

ANNUAL PERFORMANCE PROGRESS REPORT FOR SUSTAINABLE BROADBAND ADOPTION

General Information

1. Federal Agency and Organizational Element to Which Report is Submitted Department of Commerce, National Telecommunications and Information Administration	2. Award Identification Number 06-43-B10584	3. DUNS Number 047120084
4. Recipient Organization University of California, Davis 1850 Research Park Drive, STE 300, Davis, CA 95618		
5. Current Reporting Period End Date (MM/DD/YYYY) 12-31-2014	6. Is this the last Annual Report of the Award Period? <p style="text-align: center;"> <input checked="" type="radio"/> Yes <input type="radio"/> No </p>	
7. Certification: I certify to the best of my knowledge and belief that this report is correct and complete for performance of activities for the purposes set forth in the award documents.		
7a. Typed or Printed Name and Title of Certifying Official Paula Noble	7c. Telephone (area code, number and extension)	
	7d. Email Address pnoble@ucdavis.edu	
7b. Signature of Certifying Official Submitted Electronically	7e. Date Report Submitted (MM/DD/YYYY): 07-30-2014	

PROJECT INDICATORS

1. Does your Sustainable Broadband Adoption (SBA) project foster a particular broadband technology or technologies? If so, please describe this technology (or technologies) (600 words or less).

For healthcare providers to effectively participate in a technology-enabled healthcare system, a reliable and cost effective broadband infrastructure must be developed and sustained. California coordinated multiple, funded initiatives to further the reliance on broadband applications, particularly in rural/low income regions, including health records, telehealth, distance education, e-prescribing, home monitoring, and health information exchange that collectively establish a sustainable business model for providers, insurers, and consumers.

Access to Broadband Network: The California Telehealth Network (CTN) broadband architecture is comprised on an Internet Protocol (IP)-based, Multi Protocol Label Switching (MPLS) routed Virtual Private Network (VPN) with explicit quality of service, privacy and security. It incorporates a high speed, high capacity fiber core network that connects to multiple Incumbent Local Exchange Carrier/Competitive Local Exchange Carrier (ILEC/CLEC)/ provider-based landline local loop services. Access to external networks is provided through peering points with various regional, statewide and national network service providers. CTN provides state-of-the art, peer to peer, MPLS, broadband services to health care sites (predominately rural and many serving low income consumers), county health offices and academic health centers throughout California and is operated by a vendor, selected through a competitive bid process.

Model eHealth Communities: The 15 Model eHealth Communities (MCs), established in the first year of the grant, implemented a wide range of broadband dependent eHealth technologies including: telemedicine, distance learning opportunities for healthcare providers and emergency services personnel, remote patient monitoring, consumer health courses, computer health literacy trainings, interpreting services, secure eConsults between primary care providers and specialists for patients at safety net clinics, and connections between clinics and community resource centers.

Comprehensive eHealth Adoption Training: The comprehensive training partnership was an innovative collaboration between academia, community-based educators, instructional design experts and tribal representatives. The curriculum designed to support the transition to technology-enabled health and health care included content for the following on-site and on-line courses: Change Management; Broadband Adoption; CTN Broadband Orientation; EHR/HIE Adoption; Telehealth; Consumer Health Informatics and Clinical Health Informatics. The curriculum was also leveraged for consumer education through public libraries, and community colleges as well as adapted for a web based health kiosk portal (ExploreHealth) to assist consumers accessing health information via the internet.

2a. Please list all of the broadband equipment and/or supplies you have purchased during the most recent calendar year using BTOP grant funds or other (matching) funds, including any customer premises equipment or end-user devices. If additional space is needed, please attach a list of equipment and/or supplies. Please also describe how the equipment and supplies have been deployed (100 words or less).

Manufacturer	Item	Unit Cost per Item	Number of Units	Narrative description of how the equipment and supplies were deployed
N/A	N/A	0	0	No equipment or supplies were deployed in 2014.
Totals		0	0	

Add Equipment

Remove Equipment

2b. To the extent you distribute equipment/supplies to beneficiaries of your project, please describe the equipment/supplies you distribute, the quantities distributed, and the specific populations to whom the equipment/supplies are distributed (600 words or less).

No equipment was distributed in 2014.

3. For SBA access and training provided with BTOP grant funds, please provide the information below. Unless otherwise indicated in the instructions, figures should be reported cumulatively from award inception to the end of the most recent calendar year. For each type of training (other than open access), please count only the participants who completed the course.

Types of Access or Training	Number of People Targeted	Number of People Participating	Total Training Hours Offered
Open Lab Access	11,700	24,512	0
Multimedia	0	0	0
Office Skills	0	0	0
ESL	0	0	0

Types of Access or Training	Number of People Targeted	Number of People Participating	Total Training Hours Offered
GED	0	0	0
College Preparatory Training	0	0	0
Basic Internet and Computer Use	0	0	0
Certified Training Programs	0	0	0
Other (please specify): Telehealth Clinical Implementation Training; In-person eHealth Resources for Library Staff	18,045	8,836	2,102,823
Total	29,745	33,348	2,102,823

4. Please describe key economic and social successes of your project during the past year, and why you believe the project is successful thus far (600 words or less).

Access to Broadband Network: The award continued to increase the momentum and growth for California Telehealth Network (CTN). At the close of 2013, CTN reported successfully activated broadband connectivity to 795 sites. A reconciliation of the logical connections site list provided by the Indian Health Services (IHS), conducted in January 2014, identified duplicated site listings. As a result of this adjustment, the total number of activated sites at the close of the project period (March 2014) was 775. The CTN successfully activated broadband connectivity to these 775 sites through participation in the Federal Communications Commission (FCC) Rural Health Care Pilot Program (RHCPP), including 503 logically connected sub network sites through partner organizations such as the Corporation for Education Network Initiatives in California (CENIC)/University of California sites, California Rural Indian Health Board (CRIHB) and Indian Health Services (IHS). As a result of these interconnections, CTN is now in discussions with IHS and CRIHB regarding the provision of CTN cloud based software offerings to IHS and CRIHB sites. Although CTN fell short of the BTOP original 863 site goal as a result of the reconciliation adjustments and other USAC and vendor related delays, over the course of the grant window an increasing number of CTN sites requested higher capacity circuits than originally envisioned. As a result, the total amount of bandwidth funded through the RHCPP exceeded the original assumptions by 13%. CTN is the largest single state participant in the RHCPP based on site enrollment and is viewed as a best practice model by the FCC. CTN has now fully encumbered its total \$22.1 million FCC RHCPP award and is now making preparations to launch the FCC's Healthcare Connect Fund as the successor and permanent broadband subsidy for safety net health care providers.

Model eHealth Communities: The Model eHealth Community (MC) awards concluded on June 30, 2013. Key accomplishments reported by Model eHealth Community partners include: improved access and timely specialty care for consumers; improved quality of care through physician to physician consultation; provider satisfaction improvements through better care coordination and access; improved consumer experience and engagement in health and health care; improved access to interpreters and multi-lingual health education; increased efficiency and availability of health care training through access to video-conferencing and distance learning opportunities for new and current work force; sustained partnerships to continue eHealth expansion and solve other challenges; improved consumer health literacy and use of eHealth through training of local librarians and other community resource leaders. The lessons learned and key accomplishments are documented in a Compendium available to the public on the UC Davis Center for Health and Technology web site.

Comprehensive eHealth Training: Education and training is a key factor for successful eHealth adoption. The extensive content made possible by this BTOP award is unprecedented in that it spans beyond telehealth and meets the needs of learners from multiple disciplines. Providers, as well as technical staff and consumers, have been engaged as follows: workforce development through community college eHealth curriculum content; in-person and on-line eResources trainings for library staff and other community service workers; consumer health education kiosks to support health care literacy via broadband and telehealth implementation trainings for clinic staff. The majority of these trainings are available online, allowing participants to access training materials remotely. In addition, all training has been made available at no charge to learners.

5. Please estimate the level of broadband adoption in the community(ies) and/or area(s) your project serves, explain your methodology for estimating the level of broadband adoption, and explain changes in the broadband adoption level, if any, since the project began.

5a. Adoption Level (%):	Narrative description of level, methodology, and change from the level at project inception (600 words or less).

<p>5a. Adoption Level (%):</p>	<p>Narrative description of level, methodology, and change from the level at project inception (600 words or less).</p>
<p>0</p>	<p>Measuring the level of adoption is not applicable for this project. The project is health focused and the metrics for broadband adoption relating to the California Telehealth Network (CTN) differ from those noted above. As stated in the original proposal, funding from the Federal Communications Commission (FCC) was estimated to allow enrollment of 863 Community Anchor healthcare sites to the CTN for medical grade, secure access. Of these 575 will be medical and healthcare providers, 262 will be public safety entities, and 26 will be institutions of higher education. In addition to these healthcare sites, 55 community colleges and 480 libraries will be involved with the eHealth Training component. At the end of March 2014, the total number of anchor sites involved with the project is 1,363. In addition to the 775 CTN sites, 135 sites (76 unique anchor sites) were involved through the Model Community initiative. These sites include libraries, institutions of higher education, government and public safety facilities as well as non-profit organizations and tribal and non-CTN healthcare providers. An additional 292 anchor sites participated in training activities for public libraries, community college and other consumer health organizations; 40 unique sites had the ExploreHealth kiosk installed; 31 community colleges (unique sites) incorporated eHealth course content into existing curriculum and participants from 149 unique sites accessed the continuing education courses for registered nurses.</p>
<p>6. Please describe the two most common barriers to broadband adoption that you have experienced this year in connection with your project. What steps did you take to address them (600 words or less)?</p> <p>Site education on the benefits of broadband and providing the required technical and operational support to enable the sites to install and effectively utilize the services continue to be the most common barriers to broadband adoption. Developing a sustainable business model continues to be one of the biggest challenges that health care organizations face in adopting telehealth. Technical assistance and hands-on telehealth equipment and operations trainings were offered through the California Telehealth Resource Center.</p> <p>As stated in the original proposal, funding from the FCC was estimated to allow enrollment of 863 anchor health care sites to the CTN for medical grade, secure access. Although the CTN was not able to reach this goal during the project period, CTN plans to reach this site goal in the future by diversifying the types of broadband connections to include encrypted cloud based video conferencing platforms that will accelerate the pace and lower the cost of medical grade deployment. These solutions will also enable mobile broadband devices to be used in a secure fashion.</p>	
<p>7. To the extent that you have made any subcontracts or sub grants, please provide the number of subcontracts or sub grants that have been made to socially and economically disadvantaged small business (SDB) concerns as defined by section 8(a) of the Small Business Act, 15 U.S.C. 647, as modified by NTIA's adoption of an alternative small business size standard for use in BTOP. Please also provide the names of these SDB entities. (150 words or less)</p> <p>No contracts with SDB entities were initiated.</p>	
<p>8. Please describe any best practices / lessons learned that can be shared with other similar BTOP projects (900 words or less).</p> <p>Successful implementation of the California Telehealth Network (CTN) to a diverse and large number of sites within a wide-ranging geographic area requires active leadership involvement and participatory collaboration with other organizations. The CTN leadership continues to work in a collaborative fashion to share best practices with other RHCPP participants from other states, and health care leaders throughout the State to ensure responsive and successful broadband and telehealth adoption. As an example of powerful collaborations, CTN consolidated operations with the HRSA funded California Telehealth Resource Center (CTRC). CTN, CTRC and their contractors are in a unique position to assess broadband and telehealth readiness as broadband connections are installed. The CTN/CTRC consolidation enables better coordination of staff resources based on individual health care provider needs. CTN and the CTRC have also effectively pooled resources from multiple funding sources including the FCC, HRSA, United HealthCare, and this grant to meet the needs of safety net health care providers.</p> <p>The Model eHealth Communities project has provided an opportunity to glean a number of important lessons regarding the challenges that healthcare organizations in particular face in adopting broadband technology. An underappreciated feature of telehealth visits is the quality improvement that results when primary care providers, patients and specialty providers participate together in the visit. There is real-time coordination of next steps, questions are asked and answered efficiently, and primary care providers learn about management of the condition.</p> <p>Model Communities implemented a number of innovative consumer eHealth applications including:</p> <ul style="list-style-type: none"> • health education video workshops on healthy aging and training for non-English speaking seniors on how to access health information in their language; • remote patient monitoring of vital signs; • breast cancer support groups connecting participants and leaders over multiple geographies; • interpreter services via video conference; and, • eligibility determination by video conference (tele-eligibility) for public benefits. 	

Simultaneous technology implementations competed for limited IT capacity in many sites and made solving problems such as network configuration and firewall issues a difficult bottle neck. Many hospitals and clinics are in the midst of implementing EHR, which consumes significant time and resources and communities report that EHR efforts typically were viewed as a higher priority than new telehealth activities.

Implementation requires navigating technology and facility issues for each location. Firewalls, network configuration, space limitations and assessment of what telehealth equipment is needed require time commitment and creative problem solving by staff in the host site. Many health care entities are small and lack dedicated IT staff with the expertise to accurately assess equipment needs and solve technical barriers. As the initiative progressed, technical assistance was strengthened and gained traction to great advantage. Champion efforts to encourage clinician participation relies on the right messenger who is able to help providers overcome discomfort with technology, understand and address work flow changes and convey the details of how to conduct a clinical visit when one provider must rely on another for the hands-on aspect of the visit.