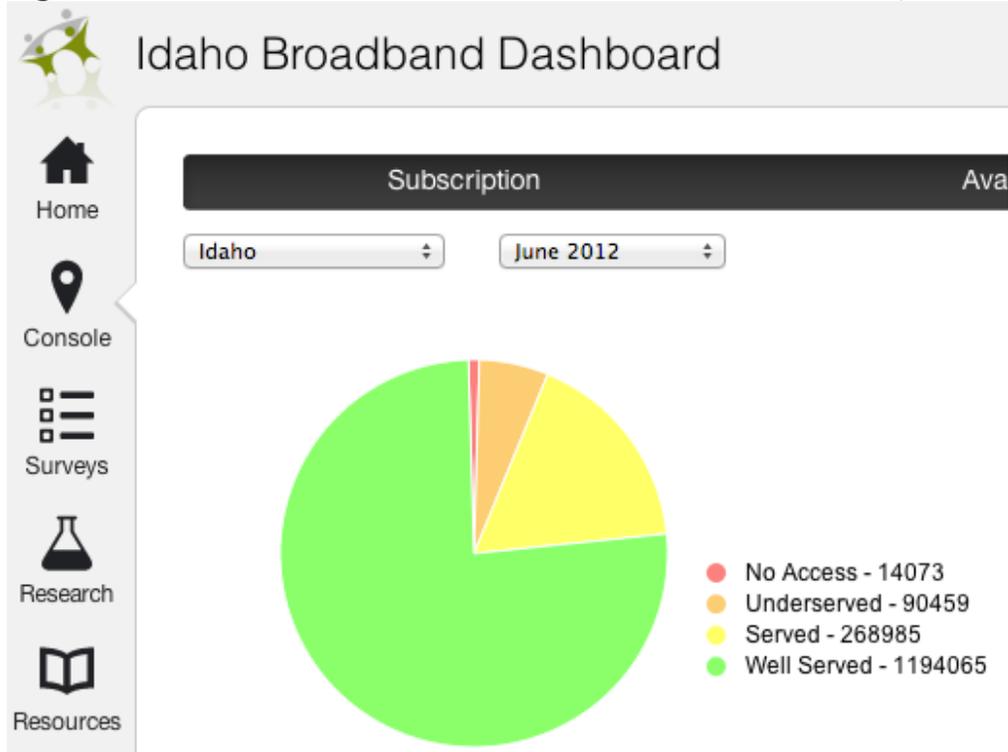
Source: MIG IMPLAN model

As already noted, expenditures on additional electronics are assumed to be from out of state vendors and therefore will not have a direct economic impact on Idaho. Purchases from Idaho vendors or Idaho based telecommunications company employees for construction needs are more than three times as great for Scenario 2 compared to Scenario 1. Employment, labor payments and indirect business tax payments are proportional to these modeled expenditures.

Jobs, labor payments and indirect business taxes associated with construction are substantial but represent a one-time impact. However, operations expenditures are on-going and provide a longer term impact on the Idaho economy. Overall 96 new telecommunications sector jobs are projected for Scenario 1 and 210 new telecom sector jobs are projected for Scenario 2 as an on-going impact. Associated with these jobs are substantial state income gains and new indirect business taxes flowing to local and state government.

Enhanced Mobile Wireless Broadband Service

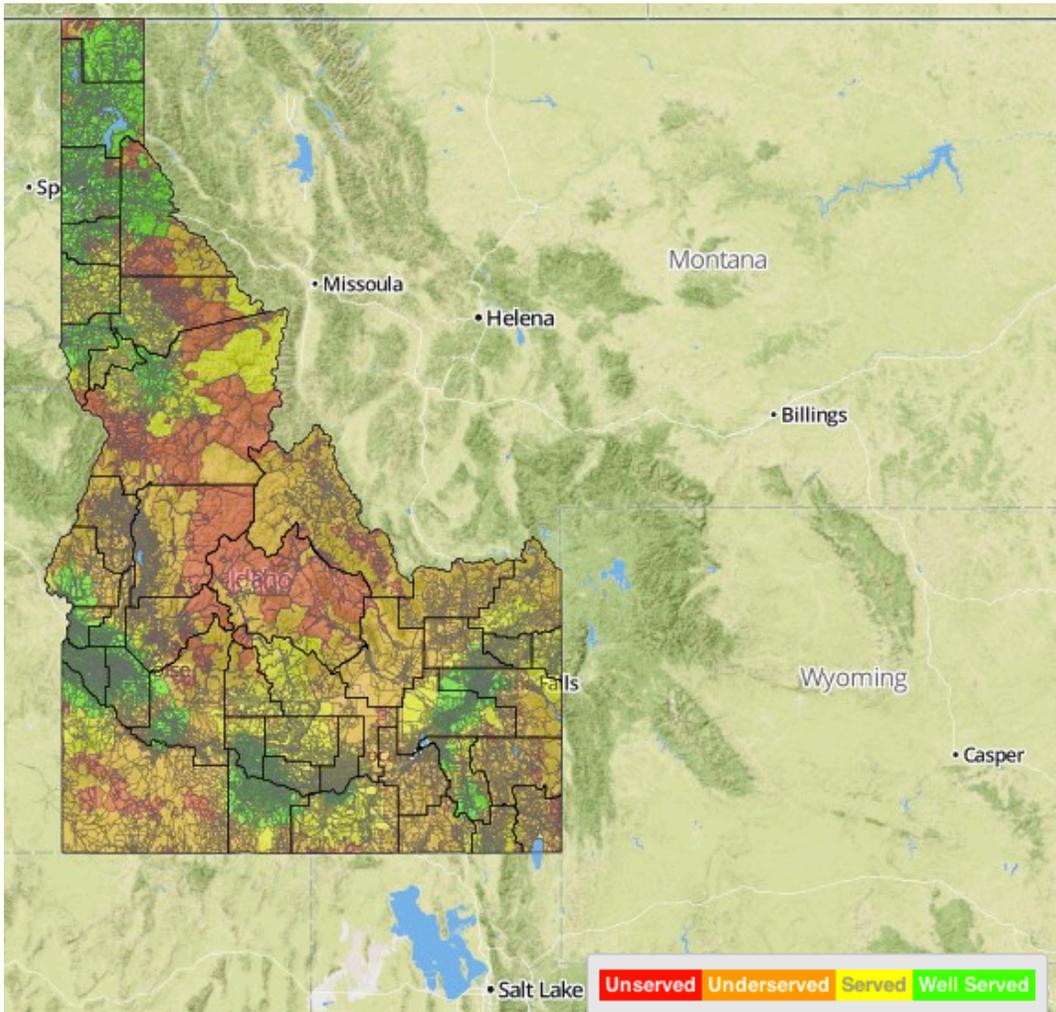
Figure 12: Idaho Mobile Wireless Broadband Service Access, June 2012



More than three-quarters of Idaho's residents live in a location where there is an advertised higher speed mobile wireless option. Only a small sliver of Idaho's population live in census blocks where there is no advertised wireless option.⁴

⁴ It is recognized that while there is advertise availability, actually availability in any location is inconsistent as a result of various terrain issues.

Figure 13: Availability of Mobile Wireless Coverage Varies Significantly Across Geography in Idaho



However the map in Figure 13 illustrates the availability and quality of mobile wireless coverage varies significantly across different geography of Idaho. In general, areas of highest population density also have the highest speed mobile wireless option available. Some level of mobile wireless coverage extends even to the more remote areas of the state. Scenario 3 anticipates investments will be made that result in all inhabited Census Blocks in Idaho having access to mobile wireless coverage delivering approximately 10 Mbps download speeds.

For purposes of this study, modeled mobile wireless investment costs are separated into the three boxes: 1) network electronics and spectrum costs, 2) tower construction and equipment and 3) annual operations expense. The distribution of those modeled expenditures by county required to bring service in all inhabited census blocks up to a 10 Mbps download speed standard are described in Figure 14 below.

Figure 14: Scenario 3-- Estimated Cost of Statewide LTE Wireless Network Upgrade to at least 10 Mbps Download by Major Expense Category

	Network Electronics and Spectrum Purchases	Tower Construction and Equipment	Annual Operations Expense
Region 1			
Boundary	\$834,498	\$8,254,445	\$3,267,889
Bonner	\$969,733	\$14,851,344	\$4,304,685
Benewah	\$279,028	\$5,935,174	\$1,538,463
Kootenai	\$724,062	\$16,196,185	\$4,304,685
Shoshone	\$582,971	\$9,598,160	\$2,653,082
Region 2			
Idaho	\$1,777,603	\$24,378,935	\$6,768,415
Latah	\$1,739,087	\$13,166,445	\$8,023,409
Lewis	\$244,914	\$2,719,166	\$93,739
Nez Perce	\$1,923,905	\$16,290,307	\$9,239,959
Clearwater	\$583,931	\$5,344,913	\$2,418,784
Region 3			
Valley	\$865,198	\$11,231,909	\$3,854,977
Washington	\$616,321	\$10,376,521	\$3,509,193
Owyhee	\$970,660	\$9,325,358	\$5,160,903
Gem	\$732,438	\$7,685,353	\$3,912,867
Ada	\$402,156	\$6,066,228	\$2,245,751
Elmore	\$1,731,876	\$19,120,050	\$8,515,973
Payette	\$970,660	\$9,325,358	\$5,160,903
Canyon	\$492,156	\$5,624,697	\$2,417,956
Adams	\$361,772	\$3,806,504	\$1,370,105
Boise	\$479,963	\$13,289,880	\$3,551,388
Region 4			
Blaine	\$1,359,948	\$16,638,688	\$7,374,235
Camas	\$152,564	\$3,280,193	\$842,599
Jerome	\$907,514	\$7,468,672	\$5,110,360
Lincoln	\$272,616	\$3,066,575	\$1,457,065
Gooding	\$684,853	\$6,974,660	\$3,768,758
Minidoka	\$848,306	\$6,675,200	\$4,728,748
Twin Falls	\$3,438,010	\$27,243,372	\$18,676,719
Cassia	\$1,167,816	\$13,863,776	\$6,644,929
Region 5			
Bear Lake	\$462,981	\$5,252,460	\$1,917,570
Bannock	\$3,695,418	\$29,520,708	\$18,807,753
Oneida	\$452,806	\$7,631,001	\$2,068,595
Power	\$564,646	\$7,404,803	\$2,665,154
Caribou	\$588,191	\$8,839,309	\$2,785,065

Bingham	\$2,006,228	\$18,747,274	\$10,601,267
Franklin	\$731,847	\$6,690,840	\$3,192,772
Region 6			
Custer	\$759,777	\$14,565,489	\$3,479,350
Teton	\$571,863	\$4,727,923	\$2,611,732
Freemont	\$819,245	\$10,085,076	\$4,130,027
Madison	\$1,573,203	\$11,939,259	\$8,650,974
Jefferson	\$1,137,316	\$9,445,993	\$5,859,247
Bonneville	\$4,372,189	\$31,177,810	\$1,973,960
Butte	\$339,210	\$5,632,847	\$1,514,817
Lemhi	\$1,434,878	\$16,539,854	\$4,714,999
Clark	\$202,360	\$4,957,280	\$1,145,858
Idaho	\$45,628,166	\$494,707,380	\$227,636,004

As is the case for wireline infrastructure builds, most electronics are not purchased in the state of Idaho and therefore their purchase does not directly impact the state economy. Similarly spectrum is not generally purchased locally. While expenditures to construct towers and purchase electronic equipment for use on those towers is substantial, much of those purchase are also out of state. For purposes of this study, one-third of total “tower construction and equipment” purchases are assumed to be local within Idaho. Two-thirds purchased out of state. The modeled annual operations expenses are substantially higher for mobile wireless upgrade than is the case for the two wireline scenarios. This in part is because for the wireless model it is assumed that that fiber or microwave connections to the towers are leased rather than constructed. Reports from knowledgeable Idaho telecom industry experts indicate those connections are often purchased from out of state vendors. Consequently, for purposes of this study it is assumed only 50% of mobile wireless operating expenses accrue to Idaho telecommunications companies.

Figure 15: Idaho Specific Direct Impact Associated with Mobile Wireless Upgrade Investments

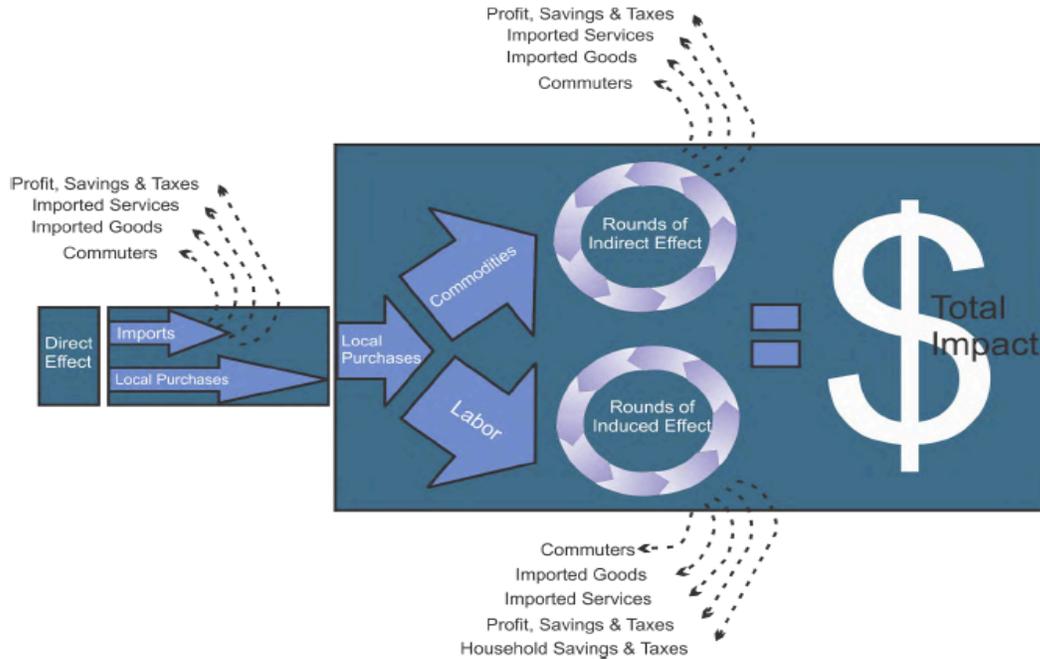
<i>One Time Construction Costs:</i>	
Scenario 3	
Total tower construction and equipment purchases from Idaho vendors	\$164,902,453
Temporary construction related jobs:	1,855
Labor Income earned for construction:	\$81,475,046
Additional indirect business tax payments:	\$5,348,759
<i>Annual Operations Expenditures:</i>	
Scenario 3	
Annual maintenance and operations expenditures:	\$113,818,066
New telecommunications sector jobs:	265
Additional annual telecommunications sector labor income	\$12,351,306
Additional indirect business tax payments resulting from expanded broadband deployment	\$6,720,641

Figure 15 summarizes elements of Idaho direct provider investment impact associated with Scenario 3. An estimated \$165 million would be spent for tower construction and equipment purchases with Idaho vendors or employees within Idaho telecommunications companies to upgrade the state mobile broadband network to deliver 10 Mbps in all inhabited locations. This would result in 1,855 one-time construction jobs creating Idaho labor income in excess of \$81 million and adding approximately \$5 million in new indirect business taxes. The resulting annual operational expenditures would create 265 new telecom sector jobs in Idaho with annual contribution to labor income of over \$12 million and add approximately 6 million in new local and state business tax payments.

SECTION 5—MODELED COMMUNITY REINVESTMENT DIVIDEND

The direct broadband provider investment in Idaho is only the start a larger process leading to new economic activity and improved quality of life throughout the state. Dollars spent in Idaho by providers that upgrade their network lead to additional returns for Idaho communities as vendors and employees in turn spend new revenues and paychecks earned. A respected economic model created by MIG Inc., known as IMPLAN, is used to estimate the economic multiplier values associated with provider investments.

Figure 16: Illustration of Community Reinvestment of Provider Purchases



The above graphic illustrates the larger Idaho economic impact associated with the direct broadband provider investment. If an Idaho worker is hired for a job, he or she earns a salary of which a portion is spent in local Idaho communities. For example he or she may eat at a local restaurant, buy clothes from a local store or purchase a new vehicle from a local dealer. Taxes paid to local or state government stay within Idaho and result in additional local purchases. Taxes paid to the federal government are lost from the state and do not contribute to the local economic impact (at least in the short run). Those local business owners who receive payments directly from broadband providers or indirectly as a result of workers or other businesses who did receive a payment as a result of the provider investment also have increased sales. And so the cycle continues.

In short the community reinvestment dividend depends on the extent purchases of goods, services and labor are obtained locally. The dollars that leave Idaho as a result of hiring out-of-state workers, making purchases from outside vendors or are lost through payments of profits or taxes to entities outside of the state reduce the community reinvestment dividend. Similarly, to the extent that new profits or labor income received as a result of the direct provider investment in Idaho are retained and reinvested locally, this dividend will increase.

Total Construction Impact

Figure 17: Summary of Construction Impacts by Scenario

Scenario 1

Impact Type	Employment	Labor Income	Output
Direct Effect	1,018	\$44,704,315	\$90,479,866
Indirect Effect	149	\$6,790,437	\$19,345,772
Induced Effect	<u>332</u>	<u>\$11,410,633</u>	<u>\$37,265,213</u>
Total Effect	1,499	\$62,905,385	\$147,090,850

Scenario 2

Impact Type	Employment	Labor Income	Output
Direct Effect	6,482	\$284,624,155	\$576,068,670
Indirect Effect	946	\$43,233,463	\$123,170,971
Induced Effect	<u>2,117</u>	<u>\$72,649,400</u>	<u>\$237,260,757</u>
Total Effect	9,544	\$400,507,018	\$936,500,397

Scenario 3

Impact Type	Employment	Labor Income	Output
Direct Effect	1,855	\$81,475,046	\$164,902,453
Indirect Effect	271	\$12,375,789	\$20,796,243
Induced Effect	<u>606</u>	<u>\$20,796,243</u>	<u>\$67,917,043</u>
Total Effect	2,732	\$114,647,078	\$268,077,784

Figure 17 above provides a summary and comparison of construction impacts for each of the three scenarios. The IMPLAN model divides impacts into three types of effects:

- **Direct Effect:** The direct hiring of Idaho vendors or Idaho employees by providers in constructing new broadband infrastructure.
- **Indirect Effect:** Additional Idaho employment, labor income and sales (output) resulting from providers purchasing goods and services from local businesses.
- **Induced Effect:** Additional Idaho employment, labor income and sales (output) resulting from workers who in turn spend earning within their local communities.

Together, the “indirect effect” and the “induced effect” make up the “community reinvestment dividend”. With larger expenditure on construction by broadband providers, there is a larger community reinvestment dividend. The overall

community reinvestment dividend for broadband construction projects, are as follows:

Employment: Each 100 jobs created directly through a broadband construction project results in 47 additional jobs created at local businesses throughout Idaho.

Labor Income: One hundred dollars paid for construction work results in approximately 41 dollars in wages, salaries and proprietors income earned in other Idaho businesses.

Output (Sales): For each 100 dollars invested in a broadband construction project, output/sales in other Idaho businesses will expand 61 dollars.

Total Annual Operations Impact

Figure 19: Summary of Annual Operations Impacts by Scenario

Scenario 1

Impact Type	Employment	Labor Income	Output
Direct Effect	96	\$4,478,747	\$41,271,914
Indirect Effect	139	\$5,455,910	\$20,706,471
Induced Effect	69	\$2,360,212	\$7,704,362
Total Effect	303	\$12,294,869	\$69,682,747

Scenario 2

Impact Type	Employment	Labor Income	Output
Direct Effect	210	\$9,774,078	\$90,068,698
Indirect Effect	302	\$11,906,564	\$45,188,233
Induced Effect	150	\$5,150,748	\$16,813,415
Total Effect	662	\$26,831,390	\$152,070,347

Scenario 3

Impact Type	Employment	Labor Income	Output
Direct Effect	265	\$12,351,306	\$113,818,006
Indirect Effect	382	\$15,046,086	\$57,103,463
Induced Effect	190	\$6,508,897	\$21,246,776
Total Effect	837	\$33,906,289	\$192,168,245

Figure 19 summarizes the annual operations impacts associated with each scenario. Since operations expenses are recurring after the expanded network is built, these

impacts continue on a more permanent basis. The overall annual operations expenses are substantially higher for the higher-speed wireline and mobile wireless options, which result in a larger on-going economic impact. The following are the modeled economic multipliers associated with the on-going operations of the enhanced broadband network.

Employment: Each 100 jobs created to support expanded broadband network operations results in 219 additional jobs created at local businesses throughout Idaho.

Labor Income: Each 100 additional dollars paid to telecommunications sector employees results in approximately 176 additional dollars in wages, salaries and proprietors income earned in other Idaho businesses.

Output (Sales): For each 100 dollars paid annually for broadband operations, output/sales in other Idaho businesses will expand 55 dollars.

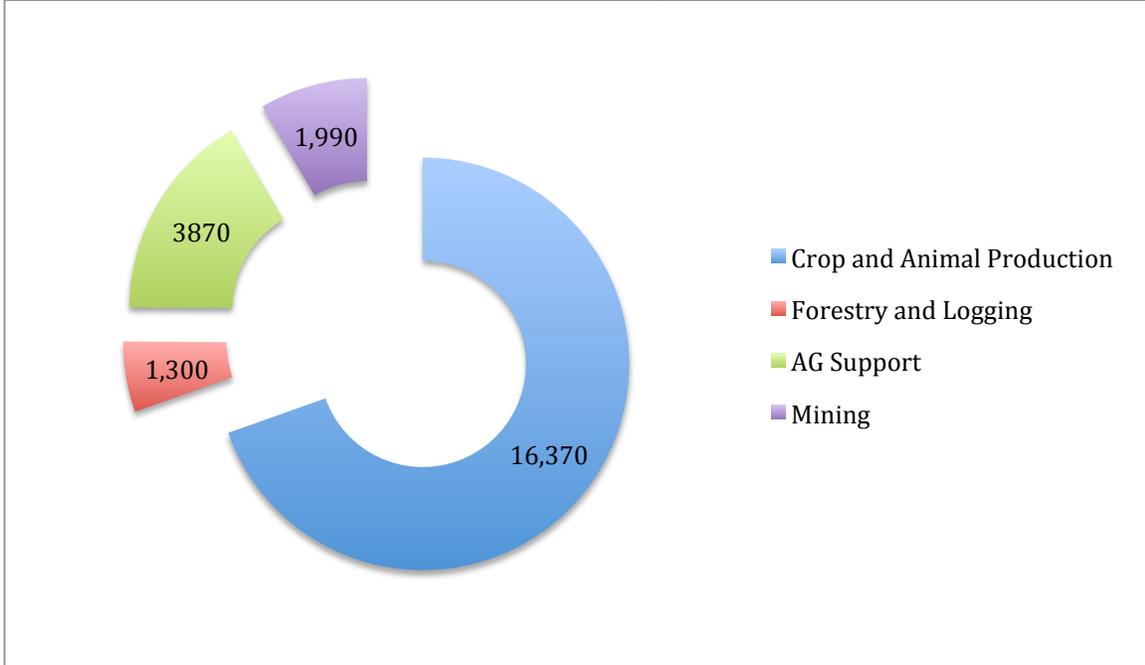
SECTION 6—ECONOMIC DEVELOPMENT AND QUALITY OF LIFE DIVIDENDS

The availability of broadband is not an end goal by itself. Broadband is valuable because it is the basic infrastructure necessary for success in today's economy and can be used in many ways that promote quality living. This section of the economic and social impact study provides a high level introduction to the economic and quality of life dividends associated with expanded broadband. A follow-up Phase 2 study to be conducted over the summer of 2013 will implement several case studies with a specific goal of assessing in more detail how expanded broadband can impact Idaho economic growth and quality lifestyles.

Broadband and the Idaho Economy

Idaho Natural Resource Industries

Figure 20: Idaho Natural Resource Based Employment, 2010



Natural resource based industries are a critical component of the Idaho economy. Crop and animal production businesses employed over 16,000 people in 2010. The sector employs an even larger number of individuals when consideration is given to self-employed and unpaid family workers. Forestry employed nearly 2,000 in 2010 and agricultural support businesses employed an additional 3,870 people. Mining employed 1,300. Overall, the natural resource sector employs about 4% of the Idaho workforce, excluding self employed and unpaid family workers.

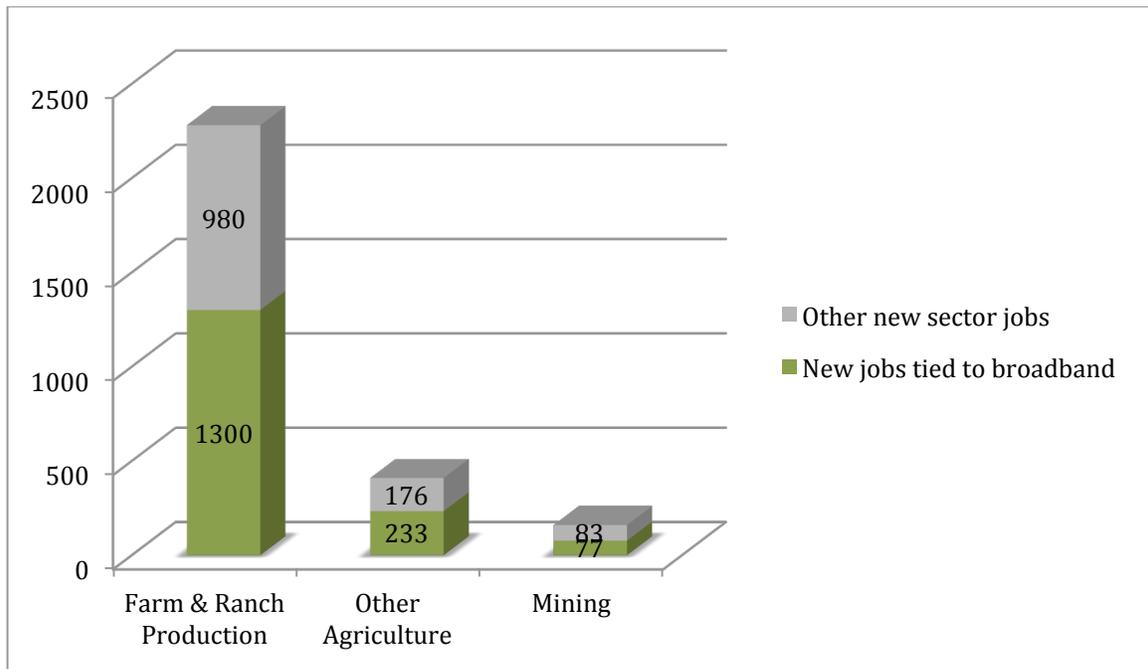
Figure 21: Examples of Idaho Natural Resource Industry Occupations and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Change 2011 - 2011
Sector Average Percent Employment Change	12.5%
Farm and Ranch Managers	14.1%
Mining Engineers	12.5%
Foresters	3.7%
Soil and Plant Scientists	4.9%
Animal Care Service Workers	26.7%
Truck Drivers	12.9%
Farmworkers and Laborers	12.3%

Figure 21 illustrates the diverse array of occupations within Idaho’s Natural Resource sector. Overall employment within this industry sector is expected to grow 12.5% between 2010 and 2020. Many employed in the industry are farm or ranch operators or laborers who support farming, ranching and forest management. This sector does not include the extensive manufacturing and wholesale network that is tied to farming, ranching and forestry operations. It only represents employment directly working within the natural resource enterprise.

The availability of broadband is important to the economic success of Idaho natural resource based industries. Ranchers utilize the Internet as a primary means to buy and sell livestock. Obtaining information via the web is one way for isolated ranch operations to connect with veterinarians saving time and money that would be associated with bringing the veterinarian to the ranch or the livestock to the vet. Intelligence is increasingly being built into precision tools that make agriculture as well as mining and petroleum operations more efficient. Mining engineers depend on computerized mapping and data base systems to target and manage extraction operations. Because much of the work accomplished within natural resource based industries occurs in the “field”, the availability of high-speed wireless connections is often needed to support those precision applications. These are just several examples.

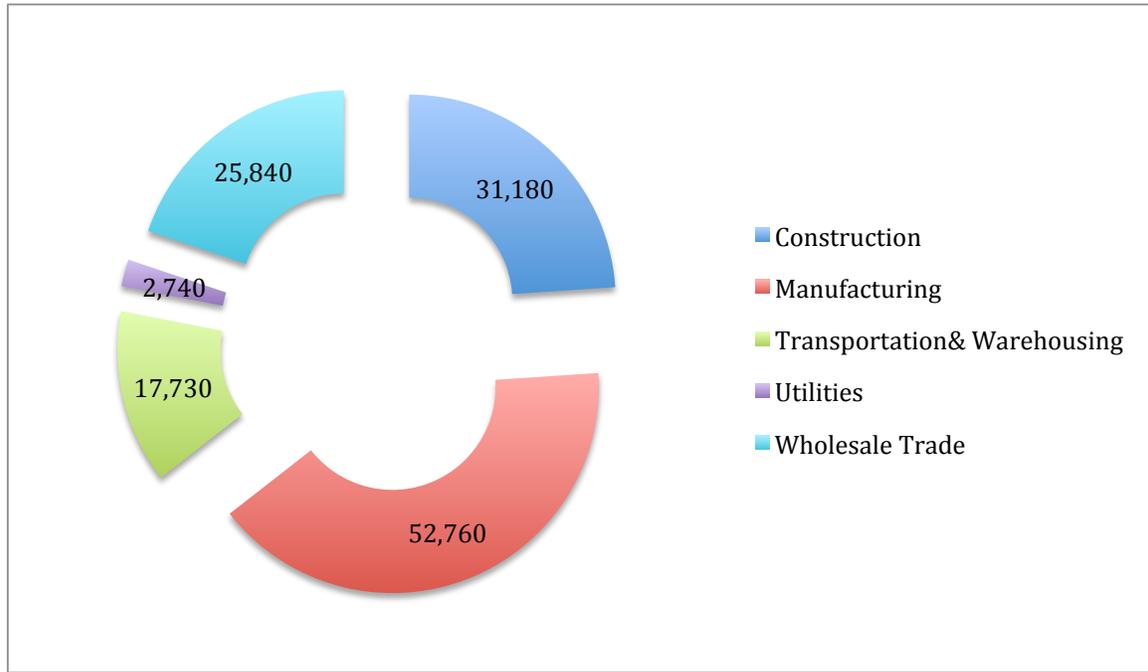
Figure 22: Idaho Projected Employment Growth for Natural Resource Industries 2010 - 2020



The U.S. Bureau of Labor estimates that between 2010 and 2020, approximately 57% of jobs opening for agriculture, forestry and hunting will be tied in some way to access to the Internet and use of computers. Idaho agricultural related employment is projected to increase by about 2,700 positions over this time period. Just over 1,500 of those jobs may be directly related to the availability of broadband connectivity. In terms of employment, mining is a relatively small sector in Idaho, but still broadband is associated with a 77 person employment increase between 2010 and 2020..

Idaho Goods Producing Industries

Figure 23: Idaho Goods Producing Employment 2010



Construction and manufacturing are Idaho’s primary goods producing sectors. Together these two sectors employed 83,940 people in 2010. While transportation, warehousing, utilities and wholesale trade do not directly produce goods; these sectors are core to production and distribution of Idaho products and are considered part of the “goods producing” sector for purposes of this study. These three sectors together employ an additional 46,000 Idahoans.

Figure 24: Examples of Idaho Goods Producing Occupations and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Growth 2011 - 2011
Construction Sector Average Change	14.7%
Architects, Surveyors and Cartographers	18.1%
Heavy Equipment Mechanics	16.6%
Electricians	15.8%
Bookkeeping	15.0%
Construction Laborers	14.32%
Manufacturing Sector Average Change	11.6%
Management Occupations	11.2%
Industrial Engineers	21.2%
Manufacturing Sales Representatives	14.0%
Computer Controlled Machine Operators	2.6%
Packers and Packagers	6.3%
Wholesale Trade:	15.9%
Office Supervisors	15.7%
Sales Representatives	19.8%
Stock Clerks and Order Fillers	18.1%
Telemarketers	16.3%
Information Systems Managers	21.8%
Transportation and Warehousing:	17.2%
Bus Drivers	18.7%
First-Line Managers	14.6%
Transportation Inspectors	8.7%
Tractor-Trailer Truck Drivers	12.9%
Conveyor Operators	16.7%
Utilities:	9.5%
Environmental Engineers	22.6%
Electricians	11.5%
Meter Readers	17.1%
Maintenance Workers	13.6%
Power Plant Operators	8.9%

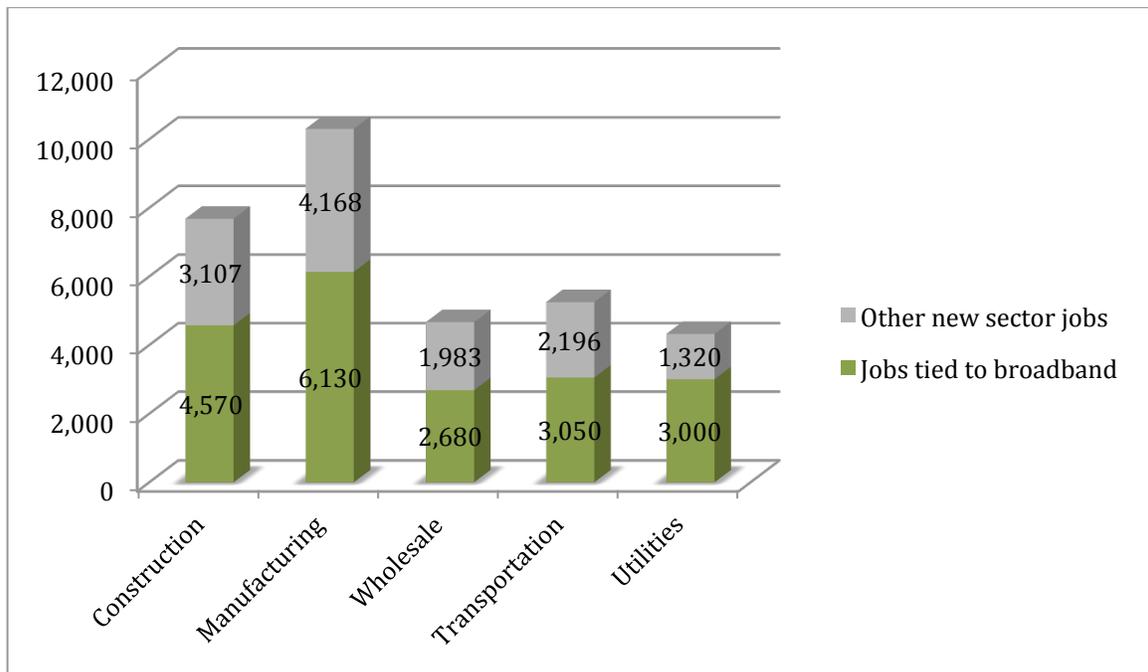
Figure 24 provides examples of occupations important to the Idaho goods producing industry. Broadband plays an important role in the efficient operation of all these industries. In manufacturing, for example, real time production systems where computerized ordering, combined with just-in-time manufacturing approaches are key to minimizing costs and improving the competitiveness of Idaho's manufacturing industry in the world economy. Some of these innovations

are labor saving and contribute to the projected decline in manufacturing employment over the next ten years. Yet without these innovations, the employment declines and loss of manufacturing production would be much greater as production takes place in global economy.

Many day-to-day functions within the goods producing sector are facilitated by computer devices, which are connected to the Internet. These functions include such things as remote meter reading, CAD design of construction plans, managing sales calls and coordinating just-in-time transportation logistics. Areas without access to quality broadband including both wireless and wireline will be at a disadvantage in attracting and retaining goods producing industries.

Overall, approximately 70% of anticipated job openings in construction, manufacturing, wholesale trade and transportation are within occupations that utilize broadband as a significant component of day-to-day functions. Within the utility sector on about 44% of projected job openings over the next ten years are within occupations where broadband connectivity is an important tool for day-to-day functions.

Figure 25: Idaho Projected Employment Growth for Goods Producing Industries 2010 - 2020

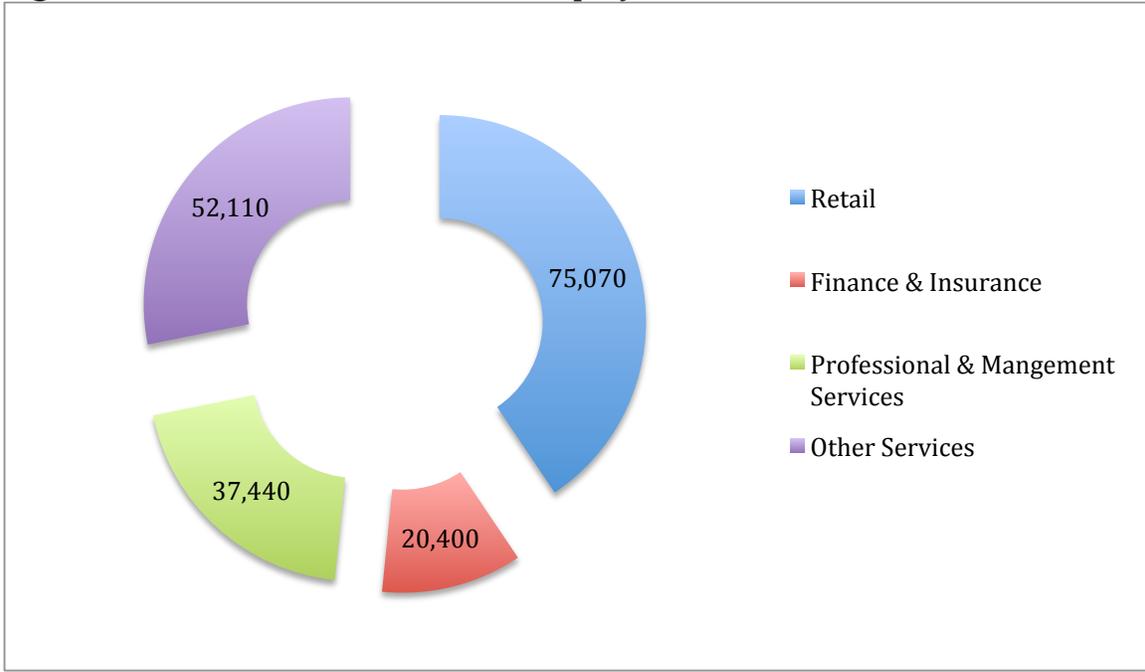


Nearly 20,000 projected net jobs will be added to the Idaho goods producing sector between 2010 and 2020. Of that job growth, 12,775 are expected to be in occupations that utilize computers and Internet connections. Manufacturing represents the largest goods producing sector in terms of projected job increases followed by construction. The supporting sectors, wholesale trade, transportation

and utilizes are each projected too add about 3,000 broadband related jobs over this ten year period.

Main Street Businesses

Figure 26: Idaho Main Street Sector Employment, 2010



Approximately 185,000 Idaho jobs are provided by predominantly smaller retail and service businesses found on Main Street. Retail stores provide over one-third of those employment opportunities. Main-street retail and service businesses are found in every Idaho community. They are not only important economic contributors but a key element of quality of life throughout Idaho. A vital retail sector is important to attracting goods producing businesses, retirees, visitors and others to the area.

Modern retail and service businesses depend heavily on available broadband connectivity for many day-to-day operations needs. For example, without broadband, credit card transactions can be very slow and frustrating for customers. On-line web sites are used by Idaho businesses to order inventory as well as to advertise and sell products. Some “main street” businesses are not located on main street at all. A growing number are located in private homes with people moving to Idaho to enjoy the state’s special lifestyle while conducting business from home to pay the bills.

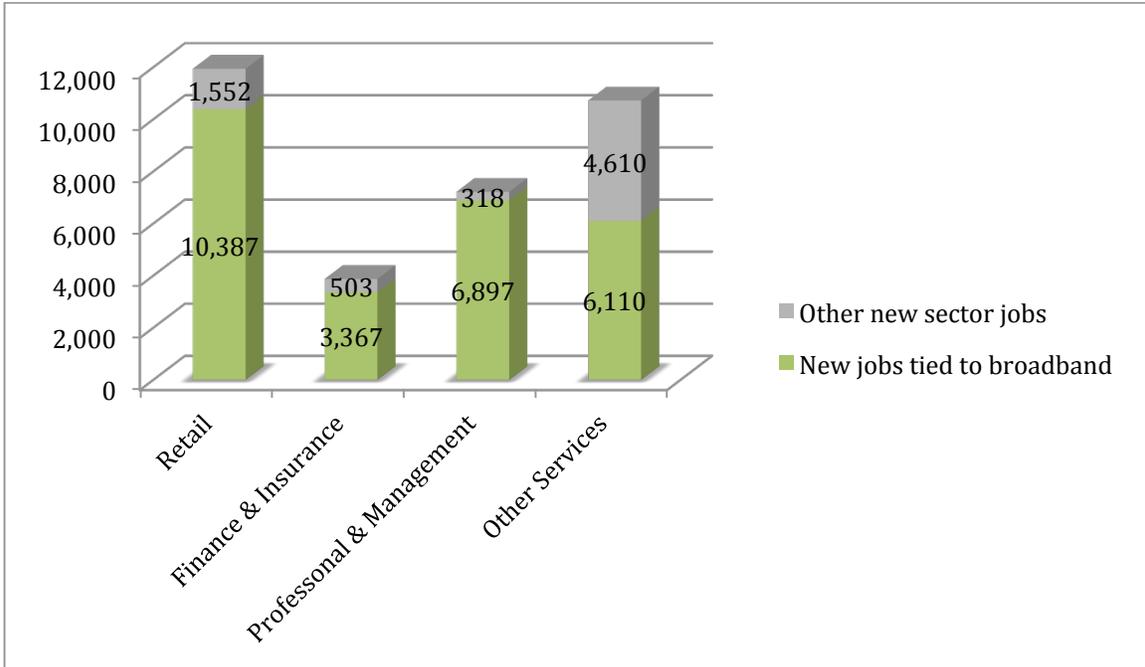
Figure 27: Examples of Main Street Occupations and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Growth 2011 - 2011
Retail:	15.9%
Retail Sales Persons	18.6%
Counter and Rental Clerks	20.4%
Bakers	11.9%
Advertising Sales Agents	1.6%
Product Promoters	16.2%
Finance and Insurance:	12.8%
Claims Adjusters	9.8%
Credit Authorizers	9.0%
Financial Analysts	21.8%
Computer System Administrators	16.3%
Tellers	5.9%
Professional and Management Services:	22.0%
Human Resource Managers	16.7%
Software Applications Developers	30.0%
Computer Programmers	21.8%
Engineers	19.2%
Protective Service Workers	13.0%
Veterinarians	30.9%
Other Services:	16.2%
Travel Agents	11.1%
Child Care Workers	16.6%
Fitness Instructors	29.1%
Bookkeeping	14.9%
Service Station Attendants	33.2%

Many main street sector occupations involve day-to-day use of computing devices and access to the Internet. For example pharmacists typically utilize secure on-line systems to communicate with doctors to renew patient subscriptions. Auto service technicians utilize computer devices, often tied to the Internet to diagnose engine problems and order supplies. Surveyors utilize sophisticated mapping software to research and draw boundaries. Lawyers conduct research using on-line databases. Child care workers go on-line to complete credit card transactions or identify learning curriculum.

Overall, 87% of retail occupations, as well as in the finance and insurance sector, are associated with the day-to-day use of computers. 91% of professional and management service occupations are tied to Internet access. About 57% of occupations in the more diverse “other services” category require day-to-day access to the computer and Internet.

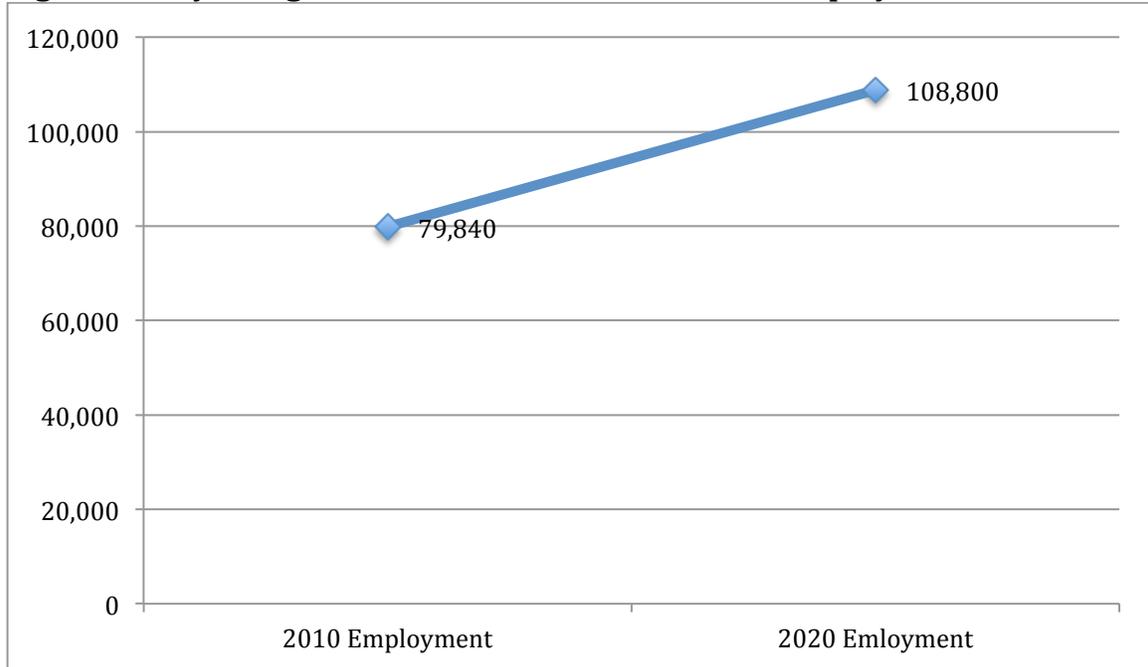
Figure 28: Idaho Projected Employment Growth of Main Street Businesses 2010 - 2020



Idaho retail businesses are projected to be the largest single sector source of Main Street job growth, with over 10,000 new jobs in occupations closely associated with the availability of broadband. Main street services businesses are expected to grow. Overall, the three major main street service sectors are projected to create over 22,000 new jobs between 2010 and 2020. Of those new jobs an estimated 16,375 will be in occupations that rely on computer and Internet access for day-to-day functions.

Health and Social Services

Figure 29: Wyoming Total Health and Social Services Employment



Idaho health and social services employment is projected to increase nearly 36% between 2010 and 2020. Health care is a major economic engine for many of Idaho’s communities and a central component of quality of life. Health and social service employment increased from 79,840 in 2010 to a projected 108,800 in 2020.

Available broadband communications is important for both the successful delivery of health care at Idaho hospitals and clinics as well as health outreach to homes within communities. For example, broadband provides a solution to specialty shortages, especially in more remote Idaho communities. An example is helping to address the professional shortage of psychiatrists in the state. Utilizing high speed Internet including video conferencing capabilities, psychiatrists located in Idaho’s larger population centers are able to consult with patients located throughout the state. This provides many benefits including helping the more geographically isolated rural Idaho residents from having to drive many miles to get specialty psychiatrist consultation. For areas with adequate broadband connectivity, on-line databases can be utilized to more efficiently manage and share critical patient information. Another example is the use of broadband to address medical consultation needs at Idaho prisons. This helps to cost effectively address medical needs of the incarcerated population and protects public safety by reducing the need to transport prisoners to medical facilities. With the ability to reach patients at home through broadband older Idaho residents are able to monitor vital signs and receive doctor consultation at home reducing the need to travel and also enabling

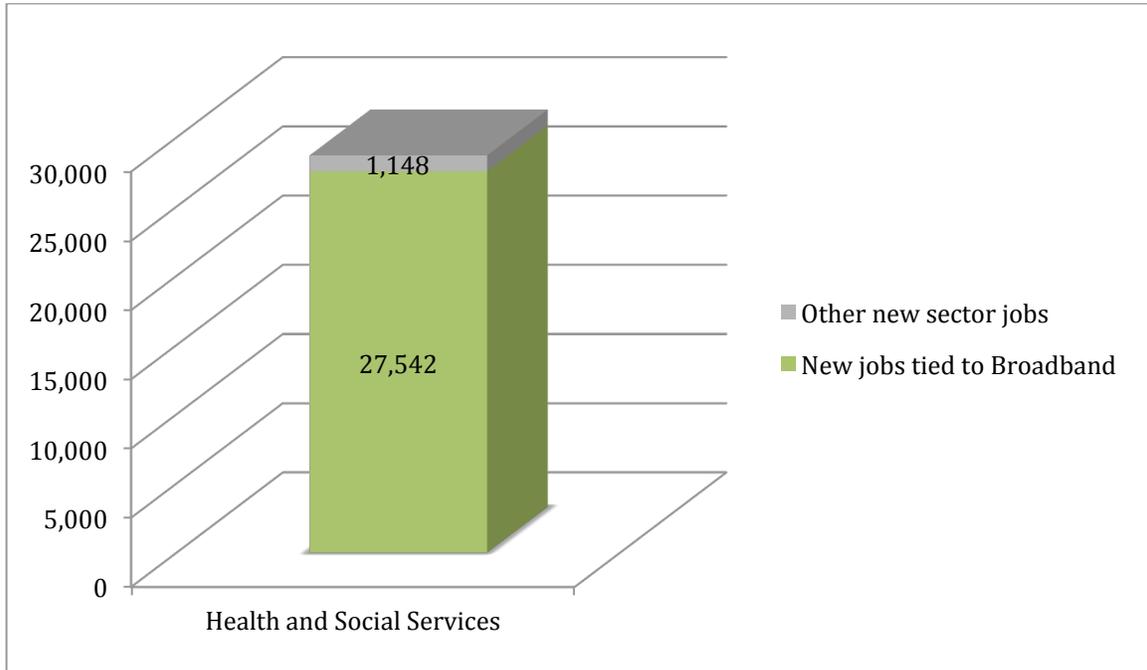
them to stay at home longer rather than move to the city. These are just several of the benefits for health care associated with better available broadband.

Figure 30: Examples of Health Care and Social Service Occupations and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Growth 2010 - 2020
Health Care and Social Service:	36.2%
Medical Record Technicians	27.7%
Home Health Aids	66.5%
Family Practitioners	24.2%
Registered Nurses	40.4%
Psychiatrists	26.2%
Medical Equipment Preparers	30.9%
Physical Therapists	46.9%

Approximately 96% of health and social service occupations are tied to the use of computers and the Internet as a component of day-to-day job functions. Applications of broadband include such things as on-line research; communication with patients and other health professionals; participation in training using video conferencing; access to specialty knowledge in response to emergencies; managing administrative tasks and much more.

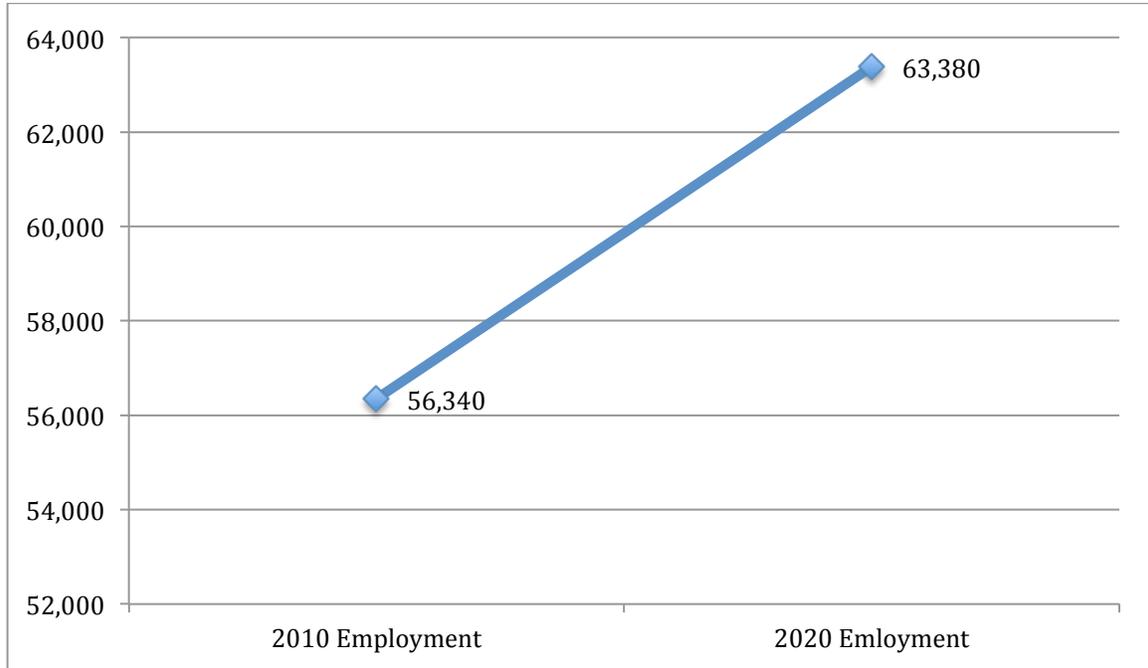
Figure 31: Idaho Projected Employment Growth of Health and Social Service Organizations 2010 - 2020



Health and social service organizations are estimated to create over 28,690 new jobs between 2010 and 2020. All but a small fraction of those jobs are linked to the use of computers and access to the Internet. Communities lacking adequate broadband connectivity will not be in a position to capture new economic opportunities associated with growth of this sector. Homes lacking adequate connectivity to utilize a growing volume of health information on the Internet or connections to medical professionals will not benefit from an improved quality of life that can be enabled by use of broadband.

Education

Figure 32: Wyoming Total Education Services Employment



Idaho educational services employment is projected to increase nearly 12.5 % between 2010 and 2020. Education is a major employer for many of Idaho’s communities and a central component of quality of life. Public and private educational employment increased from 56,340 in 2010 to a projected 63,380 in 2020.

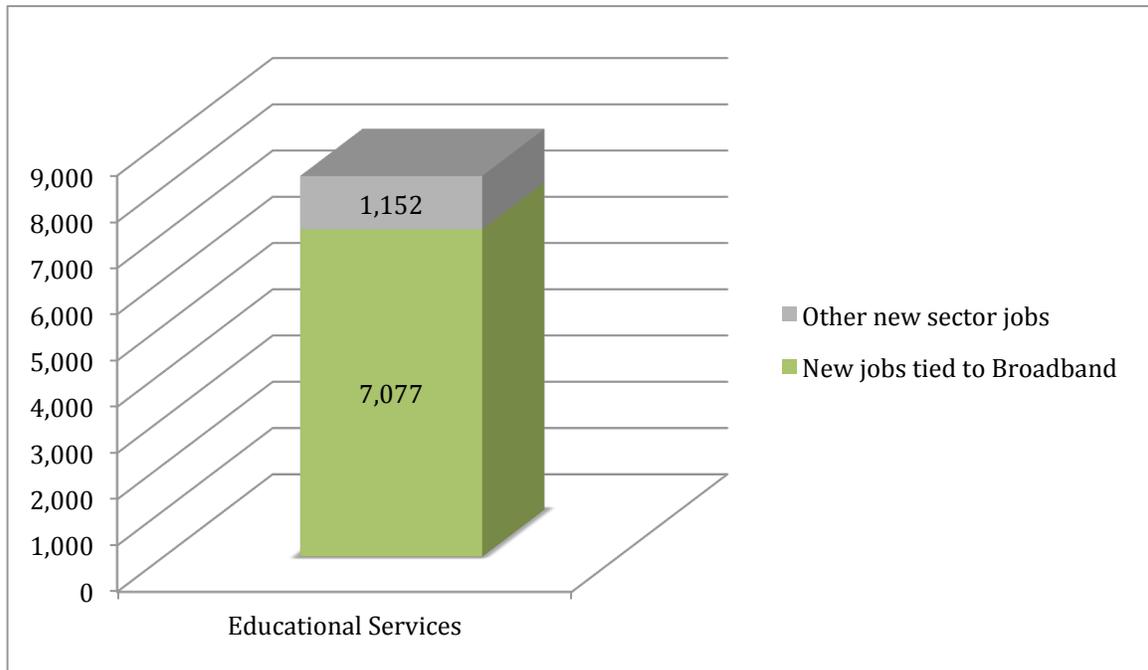
Idaho public and private schools also are changing the way education is delivered using Broadband. Distance education is utilized to bring curriculum to outlying school buildings that may otherwise not be feasible in those locations. The quality of education is improved as schools better engage parents through on-line web sites. Those same technologies enable students who have access to the Internet at home to get help with homework or to avoid losing valuable learning time when home sick or stranded by a winter storm. Schools have improved their overall efficiency using on-line technologies to manage administrative tasks. Schools that are better connected to the communities they serve are advantaged in their ability to prepare students for the needs of local employers. These represent just some of the advantages of better broadband connections.

Figure 33: Examples of Educational Service Occupations and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Growth 2010 - 2020
Educational Services:	12.5%
School Counselors	15.7%
Education Administrators, Post Secondary	19.3%
Education Administrators, Secondary	9.7%
Physical Scientists	11.9%
Health Educators	41.4%
Cafeteria Attendants	14.4%

Approximately 86% of educational service occupations are tied to the use of computers and the Internet as a component of day-to-day job functions. Applications of broadband include such things as on-line research; communication with parents; online homework help; in-service training using video conferencing; a; managing administrative tasks and much more.

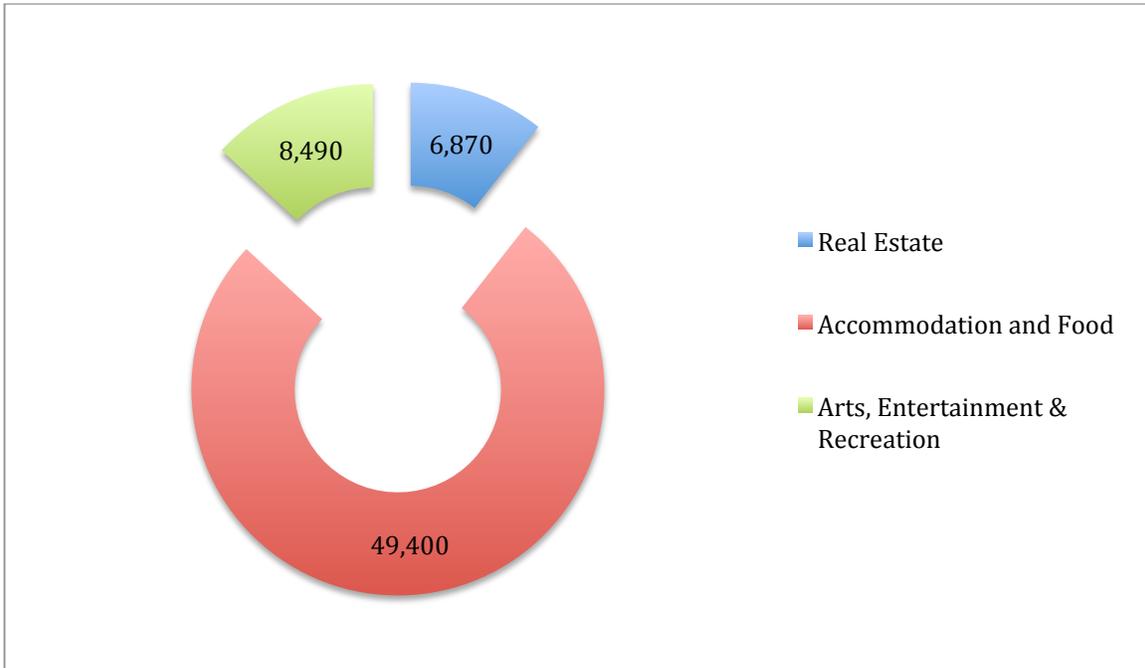
Figure 34: Idaho Projected Employment Growth for Educational Services 2010 - 2020



Educational service organizations are estimated to create over 8,229 new jobs between 2010 and 2020. Approximately 7,000 of those jobs are linked to the use of computers and access to the Internet.

Tourism and Recreation

Figure 35: Idaho Tourism and Recreation Sector Employment, 2010



The visitor and recreation industry is an important component of the Idaho economy. This sector includes arts, entertainment and recreation; accommodation and food businesses and real estate. Visitors to Idaho’s parks and recreation sites travel to the state from around the globe. Real estate plays a particularly important role as a significant number who visit Idaho also purchase second homes. The visitor and recreation industry is made up of these three sectors employs over 64,000 individuals in Idaho.

Broadband plays an important role in a vital visitor and recreation industry. Web sites for example provide a means for visitors to learn about attractions, lodging options, dining services and other important information. Today many visitors utilize smart phones to access on-line information emphasizing the importance of both mobile and landline options. Idaho visitors also include a significant number of second homeowners who choose to purchase property in Idaho. Seasonal residents are an important economic asset for Idaho communities. Better broadband allows them to stay in touch with work and family, making it more feasible to stay longer in Idaho. The more time visitors spend in Idaho, the more money they generate for local businesses. Some previously seasonal residents will choose to live in Idaho year-around and enjoy the Idaho lifestyle if broadband allows them to

simultaneously earn a living by staying connected to the rest of the world. Home-based entrepreneurs are common in many places within Idaho.

The amenities such as quality dining options, arts and recreation facilities provide a desirable quality life for all people living in the area including permanent residents. Arts, recreation and quality dining are among the assets that are important to potential business owners as they choose locations to invest.

Figure 36: Examples Visitor and Recreation Service Occupations and Projected Percent Employment Growth 2010 - 2020

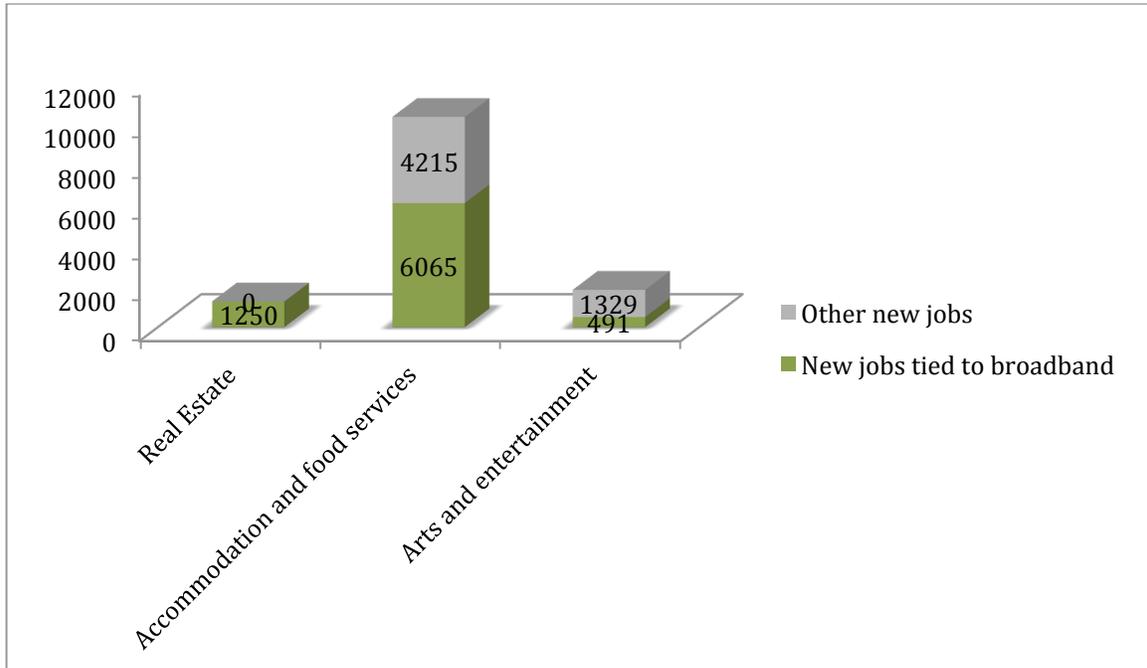
Occupation	Estimated Percent Employment Growth 2011 - 2011
Real Estate and Rent and Leasing:	18.2%
Marketing Managers	16.7%
Counter and Rental Clerks	26.6%
Security Guards	21.9%
Maintenance and Repair Workers	22.8%
Delivery Truck Drivers	15.6%
Arts, Entertainment and Recreation:	21.4%
Amusement Attendants	19.3%
Bartenders	21.0%
Musicians and Singers	12.6%
Fitness Instructors	29.4%
Self-Enrichment Education Teachers	19.9%
Accommodation and Food Service:	20.8%
Grounds Keepers	16.6%
Housekeeping	16.6%
Cooks	18.2%
Food Servers	21.9%
Sales Representatives	17.7%

The dependence on available broadband within major occupational categories varies significantly across the three visitor and entertainment sectors. Nearly all occupations (99%) with projected job opening in real estate over the next ten years require access to computers and the Internet. On the other end, only about 27% of occupations within the arts, entertainment and recreation sector are identified as requiring broadband connectivity. Accommodation and food services are in between these two bookends with 50% of occupations utilizing broadband for day-to-day functions.

The specific uses of broadband within the visitor and recreation sectors is diverse. For example real estate property managers can use broadband for multiple purposes including advertising to clients, inventorying and managing properties or monitoring the security of rental properties. An Idaho craft artist can sell her or his

work on-line to make a business in Idaho more profitable. Lodging managers are able to advertise their facilities to the world on the Internet as well as efficient receive payments. These are just a few examples.

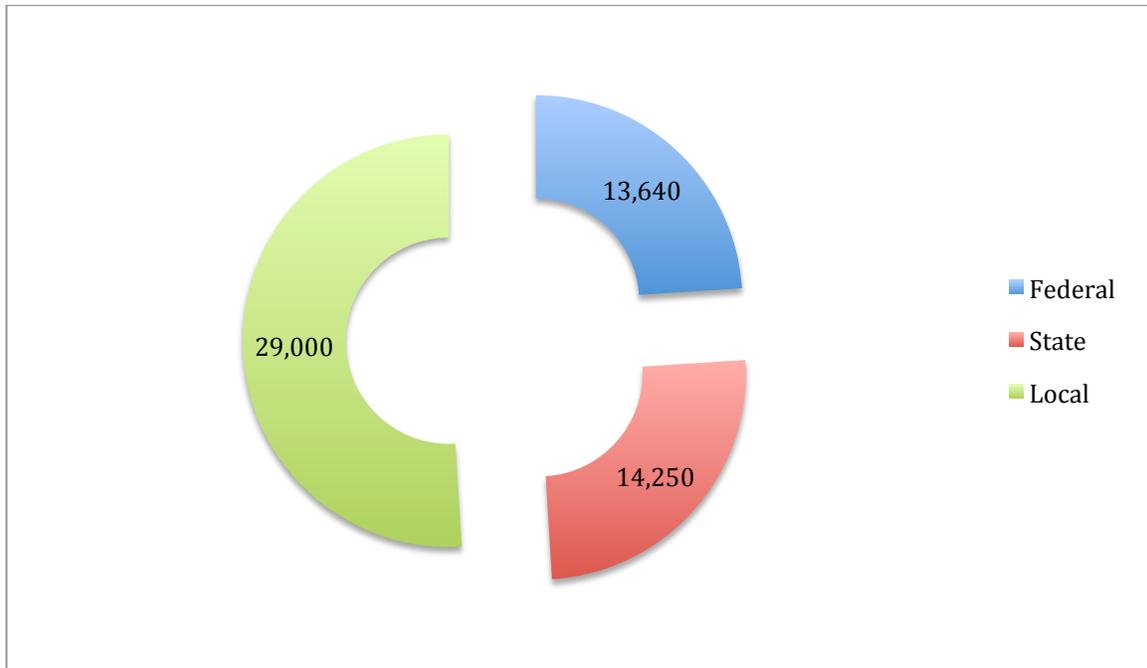
Figure 37: Idaho Projected Employment Growth of Visitor and Recreation Service Organizations 2010 - 2020



Idaho and visitor and entertainment businesses are expected to generate over 13,350 new jobs between 2010 and 2020. Of those jobs, approximately 7,800 are identified as being tied to broadband.

Government (excluding Health Care and Education)

Figure 35: Idaho Government Sector Employment (Excluding Health Care and Education), 2010



Government employs approximately 58,000 Idaho workers in in 2010, excluding health care and education. Approximately one-half of those workers are employed by local governments, with remainder employed by state and federal government.

With governmental budgets continuing to tighten, delivering the projected economic and quality of life benefits associated with traditional governmental functions will increasingly depend on available quality broadband access. Broadband helps to control costs in multiple ways. For example, substituting video conferencing for some face-to-face meetings is paying dividends for many governmental organizations by helping to control travel budgets. Utilizing electronic record processes and encouraging citizens to complete transactions on-line can reduce overall administrative costs and improve responsiveness.

Equally important, investments in technology solutions supported by broadband, enables government to deliver more responsive service with the same or less resources. Idaho library investments in technology are a good example. Broadband Internet is changing the way libraries deliver services offering digital literacy training and a wealth of on-line resources. Libraries throughout Idaho are trusted sources of information for job searches, access to government services, e-books and a multitude of information that would be hard to access in other ways. For people who lack access to the Internet at home, Idaho libraries provide public computing

options. Wi-Fi hotspots available at many public libraries are used after hours by both visitors, and residents of Idaho communities.

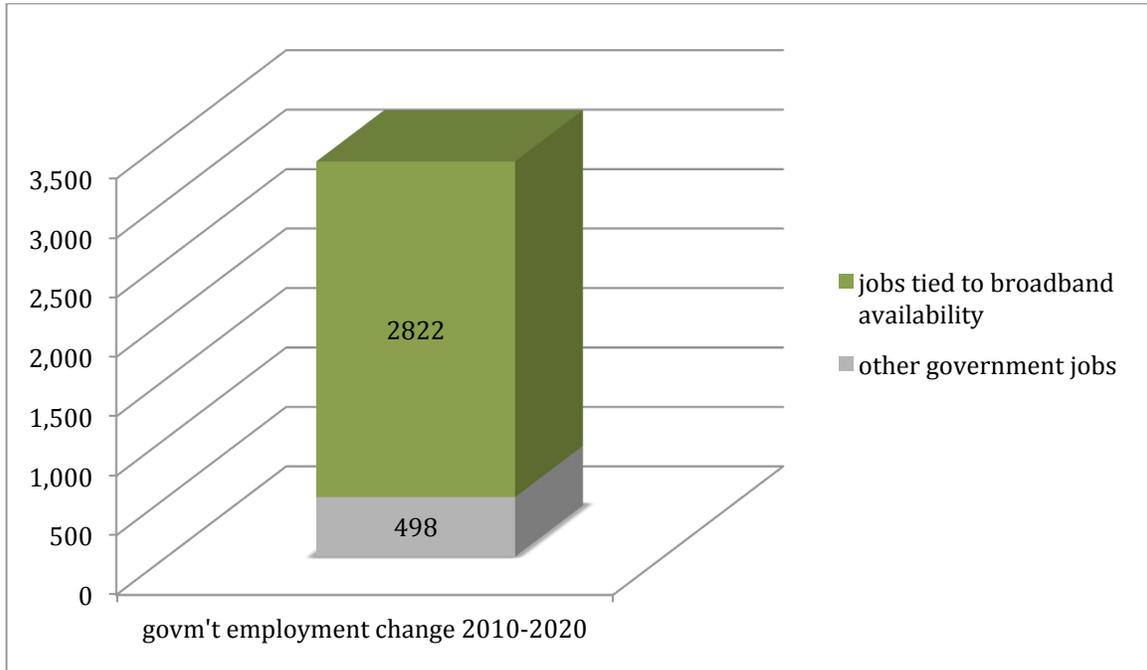
Mobile technologies continue as important cutting edge opportunities to improve government efficiency and responsiveness. Idaho has been particularly active in leveraging mobile technology opportunities in public safety. Idaho’s public safety progress may be enhanced further with an emerging Federal funding known as FirstNet. Examples include the ability to save lives reducing response time when an accident or disaster occurs. First responders equipped with mobile devices and necessary connectivity can communicate patient conditions from the site of the emergency (or disaster) preparing the hospital to effectively receive and care for the patient immediately upon arrival. With a growing population owning smart phones, the public safety community is able to quickly issue community alerts on a statewide basis. With better interoperable systems, multiple responding agencies can be more effective and efficient.

Figure 36: Examples of Government Occupations (Excluding Health and Educational Services) and Projected Percent Employment Growth 2010 - 2020

Occupation	Estimated Percent Employment Growth 2010 - 2020
Governmental Services:	12.5%
Police, Fire and Ambulance Dispatchers	13.9%
Postal Service Mail Carriers	-10.8
Budget Analysts	8.2%
Judges and Magistrates	8.7%
Social Workers	22.01
Librarians	10.7%
Police Officers	13.1%

Approximately 85% of government service occupations are tied to the use of computers and the Internet as a component of day-to-day job functions.

Figure 37: Projected increase in Idaho direct government employment 2010 – 2020 (excluding health and education)



The availability of adequate broadband connectivity is projected to support approximately 3,320 new Idaho jobs between 2010 and 2020. While Idaho is well on its way to the broadband capacity needed to support modern efficient government functions, the opportunity to benefit from government sector jobs and access to services will only accrue to those regions of the state where the needed capacity is available.

SECTION 6—SUMMARY AND CONCLUSION

Addressing Idaho’s digital divide through deployment of additional broadband infrastructure would create thousands of new Idaho construction and telecommunications sector jobs, as well as millions of dollars in new revenue for Idaho businesses. However, the largest impact is enabling all areas of Idaho to benefit from expected economic growth over the next decade. Overall, Idaho is expected to gain more than 100,000 new jobs that directly require access to affordable and quality broadband communications between 2010 and 2020. Without intervention, those communities that presently lack access to adequate wireline and mobile broadband options will fall further behind in economic prosperity and quality of life. Those communities that are on the other side of the digital divide tend to be remote, often with an older and lower income population and consequently are often not seen as profitable opportunities for broadband providers. Left simply to the market, it is doubtful substantial progress will be made in addressing this challenge. Most likely there will be a need for a combination of loans, grants, support payments and adoption education to make possible the

opportunities delivered by broadband for all of Idaho. Federal as well as Idaho policymakers are left with a decision of weighing the cost of these interventions to encourage or incent additional broadband deployment against the economic and social benefit that can be expected for Idaho's communities and Idaho's citizens. The purpose of this research is to promote and inform discussions on these important issues.