



# **National Telecommunications and Information Administration**

Broadband Technology Opportunities Program  
Evaluation Study

Order Number D10PD18645



## **Case Study Report Round 2**

### **Connect Arkansas**

#### **Sustainable Broadband Adoption**

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# Executive Summary

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*“Without this grant, there would be a lot of people that would have gone unserved – residents who would not know about the Internet, or what they can do with it, or have the training to be able to use it.” – Connect Arkansas Chief Operating Officer*

Connect Arkansas is a private, nonprofit organization under the umbrella of the Arkansas Capital Corporation Group (ACCG), an affiliation of eight organizations. The Arkansas Capital Corporation, ACCG’s primary entity, specializes in providing financing to Arkansas businesses. Through several initiatives, the principal goal of ACCG is to promote economic growth in Arkansas.

Connect Arkansas is funded by the Connect Arkansas Broadband Act, passed in 2007. This state law ensures the creation of a competitive broadband infrastructure that will improve personal lives and the economic capabilities of all Arkansans. Since the law’s inception, Connect Arkansas has promoted and fostered broadband education, use, and access throughout the state.<sup>1</sup> Connect Arkansas seeks to be a catalyst for success in communities by providing the necessary tools to create equal opportunities for all Arkansans regardless of socioeconomic distinction.

On October 1, 2010, the National Telecommunications and Information Administration (NTIA) awarded Connect Arkansas a Broadband Technology Opportunities Program (BTOP) Sustainable Broadband Adoption (SBA) grant for \$3,702,738 to fund the Expanding Broadband Use in Arkansas Through Education (EBAE) project. The goals of the project are to ensure that Arkansas is competitive in the new economy, improve healthcare, and increase the use of technology. Connect Arkansas proposed the following, with the results shown:

- Provide free refurbished computers to qualifying families.<sup>2</sup> As of March 31, 2013, Connect Arkansas had distributed 1,174 free computers to families with students qualifying for free or reduced lunch that did not have a computer in the home.<sup>3</sup>
- Train 2,600 residents over the life of the project, offering 53,000 hours of teacher-led training to help increase broadband adoption.<sup>4</sup> Connect Arkansas reported training 6,161 participants across all project programs by the end of 2012.<sup>5</sup> Connect Arkansas categorized most training hours as either “Office Skills” or “Entrepreneurship Training,” emphasizing their focus on improving the economic condition of Arkansas residents.
- Collaborate with the University of Arkansas for Medical Sciences (UAMS) to oversee a comprehensive broadband-based health awareness campaign and provide hands-on training to staff at medical facilities and healthcare providers.<sup>6</sup> As of March 31, 2013, UAMS had trained 4,122 professionals at healthcare facilities across the state.<sup>7</sup>
- Complement Connect Arkansas’ State Broadband Data and Development (SBDD) grant for broadband mapping, illustrating the broadband geography in Arkansas and helping the state formulate an effective strategy for reaching underserved areas.<sup>8</sup> Connect Arkansas leveraged its broadband mapping grant by implementing the Broadband Incentives program to facilitate dialogue between qualifying families and Internet service providers (ISP) offering discounted service in the resident’s vicinity. The grantee reported that eleven ISPs volunteered to offer special rates throughout Arkansas.

The grantee chose to target fifty-seven of Arkansas’ seventy-five counties with an average poverty rate of 15 percent or higher, based on their analysis of census data and other sources.<sup>9</sup> According to the American Community Survey (ACS) 2005-2009 5-year Summary File released in 2011, the average poverty rate in the counties served by the grant was 21.5 percent, nearly 65 percent greater than the national average.<sup>10</sup> Within the service area, also according to the ACS 2005-2009

Summary File, 23 percent of residents over age 25 are without a high school diploma as compared to 19 percent of the state and 16 percent of the nation.<sup>11</sup>

Connect Arkansas' 2012 state resident survey revealed that 78 percent of respondents use the Internet at least occasionally, which is a 2 percentage point increase from 2011.<sup>12</sup> In 2012, 71 percent of respondents had Internet access in their homes, compared to 68 percent in 2011.<sup>13</sup> Thirty-five percent of respondents cite relevance as the reason they do not use the Internet. This is a 12 percentage point decrease from 2011, when 47 percent indicated the Internet was not relevant by stating they "were not interested," "it was a waste of time," they were "too busy," or they "did not need or want it."<sup>14</sup>

This is one of fifteen case studies performed by ASR Analytics, LLC (ASR), on a sample of eight Public Computer Center (PCC) and seven SBA grants. It is part of a larger mixed-methods evaluation of the social and economic impacts of the BTOP program. The purpose of this case study is to:<sup>15</sup>

- Identify how the grantee maximized the impact of the BTOP investment.
- Identify successful techniques, tools, materials, and strategies used to implement the project.
- Identify any best practices, and gather evidence from third parties, such as consumers and anchor institutions, as to the impact of the project in the community.

This report further investigates the initial impacts reported by the grantee during the first round of visits and identifies additional impacts that occurred in the time between the site visits. The results presented in this report reflect the evaluation study team's observations at the time of the second site visit. It will serve as a basis for *Interim Report 2*, which will analyze data from fifteen case studies.

This case study is primarily qualitative. ASR presents the impacts resulting from Connect Arkansas' grant to the extent possible given the data the grantee collected. Connect Arkansas gathered some program activity statistics and outcome measures beyond the NTIA-required reporting. ASR collected the information presented here during two field visits to evaluate the social and economic impacts of the EBAE project. The evaluation study team originally met with representatives of Connect Arkansas over a two-day period in October 2011, visiting the grantee's administrative offices and subrecipient UAMS' facilities. ASR conducted a follow-up site visit with the grantee and project partners from April 2-4, 2013. ASR revisited Connect Arkansas' administrative offices and partners, the UAMS facilities, and the campus of a new project partner, University of Arkansas at Little Rock (UALR).

In total, the evaluation study team performed eleven case study site visit interviews. ASR transcribed these discussions and used this information, and other information and reports provided by the grantee, to supplement Quarterly Performance Progress Reports (PPR), Annual Performance Progress Reports (APR), and other publicly available information.

The evaluation study team noted the following major outcomes and impacts of the grant:

- Low-income families gained the knowledge and equipment necessary to adopt broadband, enabling improvements in academic performance and social connections in rural areas. Through the grant, 1,174 student and guardian pairs received a free computer and improved their digital literacy skillset and understanding of the educational benefits of the Internet.<sup>16</sup> Digital literacy training enabled participants to operate their refurbished computers at home and, coupled with the provision of a free computer, resulted in the majority subscribing to broadband.<sup>17</sup>
- Connect Arkansas provided entrepreneurship education supplementary to state curriculum to 144 high school classes throughout Arkansas.<sup>18</sup> Through the Entrepreneurship Curriculum, 2,108 students learned to leverage the Internet to engage in entrepreneurial endeavors.<sup>19</sup> One

student obtained the funding necessary to launch a bamboo fiber t-shirt company using the crowdfunding website, Kickstarter.

- Connect Arkansas implemented a new training program to support small business growth in rural communities. Seventy small business participants created fully functional websites, establishing or enhancing their online presence and strengthening their marketing strategies, with the intention of increasing their customer base and thereby increasing revenues.<sup>20</sup>
- To support the provision of telehealth service statewide and improve healthcare for residents of rural communities, UAMS developed and published a range of training and other resources online. More than 900 users completed the Telehealth 101 training program, acquiring a fundamental understanding of telehealth. Approximately 80 percent of these trainees were previously unfamiliar with telehealth.<sup>21</sup>

The BTOP grant was essential for achieving these impacts. Though Connect Arkansas operated before BTOP, its staff was limited to two members. The grant enabled Connect Arkansas to expand operations to support more than seven full-time equivalent (FTE) positions, and provide a range of services previously impossible given resource limitations. Such services include digital literacy training for students and parents, free refurbished computers for low-income families, entrepreneurship education to supplement state high school curriculum, an online aggregation of small business resources, free Internet training for small businesses, promotion of small ISPs and discount service options, and telehealth education and training.

# Section 1. Introduction

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Connect Arkansas was established by the Arkansas state legislature in 2007 with the goal of increasing broadband subscription and broadband adoption rates within the state. On October 1, 2010, the National Telecommunications and Information Administration (NTIA) awarded Connect Arkansas a Broadband Technology Opportunities Program (BTOP) Sustainable Broadband Adoption (SBA) grant for \$3,702,738 to fund the Expanding Broadband Use in Arkansas Through Education (EBAE) project. The goals of the project were to ensure that Arkansas is competitive in the new economy, improve healthcare provision to Arkansas citizens, and increase technology use among Arkansans. Connect Arkansas partners with the University of Arkansas at Monticello (UAM), the Arkansas Economic Acceleration Foundation (AEAF), the Arkansas Capital Corporation, the University of Arkansas for Medical Sciences (UAMS), and the University of Arkansas at Little Rock Arkansas Small Business and Technology Development Center (ASBTDC) to implement the project.

## 1.1 What the Interviewees Told Us

Figure 1 displays words interviewees used frequently. The interviewees included program management and representatives from each of the Connect Arkansas programs: Technology Training, Computers 4 Kids, Entrepreneurship Curriculum, Marketing and Outreach, Arkansas SourceLink, Y.E.S. 2.0, UAMS Center for Distance Health, ASBTDC Small Business Training, and the Broadband Incentives program. The word cloud displays the 100 words interviewees used most frequently. The purpose of the word cloud is to provide a succinct visual summary of the conversations that occurred. Statements made by ASR personnel during the interviews and focus groups were excluded from the analysis, as were common words, such as prepositions, articles, and conjunctions, which were identified using a standard “stop list.”

As shown in the word cloud, the terms used most frequently by interviewees include “people,” “computers,” “program,” “class,” and “training.” These terms reflect the grant’s goal of providing information and educational opportunities that promote Internet and computer use among residents and businesses. The frequency of “Arkansas,” and “county,” reflect the grant’s focus on affecting adoption and use within Arkansas, and more specifically the fifty-seven poorest counties that serve as the grant’s target population. The frequency of the terms “providers,” “connect,” and “business” reflect Connect Arkansas’ intention to facilitate the relationship between residents and Internet Service Providers (ISP) to help residents obtain broadband subscriptions.





## Section 2. Impacts

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The most prominent impacts of the Connect Arkansas project were in the focus areas of Digital Literacy, Workforce and Economic Development, and Education and Training, which is consistent with the grant's mission to increase broadband adoption and understanding while fostering sustainable economic development in Arkansas. UAMS also provided the evaluation study team with data describing Healthcare-related outcomes. According to the interviewees, the most prominent impacts of the grant related to affecting the target populations' perception of broadband's relevance, the provision of entrepreneurial education and resources, and the provision of free computers for low-income families. The grantee did not collect data to support the existence of impacts beyond what was required for grant reporting. However, it did provide success stories that indicate impacts in these focus areas.

The accounts provided to ASR by program staff include the following:

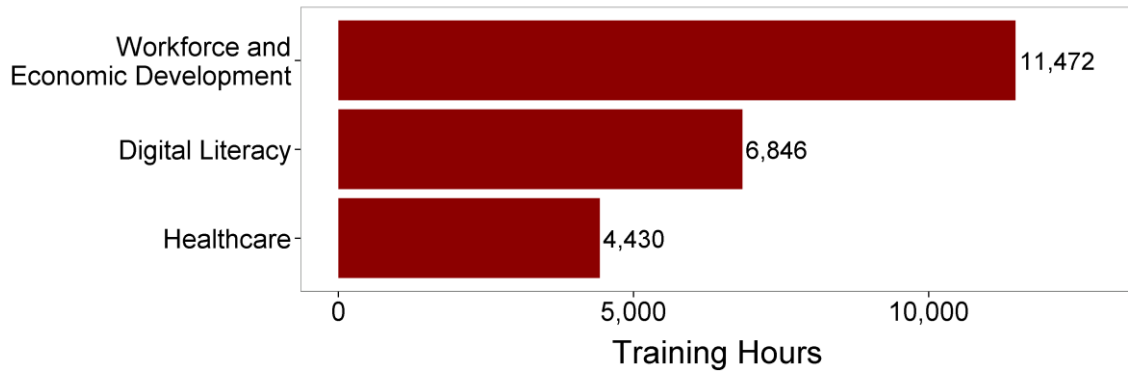
- "One of the biggest barriers that we found is the cost of the computer. You remove the cost of the computer and it becomes the cost of the Internet monthly service. So if we can then remove those two barriers, coupled with the education, we've reached a large percentage of the population, and helped them get online."
- "In talking to these kids and these parents as they go through the program and pick the computers up, it's not necessarily what they say, it's how they say it. You can just tell how thankful many of these families are. You can just tell how much it means to these parents."
- "A lot of the rural areas have seen a decrease in population. There is less of a local market to buy their products or services. Being able to have a product or service that they can market and sell online to customers and consumers outside of their local geographic area is key to them being able to stay in business in their local communities."
- "Some of these kids in the rural areas do not always have encouragement to go seek things out or learn something like entrepreneurship. Maybe it will inspire some students to go on to college and learn business or IT, or they may become an entrepreneur."

Connect Arkansas was established by the legislature; however, only a small portion of total funding is provided by the state. Before BTOP, the organization operated on a minimal budget and was limited in its attempt to achieve statewide goals. The grant enabled Connect Arkansas to make progress toward its objectives by providing funds to implement programs, trainings, and incentives to increase broadband awareness, access, and use. Connect Arkansas reached many residents by offering programs in fifty-seven of the state's seventy-five counties. Before the grant, Connect Arkansas employed two full-time staff members. They could not provide service and programs comparable to what was feasible under the grant. Future goals include a statewide expansion of programs and the continued provision of service to those living in the grant service area.

### 2.1 Focus Areas

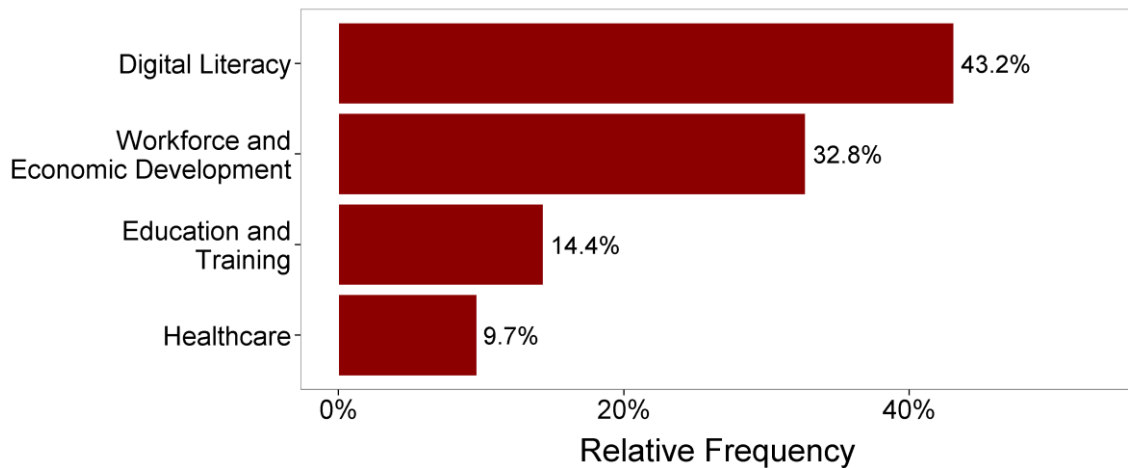
This section describes the impacts of the Connect Arkansas project in terms of five focus areas. To analyze where impacts are expected to be found for this project, ASR tabulated the training hours for Connect Arkansas reported in the 2012 Annual Performance Progress Reports (APR) using the focus area categories described in *Interim Report 1*.<sup>22</sup> Figure 2 shows that about half of the training hours reported in the 2012 APR for Connect Arkansas focused on subjects related to Workforce and Economic Development. The remaining training hours relate to Digital Literacy and Healthcare.

**Figure 2. Grantee Training Hours Categorized by Focus Area**



ASR also analyzed the statements grantees made during the interviews and focus groups and categorized them based on focus area, as shown in Figure 3. The results presented provide another measure of the grantee’s focus. Forty-three percent of interviewee responses focused on Digital Literacy, reflecting activities intended to build the basic skills required for broadband adoption. Workforce and Economic Development statements represent 33 percent of the grantee responses, while Healthcare represents only about 10 percent. While not included in Connect Arkansas APR, Education and Training represented approximately 14 percent of interviewee statements.

**Figure 3. Focus Area Statements Made by Interviewees**



## 2.2 Workforce and Economic Development

*“Broadband is going to drive a lot of our state’s economic development. People use it to go to school, to start a business, to engage in commerce. It’s really a driving force, helping to build the overall education of Arkansas.” – Connect Arkansas Chief Operating Officer*

Workforce and Economic Development includes activities that increase overall employment of the target population, or that assist employed members of that population in finding jobs that offer increased salaries, better benefits, or a more attractive career path, including self-employment. Workforce and Economic Development activities can be performed for one’s own benefit, or they

may be done on behalf of another person to assist with his or her employment situation. In order for project activities to be included in this category, it must be the intention of the grantee to assist members of the workforce in improving their employment outcomes, and project resources must be devoted to this purpose.

Connect Arkansas' Workforce and Economic Development programs targeted students, entrepreneurs, and small businesses. To help spur economic development in the state, Connect Arkansas emphasized and provided training and assistance in leveraging the Internet for entrepreneurial and business-related endeavors. These efforts have resulted in the following outcomes and impacts:

- Websites enabled small business participants to establish or enhance their online presence and strengthen their marketing strategies, increase their customer base, and increase revenue. As of March 28, 2013, seventy small business participants had created a fully functional website or made substantial progress toward completing one through the Website in a Day class.<sup>23</sup> The Website in a Day course enhanced business participants' perception of the economic importance of having a website. Instructors stated that the students' attendance demonstrates that they recognized the value in having a web presence for their business. The University of Arkansas at Little Rock Arkansas Small Business and Technology Development Center (ASBTDC) conducted post-course evaluations. All of the participants in this grant-funded program rated both the class and the instructors as "excellent/good."<sup>24</sup>
- Connect Arkansas had provided entrepreneurship education supplementary to state curriculum to 144 high school classes throughout Arkansas as of April 2013, surpassing the goal of 102 Entrepreneurship Curriculum sessions.<sup>25</sup> Through the Entrepreneurship Curriculum, 2,108 students, or 137 percent of Connect Arkansas' goal of 1,530, learned about Internet-based opportunities to engage in entrepreneurial endeavors in Arkansas.<sup>26</sup> The curriculum highlighted Internet-based business resources such as Kickstarter and other crowdfunding websites. Connect Arkansas shared an example of one student who put his business idea on Kickstarter and obtained the necessary funding to launch his enterprise. The student developed a concept to create and sell bamboo fiber t-shirts. The student's goal was to raise \$1,100 to start the business, and he ultimately raised \$1,425. The student is in the process of having the t-shirts created, which he will sell and distribute to his backers.
- Between February 1 and April 3, 2013, 6,275 unique users visited Arkansas SourceLink, a website that provides an aggregation of resources relevant to all stages of business from start-up to growth and continued operations.<sup>27</sup> Arkansas SourceLink's web-based approach saved entrepreneurs and businesses time, money, and effort in obtaining the resources necessary to start and grow their businesses. Connect Arkansas employs BizTracker backend management software to support Arkansas SourceLink. The BizTracker system is the only metric currently in place to determine whether entrepreneurs obtained the resources needed. However, users leverage Biz Tracker only if they are having trouble finding the appropriate resources. There is no way of tracking the experience of users who do not intentionally seek assistance using Biz Tracker. Relatively few users have contacted Arkansas SourceLink for assistance. There had been five entries in the Biz Tracker system as of April 2013.

Additional activities and services supporting Workforce and Economic Development include the following:

- Connect Arkansas introduced a new training program targeting small businesses throughout Arkansas through a partnership with ASBTDC. ASBTDC offered a range of training programs including Website in a Day, Creating Your Own Marketing Video, Get Listed Locally, Five Social Media Strategies for Small Businesses, and a Facebook course. They worked with local Chambers of Commerce to help determine the topics that are most suited for each particular community. Table 1 shows training delivery by county. While ASBTDC had delivered the course in eight counties, residents of sixteen of the fifty-seven target counties had attended the sessions.<sup>28</sup>

**Table 1. ASBTDC Business Training Progress**

<b>Date</b>	<b>Seminar</b>	<b>Location</b>	<b>Attendance</b>
02/27/13	Website in a Day	Jefferson County	11
02/28/13	Website in a Day	Union County	12
03/07/13	Facebook: Profiles, Pages, and Privacy	Franklin County	11
03/14/13	Website in a Day	Desha County	7
03/19/13	Website in a Day	Clark County	18
03/21/13	Website in a Day	Yell County	15
03/25/13	Website in a Day	Drew County	4
03/28/13	Website in a Day	Hempstead County	3
<b>Total</b>			<b>81</b>

- The training programs focused on online marketing and establishing an online presence. In rural areas, markets are often small, and to increase a customer base, rural businesses must leverage the Internet. Training participants learned about customer feedback platforms, such as Yelp and Trip Advisor. They learned how to engage their customers in providing feedback, including how to address negative views and solicit positive comments. Instructors also discussed how to use social media, the appropriate amount of time to allocate to social media, and how to measure its effect on business.
- ASBTDC offered free one-on-one consulting services for Arkansas businesses. Interested businesses could contact a local ASBTDC representative at any time for additional resources and support. Services were available to businesses participating in the free grant-funded training sessions.
- ASBTDC reached areas of the state that might not have been reached without the grant. Before the grant period, ASBTDC reported that many rural businesses could not afford the small entry fee of \$30 to \$50 to participate in the training. ASBTDC provided free training in rural communities served by the grant, thereby eliminating the cost barrier and reducing the distance residents need to drive to participate in training.
- The ASBTDC training course served as an impromptu networking opportunity for participants. Attendees from the same or surrounding communities sat together for six hours, often exchanging businesses ideas and realizing potential opportunities to collaborate. This knowledge exchange helped participants develop business strategies, expand current business plans, and develop new business ventures.

Connect Arkansas' Entrepreneurship Curriculum consisted of comprehensive entrepreneurship training encompassing the innovation, development, establishment, and operations of online businesses. The program intended to empower, enrich, and engage young entrepreneurs in the eighth to twelfth grades in the fifty-seven grant-targeted counties. The program provided a training course in Business 101, which explained the foundations of entrepreneurship and business, and how it affects people in the United States and around the world. It also covered social media and marketing, e-Commerce, netiquette, and elevator pitches. The grantee noted several outcomes and impacts:

- The Entrepreneurship Curriculum was an opportunity for students to refine their Internet skills and develop new skills to use technologies for business-related and academic purposes. The curriculum incorporated training using grant-funded iPads. Students unfamiliar with iPads learned how to use the device and learned about applications for business, school, and daily productivity.
- Students applied their skills to create a functioning website using Weebly. Connect Arkansas encouraged business-related websites, but students could focus their sites on a hobby, an interest, or a school project. Several students created websites for their family businesses, in some cases helping to establish an online presence. For example, one student created a website for his family's metal recycling business. No students had taken advantage of the free

three-year hosting opportunity that was available. Connect Arkansas believes students were not interested in the hosting service because they viewed the campus edition's sub-domain (.weebly web address extension) as an obstacle. Connect Arkansas is unable to monitor traffic for the student-created websites operating on Weebly's free campus edition.

- Connect Arkansas developed a partnership with the Arkansas State Library (ASL) and delivered the Entrepreneurship Curriculum to 135 students in 13 rural libraries around the state during the summer of 2012.<sup>29</sup> During the summer months, they used ASL's mobile computer lab with twenty to twenty-five Netbooks to conduct sessions in libraries around the state during their summer reading programs. The partnership was mutually beneficial, as it helped libraries to fill summer reading hours.

Arkansas SourceLink is a state-specific version of the U.S. SourceLink program purchased from the Kauffman Foundation. U.S. SourceLink connects business development resources to each other and to a national network of best practices.<sup>30</sup> Connect Arkansas conceptualized the program several years before the grant award, but had not implemented it because of resource constraints. Connect Arkansas used grant funds to purchase the software license and three years of hosting. The following descriptions of services denote those included with the license purchase. If Connect Arkansas had not received the grant, the resources would not have been available to launch the site. Staff members noted the following activities:

- Arkansas SourceLink conducted two publicity competitions, with the idea that users visiting the site for the competitions would spend additional time perusing the site's resources. Arkansas SourceLink hosted the Battle of the Brands competition, a bracket-based tournament to promote companies throughout the state. Connect Arkansas randomly selected sixty-four of the eighty-two nominated businesses to participate. By participating, businesses engaged their followers over social media to vote for their favorite company in the competition. The competition generated tens of thousands of votes, spiking social media and website hits for Arkansas SourceLink. Arkansas SourceLink reached 775 followers on Twitter as compared to 51 before the competitions.<sup>31</sup> Similarly, Facebook fans increased from 26 to 103.<sup>32</sup> Daily visits to the website also increased significantly with the competitions. The busiest day attracted 600 visitors in comparison to the minimal number of users who visited the site each day before the competition.<sup>33</sup> Arkansas SourceLink hosted a competition in the winter of 2012 to award the best elevator pitch contestant with an all-expenses paid trip to the South by Southwest festival in Austin, Texas. Twenty-three businesses submitted entries in the two weeks the competition was open. Arkansas SourceLink intends for this competition to become an annual event.
- The grant-funded SourceLink license includes two popular features: the Resource Navigator and Calendar. Connect Arkansas estimated about 500 to 600 people had used Arkansas SourceLink's Resource Navigator feature. Users completed several prompts, such as ZIP Code, industry, and business stage, which classified the specific need of the business to generate a list of relevant resources within a particular geographic scope. The Calendar is a centralized resource of events targeting businesses and entrepreneurs in Arkansas. Users can search for events by category and obtain the description, cost, and time of an event.
- Arkansas SourceLink's aggregation of resources saved users' time in their search for information, enhanced their awareness of available digital resources, and improved their understanding of the business world. Arkansas SourceLink created a Digital Learning Library that comprised a compilation of online educational resources to heighten users' awareness of available digital resources that supplemented the services available through Connect Arkansas, the Arkansas Capital Corporation Group (ACCG), and the ASBTDC. This service aggregated free educational resources from universities already published online, such as Udacity, which offered Massive Online Open Courses (MOOC). It promoted Internet-based funding resources through entities such as KivaZip, a microlending website that helps entrepreneurs raise funding with zero percent interest loans.

Y.E.S. 2.0 is an online business plan competition for students in the ninth through twelfth grades. To participate, teacher-sponsored teams of public or home-schooled students conceptualize a for-

profit business to market a new product or service. While the program, described further in Section 2.4, is an education-related initiative, some students conceptualized viable business ventures. Connect Arkansas provided an example of one of this year's winners. The student created a device that attaches to the back of a four-wheeler that has the ability to dig ditches, a quicker and cheaper solution than those currently available on the market.

## 2.3 Digital Literacy

The Digital Literacy focus area is fundamental to all the others. Digital Literacy defines a set of skills and abilities that enable an individual to interact with the digital aspects of culture, and to maintain a digital identity. In the National Broadband Plan, the Federal Communications Commission (FCC) defines digital literacy as "the skills needed to use information and communications technology to find, evaluate, create, and communicate information."<sup>34</sup>

Connect Arkansas promoted Digital Literacy through the implementation of several grant-funded programs. Connect Arkansas provided Digital Literacy training and resources in an effort to affect participants' decision to adopt broadband. It also provided supplementary resources to help users achieve entrepreneurial goals. Digital Literacy outcomes and impacts include the following:

- Low-income families gained the knowledge and equipment necessary to adopt broadband, enabling improvements in academic performance and social connections in rural areas. The Technology Training and Computers 4 Kids programs, available to students in kindergarten through twelfth grade qualifying for free or reduced lunch, provided participating families with a free refurbished computer and training emphasizing the educational benefits of broadband. Home access to computers and broadband access enabled students to complete homework assignments and conduct research. Parents gained the skills and equipment necessary to communicate with friends and family or engage in distance education opportunities.
- Connect Arkansas hired a third party to conduct a survey of participants, discussed further in Section 3.1. According to the survey responses, student and guardian participants gained an improved set of Digital Literacy skills and a greater understanding of computers and the Internet.<sup>35</sup> Parents learned about computer security and navigating the Internet. Students learned to assemble computers through a hands-on exercise and received an overview of basic Microsoft Office programs and the Internet.
- Connect Arkansas distributed 1,174 free refurbished computers to qualifying families trained through its Computers 4 Kids program through March 31, 2013.<sup>36</sup> Sixty-two percent of Computers 4 Kids participants subscribed to broadband upon completion of the course, suggesting that one of the barriers to adoption was the cost of a computer.<sup>37</sup>
- Grant funds enabled Connect Arkansas to expand its Computers 4 Kids and Technology Training programs that it carried out in partnership with the University of Arkansas at Monticello (UAM). Outside organizations observed the successes of these programs and granted Connect Arkansas funding to provide additional sessions. The Arkansas Users of Telecommunications and Information System (AUTIS), a nonprofit organization comprising IT professionals, observed the program's accomplishments and approached Connect Arkansas with \$1,500 to implement the program in Jefferson County, located within the fifty-seven-county SBA service area. The AUTIS grant provided enough funding to cover the costs, allowing Connect Arkansas to conduct classes in Jefferson County. Connect Arkansas actively sought opportunities to serve other areas of the state not funded by the grant. The Arkansas Community Foundation (ACF) gave Connect Arkansas funding to provide the Computers 4 Kids and Technology Training program to fifty students in Greene County, a county not included in the grant service area.
- Connect Arkansas intended to affect residents' broadband adoption decisions through their outreach efforts. In November 2012, Connect Arkansas introduced the "Get Connected" advertising campaign. The campaign's intention was to demonstrate the relevance of the Internet and the importance of having a broadband connection. In the first quarter of 2013, the



site received 8,500 visitors, 6,200 of which were unique visitors, representing an approximate 413 percent increase in unduplicated visits.<sup>38</sup> The organization had 391 Facebook likes, 47 of which occurred in the first quarter of 2013. Connect Arkansas had 548 followers on Twitter, 336 of which were new as of the same quarter.<sup>39</sup>

- Connect Arkansas' Entrepreneurship Curriculum, though its focus was entrepreneurship education, provided some digital literacy instruction to students. Connect Arkansas noted that, in some of the smaller, more rural schools, the students had less computer experience. In these areas, instructors paced the training accordingly, allowing for unfamiliarity with computers and keyboards. Instructors assisted students in acquiring basic computer skills, such as copying and pasting.

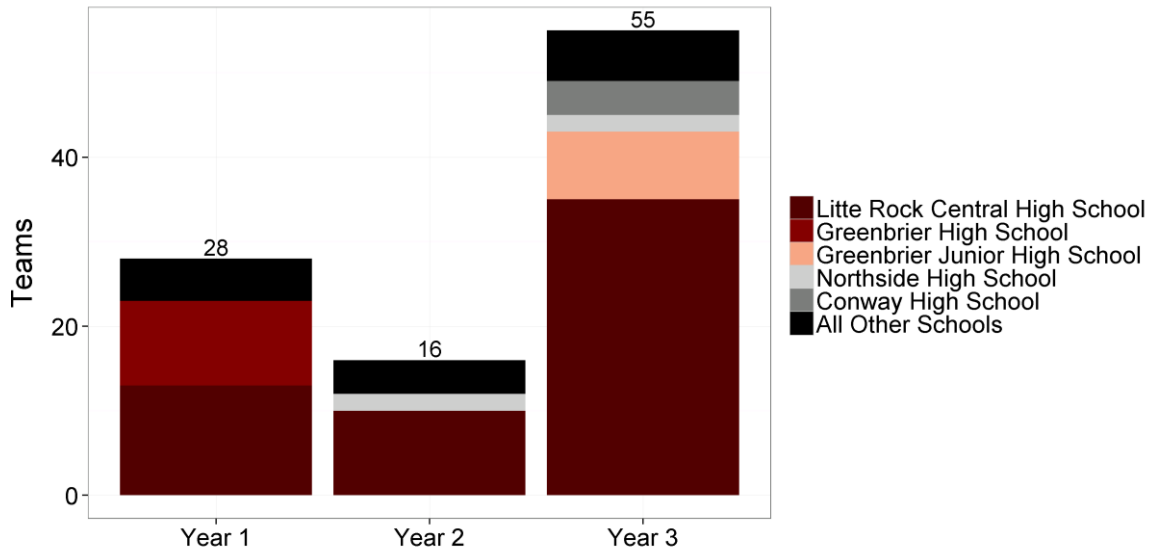
## 2.4 Education and Training

*"With my kids, hardly a day goes by, or I'll say a week just to be conservative, that they don't have some sort of homework that they need access to the Internet or a computer to work with. A lot of these families don't have the means. You really have to wonder how far that is putting their child behind." – Connect Arkansas BTOP Project Manager*

This focus area includes activities that lead to a certificate or diploma that would typically be awarded by an educational institution, or that indicates the recipient has received training that is recognized as valuable for career advancement. Examples of certificates or diplomas include the following: community college degrees, four-year college degrees, advanced degrees, general equivalency degrees (GED), certifications in advanced software technologies such as network engineering, and other licenses or certifications that reflect knowledge of a particular subject at a level that would typically be taught at an educational institution. While some activities described below do not result in a certification or diploma, the activities augment and enhance state academic curricula and improve students' awareness of future career options.

Y.E.S. 2.0, an online business plan competition for high school students, challenged participants to conceptualize and market a new product or service. The Y.E.S. 2.0 business plan competition provided supplementary business and entrepreneurship education to students throughout Arkansas. Ninety-nine teams of high school students completed and submitted businesses plans, an activity supplementary to the state curriculum.<sup>40</sup> The competition enhanced students' understanding of entrepreneurship, built critical thinking skills, and fostered confidence, creativity, and innovation among students. Connect Arkansas implemented three iterations of the competition. Competing teams comprised teacher-sponsored one- to six-member groups of public or home-schooled students. Figure 4 depicts Y.E.S. 2.0 participation by year.<sup>41</sup> By revising the competition's timeline to align with the high school calendar, participation in Y.E.S. 2.0 more than tripled in the third year of implementation. Additionally, Connect Arkansas reported that teachers participating in the program often encouraged subsequent classes of students to enter the competition.

**Figure 4. Y.E.S. 2.0 Participation**



The competition served as an educational exercise supplementary to the state academic curriculum. The Y.E.S. 2.0 program, combined with the Y.E.S. for middle schools and the Donald W. Reynolds Governor’s Cup competition, offered Arkansas students the opportunity to submit a business plan and receive professional feedback each year from fifth grade through graduate school. The competitions supported awareness of relevant post-secondary opportunities and entrepreneurial career options and provided interested students with the opportunity to engage in a hands-on learning exercise. Connect Arkansas observed that, over the course of the program implementation, some teachers integrated the competition into their course curriculum or incorporated project work into class hours.

The competition disseminated educational information through the program website. The Y.E.S. 2.0 website aggregated resources for students and faculty advisors, providing information relevant to the competition, including regulations, judging criteria, and frequently asked questions. The website was interactive, including video lessons in entrepreneurship, business plans, and marketing strategy. Educational material on the program website helped students write business plans and improve their understanding of entrepreneurship. The site provided teachers with resources to educate students on entrepreneurship and creating business plans and offered tutorials to help teachers integrate technology into the classroom.

Connect Arkansas also implemented an Entrepreneurship Curriculum program to provide entrepreneurship education to high school students in the fifty-seven counties in the grant service area. The material included in these lessons supplements the state high school curriculum. The Entrepreneurship Curriculum’s largest partnership was with the Environmental and Spatial Technology (EAST) Initiative. The EAST Initiative’s annual National Service Project theme this year was entrepreneurship. It leveraged resources and lessons from Connect Arkansas’ Entrepreneurship Curriculum and created a portal to assist students. Connect Arkansas helped EAST implement an elevator pitch competition for students to address problems in their communities and propose solutions. Eight finalists from across the state, selected from forty entrants, presented their pitches in front of judges. The third-place team in the EAST competition participated in the Entrepreneurship Curriculum, encouraged to enter the competition by the Connect Arkansas instructors.

With education shifting online, access to computers and the Internet is necessary for students to complete homework assignments and study outside of the classroom. Families that did not own a computer were eligible to participate in the Computers 4 Kids program. Staff noted the gratitude



expressed by parents for the opportunity to provide their children access to a computer. During the digital literacy course that served as a prerequisite for obtaining a computer, UAM emphasized to parents the educational potential of the Internet. Students and parents learned about free educational websites, such as the Kahn Academy.

## 2.5 Healthcare

*“We talk to people all the time who have either been a patient or they worked in a doctor’s office. Their ability to do their job has been made a lot easier due to telehealth and the training we provide.” – UAMS Learntelehealth.org Director*

The Healthcare focus area includes broadband-enabled activities undertaken by participants in Public Computer Center (PCC) and SBA programs to improve their own health or that of someone else. This definition includes not only sophisticated tasks, such as viewing one’s medical records online, but also more common activities that might not involve a medical provider at all.

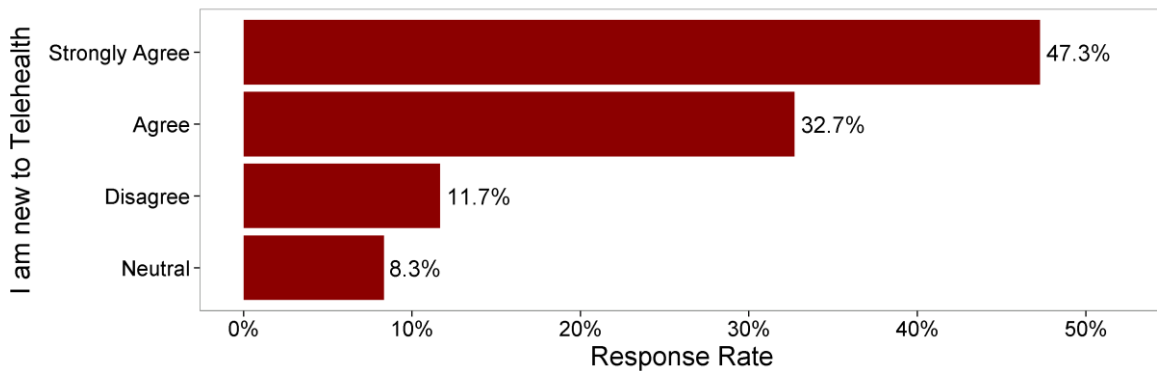
Health statistics in Arkansas were of a particular concern to Connect Arkansas. Specifically, Connect Arkansas reported that the state had the country’s ninth highest obesity rate and had the sixth highest number of smokers. In Arkansas, diabetes was the sixth leading cause of death and the life expectancy was 2.7 years below the national average.<sup>42</sup> Connect Arkansas emphasized the Internet as a tool to improve statewide health. By collaborating with UAMS, the grant employed telehealth as a means of providing improved healthcare to underserved and rural communities across the state. To spur the adoption of telehealth to achieve such impacts, UAMS provided training and resources for healthcare providers and promoted the benefits of telehealth for both patients and providers. The provision of telehealth services saved practitioners and patients time and money in transportation, and offered patients facilitated access to improved treatment options.

UAMS served as a subrecipient of the Connect Arkansas SBA grant. The Arkansas Center for Telehealth (ACT) program, designed and managed by UAMS Center for Distance Health, provided outreach and training to improve the incorporation of telehealth and broadband technologies in the delivery of healthcare, research, and community health education. The Center for Distance Health was operational before the grant period, but lacked sufficient funding to implement the ACT program. Though grant funding is concentrated in extending service to the fifty-seven target counties, the ACT program conducted outreach efforts in all seventy-five counties in Arkansas.

UAMS received a \$102,131,393 Comprehensive Community Infrastructure (CCI) grant to extend, integrate, and enhance the capabilities of two state networks to enhance healthcare, education, and public safety. The grant will improve healthcare by enabling remote clinical consultations and electronic record exchanges.<sup>43</sup> Connect Arkansas provided UAMS funding to train Arkansas medical professionals to use the telehealth equipment provided through the UAMS CCI grant. UAMS estimated it had visited nearly 80 percent of the 479 facilities that received equipment. UAMS training and service opportunities resulted in the following outcomes and impacts:

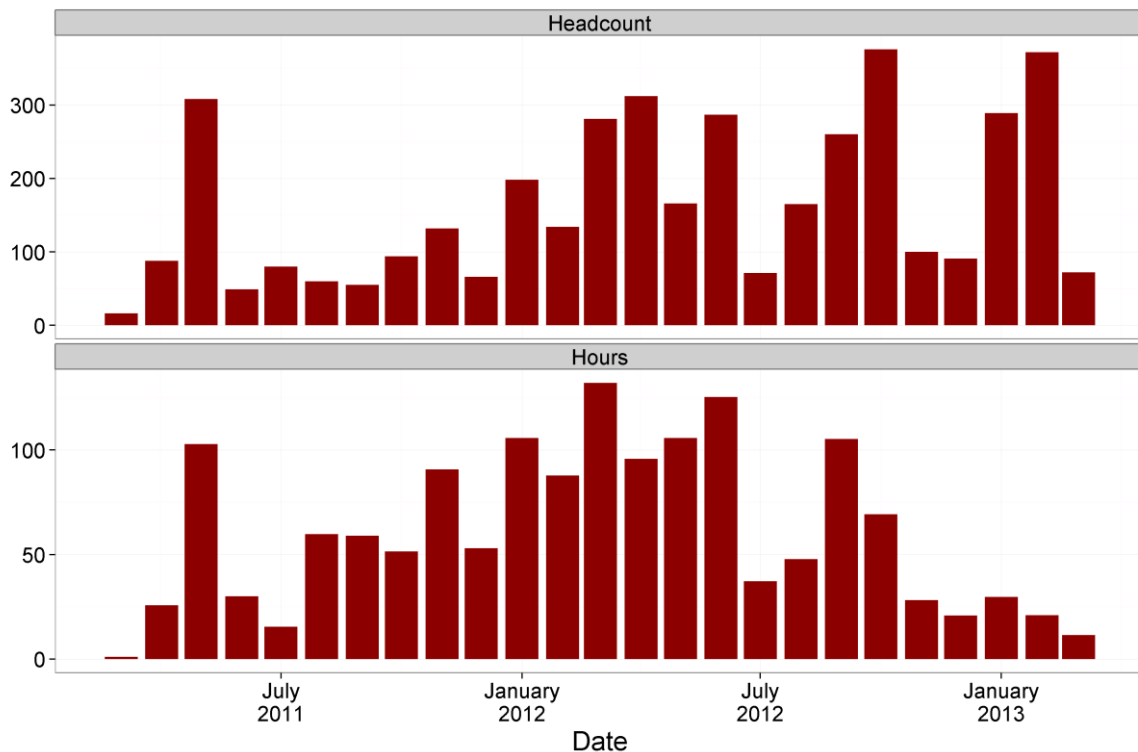
- Since the project’s inception, 919 users had completed the Telehealth 101 training program, acquiring a fundamental understanding of the online technology.<sup>44</sup> Telehealth 101, the primary training program delivered to CCI equipment recipients, provided an overview of telehealth, relevant technologies, strategy development, service sustainability models, and workshops for a wide range of equipment. As shown in Figure 5, the training and informational resources available through the Telehealth 101 program reached many users previously unfamiliar with telehealth.<sup>45</sup> Approximately 80 percent of Telehealth 101 participants indicated that they were new to the topic of telehealth.

**Figure 5. Telehealth 101 User Familiarity with Telehealth**



- Through a combination of on-site training, online training, webinars, and seminars, UAMS delivered 4,122 hours of telehealth training to 1,512 people over the course of the grant.<sup>46</sup> Participants learned to leverage telehealth equipment and resources to spur the expansion of statewide delivery of telehealth services. In addition to the provision of online training opportunities, UAMS staff members traveled around the state and delivered on-site training and seminars. Figure 6 shows the delivery of training over the course of the grant.<sup>47</sup>

**Figure 6. Telehealth Training through March 19, 2013**



- As of February 28, 2013, nearly 5,000 unique users had visited Learntelehealth.org, the website created by UAMS to distribute informational resources and provide digital training opportunities.<sup>48</sup> Nearly 1,200 users had registered as members on the site.<sup>49</sup> Approximately 56 percent of the 8,292 site visits were return users.<sup>50</sup>

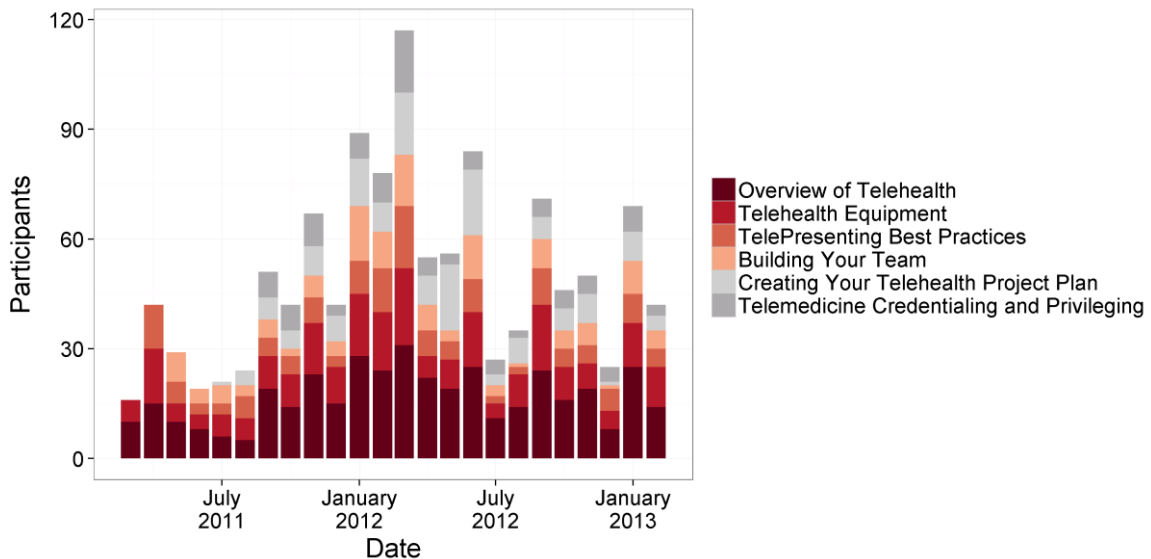
- UAMS offered live webinars quarterly on Learntelehealth.org focusing on popular topics in telemedicine. Webinars featured programs such as “Breakdown,” which discussed in-depth current topics in telehealth, and “30 Seconds with a Telehealth Expert,” which featured expert advice for establishing a telehealth network. Table 2 presents webinar attendance as of February 28, 2013.<sup>51</sup>

**Table 2. UAMS Webinar Attendance**

Live and Archived Conferences	Participants
<i>“Lessons Learned from A Life in Telehealth”</i>	75
<i>“School-based Telehealth Projects”</i>	25
<i>“Telemedicine and Nursing Homes: A Good Fit”</i>	19
<i>“Child Psychiatry Telemedicine in the State of Arkansas”</i>	12
<i>“Utilizing Telemedicine to Expand Emergency Care in Rural Mississippi”</i>	80
<i>“Determining Telehealth’s Value”</i>	49
<i>“If I Knew Then What I Know Now (telemental)” 10/18/2012</i>	165
<i>“Arkansas Delta” 1/22/2013</i>	58
<b>Total</b>	<b>483</b>

- UAMS developed 6 eLearning modules, which users accessed more than 1,200 times over the grant period.<sup>52</sup> Since implementing the training modules in March 2011, users had completed 1,197 sessions.<sup>53</sup> Figure 7 presents participation by module.<sup>54</sup> Users were able to complete tests and assessments to verify their knowledge. Of the 1,197 sessions, 30 percent of the users completed sessions. Of those completing a session, 98 percent achieved a passing grade.<sup>55</sup>

**Figure 7. Training Module Participation**



- UAMS developed several videos, including “Jennifer’s Story” and “Darryl’s Story,” to explain telehealth to viewers.<sup>56</sup> The American Telemedicine Association’s (ATA) featured “Jennifer’s Story” on its homepage. The video received 14,365 views between July 12, 2011, and April 28, 2013.<sup>57</sup> Users viewed “Darryl’s Story” 490 times between November 15, 2011, and April 28,

2013.<sup>58</sup> Connect Arkansas created thirty-two videos over the course of the project. UAMS recorded a total of 17,998 views across videos as of April 28, 2013.<sup>59</sup>

- UAMS developed a Telehealth Impact Calculator. The website allowed users to input the distance they would travel, the price of gas, their average speed, and their car's miles per gallon, and returns the amount of money and carbon dioxide they would save using telehealth rather than commuting to a particular healthcare facility. UAMS allowed users to embed the calculator on their own website.
- UAMS created another website, [Arkansastelemedicine.com](http://Arkansastelemedicine.com), to educate the public about the benefits of telehealth. It had not yet conducted a significant amount of marketing for the site. Nor had the site attracted significant participation. It did conduct radio and TV broadcasts for the site. From August 2012 through March 2013, 686 unique visitors visited the site 811 times.<sup>60</sup>

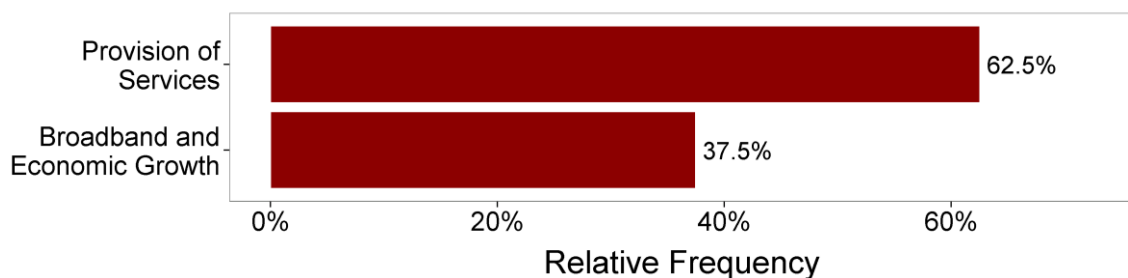
## Section 3. Recovery Act Goals

This section describes the activities and outcomes associated with the Recovery Act goals. Of the five Recovery Act goals for the BTOP program, two relate most directly to PCC and SBA programs:

1. Provide broadband education, awareness, training, access, equipment, and support to
  - a. schools, libraries, medical and healthcare providers, community colleges and other institutions of higher learning, and other community support organizations
  - b. organizations and agencies that provide outreach, access, equipment, and support services to facilitate greater use of broadband services by vulnerable populations (e.g., low-income, unemployed, seniors)
  - c. job-creating strategic facilities located in state- or federally designated economic development zones
2. Stimulate the demand for broadband, economic growth, and job creation

Figure 8 presents the relative frequency of topics related to the Recovery Act goals as discussed during interviews and focus groups. These topics were categorized by the two Recovery Act goals discussed above. The results provide another lens from which to analyze how the grantee met the requirements of the grant. More than 60 percent of the conversations with interviewees focused on providing services to increase access to and the use of broadband. Nearly 40 percent of discussions focused on broadband and economic growth, specifically the grant activities supporting entrepreneurial and small business development and the grant's impact on broadband subscribership. The statements made by interviewees reflect the project's intention to increase technology understanding and use, encourage broadband adoption, foster sustainable economic development, and improve the provision of healthcare in Arkansas.

**Figure 8. Recovery Act Goals Statements Made by Interviewees**



### 3.1 Provision of Services

*“For most students and families, the ability to access the world is incredible. A lot of them don’t necessarily know it yet. Therefore, they choose not to have broadband or they may not have it because they don’t have a computer at home. You get into some areas and it’s hard to believe the numbers of people who don’t have a functioning computer in the house that is broadband capable. These programs have really tried to target that.”*  
– University of Arkansas at Monticello Dean of Students

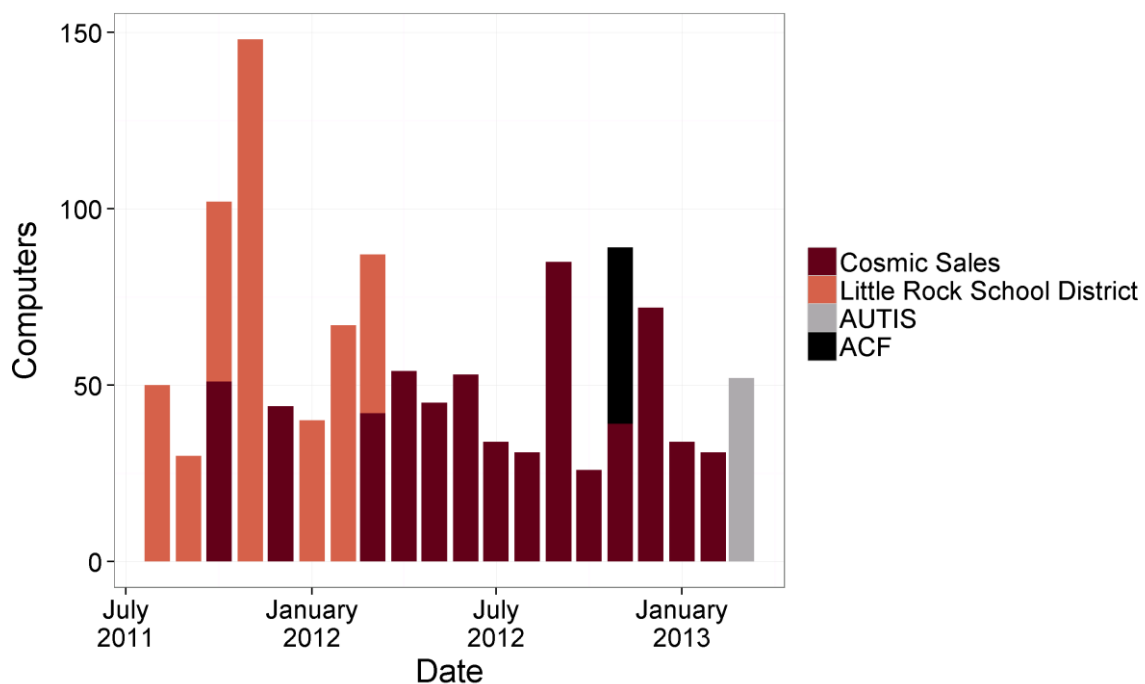
Connect Arkansas was established by the Arkansas state legislature in 2007 with the goal of increasing broadband subscription and adoption rates within the state. The organization’s focus is

getting state residents connected to and using the Internet, and offering services that facilitate connection through the provision of education and equipment. Connect Arkansas believes that, by removing barriers to adoption, residents will be without reason to remain unconnected.

Connect Arkansas provided a link on its website that enabled users to purchase low-cost refurbished computers. The link redirected users to the website for the supplier of the Computers 4 Kids computers, Cosmic Sales. Computers were available for \$149, including shipping to any location in Arkansas. Connect Arkansas does not have a figure for the number of computers sold to residents through Cosmic Sales.

Connect Arkansas noted that more than half of the 500,000 K-12 students in the state qualify for free or reduced lunch status. In some areas of the state, the percentage of families qualifying for free lunch was so high that the state designated the entire district as a 100 percent free lunch status zone. As of April 2013, Connect Arkansas had distributed 1,174 of the 1,710 free computers through the Computers 4 Kids program to families qualifying for free or reduced lunch.<sup>61</sup> Figure 9 shows the distribution of computers, denoting the machines refurbished by the Little Rock School District (LRSD) and Cosmic Sales, and indicates computers distributed through the grants described in Section 2.3.<sup>62</sup>

**Figure 9. Computers Distributed by Computers 4 Kids**



Connect Arkansas hired a third party to conduct a survey of Computers 4 Kids participants. Survey results indicated that 93 percent of the 215 respondents were satisfied with the class and 83 percent were satisfied with the quality of the computers.<sup>63</sup> Ninety-four percent of respondents believed that the instructor provided them with relevant information to use their refurbished computers.<sup>64</sup> Results suggest that participants believed Connect Arkansas provided high-quality service.

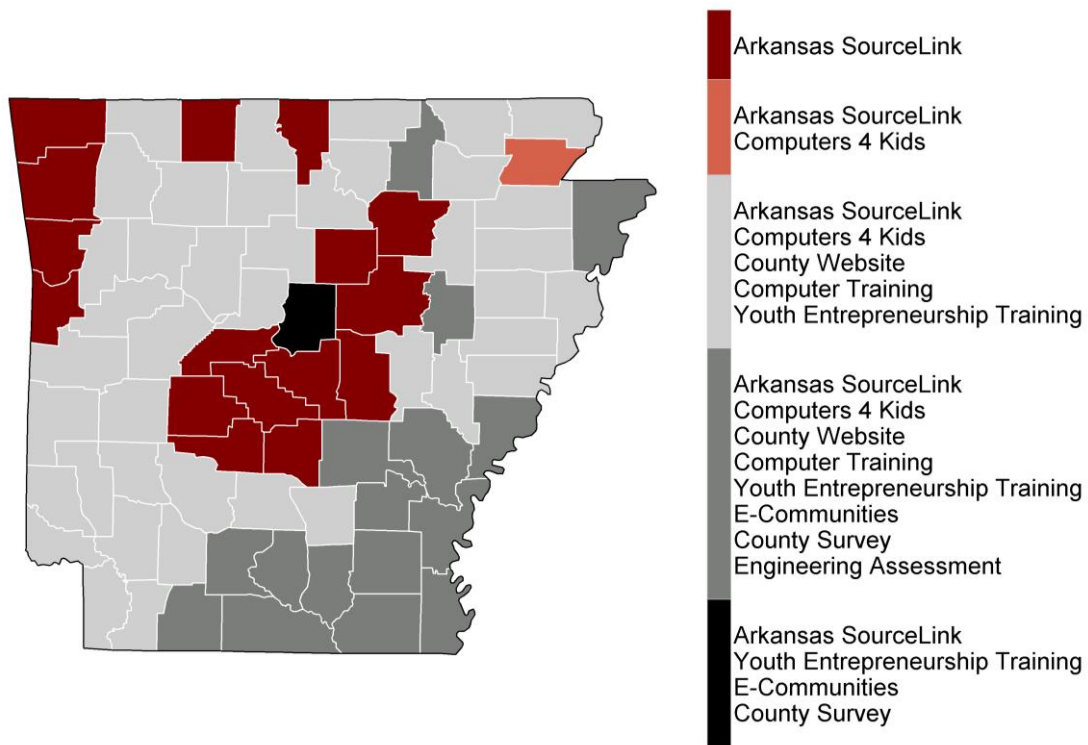
Computers distributed through Computers 4 Kids must meet minimum specification requirements. Computers supplied by Cosmic Sales generally exceeded these specifications. All computers must be Internet ready and refurbished by a certified refurbishing company. The computers also included

a six-month warranty managed by the refurbishing company, from the date of delivery. Minimum computer specifications include the following:

- Pentium 4 processor
- 256 MB of memory
- 10 GB hard drive
- Windows XP operating system
- 15" flat-panel monitor
- Mouse and keyboard

Figure 10 depicts the services provided by Connect Arkansas.<sup>65</sup> In addition to the programs highlighted in the figure, the Y.E.S. 2.0 competition, Learntelehealth.org, and telehealth training were available across the state. Small business training through ASBTDC was available in counties colored light grey and black.

**Figure 10. Grant Services by County**



Connect Arkansas also received a State Broadband Data and Development (SBDD) grant. This broadband mapping initiative illustrates the broadband geography in Arkansas and helps the state formulate an effective strategy for reaching underserved areas throughout the state.<sup>66</sup>

### 3.2 Broadband and Economic Growth

*“Arkansas has a huge problem with what’s called the brain drain. Many of our students get educated and leave the state, and they leave for good. So we’re trying to address that within the state and keep those students here and keep that innovation within the state.”*  
 – Connect Arkansas Chief Operating Officer



The Arkansas legislature established Connect Arkansas in 2007 with the goal of improving the quality of life in Arkansas and creating economic opportunity for the state by increasing and sustaining Internet adoption. Specifically, ACT 604 of the 2007 Arkansas General Assembly defines Connect Arkansas' mission, "to prepare the people and businesses of Arkansas to secure the economic, educational, health, social, and other benefits available via broadband use."<sup>67</sup> To encourage the population to adopt broadband, the project taught the fundamentals of digital literacy, stressed the Internet's relevance and importance, and provided facilitation services enabling low-income residents to obtain access to affordable technology. Data collected through survey and mapping efforts helped assure a robust approach to spurring economic and social development with broadband adoption. This section describes Connect Arkansas' efforts contributing to this effect and the corresponding outcomes and impacts.

Connect Arkansas differentiates between "subscription" and "adoption." According to its definitions, subscription does not imply use. There may be subscribers who do not know how to use the Internet. Connect Arkansas' mission is to ensure that subscribers know how to use their Internet connections. Connect Arkansas considers the perpetual use of a subscription, whether at home or work, to be adoption. They also consider users who learn to use the Internet in a new or different way to be "new adopters."

Broadband use and adoption had increased in Arkansas over the course of the grant period. Connect Arkansas' 2012 state resident survey revealed that 78 percent of respondents use the Internet at least occasionally, which is a 2 percentage point increase from 2011.<sup>68</sup> In 2012, 71 percent of respondents had Internet in their homes, compared to 68 percent in 2011.<sup>69</sup> The survey results showed that the main reason people did not use the Internet was price. Thirty-six percent indicated it is too expensive or they did not have a computer.<sup>70</sup> Thirty-five percent of respondents cited relevance as the reason they did not use the Internet. This is a 12 percent decrease from 2011, when 47 percent of respondents indicated that they were not interested in the Internet, too busy to use it, did not need it, or it was a waste of time.<sup>71</sup> The survey noted a 5 percentage point increase in Arkansans who believed broadband is a necessity.<sup>72</sup> Connect Arkansas does not claim direct responsibility for this shift in perspective. It only officially considered program participants as affected by its project efforts. The grantee was not able to verify whether exposure to Connect Arkansas' marketing campaign effected participants' adoption decisions.

Survey data suggested that socioeconomic factors strongly influence broadband adoption decisions. There remains a wide gap in subscribership between income levels. Fifty-nine percent of those with annual incomes below \$25,000 had Internet at home as compared to 89 percent of those with incomes above \$100,000.<sup>73</sup>

To address the cost barrier preventing many low-income residents from obtaining a subscription to broadband, Connect Arkansas introduced its Broadband Incentives program in early 2013. The Broadband Incentives program focused on helping residents connect to the Internet and obtain discount services. Connect Arkansas restricted the service to families on free or reduced lunch status. Connect Arkansas' goal was to facilitate the conversation between consumers and providers by eliminating the information barrier between the two parties.

In Arkansas, there were low-cost subscription options offered by Comcast and CenturyLink. The Broadband Incentives volunteer-based program encouraged ISPs to provide discounted service to low-income families. Eleven ISPs had volunteered to offer some sort of discount through the program. Participating ISPs offered discounted services. Some providers may offer introductory discount prices for the first months of service. Others waived installation costs, while some were able to offer a percentage off monthly bills. Connect Arkansas did not track the incentives. While they requested this information, ISPs were not required to provide the information to participate. Connect Arkansas did not share specific incentives with applicants, but rather indicated the name of the providers in their vicinity offering some type of discount.

Connect Arkansas mailed postcards with a list of all nearby providers to applicants. Connect Arkansas used data collected through its SBDD grant to identify the providers offering service



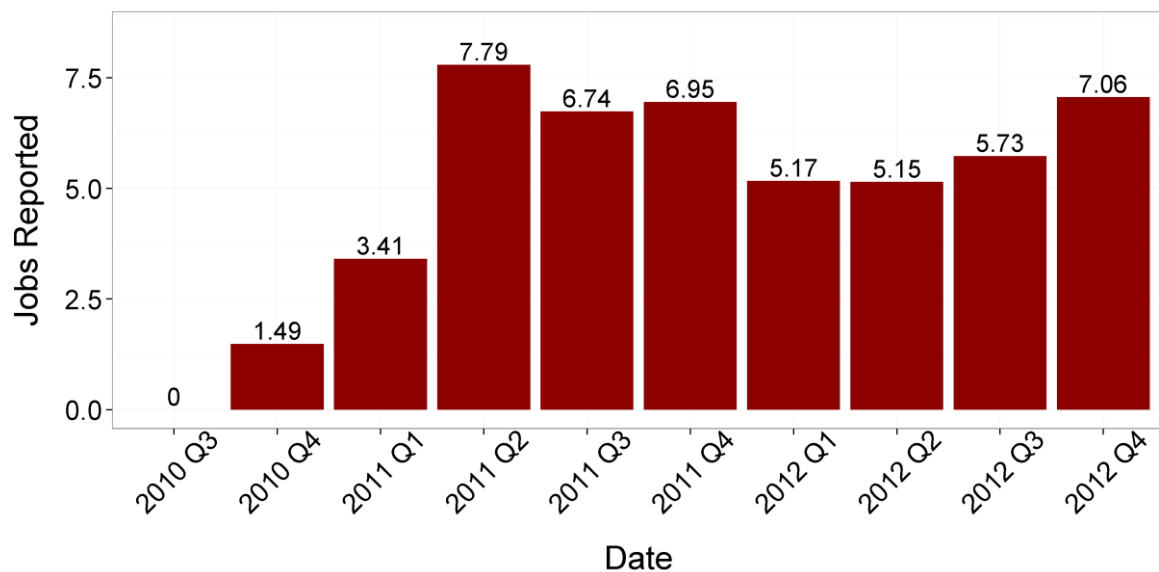
within the vicinity of each applicant's address. Because Connect Arkansas considers itself "technology neutral," it provided the name of all providers offering service in an applicant's area, regardless of whether or not the provider offers a discount. Connect Arkansas also provided all local providers with the applicants' contact information to facilitate the subscription process. Connect Arkansas received twenty-two applications for low-cost service. Fifteen of those applicants had discount providers within their vicinity.<sup>74</sup>

Connect Arkansas created an Interactive Broadband Map that allowed website users to type in their addresses to learn which broadband service options, if any, were available within their area. To create the map, Connect Arkansas leveraged data collected through its SBDD grant. The grantee estimated that there were approximately eighty broadband providers in Arkansas, including fixed wireless, mobile wireless, satellite, Digital Subscriber Line (DSL), and cable providers. The Interactive Broadband Map helped state residents identify providers, offering flexibility in their subscription decision. The service also helped smaller providers, who may not advertise as heavily as others, by promoting their services to interested residents.

Connect Arkansas also used the broadband map data to assist residents who called Connect Arkansas in response to television advertisements for broadband service. Callers received contact information about ISPs that offered broadband service. Connect Arkansas did not have the capabilities or access to information to track which ISPs filled callers' request for Internet service or the number of residents who become subscribers.

As required by the Recovery Act, Connect Arkansas reported quarterly on the number of direct jobs created because of the project. As shown in Figure 11, this had resulted in an average of approximately five full-time-equivalent positions.<sup>75</sup> The number of jobs fluctuated between five and seven positions over the course of the grant period. Connect Arkansas' staff included full-time salaried and contract positions funded by the grant. Other positions included staff shared across ACCG groups, such as marketing specialists and digital content producers. It is important to note that the figure below displays only direct jobs created, and does not include indirect or induced job creation.

**Figure 11. Direct Jobs Created by Grantee**



## Section 4. Grant Implementation

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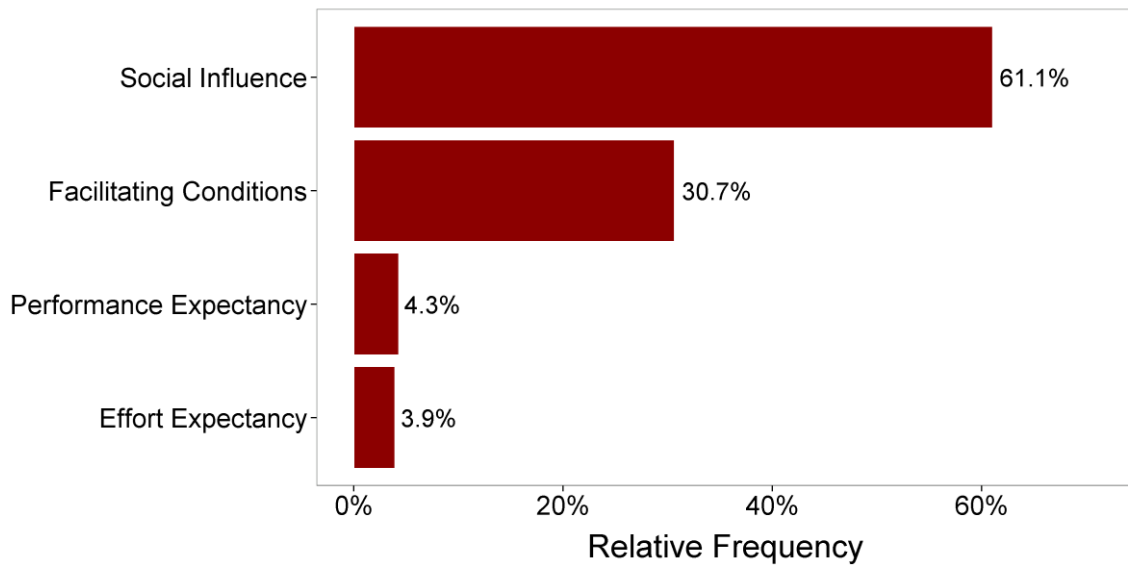
This section describes particular aspects of implementation of Connect Arkansas' project in order to understand the composition of activities and outcomes observed. The purpose of this section is twofold. First, defining a consistent set of categories for each of the grants in the study sample facilitates cross-case comparison and analysis. Second, presentation of the activities and outcomes for this grant by category simplifies understanding of the focus of the grantee's work. This analysis is based on qualitative observations made during the site visit.

ASR is using a theory-based evaluation approach to examine the social and economic impacts of the BTOP program. This permits deeper understanding of grant features in terms of theory, which helps to explain how the grant activities produce impacts. For the PCC and SBA grants, ASR uses theories of technology adoption to examine factors that shape the demand-side of broadband services. The key theory ASR employs is the unified theory of the acceptance and use of technology (UTAUT), a technology adoption model proposed by Venkatesh et al. (2003).<sup>76</sup> The model is among the top three most frequently cited articles published in the information systems field and the preeminent article explaining the adoption of information systems. The UTAUT model traces its history from theoretical constructs found in literature that have a bearing on a user's intention of technology adoption and use. The UTAUT model is derived from the leading theories of technology adoption, including the theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, a combined theory of planned behavior/technology acceptance model, model of personal computer use, diffusion of innovations theory, and social cognitive theory.

UTAUT explains technology acceptance by looking at a user's intention to use an information system and the user's long-term use of that technology. The UTAUT model combines concepts found in earlier models of technology use to posit a unified theory of information technology adoption and use. UTAUT includes four dimensions determining user intention and technology use: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. Each of these dimensions is further classified into constructs constituting the dimension. The subsections below define and discuss each of these dimensions. Venkatesh empirically tested the model and reported that it was successful in explaining more variation in user adoption of technology than other adoption models tested.

Figure 12 presents the relative frequency of topics related to the grant implementation as discussed during interviews. These topics fall into four categories, corresponding to the four UTAUT categories listed above. Social Influence, at 61 percent, is the greatest dimension discussed by Connect Arkansas staff and partners that influenced broadband use among patrons. Facilitating Conditions, the technical and organizational factors elaborated by staff that influenced computer and broadband use among patrons, is 31 percent. The frequency of discussions by Connect Arkansas staff and partners that described the Performance Expectancy and Effort Expectancy of users are roughly 4 percent each. The frequency of statements made by the interviewees reflect the grant's intention to enhance Arkansans' awareness and understanding of broadband, and to provide the equipment, training, and knowledge necessary to affect residents' broadband usage and adoption decisions.

**Figure 12. Distribution of Grant Implementation Topics by UTAUT Dimension**



## 4.1 Social Influence

*"We're driving people to the website to get them online and find additional information. Connect Arkansas is not a traditional retail or consumer-type business. We're not selling anything. We don't have a price point. People are coming to the website to get educated. They're coming here to find out additional information." – Arkansas Capital Corporation Group Vice President of Marketing*

The Social Influence category measures the degree to which potential adopters perceive that others will view them favorably or interact with them in a positive way if they adopt broadband technology. This includes friends and family members who might already be using broadband technology. It also includes measures of whether the use of broadband is considered to be a social norm for the group to which the potential adopter belongs. Components of Social Influence include subjective norms, social factors, and the image associated with broadband use. ASR noted the following activities related to Social Influence:

- Connect Arkansas implemented two direct mailing campaigns after bringing on new marketing personnel. The first campaign targeted ISPs, informing them of Connect Arkansas' Broadband Incentives Program and inviting them to participate. The other campaign targeted 625 religious leaders across the state. The letter informed them of the availability of Connect Arkansas' services and encouraged them to share knowledge about the resources with their congregations.
- The director of state libraries was on Connect Arkansas' Board of Directors. Recognizing that in many rural communities libraries may be the only source of access, the director had been proactive in working with Connect Arkansas to link its services to community libraries.
- Connect Arkansas leveraged its relationship with two state education administrators who recognized that broadband is necessary for students' academic success. Their collaboration with Connect Arkansas had a significant effect on participation in the programs targeting students. They informed teachers and superintendents about programs and resources, including those unfamiliar with the organization.

- The Technology Training program’s primary means of attracting participants was through school systems. The schools were then responsible for passing along participation information to students and their families.
- UAMS hosted the first South Central Telehealth Resource Forum (SCTRF) as an opportunity for those involved with telehealth to network and share best practices. UAMS exceeded its participation goals for the forum more than one month before the event.
- Connect Arkansas leveraged media and outreach channels to affect Arkansas residents’ perception of the Internet and encourage broadband adoption:
  - To cover all fifty-seven grant countries, Connect Arkansas placed advertisements in ninety-four newspapers, fifty-six radio stations, eleven TV stations, and five cable markets. Connect Arkansas’ Chief Operating Officer conducted more than 60 radio interviews to promote the program. The diversification strategy allowed Connect Arkansas to reach a wide variety of media consumers.
  - Television advertisements featured Connect Arkansas’ web address and a telephone number to accommodate those without Internet access. The advertisement generated more than 700 phone calls, indicating both a need and interest in subscribing to broadband. Staff members informed callers about their organizational mission and the trainings, services, and resources offered by Connect Arkansas.
  - Connect Arkansas had 1,200 monthly e-newsletter subscribers.<sup>77</sup> The newsletter covered a variety of topics, including program news, a calendar of events, and local news. The average open rate was 30 percent and click-through rate was 13 percent.<sup>78</sup> For reference, Connect Arkansas provided the 2011 fourth quarter national averages determined by North America Trends and Benchmark Results, which includes a 25 percent open rate, with a click-through rate of 5 percent.<sup>79</sup>
  - Connect Arkansas used media alerts to encourage local media to promote broadband awareness and use by advertising the grant’s programs. For example, on the last night of the Technology Training course, they sent a media alert to the local media to visit the event and take photos of participants receiving their free computers. They followed up with a news release about the event and the number of computers provided.
  - Connect Arkansas created brochures for each of the grant’s major programs. Marketing materials were modular so that staff could distribute entire packages of information or individual elements, depending on the audience.

## 4.2 Facilitating Conditions

*“Connect Arkansas will be that conduit for helping people find broadband information.”  
– Connect Arkansas Chief Operating Officer*

The Facilitating Conditions category captures the degree to which the technical infrastructure available to the user supports potential broadband adoption, and the degree to which there are organizational supports to adoption. This includes access to broadband technology, the extent to which users can choose to use broadband, the compatibility of broadband with their lifestyles and activities, and the cost of using broadband. It includes such things as the broadband connection, computers, workspaces, and clean and safe computer labs.

### 4.2.1 Training

- UAMS created one-page “quick guides” for equipment recipients. The clinical guides used graphics to explain the basic functions of the telehealth equipment that attached to the equipment with a small metal ring. UAMS created guides for the camera, electronic stethoscope, and the clinical interactive unit. UAMS determined the quick guides to be a more

effective means of training nearly 480 equipment recipients, rather than leaving them with a lengthy clinical training book.

- Resources permitting, the Technology Training program staff revisited certain counties with low participation. They opted to do this if there was an obvious interference to participation such as bad weather, a particular community event occurring the night of the training session, or poor promotion of the program by the school system.
- ASBTDC informs Website in a Day participants that, to be productive in the class, students must bring text information and images for the website on a thumb drive. ASBTDC staff members provided participants with feedback on the pre-produced content. This helped to ensure that participants left the session with a finished or close-to-finished website.
- Connect Arkansas revamped the Entrepreneurship Curriculum to cater better to students' attention spans. Rather than exclusively presenting academic material, they used hands-on activities to help engage students. Connect Arkansas introduced the Ready, Set, Design component in which students must solve a problem using a bag of materials provided by the instructors.
- Connect Arkansas presented the Y.E.S. 2.0 program to a career education group from the Arkansas Department of Higher Education who were members of the Future Business Leaders of America (FBLA), EAST, and others affiliated with economics and entrepreneurship education. Connect Arkansas explained how to integrate the program into other business education initiatives. For example, both Distributive Education Clubs of America (DECA) and FBLA conducted business plan activities. Students adapted their efforts for these programs to compete in the Y.E.S. 2.0 competition.

#### **4.2.2 Support**

- ASBTDC offered additional support to participating businesses. It provided support over the phone or in face-to-face appointments. ASBTDC provided follow-up services to ensure that participants could accomplish course goals.
- ASBTDC distributed a workbook at Website in a Day training sessions. The workbook included all of the material covered in the course for participants to take home and use in creating and maintaining their websites.
- Connect Arkansas hired an additional staff member to help manage the high volume of incoming phone calls resulting from the implementation of television advertisements.
- The Technology Training course provided parents with guidance to work with an ISP to obtain a subscription.

#### **4.2.3 Equipment and Tools**

- Connect Arkansas internally created a dashboard to review and verify Broadband Incentive program applications. Once the application was accepted, the system queried Connect Arkansas' Interactive Broadband Map database and returned a list of providers offering discounted and regular service within a feasible distance of the customer. The process created a postcard for the applicant with contact information for regular and discount providers. The system simultaneously sent an e-mail to providers, alerting them that a pre-approved consumer in their service area was interested in subscribing to broadband.
- Depending on the location, ASBTDC staff used a mobile computer lab for training courses. In small, rural communities where there was no available computer lab, ASBTDC leveraged the mobile lab and laptops.
- ASBTDC offered the Weebly Website in a Day course as an alternative to teaching users how to develop websites using HTML, which was cumbersome and resulted in limited success. HTML websites often required businesses to outsource site development and management. Weebly was a more cost-effective solution, allowing businesses to develop and update their sites independently.

- UAMS developed an online game to train healthcare employees and the public, providing users with an interactive, easy way to learn about telehealth. The game reinforced the information and lessons on [Learntelehealth.org](http://Learntelehealth.org). Staff members estimated that more than 200 participants had completed the game.

## Section 5. Techniques, Tools, and Strategies

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This section describes successful techniques, tools, and strategies identified by the grantee. Connect Arkansas noted many successful techniques, tools, and strategies that it developed over the course of the grant.

### 5.1 Techniques, Tools, and Strategies

- Relationships at the state, community, and individual levels were important across grant programs. It was especially important in rural communities to have local champions who persuaded residents to trust and accept assistance from an unknown organization. Relationships were particularly helpful in identifying facilities to host training sessions in rural communities to promote the program and encourage participation.
- Over the course of the grant, Connect Arkansas revised and enhanced its marketing strategy and social media presence to reach its target audience. The amplified outreach efforts resulted in increased website traffic and social media followers.
- Operating under the umbrella of ACCG, Connect Arkansas was able to leverage overhead resources, allowing them to focus grant funds on program implementation. For example, ACCG owned the office space, administrative and IT staff, marketing specialists, digital production equipment, and office supplies. Connect Arkansas paid for the portion it used, but was not required to seek out or contract these resources.
- Connect Arkansas functioned under a lean operations system. Staff members served in multiple capacities. There was an open communication structure between management and staff. Connect Arkansas streamlined weekly staff meetings to ensure that team members from both grants efficiently share best practices.
- UAM refined the delivery of the Technology Training through multiple iterations of the program. The trainer had identified best practices in recruiting schools and students, and in communicating with participants to ensure that relevant parties were aware of program status.
- Cosmic Sales shipped refurbished computers directly to Connect Arkansas' storage facility. Connect Arkansas stocked a pallet the day before each final training session so that it transported only the number of computers necessary to distribute, rather than transport additional computers if classes were not full.
- Rather than deliver free and low-cost computers during the Technology Training program, Connect Arkansas limited the course to students who qualified for a free computer. The logistics of managing the distribution of both types of computers was complicated and prolonged the delivery process.
- Connect Arkansas revised the timing of the Y.E.S. 2.0 competition and, as a result, the number of business plan submissions increased from sixteen to fifty-five.<sup>80</sup> Y.E.S. 2.0 used economics classes in high schools to facilitate program participation. The economics classes occurred in the spring semester and the competition did not launch until the semester begins.
- Connect Arkansas tailored the delivery of the Entrepreneurship Curriculum to take into account students' and teachers' previous knowledge. It was important to keep the discussion relevant to the skill and knowledge level of the classroom. For less experienced classrooms, instructors spent more time explaining basic tools, rather than discussing recent developments in social media or crowdsourcing.
- UAMS stopped providing Tuesday trainings for Continuing Nursing Education (CNE) credits. It shifted its focus to complete trainings for sites that received equipment through the CCI grant.

## 5.2 Challenges

- Though Connect Arkansas provided a link to Cosmic Sales' website with low-cost refurbished computers for sale, some interested consumers were not comfortable ordering items online or were deterred by unfamiliarity with the supplier.
- There were limited public computers available in many rural communities. Establishing PCCs throughout the state would have been beneficial to encourage residents' continued use of broadband.
- The greatest challenge in providing the Entrepreneurship Curriculum was bandwidth. Many of the schools were undersupplied, making it difficult to implement a web-based curriculum to more than twenty students simultaneously. Arkansas schools were required to have a minimum T1 connection, though T1 shared across a campus did not provide ideal speeds for the curriculum. Although Connect Arkansas had a wireless access point that it traveled with, it was not possible to get a cell signal in some of the more rural areas.
- The grassroots outreach efforts at festivals did not achieve the results Connect Arkansas had hoped. While it developed new promotional material, including branded flash drives, it did not achieve results to make the effort cost-effective. The efforts often required three days of staff travel. Connect Arkansas found that festival attendees were generally more interested in engaging in other festival activities.
- Healthcare facilities within smaller hospital networks had been slower to adopt telehealth than their counterparts that operate in larger networks. UAMS found that larger hospitals adopted quickly and assisted the smaller entities within their networks in employing the technologies.
- Delays associated with the CCI project prohibited UAMS from visiting facilities that had not yet received their telehealth equipment. During this time, UAMS concentrated its efforts on developing and providing online training opportunities.
- Since only a portion of state ISPs had volunteered to participate in the Broadband Incentives program, there were no discount options available for some applicants. Some providers opted not to offer incentives to avoid exposing pricing policies to competitors or to prevent current customers from switching to the lower-priced incentives.



## Section 6. Conclusions

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The EBAE project intended to increase broadband adoption, improve understanding, and foster sustainable economic development. The project emphasized the fundamentals of digital literacy and stressed the Internet's relevance and importance to encourage the population to adopt broadband. The three overarching themes of the project, digital literacy, online entrepreneurship, and access to telehealth services, were reflected throughout the project's programs. The grant addressed youth and adult education needs in the technological and healthcare arenas, along with entrepreneurship, in an effort to meet the following goals:

- **Increase technology use among Arkansans.** Over the course of the grant, broadband adoption increased in Arkansas, although it was not possible to determine how much of this change is attributable to the grantee.<sup>81</sup> To spur broadband adoption, the project provided digital literacy education and stressed the Internet's relevance and importance. Outreach campaigns emphasizing broadband's benefits as motivation to "get connected" generated substantial interest among residents. To facilitate low-income residents' adoption decision, Connect Arkansas offered low-cost computers and facilitated the promotion of ISPs that offered discounted service options. Through the grant, low-income families received a free refurbished computer and the digital literacy skills necessary to use the equipment. Survey results indicated that, after learning the educational benefits of broadband, obtaining basic digital literacy skills, and a free computer, the majority these families subscribed to broadband.<sup>82</sup>
- **Ensure that Arkansas is competitive in the new economy.** Connect Arkansas emphasized online entrepreneurship to foster sustainable economic development and help Arkansas succeed in an economy increasingly reliant on Internet-based technology. Entrepreneurial training for high school students supplemented state curriculum, teaching students to leverage Internet-based resources to develop and operate online businesses. An Internet-based business plan competition provided students with the opportunity to obtain professional feedback on unique for-profit businesses. Arkansas SourceLink supported Arkansas entrepreneurs and small business owners by aggregating resources to start and grow a business. A recently implemented training program for small business in rural communities assisted business owners in developing a web presence to complement their marketing strategies and expand their customer base with access to regional, state, and national markets.
- **Improve healthcare provision to Arkansans.** UAMS emphasized telehealth as a method of improving the provision of healthcare to residents located in rural or underserved areas of the state. UAMS developed telehealth resources and training material to enable medical facilities to maximize the benefit of the equipment and upgraded connectivity provided through the CCI grant. UAMS disseminated information and resources to enhance the public's awareness of the benefits of telehealth, encouraging the public to act as the impetus for providers to adopt and offer telehealth services. More than 900 users had completed the Telehealth 101 training program, acquiring a fundamental understanding of telehealth and the skills to use the equipment provided by the UAMS CCI grant.<sup>83</sup>

Connect Arkansas' streamlined operations and spending decisions resulted in unanticipated budget funds that were available as the project neared closeout. Connect Arkansas leveraged the remaining funds to implement three additional programs. Over the course of the grant implementation, Connect Arkansas identified additional areas of need within the state, including access to affordable broadband, technology training for small businesses, and digital literacy education for seniors. To address such needs, Connect Arkansas rolled out the Broadband Incentives and the ASBTDC programs:

- The Broadband Incentives program helped low-income state residents subscribe to broadband by identifying providers offering discount broadband service in each applicant's locality. Connect Arkansas facilitated the introduction and conversation between the applicant and provider by alerting each party of the other's existence. Connect Arkansas received twenty-two applications for low-cost service. Fifteen of those applicants had discount providers in their vicinity.<sup>84</sup>
- Connect Arkansas established a partnership with the University of Arkansas at Little Rock (UALR) ASBTDC to provide technology training for small businesses. Eighty-one small businesses completed training programs, learning to integrate the Internet and technological resources into business practices and marketing strategies.<sup>85</sup>
- Connect Arkansas plans to collaborate with UAM to implement a digital literacy training program for seniors. They will provide ninety-two training sessions in each of the fifty-seven SBA counties and thirty-three additional sessions in counties with the greatest demand. UAM will use a mobile training lab to host sessions in county libraries leveraging Wi-Fi, classroom space, and established relationships with community residents. This program was scheduled to start after the site visit.

Without the BTOP grant, it is unlikely that any of the outcomes above would have occurred. The programs described throughout this report did not exist before BTOP. Connect Arkansas, a two-person operation before BTOP, would not have had the funding or resources necessary to implement the services. Residents would not have had comparable access to digital literacy education, free and low-cost computers, supplementary entrepreneurship education for high school students, technology training for small businesses, online aggregation of resources for entrepreneurs and small businesses, or telehealth education and training. Connect Arkansas would not have implemented an outreach campaign to educate residents about the relevance of broadband, compiled a database of ISP coverage areas to assist residents in identifying broadband subscription options, or encouraged and facilitated the provision of low-cost broadband service for low-income families.

## Section 7. Next Steps for the BTOP Evaluation Study

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ASR will deliver *Interim Report 2* to NTIA in early 2014. This report will include a summary of the second round of case study visits to the fifteen PCC and SBA grants, allowing for an analysis of the impacts of the grants over time. *Interim Report 2* will also summarize the findings from case study visits to twelve CCI grants. These visits will take place in the fall of 2013 and result in a set of twelve case study reports delivered to NTIA over several months.

For the PCC and SBA projects, *Interim Report 2* will provide an update to and refinement of the analysis presented in *Interim Report 1*. For the CCI projects, *Interim Report 2* will summarize the activities underway by twelve CCI grantees and the impacts these projects intend to have on broadband availability and adoption for community anchor institutions, communities, and individuals.

There is a bill in the Arkansas legislature that, if passed, would provide funding for Connect Arkansas to carry out existing programs after the grant period. The funding would support expansion of the Connect Arkansas programs to all seventy-five state counties and would include the programmatic enhancements below:

- Connect Arkansas intends to develop and implement a digital literacy program for adults to reach the eighteen to fifty-five demographic.
- Connect Arkansas has not yet marketed its Broadband Incentives program while additional ISPs are being recruited to participate. They will use any additional funds provided to implement a more aggressive marketing campaign.

Additionally, Connect Arkansas will leverage remaining BTOP funds to implement the following enhancements to grant programs:

- Connect Arkansas will collaborate with UAM to introduce a digital literacy training program for seniors.
- Connect Arkansas will digitize the Entrepreneurship Curriculum to reach students throughout the state.
- UAMS is building version 2.0 of the project website. The new version will feature improved navigation, additional social media options, a message feature for enhanced communication between members, and a progress tracker to monitor user accomplishments. A map feature will track members' locations. UAMS will optimize the website and training courses for mobile use.
- Connect Arkansas will leverage a recently awarded grant to present the Entrepreneurship Curriculum to three Girl Scout troops in the state.
- Arkansas SourceLink is developing the "Venture Connect" and "Mentor Connect" programs. "Venture Connect" will facilitate relationships among Arkansas entrepreneurs and investors. "Mentor Connect" will match mentors with entrepreneurs and small businesses.
- Arkansas SourceLink will implement a new project, tentatively called "Arkansas Made." The project will create ten-minute vignettes of successful Arkansas entrepreneurs as a source of inspiration for the site's users. The videos will include business advice to new entrepreneurs.

In September 2014, ASR will deliver a *Final Report* that quantitatively and qualitatively measures the economic and social impact of BTOP grants (including CCI, PCC, and SBA). The centerpiece of the *Final Report* will be an assessment of how and to what extent BTOP grant awards have achieved economic and social benefits in areas served by the grantees. To the extent that such

information is available, results from studies performed by the grantees will round out the conclusions presented.

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# Glossary

Acronym	Definition
ACCG	Arkansas Capital Corporation Group
ACF	Arkansas Community Foundation
ACT	Arkansas Center for Telehealth
AEAF	Arkansas Economic Acceleration Foundation
APR	Annual Performance Progress Report
ASBTDC	Arkansas Small Business and Technology Development Center
ASL	Arkansas State Library
ASR	ASR Analytics, LLC
ATA	American Telemedicine Association
AUTIS	Arkansas Users of Telecommunications and Information Systems
BTOP	Broadband Technology Opportunities Program
CCI	Comprehensive Community Infrastructure
CNE	Continuing Nursing Education
DECA	Distributive Education Clubs of America
DSL	Digital Subscriber Line
EAST	Environmental and Spatial Technology
EBAE	Expanding Broadband Use in Arkansas through Education
FBLA	Future Business Leaders of America
FCC	Federal Communications Commission
FTE	Full-time equivalent
GED	General Equivalency Degree
HTML	HyperText Markup Language
ISP	Internet Service Provider
LRSD	Little Rock School District
MOOC	Massive Online Open Course
NTIA	National Telecommunications and Information Administration
PCC	Public Computer Center
PPR	Quarterly Performance Progress Report
SBA	Sustainable Broadband Adoption
SBDD	State Broadband Data and Development
SCTRC	South Central Telehealth Resource Center

<b>Acronym</b>	<b>Definition</b>
SCTRF	South Central Telehealth Resource Forum
UALR	University of Arkansas at Little Rock
UAM	University of Arkansas at Monticello
UAMS	University of Arkansas for Medical Sciences
UTAUT	Universal Theory of Acceptance and Use of Technology

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